Govern

Govern OpenForms Designer (OFD)

Release 6.1
Last Revision Update: 8/17/16

Govern

Govern OpenForms Designer

August 2016 - Release 6.1

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Table of Contents

Introduction

Overview

The Govern OpenForms Designer is part of the Govern OpenForms Product Suite. It is available in version 6.0 and above.

It is used for designing the end-user forms for Govern OpenForms. These forms are based on the business models and business entities created in the Business Entity Designer, where the attributes are added to the entities, mapped to the database, and the relationships between entities and between tables are created.

The OpenForms Designer provides the tools for the intermediate steps between setting up the data mapping performed in the Business Entity Designer and making the forms available in Govern.

It replaces the Govern Model Designer (MoD) offered with versions 5.1 and earlier.

The OpenForms Designer (OFD) provides:

- A user-friendly interface.
- Easy-to-handle drag and drop tools.
- Deployment ease and management with Deploy EZ.
- Access to security permissions without having to open another application.
- Greater flexibility for designing layouts.
    - Add new rows and columns anywhere on the form.
    - Group items with grids, groupboxes, or tabs.
    - Rename the items.
    - Customize the properties to meet your requirements.
    - View your new forms immediately in Govern.
    - Modify them and see your changes in real time
- Security settings for adding security when you create your forms without having to open another application.
- Add expressions anywhere on form, at the entity level, to an attribute, to a control, or to the Record Description.

Chapter 1: The OpenForms Designer User Interface

Overview

This chapter introduces the Govern OpenForms Designer (OFD) and the following topics.

Administrative Settings

Overview

The following general settings are defined in GNA for the OpenForms Designer. Both are used to define defaults that can be applied to all users forms in order to maintain consistency in spacing and text styles.

Default Margins

Default margins are used for ensuring that there is space between items on the user forms. The settings are found in the General Settings Editor in GNA. For details, see *Adding Margins on page 53*.

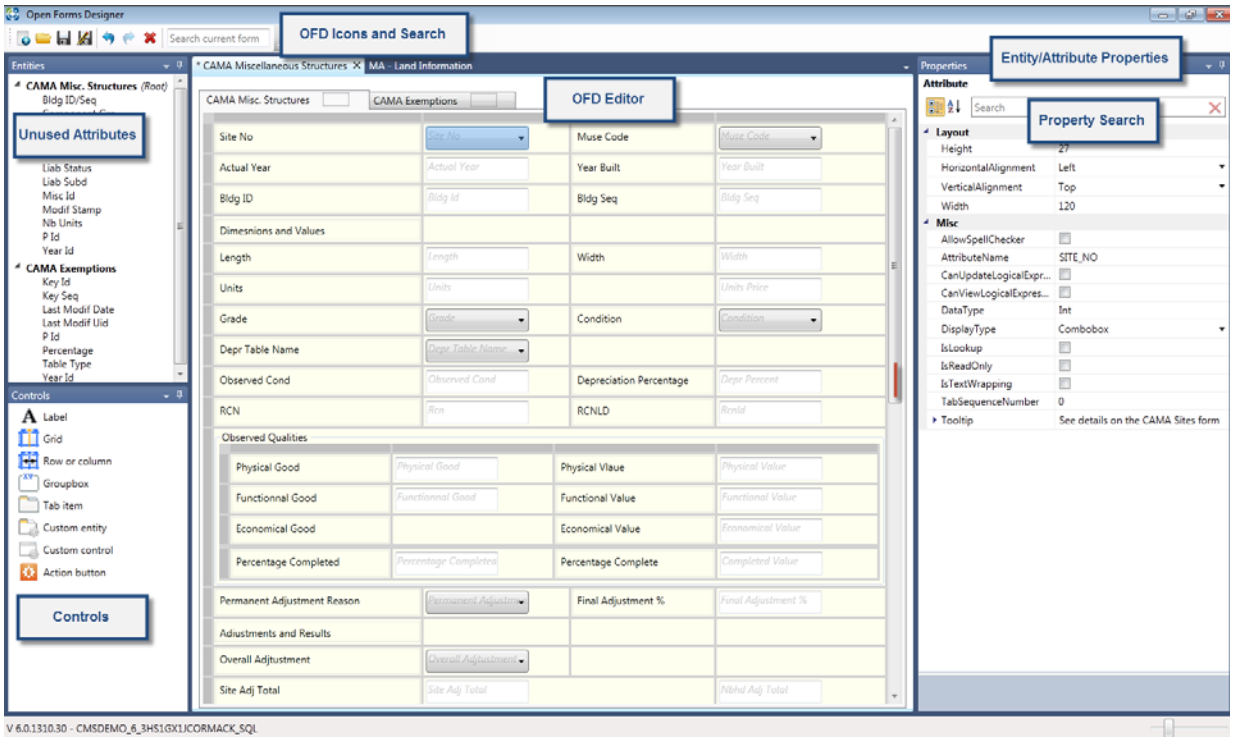
Creating Text and Foreground / Background Styles

