

# AASHTO BrM User Manual 5.2.1

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## Getting Started with BrM

*Our agency has received a copy of the new BrM Installation CD, and we want to know how to get started with the system. What can this software do for us? What has changed since the last version? How do we install it? How do we get our data into it? How can it be customized for our particular needs? Where do we look for more information? Which functions are supported by which version?*

The BrM User's Manual is organized to include content for using BrM. This chapter provides an overview of the BrM bridge management system, and describes the steps involved to install the system, load data, and set common configuration options. It presents a workflow chart which shows the sequence of activities for using BrM. It concludes with a guide on where to look in the documentation for help on using specific features of the system.

## 1.1 What is BrM?

### Overview

BrM is a comprehensive bridge management system. It can assist agencies in allocating scarce resources to protect existing infrastructure investments, ensure safety and maintain mobility. It stores inventory and inspection information about an agency's bridges, culverts and other structures, and provides a rich set of modeling and analysis tools to support project development, budgeting and program development. It helps an agency to formulate network-wide preservation and improvement policies for use in evaluating the needs of each structure in a network, and makes recommendations for what projects to include in an agency's capital plan. It also provides the capability to analyze the impact of different project alternatives on the performance of individual structures and on a network of structures. Agencies can use BrM to define and schedule projects for individual structures, or for groups of structures.

Agencies can choose to make use of all of the features of BrM, or selected portions of the software. For example, some agencies use BrM for inventory and inspection data management only; others use BrM for modeling and needs analysis only.

BrM (originally called Pontis) was originally developed in 1989 for the FHWA. The software is currently licensed through the American Association of State Highway and Transportation Officials (AASHTO) to over 50 state Departments of Transportation and other agencies. BrM is one product in the AASHTO BRIDGEWare<sup>®</sup> product suite. Other products in the suite include Virtis<sup>®</sup>, used for load rating of bridges, and Opis<sup>®</sup>, used for bridge design. BrM is designed to operate as a standalone product or together with Virtis and Opis using an integrated BRIDGEWare database.

### Software Characteristics

BrM is a web application that can be installed on a web server using Microsoft's Internet Information Services (IIS) to serve BrM over the web. BrM can also be installed on the desktop because the Workstation version of BrM comes with the Cassini Web server which can run locally.

BrM can be configured in the following ways:

- **Workstation** – this configuration, sometimes known as “Stand-alone,” has both the database and the application on a local computer. BrM uses the Cassini web server to allow BrM to run locally and to look and feel like a desktop application.
- **Client-Server** - this configuration is a multi-user configuration, with the database installed on a server and the application installed on several client computers. For BrM, this means that separate installations of BrM Workstation are installed on different computers and all speak to the same database on a separate server.

- **Server** – this configuration, sometimes known as a “thin-client” configuration, consists of BrM installed on a web server, with clients (users) connecting to BrM via Internet Explorer. In this configuration, the database is usually on a separate database server and which is in communication with the web server.

Versions 4.x was developed in a combination of Sybase PowerBuilder 9 and Microsoft Visual C++. Versions 5.x was developed in Microsoft Visual Studio against the .NET Framework, using C# as the programming language. Both versions’ database management functions use Microsoft Open Data Base Connectivity (ODBC) to allow for use of different database technologies and to facilitate integration with enterprise databases. Version 4.x supports Oracle 9i, Sybase Adaptive Server Anywhere 8 and 9, and Microsoft SQL Server 2000 databases. Version 5.x supports Oracle 10g, Oracle 11g, Oracle 10g Express, Microsoft SQL Server 2005, Microsoft SQL Server 2008, Microsoft SQL Server 2005 Express, and SQL Server 2008 Express databases.

The reporting features of Version 4.x were developed using the Sybase InfoMaker application. An InfoMaker license is distributed to each version 4.5 licensee in order to provide the capability to develop custom reports and screens. Version 5.x now makes use of Crystal Reports as its primary reporting Engine.

## Major Functions

BrM supports the entire bridge management life cycle, including:

*Inventory:*

- ✓ Establishing an accurate inventory of structure information
- ✓ Integration and data exchange with existing enterprise information systems

*Inspection:*

- ✓ Scheduling and conducting structure inspections
- ✓ Entering inspection data
- ✓ Importing data from external inspection data collection systems
- ✓ Producing required National Bridge Inventory (NBI) files
- ✓ Producing Structure, Inventory and Appraisal (SI&A) and other inspection reports

## BrM Modules

BrM is organized into seven modules:

The **Inspection Module** - is used to maintain inventory and inspection information about structures.

The **Results Module** - is used to view graphical reports on the predicted network costs and performance associated with different scenarios and programs of projects.

The **Gateway Module** - is used to import and export data between BrM and other systems.

The **Configuration Module** - is used to customize BrM according to the needs of individual agencies.

## BrM Work Flow

The following figure provides an overview of how BrM can be used for bridge management. For each activity in the work flow, a reference to the relevant User's Manual section(s) is provided. For BrM installations, the relevant activity contains a reference to the *BrM Installation Guide* which is on the BrM installation disk and is also installed with BrM.

The block on the top right of the figure contains a legend explaining the figure. The block at the top left of the figure contains activities related to initial installation and configuration of BrM. The lower block is concerned with ongoing use of BrM. Each activity is assigned a letter for reference purposes, and to provide a general indication of the sequence of steps for using BrM.

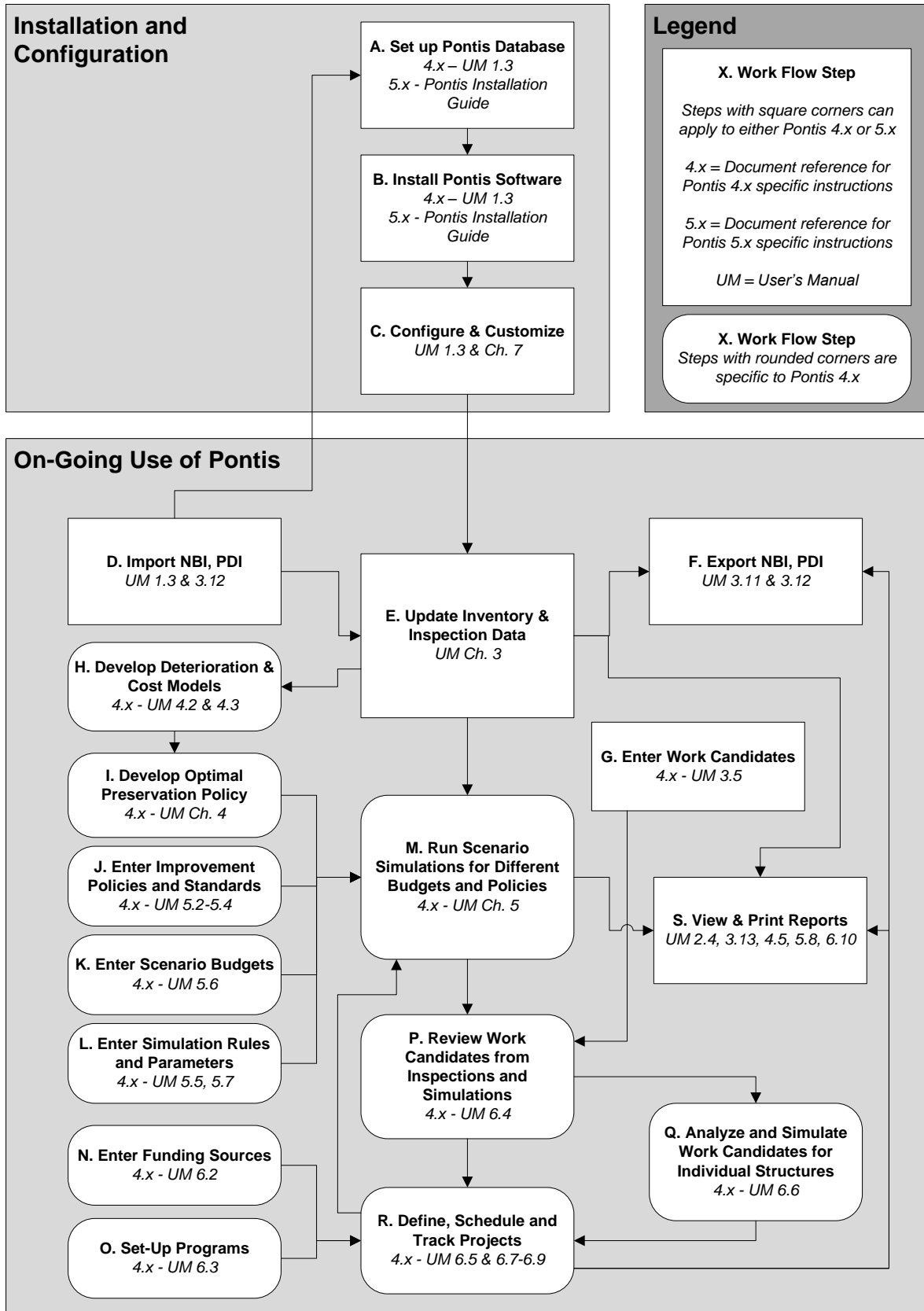
Major clusters of activity are:

**A-C: System Setup.** This cluster includes installing the system, setting up a database, and configuring and customizing the system to add custom structure elements, custom data items, screens, forms and reports. Activity D – *Import NBI, PDI* may be used to set up an initial database.

**D-G: Inventory and Inspection.** This cluster includes updating inventory information, planning and conducting inspections, entering inspection data and entering recommended work candidates into BrM. These activities may involve importing data from field computers running BrM or external inspection data programs, producing NBI files, and exporting data from BrM into other systems. Data import and export activities are included here because this is where most agencies will use them. However, these are generic capabilities that may be used in support of other activities. The arrow from Activity R – *Define, Schedule and Track Projects*, to Activity F - *Export NBI, PDI, XML* indicates that many agencies will want to export project information from BrM for use in other systems.

**S. Reporting.** This is a general utility available at any point in the BrM workflow process. However, it will most commonly be used to support the inspection, scenario analysis and project development activities (labeled E, M and R respectively).

BrM Work Flow Overview







## 1.2 What's New in Version 5.x

The most significant changes for BrM Version 5.x are:

- **Conversion to a Web Application:** BrM 5.x is a web application that can be installed to work with either the BrM 5.x Cassini standalone web server or the Microsoft Internet InformationServer (IIS).
- **Migration of Inspection Reports to Crystal Reports:** Inspection and Configuration reports have been converted to Crystal Reports.
- **Navigation:** Improvements have been made to the overall layout of the screens and navigation between modules. In the inspection module, data has been consolidated into fewer screens to aid in navigation. NBI item numbers are indicated with red to make them easier to find.
- **New Grid List** – The Structure List has been improved to allow more user customization for columns and grid layouts.
- **Bridge Images Pane** – Added to the Bridge List screen to display multimedia documents such as inspection photographs for the currently selected bridge in the Structure List.
- **Bridge Details Pane** – Added to the Bridge List screen to display a summary of the latest NBI inspection data for the currently selected bridge in the Structure List. The inspection data is organized into five tabs: Condition, Load Rating, Inventory, Roadway on, and Schedule.
- **Navigation and Field Level Security** – BrM 5.x enables agencies to create new custom screens from within BrM and integrate them with the standard BrM screens. You can also add new agency tabs to host non-inspection task screens, configure role based security for standard and agency task screens, configure navigational security for standard and agency task screens, and customize standard BrM 5.x inspection screens.

## 1.3 System Installation and Data Loading Overview (Version 5.x)

This section provides an overview of the system installation and setup process. More information is included in Chapter 1 of the BrM *Technical Manual*, but the majority of BrM 5.x installation information has been moved to the *BrM Installation Guide*. Users are encouraged to use the new *BrM Installation Guide* due to many combinations of installation possibilities. The guide is available on the BrM installation disk or in the BrM installation directory. For details concerning how to integrate BrM with Virtis and Opus, refer to the *BRIDGEWare Startup Guide* published separately.

The following steps are necessary to get started with BrM:

- Install the software
- Set up a BrM 5.x database for your agency
- Configure and customize the system

Each of these steps are reviewed below.

### Installation Procedure

Select an installation type by opening the BrM Installation Guide and clicking on *BrM Installation and Configuration > Start Installation Process Here > Select an Installation*. From here, look at the installation matrix to help you decide what type of installation you need and click on the proper links to find instructions for your installation type. The installation matrix also provides instructions for users who have previous installations of BrM.

### Getting Data into BrM

#### For Existing Users of BrM

Please refer to the BrM Installation Guide. Click on *BrM Installation and Configuration > Start Installation Process Here > Select an Installation*. Find your current installation type and click on the link (in the column labeled “Recommendations and Installation Links”) that refers to an *Existing BrM Database*. Follow the instructions you see after clicking the link.

#### For New Users of BrM

If you have not yet brought any data into BrM, there are several ways for getting data into the system:

- Loading an NBI file to bring in basic inventory data.
- Preparing and importing a Pontis Data Interchange (PDI) file, which is an ASCII text file with a specially designed format (see the *Technical Manual* for further information).

- Preparing a set of custom database scripts or pipelines to move information from existing databases into BrM. (This should be done by your system administrator, using BrM database documentation in the *Technical Manual*).
- Using the BrM data entry screens to manually input the data.

Procedures for loading NBI<sup>1</sup> and PDI files into BrM are described below. Chapter 3 provides instructions on how to enter inventory and inspection information into BrM.

**To Load an NBI file into BrM:**

1. Refer to the *BrM Installation Guide* and click on *BrM Installation and Configuration > Start Installation Process Here > Post-Installation Configuration > Importing Sample Data*.
2. Get into BrM and select the **Gateway** tab.
3. Click the **Import** task. The **Import Data** screen will appear.
4. Select “NBI File” from the *Import What?* list.
5. Use the **Browse** button to navigate to the path and file name for the NBI file you wish to import.
6. If you already have data in your database that you want to update, be sure that the *Update Only* option is checked. When checked (the default), the NBI data loading procedure will update data in the existing bridge table. If you have data that you want to completely replace, de-select the *Update Only* option. If *Update Only* is not selected, all structures in the table will be deleted before the new NBI data is loaded.
7. If the *Always Create New Inspections* option is checked (the default), new inspections will be created for all imported structures, even if inspections already exist for those structures. Inspection data will need to be entered into the new records. If this option is not selected, the most recent inspection for each bridge will be updated.
8. If the *Update and Create Inspection As Needed* option is checked (the default), then the BrM will update the existing inspection only if an inspection is found with a matching date, otherwise a new inspection is created.
9. If the *Do Not Update or Create Any Inspections* option is checked, then inspection data will not be updated or created, unless a new bridge is inserted.
10. Select either the *Metric* or *English* radio button depending on the unit of measure used in your data.
11. Click **Import**.

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<sup>1</sup> See Appendix B for a description of the NBI file format and a guide to where each NBI item is located on the BrM data entry screens.

12. You will see a message that the import is running.
13. At the end of the import you will be informed whether the import succeeded or not.
14. Click on the **Bridges** tab and click on the relevant bridges to verify that the data was imported as expected.

**Note:** See the *Technical Manual* for information on how NBI data fields are converted to BrM fields.

### To Import a Pontis Data Interchange (PDI) File:

PDI files can be created by exporting data from BrM in PDI format. In addition, the PDI format is well-documented (in the *Technical Manual*) so that other systems can be programmed to produce PDI files for import into BrM.

**Note:** You will not be able to import most PDI files generated from one version of BrM into another version of BrM, as the database structure will likely have changed.

1. Get into BrM and select the **Gateway** tab.
2. Click the **Import** task. The **Import Data** window will appear.
3. Select “Pontis Data Interchange File” (PDI) from the *Import What?* list.
4. Use the **Browse** button to navigate to the path and file name for the BrM 5.x PDI file you wish to import.
5. Click **Import**.
6. You will see a message that the import is running.
7. At the end of the import you will be informed whether the import succeeded or not.
8. Verify that the data was imported as expected.

### A Note on Missing Values

When you view records that you have imported into BrM, you will notice missing values in various fields. This is to be expected – these fields have missing values because they have no counterpart fields in your data source from which to draw data. Missing values appear as negative numbers (usually -1), symbols such as #, \_ or @, labels such as “Unknown,” or the date 01/01/1901. Missing values can either be ignored (if the data elements are not used), filled in manually in the data entry screens (see Chapter 3), or filled in with defaults via SQL scripts or with BrM formulas (see Chapter 7 and the *Technical Manual* for instructions on the BrM formula feature.)

## Configuration and Customization

The following are common configuration and customization steps:

- Customize contents of the pick lists (parameters);
- Supplement the BrM database with agency data items;
- Develop custom data entry screens;
- Develop custom reports;
- Develop custom structure lists; and
- Add/Modify structure element definitions.

While none of these steps are required for using BrM, all users will want to customize pick lists to show the appropriate listings of districts, administrative areas, counties, and census place codes. The procedure for doing this is described below. Other configuration and customization options are described in Chapter 7, or in the *Technical Manual*.

Note: if you have developed custom forms for Version 4.x, these forms will not function in the Pversion 5.x environment due to fact that version 5.x is now an ASP.NET web application. Also, reports created for version 4.x, i.e., reports created using InfoMaker, will no longer work in version 5.x as it now uses Crystal Reports for the reporting engine.

### Creating Parameters

The BrM database includes a parameters table which stores allowable values for different database columns, including important location categories such as counties, census place codes, districts, and administrative areas. Information in this table is used to create pick lists for certain fields, and for data validation.

Parameter values can be manually modified in a data entry screen.

#### To manually edit parameter values:

1. Select the **Admin** tab.
2. Select the **Parameters** task.
3. From the **Parameters** window, select the *Table Name* and *Field Name* that you will be updating. To find out the name of a field on any BrM data entry screen or structure list, hover over the field or, in the case of pick lists, over the field's label. The table and column names and the characteristics of the field will be displayed.
4. Make changes or additions in the **Parameter Values and Labels** window.

5. Save additions and changes by clicking on the **Save** button in the lower left-hand corner of the window.

### Importing Parameters

This section describes how to import parameters from a text file in PDI format.

#### To create parameter value lists to import:

**Example:** You want to import lists of counties in your state.

1. Copy the \BrMModules\Agency\_Import\_PARAMTRS\_Template.pdi file from Disk 3 to another location where you can edit it. Since you are copying from a DVD, please make the file editable by removing its read-only status.
2. Open the copied file in notepad or some other text editor that can save in text format.
3. Look at the section that describes the structure of the parameters table. It looks like this:

```
TABLE paramtrs    DATE(YYYY/MM/DD)

    COLUMN table_name
    COLUMN field_name
    COLUMN parmvalue
    COLUMN shortdesc
    COLUMN longdesc
    COLUMN misvalflg
    COLUMN helpid

END DEFINITIONS
```

4. The section lets you know that this PDI file is concerned with a table called **paramtrs** and will have several columns, beginning with **table\_name** and ending with **helpid** .

5. Look at the text below the BEGIN DATA section that looks like this:

TABLE PARAMTRS

"bridge"

"county"

"089"

"Sanders"

"-1"

" \_ "

"-1"

TABLE PARAMTRS

"bridge"

"county"

"081"

"Ravalli"

"-1"

" \_ "

"-1"

6. There are two separate data entries here, and each is formatted using the same structure as described above. The first data entry will put **bridge** in the **table\_name** column and **county** in the **field\_name** column, etc.
7. The columns are used as follows:
- a. **table\_name** – lists the table that contains the coded value you are storing that needs to be looked up in the paramtrs table. In our example, we are importing counties, and the coded value for a county is stored in the bridge table, so the value of the **table\_name** field would be **bridge**.
  - b. **field\_name** – lists the field (column) name of the coded value you are storing that needs to be looked up in the paramtrs table. In our example, we are importing counties, and the coded value for a county is stored in the **county** field of the **bridge** table, so the value of the **field\_name** field would be **county**.



- c. parmvalue – lists the code that matches the value stored in the table and column referenced in the two fields above. To continue the example, a county named **Sanders** has a parameter value of **089**. The value **089** is stored in the field named in the **field\_name** field and that matches the value stored in the **parmvalue** field of the paramtrs table.
  - d. shortdesc – a short description that gives meaning to the value in the **parmvalue** field. To continue our example, the name of the county, **Sanders**, would be stored in the **shortdesc** field because it is the readable value that matches the parmvalue of **089**.
  - e. longdesc – this field can store a longer description of the parameter value if desired, but is usually just left blank which is signified by the value -1. In our example, Sanders gives complete meaning to the county name so there is no need to give a long description.
  - f. misvalflg – this field is used to deal with missing values. This field can be just stored as "\_"
  - g. helpid – stores a link to a help file. This is really only used in previous versions of BrM and should be just -1.
8. To add county names to the pdi file, just simply copy the sections beginning with TABLE PARAMTRS, making sure you get all the text up to the next TABLE PARAMTRS heading. Edit the values of the parmvalue and shortdesc entries (the table\_name and field\_name values will stay the same in this example since all your county names will reference the same table and field name). You will need one TABLE PARAMTRS entry for every county in your state.

#### To import parameter values:

1. Get into BrM and select the **Gateway** tab.
2. Click on the **Import** task. The **Import Data** screen will appear.
3. Select **BrM Data Interchange File (PDI)** from the *Import What?* Drop-down list.
4. Use the **Browse** button to navigate to the path and file name for the pdi file you created above.
5. Click **Import**.
6. At the end of the import you will be informed whether the import succeeded or not.
7. Go to the **Admin** tab and the **Parameters** task and check the values of the appropriate field name for the parameter just imported to verify the new values imported correctly.

## 1.4 Documentation Guide

BrM documentation consists of this *User's Manual*, the *Technical Manual*, and the *On-Line Help System*. This *User's Manual* provides instructions on using each of the BrM screens. It is intended to serve as a self-contained reference for most BrM users. The *Technical Manual* provides in-depth coverage of the BrM analytical and modeling framework and algorithms, and contains advanced information on system installation, configuration and customization, and database design. The *On-Line Help System* includes the same material that is in the *User's Manual*, supplemented by reference information on each BrM database table and field.

The following table provides a guide to where to look for further information on setting up and using BrM.

| Topic                  | For Information On...                          | See...  |
|------------------------|--|---|
| Installation and Setup | Minimum System Requirements                    | BrM_Installation_Guide.chm<br>User Manual – Chapter 1<br>Technical Manual – Chapter 1 |
|                        | Installation: Basic                            | BrM_Installation_Guide.chm<br>User Manual – Chapter 1                                 |
|                        | Installation: Advanced                         | BrM_Installation_Guide.chm<br>Technical Manual – Chapter 1                            |
|                        | Database Migration from Prior Version of BrM   | BrM_Installation_Guide.chm  |
|                        | Database administration/security               | Technical Manual – Chapter 2  |
|                        | Establishing an Integrated BRIDGEWare Database | BRIDGEWare Startup Guide  |
|                        | Integration with other applications and data   | Technical Manual – Chapters 2 and 3   |
|                        | Customizing pick lists                         | User Manual – Chapter 1   |
| User Interface         | Login Procedure                                | User Manual – Chapter 2   |
|                        | Toolbars and Menus                             | User Manual – Chapter 2   |
|                        | Finding and Selecting Structures               | User Manual – Chapter 2   |
|                        | Viewing and Printing Reports                   | User Manual – Chapter 2   |
| Inventory/ Inspection  | Inventory/Inspection Data Input                | User Manual – Chapter 3   |
|                        | Calculating NBI and Sufficiency Ratings        | User Manual – Chapter 3   |

| Topic         | For Information On...   | See...                       |
|---------------|---|------------------------------|
|               | Performing Data Validation  | User Manual – Chapter 3      |
|               | Preparing NBI Files   | User Manual – Chapter 3      |
|               |   |                              |
|               | Preservation Cost and Deterioration Models                        | User Manual – Chapter 4      |
|               | Health Index Targeting  | User Manual – Chapter 4      |
|               | Improvement Standards, Costs and Benefits                         | User Manual – Chapter 5      |
|               | Running a Needs Analysis  | User Manual – Chapter 5      |
|               | Entering Rules Governing BrM Work Recommendations                 | User Manual – Chapter 5      |
|               | Defining Flexible Actions   | User Manual – Chapter 7      |
|               |   |                              |
|               | Creating and Updating Projects                                    | User Manual – Chapter 6      |
|               | Simulating Project Impacts  | User Manual – Chapter 6      |
|               | Ranking/Prioritizing Projects                                     | User Manual – Chapter 6      |
| Customization | Customizing Structure Elements and Actions                        | User Manual – Chapter 7      |
|               | Adding new data items to BrM                                      | Technical Manual – Chapter 2 |
|               | Developing custom structure lists, data entry screens and reports | Technical Manual – Chapter 3 |
|               | Customizing database management parameters                        | Technical Manual – Chapter 2 |
|               | Customizing user interface labeling / localization                | Technical Manual – Chapter 3 |
|               | Customizing user interface parameters                             | Technical Manual – Chapter 3 |
|               | Customizing simulation and modeling parameters                    | Technical Manual – Chapter 4 |

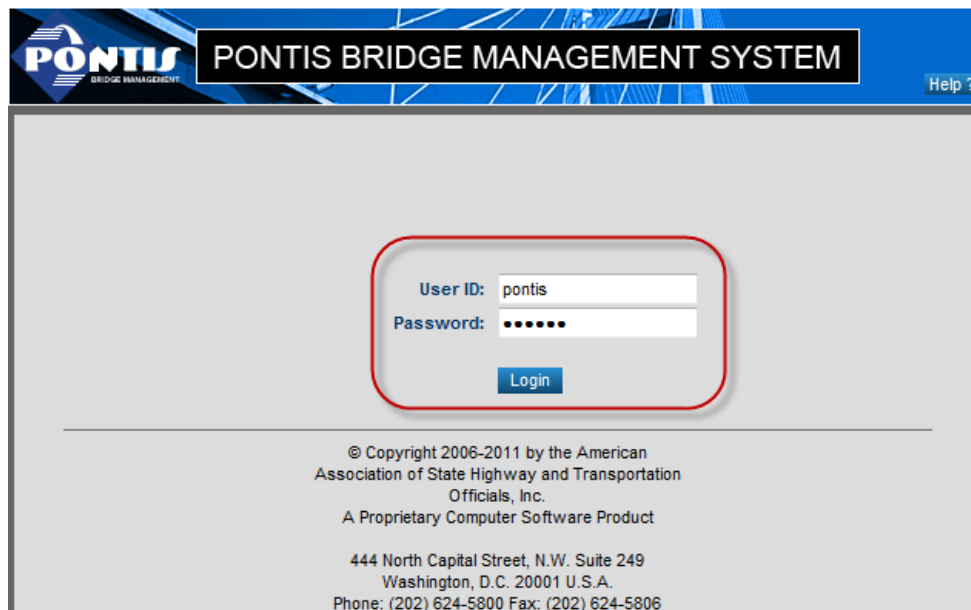
## System Basics

*BrM has been installed successfully. Now some of our staff need a basic tutorial on how to log in and operate the system. How do we navigate to different modules? How do we find information for a particular group of structures? How do we print reports? How do we get on-line help?*

**T**his chapter covers logging on to BrM, and provides an introduction to the BrM Desktop. It describes how to use the basic menu options and tools available from the BrM Desktop for selecting modules, finding and viewing bridge information and viewing/printing reports.

## 2.1 Logging On

1. Make sure that the system administrator has set up ODBC profiles for the BrM database(s) that you will be using, and established user names, passwords and user privileges for each database. Note that the standard installation of BrM with the SQL Server sample databases will automatically set up profiles for the two sample databases which have a user named “pontis” with a password “pontis”.
2. Select the BrM program from your Windows **Start** menu. For the default installation, it will be under Programs – AASHTOWARE – AASHTO BrM – BrM Program. The **Login to BrM** window will appear.



### BrM Login Screen

3. The Database drop down list, which displays when you have more than one database defined in BrM, displays the name of the most recently used database profile automatically. Select the database that you will be using if different from the one already displayed.
4. Enter your user name and password.
5. Click **Login**.

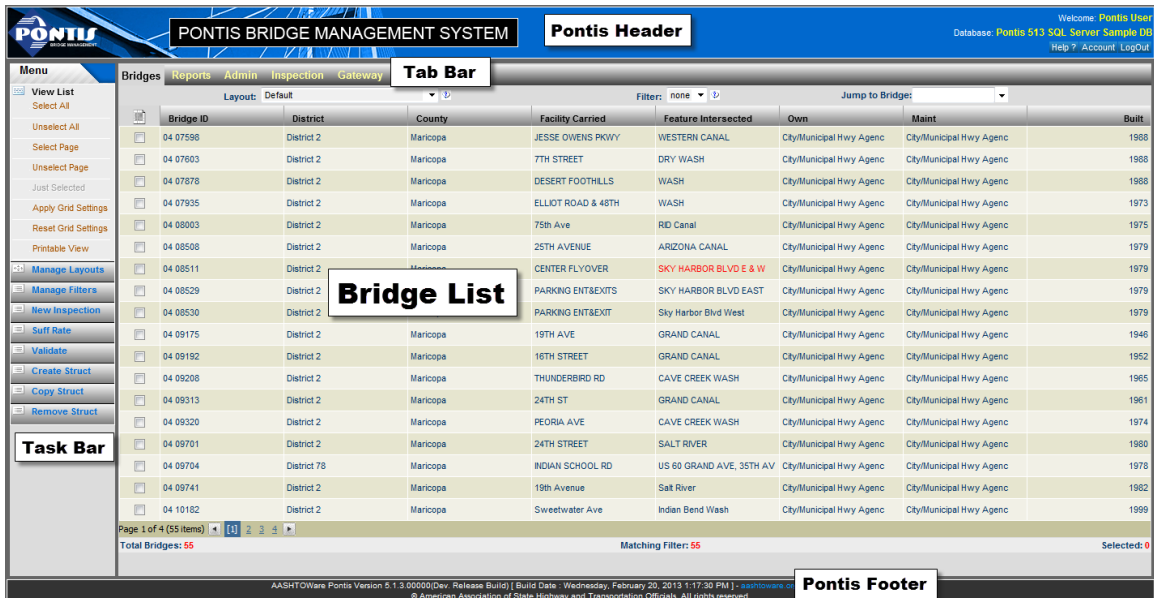


If you get a database error at this point, first try re-typing your user name and password. If that doesn't work and you are certain that these are correct, it means that the ODBC profile for the database you have selected was not properly set up, or the BrM name for the database you have selected does not match with the proper ODBC profile. Call your system administrator for assistance.

## 2.2 The BrM Desktop

### Selecting a Module

When you open BrM, you will see the BrM Desktop. If you are using BrM for the first time, the **View List** task of the **Bridge** tab will be active. The name of the currently selected module will appear in the main window title (e.g. **Bridges – View List Page**). The task name will also appear on the left side of the bridge list of the main window. To switch to a different BrM task, click on the name of the task you would like to work with.



BrM Desktop – Bridge List

### Parts of the Desktop

The basic elements of the BrM desktop are the **BrM Header** and the **Tab Bar** at the top of the screen, the **Task Bar** along the left side of the screen, the **BrM Footer** along the bottom, and the **Bridge List**, which is another name for the **View List** task of the **Bridges** tab.

Desktop features that are common to several modules are described below. Features that are unique to individual modules are described in subsequent chapters that cover specific bridge management activities.

## The BrM Header



### BrM Header

The BrM Header contains three buttons: **Help?**, **Account**, and **Logout**. The buttons are as follows:

- Use **Help?** to view the BrM help screen for the current screen.
- Use **Account** to view account information of the user.
- Use **Logout** to quit BrM.

The BrM Header also shows the current user you are logged in as and the database that is currently being used.

## The Tab Bar

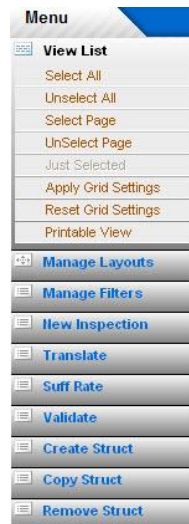


### Tab Bar

The Tab Bar contains five items: **Bridge**, **Reports**, **Admin**, **Inspection** and **Gateway**. The options are as follows:

- Use **Bridges** to view the **Bridge List**.
- Use **Reports** allows you to select, view and print Crystal Reports based reports for selected bridges or all bridges in the list.
- Use **Admin** to access the administration functions of BrM, e.g. Security-Users-Add New User.
- Use **Inspection** to access the inspection information about a selected bridge.
- Use **Gateway** export, import, check out or check in the contents of the **Bridge List**.

## The Task List



Task List

The **Task List** is located on the left side of the screen and contains commonly used tasks, which change as you select different tabs. For example, selecting the **Bridges** tab displays the **Task List** shown above. The tasks that belong to the **Bridges** tab includes the **Manage Layouts** task which has options to change what columns the bridge list displays.

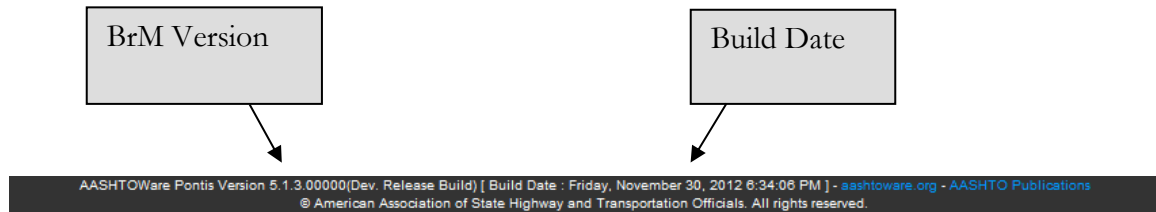
Any given task can also include sub-tasks. For example, the **View List** task, which is the default task for the **Bridges** tab, contains some sub-tasks that operate in conjunction with the **Bridge List**:

- *Select All* will select all the bridges on the **Bridge List**.
- *Unselect All* will unselect all the bridges that are currently selected from the **Bridge List**.
- *Select Page* will select all the bridges on the current page.
- *Unselect Page* will unselect all the bridges on the current page.
- *Just Selected* will only show those bridges that are currently selected
- *All Rows* will make available all the bridges in the **Bridge List**; this sub-task will only show if the *Just Selected* option was selected previously selected.
- *Apply Grid Settings* will save the current settings of the **Bridge List** (e.g. changing column width or sorting columns) for the current layout of the current user.
- *Reset Grid Settings* will reset the **Bridge List** settings to the default settings.
- *Printable View* will open a new window with a screen that will give the option to print the rows in the **Bridge List**.



## The BrM Footer

The **BrM Footer** across the bottom of the screen includes (from left to right):



- The *BrM Version* will show the current version for BrM.
- The *Build Date* will show the build date and time for the latest version of BrM.

## The Bridge List

| Apply                               |           | Layout: Default | Filter: none | Jump to Bridge:    | Go                       |                          |                          |       |
|-------------------------------------|-----------|-----------------|--------------|--------------------|--------------------------|--------------------------|--------------------------|-------|
| <input checked="" type="checkbox"/> | Bridge ID | District        | County       | Facility Carried   | Feature Intersected      | Own                      | Maint                    | Built |
| <input type="checkbox"/>            | 04 07598  | District 2      | Maricopa     | JESSE OWENS PKWY   | WESTERN CANAL            | City/Municipal Hwy Agenc | City/Municipal Hwy Agenc | 1988  |
| <input type="checkbox"/>            | 04 07603  | District 2      | Maricopa     | 7TH STREET         | DRY WASH                 | City/Municipal Hwy Agenc | City/Municipal Hwy Agenc | 1988  |
| <input type="checkbox"/>            | 04 07878  | District 2      | Maricopa     | DESERT FOOTHILLS   | WASH                     | City/Municipal Hwy Agenc | City/Municipal Hwy Agenc | 1988  |
| <input type="checkbox"/>            | 04 07935  | District 2      | Maricopa     | ELLIOT ROAD & 48TH | WASH                     | City/Municipal Hwy Agenc | City/Municipal Hwy Agenc | 1973  |
| <input type="checkbox"/>            | 04 08003  | District 2      | Maricopa     | 75th Ave           | RID Canal                | City/Municipal Hwy Agenc | City/Municipal Hwy Agenc | 1975  |
| <input type="checkbox"/>            | 04 08508  | District 2      | Maricopa     | 25TH AVENUE        | ARIZONA CANAL            | City/Municipal Hwy Agenc | City/Municipal Hwy Agenc | 1979  |
| <input type="checkbox"/>            | 04 08511  | District 2      | Maricopa     | CENTER FLYOVER     | SKY HARBOR BLVD E & W    | City/Municipal Hwy Agenc | City/Municipal Hwy Agenc | 1979  |
| <input type="checkbox"/>            | 04 08529  | District 2      | Maricopa     | PARKING ENT&EXITS  | SKY HARBOR BLVD EAST     | City/Municipal Hwy Agenc | City/Municipal Hwy Agenc | 1979  |
| <input type="checkbox"/>            | 04 08530  | District 2      | Maricopa     | PARKING ENT&EXIT   | Sky Harbor Blvd West     | City/Municipal Hwy Agenc | City/Municipal Hwy Agenc | 1979  |
| <input type="checkbox"/>            | 04 09175  | District 2      | Maricopa     | 19TH AVE           | Grand Canal              | City/Municipal Hwy Agenc | City/Municipal Hwy Agenc | 1946  |
| <input type="checkbox"/>            | 04 09192  | District 2      | Maricopa     | 16TH STREET        | GRAND CANAL              | City/Municipal Hwy Agenc | City/Municipal Hwy Agenc | 1952  |
| <input type="checkbox"/>            | 04 09208  | District 2      | Maricopa     | THUNDERBIRD RD     | CAVE CREEK WASH          | City/Municipal Hwy Agenc | City/Municipal Hwy Agenc | 1965  |
| <input type="checkbox"/>            | 04 09313  | District 2      | Maricopa     | 24TH ST            | GRAND CANAL              | City/Municipal Hwy Agenc | City/Municipal Hwy Agenc | 1961  |
| <input type="checkbox"/>            | 04 09320  | District 2      | Maricopa     | PEORIA AVE         | CAVE CREEK WASH          | City/Municipal Hwy Agenc | City/Municipal Hwy Agenc | 1974  |
| <input type="checkbox"/>            | 04 09701  | District 2      | Maricopa     | 24TH STREET        | SALT RIVER               | City/Municipal Hwy Agenc | City/Municipal Hwy Agenc | 1980  |
| <input type="checkbox"/>            | 04 09704  | District 78     | Maricopa     | INDIAN SCHOOL RD   | US 60 GRAND AVE, 35TH AV | City/Municipal Hwy Agenc | City/Municipal Hwy Agenc | 1978  |
| <input type="checkbox"/>            | 04 09741  | District 2      | Maricopa     | 19th Avenue        | Salt River               | City/Municipal Hwy Agenc | City/Municipal Hwy Agenc | 1982  |
| <input type="checkbox"/>            | 04 10182  | District 2      | Maricopa     | Sweetwater Ave     | Indian Bend Wash         | City/Municipal Hwy Agenc | City/Municipal Hwy Agenc | 1999  |
| <input type="checkbox"/>            | 04 10191  | District 2      | Maricopa     | Union Hills Dr     | Dry Wash                 | City/Municipal Hwy Agenc | City/Municipal Hwy Agenc | 1999  |
| <input type="checkbox"/>            | 04 10226  | District 2      | Maricopa     | 51st Ave           | Salt River               | City/Municipal Hwy Agenc | City/Municipal Hwy Agenc | 2000  |
| <input type="checkbox"/>            | 06 00001  | District 4      | (33)ALAMEDA  | CREEK              | ARROYO DE LA LAGUNA      | State Highway Agency     | State Highway Agency     | 1941  |
| <input type="checkbox"/>            | 06 00002  | District 3      | (12)BUTTE    | STATE ROUTE 70     | N FK FEATHER RIVER       | State Highway Agency     | State Highway Agency     | 1932  |
| <input type="checkbox"/>            | 06 00003  | District 3      | (12)BUTTE    | STATE ROUTE 162    | MPK FEATHER RI BIDWELL   | State Highway Agency     | State Highway Agency     | 1965  |
| <input type="checkbox"/>            | 06 00004  | District 3      | (11)GLENN    | STATE ROUTE 162    | SACRAMENTO RIVER         | State Highway Agency     | State Highway Agency     | 1948  |
| <input type="checkbox"/>            | 06 00005  | District 1      | (04)HUMBOLDT | STATE ROUTE 96     | KLAMATH RIVER (ORLEANS)  | State Highway Agency     | State Highway Agency     | 1966  |
| <input type="checkbox"/>            | 06 00006  | District 1      | (04)HUMBOLDT | OLD STATE ROUTE 36 | VAN DUZEN RIVER          | State Highway Agency     | State Highway Agency     | 1925  |
| <input type="checkbox"/>            | 06 00007  | District 1      | (04)HUMBOLDT | U.S. HIGHWAY 101   | EEL RIVER                | State Highway Agency     | State Highway Agency     | 1941  |

Page 1 of 3 (55 items) [1] 2 3 >

Total Bridges: 55 Matching Filter: 55 Selected: 0

### Bridge List

The **Bridge List**, along with its several control buttons across the top allows you to:

- Choose a different layout;
- Choose a different filter;
- Find a particular structure; and
- Select structures for various operations available from the **Task Bar**

The **Bridge List** has another control on the bottom of the page that will allow the user to switch between pages if there is more than one page listed on the bottom. There is also information that states the how many total bridges there are in the database; how many bridges match the current filter; and how many bridges are selected.

When BrM is first installed, the default **Bridge List** is shown. This list shows all structures sorted by Bridge ID, and includes basic information about each structure, including Bridge ID, district, county, facility carried, feature intersected, owner, maintenance responsibility, and the year built.

Alternative layouts for the **Bridge List** can be defined and made available for selection. These layouts can include a different set of data items, a different sort order, and a filter criteria (e.g. restrict list to structures in a single district). Several example layouts are included with the BrM product. See Chapter 3 of the BrM *Technical Manual* for information on how to create new layouts.

The following table summarizes how to use the various controls for the **Bridge List**.

| <b>Do this</b>  | <b>In order to...</b>   |
|---|---|
| Click <sup>2</sup> on a structure   | Selects the structure   |
| Click <b>Apply</b>  | After picking bridges by putting check marks next to them, click <b>Apply</b> and the bridges will be selected. The number of bridges selected will show next to <b>Selected</b> in the lower right hand corner.  |
| Click a column name   | Sort structures by the value of that column. If you click again, the sort will toggle between ascending and descending order.   |
| Click on the border between two columns and drag                              | Change column widths  |
| Click, hold and drag a column name  | Change the order of columns   |
| Click on the drop-down list next to <b>Layout</b>                             | Select from a list of alternative layouts for the bridge list by clicking on the down arrow beside the drop-down list that is displayed and selecting the desired layout.   |
| Click on the drop-down list next to <b>Filter</b>                             | Select from a list of alternative filters for the bridge list by clicking on the down arrow beside the drop-down list that is displayed and selecting the desired filter. The total amount of bridges that match the filter will show next to <b>Matching Filter</b> in the middle of the screen located at the bottom. |
| Enter a Bridge ID number next to <b>Jump to Bridge</b> then click <b>Go</b> . | Locate a structure based on its Bridge ID.  |

You can also sort the bridge list by using the following steps:

1. Specify the sort order by clicking the column header. Initially the row will be sorted in ascending order. This column will be the primary sort column. Hold the shift key and click on another column header along the top of the Bridge List. This one will be the secondary column. Do this for every column you want to sort by and will be sorted in the order you select the columns. You can click **Reset Grid Settings** to remove all the sorts.
2. By default, columns sort "Ascending", but you can click the column heading to toggle between "Ascending" and "Descending." If you click a row's column a second time, it will be

<sup>2</sup> **Click** refers to one click of your left mouse button (assuming you have a right-handed mouse).

## SYSTEM BASICS

sorted “Descending”. The sort status is shown by small white up or down arrows in the column header.

3. Click **Apply Grid Settings** if you want to save the sort order you specified. If this option is clicked, then the sort order is saved, and will be restored as the default when you next open BrM with the same login and layout. Each time the data is retrieved, it will automatically be sorted according to your specification.
4. To clear out any sort, click **Reset Grid Settings**.

## 2.3 Finding and Selecting Structures (Version 5.x)

Most agencies have inventories with thousands of structures. This section covers ways of narrowing down the list of structures to work with, or finding a particular structure on the list.

### Finding a Structure with Filters

The Filter window can be used when you want to find structures based on criteria (e.g. Bridge ID, Structure Name, etc.) Note that any filter that you define here will be applied and be shown in the Filter drop-down menu.

1. Click the **Manage Filters** task on the task list to the left of the **Bridge List**. This will open the **Manage Filters-Edit Filter** sub-task page.

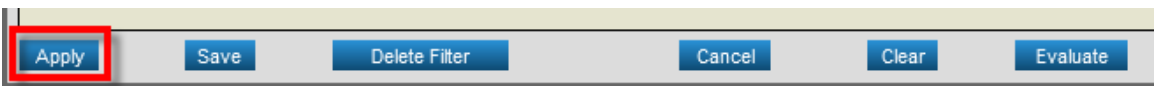
Edit Filter

2. Select ad hoc from the drop down menu labeled **Select existing filter**.



**Edit Filter Controls**

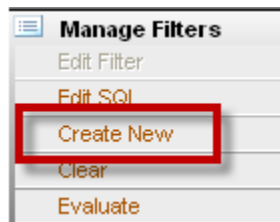
3. Enter the search criteria into one or more of the fields at the top of the screen which can be selected by the Bridge ID, Structure Name, Facility Carried, Feature Intersected, Route, and Km. Post.
4. Filter criteria can also be entered into one or more fields located in the middle section of the screen. This area allows you to set selection criteria based on district, county, ownership, bridge status, custodian, functional class, administrative area, bridge life cycle phase, inspector(s), bridge groups, NHS status, on/off system, inspection due date, or type of inspection. To select structures based on one of these criteria, make sure the **All** checkbox for the criterion is unchecked, and then click on the values that you wish to include.
5. Click the **Apply** button located at the bottom of the screen, and a list of structures meeting the current criteria will appear on the bridge list. No other bridges will appear except those meeting the criteria.



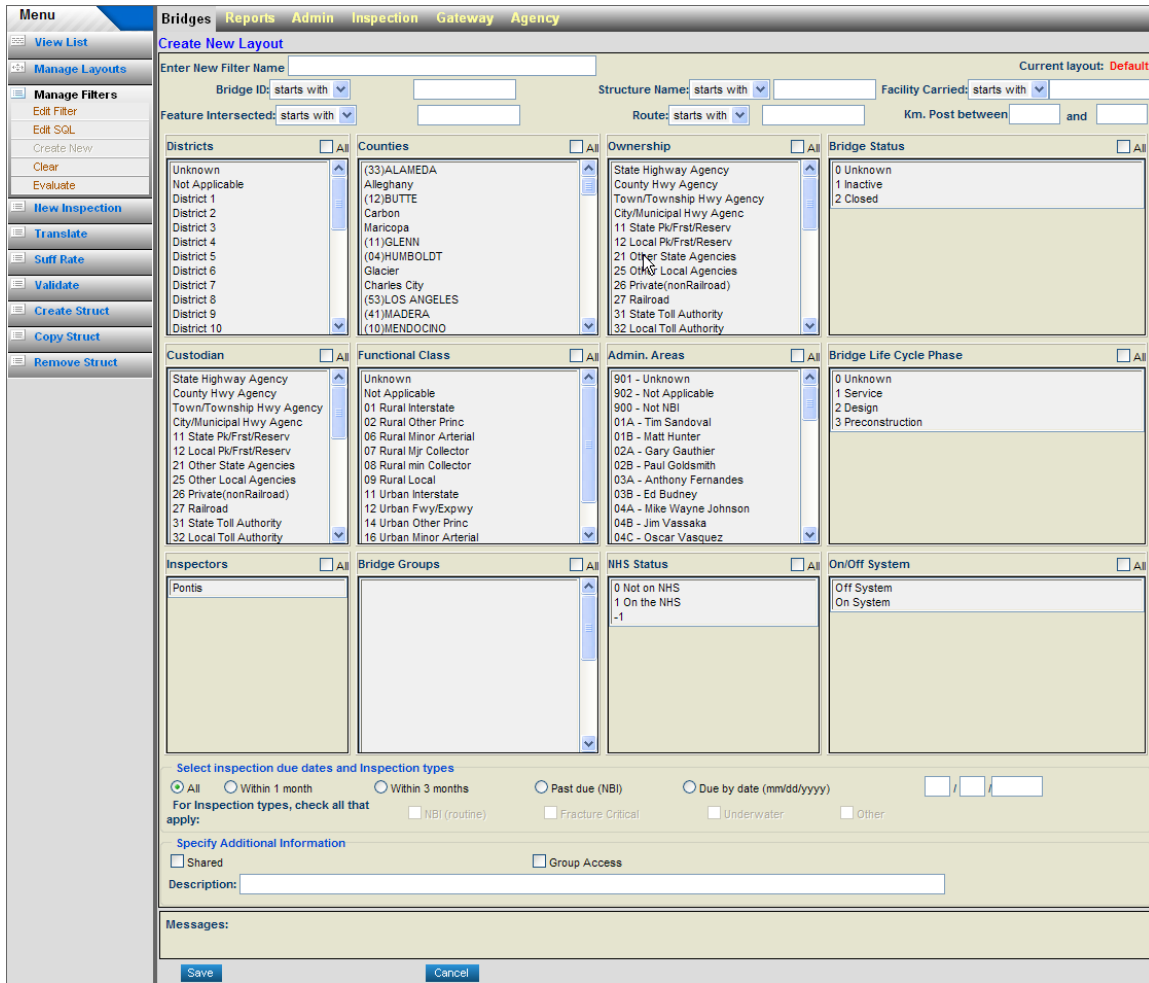
**Bottom of the Edit Filter Screen**

To create a new filter and save it, use the following steps:

1. Click the **Manage Filters** task in the task list to the left of the **Bridge List**. This will open the **Manage Filter** sub-task page.
2. Click the **Create New sub-task** under **Manage Filters** task.