Use the Text Style Editor in GNA to create styles for the text that appears on your forms as headings or labels. You can also use it to create foreground and background colors for the items that appear on forms. Creating Text and Foreground / Background Styles on page 57.

Quick Tour of the Govern OFD Interface

Overview

The following screenshot provides an overview of the OpenForms Designer (OFD) User Interface.



The Govern OpenForms Designer has a similar look and feel to the other applications in the Govern OpenForms Product Suite. It has two explorers on the left, the Entity and Controls Explorer, and one on the right, the Properties Explorer. As with other OpenForms applications, you can hide the Explorers or detach them and move them to another location on your screen.

The Entity Explorer lists all the entities in the business model. If you expand an entity, you view the attributes that are not included on the form. The attributes that are included can be viewed in the OFD Editor. The Controls Explorer lists the controls, or design elements, that you can add to an entity. The Properties Explorer lists the properties of the item that is currently selected. The OFD Editor is located in the center of the interface. It is used for creating the layouts for the forms.

The icons along the top are used for performing standard Windows actions, such as creating a new form, opening or deleting an existing one, saving, deleting an item, or undoing / redoing an action.

The version of the application and the connection key are displayed on the status bar at the bottom of the interface.

The interface is described in more detail in the following sections:

OFD Editor

The OFD Editor is used for creating the layouts for the Govern user forms. *See The OpenForms Designer Editor on page 7*.

Search

The search is used for locating and highlighting an item on the form. *See OFD Editor Search on page 10*.

Entities Explorer

The Entities Explorer lists the entities in the selected model with the unused attributes for each. *See The Entities Explorer on page 11*.

Controls Explorer

The Controls Explorer is used for adding items other than attributes to the form, such as grid, groupboxes, tabs, links, and action buttons. *See OFD Controls on page 14*.

OFD Icons

The icons across the top of the OpenForms Designer UI are used for standard Windows file operations, such as opening and saving a form, undoing or redoing one or more actions, and deleting an item. See *OFD Title Bar Icons on page 16*.

Culture

A Combo box is included in the OFD title bar for switching the culture and language of the OpenForms Designer. See *Changing the Culture on page 29*.

Security

The Security icon is used for granting and restricting security permissions at the entity level and for each of the controls, such as label, link, groupbox, and action button. With the OpenForms Designer (OFD), you can set up your security when you are creating the form. You can also define security permissions in the Govern Security Manager (GSM). The two applications are synchronized.