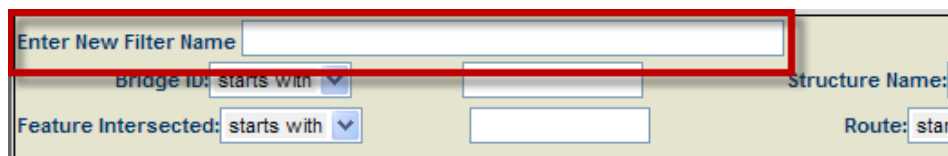


**Manage Filters Task List**



New Filters Screen

3. Enter a name in **Enter New Filter Name** field.

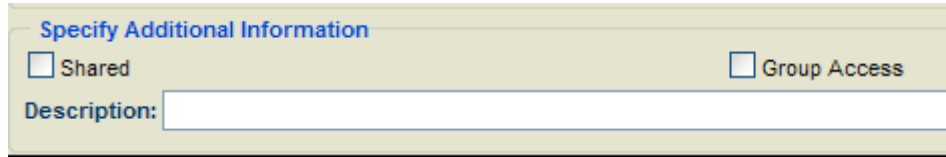


New Filter Name Field

4. Enter the search criteria into one or more of the fields at the top of the screen which can be selected by the Bridge ID, Structure Name, Facility Carried, Feature Intersected, Route, and Km. Post.
5. The information can also be entered into one or more fields located in the middle section of the screen. This allows you to set selection criteria based on district, county, ownership, bridge status, custodian, functional class, administrative area, bridge life cycle phase, inspector(s), bridge groups, NHS status, on/off system, inspection due date, or type of

inspection. To select structures based on one of these criteria, make sure the **All** checkbox for the criterion is blank, and then click on the values that you wish to include.

6. Enter a description and whether you want the filter to be shared (usable by other users) and have group access. The description is a required field.



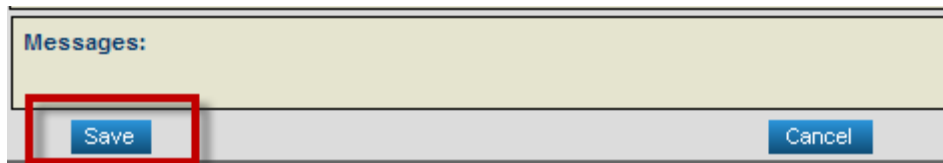
Specify Additional Information

Shared  Group Access

Description:

**Additional Information**

7. Click the **Save** button located at the bottom of the screen.



Messages:

8. Click the **Apply** button located at the bottom of the screen, and a list of structures meeting the current criteria will appear on the bridge list.

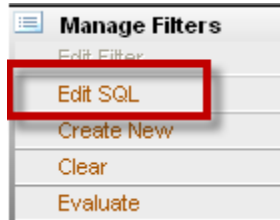
## **Edit Filters**

1. Click the **Manage Filters** task in the task list to the left of the **Bridge List**. This will open the **Manage Filter** page.
2. Select **Edit Filter** if not already chosen.
3. Select which filter to edit by choosing from the drop-down menu next to **Select existing filter**.
4. Edit the filter by entering the values in the fields that you would want to filter.
5. Once you complete the editing, click the **Save** button located at the bottom of the screen.
6. Click the **Apply** button located at the bottom of the screen, and a list of structures meeting the current criteria will appear on the bridge list.



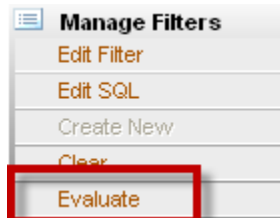
## Edit Filter by SQL

1. Click the **Manage Filters** task in the task list to the left of the **Bridge List**. This will open the **Manage Filter** page.
2. Select which filter to edit by choosing from the drop-down menu next to **Select existing filter**.
3. Click on the **Edit SQL** sub-task in the task bar if not already selected.



Manage Filters Task List

4. The **Edit SQL** screen will open up, allowing the SQL to be edited directly.
5. Click on **Evaluate** to verify the SQL query.



Manage Filters Task List

6. Once you complete the editing, Click the **Save** button located at the bottom of the screen.
7. Click the **Apply** button located at the bottom of the screen, and a list of structures meeting the current criteria will appear on the bridge list.

**Important Note:** If you edit a filter using SQL, you will no longer be able to edit the filter by using graphical interface of the **Edit Filter** sub-task since the filter will be considered a *custom* filter.

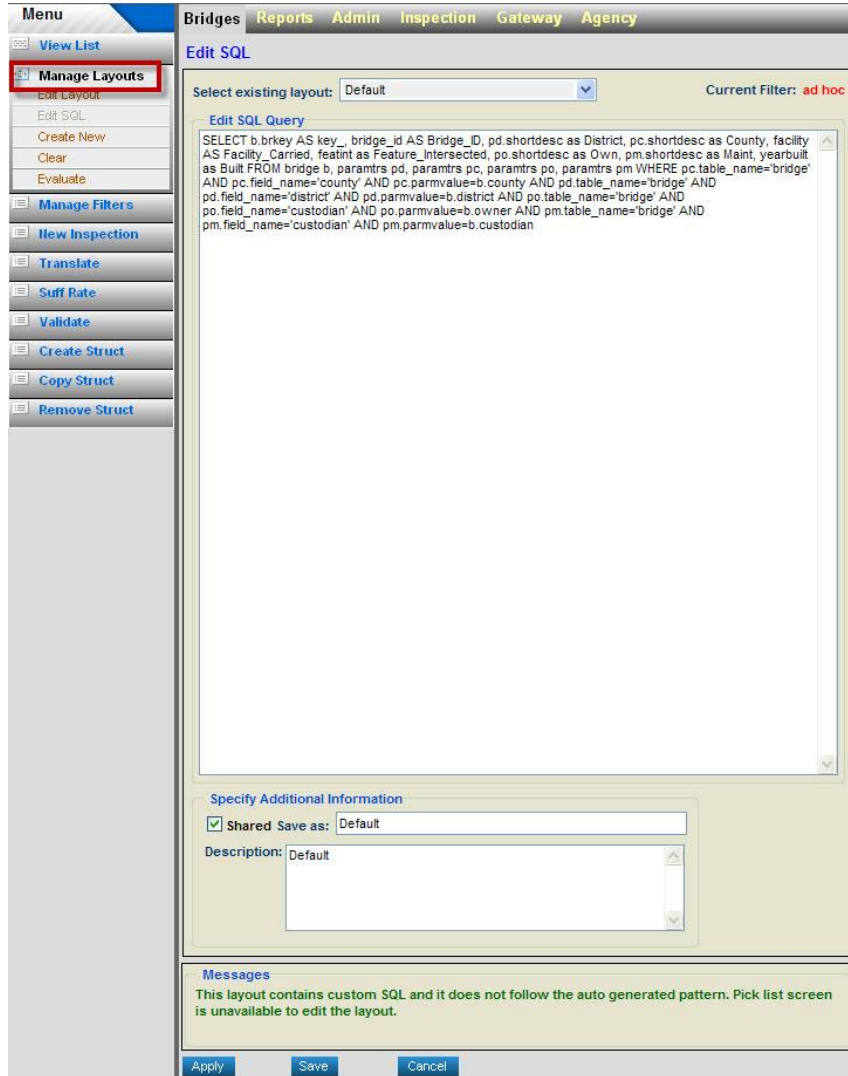
## Delete Filters

1. Click the **Manage Filters** task in the task list to the left of the **Bridge List**. This will open the **Manage Filter** page.
2. Select which filter to edit by choosing from the drop-down menu next to **Select existing filter**.
3. Click on **Delete Filter** located at the bottom of the screen.

## Finding Structures with Layouts

The layout window can be used when you want to find structures based on criteria from the g. Bridge, Roadway, and Inspevnt tables. Note that any layout that you define here will be applied and be shown in the **Layout** drop-down menu in both the **Bridge List** and in the **Manage Layout** task.

1. Click the **Manage Layout** task in the task list to the left of the **Bridge List**. This will open the **Manage Layout** page.



Edit Layout SQL

## SYSTEM BASICS

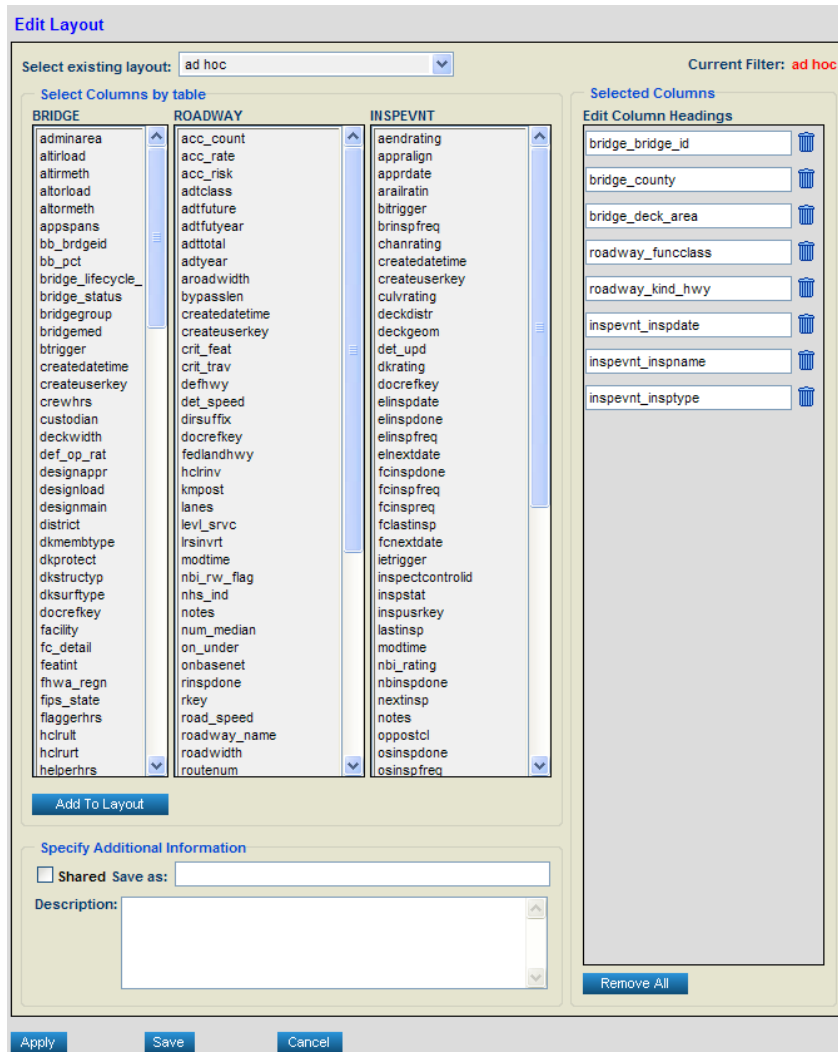
2. Select **ad hoc** from the drop down menu **Select existing layout**. This takes you to the **Edit Layout** screen.

The screenshot shows the 'Edit Layout' interface. At the top, a dropdown menu labeled 'Select existing layout' is set to 'ad hoc', which is highlighted with a red box. To the right, it says 'Current Filter: ad hoc'. Below this, there are three columns of fields, each with a scroll bar and a small arrow icon at the top. The columns are labeled 'BRIDGE', 'ROADWAY', and 'INSPEVNT'. The 'BRIDGE' column contains fields like adminarea, altirload, altirmeth, etc. The 'ROADWAY' column contains fields like acc\_count, acc\_rate, adtclass, etc. The 'INSPEVNT' column contains fields like aendrating, appraisal, apprdate, etc. Below the columns is a blue button labeled 'Add To Layout'. Underneath that is a section titled 'Specify Additional Information' with a checkbox for 'Shared Save as:' and a text input field. Below that is a 'Description:' label and a larger text area. At the bottom of the window are three buttons: 'Apply', 'Save', and 'Cancel'.

Edit Layout Screen

3. Enter the search criteria into the fields by clicking on the columns. You can select more than one column or unselect in each table by holding down the **Ctrl** key.
4. Click **Add To Layout**.

5. Enter custom names for the columns in the **Edit Column Headings** list.



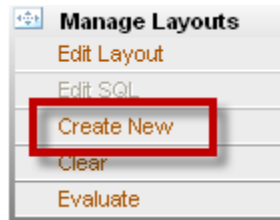
Edit Layout Screen

6. Click on **Apply**. This will take you to the **Bridge List** with the new layout and the columns that were selected. Based upon what was chosen for the columns, this could also filter out those bridges that do not have the necessary information for the columns.

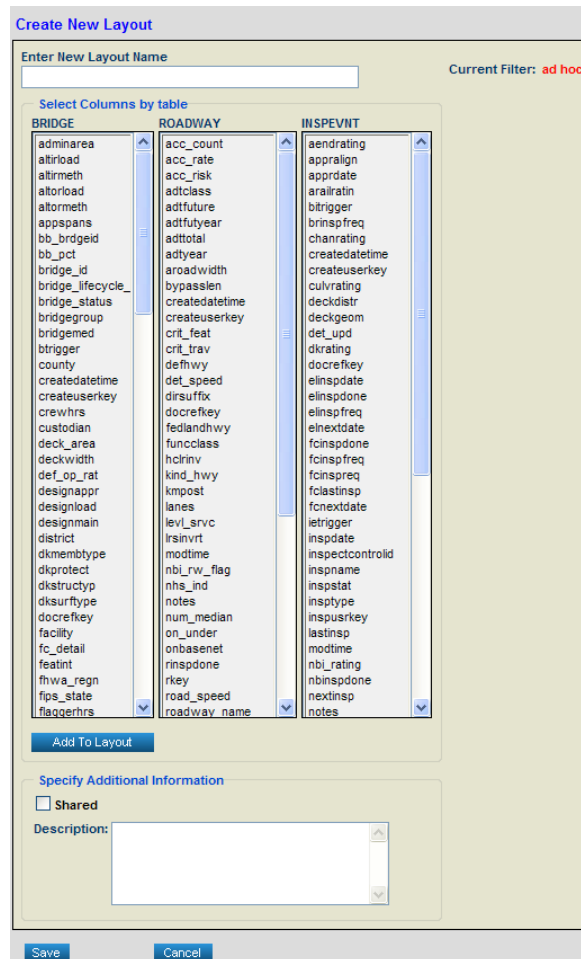
## SYSTEM BASICS

To create a new layout and save it, use the following steps:

1. Click the **Manage Layout** task in the task list to the left of the **Bridge List**. This will open the **Manage Layout** page.
2. Click the **Create New** sub-task under **Manage Layout** task.



Manage Layouts Task List



The image shows the "Create New Layout" screen. At the top, there is a text input field for "Enter New Layout Name" and a "Current Filter: ad hoc" indicator. Below this is a section titled "Select Columns by table" with three columns: BRIDGE, ROADWAY, and INSPEVNT. Each column contains a list of field names. Below the columns is an "Add To Layout" button. Underneath is a "Specify Additional Information" section with a "Shared" checkbox and a "Description:" text area. At the bottom are "Save" and "Cancel" buttons.

New Layout Screen

## SYSTEM BASICS

3. Enter a name in **Enter New Layout Name** field.

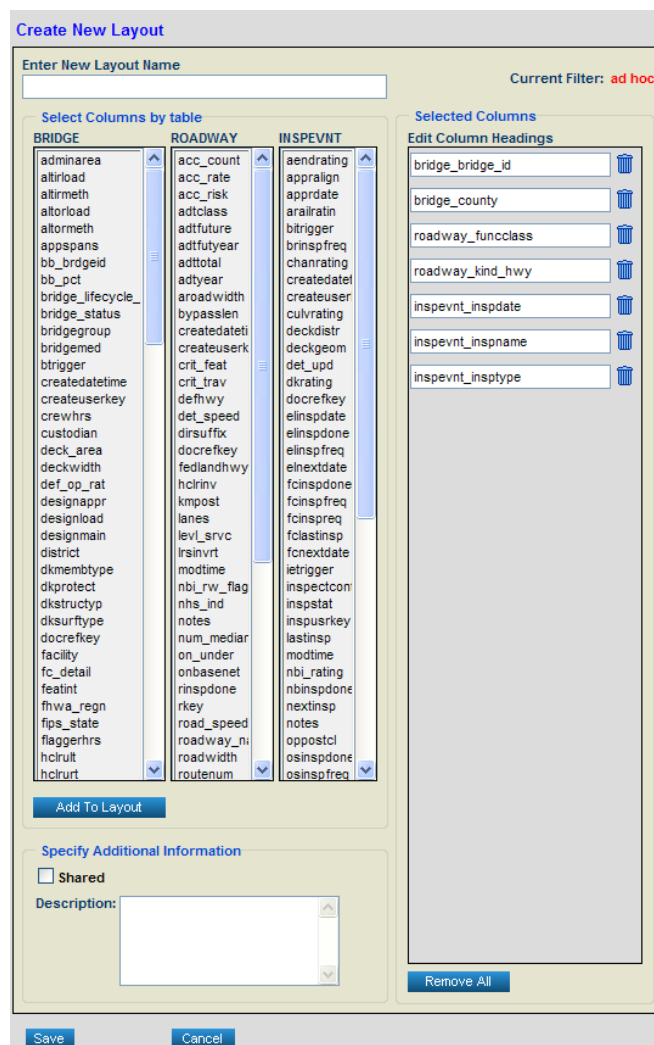


Enter New Layout Name

Current Filter: ad hoc

### New Layout Name Field

4. Enter the search criteria into the fields by clicking on the columns. You can select more than one column or unselect in each table by holding down the **Ctrl** key.
5. Click **Add To Layout**.
6. Enter custom names for the columns in the **Edit Column Headings** list.



**Create New Layout**

Enter New Layout Name

Current Filter: ad hoc

Select Columns by table

| BRIDGE            | ROADWAY      | INSPEVNT    |
|-------------------|--------------|-------------|
| adminarea         | acc_count    | aendrating  |
| altirload         | acc_rate     | appralign   |
| altirmeth         | acc_risk     | apprdate    |
| altorload         | adclass      | arallratn   |
| altormeth         | adtfuture    | bitrigger   |
| appspans          | adtfuture    | brinspfreq  |
| bb_brdgeid        | adttotal     | chanrating  |
| bb_pct            | adtyear      | createdatet |
| bridge_lifecycle_ | aroadwidth   | createuser  |
| bridge_status     | bypasslen    | culvrating  |
| bridgegroup       | createdateti | deckdistr   |
| bridgedem         | createuserk  | deckgeom    |
| btrigger          | crit_feat    | det_upd     |
| createdatetime    | crit_trav    | dkrating    |
| createuserkey     | defhw        | dcrefkey    |
| crewhrs           | det_speed    | elinspdone  |
| custodian         | dirsuffix    | elinspdone  |
| deck_area         | dcrefkey     | elinspfreq  |
| deckwidth         | fedlandhwy   | elnextdate  |
| def_op_rat        | hclirrv      | fcinspdone  |
| designappr        | kmpost       | fcinspfreq  |
| designload        | lanes        | fcinspreq   |
| designmain        | levl_srvc    | fclastinsp  |
| district          | lrsinrvt     | fcnextdate  |
| dkmembytype       | modtime      | ietrigger   |
| dkprotect         | nbi_rw_flag  | inspectcon  |
| dkstructyp        | nhs_ind      | inspstat    |
| dksurftype        | notes        | inspurkey   |
| dcrefkey          | num_mediar   | lastinsp    |
| facility          | on_under     | modtime     |
| fc_detail         | onbasenet    | nbi_rating  |
| featint           | rinspdone    | nbinspdone  |
| fmwa_regn         | rkey         | nextinsp    |
| fips_state        | road_speed   | notes       |
| flaggerhrs        | roadway_ni   | oppostcl    |
| hclruit           | roadwidth    | osinspdone  |
| hclurt            | routenum     | osinspfreq  |

Add To Layout

Specify Additional Information

Shared

Description:

Remove All

Save Cancel

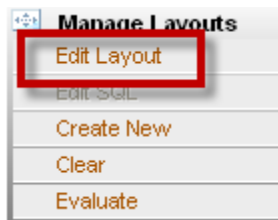
### New Layout Screen

7. Enter a description and whether you want the filter to be shared.

8. Click the **Save** button located at the bottom of the screen.
9. To view the layout, click on the **View List** then select the new layout you created.

## Edit Layout

1. Click the **Manage Layouts** task in the task list to the left of the **Bridge List**. This will open the **Manage Filter** page.
2. Select which layout to edit by choosing from the drop-down menu next to **Select existing layout**.
3. Click the **Edit Layout** sub-task.



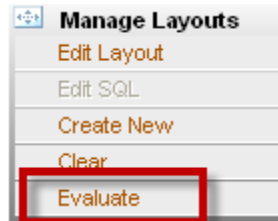
Manage Layouts Task List

4. Edit the layout by changing the values in the fields that you want to change.
5. Once you complete the editing, click the **Save** button located at the bottom of the screen.
6. Click the **Apply** button located at the bottom of the screen, and a list of structures meeting the current criteria will appear on the bridge list.

## Edit Layout by SQL

1. Click the **Manage Layouts** task in the task list to the left of the **Bridge List**. This will open the **Manage Layout** page.
2. Select **Edit SQL** from the task bar if not already chosen.
3. Select which filter to edit by choosing from the drop-down menu next to **Select existing layout**.
  4. The **Edit SQL** screen will open up, allowing the SQL to be edited directly.
5. Click on **Evaluate** to verify the SQL query.





### Manage Layouts Task List

6. Once you complete editing, click the **Save** button located at the bottom of the screen.
7. Click the **Apply** button located at the bottom of the screen, and a list of structures meeting the current criteria will appear on the bridge list.

**Important Note:** If you edit a layout using SQL, you will no longer be able to edit the layout by using the graphical interface of the **Edit Layout** option since the layout will be considered a *custom* layout.

## Delete Filters

1. Click the **Manage Layout** task in the task list to the left of the **Bridge List**. This will open the **Manage Layout** page.
2. Select which filter to edit by choosing from the drop-down menu next to **Select existing layout**.
3. Click on **Delete Layout** located at the bottom of the screen.

## 2.4 Viewing and Printing BrM Reports

To view and print a BrM report:

Report Name: insp003\_inspection\_schedule (Crystal)

Back to Report Generation

1 / 3 70.7% One Full Page Find

Baker Airside  
BMS

**Inspection Scheduling Information**  
Recent Bridge Inspections with Future Schedule by Type

| Bridge ID | Facility           | Inspector | Regular Inspections |     | Underwater |            | Fracture Critical |            | Other Special |            |               |
|-----------|--------------------|-----------|---------------------|-----|------------|------------|-------------------|------------|---------------|------------|---------------|
|           |                    |           | Last                | mo* | Next Due   | Last       | mo*               | Next Due   | Last          | mo*        | Next Due      |
| 04 07599  | JESSE OWENS PKWY   | TJP-PP    | 12/19/2004          | 24  | 12/15/2006 |            |                   |            |               |            |               |
| 04 07603  | 7TH STREET         | TJP-PP    | 12/15/2005          | 48  | 12/15/2009 |            |                   |            |               |            |               |
| 04 07878  | DESERT FOOTHILLS   | PAP-GS    | 04/30/2003          | 48  | 04/30/2007 |            |                   |            |               |            |               |
| 04 07935  | ELLIOT ROAD & 49TH | DEK-PP    | 02/09/2006          | 48  | 02/09/2010 |            |                   |            |               |            |               |
| 04 08003  | 75th Ave           | DEK-PP    | 11/07/2005          | 24  | 11/07/2007 |            |                   |            |               |            |               |
| 04 08508  | 25TH AVENUE        | PJW-PP    | 10/03/2005          | 24  | 10/03/2007 |            |                   |            |               | 12/11/1998 |               |
| 04 08511  | CENTER FLYOVER     | JXH-PP    | 02/07/2005          | 24  | 02/07/2007 |            |                   |            |               |            |               |
| 04 08529  | PARKING ENT&EXITS  | SCS-PP    | 02/14/2005          | 24  | 02/14/2007 |            |                   |            |               |            |               |
| 04 08530  | PARKING ENT&EXIT   | SCS-PP    | 02/15/2005          | 24  | 02/15/2007 |            |                   |            |               |            |               |
| 04 09175  | 19TH AVE           | PJW-PP    | 04/02/2009          | 12  | 04/02/2010 | 04/02/2009 |                   | 04/02/2009 | 04/02/2009    | 12         | 04/02/2010    |
| 04 09192  | 16TH STREET        | PJW-PP    | 01/10/2006          | 12  | 01/10/2007 |            |                   |            |               | 01/18/2005 | 12 01/18/2006 |
| 04 09208  | THUNDERBIRD RD     | JXH-PP    | 11/18/2004          | 24  | 11/18/2006 |            |                   |            |               |            |               |
| 04 09313  | 24TH ST            | PJW-PP    | 01/09/2006          | 12  | 01/09/2007 |            |                   |            |               | 01/10/2001 | 12 01/23/2006 |
| 04 09320  | PEORIA AVE         | SCS-PP    | 09/22/2004          | 24  | 09/22/2006 |            |                   |            |               |            |               |

BrM Report Page

1. If you are in the **Bridge List** and you want your report to be based on a subset of bridges, selecting several bridges by checking in the box next to the desired Bridge IDs.
2. Select the **Reports** tab from the **Tab Bar**.
3. The report generation window will appear. To generate a standard BrM (DWNET or Crystal) report, select name of the report you wish to generate by selecting from the drop-down list next to **Report**.
4. Choose the desired format (e.g. PDF, Text, Excel, RTF, Word, HTML for Crystal, and PDF, Text, CSV, XML, and HTML).
5. Many reports have the option to choose from various parameters. For example, summaries of element condition [insp006 and insp009] allow you to select which elements to include. You may enter one or more criteria for each column by clicking on multiple elements while holding down the **CTRL** key on the keyboard. You can also leave this screen blank to retrieve all records. Click **Generate Report** to apply your criteria and close the screen.
6. For reports that present information on individual structures (e.g. SI&A reports, inspection schedules, lists of needs for each structure), the following options will appear:
  - *All Structures*: include all bridges

## SYSTEM BASICS

- *xx structure(s) in the list*: include bridges that have been loaded into the **Bridge List**. (The number of bridges that have been loaded appears on the bottom of the bridge list. For example, “55 structure(s) in the list” indicates that 55 bridges have been loaded.)
  - *x selected structures*: include bridges you have selected (highlighted) on the **Bridge List**.
  - *Specific bridge (please enter its **Bridge ID**)*: includes only the bridge entered in manually in the space provided.
7. Click **Generate Report** to run the report.
  8. When your report appears, you can use the **Next Page** and **Previous Page** buttons to scroll through the different pages. You can also use the scrollbar on the right side of the screen.
  9. To print the report, click the **Print** button. You can also export the information in reports to external files using the **Save** button.
  10. Click the **Back to Report Generation** button to close the **Report** window.

## 2.5 Site Map (Version 5.x)

### Bridges

#### View List

Select All  
Unselect All  
Select Page  
UnSelect Page  
Just Selected  
All Rows  
Apply Grid Settings  
Reset Grid Settings  
Printable View

#### Manage Layouts

Edit Layout  
Edit SQL  
Create New  
Clear  
Evaluate

#### Manage Filters

Edit Filter  
Edit SQL  
Create New  
Clear  
Evaluate

#### New Inspection

#### Translate

#### Suff Rate

#### Validate

#### Create Structure

#### Copy Structure

#### Remove Structure

### Reports

#### Generate

#### Register

Crystal

## **Admin**

|   |  |                       |                        |  |                       |
|---|--|-----------------------|------------------------|--|-----------------------|
| <b>Security</b><br>Users<br>Groups<br>Roles<br>Permissions<br>Databases | <b>Parameters</b>  | <b>Element Spec</b>   | <b>Definitions</b>     | <b>Actions</b><br>Action Type Defs<br>Flex Actions | <b>Options</b>        |
| <b>Cost Index</b>   | <b>Formulas</b>  | <b>Export Options</b> | <b>Data Dictionary</b> | <b>Checked Out<br/>Bridges</b>                     | <b>Renumber BrKey</b> |
| <b>Logging</b>  | <b>Navigation &amp; Field<br/>Security</b><br>Standard<br>Agency |                       |                        |  |                       |

## **Inspection**

|                  |                  |  |                 |   |                   |
|------------------|------------------|--|-----------------|---|-------------------|
| <b>Condition</b> | <b>Appraisal</b> | <b>Inventory</b><br>Admin<br>Design<br>Roads<br>Agency Items | <b>Schedule</b> | <b>Work</b><br>Work Candidates<br>Project Information | <b>Multimedia</b> |
|------------------|------------------|--|-----------------|---|-------------------|

## **Gateway**

|               |               |                  |                 |                 |
|---------------|---------------|------------------|-----------------|-----------------|
| <b>Export</b> | <b>Import</b> | <b>Check Out</b> | <b>Check In</b> | <b>Override</b> |
|---------------|---------------|------------------|-----------------|-----------------|

## Inventory and Inspection Data Management

*We have loaded our existing structure inventory into BrM, and need to know how to keep this information up-to-date to reflect changes in our inventory. We are also ready to collect element-level inspection data on our structures, and want to know how BrM can help us to plan and prepare data for these inspections. When the inspections are completed, how do we get the data into BrM? After we get the inspection data in, what reports are available and how do we export data for NBI reporting and other purposes?*

This chapter covers maintaining inventory and inspection information in BrM, and using this information to create reports, NBI files, and other export files for use in other systems. It begins with an introduction to how BrM inventory and inspection data is structured. Instructions are provided for adding and removing structures from the inventory, viewing and updating structure information, planning and conducting inspections, and recording inspection information. The chapter concludes with sections on common data export procedures (such as producing an NBI file) and available inspection reports. Section 3.1 of this chapter covers concepts about structures that are common to users working with BrM.

## 3.1 Important Concepts

The BrM database stores all of the NBI-required structure inventory and condition data, and the system can be used for handling the standard NBI reporting requirements. In order to take advantage of the modeling and optimization features of BrM, you will need to expand your inventory information to include identification of the major types of elements on each structure, and the quantity of each element. When inspections are done, you will need to assess and record the condition of each element. In order to prepare for this approach to structure inspection, it is important to understand some key concepts and definitions related to how structures are represented in BrM, and how element conditions are determined.

### Representation of Structures

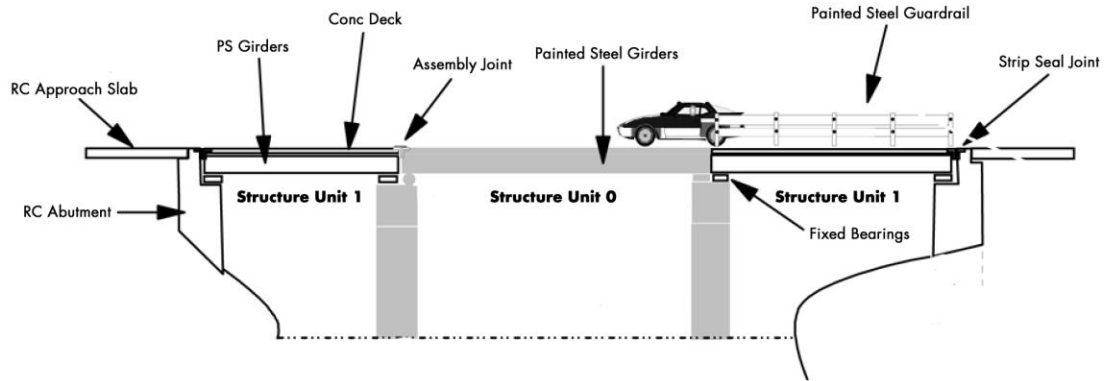
A *structure* is a bridge, culvert, tunnel or any other structure for which data are required for the analysis. Structures can be divided into one or more smaller units, called structure units. A *structure unit* is any logical grouping of structure components usually having the same structural design and material. Although a structure unit can be an individual span, structure units can be used to represent groups of spans having the same structural design and material, or portions of the structure that might be rehabilitated separately (e.g. approach spans might be one unit; the main span another). In order to keep data collection manageable, it is best to define the smallest possible set of structure units that adequately captures the major structural components. To keep inspections as simple as possible, a structure need not be divided into multiple structure units – the entire structure can be identified as a single structure unit.

An *element* is an individual component type that together with other elements constitutes the structure. BrM uses the “Commonly Recognized” (CoRe) structural elements which were developed by a task group of bridge engineers from six state highway agencies and the Federal Highway Administration (FHWA)<sup>3</sup>. The purpose of the CoRe elements is to provide a uniform basis for data collection for bridge management systems and to facilitate sharing of information across agencies. A guide to CoRe elements is published by the American Association of State Highway and Transportation Officials (AASHTO)<sup>4</sup>. As stated in the introduction to this guide: “In general, all girders, trusses, arches, cables, floor beams, stringers, abutments, piers, pin and hangers, culverts, joints, bearings, railings, decks and slabs are included as CoRe elements.” The CoRe element guide defines the measurement units for each element. When elements are first set up in BrM, the total quantity of the structure must be supplied. If a structure has been divided into structure units, the quantity of each element on each structure unit is required.

---

<sup>3</sup> While the CoRe elements are built into the standard BrM database, agencies also have the capability to define their own unique types of elements. See Section 7.4 for further information.

<sup>4</sup> AASHTO Guide for Commonly Recognized Structural Elements, 1997.



## Environments

The deterioration of a structure is partially determined by its environment and operating practices (e.g. weather conditions or use of road salt). To capture these effects, four standard environmental classifications have been defined:

- **Benign** - No environmental conditions affecting deterioration.
- **Low** - Environmental conditions create no adverse impacts, or are mitigated by past non-maintenance actions or highly effective protective systems.
- **Moderate** - Typical level of environmental influence on deterioration.
- **Severe** - Environmental factors contribute to rapid deterioration. Protective systems are not in place or are ineffective.

Each element on a structure can belong to one or more of these environment classifications. While the full quantity of an element on a structure is typically in a single environment, there may be cases where an element should be split into more than one environment – for example, if one portion of a structure is subject to salt spray. If an element is in more than one environment, the total quantity of the element in each environment must be determined.

## Condition Measurement

During a BrM inspection, each combination of structure unit, element, and environment is assigned one of up to five condition states.

A *condition state* categorizes the nature and extent of damage or deterioration on a bridge element. Each bridge element can have up to five condition states (some have less). Condition state one is always defined as no damage. The higher the condition state, the more damage there is on the element. Condition states for each element have been precisely defined in terms of the specific types of distresses that the elements can develop.



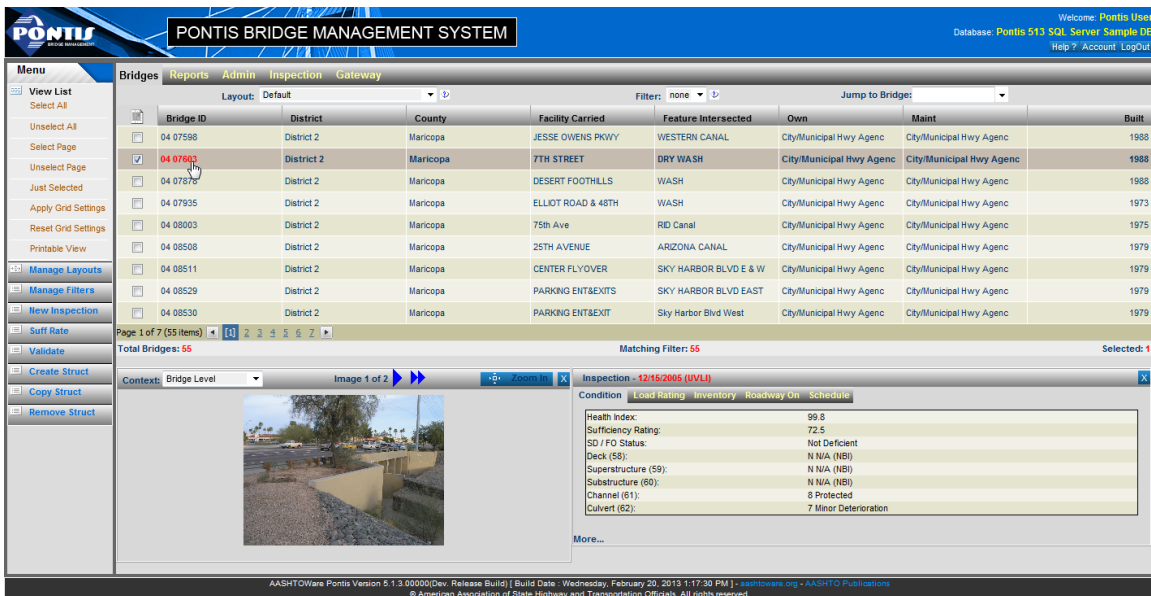
**I N V E N T O R Y   A N D   I N S P E C T I O N   D A T A   M A N A G E M E N T**

## 3.2 Overview of Inventory and Inspection Data (Version 5.x)

BrM 5.x consists of **Tabs** across the top of the screen in the **Tab Bar**, with **Tasks** and **Sub-Tasks** in the **Task List** on the left. The tasks and sub-tasks that appear on the left will change depending on the selected tab. The terms **screen** and **page** are often used interchangeably, but both refer to what is on the computer screen, and usually correspond with a task or sub-task.

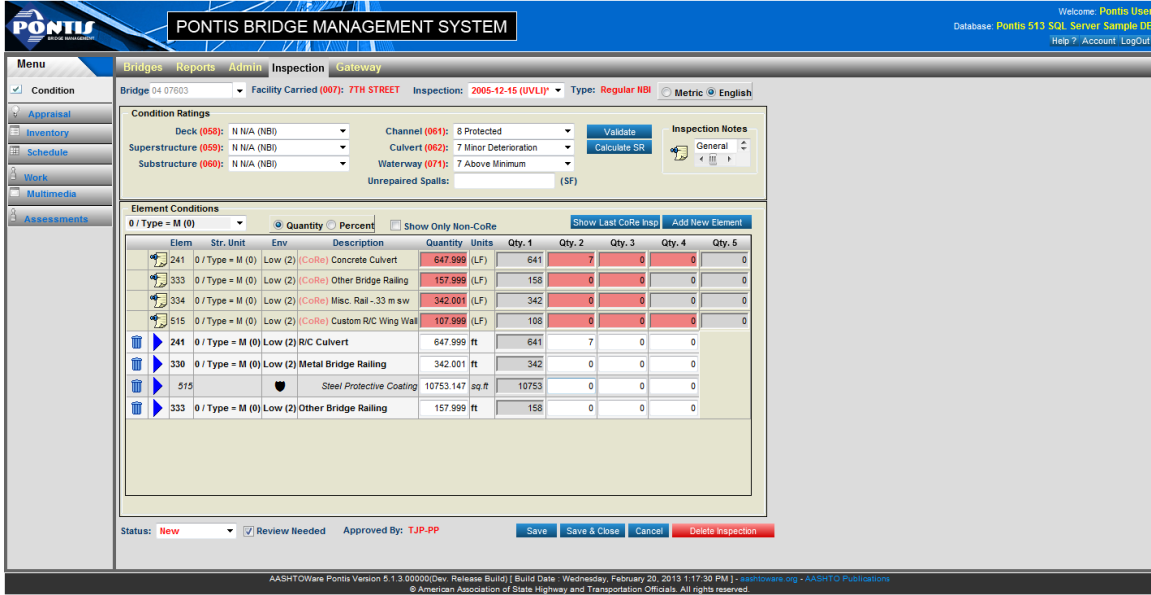
### Inspection Tab

If you select a bridge in the **Bridge List** by clicking anywhere on its row, the bridge will be highlighted and more information about the bridge will display below the bridge list. In the figure below, a user clicked on bridge **04 07603**, which highlighted the information on its row and displayed bridge photos and inspection information in the panels below the list. To access the specific and editable inspection information, click on the **Inspection** tab at the top of the page. Doing so will take you to the inspection pages for the highlighted bridge.



Bridge List with highlighted bridge

The following figure shows the initial page of the **Inspection** task. The **Condition** task is the first task you will see unless your agency has changed the task list on the left.



Condition Task of the Inspection Tab

### Selecting An Inspection

BrM stores an unlimited number of inspections for each structure in the database. Some of the information on the task screen (e.g. condition and appraisal ratings) pertains to particular inspections, while other information pertains to the bridge (e.g. classification, identification, structural characteristics). The **Inspection** drop down list at the top center of the screen allows you to view data from previous inspections. (When the task is opened, the most recent inspection is shown by default.)

### Selecting Measurement Units

There are radio buttons for selection of English or metric measurement units at the top of the screen to the right of the **Inspections** drop down list. BrM stores data in metric units, but you can enter or view information in English units by selecting the **English** radio button.

## Finding NBI and Other Information on the inspection task screens

Different task screens and their contents are as follows.

- **Condition:** This task screen shows both NBI and element condition information for the inspection date indicated in the **Inspections** selection list at the top of the screen. NBI condition ratings are shown for the structure at the top of the card, followed by element-level condition information. You can add and remove elements, and enter condition information from this card. You can also calculate the sufficiency and NBI ratings and perform data validation. (See Sections **Error! Reference source not found.**, 3.7 and 3.8.)
- **Appraisal:** This task screen shows NBI structure appraisal information, including the sufficiency rating, clearances, and navigation data. This task screen also shows operating and inventory ratings, and the posting status of the structure.
- **Inventory:** This task screen has four sub-tasks. **Admin** contains structure identification, location, age and service, management information and miscellaneous administrative and descriptive classificatory values on the structure. **Design** has information on the structural and geometric characteristics of the deck and spans, plus descriptive information about structure units. **Roads** has data on roadways on or under the structure including traffic, clearance and classification data. **Agency Items** has a set of open 30-character width fields that your agency can use for any purpose it chooses.
- **Schedule:** This task screen contains the date and type(s) of the selected inspection, as well as information about the scheduling of subsequent inspections, and inspection resource requirements. (See Section 0 **Error! Reference source not found.** for a more detailed explanation of the contents of this task.)
- **Work:** This task screen has two sub-tasks. **Work Candidates** consists of a list of work candidates identified by the inspector and a record detail for the work candidate selected from the list. Note that all work candidates for a structure are displayed on this task screen from both the current and all previous inspections.
- **Multimedia:** This task screen lets you associate multimedia documents with bridges and bridge inspections. You can also view these multimedia documents by clicking on the entries or using **Open**.
- **Agency:** This task will only appear if your system administrator has set the option to turn it on in the **Navigation and Field Level Security** task under the **Admin** tab. It may or may not include sub-tasks which can be set up to contain information from the four special user-defined tables in BrM which can supplement information provided in the standard BrM tables. User tables are provided for bridge, inspection, roadway and structure unit information. See the BrM *Technical Manual* for information on how to make use of custom user tables in BrM.

**Tip:** Hover your mouse over any field in BrM to bring up a screen documenting the item. Hover over labels for drop-down lists or over the field directly for other control types to see the documentation.

The table in Appendix B provides a guide to the location of the NBI items in the **Inspection** Tab<sup>5</sup>.

## Data Review and Update Procedure

To view and update existing inventory and inspection information for a particular structure:

1. From the **View List** of the **Bridges** tab, click on a structure to highlight it and then click on the **Inspection** tab OR click in the checkbox to the left of a structure's **Bridge ID** and then click the **Inspection** tab.
2. The **Condition** task of the **Inspection** tab for the most recent inspection of the selected structure will appear.
3. Select the inspection you wish to view/edit from the **Inspection** selection list at the top of the screen.
4. Select the task with information you wish to edit. Note that the **Inventory** and **Work** tasks have sub-tasks as well.
5. Depending on your privileges, you may not be able to edit certain items. These items will be shown with grey backgrounds.
6. Make your desired changes, and then the **Save** button to save them.
7. To return to the **View List**, click on the **Bridges** tab.

**Caution: Important Note on Adding New Inspections vs. Editing Old**

**Inspections:** When you highlight a structure in the **View List** and then click on the **Inspection** tab, or select it and click on the **Inspection** tab, you will be viewing and changing information for a *previous* inspection. If you want to add information on a *new* inspection, highlight or select the structure, and click the **New Inspection** task in the task menu on the left. For information about adding inspections, see Section **Error!**

## 3.3 Adding a New Structure

Prior to adding a new structure into BrM, you will need to assign an ID for the structure, identify its structure units, elements and environments, and assemble available data.

## Assigning Unique IDs

Each structure in the BrM database must have a unique ID. There are three ID fields for structures in BrM:

- The BrM bridge key (brkey), which is used as a key field in the BrM database to link the bridge table with other related tables for roadways, structure units, inspections, etc.
- The NBI structure number or NBI Item 8 (struct\_num), which is required by FHWA to be a unique bridge identifier that remains constant over time.
- The agency bridge ID (bridge\_id), which can be used to store another identifier selected by the agency, and is the ID shown on the default **View List** and standard BrM reports.

By default, when bridge data is imported from an NBI file, all three of these ID's are set to be the value of NBI Item 8 – structure number. Similarly, when a new structure is created and a value for Item 8 is entered, the other two ID's are automatically set to this value. For agencies that will be using BrM to import and export NBI files, the bridge key must match the structure number. Agencies can use a bridge ID that differs from the structure number.

## Identifying Structure Units, Elements and Environments

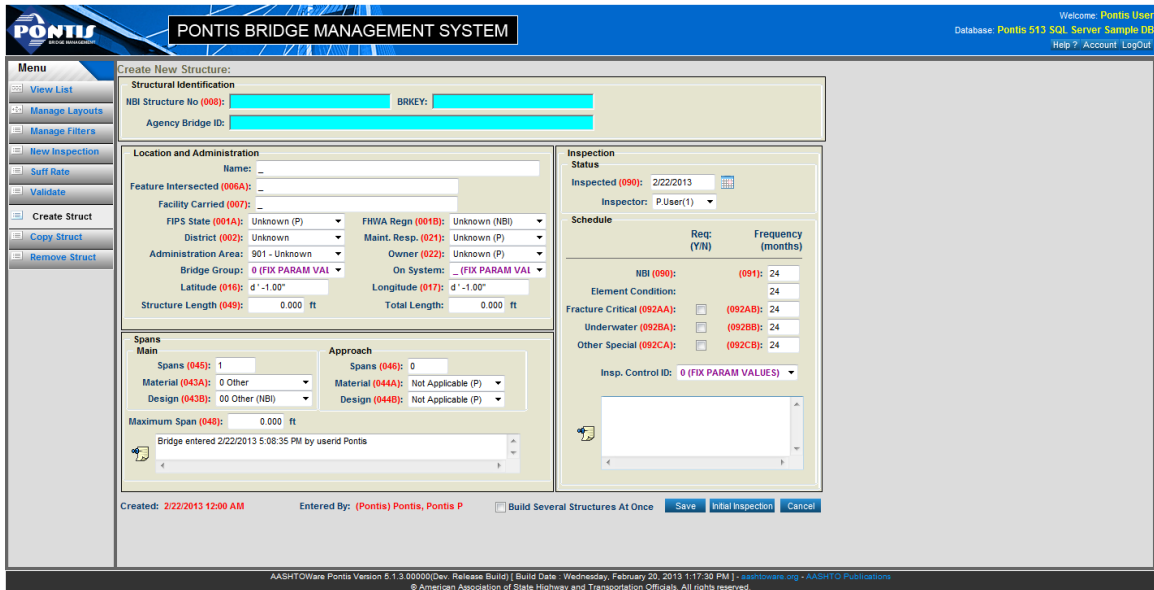
Before adding a new structure to the inventory, decide if you would like to split the structure into more than one structure unit. For each structure unit, prepare a list of elements and decide which environments they are in. Estimate the quantities of each structure unit/element and environment combination.

## Preparing Other Data

The only *required* items for adding a new structure are the structure number and bridge key. However, it is recommended that the full set of NBI data be assembled and entered when structures are added. This is done through an initial inspection which is discussed below.

## Creating a New Structure

1. Click on the **Bridges** tab and click on the **Create Struct** task. The **Create New Structure** screen will appear.



### Create a New Structure

2. Enter data into the fields on the screen. In the screen item names, the numbers in parentheses represent the NBI Item Number. Note that if you enter the first item, *NBI Structure No*, and then press the <TAB> key, the other two Structure Identification items are automatically filled in to match the NBI Structure Number.
3. You have the option to create several structures in a row and then add inspection data for the structures after they are all added. If you wish to add several structures in a row, click the **Build Several Structures At Once** checkbox in the bottom middle of the window. If you are only adding a single structure, de-select this checkbox.

**Note:** When a new structure is created, records are also created for: a roadway on the structure, a structure unit, and an inspection with the current system date. This default data should be reviewed and revised on the **Condition**, **Appraisal** and **Inventory** tabs in the initial inspection as described below.

4. If you are adding several structures at once, click **Save** to create the new structure. A new **Create New Structure** screen will appear for you to enter data for the next structure in your batch. When you have entered information for the last structure, click **Save**. A new screen ready for data entry will appear. Click **Cancel** to return to the View List.

If you are not using the option to build several structures at once, you can now create an initial inspection for the new structure. To do this, click the **Initial Inspection** button (instead of the **OK** button) to create the new structure and open the **Condition** task of the

**Inspection** tab to enter and edit the information. Follow the procedures described in the remainder of this section to add/modify inventory information for the structure. If you have already completed an element inspection for the structure, follow the procedures in Section 3.5 Entering Inspection Information to enter the new condition data and inspector work recommendations.

## Entering and Updating Structure Unit Information

Structure Unit information must be set up first because other information for the new structure references it. When a structure is first created in BrM, a default structure unit is created, with the label “Structure Unit 1”. To edit information for this structure unit and create new structure units:

1. Highlight or select a bridge on the **View List**. Click on the **Inspection** tab and then on the **Inventory** task. Click on the **Design** sub-task to see the screen with Structure Units.

The screenshot displays the PONTIS BRIDGE MANAGEMENT SYSTEM interface. At the top, it shows the system name and user information: "Welcome: Pontis User", "Database: Pontis 513 SQL Server Sample DB", and "Help ? Account LogOut". The main navigation bar includes tabs for "Bridges", "Reports", "Admin", "Inspection", and "Gateway". The "Inspection" tab is active, and the "Design" sub-task is selected.

The interface shows the following details:

- Bridge:** 04 07603
- Facility Carried (007):** 7TH STREET
- Inspection:** 2005-12-15 (UVLI)\*
- Type:** Regular NBI
- Metric:** English

**Condition Ratings:**

- Deck (058):** Unknown (NBI)
- Superstructure (059):** Unknown (NBI)
- Substructure (060):** 0 Failed
- Channel (061):** 8 Protected
- Culvert (062):** 7 Minor Deterioration
- Waterway (071):** 7 Above Minimum
- Unrepaired Spalls:** (SF)

**Element Conditions:**

0 / Type = M (0) |  Quantity  Percent |  Show Only Non-CoRe |



| Elem | Str. Unit        | Env     | Description                 | Quantity  | Units | Qty. 1 | Qty. 2 | Qty. 3 | Qty. 4 | Qty. 5 |
|------|------------------|---------|-----------------------------|-----------|-------|--------|--------|--------|--------|--------|
| 241  | 0 / Type = M (0) | Low (2) | (CoRe) Concrete Culvert     | 647.999   | (LF)  | 641    | 7      | 0      | 0      | 0      |
| 333  | 0 / Type = M (0) | Low (2) | (CoRe) Other Bridge Railing | 157.999   | (LF)  | 158    | 0      | 0      | 0      | 0      |
| 334  | 0 / Type = M (0) | Low (2) | (CoRe) Misc. Rail - 33 m sw | 342.001   | (LF)  | 342    | 0      | 0      | 0      | 0      |
| 515  | 0 / Type = M (0) | Low (2) | (CoRe) Custom R/C Wing Wall | 107.999   | (LF)  | 108    | 0      | 0      | 0      | 0      |
| 241  | 0 / Type = M (0) | Low (2) | R/C Culvert                 | 647.999   | ft    | 641    | 7      | 0      | 0      | 0      |
| 330  | 0 / Type = M (0) | Low (2) | Metal Bridge Railing        | 342.001   | ft    | 342    | 0      | 0      | 0      | 0      |
| 515  |                  |         | Steel Protective Coating    | 10753.147 | sq.ft | 10753  | 0      | 0      | 0      | 0      |
| 333  | 0 / Type = M (0) | Low (2) | Other Bridge Railing        | 157.999   | ft    | 158    | 0      | 0      | 0      | 0      |

**Status:** New |  Review Needed | **Approved By:** TJP-PP |

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Structure Units on the Design sub-task of the Inventory task

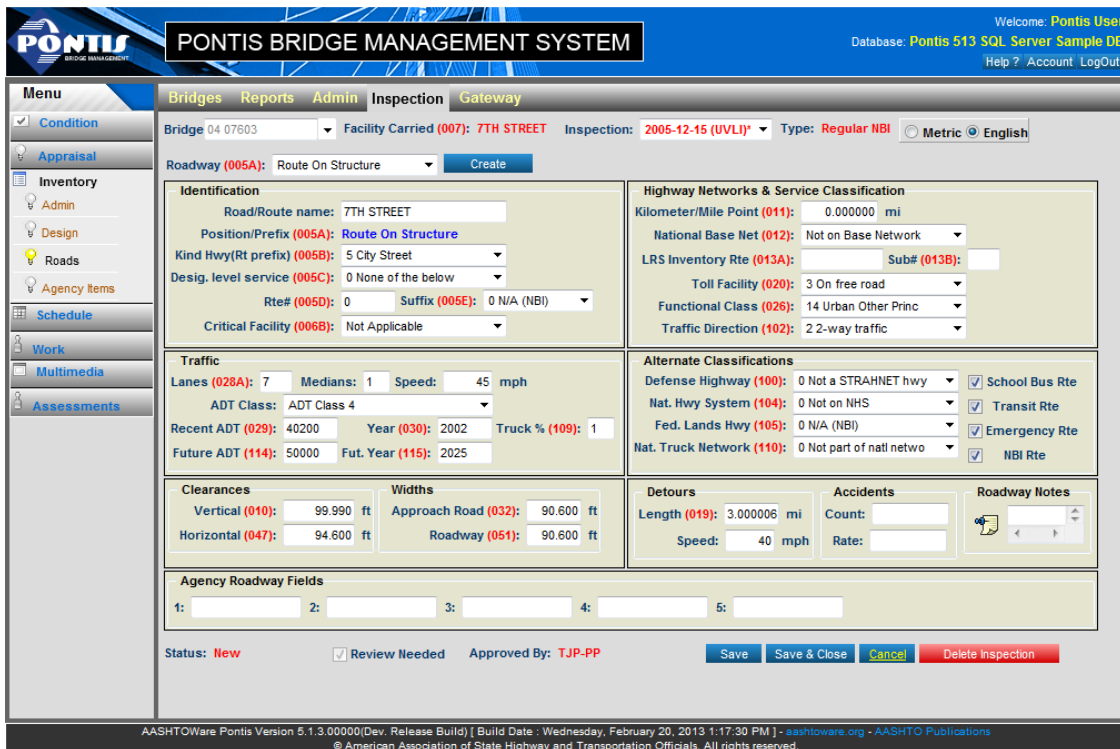


2. Edit the *Unit*, *Type*, and *Description* for the structure unit. You may enter longer notes about the structure by clicking on the  symbol in the *Notes* column. The *Default* item is covered in the following step.
3. To add a new structure unit, click the **Add New** button, and then enter information for the new unit. Note that only one structure unit may be designated as the default structure unit. Any new elements that are created are assigned to this structure unit. To modify the default structure unit, select the structure unit that you want to be the default from the grid-style list, and then check the *Default* item. The default designation is automatically removed from the previous default structure unit.
4. To remove a structure unit, first make sure that it has not been designated as the default unit. (If it has, you will need to designate another unit as the default). Then, click the **Delete** button, which looks like a garbage can.  You will be asked to confirm the deletion.
5. Click the **Save** button to save your changes to the database.

## Entering and Updating Roadway Information

When a structure is first created in BrM, a default roadway on the structure is created. To edit information for this roadway and create roadways (on or under the structure):

1. Highlight or select a bridge on the **View List**. Click on the **Inspection** tab and then on the **Inventory** task. Click on the **Roads** sub-task to see roadway information.



**PONTIS BRIDGE MANAGEMENT SYSTEM**


Welcome: **Pontis User**  
Database: **Pontis 513 SQL Server Sample DB**  
Help ? Account LogOut

Menu: **Condition** | Bridges | Reports | Admin | Inspection | Gateway

Bridge: 04 07603 | Facility Carried (007): **7TH STREET** | Inspection: 2005-12-15 (UVLI)\* | Type: Regular NBI | Metric  English

Roadway (005A): Route On Structure | Create

|  |  |  |  |
|--|--|--|--|
| <b>Identification</b><br>Road/Route name: 7TH STREET<br>Position/Prefix (005A): Route On Structure<br>Kind Hwy(Rt prefix) (005B): 5 City Street<br>Desig. level service (005C): 0 None of the below<br>Rte# (005D): 0   Suffix (005E): 0 N/A (NBI)<br>Critical Facility (006B): Not Applicable |  | <b>Highway Networks &amp; Service Classification</b><br>Kilometer/Mile Point (011): 0.000000 mi<br>National Base Net (012): Not on Base Network<br>LRS Inventory Rte (013A):   Sub# (013B):<br>Toll Facility (020): 3 On free road<br>Functional Class (026): 14 Urban Other Princ<br>Traffic Direction (102): 2 2-way traffic   |  |
| <b>Traffic</b><br>Lanes (028A): 7   Medians: 1   Speed: 45 mph<br>ADT Class: ADT Class 4<br>Recent ADT (029): 40200   Year (030): 2002   Truck % (109): 1<br>Future ADT (114): 50000   Fut. Year (115): 2025   |  | <b>Alternate Classifications</b><br>Defense Highway (100): 0 Not a STRAHNET hwy <input type="checkbox"/> School Bus Rte <input checked="" type="checkbox"/><br>Nat. Hwy System (104): 0 Not on NHS <input type="checkbox"/> Transit Rte <input checked="" type="checkbox"/><br>Fed. Lands Hwy (105): 0 N/A (NBI) <input type="checkbox"/> Emergency Rte <input checked="" type="checkbox"/><br>Nat. Truck Network (110): 0 Not part of natl netwo <input type="checkbox"/> NBI Rte <input checked="" type="checkbox"/> |  |
| <b>Clearances</b><br>Vertical (010): 99.990 ft<br>Horizontal (047): 94.600 ft  |  | <b>Widths</b><br>Approach Road (032): 90.600 ft<br>Roadway (051): 90.600 ft  |  |
| <b>Agency Roadway Fields</b><br>1:   2:   3:   4:   5:   |  |  |  |

Detours: Length (019): 3.000006 mi | Speed: 40 mph  
 Accidents: Count: | Rate: | Roadway Notes: 

Status: **New** |  Review Needed | Approved By: TJP-PP | Save | Save & Close | Cancel | Delete Inspection

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Roadway information on the Roads sub-task of the Inventory task

2. Enter/update the items on the screen (these are primarily NBI items). Only one roadway may be designated as a route ON the structure (by selecting “Route on Structure” from the *Roadway (005A)* item), but you can have an unlimited number of UNDER records. To designate a roadway as the ON roadway, first make sure that an ON roadway does not already exist (if so, remove it, or designate it as an under-route.) To exclude the roadway from NBI reporting, de-select the *NBI Rte* item in the *Alternate Classifications* group. There are five free-form fields at the bottom that can be used to store additional items about the roadway.
3. To add a new roadway, click the **Create** button, and then enter information for the roadway. If a roadway ON the structure already exists, you will need to designate the new roadway as a roadway UNDER the structure.
4. To remove a roadway, first make sure that it has not been designated as the ON-route (If it has, you will need to designate another roadway as the ON route). Then, click the **Remove** button. You will be asked to confirm the deletion.
5. Click the **Save** button to save your changes to the database.

## Entering and Updating NBI and Appraisal Information

Enter the most up-to-date NBI items for the structure on the **Condition, Inventory, Appraisal,** and **Schedule** task screens. Appendix B provides a guide to the location of the various NBI items.

## Creating Elements for the Structure

You will need to identify the elements that are present on each structure unit that you have set up. See the Element Specifications task in the **Configuration** tab for element descriptions. By default, the BrM elements match the AASHTO CoRe elements, though new elements may be added. (See the discussion of the CoRe elements in Section 3.1.) For each of these element/structure unit combinations, you must decide whether a single environment classification is appropriate, or if you’d like to split the element into two or more environments. You will end up with a set of unique structure unit/element/environment combinations, each of which must have a quantity.

### To set up elements for a new structure:

1. For your selected bridge, click the **Schedule** task in the **Inspection** tab. Make sure that the **Element Condition** checkbox is selected under *Types of Inspections Performed*. If it is not, select it and click the **Save** button.
2. Select the **Condition** task in the **Inspection** tab.
3. Make sure that the Metric /English radio button is set to the measurement units that you would like to use for specifying the element quantity.
4. Click on the **Add New Element** button. The **Add Element** screen will appear.

**Add a new Element to this structure:**

**Element ID:** [Dropdown]

**Structure Unit:** 0 / Type = M (0) [Dropdown]

**Environment:** [Dropdown]

**Quantity/Count:** 1

**Scale Factor:** 1

**Element Record Trigger:** Off [Dropdown]

**Element Description:** Element record added 2009-04-09.

[OK] [Cancel] [Help]

**Add Element Detail Dialog**

5. Select the *Element ID*. By default, this list includes all of the CoRe elements (See Section 3.1 for a discussion of the CoRe elements). If your agency has defined your own custom elements in the **Configuration** module, these will also appear on the pick list.
6. Select the *Structure Unit* for the element.
7. Select the *Environment*.
8. Enter the total *Quantity* of the element on the selected structure unit. The measurement units are automatically determined by the specification for the element in the **Configuration** module.
9. (Optional) Enter the *Scale Factor* for this element. This has a default value of 1 (and must be greater than 0). This can be used to specify an additional measurement for the element that can be used to adjust project-level cost calculations. The type of scale factor is part of the element specification. For example, most deck elements have an overlay depth scale factor; girders and stringers which are measured in lineal feet or meters have a depth scale factor; cables which are measured in “eaches” have a length scale factor. (See the *Technical Manual* for further information.)
10. (Optional) Set the *Element Record Trigger* for this element. This item is used in conjunction with the BrM Formula facility in the **Configuration** module, which allows you to define formulas for modifying data. (For example, a formula could be run to set initial values for the condition distribution for a given type of element, or a default value for the scale factor for an

element when this value is set to 1) When the *Element Record Trigger* is set to “ON”, formulas can change the information related to the element. When it is set to “OFF”, formulas will not be able to update the information. (See the *Technical Manual* for further information.)

11. (Optional) Enter a detailed description of the element.
12. Click **OK** to save the information.

## 3.4 Reviewing and Updating Inspection Schedules (Version 5.x)

The **Inspection** module can be used to maintain information about inspection frequencies, assigned inspectors, and special inspection requirements for different structures. These data items can be used to produce reports listing which structures are due for inspection within a selected time period, and what the associated resource requirements are.

### Updating Inspection Planning and Scheduling Information

If you'd like to use the inspection planning and scheduling features of BrM, you can either manually enter the next inspection date for each structure, or you can have the system calculate the next dates based on when the last inspection was and the required frequency of inspections. If you want BrM to calculate the next inspection date, you will need to update information on the most recent inspection type and date for each structure. You will also need to ensure that NBI items (90-92) on the types of required inspections and associated inspection frequencies are accurate.

To enter and update inspection scheduling information:

1. Highlight or select a bridge and click on the **Inspection** tab to get into the **Inspection** module.
2. Click on the **Schedule** task.

**PONTIS BRIDGE MANAGEMENT SYSTEM**

Welcome: Pontis User  
Database: Pontis 513 SQL Server Sample DB  
Help ? Account LogOut

Menu: Condition, Appraisal, Inventory, Schedule, Work, Multimedia, Assessments

Bridges Reports Admin Inspection Gateway

Bridge: 04 07603 Facility Carried (007): 7TH STREET Inspection: 2005-12-15 (UVLI)\* Type: Regular NBI Metric English

**Summary**

Inspection Date (090): 12/15/2005  
Inspector: P.User(1)  
Primary Type: Regular NBI  
Inspection Group: T001042B10F300000000 (FIX PARA)

Types of Inspections Performed:  
National Bridge Inventory:   
Element Condition:   
Fracture Critical:   
Underwater:   
Other Special:

| Schedule                   | Required (Y/N)           | Last date        | Frequency (months) | Next Date  |
|----------------------------|--------------------------|------------------|--------------------|------------|
| NBI (090):                 |                          | 3/20/2002        | (091): 48          | 12/15/2009 |
| Element Condition:         |                          | 3/20/2002        | 48                 | 12/15/2009 |
| Fracture Critical (092AA): | <input type="checkbox"/> | (093A): 1/1/1901 | (092AB):           | 1/1/1901   |
| Underwater (092BA):        | <input type="checkbox"/> | (093B): 1/1/1901 | (092BB):           | 1/1/1901   |
| Other Special (092CA):     | <input type="checkbox"/> | (093C): 1/1/1901 | (092CB):           | 1/1/1901   |

**Inspection Resources**

Next Inspector: P.User(1) Crew Hours: 8.00 Snooper Hours: 0.00  
Bridge Group: 4 (FIX PARAM VALUES) Flagger Hours: 0.00 Special Crew Hours: 0.00  
Helper Hours: 0.00 Special Equip. Hours: 0.00

Status: New  Review Needed Approved By: T.JP-PP Save Save & Close Cancel Delete Inspection

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### Schedule Task Screen

- The items on the screen will be affected by your level of privileges. If you don't have the correct privileges, much of this screen won't be editable.
- Click on the *Inspection* pick list at the top of the screen to make sure that you are looking at the most recent inspection for the structure (this is displayed by default).
- If you have not yet entered any actual inspections into BrM for this structure (in this case there will be an empty inspection record corresponding to when you added the structure), modify the *Inspection Date*, *Inspector* (if available), and *Primary Type* to reflect the last inspection. (Most typical element inspections have a *Primary Type* of "Regular NBI"). While each inspection has a primary type for reporting purposes, it is common practice for more than one type of inspection to be done at the same time (e.g. a regular condition inspection and an underwater or fracture critical inspection). It is important to check off what types of inspections were actually performed – this information is used to determine the next inspection dates for each required type.
- Verify the accuracy of the information on required inspection types and frequencies in the *Schedule* section of the screen. Most of this information is required for NBI reporting purposes.
- If you want BrM to re-calculate the last actual inspection dates for each type of inspection (based on the inspections in the database), click on the **Calculate Last** button. Note that the dates in the *Last Date* column refer to the last date *prior* to the inspection currently being

edited. BrM will search for an inspection of each type prior to the currently selected inspection. If there are no inspections of a particular type in the BrM database, a missing value for the date will be shown (01/01/1901). You may enter the actual dates in place of the missing values (to reflect inspections that were done before you started entering data into BrM), with one important exception. BrM will issue a warning if you attempt to enter a last inspection date that is BEFORE an existing inspection of the relevant type that is in the BrM database (and prior to the currently selected inspection.) For example, if you are looking at an NBI inspection on 1/1/2009, and the BrM database also has an NBI inspection on 1/1/2007, you will receive a warning from BrM if you attempt to enter 1/1/2006 for Last NBI inspection date (since BrM knows there was actually one later than that, on 1/1/2007).

8. You can manually enter next inspection dates for the structure, or you can have BrM calculate them. If you want BrM to calculate the next inspection dates for each type of inspection (based on the inspections in the database and the intervals), click on the **Calculate Next** button. (The update to the next inspection date does not occur automatically when you change the inspection frequency or last date – you must click the inspection icon to calculate next inspection dates.) For the inspection types performed as part of the inspection, the calculations of next inspection dates are performed relative to the date of the currently selected inspection shown in the Inspections drop-down list at the top of the screen (e.g. “Inspections: 10/25/2001). That is, the frequency is added to the CURRENT inspection date, not the *Last Inspection* date. For the inspection types not performed as part of the inspection, calculations are performed relative to the *Last Inspection* date.

**Example:** There have been 2 inspections for the current bridge, one for 2/5/1995, and another on 2/5/1997. Both of these inspections have “element” and “Regular NBI” checked under type of inspections performed.

If you select the 2/5/1995 inspection, enter a frequency of 24 months for NBI and Element inspections, and then click on the Calculate Next button, you will get a 2/5/1997 for these types of inspections.

Clicking on the Calculate Next button will result in the missing value data for all types of inspections, since there were no inspections prior to 2/5/1995.

If you select the 2/5/1997 inspection, with the same frequency of 24 months, and then click on the Calculate Next button, you will get 2/5/1999.

Clicking on the Calculate Last button will result in the 2/5/1995 for NBI and Element inspections (and a missing value date for the other types of inspections).

9. In the *Inspection Resources* group of the **Schedule** task screen, select the inspector to whom the next inspection is assigned from the list of inspectors. This defaults to the inspector for the current inspection. You can also assign the structure to an inspection group. Enter new group designations to this field through the **Parameters** task on the **Admin** tab. Once added, a parameter will be available on the pick list for subsequent inspections (on this and other structures).

10. You may enter the number of hours for personnel and equipment for the inspection under the *Inspection Resources* section. This information may be helpful for scheduling available inspection resources.
11. Click the **Save** button to commit your changes to the database.

## **Reviewing Existing Inspection Scheduling Information**

1. From the **View List**, select the structures of interest by clicking on the checkboxes to the left of each **Bridge ID** and then clicking the **Apply** button.
2. Click on the **Reports** tab.
3. View and print report **insp003\_inspection\_schedule** to see the current inspection intervals and due dates for the selected structures. BrM 5.x is delivered with two versions of the **insp003\_inspection\_schedule** report, reated in Crystal Reports. (See Section 2.4 for information on viewing BrM reports.)
4. View and print report **insp004\_inspection\_resource\_req** to view inspection resource requirements for the selected structures. Only those structures for which this information has been entered will appear on this report.



## 3.5 Entering Inspection Information

Inspection information can be entered directly into the master BrM database, or on field computers running BrM. Procedures for entering the inspection information into either the BrM master database, or into the BrM database on the field computer are provided in this section.

### Creating a New Inspection

**Note:** When a new structure is added into BrM, the program automatically creates an initial inspection. Thus, the process of creating a new inspection outlined below can be skipped for the first inspection for a structure. (However, be sure to enter information for this initial inspection.)

1. Select the structure for the new inspection from the bridge **View List**.
2. Click the **New Inspection** task on the menu on the left. The new inspection form will appear.

**Previous inspections for Bridge 04 09192**

| Key                                   | Date      | Type                   | Inspector            | Control Group |
|---------------------------------------|-----------|------------------------|----------------------|---------------|
| <input checked="" type="radio"/> SUGR | 1/10/2006 | Regular NBI Pontis (1) | T00105D4FA8C00000000 |               |
| <input type="radio"/> TZVL            | 1/18/2005 | Regular NBI Pontis (1) | T00105D4FA8C00000000 |               |
| <input type="radio"/> TTYR            | 1/23/2004 | Regular NBI Pontis (1) | T00105D4FA8C00000000 |               |
| <input type="radio"/> XOTN            | 2/6/2003  | Regular NBI Pontis (1) | T00105D4FA8C00000000 |               |
| <input type="radio"/> TUUE            | 1/10/2001 | Regular NBI Pontis (1) | -1                   |               |
| <input type="radio"/> BUJZ            | 12/8/1998 | Regular NBI Pontis (1) | -1                   |               |
| <input type="radio"/> ADOT            | 1/27/1997 | Regular NBI Pontis (1) | -1                   |               |
| <input type="radio"/> JQSX            | 1/15/1995 | Regular NBI Pontis (1) | -1                   |               |

**Create New Inspection**

**Duplicate Previous:**

**Element Inspection:**

Create New Inspection Screen

3. If you want the new inspection to be created with the same information as the last inspection, select the **Duplicate Previous** checkbox. If you want the new inspection to be blank, with elements initialized to the best condition state, de-select the **Duplicate Previous** checkbox.
4. If the new inspection is an element-level inspection, select the **Element Inspection** checkbox. Otherwise, make sure this box is empty.

- Click the **Create** button. The **Schedule** screen will appear. Enter the date that the new inspection was done, the name of the Inspector, and the primary type for the inspection. Check off the specific types of inspections to be done. Note that all of this information can be modified later. However, if you will be entering element inspection data, be sure that the **Element** checkbox is selected. Be sure to edit information on the inspection schedule and resources.

**Note:** If you are creating a duplicate inspection, BrM copies information from the latest inspection to the new one. If the new inspection is an element inspection, but the prior one was not, BrM copies element condition information from the most recent element inspection in the database.<sup>6</sup>

- To retain your inspection, click **Save**. If you want to retain your inspection and come back later to change or add data, click **Save & Close**. If you do not want to create the inspection, click **Cancel**. When prompted to navigate away from the page, click **OK**.
- If you clicked **Save**, you will be transferred to the **Condition** task of the **Inspection** tab. You can proceed to enter inspection information (see below). If you wish to enter the data later, click **Save & Close**.

## Modifying Element Information

When a new inspection is conducted, it is possible that the types, quantities, structure units or environments observed for the elements may not match those entered for the previous inspection. This may be the result of actual physical changes on the bridge (e.g. overlaying a bare concrete deck would change its element ID), or the result of an error in the previous inspection information. If there are errors in the previous inspection information, you should select the first inspection that includes the error, and modify the element information there. The changes will be propagated to all of the later inspections. If there was an actual physical change in the structure since the last inspection, make the modifications on the current inspection. Past inspections will not be affected by the change.


When an element is deleted from an inspection, any work candidates that were previously created in the **Work** task based on that element will still exist. These should be modified or deleted. See the section below on Entering Inspector Work Candidates. In addition, projects may have been created based on the old elements. These should be reviewed, modified or deleted as well. See Chapter 6 for information on reviewing and modifying projects.

- Go to the **Condition** task of the **Inspection** tab.
- If you do not see any element information or buttons for adding or removing elements, this means that the inspection you are editing was not designated as an Element inspection. Select the **Schedule** task, and select the **Element Condition** checkbox under *Types of Inspections*

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<sup>6</sup> If the Configuration Module Option called COPYNBIONLY is set to “YES”, the latest NBI inspection will be copied. Otherwise (the default), information from the latest inspection of any type will be copied.

*Performed.* Click the **Save** button. Select the **Condition** task again, and you should see the element-related buttons, and whatever elements were set up on the previous element inspection.

3. To change the quantity of an element on the structure, edit the quantity directly in the **Condition** task. You will be asked to confirm that you want to change this quantity for this and any later inspections.
4. To change the structure unit or environment for an element, make the changes directly on the screen. Click **Save**.
5. To replace an element on the structure, you will need to add a new element (using the **Add New Element** button), and then delete the old one (using the **Delete** button ). When you remove an element, you will need to confirm that you want to remove the element from this and any existing later inspections. If you want to remove any work recommendations and project work items for the element, click the checkbox in the **Delete WCand** column before clicking the **Delete** button.

## Entering Condition Information and Inspector Notes

If you are entering information for an element inspection, you will need to enter information on quantities by condition state for each element in the condition task. You may then also enter NBI condition ratings directly at the top of the task screen or calculate the NBI condition ratings by clicking on the **NBI Translator** button. (See Section **Error! Reference source not found.** for ore information.)

If you are entering information for another type of inspection, you should not see any element information on the **Condition** task screen. Note that all information for special inspections can be recorded in the **Schedule** task. Other information related to the inspection can be entered in the **Inspection Notes**, accessed via the notes icon  near the top of the screen.

### To enter condition ratings:




1. Select the **Condition** task of the **Inspection** tab.
2. (For element inspections only) If you want to enter the percent of each element in the different condition states, click on the **Percent** radio button above the **Element Conditions** grid. If you want to enter the actual quantity in each condition state, click on the **Quantity** radio button. If you are entering quantities, select either English or metric units from the radio buttons at the top right of the screen.
3. (For element inspections only) Fill in the percent or quantity of each element in condition states 2-5. The remaining percent or quantity will automatically be put into condition state 1. If you enter quantities or percentages which exceed the total quantity of the element (or 100 percent), a message will be displayed and you will need to modify your entries before moving to a new element. For elements which have the “Inspect as Each” option selected on the **Element Spec** task screen in the **Admin** task, you must enter 100 percent in a single

condition state. (By default, all deck elements are designated as “Inspect as Each,” shown with **(ea)** after the element description.)

4. Enter NBI condition ratings at the top of the screen. If you have entered element condition distributions, you have the option of using the **NBI Translator** button to calculate the NBI ratings.

#### To enter notes:

1. BrM is designed to store notes about the bridge as a whole, about each structure unit and roadway on/under the bridge, about the overall inspection, and about each element inspected. The notes for the bridge, structure unit and roadways are part of the inventory, and do not change when you switch inspections or enter a new inspection. Notes about the inspection and the elements change with each inspection. Notes about the bridge can be entered in the *Bridge Notes* item on the **Admin** sub-task under the **Inventory** task on the **Inspection** tab.

Notes about the inspection can be entered by clicking on the notes icon  near the top of the **Condition** task screen under the **Inspection** tab. Notes about structure units and roadways are entered on the **Inventory** task screen (**Design** and **Roads** sub-tasks). To enter notes about a particular element, select the **Condition** task, select the element by clicking on the select triangle () , and then click on the notes icon  in the area that opens at the bottom of the screen.

2. When you have finished your edits, click the **Save** button to commit your changes to the database.

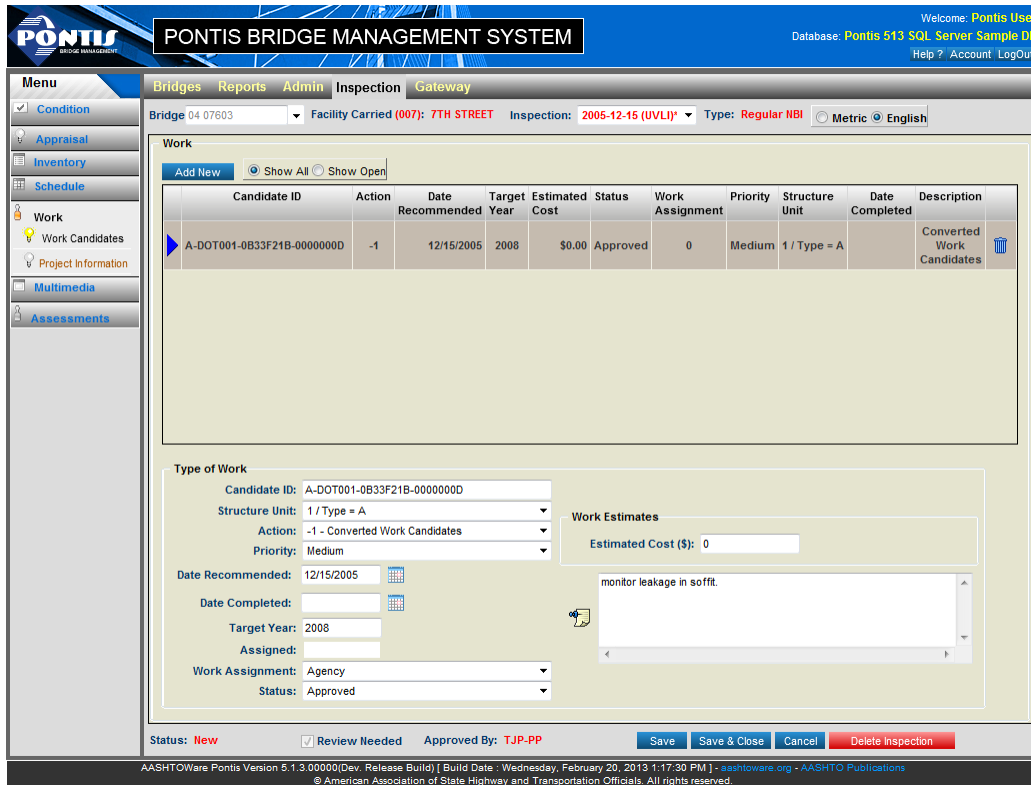
## Entering Inspector Work Candidates

Inspector work candidates may be entered on the **Work Candidates** sub-task of the **Work** task as part of the inspection data entry process. Their impacts on bridge and element conditions can be simulated, and they can be used to create projects. All information entered about a work candidate is carried over if it is selected to become part of a project. If a work candidate has been selected for inclusion in a project, the *Assigned* item on the **Work Candidates** sub-task screen will say “Yes”, and clicking on the **Project Information** sub-task will bring up information about all the projects for the current bridge and work candidate. Also shown on the **Project Information** sub-task screen are the NBI items (75A, 75B, 76, and 94 through 97) storing project data.

Note that all work candidates for a structure that have been entered on all inspections to date will be shown on the **Work Candidates** sub-task screen. This allows you to see a complete record of the recommendations that have been made. When projects are actually completed, you can delete work candidates that are no longer relevant, or you can choose to maintain a historical record of the inspector work candidates. If you choose to keep a historical record, you may wish to use the *Status* field<sup>7</sup> to keep track of which work candidates have already been addressed, and should no longer be examined in the project planning process.

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<sup>7</sup> You can customize the options for the Status field on the Parameters task screen of the Admin tab – the table and column name are insp\_wcand.agency\_status.



**Work Candidates sub-task screen**

To add a new work candidate:

1. Select the **Work Candidate** sub-task screen.
2. To add a work candidate, click the **Add New** button. A new row in the grid for the new inspector work candidate will appear. The new row will be selected and the area at the bottom of the screen, which corresponds to the new row, will be available for editing.
  - a. Enter a *Candidate ID* for your work candidate. This ID can be anything you choose (e.g. a sequential number, inspector initials plus the month and year, etc.).
  - b. If the structure has more than one structure unit, you can either specify the structure unit on which the work is recommended, or you can select “9999 - All StrUnits” from the *Structure Unit* dropdown list.
  - c. Select the *Action* you want to recommend from the dropdown list. This will include all of the flexible actions that have been set up in the **Flex Actions** sub-task of the **Actions** task on the **Admin** tab.
  - d. Set a *Priority* for your work candidate. This appears on the standard BrM report plan002\_projects\_candidates which shows work candidates and scheduled projects for a set of selected structures.

- e. The *Date Recommended* will by default be set to the inspection date. You can modify this if you wish.
- f. Enter the *Target Year* for the work – this is the year that you recommend the work be completed.
- g. For *Work Assignment*, select whether the work is likely to be done by contractor or in-house agency forces.
- h. Select a *Status* for the work candidate. This item can be used for management of the work candidate review process.
- i. Enter the *Estimated Cost* for the work candidate.
- j. Enter free-form notes about the work candidate – click on the notes icon to expand the Notes field.
- k. Click the **Save** button to save your entries

## Entering Agency Information

If your agency has added a customized inspection information table and form containing special data elements that are not in the standard BrM database, select the **Agency** tab, and enter the required information. This card can contain additional information about bridges, structure units, roadways, and inspections. To use the **Agency** tab, your system administrator must create the new data items in the BrM database, create the tab using the **Navigation and Field Security** task, and set the necessary security options to make the tab active. The *Technical Manual* provides detailed instructions on setting up custom forms in BrM.

## Entering Multimedia Document Links

During inspection data entry, you can link multimedia documents with bridges and bridge inspections using the **Multimedia** task under the **Inspection** tab. With this feature, BrM stores the names and locations of the associated multimedia files in the BrM database. A central multimedia document server may be used or documents may reside on your hard disk. You can enter descriptive notes along with the files and work with a multimedia file using its associated Windows desktop application.

To associate a multimedia document with a bridge or bridge inspection:

1. Select the **Multimedia** task on the **Inspection** tab.
2. Press the **Browse...** button. BrM displays a dialog for you to use to browse for the multimedia document that you want to associate with the bridge or inspection. Browse for the file you want and click **Open**.
3. Select the proper context for the file by selecting “Bridge” or “Inspection” from the *Context* pick list.
4. Click the **Link** button to link the document to the bridge or inspection.
5. If desired, enter a descriptive *note* for the document, and/or select an *agency type* for the document.

Once you have associated a multimedia document with a selected bridge or inspection, you can display the thumbnail image at full-size. When you click on the thumbnail image displayed with the file information, the associated Windows application for viewing the document will be launched, retrieving the document and allowing you to view it at full size. You can display any of the following standard Windows file types and others, provided you have loaded an application that can interpret them: BMP, GIF, JPG, PDF, PCX, TXT, HTML, XLS, PPT, and DOC.



The screenshot displays the 'Multimedia Task Screen' in the PONTIS BRIDGE MANAGEMENT SYSTEM. The interface includes a navigation menu on the left with options like Condition, Appraisal, Inventory, Schedule, Work, Multimedia, and Assessments. The main content area shows a table of multimedia documents for bridge 04 07603. The table has columns for Name, Type, Agency Type, Report Flag, Sort Order, Location, and Agency Item 1 through 4. The selected document is 04 07603G01, which is a JPG file of type Design Document. Below the table, there is a 'Document Information' section with fields for File (04 07603G01.jpg), Location (C:\Program Files\AASHTO\WARE\Pontis5\webedir\Multimedia\Sample Photos\04 07603\04 07603G01.jpg), Created, Accessed, Modified, and Status (Unavailable). A 'Link and Upload Documents' section includes a 'Copy File to Server' checkbox (checked) and a 'Select Multiple Files' button. The status bar at the bottom shows 'Status: New', 'Review Needed' checked, and 'Approved By: TJP-PP'. Buttons for Save, Save & Close, Cancel, and Delete Inspection are also visible.

### Multimedia Task Screen

To remove the association of a multimedia document with a bridge or bridge inspection:

1. Select the multimedia document you want to unlink by clicking on the select triangle.
2. Press the **Unlink** button. BrM deletes the reference link from the database. The actual document file is not affected and must be removed externally.

## Updating Inventory, Appraisal and Schedule Information

As part of entering new inspection data, it is good practice to review and update information in the **Inventory**, **Appraisal** and **Schedule** tasks. Instructions for the **Inventory** and **Appraisal** tasks are provided in Section 3.3. Instructions on updating schedule information are provided in Section 3.4.

## Updating the BrM Models to Reflect New Inspections

After completing and entering a full annual cycle of inspections, it is recommended that you update the BrM deterioration and preservation optimization models to reflect this new information. For instructions, see Chapter 4.

## 3.6 Using Paper Forms for Inspection Data Entry

(Optional) Develop an inspection data entry form. Please see the *BrM Technical Manual* for instructions on how to create, register and use custom agency data forms.

## 3.7 Calculating Sufficiency Ratings (Version 5.x)

BrM can calculate the NBI sufficiency ratings, Appraisal ratings (Structural, Deck Geometry and Underclearance) and SD/FO status based on the standard items in the BrM database.

1. Prior to calculating sufficiency ratings, make sure that the NBI ratings upon which the sufficiency rating depends are up-to-date
2. If you are in the **Inspection** tab, you can calculate the sufficiency rating for the current structure by clicking on the **Calculate SR** button on the **Condition** task screen. You can check the *SR Calculate Status* item on the **Admin** sub-task of the **Inventory** task to see if data affecting the sufficiency rating has changed since it was last calculated. This pick list will read “SR Recalc Required” if the sufficiency rating needs to be recalculated.
3. You can also calculate ratings for a group of structures from the **View List** of the **Bridges** tab. To do this, and select the layout called “Bridges with expired sufficiency ratings.” This layout includes only those structures for which inspection or inventory has changed since the last time the sufficiency rating was calculated. You will normally want to select all of the structures on this list, using the **Select All** sub-task of the **View List** task. If you prefer, you can select smaller groups of structures from the list by clicking on them.
4. Click the **Suff Rate** task on the menu on the left. The sufficiency ratings will be calculated for your selected structure(s), and the **Sufficiency Rating Results** screen will appear. This screen shows the previous values and the calculated values.

**INVENTORY AND INSPECTION DATA MANAGEMENT**

| Sufficiency Rating Results      |                 |                     |                  |               |                 |           |             |              |
|---------------------------------|-----------------|---------------------|------------------|---------------|-----------------|-----------|-------------|--------------|
| Bridge ID                       | Inspection Date |                     | Structure Rating | Deck Geometry | Under Clearance | SR Prefix | Suff Rating | SD/FO Status |
| 04 07598                        | 2004-12-15      | Previous Ratings:   | 6                | 9             | II              |           | 97.5        | 0            |
| Accept <input type="checkbox"/> |                 | Calculated Ratings: | 6                | 9             | II              |           | 97.5        | 0            |
| 04 07603                        | 2005-12-15      | Previous Ratings:   | 7                | II            | II              | *         | 72.5        | 0            |
| Accept <input type="checkbox"/> |                 | Calculated Ratings: | 7                | 5             | II              |           | 89.8        | 0            |
| 04 07878                        | 2003- 4-30      | Previous Ratings:   | 7                | 4             | II              | *         | 87.7        | 0            |
| Accept <input type="checkbox"/> |                 | Calculated Ratings: | 7                | II            | II              |           | 84.7        | 0            |
| 04 07935                        | 2006- 2- 9      | Previous Ratings:   | 6                | 4             | II              | *         | 90.8        | 0            |
| Accept <input type="checkbox"/> |                 | Calculated Ratings: | 6                | 7             | II              | *         | 92.4        | 0            |
| 04 08003                        | 2005-11- 7      | Previous Ratings:   | -                | -             | -               | -         | -1          | -            |
| Accept <input type="checkbox"/> |                 | Calculated Ratings: | 7                | 9             | II              |           | 96.3        | 0            |
| 04 08511                        | 2005- 2- 7      | Previous Ratings:   | 4                | 2             | 4               |           | 53.2        | 2            |
| Accept <input type="checkbox"/> |                 | Calculated Ratings: | 6                | 2             | 4               |           | 82.0        | 2            |
| 04 08529                        | 2005- 2-14      | Previous Ratings:   | 4                | 2             | 4               | *         | 53.2        | 2            |
| Accept <input type="checkbox"/> |                 | Calculated Ratings: | 7                | 2             | 4               | *         | 76.5        | 2            |
| 04 09192                        | 2009- 4-13      | Previous Ratings:   | 3                | 2             | II              |           | 43.8        | 2            |
| Accept <input type="checkbox"/> |                 | Calculated Ratings: | 2                | 2             | II              |           | 51.1        | 1            |
| 04 09208                        | 2004-11-18      | Previous Ratings:   | 6                | 2             | II              | *         | 62.5        | 2            |
| Accept <input type="checkbox"/> |                 | Calculated Ratings: | 6                | 2             | II              |           | 64.6        | 2            |
| 04 09320                        | 2004- 9-22      | Previous Ratings:   | 7                | 2             | II              | *         | 63.1        | 2            |
| Accept <input type="checkbox"/> |                 | Calculated Ratings: | 7                | 2             | II              | *         | 63.2        | 2            |
| 04 09701                        | 2005-12- 1      | Previous Ratings:   | 7                | 7             | II              |           | 93.7        | 0            |
| Accept <input type="checkbox"/> |                 | Calculated Ratings: | 7                | 7             | II              |           | 93.1        | 0            |
| 04 09704                        | 2005- 2- 5      | Previous Ratings:   | 7                | 5             | 3               | *         | 81.0        | 2            |

Accept Accept All Cancel

**Sufficiency Rating Results Screen**

- To accept all of the calculated ratings and save them to the database, click on the **Accept All** button. To accept only some of the ratings, click the *Accept* box for the bridge(s) you want, and then click on the **Accept** button. This will save the selected ratings to the database. Ratings that are not accepted will be discarded, and the previously existing ratings will remain unchanged in the database. Click on the **Cancel** button to close the screen.

## 3.8 Performing Data Validation (Version 5.x)

BrM can perform data validation checks such as the Federal Highway Administration (FHWA) Edit/Update check for the selected bridges.

1. Prior to performing data validation, make sure the inspection data are up-to-date.
2. If you are in the **Condition** task of the **Inspection** tab, perform data validation for the current structure by clicking on the **Validate** button.
3. You can perform data validation for a group of structures from the **View List** task of the **Bridges** tab. To do this, select a layout. You will normally want to select all of the structures on this list, using the **Select All** button. If you prefer, you can select smaller groups of structures from the list by clicking the checkboxes on the left of each row and then clicking **Apply**.
4. Click the **Validate** task on the menu on the left. A screen appears to show you the bridges you selected. You can continue with the selected bridges by clicking **Validate Only Selected**. To validate all structures, click **Validate All in the Database**. Exit this task by clicking **Cancel**. If you clicked either of the first two options, the data validation will be performed for your selected structure(s), and the Validation Results screen will appear. The top pane of the screen displays the selected structure(s). The bottom pane shows warnings and fatal errors generated by the data validation routine. If no validation errors are found for a bridge, then the “No warnings or errors generated by data validation” message is displayed in the **Validation Results** window.
5. To display the validation result for all selected structures, check the **Show All Results** checkbox. To view the result for one structure at a time, uncheck the checkbox and click the select triangle for the structure whose results you wish to see. You must close the screen to edit the data.

**INVENTORY AND INSPECTION DATA MANAGEMENT**

**Validation Results**

| Bridge ID | Feature Intersected | District | County | Own | Maint. | Area | Meters           | Built | Structure Name     | Facility Carried |
|-----------|---------------------|----------|--------|-----|--------|------|------------------|-------|--------------------|------------------|
| 04 09175  | GRAND CANAL         | 02       | 013    | 04  | 04     | 03   | 16.1539993286133 | 1946  | Grand Canal Bridge | 19TH AVE         |
| 04 09192  | GRAND CANAL         | 02       | 013    | 04  | 04     | 04   | 13.7159996032715 | 1952  | Grand Canal Bridge | 16TH STREET      |
| 04 09313  | GRAND CANAL         | 02       | 013    | 04  | 04     | 04   | 13.6149997711182 | 1961  | Grand Canal Bridge | 24TH ST          |
| 04 09741  | Salt River          | 02       | 013    | 04  | 04     | 03   | 306.799987792969 | 1982  | Salt River Bridge  | 19th Avenue      |

| Bridge ID | FHWA Error ID | Severity | Validation Message                                  | Record Type | Pontis Error ID |
|-----------|---------------|----------|---|-------------|-----------------|
| 04 09192  | IE115-2       | WARNING  | THE YEAR OF FUTURE ADT IS < 17 YEARS FROM INSP DATE | 1           | 137             |

Show All Results:

Close

**Validation Results Screen**

## 3.9 Deleting an Inspection (Version 5.x)

**Caution:** Deleting an inspection permanently removes it from the BrM database. It is strongly advised to make a backup of the database or use to PDI export feature (see Section **Error! Reference source not found.**) to save a record of the inspection prior to

1. Check with the system administrator to make sure that you have the necessary privileges to delete an inspection.
2. Select or highlight a structure and click on the **Inspection** tab.
3. If more than one inspection exists for the structure, use the **Inspections** selection list at the top of your screen to select the date of the inspection you wish to delete. The inspection information will be displayed.
4. Click the **Delete Inspection** button. If this option is grayed out, then you do not have permission to delete inspections.
5. A confirmation message will appear; click **OK** to complete the deletion. All data associated with the inspection will be deleted permanently.

## 3.10 Deleting a Structure (Version 5.x)

**Caution:** Deleting a structure permanently removes it from the BrM database. It also causes all of the information associated with the structure, including inspections, projects, scenario results, etc. to be removed from the system. Therefore, it should only be done with extreme care by someone who fully understands the impacts on all aspects of the system. It is strongly advised to make a backup of the database or use the PDI export feature (see Section **Error! Reference source not found.**) to save a record of the data prior to

1. Check with the system administrator to make sure that you have the necessary privileges to delete a structure.
2. Select the structure(s) you wish to delete. It is good practice to click the **Just Selected** sub-task on the **View List** to clearly view the set of structures you have selected before performing a delete.
3. Click the **Remove Struct** task in the menu on the left. You will see a list of the selected bridges. Click the **Remove** button. You will be given a second chance to verify that you really want to delete the structure. If you click **OK**, the structure will be permanently removed from the database, and all associated data will be lost.

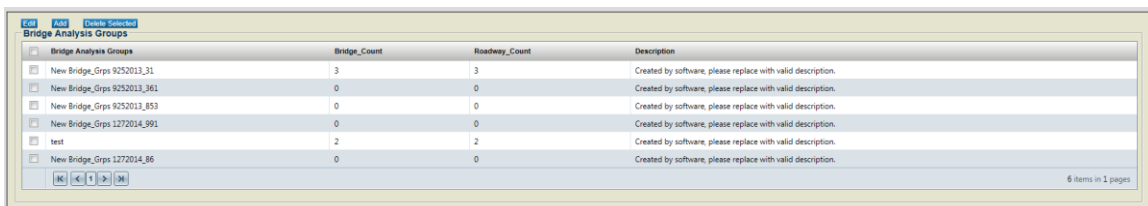
## 3.11 Manage Bridge Analysis Groups

The Bridge Analysis Groups page can be accessed by selecting the Manage Bridge Analysis Groups task within the Bridges tab. This task contains four subtasks that provide the ability to browse, find, edit, create, and delete bridge analysis groups. Each subtask and associated functionality is outlined below.

### Bridge Analysis Groups

The Bridge Analysis Groups subtask is used to find and view bridge analysis groups. The page is broken up into three main sections which are the filter and layouts section, the quick filter section, and the analysis groups data grid section.

The primary focus of the page is the data grid section located at the bottom of the page containing a list of bridge analysis groups.



| Bridge Analysis Groups                               | Bridge_Count | Roadway_Count | Description   |
|--|--------------|---------------|---|
| <input type="checkbox"/> New Bridge_Grps 9252013_31  | 3            | 3             | Created by software, please replace with valid description. |
| <input type="checkbox"/> New Bridge_Grps 9252013_361 | 0            | 0             | Created by software, please replace with valid description. |
| <input type="checkbox"/> New Bridge_Grps 9252013_853 | 0            | 0             | Created by software, please replace with valid description. |
| <input type="checkbox"/> New Bridge_Grps 1272014_991 | 0            | 0             | Created by software, please replace with valid description. |
| <input type="checkbox"/> test                        | 2            | 2             | Created by software, please replace with valid description. |
| <input type="checkbox"/> New Bridge_Grps 1272014_86  | 0            | 0             | Created by software, please replace with valid description. |

6 items in 1 pages



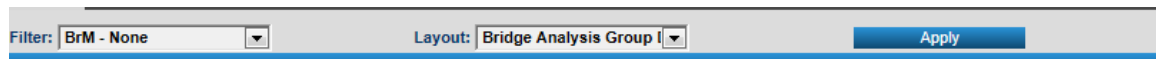
From within the grid, bridge analysis groups can be selected. Once selected, the analysis groups can either be edited or deleted by clicking the edit or delete buttons located above the grid.

The delete button will only function if there are selected Bridge Analysis Groups, otherwise the user will receive a popup letting them know that some groups must be selected. If the button is clicked when there are groups selected the user will be prompted to confirm the deletion of the groups.

If either the Add button or the Edit button is selected, the page will be directed to the Bridge Analysis Group Details subtask. The first selected Bridge Analysis Group will automatically be selected in the Bridge Analysis Group Details form. Please note that clicking the “Add” button on this page will automatically add a new Bridge Analysis Group to the database with an auto-generated, unique name. See the Bridge Analysis Group Details section for further information on Adding and Editing analysis groups.

The filter and layout section is located at the very top of the page. This section provides the ability to select a custom filter and layout for which the analysis groups will be displayed in the data grid.

The filter list contains filters created through the Manage Filters task within the Bridges tab as well as custom quick filters that are created through the quick filter section in this page. All quick filters in the list will be prefaced with an asterisk(\*). The layouts list contains layouts created through the Manage Layouts task within the Bridges tab. Click the Apply button to apply the selected filter and layout to the data grid.



Below the filter and layout section is a collapseable panel for creating/editing quick filters. Within this section there are a number of Roadway and Bridge characteristics for which the bridge analysis group data can be filtered.

To filter data grid items:

1. Designate filter criteria by selecting items from the various drop down lists or entering data into the text boxes
2. Click the Filter Results button to apply the filtering criteria to the data grid.
3. Note: this will only filter based on current criteria and will not save the filter

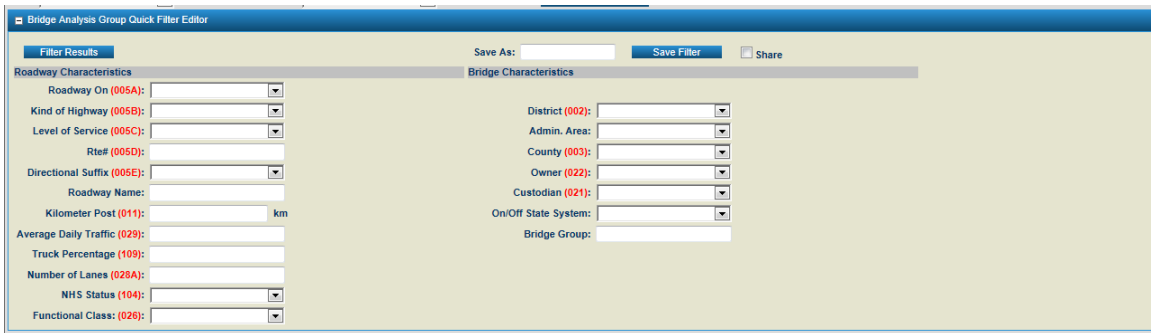
To edit a quick filter:

1. Select and apply a filter in the Filter and Layout section
2. Modify filter criteria by selecting items from the various drop down lists or entering data into the text boxes
3. Click the Save Filter button
4. Note: only Filters with the asterisk prefix(\*) can be edited in this interface

To add a quick filter:

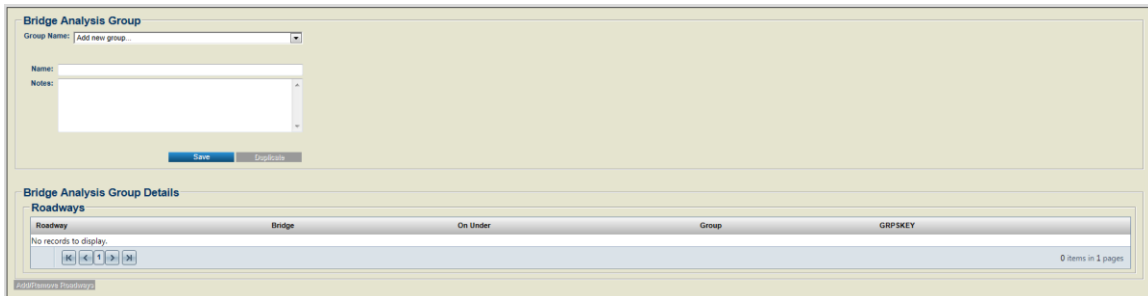
1. Designate filter criteria by selecting items from the various drop down lists or entering data into the text boxes
2. . Enter a name in the Save As text box
3. Click the Save Filter button.