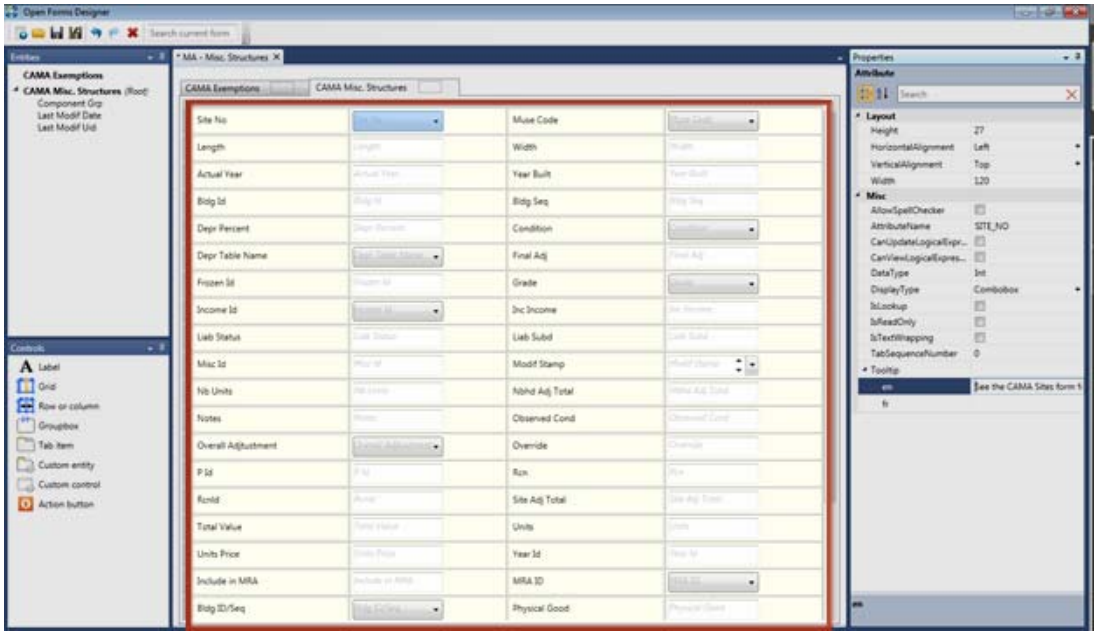
Properties

The Properties pane is used for viewing and modifying the item that is currently selected on the form. *See Defining Properties on page 32*.

The OpenForms Designer Editor

Overview

The OpenForms Designer (OFD) Editor is located in the center of the interface. It is used for creating the layouts for the Govern user forms.



Tasks that you can accomplish with the OFD Editor include:

- Adding and repositioning attributes
- Adding labels to describe items on the forms.
- Adding grids, group boxes, and tabs to group together similar items.
- Defining properties for the items on the forms.

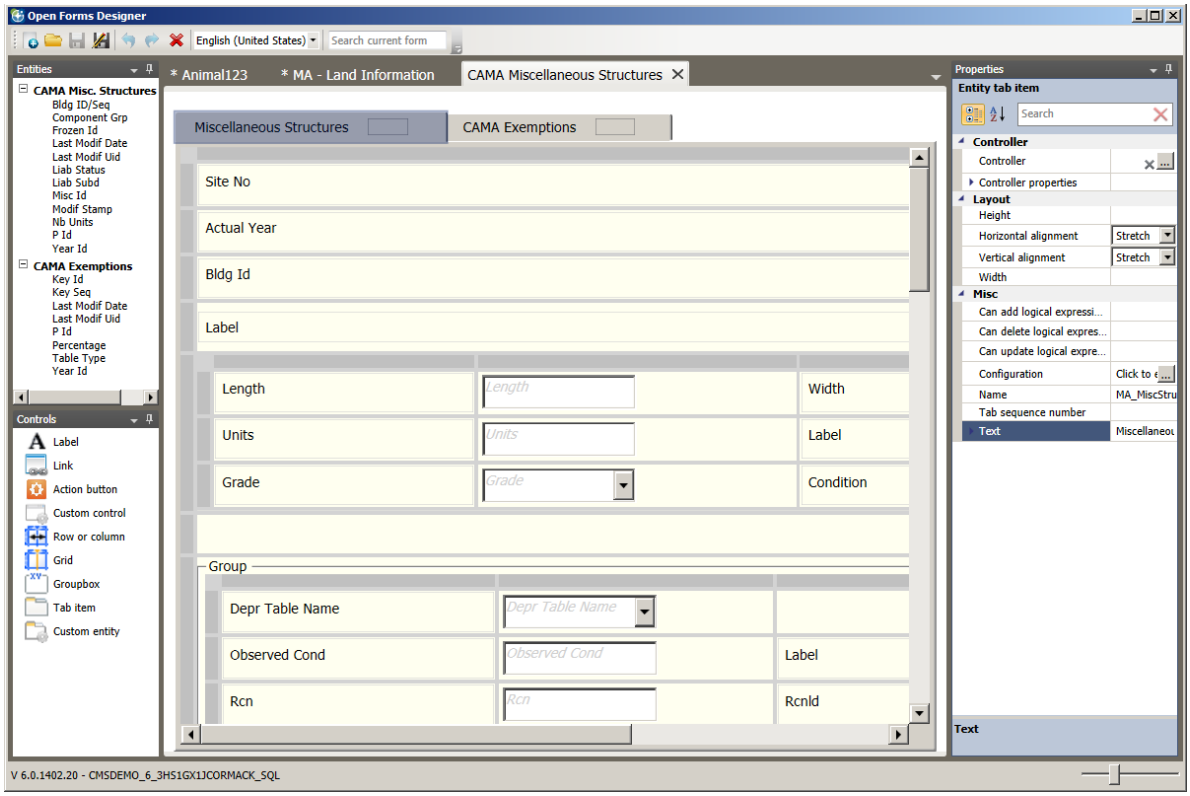
For more information about the OFD Editor, see Adding Controls and Layout Items on page 50.