This filter will now be available in the filter dropdown and prefaced with an asterisk(\*).If the Shared checkbox was selected, this filter will also be available to other users.



## Bridge Analysis Group Details

The Bridge Analysis Group Details subtask is used to display the details of a particular analysis group and manage the analysis group at a high level. This page has two main sections to it. The first is the bridge analysis group section at the top of the page which contains the name and notes about the analysis group. Below that is the details section which contains all of the roadways for the specific bridge analysis group.



To Add a new group:

1. Select “Add new group...” from the Group Name dropdown.
2. Enter a name into the Name text box. This is a required field.
3. Add notes to the Notes textbox if applicable.
4. Click the Save button to save the new group.

To duplicate a group:

1. Select an existing group from the Group Name drop down list.
2. Enter a name in the Name text box for the new duplicate group. If a new name is not specified a default name will be created.
3. Add notes to the Notes textbox if applicable.
4. Click the Duplicate button to duplicate the group.

To Add/Remove Roadways to/from a group:

1. Click the Add/Remove Roadways button located to the bottom left of the under the roadway grid.
2. This will navigate the page to the Add/Remove Roadways subtask. See the details for this subtask for further information on adding and removing roadways.

## Add/Remove Roadways

The Add/Remove Roadways subtask is used to maintain the roadways associated with a particular bridge analysis group. This page is broken out into three main sections that are very similar to the sections of the Bridge Analysis Groups subtask. These sections are the filter and layout section, the quick filter section, and the roadways data grid section.

The primary section of the page is the roadways data grid section which is located at the bottom of the page. It is this section that displays the list of all roadways that can be added to bridge analysis groups.

| Bridge ID | On Under | Kind of Highway | Level of Service | Route | Dir | Functional Class |
|-----------|----------|-----------------|------------------|-------|-----|------------------|
| 04 07598  | 1        | 5               | 1                | 00000 | 0   | 17               |
| 04 07603  | 1        | 5               | 0                | 0     | 0   | 14               |
| 04 07878  | 1        | 5               | 1                | 00000 | 0   | 16               |
| 04 07935  | 1        | 5               | 1                | 00000 | 0   | 16               |
| 04 08003  | 1        | 5               | 1                | 00000 | 0   | 16               |
| 04 08508  | 1        | 5               | 1                | 00000 | 0   | 17               |
| 04 08511  | 1        | 5               | 1                | 00000 | 0   | 19               |
| 04 08511  | 2        | 5               | 1                | 00000 | 0   | 19               |
| 04 08529  | 1        | 5               | 8                | 00000 | 0   | 19               |
| 04 08529  | A        | 5               | 8                | 00000 | 0   | 19               |

To add roadways to a group:

1. Select the bridge analysis group from the Group Name drop down list located just above the data grid to which roadways will be added.
2. Select roadways by checking the checkbox in the first column of the grid for the grid data row of the desired roadways.

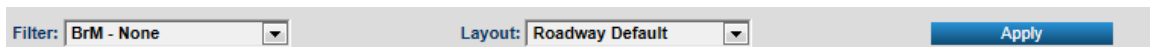
3. Once all roadways are selected, click the Save Roadways to Group button to save the roadways to the group.

To add a new analysis group:

1. Select roadways by checking the checkbox in the first column of the grid for the grid data row of the desired roadways.
2. Enter a group name into the text box located above the grid next to the Add New Group button.
3. Click the Add New Group button to add a new group with the name specified in the text box.

The filter and layout section is located at the very top of the page. This section provides the ability to select a custom filter and layout for which the roadways will be displayed in the data grid.

The filter list contains filters created through the Manage Filters task within the Bridges tab as well as custom quick filters that are created through the quick filter section in this page. All quick filters in the list will be prefaced with an asterisk(\*). The layouts list contains layouts created through the Manage Layouts task within the Bridges tab. Click the Apply button to apply the selected filter and layout to the data grid.



Below the filter and layout section is a collapseable panel for creating/editing quick filters. Within this section there are a number of Roadway and Bridge characteristics for which the roadway data can be filtered.

To filter data grid items:

1. Designate filter criteria by selecting items from the various drop down lists or entering data into the text boxes
2. Click the Filter Results button to apply the filtering criteria to the data grid.
3. Note: this will only filter based on current criteria and will not save the filter

To edit a quick filter:

1. Select and apply a filter in the Filter and Layout section
2. Modify filter criteria by selecting items from the various drop down lists or entering data into the text boxes
3. Click the Save Filter button
4. Note: only Filters with the asterisk prefix(\*) can be edited in this interface

To add a quick filter:

1. Designate filter criteria by selecting items from the various drop down lists or entering data into the text boxes
2. . Enter a name in the Save As text box
3. Click the Save Filter button.

This filter will now be available in the filter dropdown and prefaced with an asterisk(\*).If the Shared checkbox was selected, this filter will also be available to other users.

## Setup Bridge Analysis Groups

The Setup Bridge Analysis Groups subtask page is used to build bridge analysis groups quickly based on certain specified roadway criteria. The top section of this page displays all of the roadway filters that can be used to build bridge analysis groups.

The screenshot shows a window titled "All Roadway Filters" with a grid of 16 filter criteria, each with a checkbox. The "Admin area" checkbox is selected. Below the grid is a text box labeled "Stem of new bridge groups names:" and a "Start grouping" button.

| Filter Criteria     | Selected                            |
|---------------------|-------------------------------------|
| On/under            | <input type="checkbox"/>            |
| District            | <input type="checkbox"/>            |
| On/off state system | <input type="checkbox"/>            |
| Kind of highway     | <input type="checkbox"/>            |
| Action Defs         | <input type="checkbox"/>            |
| Admin area          | <input checked="" type="checkbox"/> |
| NHS status          | <input type="checkbox"/>            |
| Level of service    | <input type="checkbox"/>            |
| County              | <input type="checkbox"/>            |
| Bridge group        | <input type="checkbox"/>            |
| Route               | <input type="checkbox"/>            |
| Owner               | <input type="checkbox"/>            |
| Functional class    | <input type="checkbox"/>            |
| Directional suffix  | <input type="checkbox"/>            |
| Custodian           | <input type="checkbox"/>            |
| Roadway name        | <input type="checkbox"/>            |

Stem of new bridge groups names:  Start grouping

To create bridge analysis groups:

1. Check one or more of the of the roadway filter criteria for which the analysis groups will be created. Note that the more criteria that are selected the more granular the groups will be and therefore more groups will be created.
2. Define a stem for the group names in the Stem of new bridge group names text box. If a stem is specified, each group will be named with this stem then followed by a sequenced number. If a stem is not specified, the groups will be named with the sequenced numbers only.
3. Click the Start Grouping button. This will calculated the number of groups that will be created and display the number in a confirmation box.
4. If the number of groups is sufficient, click OK to create the new Bridge Analysis Groups.

Once new Bridge Analysis Groups are created, they will be displayed in the grid on the lower section of the page which shows all bridge analysis groups. This is a read only grid. There are not any actions that can be performed from this grid.

| Bridge Analysis Groups      | Bridge_Count | Roadway_Count | Description   |
|-----------------------------|--------------|---------------|---|
| New Bridge_Grps 9252013_31  | 3            | 3             | Created by software, please replace with valid description. |
| New Bridge_Grps 9252013_361 | 0            | 0             | Created by software, please replace with valid description. |
| New Bridge_Grps 9252013_853 | 0            | 0             | Created by software, please replace with valid description. |
| New Bridge_Grps 1272014_991 | 0            | 0             | Created by software, please replace with valid description. |
| test                        | 2            | 2             | Created by software, please replace with valid description. |
| New Bridge_Grps 1272014_86  | 0            | 0             | Created by software, please replace with valid description. |
| New Bridge_Grps 1272014_876 | 0            | 0             | Created by software, please replace with valid description. |
| New Group                   | 4            | 4             |   |
| New Group_dup               | 2            | 2             |   |
| New Group 2                 | 2            | 2             |   |
| 1                           | 55           | 55            |   |
| 2                           | 4            | 4             |   |
| 3                           | 4            | 4             |   |
| 4                           | 4            | 4             |   |
| 5                           | 1            | 1             |   |
| 6                           | 2            | 2             |   |

### 3.12 Bridge Mapping/GIS

The GIS page can be accessed by selecting the mapping task within the Bridge tab. Bridges are required to be selected from the main bridge grid in order for the page to load. If no bridges are selected, a message will be displayed saying selection of bridges is required.

The page will plot all selected bridges (up to 100 bridges, a warning message will display if more than 100 is selected and only the first 100 bridges will be displayed). For those that have the point (-1,-1), reserved for default values, will be added to unmapped grid below the google maps and street view.

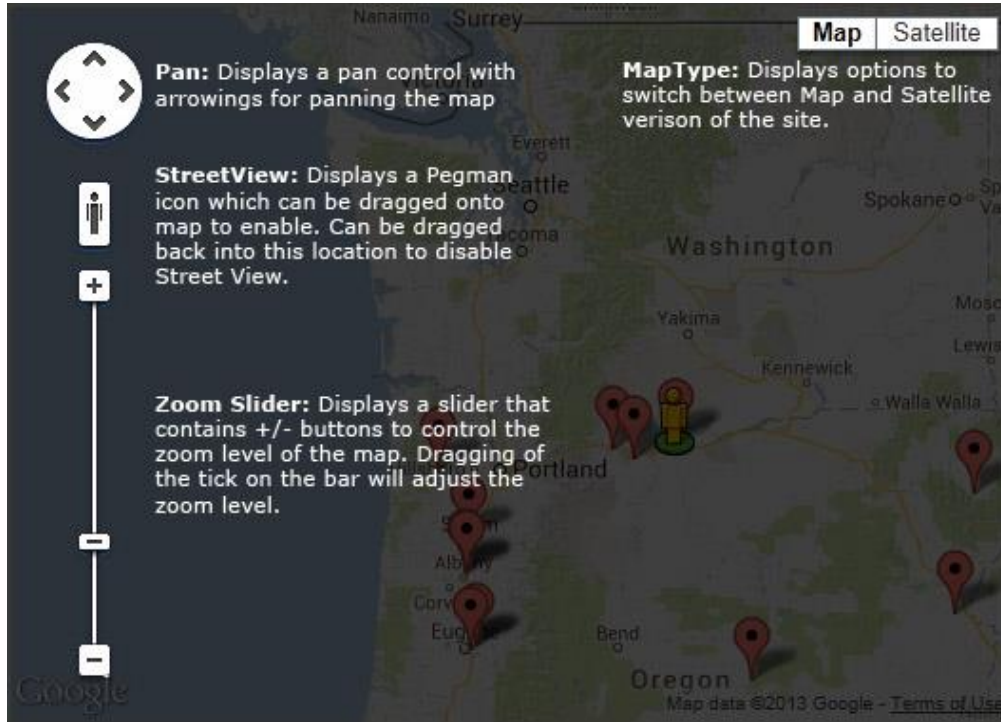
**GEOGRAPHIC INFORMATION SYSTEM OF SELECTED BRIDGES**

| BrKey              | Facility        | Location                  |
|--------------------|-----------------|---------------------------|
| 0000001            | _test           | -                         |
| 00311F019<br>00100 | OLD SHERIDAN RD | 0100 MI SW ON 19 FROM S18 |
| 00314F019<br>00077 | OLD SHERIDAN RD | 0077 M SW ON 19 FROM ST18 |
| 00316F000          | COUNTY RD 19    | ON CR 19 SW MCMINN        |

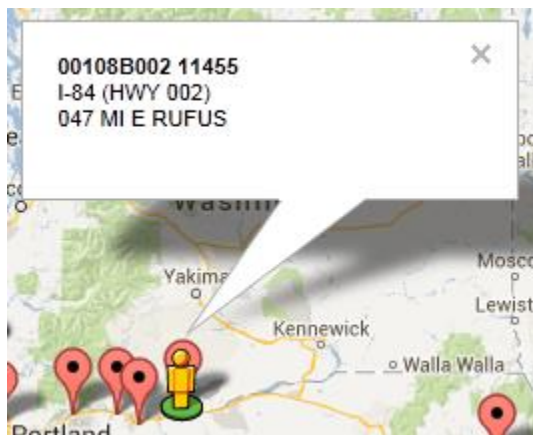
Update Count: 0 Save Print

## Using the map

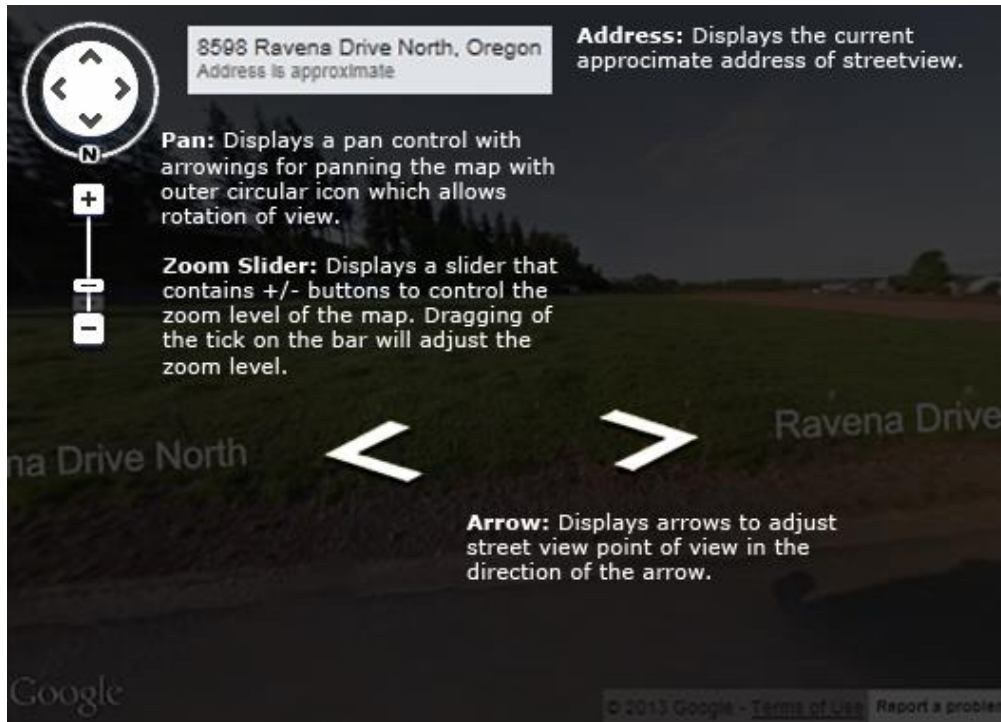
1. The map is displayed on the left side of the screen and can be adjusted and navigated using the controls described in the image below.



2. Clicking on a point will make a comment box display for the point.



3. If the selected point has a valid street view for Google Streetview, a Streetview map will be displayed on the right side of the screen.



- If any bridges that were selected with points set at -1 and -1, they will be included in the unmapped bridges list on this page. This grid only displays if there is one or more bridges that are unmapped.

| UNMAPPED BRIDGES |          |          |
|------------------|----------|----------|
| BrKey            | Facility | Location |
| 0000001          | _test    | -        |

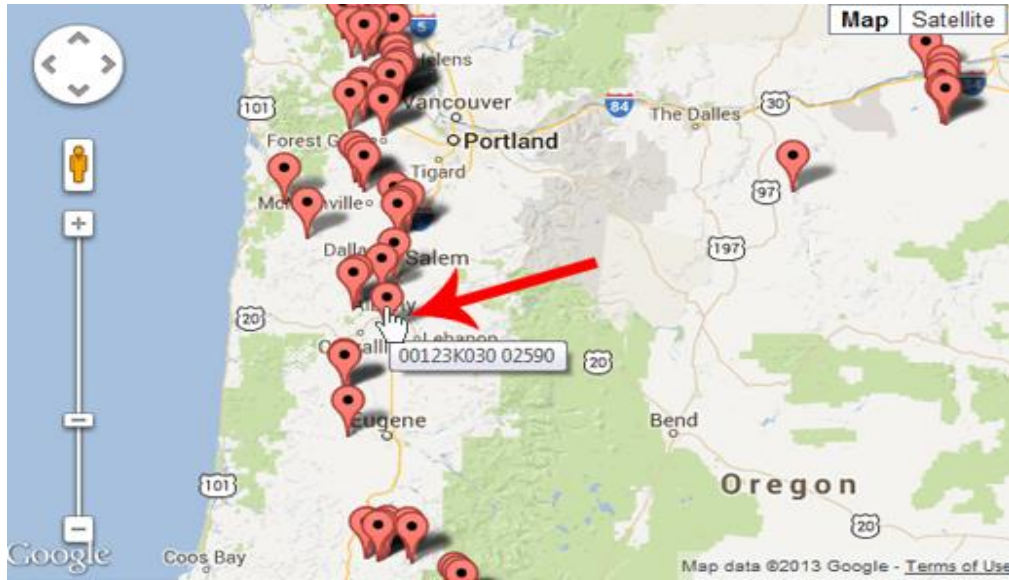
- A counter is displayed on the bottom right to keep count of how many items are dirty on the page.

Update Count: 0

### Selecting a mapped Data Point

- When a point is active, bridge detail and street view will display. If the street view is unavailable for the point, a message will be displayed instead. To make a point active, just click the marker.





- When the maker is clicked, the info dialog will display. This box can be closed with the X on the top right of the dialog box. The Street View will adjust to the point.



### Plotting an Unmapped Bridge

- If any Bridges that were selected with points set at -1 and -1, they will be included in the unmapped bridges list on this page. This grid only displays if there is one or more bridges that are unmapped.

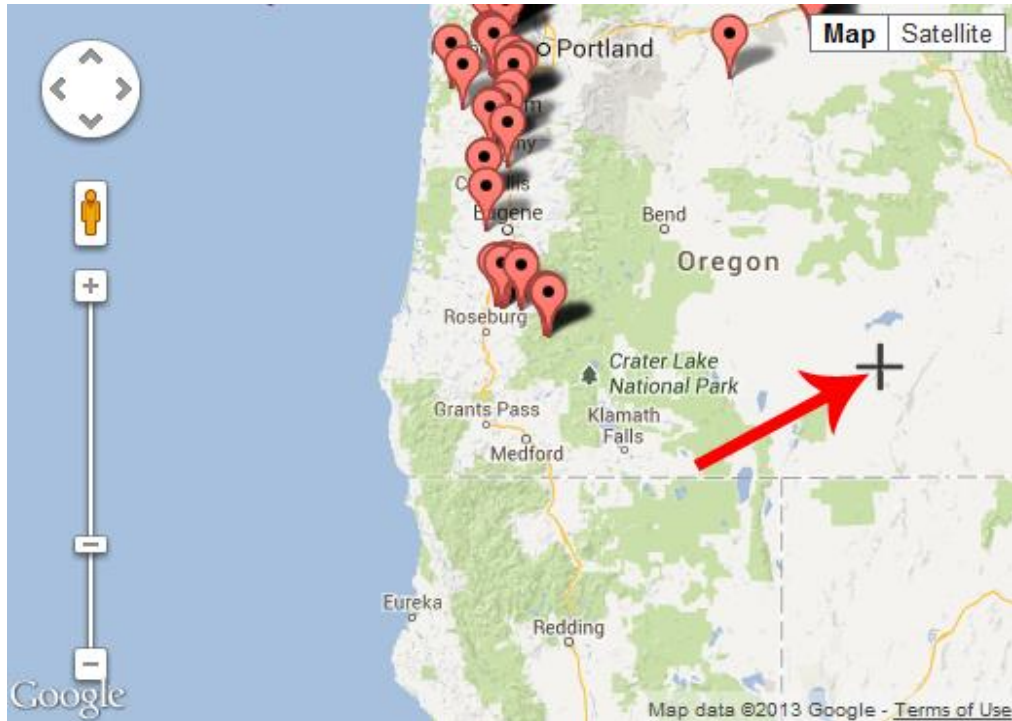
| UNMAPPED BRIDGES   |                 |                           |
|--------------------|-----------------|---------------------------|
| BrKey              | Facility        | Location                  |
| 0000001            | _test           | -                         |
| 00311F019<br>00100 | OLD SHERIDAN RD | 0100 MI SW ON 19 FROM S18 |
| 00314F019<br>00077 | OLD SHERIDAN RD | 0077 M SW ON 19 FROM ST18 |
| 00316F000          | COUNTY RD 19    | ON CR 19 SW MCMINN        |

- To map a bridge, you will need to find the row and select it by clicking on the row of data on the grid.

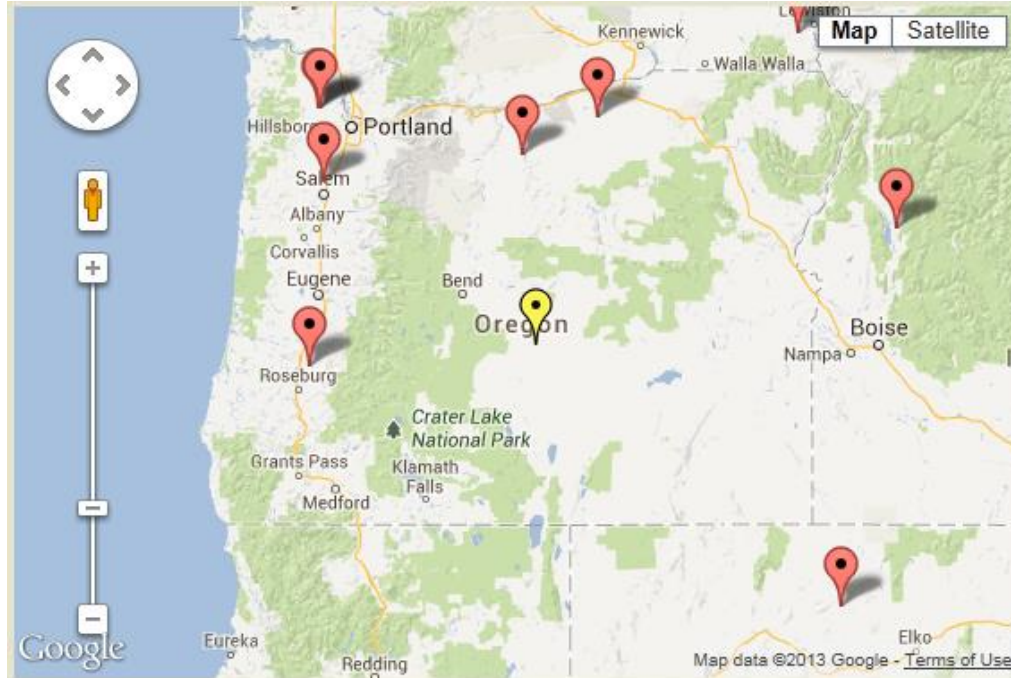
## INVENTORY AND INSPECTION DATA MANAGEMENT

| UNMAPPED BRIDGES   |                 |                           |
|--------------------|-----------------|---------------------------|
| BrKey              | Facility        | Location                  |
| 0000001            | _test           | -                         |
| 00311F019<br>00100 | OLD SHERIDAN RD | 0100 MI SW ON 19 FROM S18 |
| 00314F019<br>00077 | OLD SHERIDAN RD | 0077 M SW ON 19 FROM ST18 |
| 00316F000          | COUNTY RD 19    | ON CR 19 SW MCMINN        |

3. Once a row is highlighted, a cross will appear when you move the mouse over the Map view. If you move over a point, it will switch to a mouse icon that will select the point to display details instead. To place a point close to another point, use the zoom feature.



4. After clicking the point, the bridge will be removed from the list and a yellow point will be placed on the map. The map will center itself to the point and the page will be marked dirty.



## Moving a Plotted Point

1. Any marker on the map can be clicked and dragged. This will adjust the point to a new spot that the point was dropped at. The marker will adjust to yellow after being moved. The page will be marked dirty and the map will center to the new location of the marker after dropping it to a new point.

## 3.13 Exporting Inventory and Inspection Data (Version 5.x)

BrM data can be exported to standard NBI files, XML, or to a special Pontis Data Interchange (PDI) format, which is documented in the *Technical Manual*. Procedures for preparing these types of files are presented below.

**Note:** Data from any report can be exported to common text, spreadsheet or database formats by selecting the desired format in the **Reports** tab. Data from the current structure list can also be exported to a variety of file formats by selecting the structure(s) you wish to export and clicking on the **Gateway** tab.

## Exporting NBI Files

1. If your agency is not using bridge keys that are identical to the NBI Structure Number, see your system administrator for assistance. These ID's must match for the standard NBI export procedure to work properly.
2. Select the structures you wish to export. You can do this via the **Manage Filters** task if you have specific criteria to apply to your selection. Use the resulting filter to limit the **View List**.
3. Click on the **Gateway** tab and you will see a list of the bridges you selected. The screen defaults to the **Export** task.
4. The default is to export only the bridges you selected. However, you can still export all bridges by selecting the **All Bridges in the Database** option.

**Tip:** You may wish to use a combination of the Manage Layouts and Manage Filters tasks to retain your customized list of structures for NBI export.

5. Select "Metric NBI File" or "English NBI File" from the *Export What?* selection list.
6. Click on the **Export** button. A dialog will appear telling you that the export is in process.
7. When complete, you will see a message to that effect in the box at the bottom of the screen, and you will be prompted to save the export file to a location of your choice.
8. Click the Save button and enter the name of the output file you wish to produce. Use the **Save As** dialog to navigate to the desired location for the output file.
9. Click **Save** to save the file.

See the *Technical Manual* for details on how BrM data fields are converted to NBI fields.

## Exporting XML Files

The procedures for exporting an XML files is basically the same as exporting a NBI file.

1. Select the structure(s) you wish to export of check out. You can do this via the **Manage Filters** task if you have specific criteria to apply to your selection. Use the resulting filter to limit the **View List**.
2. Click on the **Gateway** tab and you will see a list of the bridges you selected. The screen defaults to the **Export** task. The default option will be XML.

3. Select “Extensible Markup Language File (XML)” or “Extensible Markup Language File (XML) Non-Compressed” from the *Export What?* selection list.
4. Select what data are to be included in the XML export file. Options are to export bridge data only (use this option for field inspections) non bridge data, all data, data from a single selected table, data from a custom list of tables, scenario summary data, or scenario detail data
5. Click **Export**. A dialog will appear telling you that the export is in process.
6. When complete, you will see a message to that effect in the box at the bottom of the screen, and you will be prompted to save the export file to a location of your choice.
7. Click the Save button and enter the name of the output file you wish to produce. Use the **Save As** dialog to navigate to the desired location for the output file.
8. Click **Save** to save the file.

## Exporting or Checking Out PDI Files

The procedures for exporting and checking out PDI files are almost the same, and are both covered below. Use check-out if you are preparing a PDI file for field inspections, which will be checked-back in to the master database. Use export to prepare data for use in external systems, or to transfer data between different BrM databases.

9. Select the structure(s) you wish to export or check out. You can do this via the **Manage Filters** task if you have specific criteria to apply to your selection. Use the resulting filter to limit the **View List**.
10. Click on the **Gateway** tab and you will see a list of the bridges you selected. The screen defaults to the **Export** task. IF you wish to export to PDI, stay on this task. If you wish to check out structures, click on the **Check Out** task.
11. Select “Pontis Data Interchange File” or “Pontis Data Interchange Custom Export File” from the *Export What?* selection list. If you are checking out data, this list will be labeled *Check-Out What?*
12. If exporting to a non-custom PDI format, the **Include** list is set to “<01> Bridge Data” by default, although several other options are available. Select the data you wish to include in your export. If you selected the custom PDI option, the **Include** list is not available.
13. Select what data are to be included in the PDI export file. Options are to export bridge data only (use this option for field inspections) non bridge data, all data, data from a single selected table, data from a custom list of tables, scenario summary data, or scenario detail data. If you are checking out data, only two options, bridge data only and non bridge data, are available. If you wish to use the custom list of tables option, use the **Export Options** task on the **Admin** tab to define the list. See the *Technical Manual* for more information.

14. Click **Export** or **Check-Out**. A dialog will appear telling you that the export is in process.
15. When complete, you will see a message to that effect in the box at the bottom of the screen, and you will be prompted to save the export file to a location of your choice.
16. Click the Save button and enter the name of the output file you wish to produce. Use the **Save As** dialog to navigate to the desired location for the output file.
17. Click **Save** to save the file.

### 3.14 Check-In/Check-Out Procedures for Field Inspections (Version 5.x)

In order to support the field inspection process, BrM allows a set of structures to be “checked-out” to an export file. This file can then be loaded onto a field computer running BrM or another inspection program which can import and export Pontis Data Interchange (PDI) files. After inspection data is entered on the field computer, a PDI file is exported from the field computer database. The structures are checked back into the master database. When structures are checked out, records are written to the check-in/check-out control table, recording the bridge ID (brkey), the date, and the ID of the user doing the check-out. If data are changed in the master database for the structures that were checked out, a record is written to an exceptions table. BrM will not check in data for those structures unless the person performing the check-in specifically reviews and overrides the exception.

1. Create a check-out PDI file containing data on the structures you wish to inspect in the field. To do this, select the structures you wish to check out, click on the **Gateway** tab and click on the **Check Out** task. Then, follow the procedures for exporting data to a PDI file in Section **Error! Reference source not found. Error! Reference source not found.**
2. Install BrM onto the field computer using the **Workstation** installation option on the BrM Installation CD. You will need to install an empty database that matches the structure of the master database (the working database is fine assuming no customizations have been made) and set up an ODBC data source on the field computer for this database using the ODBC tool in your Windows control panel. See the BrM Installation Guide for more details.
3. Copy the PDI file onto your field computer, or attach your field computer to the network.
4. Import the PDI file into the database on your field computer, following the procedure described in Section 1.3.
5. Add inspections and enter inspection data for each of the structures in the field computer database.
6. In the field computer, check out completed inspections to a PDI file using the procedure described in Section **Error! Reference source not found.**
7. Copy the PDI file with the completed inspections onto your office computer hard disk or network drive, or attach your field computer to the network.
8. Check in the PDI file with completed inspections into the master database, following the procedure described below.

#### Checking in a PDI File

Note: only structures that have been checked out using the **Check-Out** feature can be checked in. For other structures, use **Import** instead of **Check-In**.

1. Prior to checking in a PDI file, review the status of checked-out structures, and see if any have had data changed since the check-out. To do this, go to the **Bridges** tab and select the layout called “Checked-out bridges.” Structures that have had information modified since being checked out will show a “Yes” in the *Changed Since Check-Out* column.
2. Click on the Gateway tab and click on the **Check-In** task.
3. Select “Pontis Data Interchange” from the *Import What?* list.
4. Use the **Browse** button to navigate to the path and file name for the PDI file you wish to check back in.
5. Click the **Check-In** button. You will be prompted to continue. Click **OK**.
6. The system will check the structures in the PDI file against the database, and make sure that they exist, and that they have not already been checked-in. If a structure does not exist in the database, or if it has already been checked back in, an exception will be recorded. If data for the structure have been changed in the master database after the structure was checked-out, an exception will also be recorded. To review exceptions, click **Accept Exceptions**. Click an X into the **Accept** column for those structures you wish to accept into the database, and then click on the **Accept** button. To accept all exceptions, click on the **Accept All** button.

**Note:** Overriding exceptions is a privileged function and appropriate security must be granted by the system administrator.



## 3.15 Inspection Reports (Version 5.x)

There are 10 standard BrM inspection reports. A brief overview of each report is provided below. Each report is available as a DataWindow .NET report (a report created in InfoMaker or DataWindow .NET) or as a Crystal Reports based report. Please note that DataWindow .NET is included for backwards compatibility. Starting in version 5.x, reports should be created in Crystal Reports. See Appendix D for more detailed report documentation.

These reports can be viewed and printed using the procedures in Section 2.4.

**insp001\_inspection\_sia\_metric** is the standard Structure, Inventory and Appraisal (SI&A) sheet (with metric units). It contains all NBI Structure, Inspection and Appraisal information, as well as element-level condition data and past inspection comments.

**insp002\_insp\_report\_metric** is the metric version of an expanded SI&A report, which includes notes entered about the bridge, the inspection, and each element; inspector work candidates; and summary information on past inspections.

**insp003\_inspection\_schedule** shows inspection scheduling and planning information. It lists the date and inspector for the most recent regular and special inspections on the structure. It also lists the scheduled frequency of regular and special inspections, along with the planned dates for the next inspections.

**insp004\_inspection\_resource\_req** can be used to plan resources for new inspections. It lists the dates of the previous and next inspections, and the required inspection resources (hours for crew, flaggers, helpers, snoopers, special crews, and special equipment).

**insp005\_bridge\_health\_index\_det** shows the health index for the selected bridges, along with detailed information about the element condition distributions that are used to calculate the health index.

**insp006\_network\_element\_summary** is the metric version of a report showing the network-wide distribution of elements by environment and condition state.

**insp007\_inspection\_english** is the same report as **insp001\_sia\_metric**, but with English units instead of metric units.

**insp008\_insp\_report\_english** is the same report as **insp002\_inspect\_report\_metric** but with English units instead of metric units.

**insp009\_network\_elem\_sum\_english** is the same report as **insp006\_network\_element\_summary** but with English units instead of metric.

**insp010\_bridge\_condition\_summary** shows the facility carried, last inspection date, SD/FO status, sufficiency rating, and NBI condition ratings for deck, superstructure, substructure, culvert, and channel.

**Chapter**

**4**

# Performing Analysis

## 4.1 Work Candidate Bridge Analysis (Version 5.x)

The screenshot displays the AASHTO BrM software interface for bridge analysis. The top panel shows the bridge description for 'Western Canal Bridge' (Facility Carried (007): JESSE OWENS PKWY, Feature Intersected (006A): WESTERN CANAL). Key details include Route: 0000, District: District 2, Owner: City/Municipal Hwy Agenc, Material: 5 Prestressed Concrete, and Scour: 6 Cuts not made. The 'Current Scaled Performance' section shows a Condition of 58.34, Risk of 53.81, and a Rating of 97.5. The 'Sufficiency' section shows a Rating of 97.5 and SDFO: Not Deficient. The 'Work Candidates' table lists four candidates with their respective Utility, Utility Change, Cost, and Benefit/ Cost (Bk) values. The 'Effects on Each Element' table shows the impact of various work candidates on different bridge elements, such as Concrete Deck, Concrete Slab, and Concrete Bridge Railing.

The Bridge analysis page is broken out into two main sections. The top panel displays relevant information about the selected bridge. The bottom panel displays all incomplete work candidates and the effected Utility criterion and Elements for a selected work candidate.

### Changing the Bridge Display

The screenshot shows the top navigation bar of the AASHTO BrM software. It includes a dropdown menu for 'Bridge 04 07598', a text field for 'Name: Western Canal Bridge', and a text field for 'Facility Carried (007): JESSE OWENS PKWY'. There are also buttons for 'Metric' and 'English'.

Two main tools control the display:

- Bridge drop-down list:
  - Select a specific bridge from the list.
  - Filter through the list by typing the bridge ID.
  - View the data for the bridge.
- Metric/English selection:

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- Select the measurement unit system.
- Basic information about the selected bridge, including:
  - Bridge name
  - Facility carried
  - Feature intersected.

### Viewing Bridge Information

|   |  |  |  |
|---|--|--|--|
| <b>Description</b><br>Route: 0000 Milepoint: mi<br>District: District 2 County: Maricopa<br>Owner: City/Municipal Hwy Agency Area: 028 - Paul Goddwinth<br>Material: 5 Prestressed Concrete Resp: City/Municipal Hwy Agency<br>Score: 6 Calcs not made Design: 05 Multiple Box Beam |  | <b>Conditions</b><br>Deck: 4 Poor Superstr: 6 Satisfactory<br>Substr: 7 Good Culvert: N/A (NBI)<br>Structure: 8 Protected Deck Index: 50.02<br>Superstr Index: 45.89 Substr Index:<br>Culvert Index: Structure HI: 42.13 |  |
| <b>Current Scaled Performance</b><br>Condition: 59.34 Risk: 53.81<br>Lifecycle: Mobility: 34.2  |  | <b>Recent Completed Work</b><br>No recently completed work found.  |  |
| <b>Sufficiency</b><br>Rating: 97.5 SDFID: Not Deficient   |  |  |  |

The information panel of the page displays relevant information about the selected bridge. Most of this information is obtained from the structure creation process, or during inspections. Each section of this panel is described below.

Description – Displays road identification and location details

Current Scaled Performance – Quick summary of the calculated utility values for each of the 4 main utility categories defined.

Sufficiency – Displays the sufficiency rating and its NBI status

Conditions – Shows the NBI condition ratings for aspects of the bridge, as well as the calculated health indexes for those categories.

Recently Completed Work – Displays a list of work candidates that have been marked “Complete”, as well as the year completed and the estimated cost of the work. This grid can be sorted on any column by clicking on the column headers.

### Viewing Work Candidates and associated details

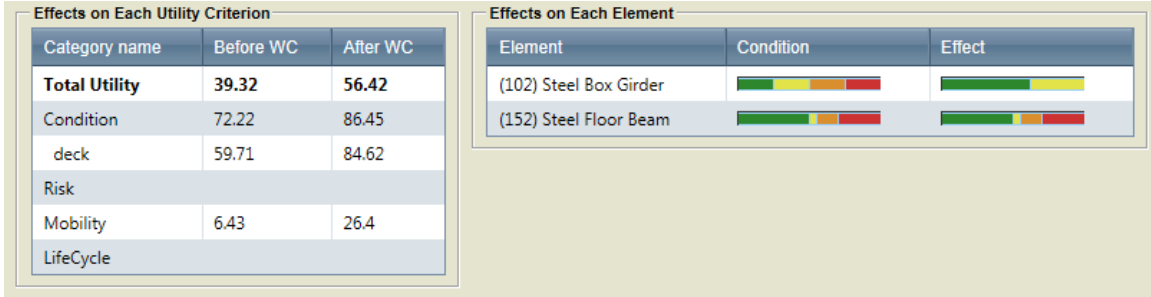
| Work Candidate  | Utility | Utility Change | Cost           | Benefit / Cost (\$K) | Cost (\$K) / Benefit |
|---|---------|----------------|----------------|----------------------|----------------------|
| Do Nothing  | 50.34   |                |                |                      |                      |
| 04-0759-NMHO-091113-E2ABC9DA58 - Approach Slab-Repair | 50.45   | 0.11           | \$4,189,700.00 |                      | \$18,048             |
| A-DO7001-05776A47-0000006A - Bridge Rail-Repair       | 50.34   | 0              | \$50,000.00    |                      |                      |
| A-DO7001-05776A47-0000006D - Deck-Rehab               | 50.34   | 0              | \$100,000.00   |                      |                      |

The bottom section of the page displays a grid of all incomplete work candidates. On initial page load, there is no row selected, and no other controls display on the page. The first row in the grid, with work candidate name “Do Nothing” shows the utility value of the bridge as it is currently. All other rows show the utility value of the bridge, as it would be if the work were completed. Each row also shows the utility change (the difference between the base

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“Do Nothing” value and the estimated work candidate utility value), the work candidate cost as entered on the Work page, and a simple calculated benefit / cost (utility change divided by the estimated cost). This grid can be sorted on any column by clicking on the column header.

On selecting a row in the work candidates grid, the page refreshes to show two new grids



Effects on Each Utility Criterion shows a list of all defined utility criteria in their current state and the state after finishing the work candidate. These values are scaled using the functions or graphs defined by the user in Admin Utility. Each criterion is shown nested under its parent criterion, with Total Utility at the top.

Effects on Each Element shows a list of the AASHTO Bridge Elements that are associated with the bridge, and the effect that the work candidate will have on each element, broken down by condition state. These effects are defined by the user in Admin Benefit Groups. The Condition and Effect columns display as stacked bar graphs, color-coded for clarity. The green portion of the graph indicates the percentage of the total quantity of the element that is in Condition State 1. The yellow shows percent of Condition State 2, the orange is Condition State 3, and red is Condition State 4.

## 4.2 Work Candidates Reverse Calculation (Version 5.x)

The screenshot shows the AASHTO BrM software interface. At the top, it says 'Welcome: Pontis User Database: SamplePontis Help? Account Logout'. The main menu includes 'Bridges', 'Reports', 'Admin', 'Inspection', 'Gateway', and 'Analysis'. The 'Analysis' tab is active, showing 'Reverse Calculation' for 'Bridge 04 07598'. The bridge name is 'Western Canal Bridge', Facility Carried is '(007): JESSE OWENS PKWY', and Feature Intersected is '(006A): WESTERN CANAL'. The interface is divided into several sections: Description (Route: 00000, Milepoint: mi, District: District 2, County: Maricopa, Func: 17 Urban Collector, Area: 028 - Paul Goldsmith, Owner: City/Municipal Hwy Agenc, Resp: City/Municipal Hwy Agenc, Material: 5 Prestressed Concrete, Design: 05 Multiple Box Beam, Scour: 6 Calcs not made), Mobility - Safety (Operating: 1 LF Load Factor, Inventory: 1 LF Load Factor, Geometry: 9 Above Desirable Crit, Approach: 8 Equal Desirable Crit, Waterway: 8 Equal Desirable), Conditions (Deck: 3 Serious, Superstr: 6 Satisfactory, Substr: 7 Good, Culvert: 1 Br Closed - Correct, Structure: 8 Protected, Deck Index: 54.17, Superstr Index: 54.17, Substr Index: 54.17, Culvert Index: 54.17, Structure HI: 54.17), Current Scaled Performance (Condition: 72.22, Risk: 6.43, Lifecycle: 6.43, Mobility: 6.43), and Sufficiency (Rating: 97.5, SDFI: Not Deficient). There is also a photo of the bridge and a table of 'Recent Completed Work'.

| Work Candidate            | Base Utility | Utility | Utility Change | Estimated Cost | Benefit / Cost (\$k) | Cost (\$k) / Benefit |
|---------------------------|--------------|---------|----------------|----------------|----------------------|----------------------|
| Converted Work Candidates | 39.32        | 41.46   | 2.14           | \$7,000.00     | 0.3057               | \$3.271              |
| Do nothing (flex)         | 39.32        | 41.46   | 2.14           | \$14,100.00    | 0.1518               | \$6.5888             |
| Rehab Sub (flex)          | 39.32        | 41.46   | 2.14           | \$5,200.00     | 0.4115               | \$2.4299             |
| Paint Bridge (flex)       | 39.32        | 41.46   | 2.14           | \$5,000.00     | 0.428                | \$2.3364             |
| Bridge-Paint ID           | 39.32        | 41.46   | 2.14           | \$20,000.00    | 0.107                | \$9.3458             |

Reverse Calculations within the Analysis tab assist the user in viewing individual bridge information and all work candidates, maintenance, files, and reports attached to it.

### Changing the Bridge Display

The screenshot shows the top of the software interface. It includes a dropdown menu for 'Bridge 04 07598', the bridge name 'Western Canal Bridge', Facility Carried '(007): JESSE OWENS PKWY', and Feature Intersected '(006A): WESTERN CANAL'. There are also buttons for 'Metric' and 'English'.

Two main tools control the display:


- Bridge drop-down list:
  - Select a specific bridge from the list.
  - Filter through the list by typing the bridge ID.
  - View the data for the bridge.
- Metric/English selection:
  - Select the measurement unit system.
- Basic information about the selected bridge, including:
  - Bridge name
  - Facility carried
  - Feature intersected.

**View Bridge Reverse Calculation Details**

After a user selects the desired bridge, the bridge details generate in the information panel. Most of the information includes data entered during the structure creation process and inspections.

|   |   |                                       |  |
|---|---|---------------------------------------|--|
| <b>Description</b>                      |   | <b>Milepoint:</b> mi                  |  |
| <b>Route:</b> 00000                     | <b>District:</b> District 2             | <b>County:</b> Maricopa               |  |
| <b>Func:</b> 17 Urban Collector         | <b>Area:</b> 02B - Paul Goldsmith       | <b>Resp:</b> City/Municipal Hwy Agenc |  |
| <b>Owner:</b> City/Municipal Hwy Agenc  | <b>Design:</b> 05 Multiple Box Beam     |                                       |  |
| <b>Material:</b> 5 Prestressed Concrete | <b>Scour:</b> 6 Calcs not made          |                                       |  |
| <b>Mobility - Safety</b>                |   |                                       |  |
| <b>Operating:</b> 1 LF Load Factor      | <b>Inventory:</b> 1 LF Load Factor      |                                       |  |
| <b>Geometry:</b> 9 Above Desirable Crit | <b>Approach:</b> 8 Equal Desirable Crit |                                       |  |
| <b>Waterway:</b> 8 Equal Desirable      |   |                                       |  |
| <b>Conditions</b>                       |   |                                       |  |
| <b>Deck:</b> 7 Good                     | <b>Superstr:</b> 6 Satisfactory         |                                       |  |
| <b>Substr:</b> 7 Good                   | <b>Culvert:</b> 1 Br Closed - Correct   |                                       |  |
| <b>Structure:</b> 8 Protected           | <b>Deck Index:</b>                      |                                       |  |
| <b>Superstr Index:</b> 54.17            | <b>Substr Index:</b>                    |                                       |  |
| <b>Culvert Index:</b>                   | <b>Structure HI:</b> 54.17              |                                       |  |
| <b>Current Scaled Performance</b>       |   |                                       |  |
| <b>Condition:</b> 64                    | <b>Risk:</b>                            |                                       |  |
| <b>Lifecycle:</b>                       | <b>Mobility:</b> 55.25                  |                                       |  |
| <b>Sufficiency</b>                      |   |                                       |  |
| <b>Rating:</b> 97.5                     | <b>SD/FO:</b> Not Deficient             |                                       |  |

Context: Bridge Level Image 1 of 1 Zoom In



| Recent Completed Work  | Year | Cost    |
|------------------------|------|---------|
| Bridge repaint project | 2013 | 35000.0 |

| History - Geometry       |                         |
|--------------------------|-------------------------|
| <b>Built:</b> 1988       | <b>Reconstr:</b> 2008   |
| <b>Length:</b> 42.001 ft | <b>Width:</b> 72.001 ft |
| <b>Span:</b> 42.001 ft   |                         |

Each page section provides the following information:

- **Description** displays the road identification and location details.
- **Mobility – Safety** includes NBI Load Ratings and structural appraisal values.
- **Conditions** shows the NBI condition ratings for aspects of the bridge and their calculated health indexes.
- **Current Scaled Performance** is a quick summary of the calculated utility values for each of the 4 main utility categories defined.
- **Sufficiency** displays the sufficiency rating and its NBI status.
- **History – Geometry** holds the date that the bridge was built and the date of its reconstruction, length, width, and span.

Users can view images linked to the bridge, both on the bridge level and on the individual inspection level. Users can switch between these contexts using the *Context* drop-down.

## PROJECT PLANNING

| All Available Work Candidates |              |         |                |                |                      |                      |
|-------------------------------|--------------|---------|----------------|----------------|----------------------|----------------------|
| Work Candidate                | Base Utility | Utility | Utility Change | Estimated Cost | Benefit / Cost (\$k) | Cost (\$k) / Benefit |
| Converted Work Candidates     | 39.32        | 49.31   | 9.99           | \$7,000.00     | 1.4271               | \$0.7007             |
| Do nothing (flex)             | 39.32        | 49.31   | 9.99           | \$14,100.00    | 0.7085               | \$1.4114             |
| Rehab Sub (flex)              | 39.32        | 49.31   | 9.99           | \$5,200.00     | 1.9212               | \$0.5205             |
| Paint Bridge (flex)           | 39.32        | 49.31   | 9.99           | \$5,000.00     | 1.998                | \$0.5005             |
| Bridge-Paint ID               | 39.32        | 49.31   | 9.99           | \$20,000.00    | 0.4995               | \$2.002              |

Navigation: [K] [←] [1] [→] [X] Page size: 10 5 items in 1 pages

The grid at the bottom of the page includes all actions (work candidates) that directly affect the bridge. Each action has its own row and is either:

- a unit cost for elements associated with the bridge, or
- a change in the potential utility value.

Each row shows:

- the action type,
- the base utility of the bridge,
- the projected utility value for the bridge,
- the difference between these values,
- the estimated cost (based on unit cost defined on Admin Actions and the total quantity for the associated element),
- benefit per cost in thousands of dollars, and
- cost per benefit in thousands of dollars.

The grid can be sorted on any column by clicking on the column header.

| All Available Work Candidates |              |         |                |                |                      |                      |
|-------------------------------|--------------|---------|----------------|----------------|----------------------|----------------------|
| Work Candidate                | Base Utility | Utility | Utility Change | Estimated Cost | Benefit / Cost (\$k) | Cost (\$k) / Benefit |
| Converted Work Candidates     | 39.32        | 49.31   | 9.99           | \$7,000.00     | 1.4271               | \$0.7007             |
| Do nothing (flex)             | 39.32        | 49.31   | 9.99           | \$14,100.00    | 0.7085               | \$1.4114             |
| Rehab Sub (flex)              | 39.32        | 49.31   | 9.99           | \$5,200.00     | 1.9212               | \$0.5205             |
| Paint Bridge (flex)           | 39.32        | 49.31   | 9.99           | \$5,000.00     | 1.998                | \$0.5005             |
| Bridge-Paint ID               | 39.32        | 49.31   | 9.99           | \$20,000.00    | 0.4995               | \$2.002              |

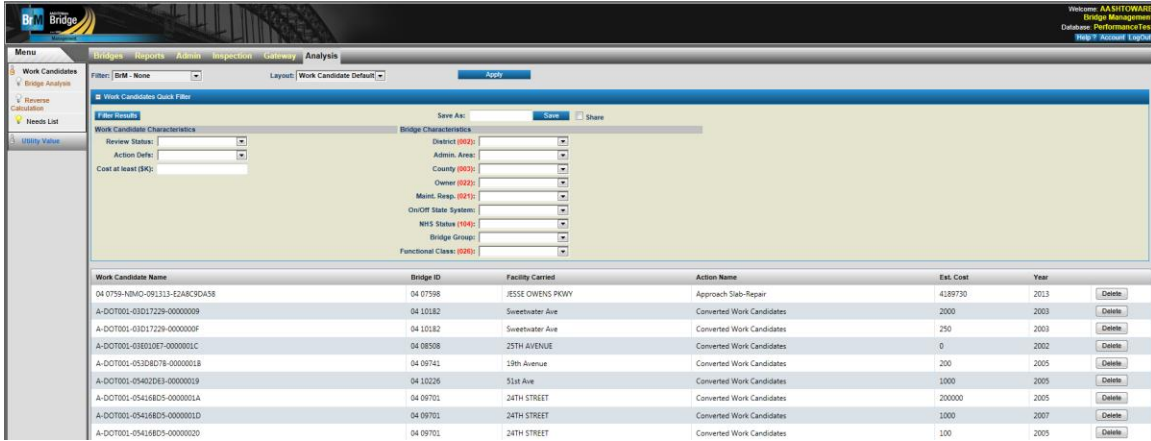
Navigation: [K] [←] [1] [→] [X] Page size: 10 3 items in 1 pages

Tools relevant to the work candidates grid include:

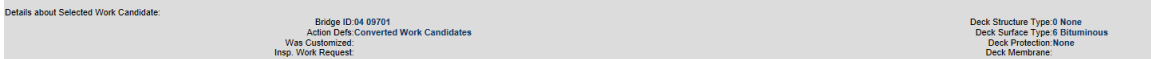
- Navigation between pages of the grid.
- Control of the number of items per page (default is 10).
- Total number of work candidates.



## 4.3 Work Candidates Needs List (Version 5.x)



The Work Candidates Needs List displays work candidates based on the selected filter and layout. The work candidates displayed in the grid can be further limited using the quick filter. When a work candidate is selected from the grid, details about that work candidate are displayed in the section below the grid.



A work candidate can be deleted from the the grid, however changes to an existing work candidate or creating a new one must be completed through the Inspection and Admin tabs.

## 4.4 Utility Value (Version 5.x)

The Utility Value screen under the Analysis tab is a purely informational screen that shows a high-level breakdown of the utility rating for a selected bridge.

The overall utility value for the bridge is displayed in the upper left corner of the screen.



Under the Utility Value there will be a series of grids, one for each value in the first tier of the Utility Calculation. Utility Calculations are agency dependent and will be setup by the agency’s administrators using the Utility Editor under the Admin tab.

The grids are read only and cannot be edited or adjusted by the user. The user can minimize any grids they don’t wish to evaluate to make room for other grids by manipulating the

collapse/open button in the upper left of the grid. This is particularly useful for agencies with large utility calculations.

| Condition Value   |            |              |        |                |
|---|------------|--------------|--------|----------------|
| Base Condition Value: 0.64 Scaled Value: 0.64 x Weight: 35.00 = Adjusted Condition Value: 22.40 |            |              |        |                |
| Mobility Value  |            |              |        |                |
| Base Mobility Value: 100 Scaled Value: 100 x Weight: 30.00 = Adjusted Mobility Value: 3000.00   |            |              |        |                |
| Mobility Item   | Base Value | Scaled Value | Weight | Adjusted Value |
| ADT   | 7000       | 100          | 50.00  | 5000.00        |

The grids will display a detailed breakdown of each value in the second tier that are tied to the first tier value that the grid is displaying.

| Condition Value   |            |              |        |                |
|---|------------|--------------|--------|----------------|
| Base Condition Value: 0.64 Scaled Value: 0.64 x Weight: 35.00 = Adjusted Condition Value: 22.40 |            |              |        |                |
| Condition Item  | Base Value | Scaled Value | Weight | Adjusted Value |
| Superstructure  | 6          | 0.6          | 3.00   | 1.80           |
| Deck Rating   | 7          | 0.7          | 2.00   | 1.40           |

| Mobility Value  |            |              |        |                |
|---|------------|--------------|--------|----------------|
| Base Mobility Value: 100 Scaled Value: 100 x Weight: 30.00 = Adjusted Mobility Value: 3000.00 |            |              |        |                |
| Mobility Item   | Base Value | Scaled Value | Weight | Adjusted Value |
| ADT   | 7000       | 100          | 50.00  | 5000.00        |

From left to right the values are:

Item Name – Name of the value being displayed

Base Value – The value stored in the database for this item.

Scaled value – The base value after scaling is applied. Scaling is setup in the utility page under the admin tab.

Weight – the weight of the item as compared to other items in this tier when rolling up to the parent level.

Adjusted Value – the scaled value multiplied by the weight.

The sum of all adjusted values will be divided by the sum of all weights to determine the base value of the parent level item. In the above example  $1.80 + 1.40 = 3.2$  total adjusted value which is then divided by a total weight of 5 ( $3.00 + 2.00$ ) for a base Condition value of 0.64.

The header of each tier one grid will display the detailed breakdown for that item on the right side which will be rolled up in the same way to achieve the total utility value.

## Configuring and Customizing BrM

*We'd like to know how can BrM be customized for our particular needs. Can we define our own elements? Can we change the picklists that appear in the data entry screens? What other customization is possible?*

**P**ontis was designed to be used by a wide range of agencies. Therefore, the software is highly customizable, providing each agency with powerful capabilities to add new data items, create custom screens and reports, and configure the modeling and analysis routines to meet their needs.

When an agency first implements BrM, it is recommended that they experiment with sample data to understand the system's features, and then develop a plan for the type of customization to be done. It is much easier to customize the system at the start. Once data have been loaded, models have been run, projects developed, etc., customization must be done with a greater degree of care.

The *Technical Manual* provides detailed coverage of how to customize BrM, including instructions for customizing the user interface. Some BrM customization, such as development of new screens, structure lists, and reports must be done through the InfoMaker tools (which is packaged with the BrM license). Other types of customization are done through the **Configuration** module. This chapter provides an overview of each of the cards in this module.



the tab and task bar menu to navigate to the required page. The following is an outline of the **Admin** tab:

- The **Admin** tab has fourteen tasks.
- The **Security** task allows you to register BrM users and establish privileges for different operations, as well as restrict the bridges with which each user can work. It also lets you administer database connections.
- The **Parameters** task allows you to customize picklists of values for different data items.
- The **Element Spec** task allows you to define new structure elements, or edit information about existing elements.
- The **Definitions** task allows you to view and edit information about the definition of environments, element materials, element categories, and element types.
- The **Actions** task allows you to view and edit information about different types of work. It allows you to supplement the standard set of actions with additional actions (which are necessary to support the new Scoping and Painting simulation rules). It also lets you define Flexible Actions, which are sets of action/element combinations along with rules for how the BrM simulation should model resultant changes in conditions (Flexible Actions should be set up to support the new Major Rehabilitation simulation rules).
- The **Options** task allows you to set values for a wide range of parameters which control how the application and database operate.
- The **Cost Index** task allows you to enter new values for the Construction cost index, which is used to inflate unit costs for actions to the current year.
- The **Formulas** task allows you to create formulas for modifying data in your BrM database in order to fill in missing values.
- The **Export Options** task allows you to configure the options available on the **Export** task under the **Gateway** tab.
- The **Data Dict** task allows you to edit the entries in the BrM data dictionary table.
- The **Checked Out Bridges** task allows you to remove the checked out status of bridges.
- The **Renumber Brkey** task allows you to renumber the brkey of the existing bridges in the database.
- The **Logging** task allows you to configure application logger settings and also lets you download and view current application log file.

- The **Navigation & Field Security** task allows you to set the role based field level security for the bridge inspection. You can also use this task to apply navigational security independent of the user roles. It also lets you create custom agency inspection and non-inspection pages.

**Caution:** Before undertaking any customization, see the *Technical Manual* for an in-depth discussion of customization and configuration procedures, and how different options affect the database, the application, and the models. Most of the procedures described in this chapter should only be performed by a system administrator who understands what the impacts of the changes they are making will be, and can take steps to recover from unintended loss or modification to information. In an enterprise environment, you should make sure that the BrM 5.x web server is shut down and that no users are connected while you are performing the operations described in this chapter. You should inform users well in advance regarding your BrM 5.x maintenance schedule.

## 5.2 Setting Up BrM Users and Privileges

The sub-tasks under the **Admin\Security** task allow you to perform the following operations:

- User account administration which involves creating new users, editing user account information, assign a group to a user, assigning a role to a user;
- Manage user group membership;
- Create the application roles
- Assign permissions to application roles, and
- BrM database connection administration.

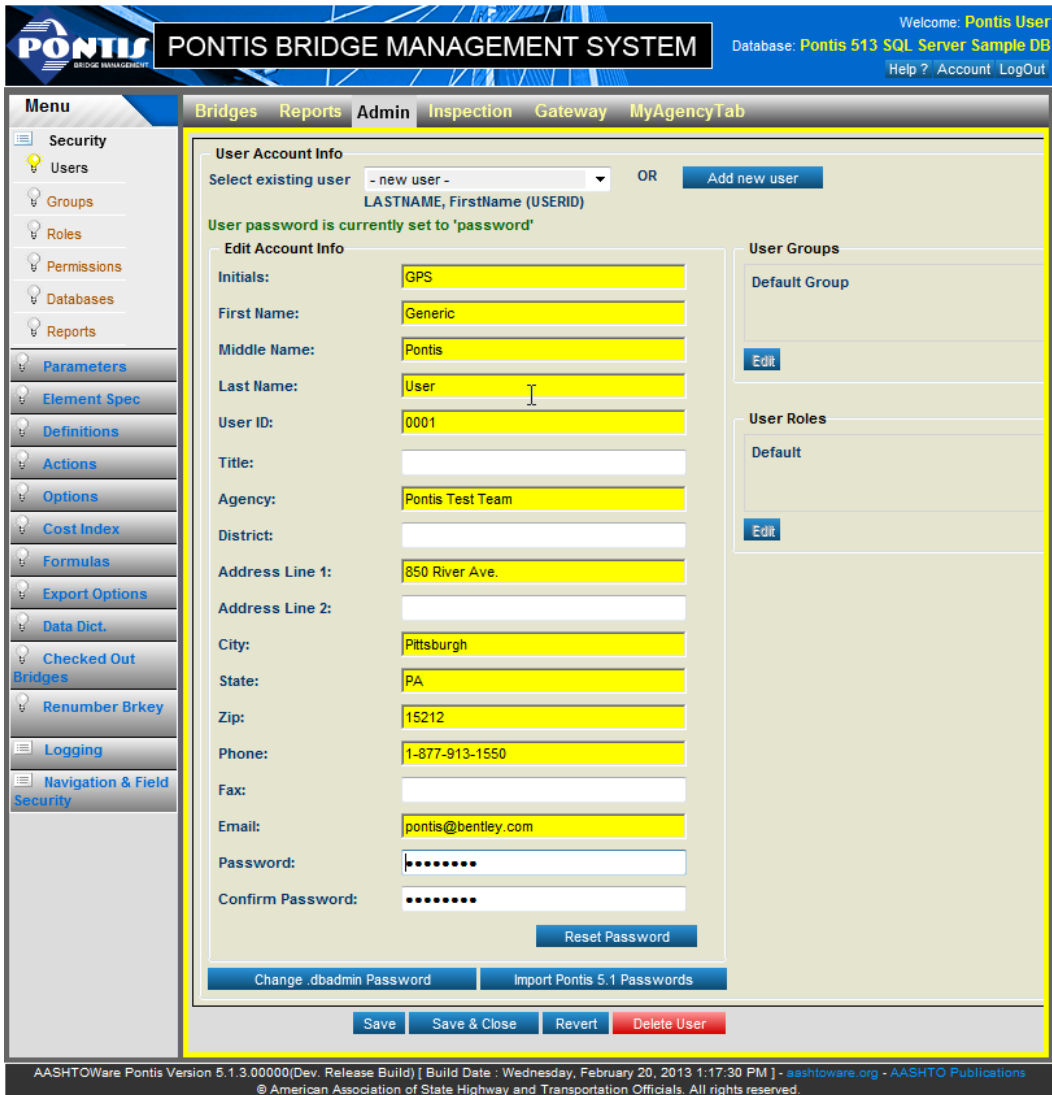
Note that the System Administrator will need to assign each user a password and user id, set up the authentication and set up the BrM database connection profile before they will be able to use BrM.

To set up the new users or change information for existing users:

1. Click on the **Users** sub-task under **Admin\Security** task.
2. To enter a new user, click **Add New User** link on the **Users** task screen. A new user screen will be presented with some blank fields. You must enter a new unique User ID on the new user screen.
3. The new user screen will set a default password to be **password**. You can assign a different password by entering the password of your choice. You can also use the **Reset Password** button to reset the password back to **password**.
4. The create new user screen has following required fields:
  - a. First Name
  - b. Last Name
  - c. Agency

You may leave the other fields empty. When you save a new user to the database BrM will warn you about fields that you left empty.

5. You can the select appropriate groups for your new user. BrM is shipped with one group named **Default**. You can create new groups from the groups task screen as described later in the section. This feature allows you to organize your users in to the different groups so that they can be assigned different group filters to each user. This enables you to enforce different bridge access policies for your users.



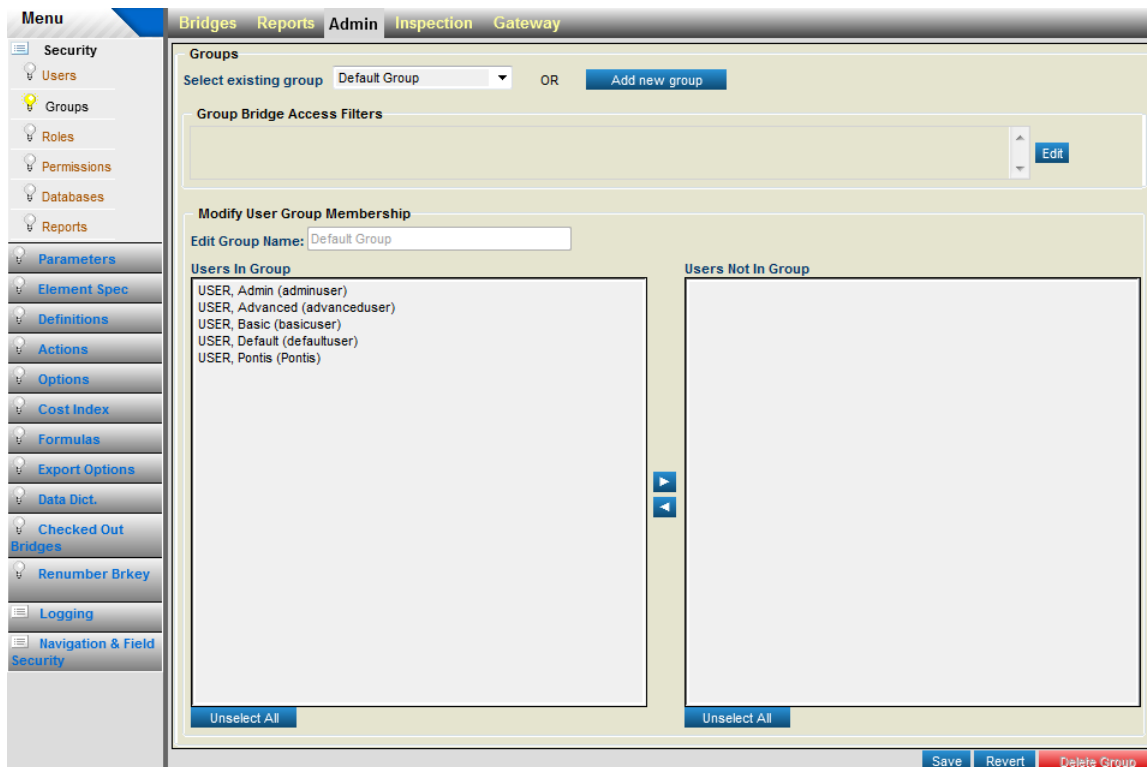
### User Administration Task Screen

6. You can select appropriate application role for your new user. BrM 5.x is shipped with four roles in the sample database.
  - a. Default
  - b. Basic
  - c. Advance
  - d. Admin



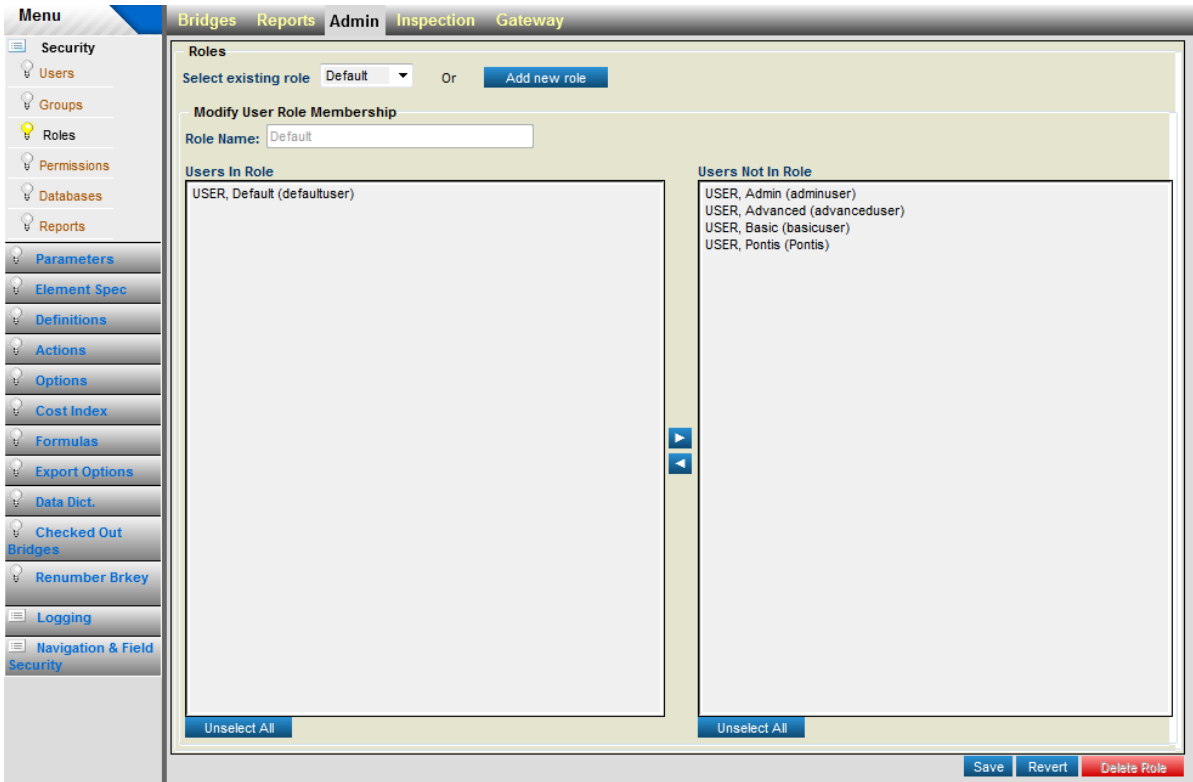
BrM will automatically assign the **Default** role to each new user. This is a very important aspect of new role based security implemented in BrM 5.x. You can modify the role membership by clicking **Edit** under the **User Roles** header.

7. To modify the information for an existing user, select the appropriate user from the **Select Existing Users** dropdown list.
8. Enter or edit information about the user. The User ID of the existing user is not editable once the user is created.
9. You can click the **Delete User** button to delete a user from the BrM 5.x system. Deleting a user will not remove the user from the system but it will mark it inactive.
10. You can use the **Groups** task to create a new group or modify the existing groups. You can assign **Access Filters** for each group. The filters assigned to the selected group are listed under **Group Bridge Access Filters**. This list can be modified by clicking the **Edit** button. The edit filters form lists all the shared user filters that have a group access attribute.
11. You can use the user list boxes to move users in and out of the different groups.. The user must be a member of at least one group, and there is no maximum. In other words, you will not be able to remove a user from a group if he is not a member of any other groups.



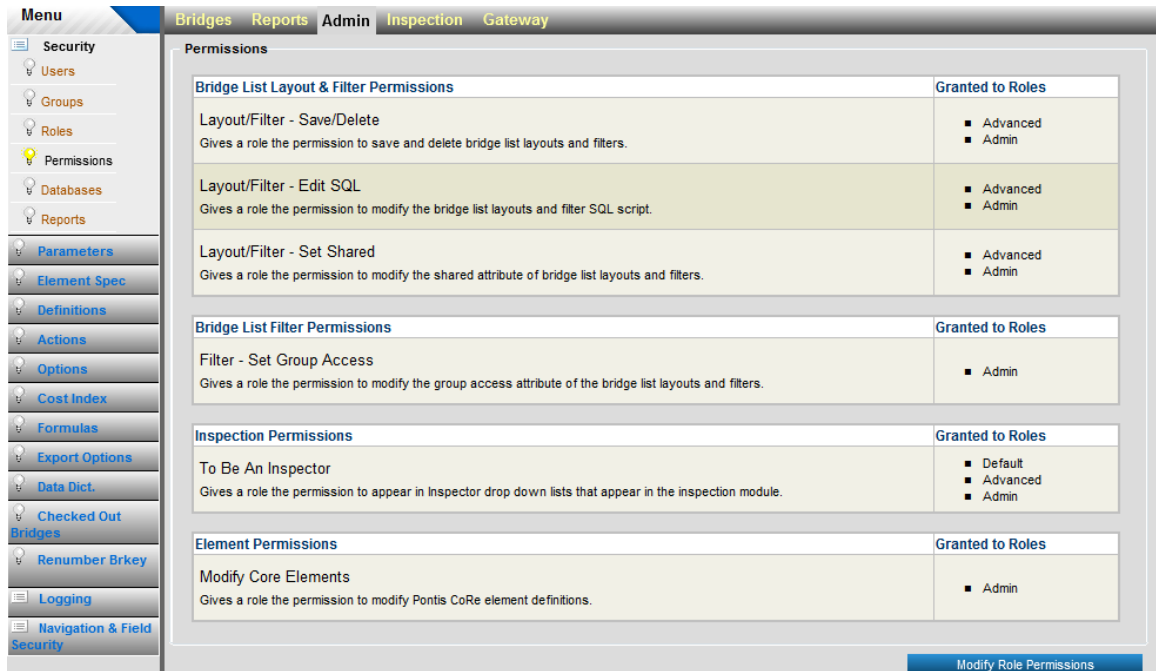
User Group Task Screen

12. The **Roles** task allows you to add new roles, add users to the role, delete a role, and edit existing roles.



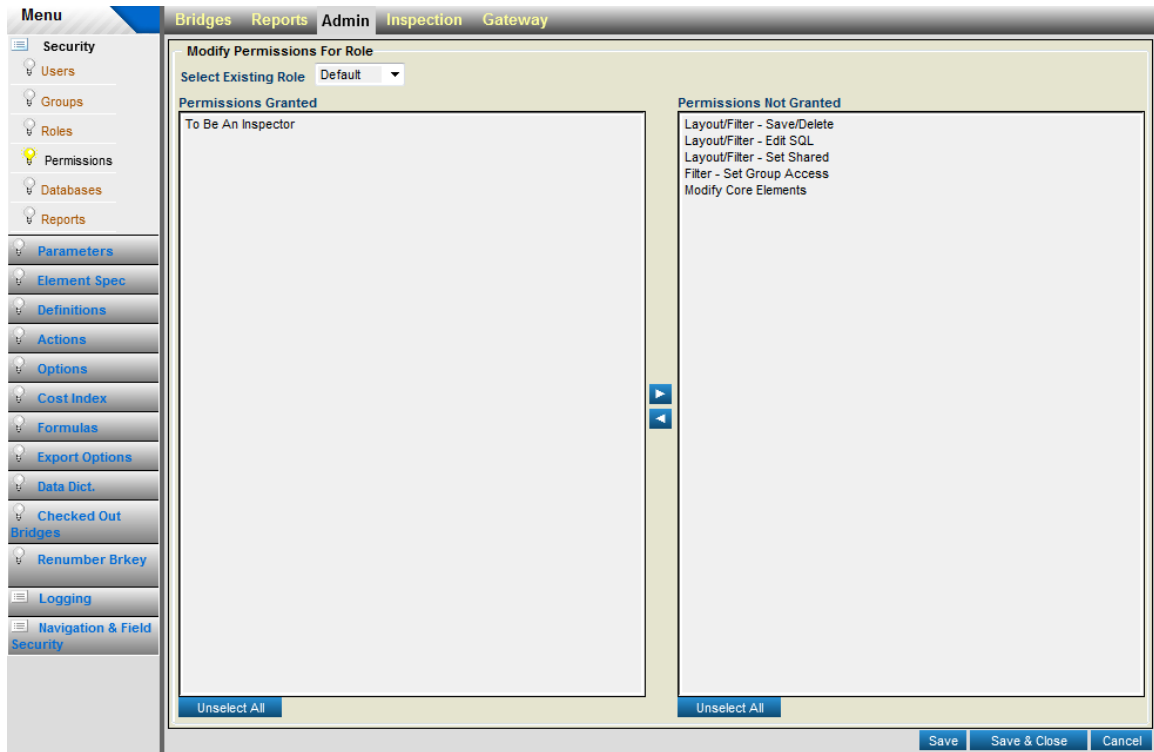
Roles Task Screen

13. You can use the arrows between the list boxes to move users in and out of a role. Users must be a member of at least one role and there is no maximum.



Permissions Task Screen

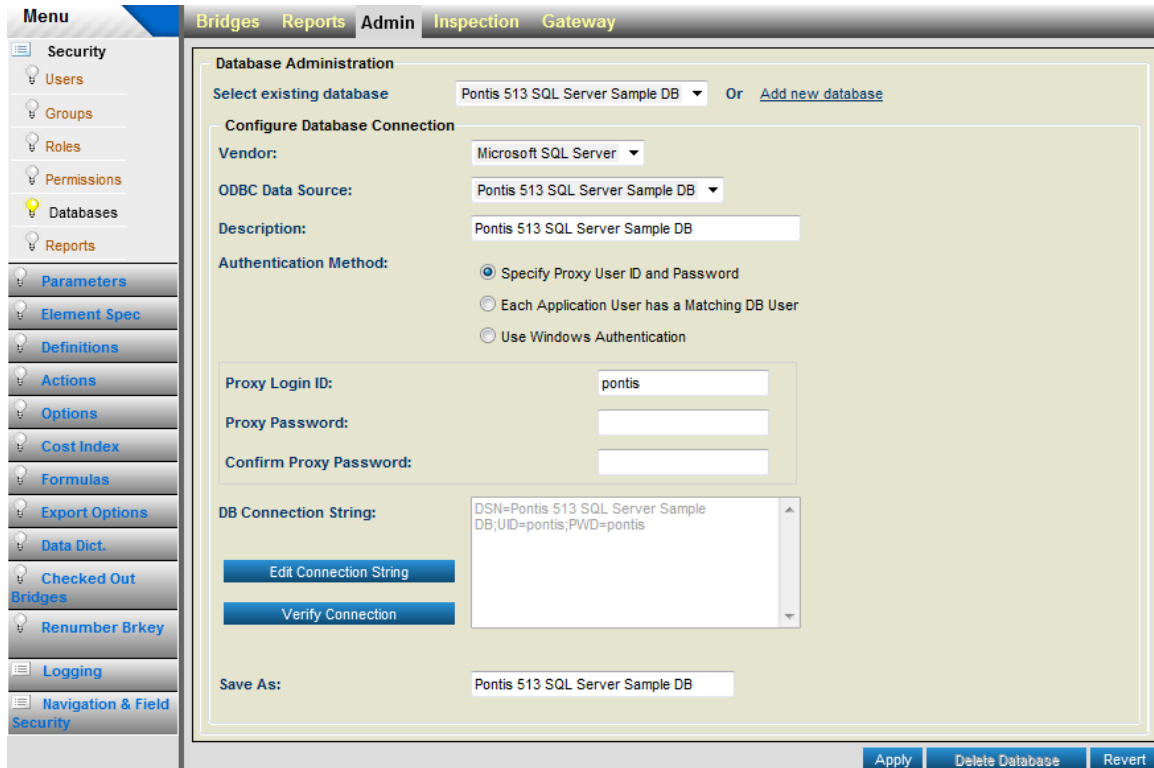
- The **Permissions Task Screen** lists all of the permissions used by BrM along with the roles that have the given permission granted. To modify the permission, click the **Modify Role Permissions** button.



**Edit Permissions Task Screen**

- You can assign the **Inspector** check box to grant a user Inspector rights. Granting this permission will cause that user to be displayed in the *Inspector* and *Next Inspector* pick lists on the inspection schedule page.
- You can assign the **Modify Core Element** check box to grant a user the privilege to modify core elements on the **Element Specification** task screen. If the user does not have this permission then the **Element Specification** task screen will display element definitions as *read only* if the element is a core element.
- Click the **Save** button to save your changes and remain on the page, or **Save & Close** to save your changes and return to the **Permissions Task Screen**.
- Click the **Cancel** button to revert your changes to the default values and return to the **Permissions Task Screen**.

## 5.3 BrM Database Administration



Database Administration Task Screen

BrM 5.x is developed to support different types of databases:

- Microsoft SQL Server 2005 and 2008, including the Express version
- Oracle 10g and 11g, including the Express version

The **Databases** task under the **Admin** tab can be used to set up the database connection profile for BrM. It also allows you to configure authentication mode for your BrM implementation. Before using this screen, you have to make sure that ODBC connection profile is created on your machine for your database. Please refer to the *BrM Installation Guide* and the *BrM Technical Manual* for detailed discussion on database profiles and authentication methods. This section explains the features available on this task screen

**Important Note:** The database configuration can also be accessed without logging in to BrM 5.x. This can be done by using a special login account that BrM 5.x will honor and it will bring up the **Database** task screen. Please use the login: **.dbadmin** and the password: **password** in order to launch the database screen directly. See the *Technical Manual* for an in-depth discussion of customization and configuration procedures, and how different options affect the database and the application. Most of the procedures described in this chapter should only be performed by the system administrator who understands what the impacts of the changes they are making will be, and can take steps to recover from unintended loss or modification to the information.

1. You can click the **Add new database** link to create new database profile. When you select the appropriate vendor, the ODBC Data Source pick list will be populated with profiles specific to that vendor. You can pick an appropriate ODBC profile by pointing to the BrM 5.x database that you created.
2. Type in a description for your database profile.
3. Select the appropriate authentication method for your application.
4. BrM will generate a connection string automatically based on your earlier input. You can also use the **Edit connection string** button to enable the connection string text box and edit it manually.
5. **The Verify Connection** button allows you to make sure the connection string is valid and that the database connection can be established without any errors.
6. You can save your database profile by entering a name in the **Save As** text box. This name will be available in the **Select existing Database** pick list once you save your new profile.
7. Click the **Apply** button to save your changes.
8. Click the **Revert** button to revert your changes to the default values.
9. You can use the **Select existing database** pick list to edit the existing database profiles.

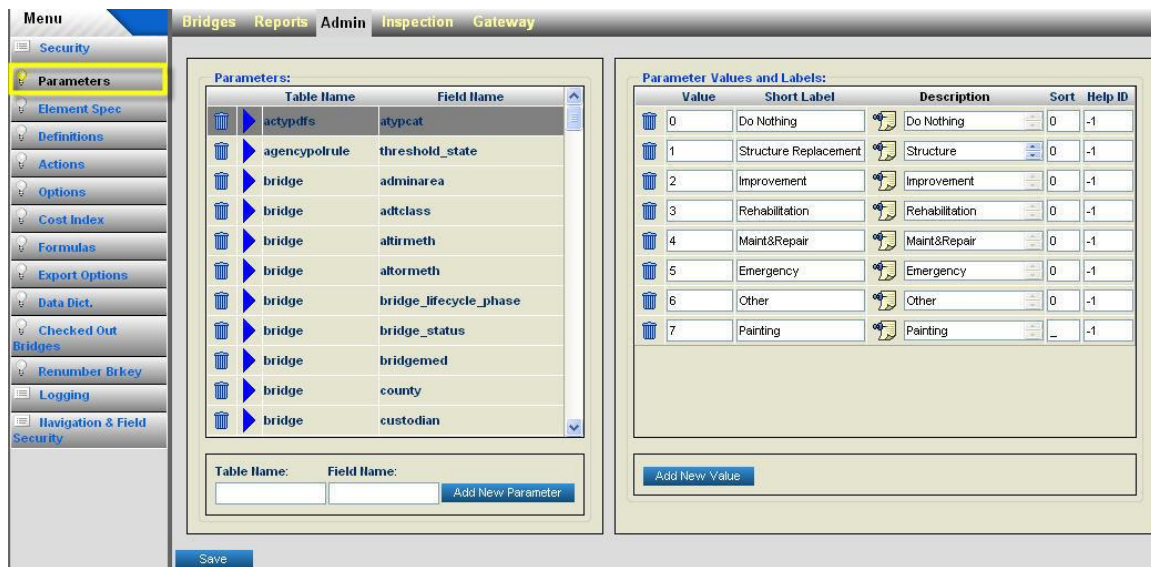
**Caution:** Database configuration should only be performed by a system administrator. It is strongly recommended that agencies should add only one database profile for BrM 5.x in a production environment. It is also recommended that the database configuration should be done only by logging in to BrM using the special credentials mentioned earlier. If you make changes to your database profile from **Admin\Security\Databases** then you must log out of BrM and restart the web server. As a rule of thumb, if you switch the database for your BrM system, you should shut down and restart the BrM 5.x web server. However, it is not recommended to switch the databases in a production environment.

## 5.4 Viewing and Modifying Data Field Coding (Version 5.x)

Many fields in the BrM database are restricted to a limited number of coded values. A parameters table keeps track of what each of the codes mean. This table is used to create pick-lists of values which appear on data entry screens, and to supply English labels for screens and reports.



To view or modify the coding for a field:

1. Make sure that you have the necessary privileges to modify parameters.
2. Do not modify any parameter without understanding how and where it is used in the system.
3. Refer to the BrM data dictionary to look up the name(s) of the table(s) and field(s) that you want to review. The data dictionary can be viewed on-line in the database reference section of the help system, or by printing report **config004\_data\_dictionary**. (See Section 2.4 for instructions on viewing and printing.)
4. Click on the **Parameters** task on the menu under the **Admin** tab.




Parameters Screen

5. On the left side of the screen, scroll down to the table/field name combination for the parameter you wish to edit, and click blue triangle ▶ for that row. The coding for the selected field will appear on the right side of the screen. If the field is not there, it generally means that there is no picklist for it, or the picklist cannot be customized.

6. To edit the descriptions for the different codes, you can directly enter the text for all the fields. The *Short Label* is the item that typically appears on pick lists and reports. To edit the *Description*, either directly edit the text or click on the notes image .
7. To add a new value for the parameter, click the **Add New Value** button. A blank row will appear.
8. Enter the *Value* and *Short Label*. Other items are optional. Make sure that the *Value* you enter is not already listed for this parameter – it must be unique.
9. To remove a value from the list, click the trashcan image  for that row.
10. Click the **Save** button to save your changes.

**To add a new parameter:**

1. Click on the **Parameters** task on the menu under **Admin** tab.
2. Enter the table and field name for your parameter and click on the **Add New Parameter** button.
3. A new row for this table and field will be added to the parameter list.
4. Use the **Add Value** button (described above) to add a set of values for the new parameter.
5. Click the **Save** button to save your changes.

If you want to delete a parameter, it is strongly recommended that you backup the parameters table first. To delete a parameter, click the trashcan image  for that row. You will be asked to confirm the deletion. If you confirm by clicking **OK**, the parameter and all of its values will be removed from the database. Note that this only affects the picklists and display of information – it does not affect the actual values stored in the field that the parameter was for.

## 5.5 Viewing and Modifying Element Specifications (Version 5.x)

Bridge element definitions are customizable through the **Admin** tab. Elements may be added and deleted, and their condition state language and feasible actions may be modified.

**Caution:** Modifications to element specifications should be done with extreme care, and a complete database backup should be made prior to any modifications. Modifying an element after the inventory has been loaded and models have been run can have impacts throughout the system - affecting the bridge inventory, historical inspection data, projects, scenario results, simulation rules, and preservation models.

The standard set of elements in BrM consists of the National Bridge elements (NBEs) and smart flags. Use of NBE elements provides a standard for bridge condition tracking which enables data sharing among states, and provides a basis for a conversion of detailed bridge condition data to NBI condition ratings.

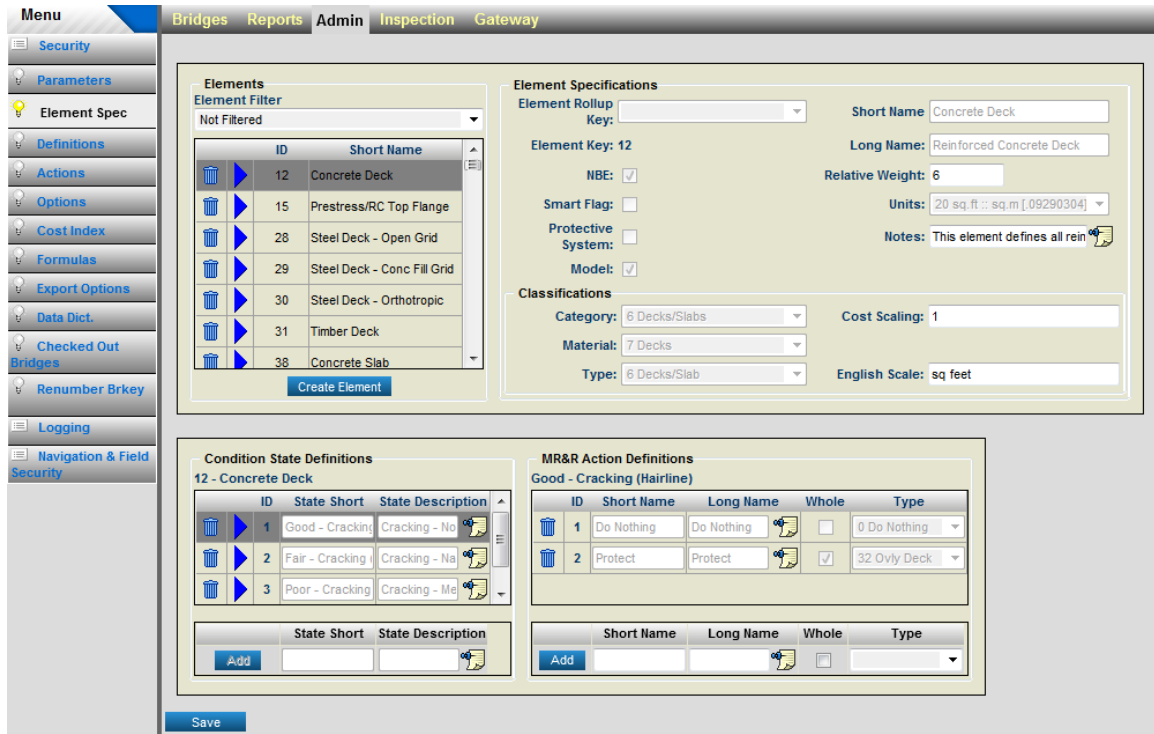
Smart flags are also included in the element specifications list. Smart flags allow tracking of distress conditions such as pack rust and deck cracking which are not included in the standard condition state language for NBE elements because they follow different patterns of deterioration and are measured in a different way. In BrM, smart flags operate as if they are elements (i.e., they each have a distinct element number and are described by a conditions state language). However, they do not have feasible actions and costs associated with them, and are therefore excluded from the preservation modeling.

BrM also supports the concept of sub-elements, which are elements that correspond to a specific NBE element, sharing the same units, condition state language and feasible actions. Sub-elements are intended to be used where deterioration patterns or repair costs may vary based on factors such as the type of paint systems in place, element location (e.g., internal vs. external girders), or other characteristics (e.g., the degree of deck/slab substrate repair). Each agency must add and maintain sub-elements as they deem necessary.




To modify element specifications:

1. Click on the **Element Specifications** task under the **Admin** tab.

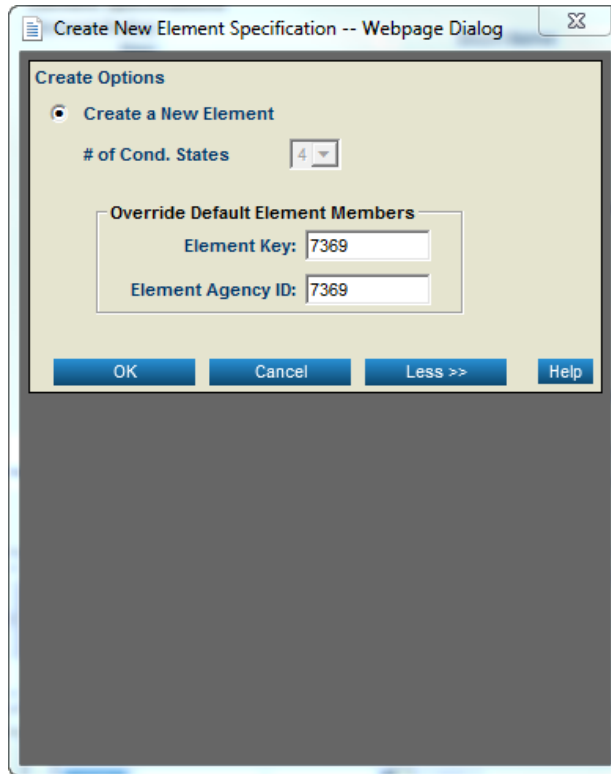


Element Specifications Screen

2. Use the scrollbar next to the elements list to scroll down to the element you wish to edit, and then click on it. Notice that the condition state descriptions for the element will appear in the lower left corner of the screen. If you click on  for one of the condition states, then the possible actions for the selected condition state will be shown in the lower part of the screen.
3. Click the **Save** button to save your changes.

To add a new element:

1. To add a new element, click on the **Create Element** button. The **Create New Element Specification** screen will appear.




2. To create a new element click on the **Create a New Element** radio button
  - Click **More** to enter a custom element number and element key value.
4. Click **OK** to create the new element.

**To add a PDF reference to newly created element:**

1. Write up a description of the newly added element and save it as a PDF.
2. Name the PDF to the same name as the newly added element. For example, based on the screenshot above, the PDF would be named “7369.pdf”.
3. Copy the PDF to the ElemGuideManuals folder in the BrM directory. If you did a default install the folder would be located at “C:\Program Files\AASHTOWare\BrM<version number>\ElemGuideManuals”.
4. After the PDF has been added a PDF icon will appear in the lower right hand corner when viewing the element. Click on this to view the PDF.



**To delete an element:**

1. Make sure that you have the necessary privileges to remove an element, and be aware that this will have far-reaching effects throughout the BrM database.
2. Click on the **Element Specifications** task under the **Admin** tab.
3. Click on an element on the top of the screen, and use the arrow keys to scroll down to the one you wish to delete.
4. Click on the trashcan image . This deletes all information related to the current element (including elicitation records, inspection information, action information, etc.)

**Important Note:** The old **ELEMENTS.PRN** file is now represented by a new **PON\_CTRL\_ELEMENTS** database table in BrM 5.x. Note that adding a new element from the Element Specification task under the **Admin** tab does not update the **PON\_CTRL\_ELEMENTS** database table, which is used by the NBI Translator to generate NBI condition ratings from element condition ratings. You will need to perform the database update operation to edit this table outside BrM 5.x and synchronize it with the BrM element definitions.

## 5.6 Viewing and Modifying Definitions (Version 5.x)

### Viewing and Modifying Environment, Materials, and Element Classification Definitions

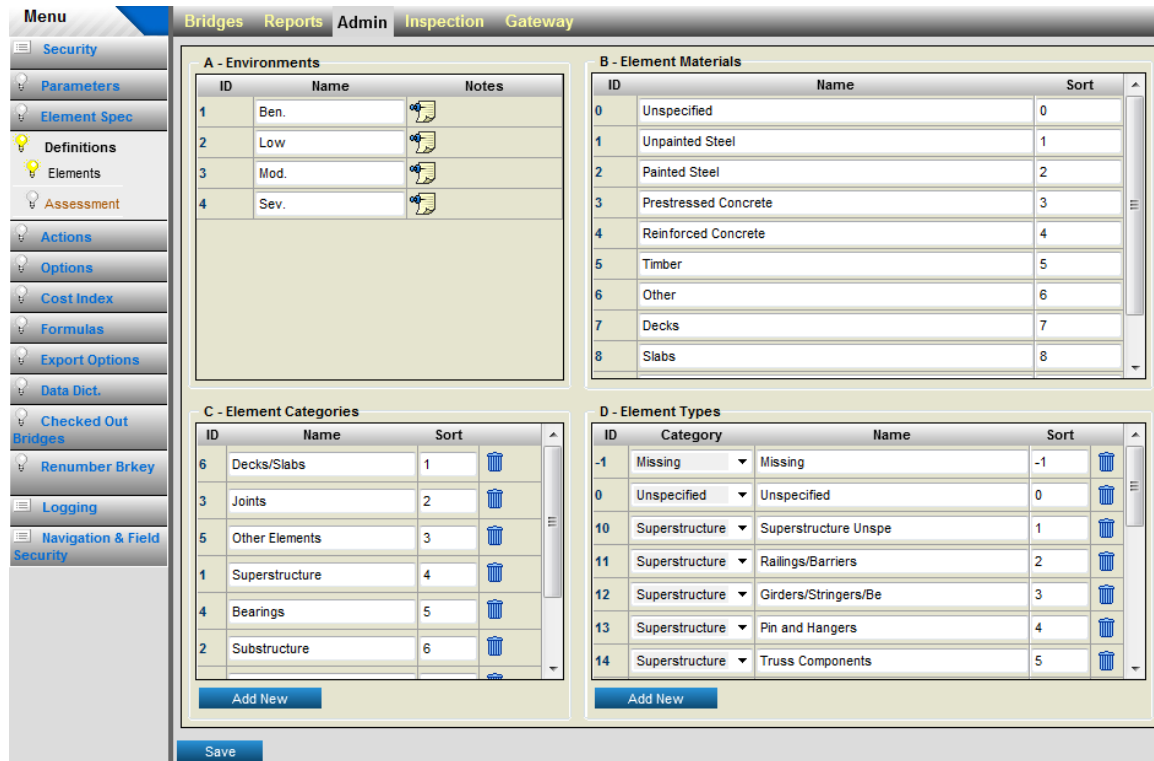
The **Element** subtask of the **Definitions** task within the **Admin** tab maintains the codes and associated meanings of the following:

- Environments;
- Element Types;
- Element Materials; and
- Element Categories.

**Caution:** These definitions are used throughout the system, and should only be modified with extreme care. It is strongly advised that a backup of the database be performed prior to making any changes.

**To view or modify the definitions of environments, element types, materials and categories:**

1. Click on the **Definitions** task under the **Admin** tab. There are separate sections for environments, element types, element materials and element categories. Each section includes codes, names, and positions (which can be used in user-defined reports for special sort orders). The element type section also designates which element category each type belongs to.

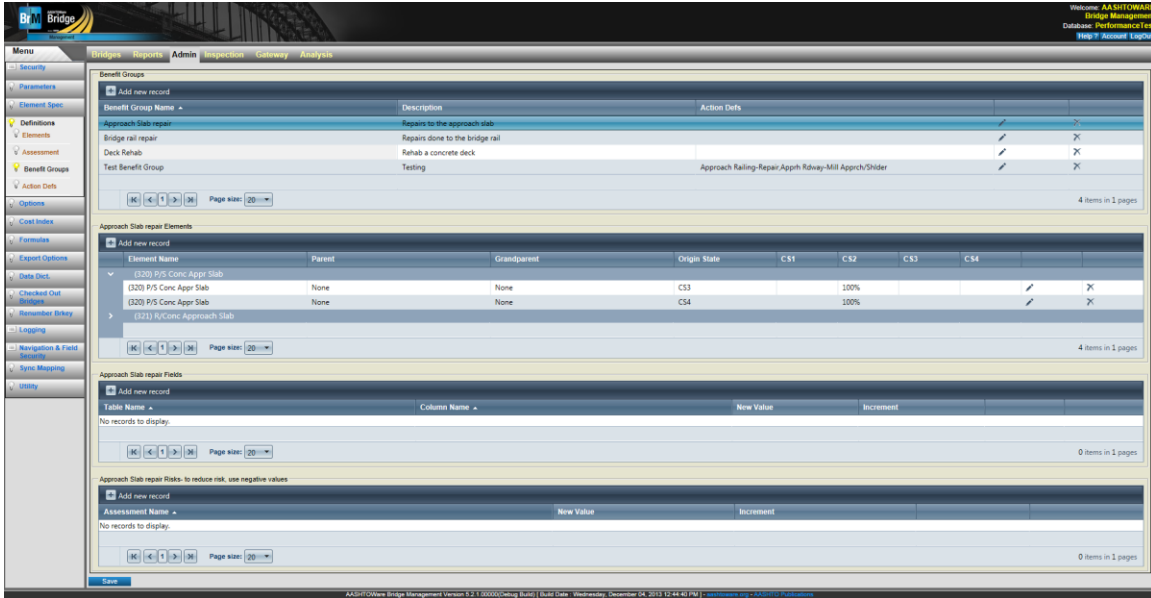


Definitions Screen

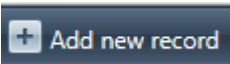



2. In the appropriate section of the screen, click on the name or category (for element types) column.
3. Enter your changes.
4. Click the **Save** button to save your changes.

## Viewing and Modifying Benefit Groups



The **Benefit Groups** subtask of the **Definitions** task within the **Admin** tab contains grids displaying Benefit Groups as well as their associated Elements, Fields, and Risk Assessment data. On loading the page for the first time, all four grids will be empty, and the Benefit Groups grid will be the only one that can be used. On further visits to the page, the first benefit group in the grid will be selected, and the Elements, Fields, and Risk grids will be populated with the benefits associated with the group. The user can change this selection by clicking on a row in the Benefit Groups grid. The other grids will automatically refresh.



**To add/edit a Benefit Group:**



1. Click the  button at the top of the Benefit Group Grid to add a new Benefit Group. Click the  button on the the row of the Benefit Group to Edit.
2. Input/Edit a name and description for the benefit group. The grid also displays the associated actions, which can be set on the Admin Actions page once the benefit group is created.
3. Click the  button on in the row for the new record. This will commit the change to the grid.
4. Click the  button on the page to save changes to the database.