Magnifying the OFD Editor

A sliding bar is located in the lower right corner of the OFD interface. This is used for Zooming In and Zooming Out in the OFD Editor.

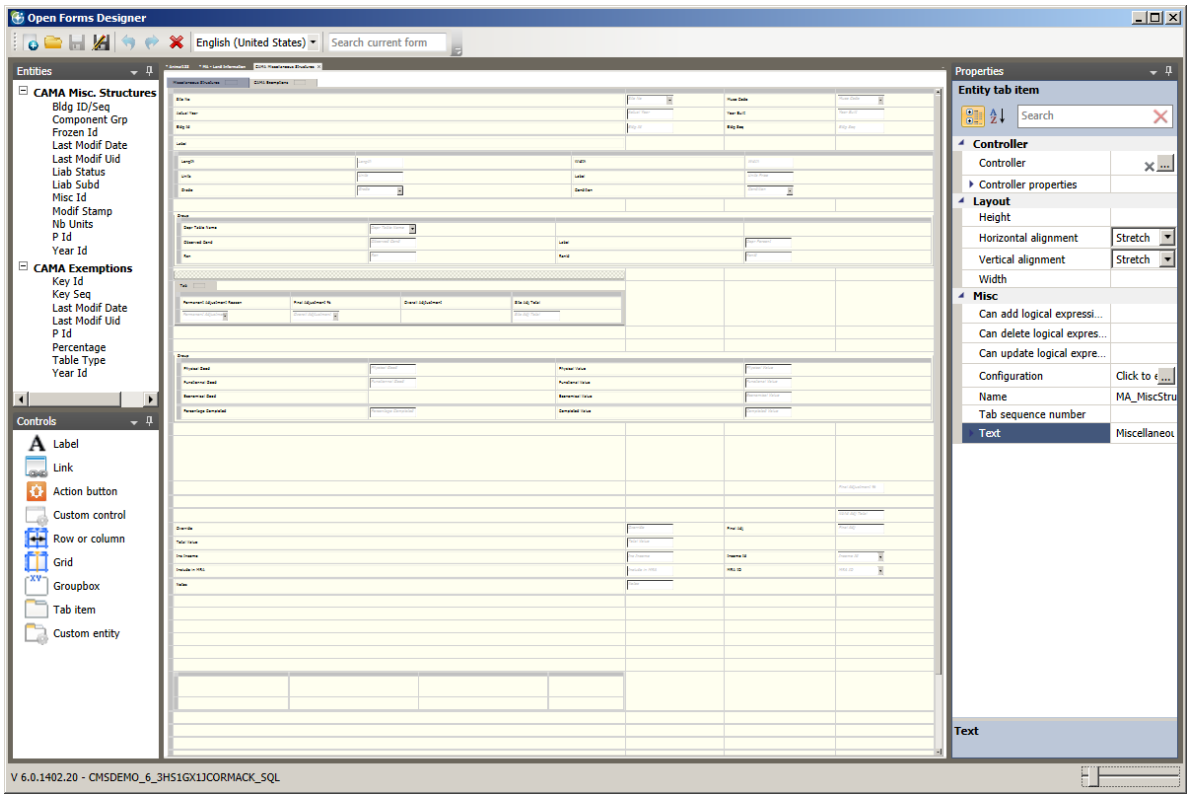
Zooming In

The Zoom In is useful if you want to work on a specific field or group of fields.