**To add/edit an Element:**

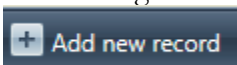

1. For each benefit group, the user can specify how the benefit will impact an element on the bridge. Click the  button at the top of the Elements Grid to add a new Element. Click the  button on the the row of the Element to Edit.
2. Select an element by name, and then chooses an origin state. This indicates the condition state that the benefit is applying to; for example, by choosing origin state CS4, the user can decide to redistribute all of that element’s CS4 into condition states 1-4, improving its overall condition. Each element-origin state pair can only be entered once per benefit group.

## CONFIGURING AND CUSTOMIZING BRM


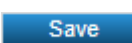
| Element Name                 | Parent | Grandparent | Origin State | CS1 | CS2  | CS3 | CS4 |
|------------------------------|--------|-------------|--------------|-----|------|-----|-----|
| (320) P/S Conc Approach Slab | None   | None        | CS1          | 100 |      |     |     |
| (320) P/S Conc Approach Slab | None   | None        | CS4          |     | 100% |     |     |
| (321) R/Conc Approach Slab   | None   | None        | CS3          |     |      |     |     |
| (321) R/Conc Approach Slab   | None   | None        | CS2          |     | 100% |     |     |
| (321) R/Conc Approach Slab   | None   | None        | CS1          |     | 100% |     |     |

3. Redistribute the elements condition state by entering percentage values in the applicable condition stat text boxes. It is not permitted to distribute an origin state into lower condition states; origin state 2 cannot be distributed into CS3 or CS4. Each text box can only accept a number value, and the total value of all the text boxes must add up to 100.
4. Click the  button on in the row for the new record. This will commit the change to the grid.
5. Click the  button on the page to save changes to the database.



### To add/edit an Fields:

1. The Fields grid allows the user to apply benefit to any field on any table. Click the  button at the top of the Fields Grid to add a new Field. Click the  button on the the row of the Field to Edit.
2. Select the table name, then a column name from the drop down list. Choose either to apply a new value, which will replace that field's value in the utility calculations, or to apply a modifier. Modifiers must be written as an integer, either signed or unsigned (2, +2, or -2 are all acceptable values). It is not allowed to enter values for both fields, remove one if both are filled out.

| Table Name | Column Name | New Value | Increment |
|------------|-------------|-----------|-----------|
| fields     | akry        |           |           |

3. Click the  button on in the row for the new record. This will commit the change to the grid.
4. Click the  button on the page to save changes to the database

### To add/edit an Risks:

1. The Risks grid allows the user to apply benefit to any Risk Assessment. Click the  button at the top of the Risks Grid to add a new Risk Assessment. Click the  button on the the row of the Risk to Edit.

## CONFIGURING AND CUSTOMIZING BRM

2. Select the Risk Assessment name and choose either to apply a new value, which will replace that field's value in the utility calculations, or to apply a modifier. Modifiers must be written as an integer, either signed or unsigned (2, +2, or -2 are all acceptable values). It is not allowed to enter values for both fields, remove one if both are filled out.

3. Click the  button on in the row for the new record. This will commit the change to the grid.
4. Click the **Save** button on the page to save changes to the database.

## 5.7 Viewing and Modifying Action Definitions (Version 5.x)

The Action Definitions page can be accessed by selecting the Admin Tab with an account with privilege to the Admin Tab. Select Actions from the Task Bar.

| Key | Name                    | Description                          | Notes                     | Sort Order |
|-----|-------------------------|--------------------------------------|---------------------------|------------|
| -1  | Converted Work Candidat | Converted Work Candidates            | Converted Work Candidates |            |
| 0   | Do nothing (flex)       | Bridge deteriorates according to the | -1                        |            |
| 1   | Replace Super (flex)    | Replace Superstructure               | -1                        |            |
| 2   | Replace Deck (flex)     | Replace Deck                         | -1                        |            |
| 3   | Replace Sub (flex)      | Replace Substructure                 | -1                        |            |
| 4   | Rehab Super (flex)      | Rehab Superstructure                 | -1                        |            |
| 5   | Rehab Deck (flex)       | Rehab Deck                           | -1                        |            |
| 6   | Rehab Sub (flex)        | Rehab Substructure                   | -1                        |            |
| 7   | Paint Bridge (flex)     | Paint Bridge                         | -1                        |            |
| 8   | Spot Paint (flex)       | Spot Paint Bridge                    | -1                        |            |
| 9   | Rehab (flex)            | Rehab Bridge                         | -1                        |            |
| N   | Testing                 | Testing                              | -1                        |            |

| ID  | Element Name            | Cost Per Unit | Unit  |
|-----|-------------------------|---------------|-------|
| 12  | Concrete Deck           | \$            | sq.ft |
| 15  | Prestress/RC Top Flange | \$            | sq.ft |
| 102 | Steel Box Girder        | \$ 123456.00  | ft    |
| 212 | Timber Pier Wall        | \$ .00        | ft    |



There are three main section to this page. The Actions Grid displays a list of actions.

| Key | Name                    | Description                          | Notes                     | Sort Order |
|-----|-------------------------|--------------------------------------|---------------------------|------------|
| -1  | Converted Work Candidat | Converted Work Candidates            | Converted Work Candidates |            |
| 0   | Do nothing (flex)       | Bridge deteriorates according to the | -1                        |            |
| 1   | Replace Super (flex)    | Replace Superstructure               | -1                        |            |
| 2   | Replace Deck (flex)     | Replace Deck                         | -1                        |            |
| 3   | Replace Sub (flex)      | Replace Substructure                 | -1                        |            |
| 4   | Rehab Super (flex)      | Rehab Superstructure                 | -1                        |            |
| 5   | Rehab Deck (flex)       | Rehab Deck                           | -1                        |            |
| 6   | Rehab Sub (flex)        | Rehab Substructure                   | -1                        |            |
| 7   | Paint Bridge (flex)     | Paint Bridge                         | -1                        |            |
| 8   | Spot Paint (flex)       | Spot Paint Bridge                    | -1                        |            |
| 9   | Rehab (flex)            | Rehab Bridge                         | -1                        |            |
| N   | Testing                 | Testing                              | -1                        |            |

The Action New Row can be used to add a new row to the Action Grid.

| Key | Name | Description | Notes | Sort Order                         |
|-----|------|-------------|-------|------------------------------------|
| 10  |      |             |       | <input type="button" value="Add"/> |

The Associated Benefit Group panel contains a grid and a drop down that allows the user to associate the selected action to a Benefit Group. (See Benefit Groups to create them)

Associated Benefit Group

Selected Benefit: 1 - TestGrp  Metric  English

| ID  | Element Name            | Cost Per Unit           | Unit  |
|-----|-------------------------|-------------------------|-------|
| 12  | Concrete Deck           | \$ <input type="text"/> | sq.ft |
| 15  | Prestress/RC Top Flange | \$ <input type="text"/> | sq.ft |
| 102 | Steel Box Girder        | \$ 123456.00            | ft    |
| 212 | Timber Pier Wall        | \$ .00                  | ft    |

Additionally the Unit Type Radio Buttons provide the ability to switch Cost per Unit from Metric to English

Metric  English

## Modifying Action Definitions

1. The first action in the actions grid is selected by default. To switch between Actions, click the arrow in the Action Grid on the row that is desired.

| Action Defs |                         |                         |       |            |
|-------------|-------------------------|-------------------------|-------|------------|
| Key         | Name                    | Description             | Notes | Sort Order |
| 01          | Approach Railing-Repair | Approach Railing-Repair | -1    |            |
| 02          | Approach Railing        | Approach Railing        | -1    |            |

2. Make changes to the action by editing the name, description, notes, and/or sort order.
3. To add a new action to the Action Grid, fill in Action New Row and click the Add button. The new row is added and the page is marked dirty.

| Key  | Name | Description | Notes | Sort Order |
|------|------|-------------|-------|------------|
| 1082 |      |             |       |            |

4. Click the  button to save changes to new action or existing action.
5. To delete an action, click the 'x' button for the desired action row in the Action Grid. A confirmation alert message will display. Click Ok to delete. Doing this action does not require the save and will permanently delete the action.

## Associate Action to Benefit Group

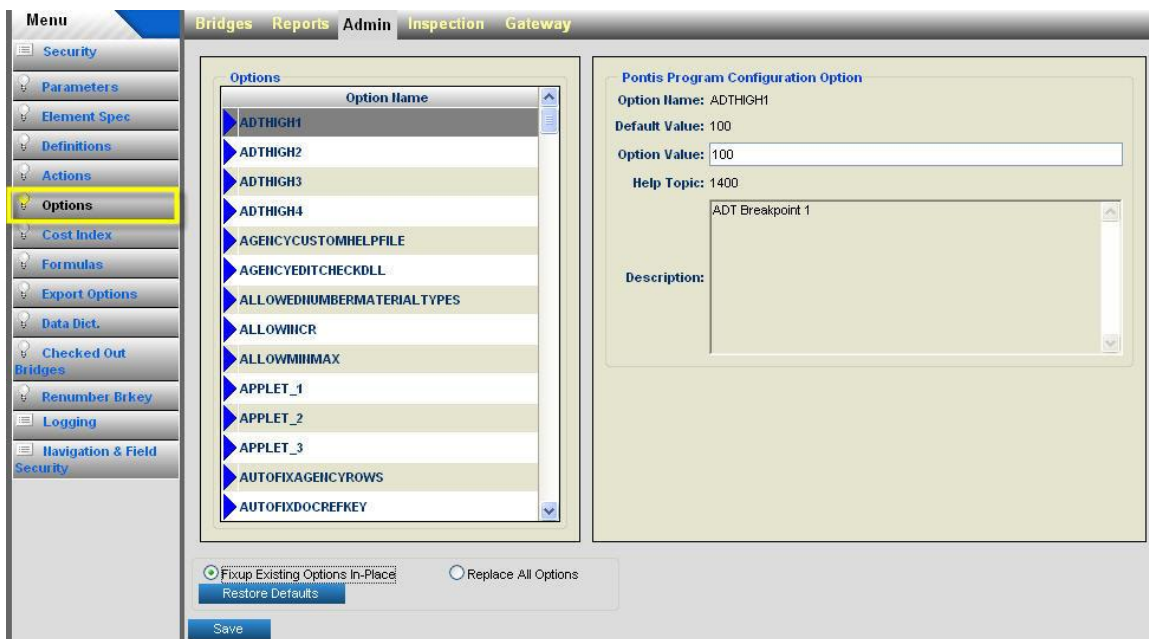
1. To associate an action to a Benefit Group, first select Action.
2. Click on the drop down in the Associated Benefit Group panel and select the desired Benefit Group. (To set up Benefit Groups, refer to Benefit Groups) If no Benefit Group exist, the dropdown will display an empty set and the Action will not be able to be assign to one.
3. The page will become dirty and click the  button to save changes.
4. The elements in the Benefit group will be displayed in the grid within the Associated Benefit Group panel. Each element can get an associate cost per unit in the Cost per Unit Column. To change the unit standard, use the Unit Type Radio Buttons.

## 5.8 Viewing and Modifying Configurable Options (Version 5.x)


Several features of BrM are customizable. Customization is controlled by a set of option fields in a table called **options**. Values of option fields can be modified on the **Options** task under **Admin** tab. Configuration options should not be modified without a full understanding of how they affect the system operation. See the *Technical Manual* for further explanation of how options are used.

To modify configuration options:

1. Click on the **Options** task under the **Admin** tab.



Options Screen

2. Use the scroll bar and  arrow buttons to navigate and select the appropriate *Option Name*.
3. Edit the *Option Value*.
4. Click the **Save** button to save your changes.

To restore all configuration options to their default values, click on the **Restore Defaults** button.

The different configuration options are described in the *Technical Manual*.

## 5.9 Viewing and Modifying the Cost Index (Version 5.x)

A cost index table is maintained in BrM so that each unit cost can be normalized to a base year, and inflated to the current year for display or use in the models. Unit costs can be inflated by clicking on the **Adjust Costs** button on the Preservation desktop, and then clicking on the **Inflate** button in the MR&R Model Information screen. When this selection is made, all unit costs are multiplied by the ratio of the current cost index divided by the cost index last used.

The BrM sample and working databases ship with a populated cost index table. The series supplied is the Federal Highway Administration Highway Construction Cost Index as reported in the US Department of Transportation publication *Highway Statistics*. These have been adjusted to use a consistent base year of 1987. Where data were not available for a particular year, a straight-line interpolation between the nearest available years was used. You may want to replace the supplied data with a series of your choosing.

To enter a new cost index or modifying existing cost index entries:


1. Click on the **Cost Index** task under the **Admin** tab.


| Construction Cost Index |                |        |
|-------------------------|----------------|--------|
|                         | Effective Date | Value  |
| 🗑                       | 01/01/2006     | 221.30 |
| 🗑                       | 01/01/2005     | 183.60 |
| 🗑                       | 01/01/2004     | 154.40 |
| 🗑                       | 01/01/2003     | 149.80 |
| 🗑                       | 01/01/2002     | 147.90 |
| 🗑                       | 01/01/2001     | 144.80 |
| 🗑                       | 01/01/2000     | 145.60 |
| 🗑                       | 01/01/1999     | 136.50 |
| 🗑                       | 01/01/1998     | 126.90 |
| 🗑                       | 01/01/1997     | 130.60 |
| 🗑                       | 01/01/1996     | 120.20 |
| 🗑                       | 01/01/1995     | 121.90 |
| 🗑                       | 01/01/1994     | 115.10 |

Buttons: Add New, Save, Discard

Cost Index Screen

## CONFIGURING AND CUSTOMIZING BRM

2. To enter a new cost index, type in an *Effective Date* or select it from calendar popup window by clicking  image. Enter the cost *Value* in the text box. Click on the **Add New** button to add the new cost index.
3. You can directly modify information for an existing entry.
4. Click on the **Save** button to save your changes.

To delete a row from the cost index table, click on the trashcan  image for the row.

## 5.10 Viewing and Modifying BrM Formulas

BrM contains a set of editable formulas that can be used to correct missing or erroneous database information. Note that the network optimization and program simulation models do not make use of the BrM formulas table (for performance reasons). Note also that most of the parameters that affect improvement selection and costing can be modified from within the **Programming** module. Therefore, most users will not need to make use of the formula editor.

A typical formula consists of a set of logical steps that will set new database values for bridges or other types of data meeting certain conditions. Formulas consist of three parts: a result field, the formula text, and an optional trigger field. The result field stores the calculation represented by the formula text. In certain situations, the trigger field is used to indicate when the formula should be executed. A blank trigger field indicates that the formula should be run for all records.

### Trigger Fields

Trigger fields allow users to control the execution of formulas at the level of individual bridges or projects. Normally, they are turned on, which causes the formulas to be calculated whenever **Run Formulas** is selected. However, if you want to freeze the data in a record so that the formulas cannot modify valid data, the trigger field should be turned off. In this case, the formula is triggered only if the field has a missing (unknown) value.

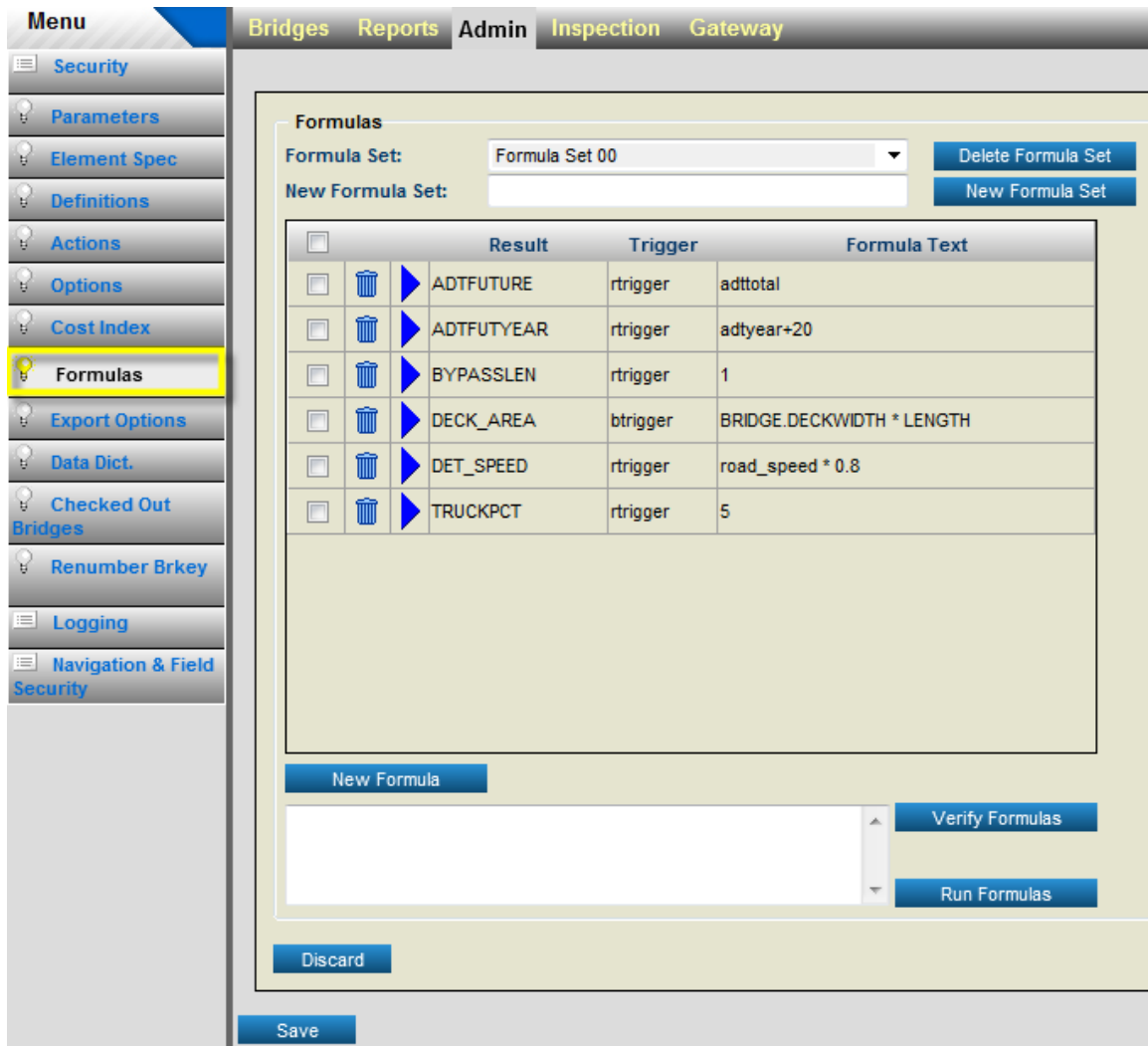
The trigger field for the bridge table is located on the **Inventory - Admin** sub-task within the **Inspection** tab. It is a checkbox labeled **Formulas Trigger**.

**Example:** **missing roadway speed.** Since speed is not an NBI data item, many states will not have data for it. There is a formula in the system to estimate roadway speed from the functional class. If the roadway trigger field is turned on, this formula is re-calculated when **Run Formulas** is selected to reflect changes in either the speed formula, or in the functional class. If the user has field-checked the speed, then he should click off the roadway trigger field. In this case, the speed remains as-is even if the speed formula or the functional class is later modified.

### Maintaining Formula Sets

Formulas are defined and maintained on the **Formulas** task under the **Admin** tab.

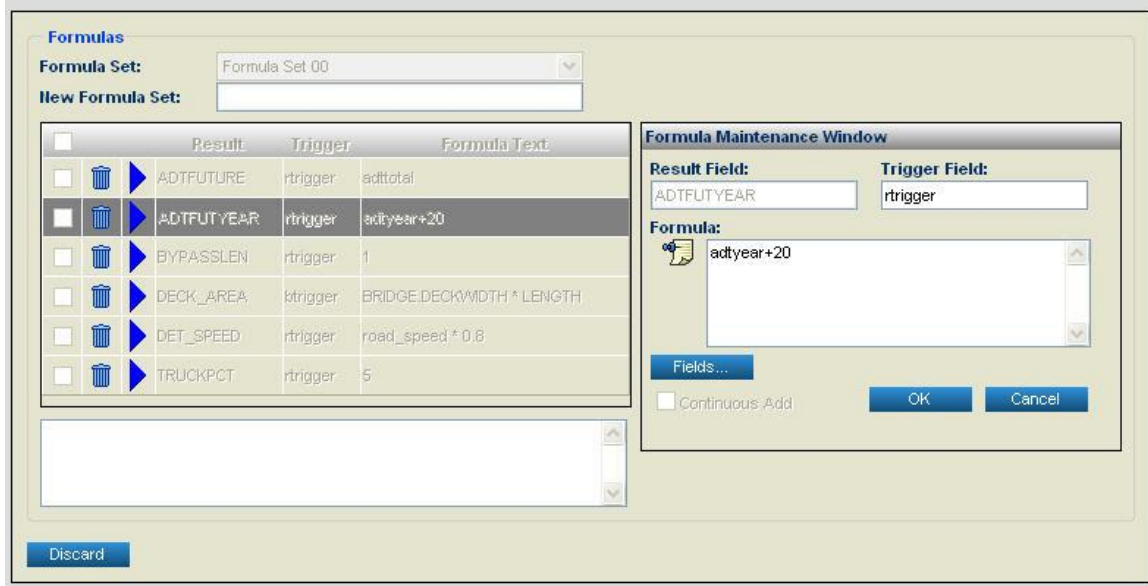
Several different sets of formulas can be stored in BrM. When the **Run Formulas** button is selected, all formulas in the current *formula set* are run. A formula set may be selected with the Formula Set picklist at the top of the screen. Use the **New Formula Set** and **Delete Formula Set** buttons to add and remove existing formula sets.



Formulas Task Screen

To add new formulas to a formula set, or edit existing formulas:

1. Select a formula set from the **Formula Set** picklist at the top of the screen.
2. Enter a name for the formula set and click on the **New Formula** button if you are adding a new formula. To edit an existing formula, click image to select the row.




Adding New Formulas Screen



Selecting Unique Field Names Screen

3. The **Formula Maintenance** window will appear. Position the cursor in the formula area to revise the text as required.
4. To select a field to use in your formula, click on the **Fields...** button. The **Select Formula Fields** screen will open, listing all of the tables and fields which can be used within formulas. Formulas utilize BrM unique field names (so there is no need for both a table and column name). Both the unique field name and the actual column name are shown. Select a row by



clicking  image for the required *DB Column Name* and hit **OK** button. A unique field name will be now available to paste and **Fields...** window will be closed. Use **CTRL+V** keyboard keys to paste the unique name at desired location. Click the **Cancel** button to close the window.

5. When you have finished entering your formula, click the **OK** button on the **Formula Maintenance** window.
6. Click the **Verify Formula** button to check the syntax of the formula. If the message “The Formula Verification run was cancelled” appears, errors were found in the formula. Any errors will be displayed in the text box at the bottom of the **Formulas** box on the screen. If errors were found, repeat the previous steps to correct the formula and verify it again. If no message appears, the formula is correct.
7. Click **Save** button to save changes.

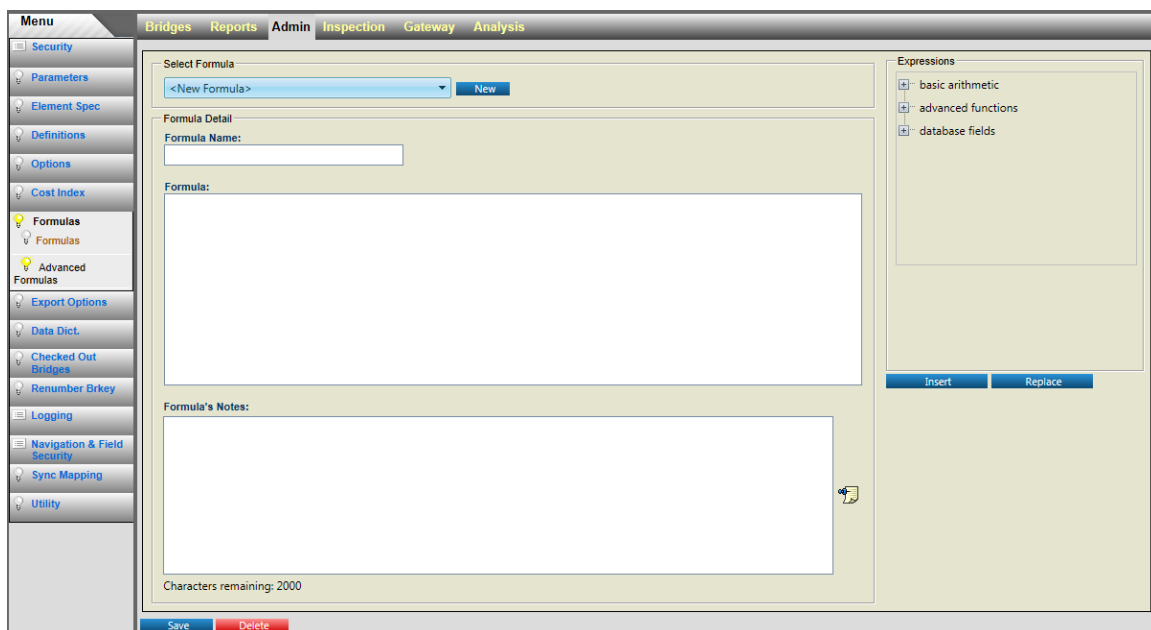
To delete a formula, click the trashcan image  on the formula row.

Choose the **Run Formulas** button to execute the formulas in the currently selected set.

## Maintaining Advanced Formulas

Advanced Formulas are defined and maintained on the **Advanced Formulas** subtask under **Formulas** task in the **Admin** tab.

The Advanced formulas editor is designed to allow users to create, modify, and delete reusable formulas for use in areas such as the scaling of Utility Rating category items.



**To add a new formula or edit and existing formula:**

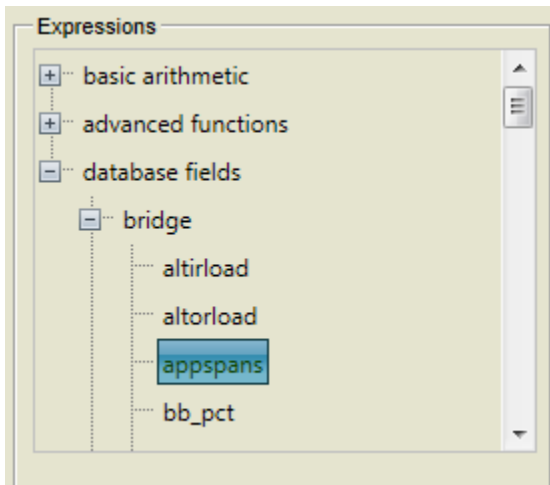
5. Select a formula from the drop down to edit and existing formula or select the <New Formula> option from the drop down or click the **New** button to set up the page up for adding a new advanced formula.
6. Edit or Enter new Formula Name, Formula, and Formula's Notes. Any fields to which changes are made will be indicated as modified by a yellow border.



7. Select **Save** to save change to existing or new formula. All highlighting to modified fields will be removed to indicate a successful save.

**To add an expression to an advanced formula:**

1. Navigate through the expression list tree view to find an arithmetic operator, a function, or a database field to be used as a variable. Note that only the database fields capable of being used in an arithmetic expression will be listed in the treeview.



2. Select the expression from the tree view and either click the **Insert** button or double click the expression to add it to the formula. When adding a function select text within the formula that will be used as an argument.

Ex: In the string  $2 + 3.56 - 1$ . If the 3.56 was highlighted and the abs function was inserted the resulting formula would be  $2 + \text{abs}(3.56) - 1$

3. In order to replace a portion of the formula with an expression, highlight the text in the formula to be replaced, select the new expression, and either click the **Replace** button or double click the expression to replace the selected text in the formula.

**To add a custom variable to a formula:**

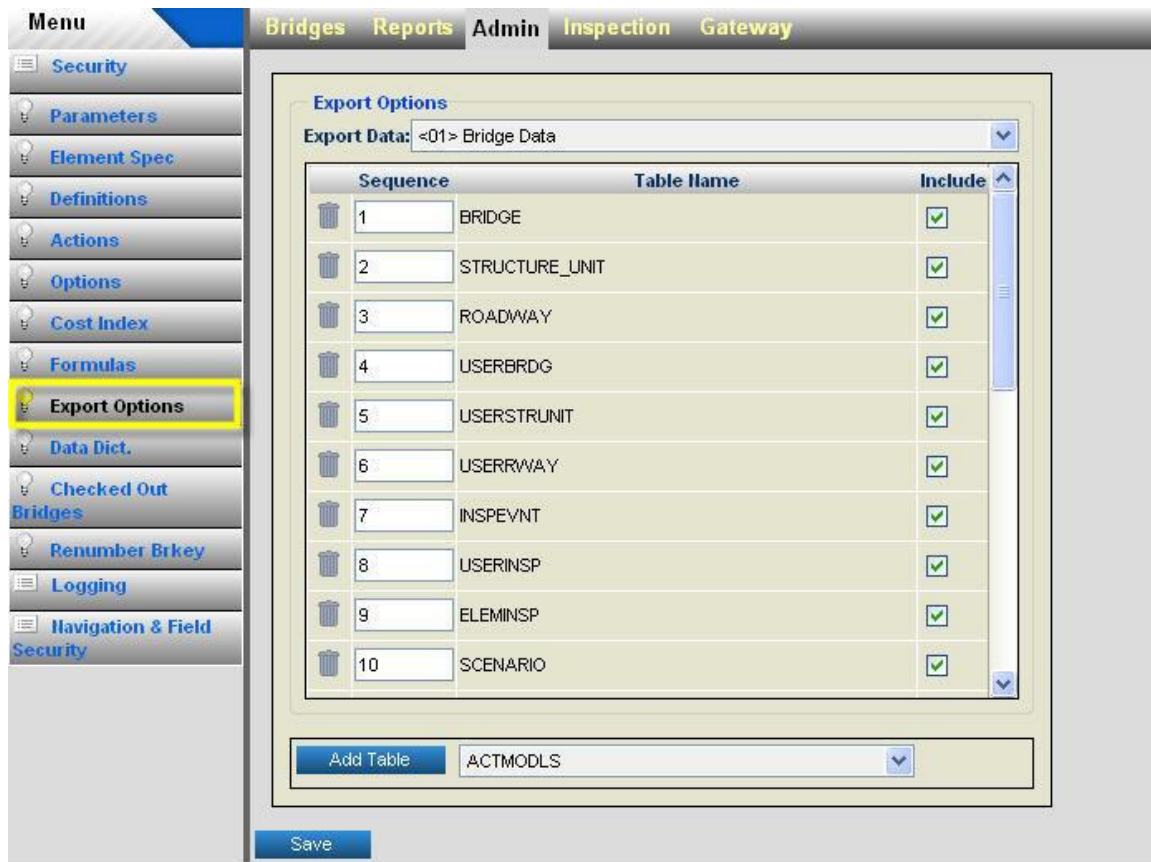
1. Enter a custom variable into a formula using the same brackets that are used when a database field is entered from the expressions list. For example in the formula 2+ {X}, X is interpreted as the custom variable. Note, since a period (.) is used to interpret a database table/field combo (table.field), this cannot be used as an operator in custom variables.

**To delete an advanced formula:**

1. Select an existing formula from the advanced formulas list drop down.
2. Click the **Delete** button to delete the formula.

## 5.11 Configuring Export Options (Version 5.x)

This task is a new feature added to BrM 5.x system. BrM 5.x uses a database table, which contains the seven export options. A separate child table was added to hold the table list for each export option. This screen is an interface to those database tables.

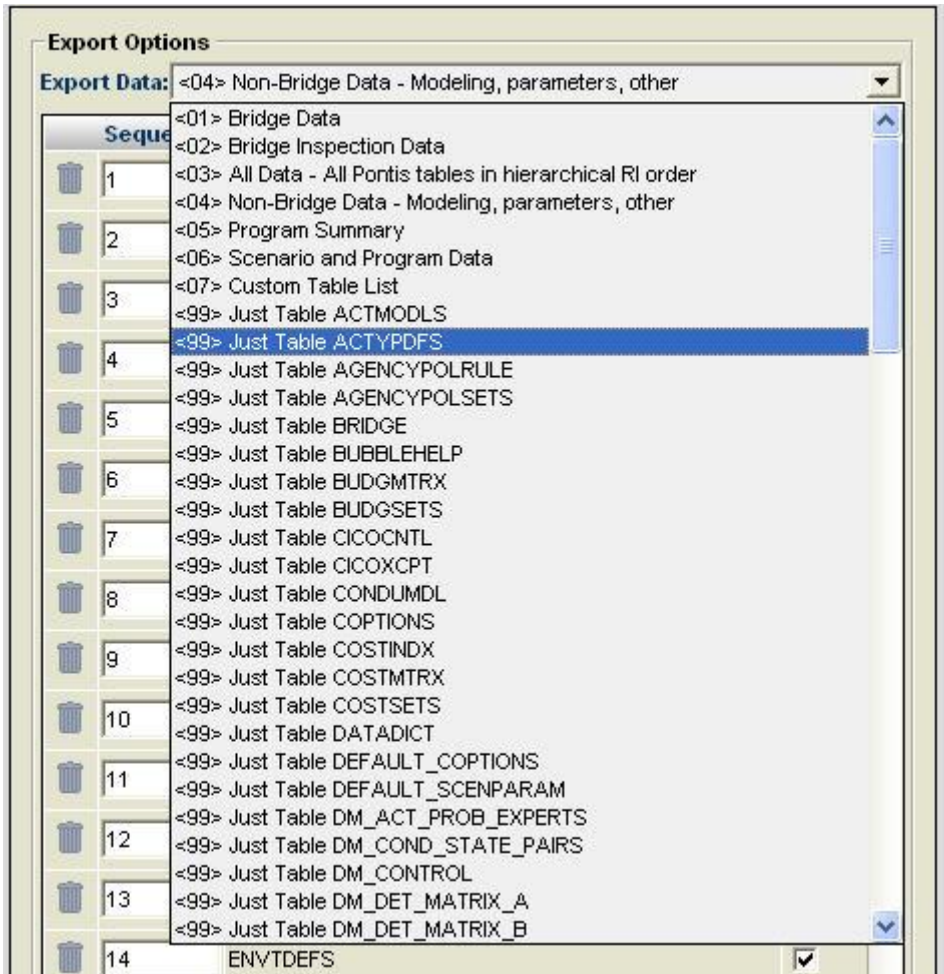


Formulas Task Screen

There are six standard export options listed with name starting with <01> - <06> in the *Export Data* picklist. Each standard export option has pre-defined tables pertaining to that option. You

can customize these options by adding the new tables to their lists. You can not delete the table names that are part of the standard list, however, you can use the check box for each standard *Table Name* row to include or exclude that table from that standard option. You can delete the new tables that you may have added to the standard options.



This screen also enables you to create a completely customized export option by selecting **<07> Custom Table List**, which can contain only the tables of your choice.



The options beginning with **<99> Just Table** are single table options; they are dedicated to a predefined single table. You can neither delete table from these options nor add a new table to them.

**To customize the export options:**

1. Use *Export Data* pick list to select the option.
2. To add a new table to the option, select a new table from the picklist on the right of the Add Table button and click the **Add Table** button.

3. You can uncheck or check the check box under the Include column, to include or exclude a table from that option.
4. The grayed trashcan image  indicates that you are not allowed to delete that row.
5. Click trashcan image  if you want to remove the table you have added to the option.
6. Click **Save** button to save your changes.

## Full export of an existing BrM database into a blank BrM database.

If you are looking to do a full export of your existing BrM database you will need to manually add the STATEDFS, ELEMDEFS, and MRRACTDF tables to your export. To do so, follow the steps below.

- 1) Select the Admin tab from the tab menu at the top of the screen.

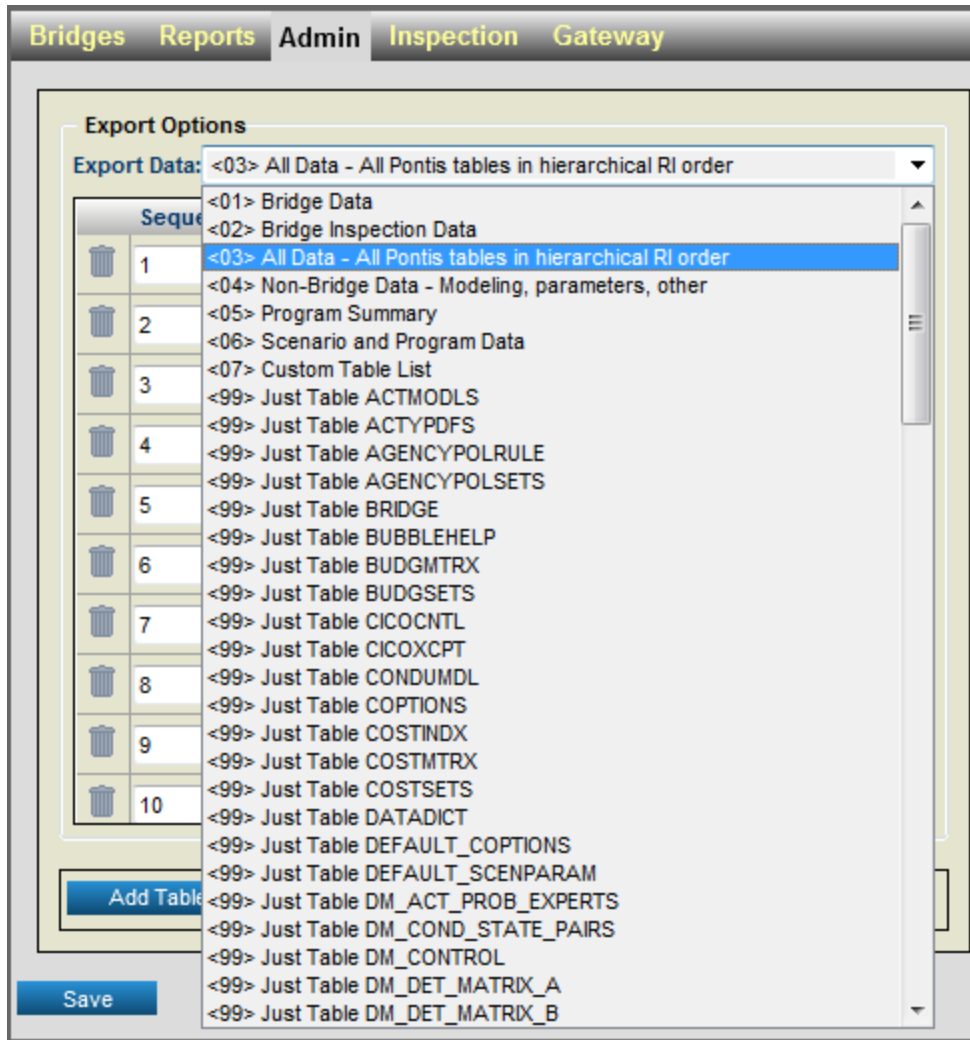


\* You need to be logged into BrM as an Admin or have administrative permissions to view the Admin tab.

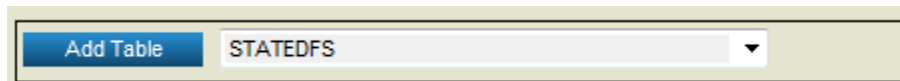
- 2) Once on the Admin page, select the Export Options task from the left side menu on the page.



- 3) In the Export Options page select “<03> All Data - All BrM tables in hierarchical order” from the “Export Data:” dropdown.



- 4) Select the STATEDFS table from the Add Table dropdown at the bottom of the screen and click the Add Table button. Repeat these steps for the ELEMDEFS and MRRACTDF tables. Then the Save button.



\* After you add the first table to the Export Options group you will notice the page becomes outlined in yellow. The yellow outline is a sign that a change has been made that has not been saved to the database yet.

- 5) After you have added the tables check the Export Options group and make sure the new tables are showing up in this group. They will be visible at the bottom of the list.

Export Options

Export Data: <03> All Data - All Pontis tables in hierarchical RI order

| Sequence | Table Name                | Include                             |
|----------|---------------------------|-------------------------------------|
| 119      | PON_APP_ROLES_PERMISSIONS | <input checked="" type="checkbox"/> |
| 120      | PON_APP_ROLES_TABS        | <input checked="" type="checkbox"/> |
| 121      | PON_APP_ROLES_TASKS       | <input checked="" type="checkbox"/> |
| 122      | PON_APP_USERS             | <input checked="" type="checkbox"/> |
| 123      | PON_LAYOUTS               | <input checked="" type="checkbox"/> |
| 124      | PON_ATTRIBUTE_DISPLAY     | <input checked="" type="checkbox"/> |
| 125      | PON_COMMON_LISTS          | <input checked="" type="checkbox"/> |
| 126      | STATEDFS                  | <input checked="" type="checkbox"/> |
| 127      | MRRACTDF                  | <input checked="" type="checkbox"/> |
| 128      | ELEMDEFS                  | <input checked="" type="checkbox"/> |

Add Table ELEMDEFS



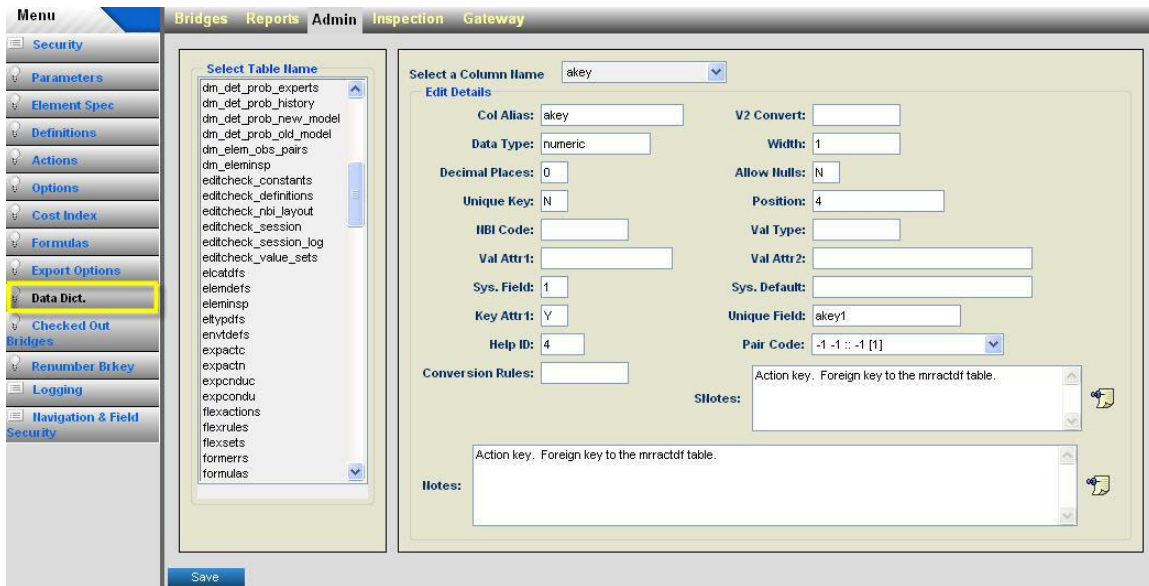
## 5.12 Modifying the Data Dictionary (Version 5.x)

This task is a new feature added to BrM 5.x. This screen enables you to modify the **DATADICT** table in the database.

**Caution:** The data dictionary data is used throughout the system, and should only be modified with extreme care. It is strongly advised that a backup of the database be performed prior to making any changes.

The *Select Table Name* group box on the left of this task screen provides the list of table names. When you select an item in the table name group box, the right side of the screen will display data pertaining to that table name. The *Select a Column Name* pick list on the top right of the screen is populated with the column names of the table name that you selected on the left.

The *Edit Details* group box displays the data from the record in the **DATADICT** database table that you can modify.



Data Dictionary Task Screen

### To Modify Data Dictionary Data:

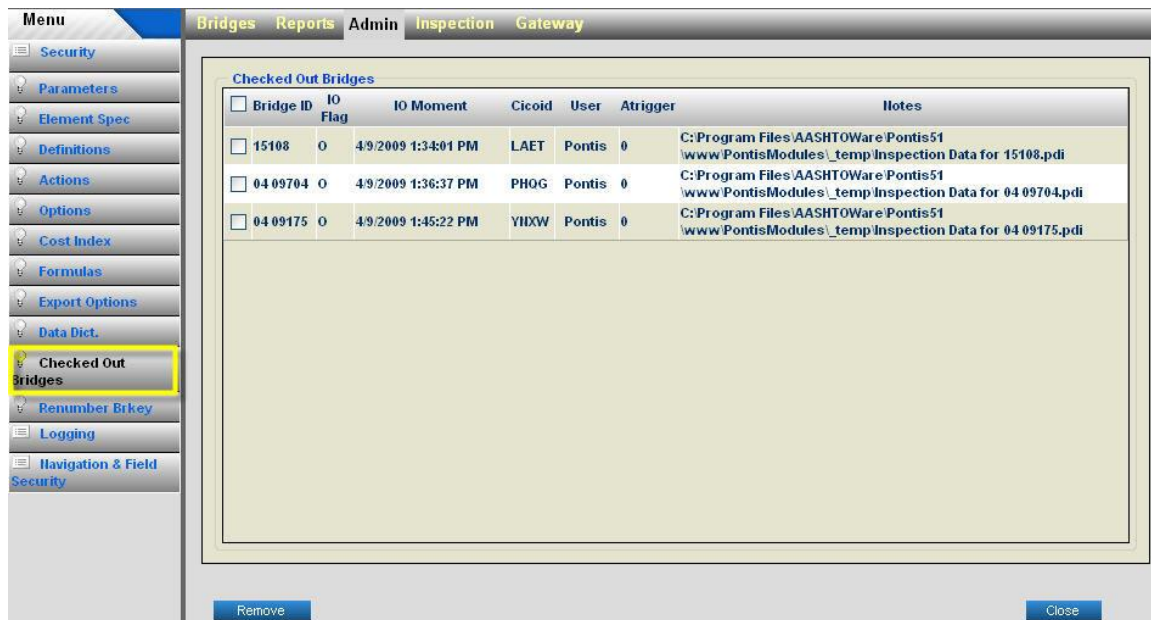
1. Select a table name from the left **Select Table Name** list box.
2. Select a column name from the **Select a Column Name** pick list located on the top-right of the screen.
3. Edit the data under *Edit Details* group box.

- Click the **Save** button to save your changes.

## 5.13 Removing Bridge Checked Out Status (Version 5.x)

This task is a new feature added to BrM 5.x. This screen enables you to clear the checked out status of the bridge and clean up **CICOCNTL** database table.

**Caution:** It is recommended that only the person who has appropriate privileges as well as the functional knowledge of how the **CICOCNTL** table is used should perform this operation. Inappropriate modifications made to the **CICOCNTL** table can have a system wide adverse effect, such as the data exchange operations under the **Gateway** module not functioning correctly, which could result in loss of data or unwanted modifications to your database.



Clear Checked Out Bridges Task Screen

*This section assumes you have checked out bridges under the Gateway tab.*

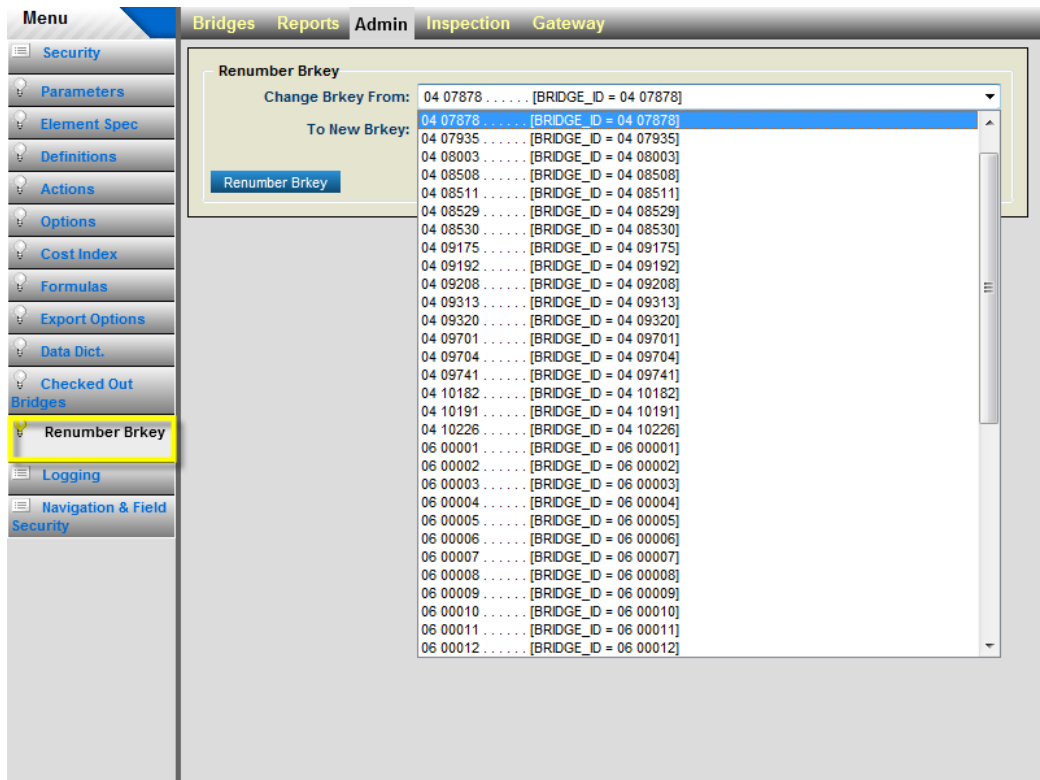
- Navigate to the **Admin\Checked Out Bridge** task screen.
- Check the check boxes for the rows you want to delete.
- Check the check box in the first column of the grid header to select all the rows.
- Click the **Remove** button to remove the selected rows.

- Click the **Close** button to return to the bridge list.

## 5.14 Renumbering the Bridge Brkey

This task is a new feature added to BrM 5.x. This screen enables you to renumber a bridge Brkey in the entire BrM 5.x database.

**Caution:** This operation should be performed with extreme care. This is a far reaching database operation since it could affect numerous tables in the database. You may have to perform additional steps if your database contains unregistered custom tables with a dependency on the Bridge Brkey. Please consult with your database administrator before performing this operation. This operation could result in unwanted modifications to your database and make your system unstable.



Renumber Bridge Brkey Task Screen

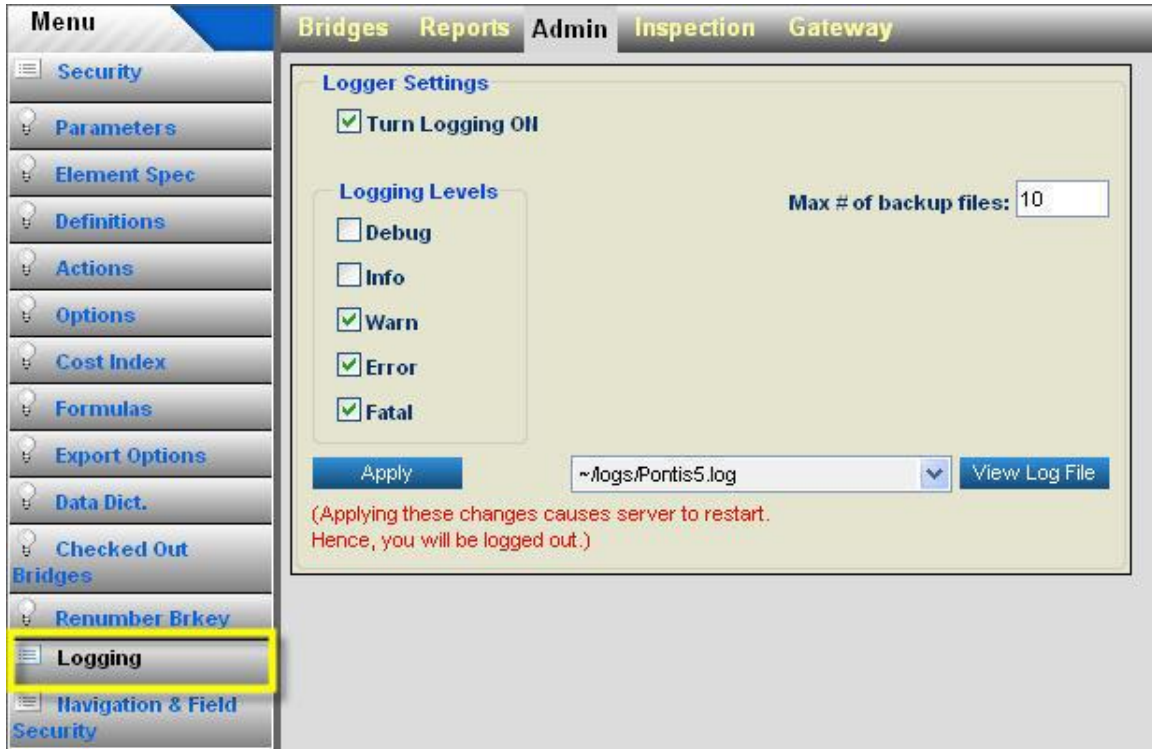
To renumber a Brkey:

- Navigate to the **Admin\Renumber Brkey** task screen.
- Select the Brkey you want to change from the **Change Brkey From** pick list
- Enter a new Brkey in the **To New Brkey** text box.

- Click the **Renumber Brkey** button to perform the operation.

## 5.15 Configuring the BrM Application Logger

This task is a new feature added to BrM 5.x. This screen enables you to adjust the BrM 5.x web application logger which logs the activity of the all the connected users. This interface follows the *Log4Net API*, a third party logging software. It also allows you to download and view the current log file.



Configure BrM 5.x Application Logger Settings

To modify the logger settings:

- Navigate to the **Admin\Logging** task screen.
- Check the **Turn Logging ON** check box to turn on or off the logging.
- Click the appropriate logging level check box under **Logging Levels** group box. The level of verbosity increases from *Fatal* to *Debug*. If you select the *Warn* level then BrM will also log all the messages up to that level. In other words, *Error* and *Fatal* messages will also be logged. However, *Debug* and *Information* message will not be logged. If you select the *Debug* level, then BrM will log the message from all the lower levels as well.
- Enter desired number to control the count of archived log files.
- Click **View Log File** button to download and view the current log file.

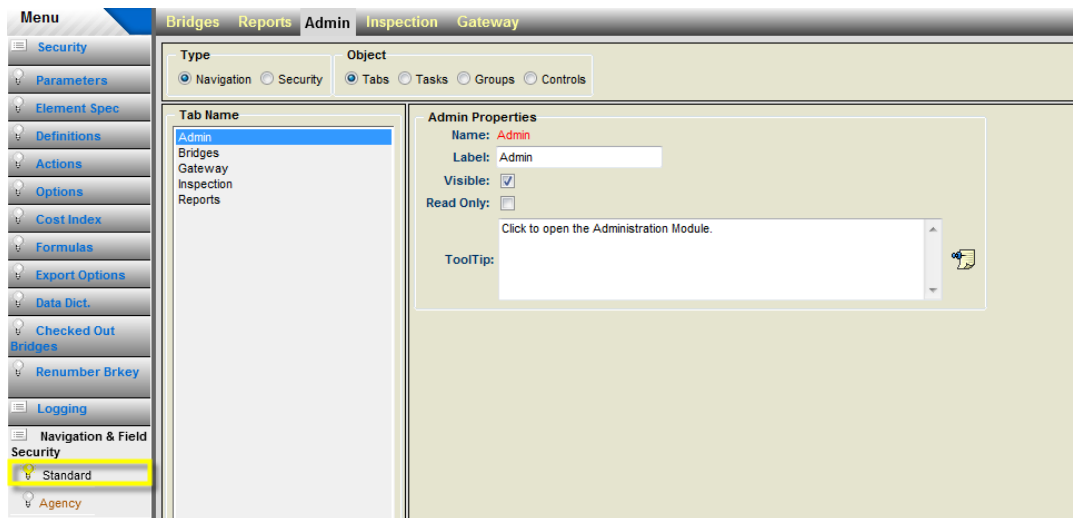
6. Click **Apply** to apply your changes.

## 5.16 Configuring Navigation & Field Level Security (Version 5.x)

This task is a new feature added to BrM 5.x. This task screen has two sub-tasks under it. This task enables you to apply navigational security, customize the inspection field, tab, task and group box labels, role-based field level security, create custom inspection task screens, and create non-inspection custom tasks.

The **Agency** sub-task screen can be used to customize the portion of the user interface that an agency has added to BrM 5.x. The **Standard** sub-task screen enables you to customize the standard items on the user interface that were shipped as a part of BrM 5.x.

The BrM 5.x site layout is made up of four hierarchical navigational objects Tabs, Tasks, Groups and Controls (fields). Each *Tab* can contain one or more tasks under it, each *Task* can contain Groups under it and each *Group* can contain controls (fields) under it.



Modifying Standard Tabs on the Navigational Screen

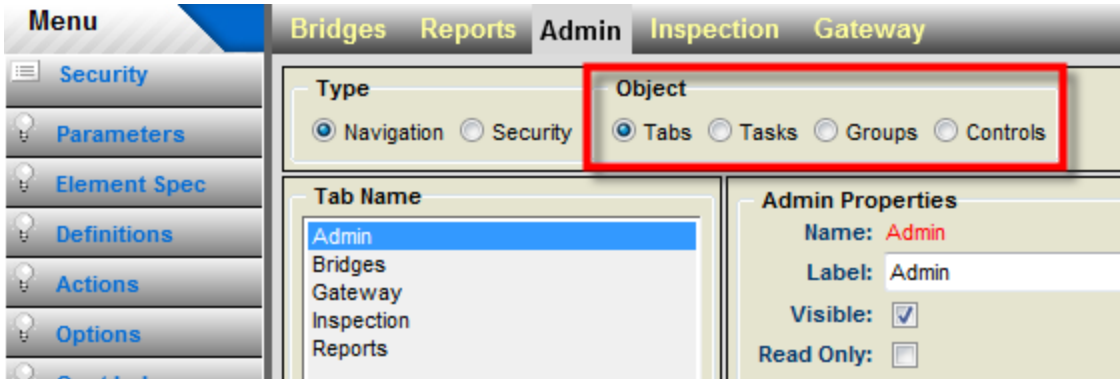
To modify Standard/Agency Navigational Object Properties:

1. Navigate to the **Admin\Navigation & Field Security\Standard** task screen.



Group Box to Select Navigation or Security Context

- Click the **Navigation** radio button in the **Type** Group Box.



Group Box to Select Object Type

- Select the appropriate navigational object from **Object** Group Box.
- Select the appropriate *Parent* item from the pick list under **Select** Group Box.



Control Object Parent Selection Group Box

- Select an object item from the selection list box on the left. This selection box will list the items pertaining to the parent object selected under Select **Group** Box.
- Edit the data in the Properties group box on the right.
- Click the **Save** button to save your changes.
- Click the **Admin\Navigation & Field Security\Agency** sub-task and follow steps 2 through 6 to modify Agency Navigational Object Properties.

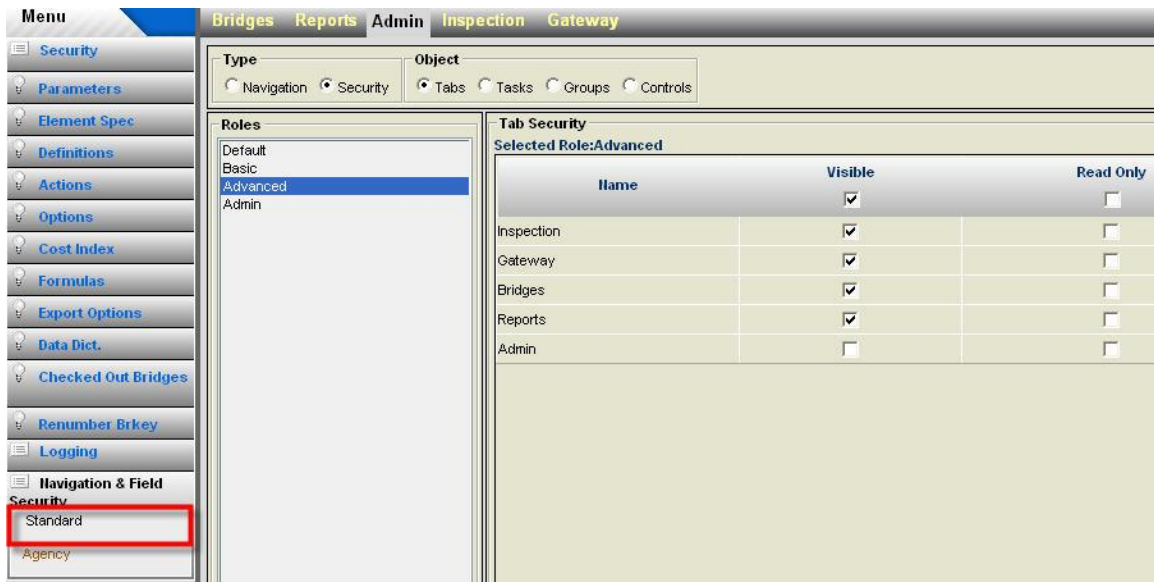
### To apply Standard/Agency Role-Based Security

- Navigate to the **Admin\Navigation & Field Security\Standard** task screen.



Security Context with Tab Object Selected

2. Select the appropriate Object type and select the parent object.
3. Select a role from the list box on the left of the screen.
4. The security Group Box on the right of the screen will show the object items of the parent object that you selected in step 2.
5. Check or Uncheck *Visible* and/or *Read Only* check boxes for all the objects for that role.
6. You can click different roles and check or uncheck the *Visible* and *Read Only* check boxes to configure the security for that role for each object.
7. Navigate to the **Admin\Navigation & Field Security\Agency** sub-task screen to apply the role-based security to agency items by following steps 2 through 6.



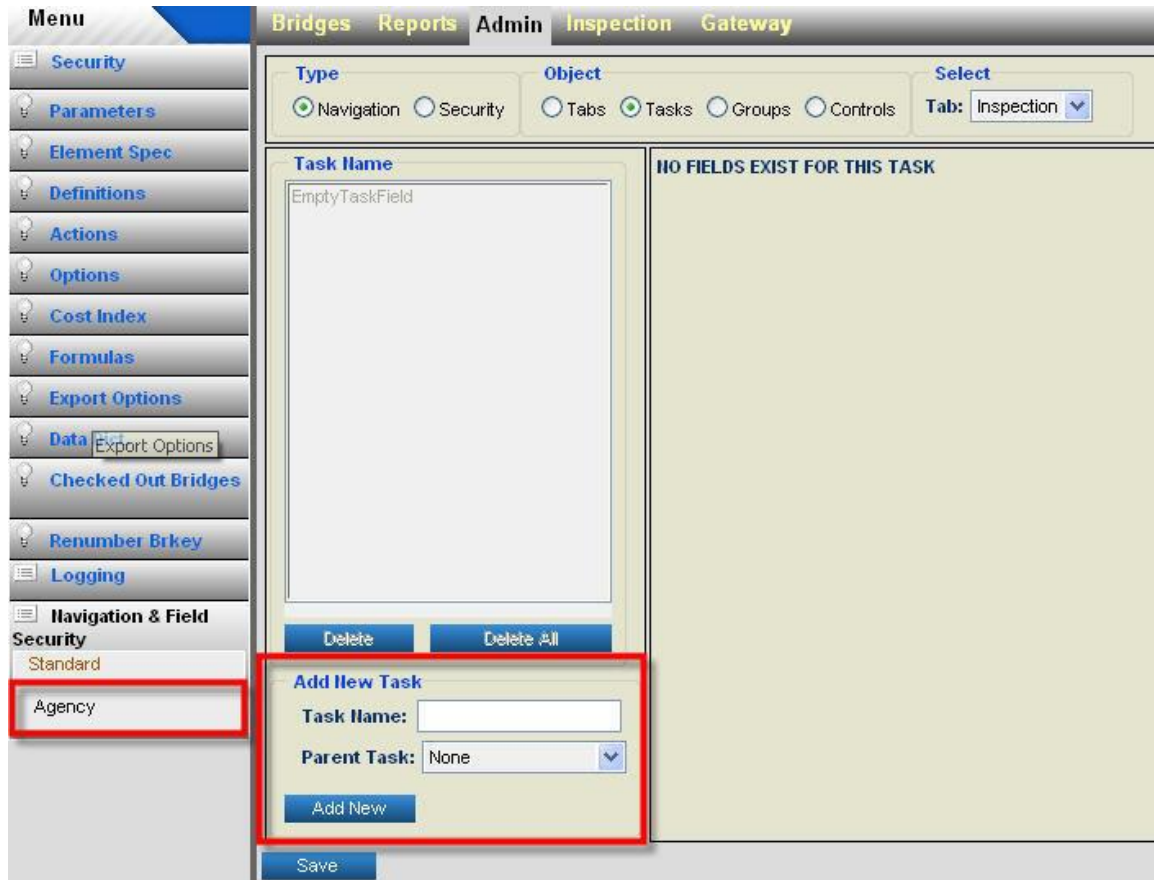
Apply Role Based Security to Standard Objects



### To Add New Navigational Objects

The following section describes how you can add a new task to BrM 5.x.

1. Navigate to the **Admin\Navigation & Field Security\Agency** task screen
2. Select the *Navigation* radio button under the **Type** group box.



Adding Custom Navigational Object – Task Screen

3. Select the type of object you want to add by clicking the corresponding radio button under **Object** group box.
4. From **Add New** group box, you should enter the name for your object and optionally select a parent for it from the Parent pick list.
5. Click the **Add New** button to create the new object. Next screen will display the object that you just added in the selection list on the left. The corresponding properties will be displayed under the group box on the right of the screen.
6. Edit the object properties under the group box on the right of the screen.

7. Click the **Save** button to save your changes to the database.
8. You can follow steps 1 through 7 to create any of the four objects. *Group* and *Control* objects may offer more properties to edit compared to the *Tab* and *Task* objects.

**Note:** Please refer to the BrM 5.x Technical Manual for in-depth discussions on how to apply navigational security and role-based security and for information on creating the basic agency task screens and complex agency task screens.

## 5.17 Configuring Utility

The Utility screen is used to configure the necessary components used in the utility rating scaling functions. There are two main sections to this screen. The top portion (Components) shows a parent-child relationship between components. The bottom portion of the screen displays the details for a component for further configuration.

The screenshot displays the 'Utility' configuration screen in the BrM Bridge Management software. The interface includes a menu on the left with options like Security, Parameters, Element Spec, Definitions, Options, Cost Index, Formulas, Export Options, Data Dict., Checked Out Bridges, Renumbr Brkey, Logging, Navigation & Field Security, and Sync Mapping. The main area is divided into two sections: 'Components' and 'Deck' configuration.

**Components Section:** A hierarchical tree structure showing the relationship between components. 'Total Utility' (Weight: 31) is the root, which branches into 'Condition' (Weight: 31), 'Risk' (Weight: 22), 'Mobility' (Weight: 22), and 'LifeCycle' (Weight: 25). 'Condition' further branches into 'Deck' (Weight: 1), 'Superstructure' (Weight: 1), 'Substructure' (Weight: 1), 'Culverts' (Weight: 1), 'Scour' (Weight: 22), and 'Element ratings' (Weight: 1). 'Risk' branches into 'Accident' (Weight: 15) and 'Percent of truck detoured' (Weight: 1). 'Mobility' branches into 'Percent of truck detoured' (Weight: 1).

**Deck Configuration Section:** This section allows for detailed configuration of the 'Deck' component. It includes fields for 'Name: Deck' and 'Weight: 1'. Below these are dropdown menus for 'Type: Field', 'Table: inspevnt', and 'Column: dkrating'. The 'Scaling' section features a 'Formula: Use scaling graph' dropdown and a graph showing 'Scaled Utility Value' on the y-axis (0 to 100) and 'Criterion Rating' on the x-axis (0 to 9). A table to the right of the graph lists 'Original' and 'Scaled' values for each criterion rating, with a 'Delete' button for each row.

| Original | Scaled | Action |
|----------|--------|--------|
| 0        | 0      | Delete |
| 1        | 2      | Delete |
| 2        | 5      | Delete |
| 3        | 19     | Delete |
| 4        | 42     | Delete |
| 5        | 64     | Delete |
| 6        | 81     | Delete |
| 7        | 91     | Delete |
| 8        | 98     | Delete |
| 9        | 100    | Delete |

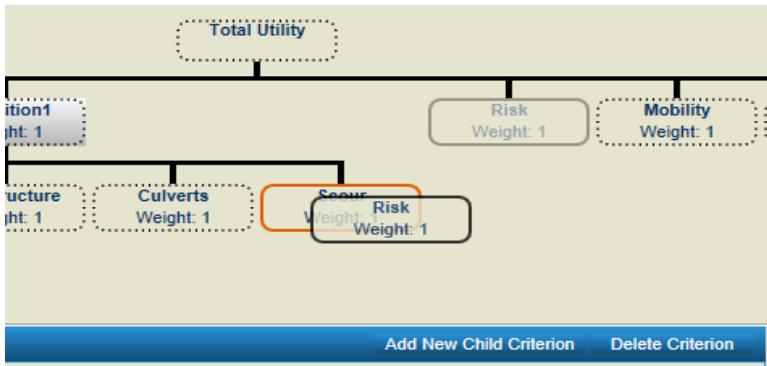
At the bottom of the configuration section, there are fields for 'Criterion Rating Range' with 'Min: 0' and 'Max: 9', and buttons for 'New Point' and 'Calc Criterion Range'. A 'Save' button is located at the bottom left of the screen.

**To Add New Component:**

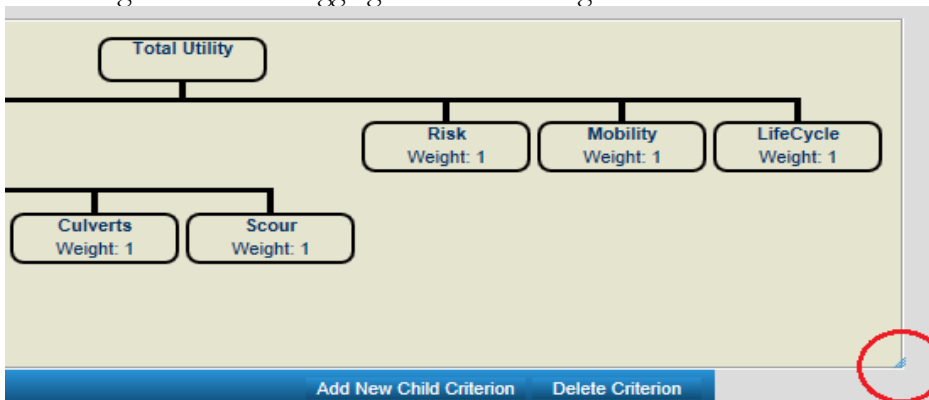
1. Select the component for which the child component will be added. The “Total Utility” component will always be present. Therefore, the first child component must be added to the “Total Utility” Component.
2. Select the **Add New Child Criterion** button. The page will become dirty with a yellow border and a blank details section will be displayed in the bottom section of the page.
3. At the very least, enter a unique name for the component.
4. Click the **Save** button to save all changes to the new component.

**To change Parent/Child Relationship of Components:**

1. The components can be moved by clicking and dragging a component to a new location. To do so select a component and drag it over top of the new parent component. In the example, below, by dragging and dropping the “Risk” component on top of “Scour”, Risk will become a child component of “Scour”.



2. The Components section can be resized by clicking and dragging the drag handle in the bottom right corner or dragging the bottom or right side border.

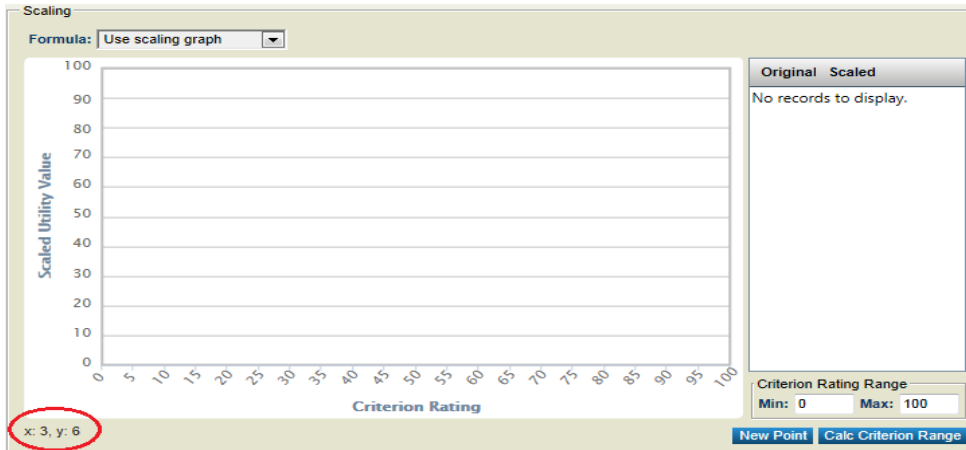


- Click the **Save** button to save all changes.

**To Configure a Component:**

- Single click a component to view the details of that component in the bottom details section of the screen. The details can be configured in this section.
- Enter/Change Name. This is a required field and must be unique among all other components.
- The Type dropdown determines how the value to be scaled is retrieved from the database. If “Field” is selected, choose a Table-Column from the Table dropdown. If “Assessment”, the Final Value field found on the Inspection>Assessment page will be used. If “Element”, the value retrieved from calculating the health index for that particular element will be used.
- Next, specify the scaling which can be performed by either using the scaling graph or a predefined scaling formula.

When using the scaling graph, the current coordinates of the mouse pointer over the graph will be displayed in the bottom left just below the graph.

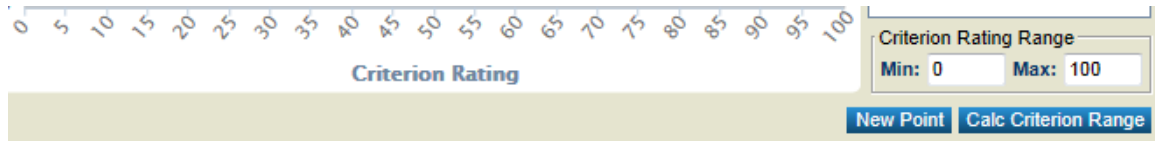


Click on a point on the graph to add a point and an associated row to the grid will also be added with the proper coordinates.

Click the **New Point** button located at the bottom right below the graph to add a blank row to the bottom of the grid to enter the desired coordinates manually.

- To delete a point, either click the point on the graph, or click “Delete” in a particular row in the grid
- To edit a point, use the grid to change the values.
- The “Criterion Rating Range” is used to set the range of the bottom portion of the graph. This can be changed by typing in the desired values for the min/max. If “Field” type is

selected, the **Calc Criterion Range** button will be available. Click this button to find the min/max of the specified Table-Column and change the range to match those values.



8. To use a custom formula instead of the graph, choose the desired formula from the “Formula” dropdown. A read only version of the selected formula will be displayed next to the dropdown.

Custom formulas can be created using the Admin > Formulas > Advanced Formulas page. When using a formula, the value to be scaled will replace all variables specified in the formula.

9. Click the **Save** button to save all changes.

## 5.18 Configuration Reports

Eight reports are available in version 4.5 and ten reports are available with version 5.x to display configuration-oriented information. These reports can be viewed and printed using the procedures in Section 2.4. A brief overview of each report is provided below. See Appendix D for more detailed report documentation.

### Version 4.5 and 5.x

**config001\_elem\_states\_actions** shows the specifications for a selected set of elements. Options are provided for printing this report for all elements or for selected element numbers, types, or categories. For each element, all of the information on the **Element Specifications** card is shown, including all of the possible condition states (and the associated condition state language), and the actions for each condition state.

**config002\_config\_options\_list** is an alphabetical listing of all of the configurable options, from the **Options** card. Default values, current values and descriptions are shown for each option.

**config003\_parameter\_report** is a list of all of the parameters that can be modified on the **Parameters** card in order to customize picklists. It is organized by table and field name.

**config004\_data\_dictionary** is a data dictionary for the BrM database, providing information for each column including names, widths, types and descriptions. It can be printed for all tables, or a selected set of tables.

**config005\_ini\_file\_report** allows you to view the contents of the BrM INI file, as well as other INI files that are examined by the BrM software.

**config006\_user\_list** displays information about each user on the **User Administration** card.

**config007\_misc\_sys\_param** includes information from the **Definitions** and **Actions** cards – lists of environments, element materials, element categories, and action types

**config008\_flex\_actions** displays information on flexible actions defined on the Actions card. It shows each flexible action that has been created, along with the associated impacts and included element actions.

### Version 5.x only

**config009\_ui\_navigation** displays information about navigational security defined on the Navigation and Field Security task screen. It shows tab, task, group and controls properties for selected tab. Object properties also display navigational security settings.

**config010\_app\_security** displays information about BrM 5.x role-based security defined on the Navigation & Field Security task.. It shows visible and read only settings for all the tabs, tasks, groups and controls for selected role. You can generate this report to audit BrM 5.x application wide security for each role.

## 5.19 Manage Layouts

Users can create and modify layouts via the Bridges > Manage Layouts > Edit Layout screen. Layouts contain fields for populating grids with data.

To select the desired layout:

1. Context lists each context in the system. Context identifies the area of focus in which the layout is used. Context limits the tables available and usable for layouts and fields. A context must be selected first.
2. Layout lists each layout within the chose context. Select a layout or click the New button to create a new layout.
3. Description Displays the editble description for the layout.

4. Shared Checkbox shares the selected layout with all system users.

To Modify the layout:

| Table Name | Field Name | Header Text         | Use Parameters                      |  |  |
|------------|------------|---------------------|-------------------------------------|--|--|
| bridge     | bridge_id  | Bridge ID           | <input type="checkbox"/>            |  |  |
| bridge     | district   | District            | <input checked="" type="checkbox"/> |  |  |
| bridge     | county     | County              | <input checked="" type="checkbox"/> |  |  |
| bridge     | facility   | Facility Carried    | <input type="checkbox"/>            |  |  |
| bridge     | featint    | Feature Intersected | <input type="checkbox"/>            |  |  |
| bridge     | owner      | Own                 | <input checked="" type="checkbox"/> |  |  |
| bridge     | custodian  | Maint               | <input checked="" type="checkbox"/> |  |  |
| bridge     | yearbuilt  | Built               | <input type="checkbox"/>            |  |  |
| bridge     | altirmeth  | altirmeth           | <input type="checkbox"/>            |  |  |
| bridge     | altorload  | altorload           | <input type="checkbox"/>            |  |  |

1. In the table list box, select the table from which to choose fields. Only tables within the selected context are available.
2. In the fields list box, select to add one or more fields to the selected table.
3. Click the add button below the list boxes to add the selected field(s) to the layout grid. This will be disabled if no field(s) are selected.

The layout grid contains the following columns:

- **Table Name** is a read-only column.
  - **Field Name** is a read-only column.
  - **Header Text** defaults to Field Name column content, but can be updated by editing the row (see Edit below). This value appears in grid headers where the layout is used to display data.
  - **Use Parameters** displays a more user-friendly value than the typical database value when selected.
  - **Pencil** button places the record into “edit mode”, in which users can modify enabled columns.
  - **Check mark** button appears when a user edits a row and finalizes the edit. This button does not save the changes to the database.
  - **X** button appears when a user edits a row and undoes changes.
4. Use the buttons to the right of the grid reorder the grid records. Each button performs the following:
- **Top** button places the selected record at the top of the layout order.
  - **Up** button moves the selected record up one in the order.
  - **Down** button moves the selected record down one in the order.
  - **Bottom** button places the selected record at the bottom of the layout order

**Committing changes to layouts:**



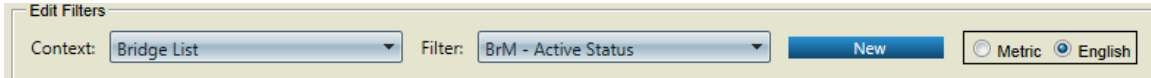
1. Click the save button to save changes to the database.
2. Click the Save As button to save the layout as a new layout in the database. Type an appropriate name into the input box.
3. Click the reset button to reset the selected layout to its previous state or reset a new layout.
4. Click the delete button to remove the selected layout from the database.

## 5.20 Manage Filters

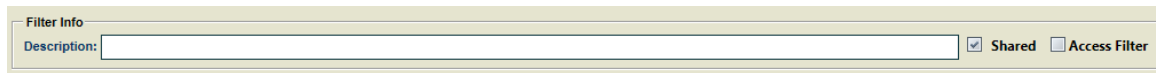
The Edit Filters screen is used for creating and modifying Filters. Filters restrict the data records that will be returned when populating grids with data.



To select the desired Filter:

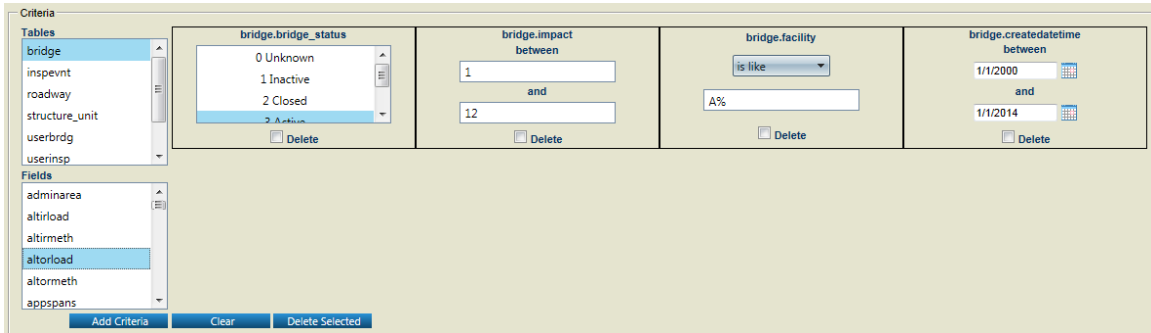


1. Context lists each context in the system. Context identifies the area of focus in which the filter is used. Context limits which tables are available to be used in filters and which fields from those tables are selectable. A context must be selected first.
2. Filter lists each filter within the chosen context. Filters beginning with 'BrM - ' Select a filter or click the New button to create a new Filter.
3. Select Metric/English from the radio button which will determine what units of measure will be used on this screen when setting up a filter.
4. Description Displays the editable description for the Filter.



5. Shared Checkbox shares the selected filter with all system users.

Defining filter criteria:



1. In the table list box, select the table from which to choose fields. Only tables within the selected context are available.
2. In the fields list box, select to add one or more fields to the selected table. This will be limited to fields in the chosen table. If this control is disabled, then select a table in the table list box.
3. Click the Add Criteria button below the list boxes to add the selected fields to the criteria control group to the right. The type of criteria added will be dependent on the data type of the field chosen

Multi-Select list criteria – List of all possible values for the field. You can select one or more values that you wish to return data.

Numeric Criteria – Contains 2 text boxes to select a range of numbers. The records returned will be only those falling between (and including) the two numbers listed. Leaving the top number blank will create a criteria of less than or equal to the bottom number. Leaving the bottom number blank will create a greater than or equal to result.

Text Criteria – Fields that allow any text to be entered. First select either “equals” or “is like” from the comparison drop down then type text in the box that you wish to check for. For ‘is like ‘ the wild car characters:

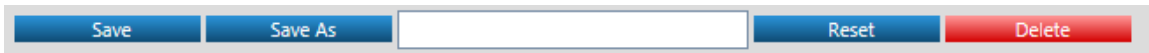
% - a substitute for zero or more characters

\_ - a substitute for a single character

Data Criteria – Contains two date selector to select a range of dates. The records returned will be only those falling between ( and including) the two dates listed. Leaving the top date blank will create a criteria of less than or equal to the bottom date. Leaving the bottom date blank will create a great than or equal to result.

4. Click the Clear button to remove all criteria from the filter
5. Click the delete selected button to remove any criteria that has its delete check box selected from the filter.

**Committing changes to Filters:**



1. Click the save button to save changes to the database.
2. Click the Save As button to save the filter as a new filter in the database. Type an appropriate name into the input box.
3. Click the reset button to reset the selected filter to its previous state or reset a new filter.
4. Click the delete button to remove the selected filter from the database.

## Navigation and Field Level Security

*We'd like to know how BrM can be customized for our particular needs. Can we add our own inspection screens? Can we add our own non-inspection screens? Can we configure the inspection module so that users can only perform the operations they are authorized to perform?*

Pontis release 5.x enables agencies to create new custom screens and integrate them with the standard BrM screens. Agencies can add their own inspection screens by simply using the BrM 5.x user interface. The BrM 5.x system also allows you to add new agency tabs to host non-inspection task screens, configure role based security for standard and agency task screens, configure navigational security for standard and agency task screens, and to customize standard BrM 5.x inspection screens.

Before you perform the operations described in this chapter, you should coordinate with your database administrator to find out how you can prepare the database before you add new screens to the BrM 5.x system. You should also coordinate with your system administrator to plan the security implementation for the BrM system. It is important to back up your production database before you carry out the operations described herein.

After carefully planning your customization and security implementation, you should implement it on the standalone BrM 5.x system before applying your changes to the production server.

The *BrM Technical Manual* provides detailed information on how to create basic and complex agency task screens. This chapter provides an overview of the operations that can be performed using **Navigation and Field Security** pages that are accessible under the BrM 5.x **Admin** Tab.

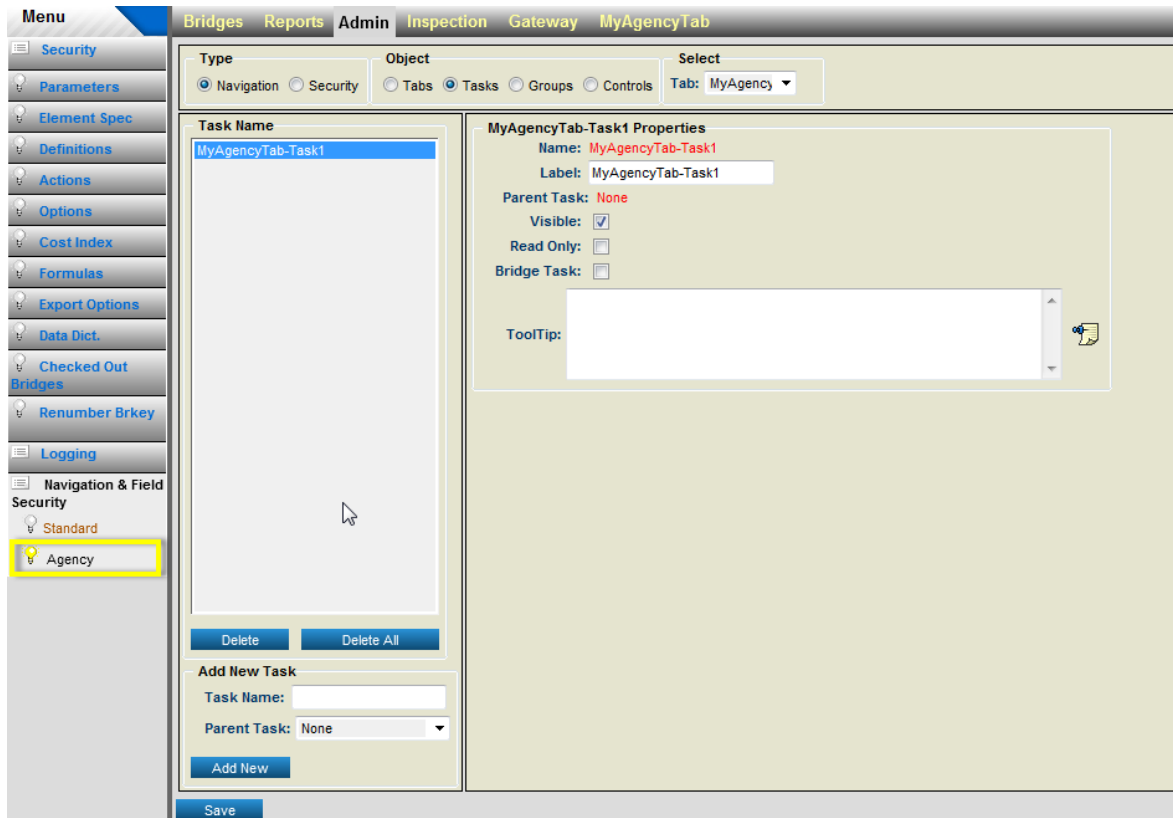
### 6.1 Customizing Standard Inspection Screens

The standard inspection task screens in BrM 5.x can be customized through the *Navigation & Field Security* task under the **Admin** tab. These operations require administrative privileges since the

## NAVIGATION AND FIELD LEVEL SECURITY

changes have system-wide impact. BrM 5.x allows the following customizations on standard screens:

- Modify the captions of the *Tab*, *Task*, *Group* and *Control* items
- Modify the *Tab* and *Task* tooltips.
- Make the *Tab*, *Task*, *Group* and *Controls* visible or invisible.
- Make the *Tab*, *Task*, *Groups* and *Controls* editable or read only.



### Modifying Standard Tabs on Navigational Screen

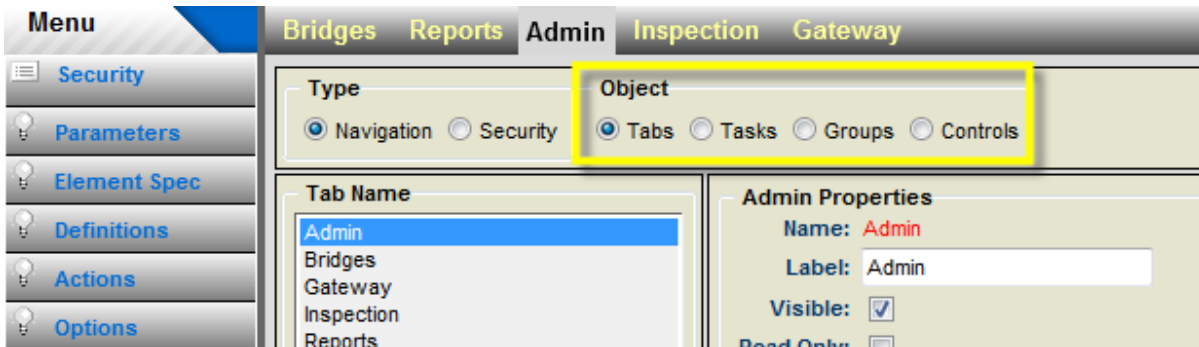
To modify Standard Tab properties:

1. Navigate to **Admin\Navigation & Field Security\Standard** task screen.
2. Select the **Navigation** radio button in the **Type** group box.



Group Box to Select Navigation Context

3. Select the **Navigation** radio button from **Type** group box.



Group Box to Select Object Type

4. Select the *Tab* from the **Tab Name** list box on the left of the screen.
5. Modify the **Label** text box to update the *Tab* caption.
6. Check or uncheck the **Visible** check box to make the selected *Tab* Visible or Invisible respectively.
7. Check or uncheck the **Read Only** check box to make the selected *Tab* editable or read only.

**Important Note:**

When a Tab is marked read only, all the tasks under it will be automatically marked read only. When the Task is read only, all the Groups under that task will automatically become read only. Similarly, if the Group is read only then all the controls under that group will automatically become read only. Hence, if you make a Tab read only then it will have a hierarchical effect on the entire module.

8. Modify the **ToolTip** text box to update the tab tooltips.
9. Click the **Save** button to update your changes in to the database.

**To modify Standard Task properties:**

1. Navigate to **Admin\Navigation & Field Security\Standard** task screen.

2. Select the **Navigation** radio button in the **Type** group box.
3. Select the **Tasks** radio button from **Object** group box.
4. The **Select** group box will display the available tabs in the drop down list. You can pick the desired tab under **Select** group box to retrieve the corresponding *Tasks*.
5. Select the *Task* from the list box on the left of the screen.
6. Modify the **Label** text box to update the *Task* caption.
7. Check or uncheck the **Visible** check box to make the selected *Task* Visible or Invisible respectively.
8. Check or uncheck the **Read Only** check box to make the selected *Task* editable or read only.

**Important Note:** When the Task is made read only, all the Groups under that task will be automatically made read only. When the Group is read only, all the controls under that group will be automatically made read only. Hence, if you make a Task read only then it will have hierarchical effect and will make the entire task screen read only. Read only tasks may still allow you to browse the data but you will not be able to edit the data or perform any operations.

9. Modify the **ToolTip** text box to update the *Task* tooltip.
10. Click the **Save** to update your changes in to the database.

**To modify Standard Group properties:**

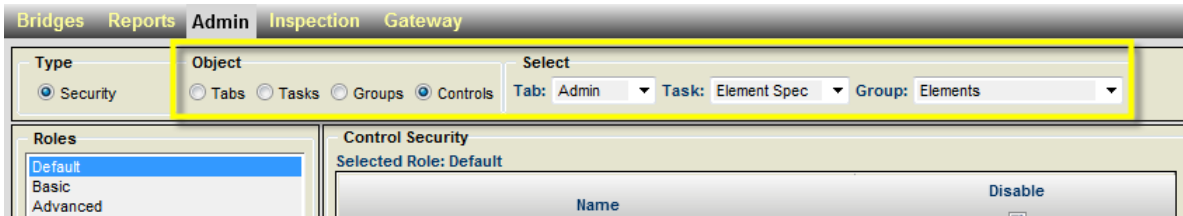
1. Navigate to the **Admin\Navigation & Field Security\Standard** task screen.
2. Select the **Navigation** radio button in the **Type** group box.
3. Select the **Groups** radio button from **Object** group box.
4. The **Select** group box will display the available Tabs and Tasks drop down list. You can pick the desired tab and then desired task under **Select** group box to retrieve the corresponding *Groups*.
5. Select the *Group* from the **Group Name** list box on the left of the screen.
6. Modify the **Label** text box to update the *Group* caption.
7. Check or uncheck the **Visible** check box to make the selected *Group* Visible or Invisible respectively.
8. Check or uncheck the **Read Only** check box to make the selected *Group* editable or read only.

**Important Note:** When the Group is marked read only, all the controls under that group will be automatically marked read only. The Standard BrM 5.x inspection screens also have several complex controls that represent data from the multiple rows in the database. These complex controls also have their own groups. The complex control will be read only when the group representing such composite control is marked read only.

9. Click the **Save** to update your changes in to the database.

**To modify Standard Inspection Control properties:**

1. Navigate to the **Admin\Navigation & Field Security\Standard** task screen.
2. Select the **Navigation** radio button in the **Type** group box.
3. Select the *Controls* radio button from the **Object** group box.



**Control Parent Selection Group Box**

4. The **Select** group box will display the available *Tab*, *Task* and *Group* drop down list. You can pick the desired tab and task and then desired group under the **Select** group box to retrieve the associated *Controls*.
5. Select the *Control* from the **Control Name** list box on the left of the screen.
6. Modify the **Label** text box to update the *Control* caption.
7. Check or uncheck the **Visible** check box to make the selected *Control* Visible or Invisible respectively.
8. Check or uncheck the **Read Only** check box to make the selected *Control* editable or read only.
9. Click the **Save** to update your changes in to the database.

**Important Note:** The Tooltips on the standard inspection controls are generated automatically by the BrM 5.x system. The tooltip on the inspection task screen controls represent the field descriptions from **DATADICT** table. Hence, these tooltips are not editable by the user.

## 6.2 Creating Agency Inspection Screens

BrM 5.x enables users to create custom data entry *Task* screens. Agencies can also develop complex controls that manipulate multiple rows of data from the database. Developing the agency inspection screens may require you to perform certain database operations as a prerequisite.

**Important Note:** Please refer to *BrM 5.x Technical Manual* for in-depth discussion on how to create basic as well as complex agency task screens that represent inspection or non inspection data.

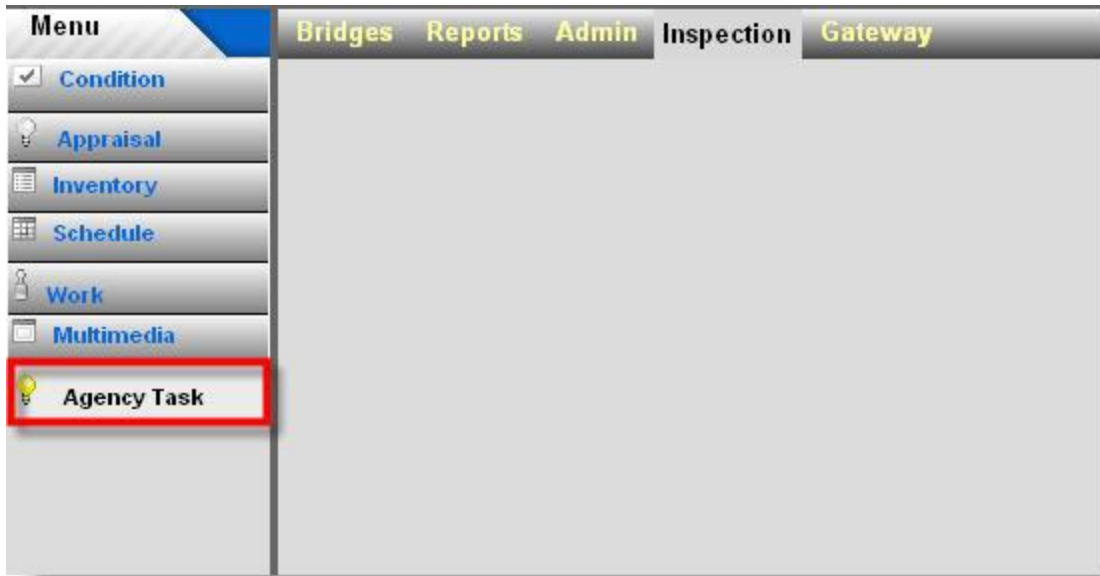
This section covers the following basic steps involved in creating agency inspection screens:

- Create a new agency task under the **Inspection** tab.
- Create a new group under the agency inspection task screen.
- Add controls to the agency groups.

### To create a new agency task under Standard Inspection Tab:

The BrM 5.x system offers two ways to represent the agency inspections task screens as shown in the following screen captures:



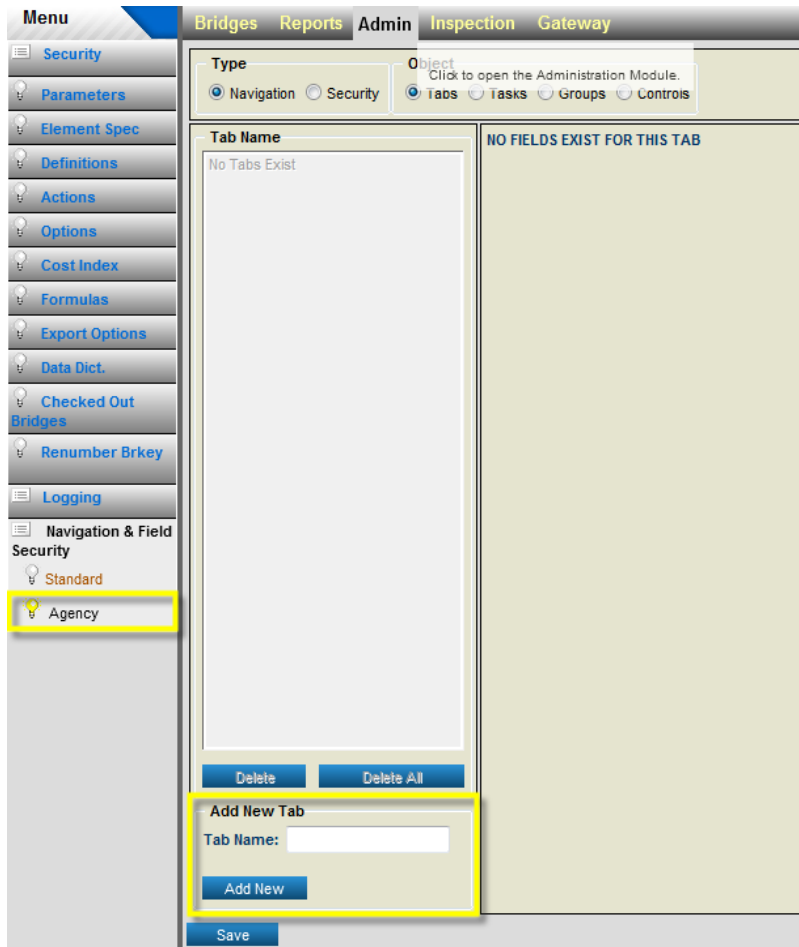


Agency Inspection Task Screen As a Root Task



Agency Inspection Sub-Task Screen - As a Sibling of the Inventory Task

- A. To add an Agency inspection task as a **Root** inspection task:
  1. Navigate to the **Admin\Navigation & Field Security\Agency** task screen.
  2. Select the **Navigation** radio button in the **Type** group box.
  3. Select the **Tasks** radio button from **Object** group box.
  4. Select *Inspection* on the **Tab** dropdown list under **Select** group box.
  5. Select *None* on the **Parent Task** dropdown list under **Add New Task** group box.
  6. Enter a name for your task in the **Task Name** text box.
  7. Click the **Add New** button.