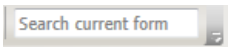
Zooming Out

The Zoom Out is useful if you want to work on the layout as a whole.


Open Forms Designer
English (United States)
Search current form
Entities
CAMA Misc. Structures
Bldg ID/Seq
Component Grp
Frozen Id
Last Modif Date
Last Modif Uid
Liab Status
Liab Subd
Misc Id
Modif Stamp
Nb Units
P Id
Year Id
CAMA Exemptions
Key Id
Key Seq
Last Modif Date
Last Modif Uid
P Id
Percentage
Table Type
Year Id
Controls
Label
Link
Action button
Custom control
Row or column
Grid
Groupbox
Tab item
Custom entity
Properties
Entity tab item
Search
Controller
Controller
Controller properties
Layout
Height
Horizontal alignment
Stretch
Vertical alignment
Stretch
Width
Misc
Can add logical expressi...
Can delete logical expres...
Can update logical expre...
Configuration
Name
Tab sequence number
Text
Text
V 6.0.1402.20 - CMSDEMO_6_3HS1GX1JCORMACK_SQL

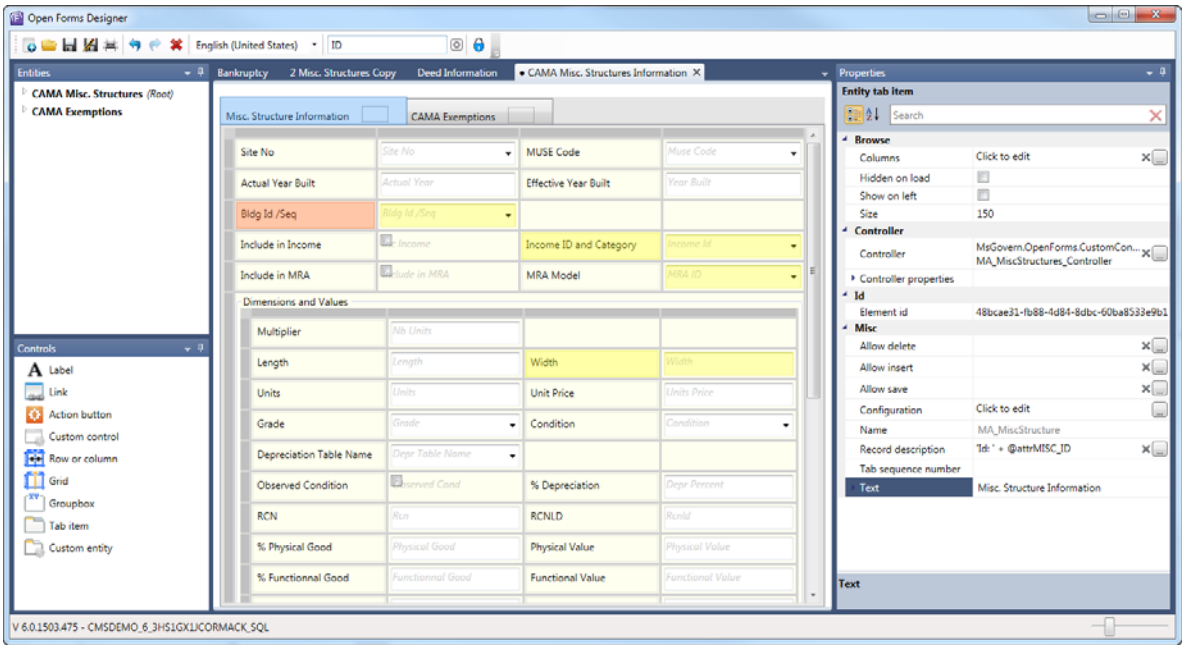
OFD Editor Search

Overview

The OpenForms Designer includes a **Search** 

at the top of the interface.