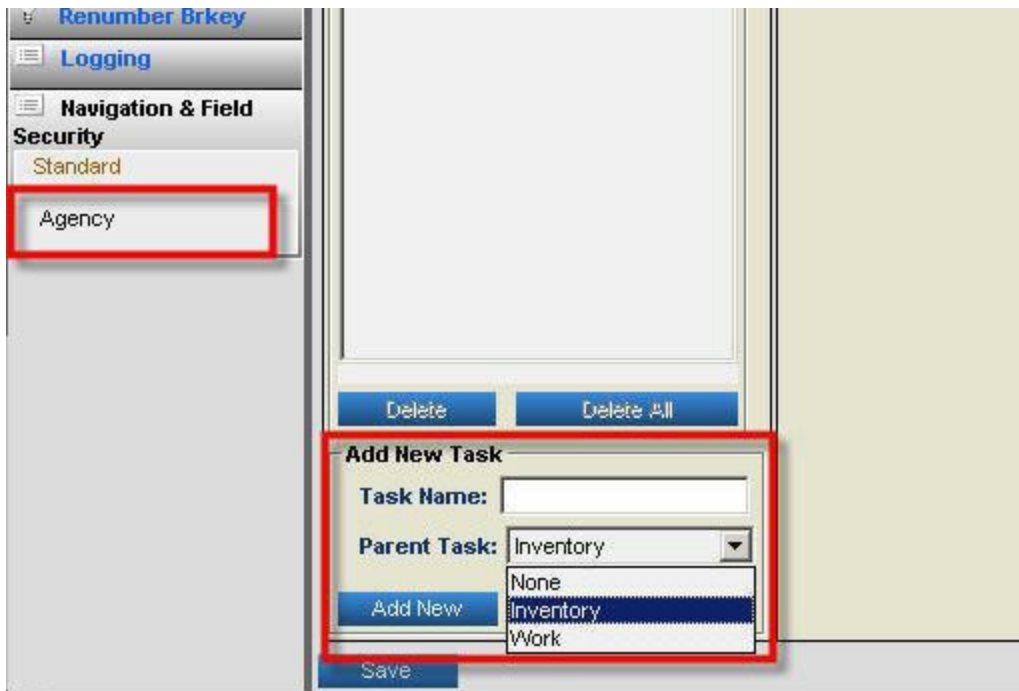


Add New Task - Group Box

8. Click the **Save** button to store the new task into the database.

B. To add an Agency inspection task as a **Sibling** of the existing standard inspection sub- tasks:

1. Navigate to the **Admin\Navigation & Field Security\Agency** task screen.
2. Select the **Navigation** radio button in the **Type** group box.
3. Select the *Tasks* radio button from the **Object** group box.
4. Select *Inspection* from the *Tab* dropdown list under the **Select** group box
5. Select *Inventory or Work* from the *Parent Task* dropdown list under the **Add New Task** group box.
6. Enter a name for your task in the **Task Name** text box.
7. Click the **Add New** button.



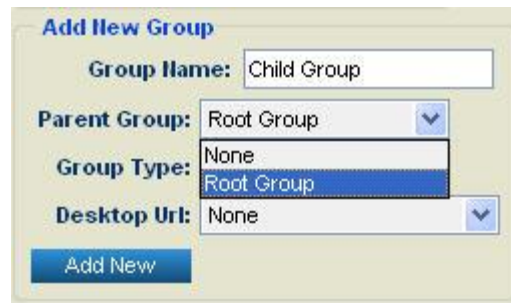
Selecting Parent Task for New Agency Task

8. Click the **Save** button to store the new task in the database.

To create a new group on the agency task screen:

1. Navigate to the **Admin\Navigation & Field Security\Agency** task screen.

2. Select the **Navigation** radio button in the **Type** group box.
3. Select the **Groups** radio button from the **Object** group box.
4. Select the agency task to which you want to add your group from the *Task* dropdown list under the **Select** group box.
5. Set the Parent Group to be **None** on the *Parent Group* dropdown list (under the *Add New Group* box) if you want your group to be the root group. If you already have groups added then you could select any of them to be the parent of your new group. If you select the parent for your new group then the new group would be displayed **within** the parent group box on your new agency task screen.



Selecting Parent Group for the New Group

6. Enter the name for your new group in the *Add New Group* box.
7. Select an appropriate *Group Type* for your group. BrM 5.x will automatically organize the task screen content based three group types as follows:
  - a. **Inspection Header Group:** Select this group type if you have controls that you would like to be on top of the task screen. The following image illustrates the inspection header on the standard *Appraisal* task screen:

NAVIGATION AND FIELD LEVEL SECURITY

The screenshot displays the 'Inspection' task screen for a bridge appraisal. The interface is organized as follows:

- Menu:** Appraisal, Inventory, Schedule, Work, Multimedia, Assessments.
- Header:** Bridges, Reports, Admin, Inspection, Gateway. Sub-headers: Condition, Bridge 04 07603, Facility Carried (007): 7TH STREET, Inspection: 2005-12-15 (UVLI)\*, Type: Regular NBI, Metric, English.
- Structural Appraisal:**
  - Open/Posted/Closed (041): A Open, no restriction
  - Approach Alignment (072): 8 Equal Desirable Crit
  - Bridge Railings (036A): 1 Meets Standards
  - Transitions (036B): 1 Meets Standards
  - Approach Guardrail (036C): 1 Meets Standards
  - Approach Guardrail Ends (036D): 1 Meets Standards
  - Pier Protection (111): Not Applicable (P)
  - Scour Critical (113): 8 Stable Above Footing
  - Fracture Critical Details: No FC Details
- Calculated Appraisal Ratings:**
  - Structural Evaluation (067): 7 Above Min Criteria
  - Deck Geometry (068): N Not applicable (NBI)
  - Underclearances (069): N Not applicable (NBI)
  - SD/FO Status: Not Deficient
  - Sufficiency Rating (SRB): 72.5
  - Sufficiency Rating Calculate Status: SAVED / 1
  - Health Index: 99.75%
- Clearances:**
  - Minimum Vertical Clearances:**
    - Over Structure (053): 99.990
    - Under (Reference) (054A): N Feature not hwy or RR
    - Under Clearance (054B): 0.000
  - Minimum Lateral Clearances:**
    - Reference Feature (055A): N Feature not hwy or RR
    - Right Side (055B): 0.000 ft
    - Left Side (056): 0.000 ft
  - Navigation Data:**
    - Navigation Control Exists (038): Permit Not Required
    - Navigation Vertical Clearances (039): 0.000 ft
    - Navigation Horizontal Clearances (040): 0.000 ft
    - Minimum Vertical Lift Clearances (116): -3.281 ft
- NBI Load Ratings:**
  - Load Rating Review Recommended:
  - Rating Date: 6/1/2002
  - Initials: pec
  - Design Load (031): 5 MS 18 (HS 20)
  - Posting (070): 5 AU/Above Legal Loads
  - Operating Type (063): 1 LF Load Factor
  - Operating Rating (064): 126.5 ton
  - Inventory type (065): 1 LF Load Factor
  - Inventory Rating (066): 75.6 ton
  - Alternate Operating Rating Type: \_ (FIX PARAM VALUES)
  - Alternate Operating Rating: ton
  - Alternate Inventory Rating Type: \_ (FIX PARAM VALUES)
  - Alternate Inventory Rating: ton
- Posting Loads:**
  - Inventory:**
    - Type 1: 55.0 ton
    - Type 2: 94.0 ton
    - Type 3: 92.0 ton
  - Operating:**
    - Type 1: 92.0 ton
    - Type 2: 155.0 ton
    - Type 3: 152.0 ton
- Status Bar:** Status: New, Review Needed, Approved By: TJP-PP, Save, Save & Close, Cancel, Delete Inspection.

- b. **Content Group:** Select this group type if you want to add controls to the center of the task screen. In other words, below the inspection header and above the inspection footer (see below). The following image illustrates the inspection content groups on the standard *Appraisal* task screen.

## NAVIGATION AND FIELD LEVEL SECURITY

The screenshot shows the 'Inspection Gateway' interface. The 'Inspection Footer Group' is highlighted in yellow and contains the following elements:

- Status: **New**
- Review Needed
- Approved By: **TJP-PP**
- Buttons: **Save**, **Save & Close**, **Cancel**, **Delete Inspection**

- c. **Inspection Footer Group:** Select this group type if you have controls that you would like to be on the bottom of the task screen. The following image illustrates the inspection footer group on the standard *Appraisal* task screen.

The screenshot shows the 'Inspection Gateway' interface. The 'Eng Metric Selection Group' is highlighted in yellow and contains the following elements:

- Metric
- English

- d. **Eng Metric Selection Group:** Select this group if you would like to place a English-Metric unit selection radio button control on your screen.



### English Metric Unit Selection Control Group

1. Select **None** in the *DeskTop Url* dropdown list under the *Add New Group* box. Please refer to **BrM 5.x Technical Manual** for in-depth discussion on when to select the option other than **None**.
2. Click the **Add New** button.
3. Click the **Save** button to update the database.
4. Select your newly created group from the list box in the **Group Name** group box on the left of the screen.
5. On the right side of the screen you will see the **Group Properties** box for your selected group on the left. You can modify your group properties and click the **Save** button to store the changes to the database.

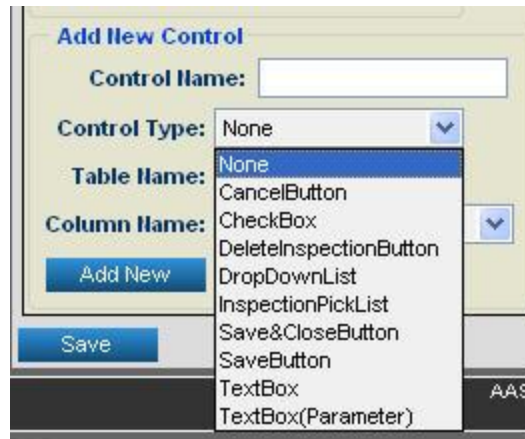
**Important Note:**

You can select the **SkinID** dropdown list to be **None** if you want the transparent background for your group box. You can edit the **Label** text box entry to the name of your choice. If you want your group box to have no grouping text with the border then you should clear the **Label** text box entry. Please note that your group box will not be displayed on the task screens until you add controls to it. Please refer to **BrM 5.x Technical Manual** for in-depth discussion on how to set the group properties for agency task screens.

**To add new controls on the agency task screen:**

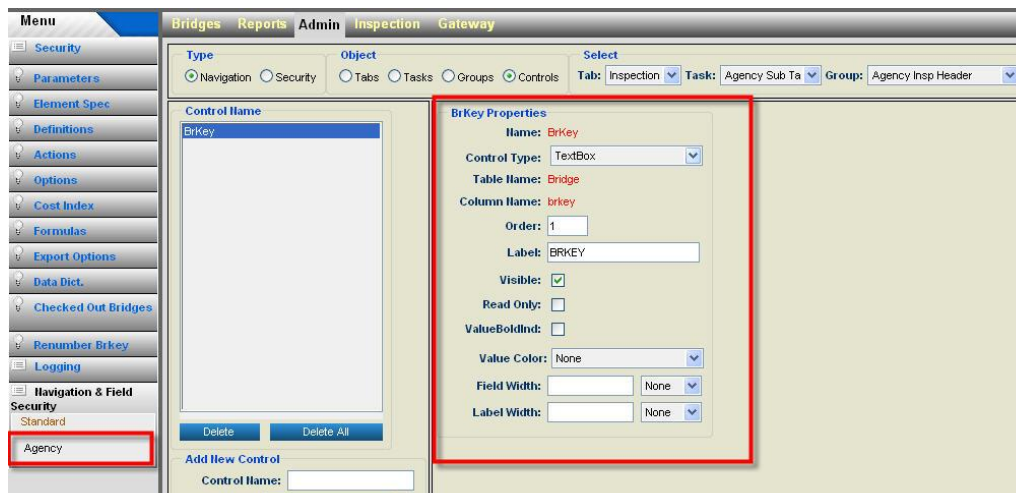
1. Navigate to the **Admin\Navigation & Field Security\Agency** task screen.
2. Select the **Navigation** radio button in the **Type** group box.
3. Select the **Controls** radio button from the **Object** group box.
4. Select your agency task on the **Task** dropdown list under the **Select** group box.
5. Select your agency group in the **Group** dropdown list under the **Select** group box.
6. In the **Add New Control** group box, enter a name for your control.

- In the **Add New Control** group box, select the appropriate *Control Type* that you are creating. Please refer to the *BrM 5.x Technical Manual* for further details about each type of pre-defined control types.



Add New Control Group Box

- In the **Add New Control** group box, select the *bridge* or *inspection* table name.
- In the **Add New Control** group box, select the appropriate column name of the table name that you selected.
- Click the **Add New** button.
- Click the **Save** button to store changes to the database.
- Select the control name from the **Control Name** list box on the left of the screen



Control Properties Group Box



13. Update the control properties on the left of the screen. Please refer to the **BrM 5.x Technical Manual** for more in-depth details on how to set the control properties.
14. Click the **Save** button to store the changes to the database.

**To delete Tabs, Tasks, Groups and Controls on an agency task screen:**

1. Navigate to the **Admin\Navigation & Field Security\Agency** task screen.
2. Select the **Navigation** radio button in the **Type** group box.
3. Select the appropriate radio button from the **Object** group box.
4. Select the appropriate parent task on the dropdown list under **Select** group box.
5. Select the *Tab*, *Task*, *Group* or *Control* on the list box displayed on the left of the screen based on your selections in step 3 and step 4.
6. Click the **Delete** button to delete the selected item.
7. Click the **Delete All** button to delete all the items in the list box on the left of the screen.
8. Click the **Save** button to store the changes to the database.

**Important Note:**

*Tabs*, *Tasks*, *Group* and *Controls* are the building blocks of the BrM 5.x application. The **Delete** operation effect propagates in a **Top-Down** hierarchical manner with *Tabs* at the top level to *Controls* at the bottom. In other words, if the *Tab* is deleted then all the *Tasks*, *Groups* and *Controls* under it are automatically deleted. Similarly, if the *Group* is deleted then all the *Sub-Groups* and *Controls* under it are automatically deleted.

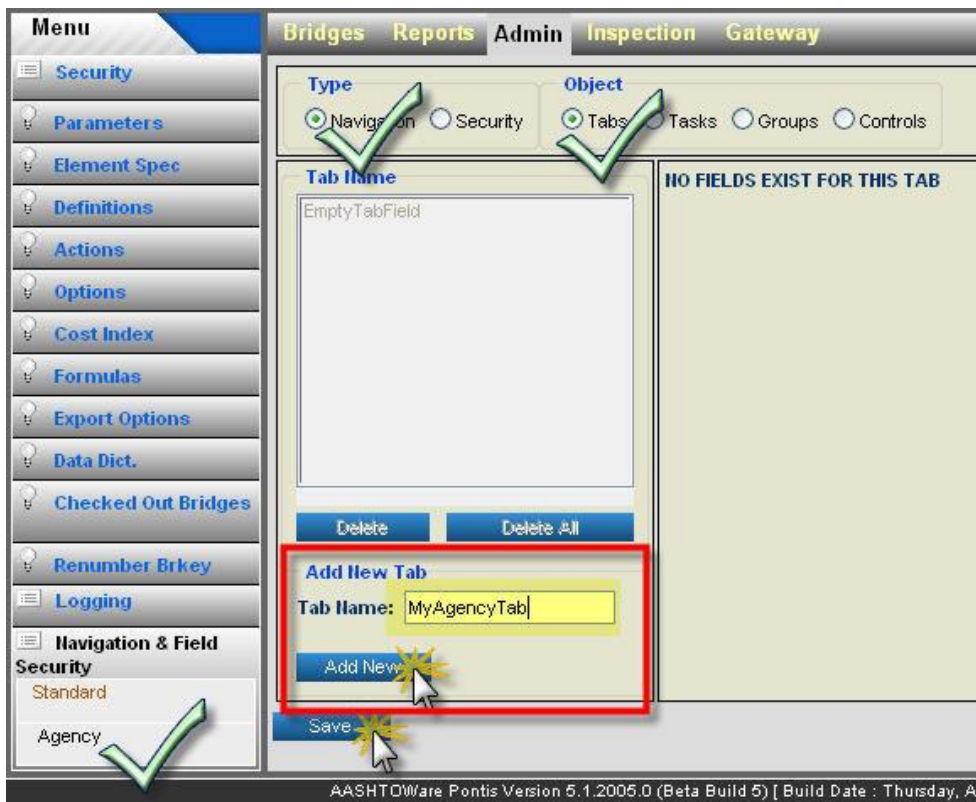
## 6.3 Creating Agency Non-Inspection Screens

BrM 5.x enables you to create your own *Tabs* in addition to the standard BrM *Tabs*. This allows agencies to group their new custom *Task* screens under a separate *Tab*. These custom task screens may not be inspection related. BrM 5.x comes with the five standard tabs. Non-Inspection task screens are those that will reside under the agency tabs. This section describes how to add a new *Tab* and how to create a new Non-Inspection *Task* screen under the agency *Tab*.

Non-inspection screens do not require the bridge to be selected before screen can be displayed. Non-inspection task screens will require a new agency tab as their parent. Creating Non-Inspection screens requires database preparation before the screens are developed and added to BrM 5.x.

To create a new agency Tab:

1. Navigate to the **Admin/Navigation & Field Security/Agency** task screen.

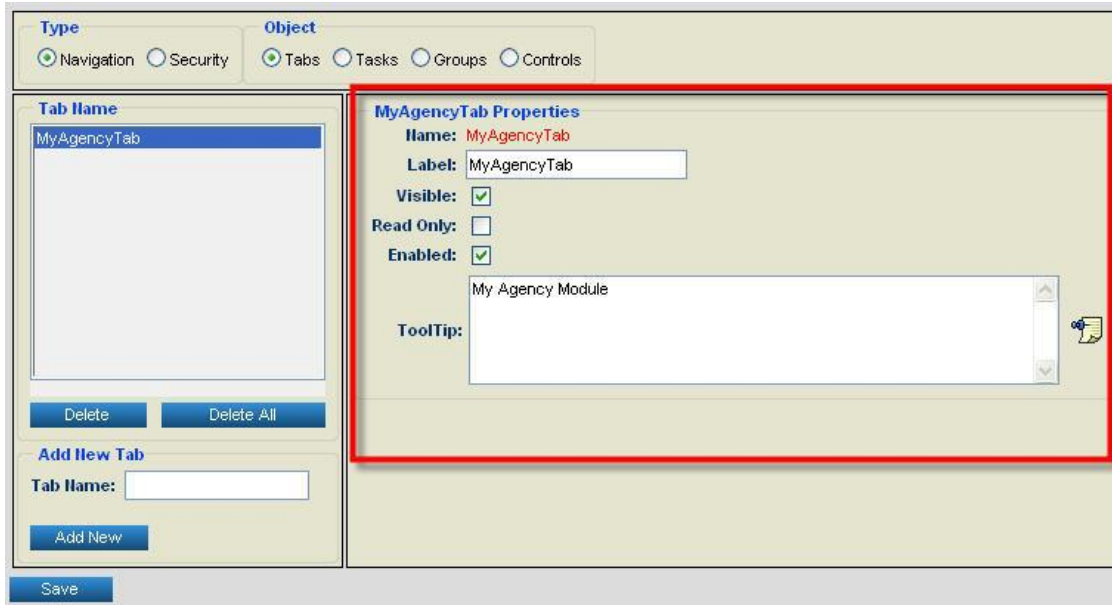


Adding New Agency Tab

2. Select the **Navigation** radio button in the **Type** group box.
3. Select the **Tabs** radio button from the **Object** group box.

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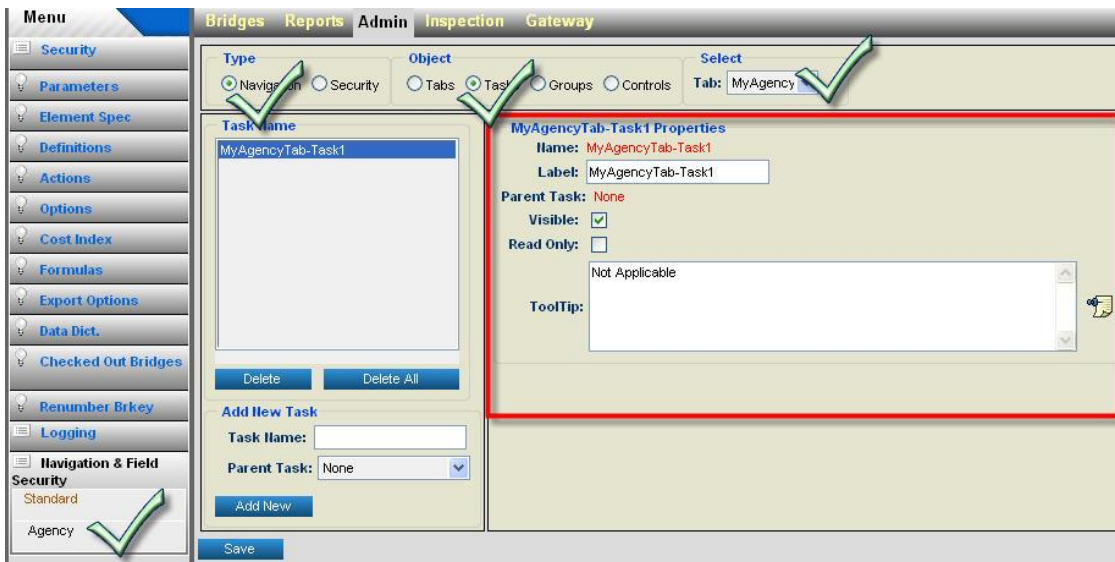
4. Enter a name for your tab in the **Task Name** text box in the **Add New Tab** group box.
5. Click the **Add New** button.
6. Click the **Save** button to store the new tab in the database.



### Modify Agency Tab Properties

7. Modify the properties under the **Tab Properties** group box on the right side of the screen.
8. Click the **Save** button to store the changes in the database.

### To create a new agency Task under an agency Tab:



9. Select the **Tasks** radio button from **Object** group box.
10. Select the *Task* in the **Task Name** list box on the left of the screen. Please note that a new *Task* is automatically created when you create a new *Tab*.
11. Modify the properties of your newly added task.
12. Click the **Save** button to store the changes in the database.

**Important Note:** Please refer to the *BrM 5.x Technical Manual* for an in-depth discussion on how to create basic and complex agency task screens that represent the inspection or non inspection data. Also, refer to *Section 8.2* of this chapter for details on how to create sub-tasks under a root task and how to add groups and controls on the task screens.

**To delete Tabs, Tasks, Groups and Controls on the agency task screen:**

1. Navigate to the **Admin\Navigation & Field Security\Agency** task screen.
2. Select the **Navigation** radio button in the **Type** group box.
3. Select the appropriate radio button from the **Object** group box.
4. Select the appropriate parent from the dropdown list under **Select** group box.
5. Select a *Tab*, *Task*, *Group* or *Control* on the list box displayed on the left of the screen based on your selections in step 3 and step 4.
6. *Click the **Delete** button* to delete the selected item.
7. Click the **Delete All** button to delete all the items in the list box on the left of the screen.
8. Click the **Save** button to store the changes to the database.

**Important Note:** The *Tabs*, *Tasks*, *Group* and *Controls* are the building blocks of The BrM 5.x application. The **Delete** operation effect propagates in a **Top-Down** hierarchical manner from *Tabs* being at the top level to *Controls* at the bottom. In other words, if the *Tab* is deleted then all the *Tasks*, *Groups* and *Controls* under it are automatically deleted. Similarly, if the *Group* is deleted then all the *Sub-Groups* and *Controls* under it are automatically deleted.

## 6.4 Creating Role-Based Security Profiles

BrM 5.x allows an agency to enforce the application security depending upon the role of the logged in user. This means that if you have fifty BrM users in your agency then you do not need to create set of security settings for each of the fifty BrM users. You can create logical roles that reflect the business practices and responsibilities of the BrM users in your agency.

Once you create the roles you need, you can create a set of security settings for each role such that the settings will restrict the use of BrM 5.x for that role. The set of security settings for each role can be called a *security profile* for that role. You can assign user an appropriate role so that user will be able to use the BrM based on the security profile associated with his/her role.

**Important Note:** Please refer to the *BrM 5.x User Manual - Chapter 7* and the *BrM 5.x Technical Manual* for detail information on how to create BrM users, how to create user roles, and how to associate users with roles.

This section describes the main steps involved in creating security profiles for your user roles. You should plan your security profiles before you create them. You can represent these security profiles in a spreadsheet that you can maintain and use to track the settings on the production server. The planning typically involves following steps:

- Identify the **Operations** that are not allowed for each role.
- Identify the **Controls** to edit the data that are not supposed to be visible or supposed to be read-only for each role.
- Identify the **Tabs** that are not supposed to be visible or supposed to be read-only for each role.
- Identify the **Task** screens under tabs that are not supposed to be visible or supposed to be read-only for each role.
- Identify the **Groups** on the task screens that are not supposed to be visible or supposed to be read-only for each role.

**Important Note:** The *Tabs*, *Tasks*, *Group* and *Controls* are the building blocks of The BrM 5.x application. The security settings propagate in **Top-Down** hierarchical manner from *Tabs* being at the top level to *Controls* at the bottom. In other words, if the Tab is marked read only then all the *Tasks*, *Groups* and *Controls* under it are automatically marked read only. Similarly, if the *Group* is marked read only then all the *Controls* under it are automatically marked read only.

- Identify the granularity at which you should apply the security.

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BrM 5.x comes with a sample database that has four basic roles and corresponding security profiles that can be used as an example. The following list enumerates the four **sample roles** in the out of the box sample database:

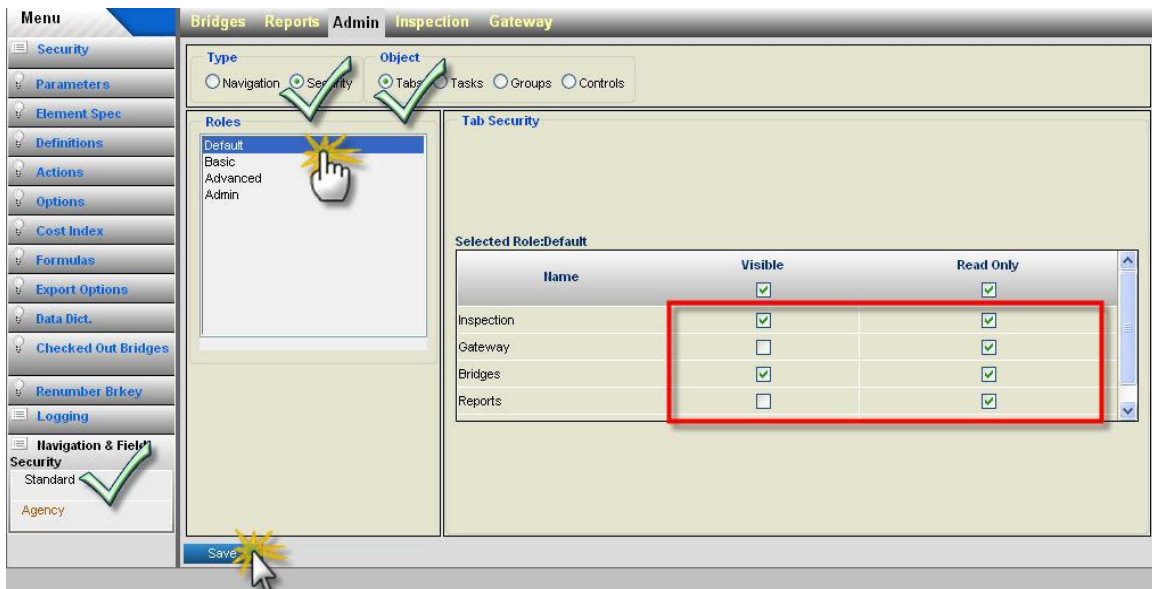
- Default
- Basic
- Advanced
- Admin

### Important Note:

*Role Based Security* settings override the *Navigational Security* settings with restrictive rights only when *Navigational Security* settings are non-restrictive. In other words, if role based security is restrictive and if navigation security is not restrictive then role based security will govern.

### To configure role based security for the Standard Tabs:

The following steps can also be use for **Agency** tabs by selecting **Agency** instead of the **Standard** sub-task on the task bar menu.



### Setting Role Based Security for Tabs

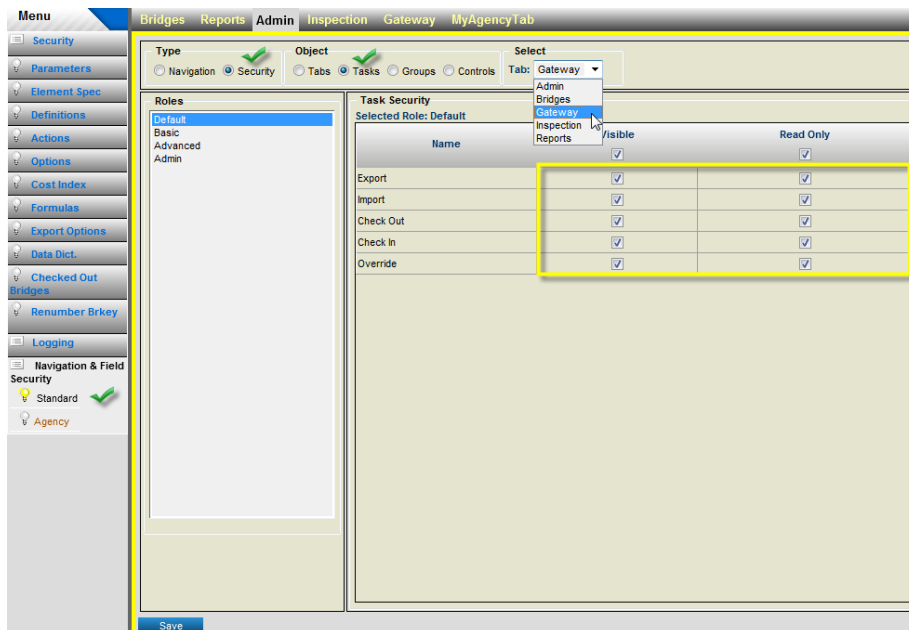
1. Navigate to the **Admin/Navigation & Field Security/Standard** task screen.
2. Select the **Security** radio button in the **Type** group box.
3. Select the **Tabs** radio button from the **Object** group box.

## NAVIGATION AND FIELD LEVEL SECURITY

4. Select the *Role* from the **Roles** list box on the left of the screen.
5. Check or uncheck the **Visible** check boxes for each tab listed under the **Name** column in **Tab Security** group box on the right of the screen.
6. Check or uncheck the **Read Only** check boxes for each tab listed under the **Name** column in **Tab Security** group box on the right of the screen.
7. Click the **Save** button update your changes in to the database.

### To configure role based security for the Standard Tasks:

The following steps can also be used for **Agency** tabs by selecting the **Agency** instead of the **Standard** sub-task on the task bar menu.



### Setting Role Based Security for Tasks

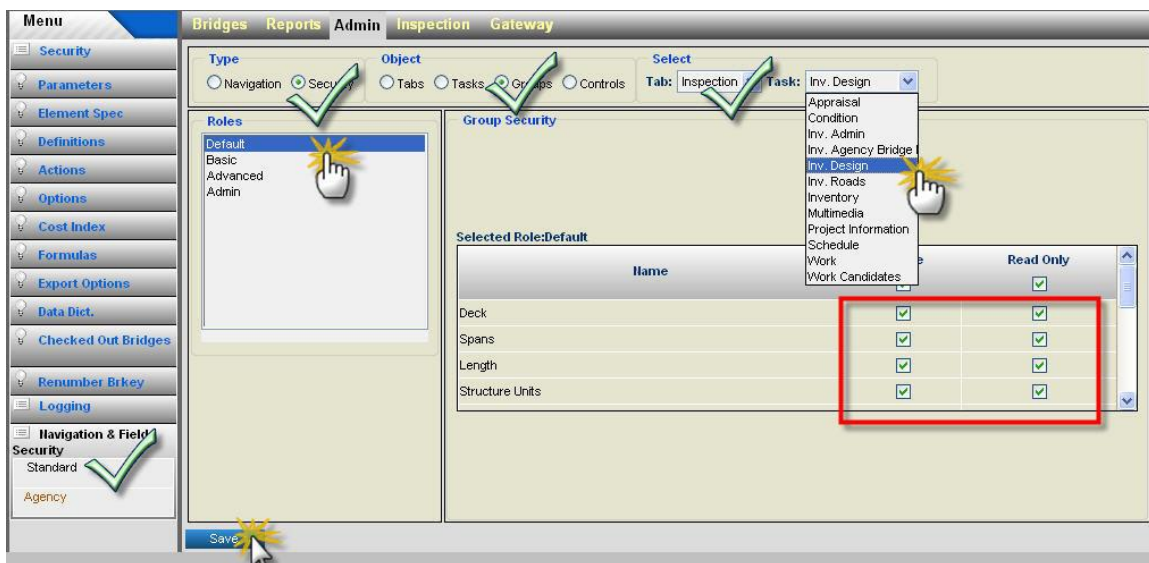
1. Navigate to the **Admin\Navigation & Field Security\Standard** task screen.
2. Select the **Navigation** radio button in the **Type** group box.
3. Select the **Tasks** radio button from the **Object** group box.
4. Select the parent tab on the **Tab** dropdown list in the **Select** group box.
5. Select the *Role* from the **Roles** list box on the left of the screen.
6. Check or uncheck the **Visible** check boxes for each task listed under the **Name** column in the **Task Security** group box on the right of the screen.

## NAVIGATION AND FIELD LEVEL SECURITY

7. Check or uncheck the **Read Only** check boxes for each task listed under the **Name** column in the **Task Security** group box on the right of the screen.
8. Click the **Save** button update your changes in to the database.

### To configure role based security for the Standard Groups:

The following steps can also be used for **Agency** tabs by selecting the **Agency** instead of the **Standard** sub-task on the task bar menu.



### Setting Role Based Security for Groups

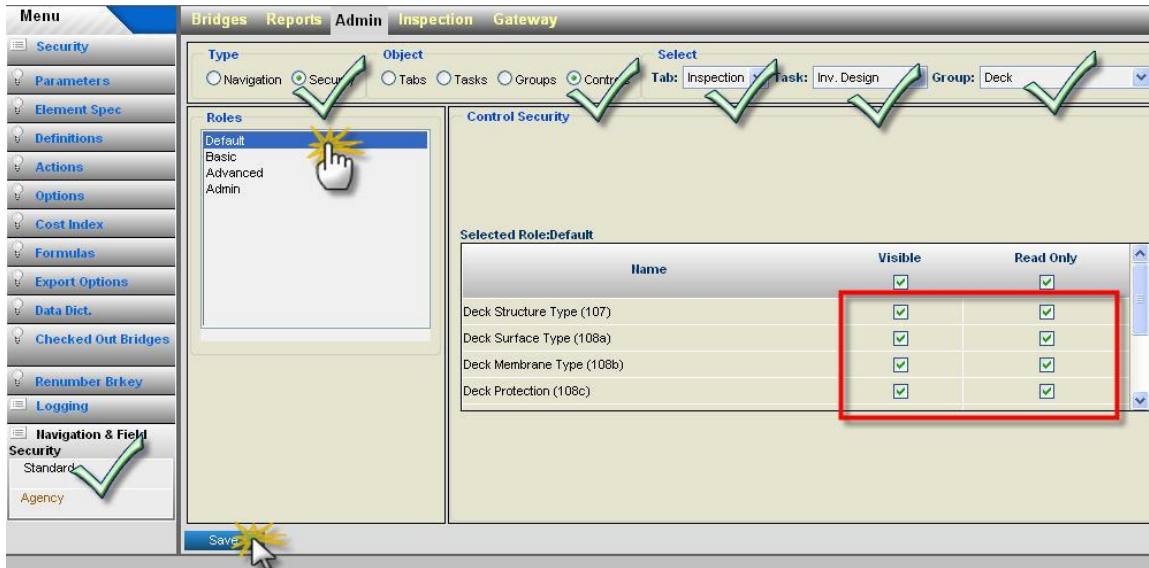
1. Navigate to the **Admin\Navigation & Field Security\Standard** task screen.
2. Select the **Navigation** radio button in the **Type** group box.
3. Select the **Tasks** radio button from **Object** group box.
4. Select the parent tab on the **Tab** dropdown list in the **Select** group box.
5. Select the parent task on the **Task** dropdown list in the **Select** group box.
6. Select the *Role* from the **Roles** list box on the left of the screen.
7. Check or uncheck the **Visible** check boxes for each group listed under the **Name** column in the **Group Security** group box on the right of the screen.
8. Check or uncheck the **Read Only** check boxes for each group listed under the **Name** column in the **Group Security** group box on the right of the screen.



- Click the **Save** button update your changes in to the database.

**To configure role based security for the Standard Tabs:**

The following steps can also be use for **Agency** tabs by selecting the **Agency** instead of the **Standard** sub-task on the task bar menu.



**Setting Role Based Security for Controls**

- Navigate to the **Admin\Navigation & Field Security\Standard** task screen.
- Select the **Navigation** radio button in the **Type** group box.
- Select the **Tasks** radio button from **Object** group box.
- Select the parent tab on the **Tab** dropdown list in the **Select** group box.
- Select the parent task on the **Task** dropdown list in the **Select** group box.
- Select the parent group on the **Group** dropdown list in the **Select** group box.
- Select the *Role* from the **Roles** list box on the left of the screen.
- Check or uncheck the **Visible** check boxes for each group listed under the **Name** column in **Control Security** group box on the right of the screen.
- Check or uncheck the **Read Only** check boxes for each group listed under the **Name** column in **Control Security** group box on the right of the screen.
- Click the **Save** button update your changes in to the database.

## 6.5 Applying Navigational Security

Navigational security can be applied to either agency or standard screens. This mainly includes setting the visibility and read only properties of *Tabs*, *Tasks*, *Groups*, and *Controls* from the Navigation context. These settings enable you to secure the BrM 5.x user interface from all the BrM users regardless of their application role.

Navigation security also allows you to globally customize BrM 5.x as per your agency needs. For example, if your agency does not use one of the standard BrM 5.x inspection fields then you could mark that particular field invisible. Furthermore, if your agency does not need a certain standard task screen then you could make that task screen invisible.

**Important Note:** Navigational Security settings override the role based security with restrictive rights. In other words, if role base security is not restrictive and if navigation security is restrictive then navigational security will govern. If navigational security is non-restrictive then role based security will govern.

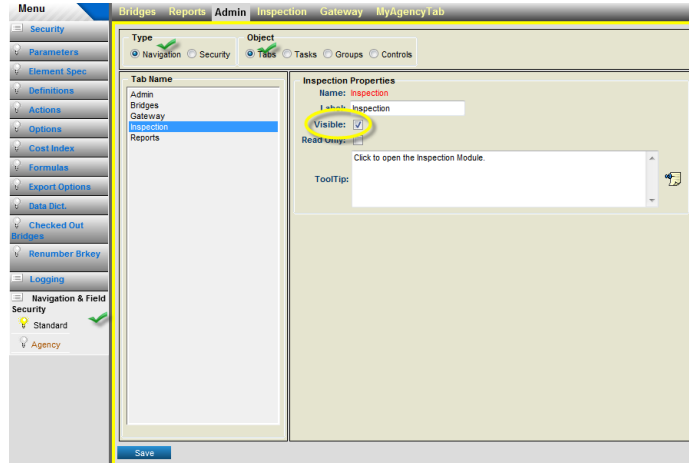
While applying navigational security settings, you should plan the granularity at which you need to apply the agency wide restrictions on the use of BrM 5.x. The following are some **examples** of the typical questions you should consider while planning navigational security settings:

- Do I need to restrict the use of one control on certain inspection task screen or several controls?
- In my agency, we do not need **Snooper hours, Special Crew Hours, Special Equip. Hours** fields displayed on **Inspection\Schedule task screen**. Can I just make the whole group read only instead of making all three controls read only within that sub-group one by one?
- In my agency, we **do not need** all the controls on the **Inspection\Work\Project Information editable**. Can I just make the whole **Inspection\Work\Project Information** task screen read only instead of making all *Groups* or all the *Controls* under it read only?

**Caution:** Modification to Navigation Security settings have a system wide impact and can affect the whole BrM System as well as users. This operation requires administrative privileges. These settings should only be performed by an individual who has functional knowledge of BrM 5.x security architecture and the related database structure. You should back up your database and try different settings in conjunction with the role based security profiles that you may have on your BrM 5.x system before applying them to the production server.

**To make a Standard Tab Invisible or Read Only:**

The following steps can also be use for **Agency** tabs by selecting the **Agency** instead of the **Standard** sub-task on the task bar menu.



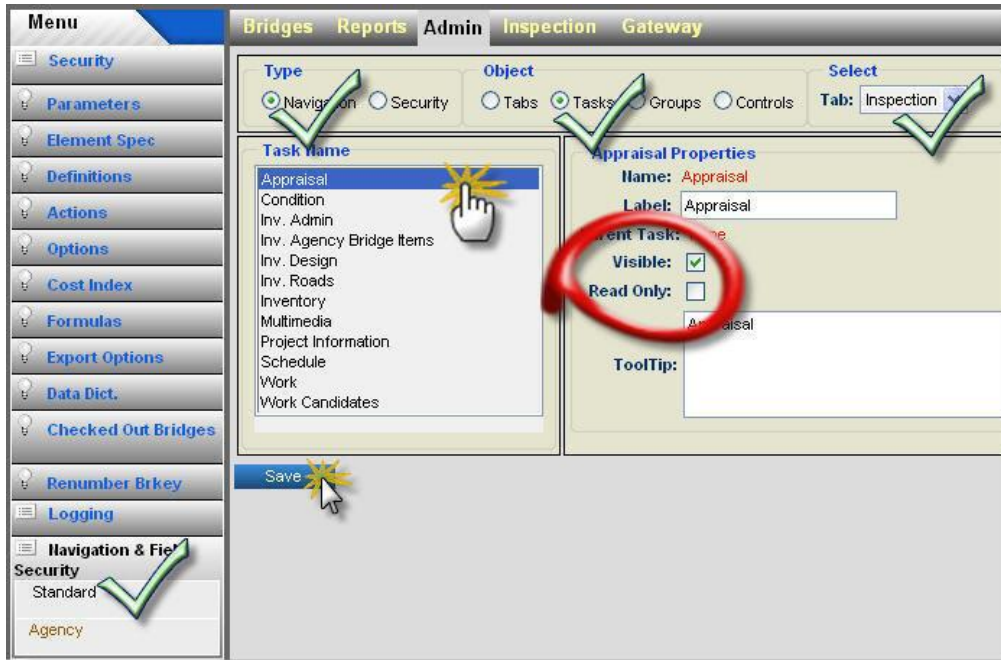
Setting Navigational Security for Tabs

1. Navigate to the **Admin\Navigation & Field Security\Standard** task screen.
2. Select the **Navigation** radio button in the **Type** group box.
3. Select the **Tabs** radio button from **Object** group box.
4. Select the *Tab* from the **Tab Name** list box on the left of the screen.
5. Check or uncheck the **Visible** check box to make the selected *Tab* Visible or Invisible respectively.
6. Check or uncheck the **Read Only** check box to make the selected *Tab* editable or read only.
7. Click the **Save** button update your changes in to the database.

**Important Note:** When a Tab is made read only, all the tasks under it will be automatically made read only. When the Task is read only, all the Groups under that task will be automatically become read only. If the Group is read only then all the controls under that group will be automatically become read only. Hence, if you make a Tab read only then it will have hierarchical effect and it will make the entire module read only.

**To make a Standard Task Invisible or Read Only:**

The following steps can also be followed for **Agency** tasks by selecting the **Agency** instead of the **Standard** sub-task on the task bar menu.



### Setting Navigational Security for Tasks

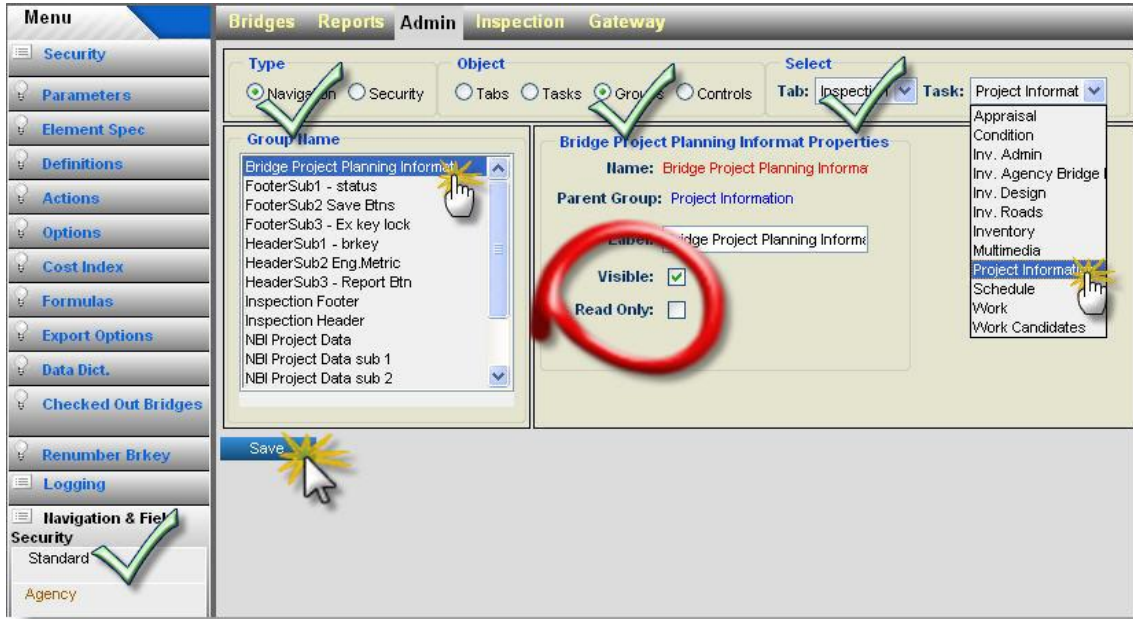
1. Navigate to the **Admin/Navigation & Field Security/Standard** task screen.
2. Select the **Navigation** radio button in the **Type** group box.
3. Select the **Tasks** radio button from **Object** group box.
4. Select the parent tab on the **Tab** dropdown list in the **Select** group box.
5. Select the *Task* from the **Task Name** list box on the left of the screen.
6. Check or uncheck the **Visible** check box to make the selected *Task* Visible or Invisible respectively.
7. Check or uncheck the **Read Only** check box to make the selected *Task* editable or read only.
8. Click the **Save** button update your changes in to the database.

**Important Note:**

When the Task is made read only, all the Groups under that tasks will be automatically made read only. When the Group is read only, all the controls under that group will be automatically made read only. Hence, if you make a Task read only then it will have hierarchical effect and it will make the entire task screen read only. Read only tasks may still allow you to browse the data but you will not be able to edit the data or perform any operations.

To make a Standard Group Invisible or Read Only:

The following steps can also be followed for **Agency** groups by selecting the **Agency** instead of the **Standard** sub-task on the task bar menu.



Setting Navigational Security for Groups

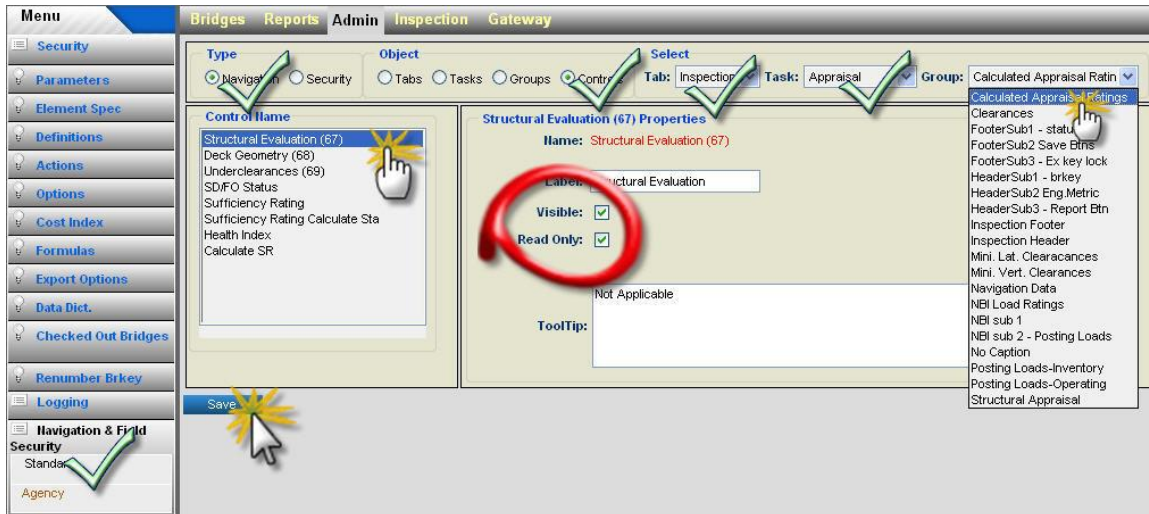
1. Navigate to the **Admin/Navigation & Field Security/Standard** task screen.
2. Select the **Navigation** radio button in the **Type** group box.
3. Select the **Groups** radio button from **Object** group box.
4. Select the parent tab on the **Tab** dropdown list in the **Select** group box.
5. Select the parent task on the **Task** dropdown list in the **Select** group box.
6. Select the *Group* from the **Group Name** list box on the left of the screen.
7. Check or uncheck the **Visible** check box to make the selected *Group* Visible or Invisible respectively.
8. Check or uncheck the **Read Only** check box to make the selected *Group* editable or read only.

**Important Note:** When the Group is marked read only, all the controls under that group will be automatically marked read only. The Standard BrM 5.x inspection screens also have several complex controls that represent data from the multiple rows in the database. These complex controls also have their own groups. The complex control will be read only, when the group representing such composite control is marked read only. For example, **Element Condition** group under condition task.

- Click the **Save** button update your changes in to the database.

**To make a Standard Control Invisible or Read Only:**

The following steps can also be followed for **Agency** controls by selecting the **Agency** instead of the **Standard** sub-task on the task bar menu.



**Setting Navigational Security for Controls**

- Navigate to the **Admin/Navigation & Field Security/Standard** task screen.
- Select the **Navigation** radio button in the **Type** group box.
- Select the **Groups** radio button from **Object** group box.
- Select the parent tab on the **Tab** dropdown list in the **Select** group box.
- Select the parent task on the **Task** dropdown list in the **Select** group box.
- Select the parent group on the **Group** dropdown list in the **Select** group box.
- Select the *Control* from the **Control Name** list box on the left of the screen.
- Check or uncheck the **Visible** check box to make the selected *Control* Visible or Invisible respectively.
- Check or uncheck the **Read Only** check box to make the selected *Control* editable or read only.
- Click the **Save** button to update your changes in to the database.

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