Use the Search to quickly locate any item on the entity currently displayed in the OFD Editor. All matches are highlighted. The current item is highlighted in a different color.



When an item is highlighted on the form, its properties are displayed in the Property Explorer. Thus, using the search makes it easy to quickly run through and configure all the similar items in an entity.

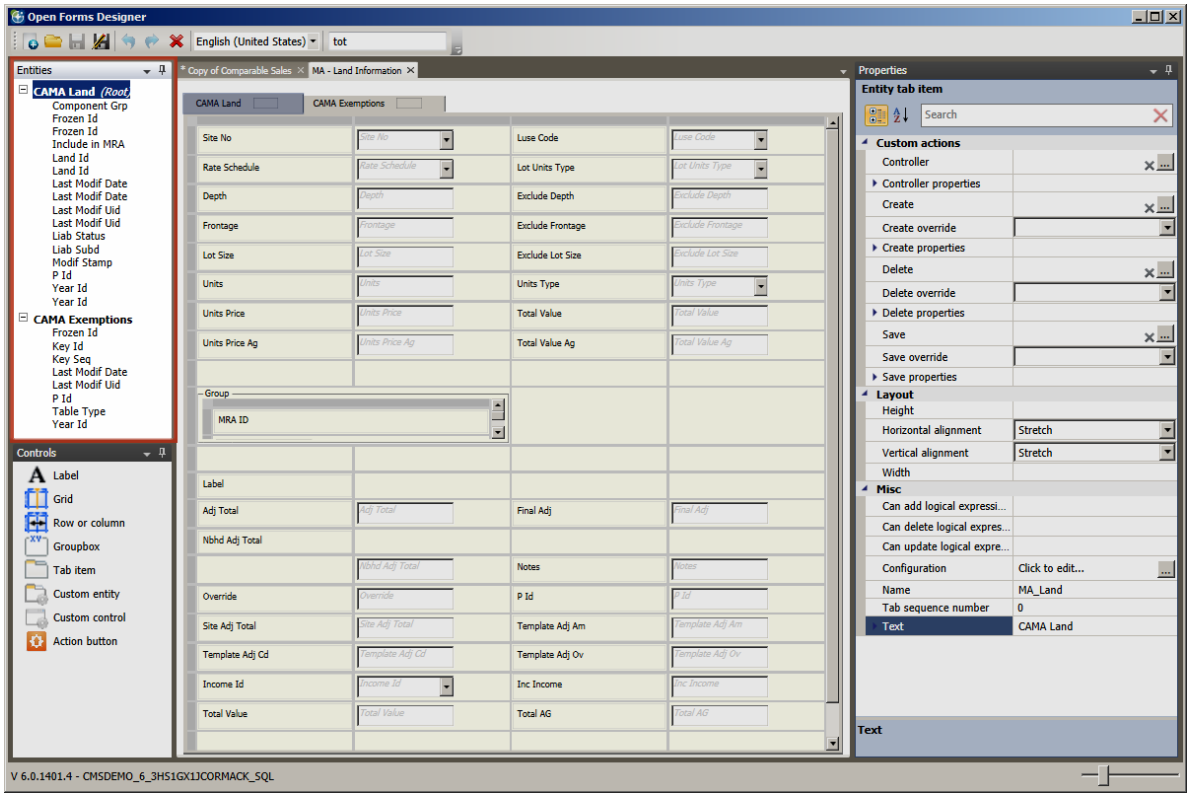
The first match is selected, regardless of where the cursor was positioned when you began the search. Press the `[Enter]` key on your keyboard to select the next match. If no match is found, the Search text box turns red.

You can perform a search with only a few letters. The Search is not case-sensitive and it is not restricted to whole words.

The Entities Explorer

Overview

The Entities Explorer is located at the top left of the OpenForms Designer interface, by default. It lists all the entities that are part of the Business Entity Designer business model selected for the current form.

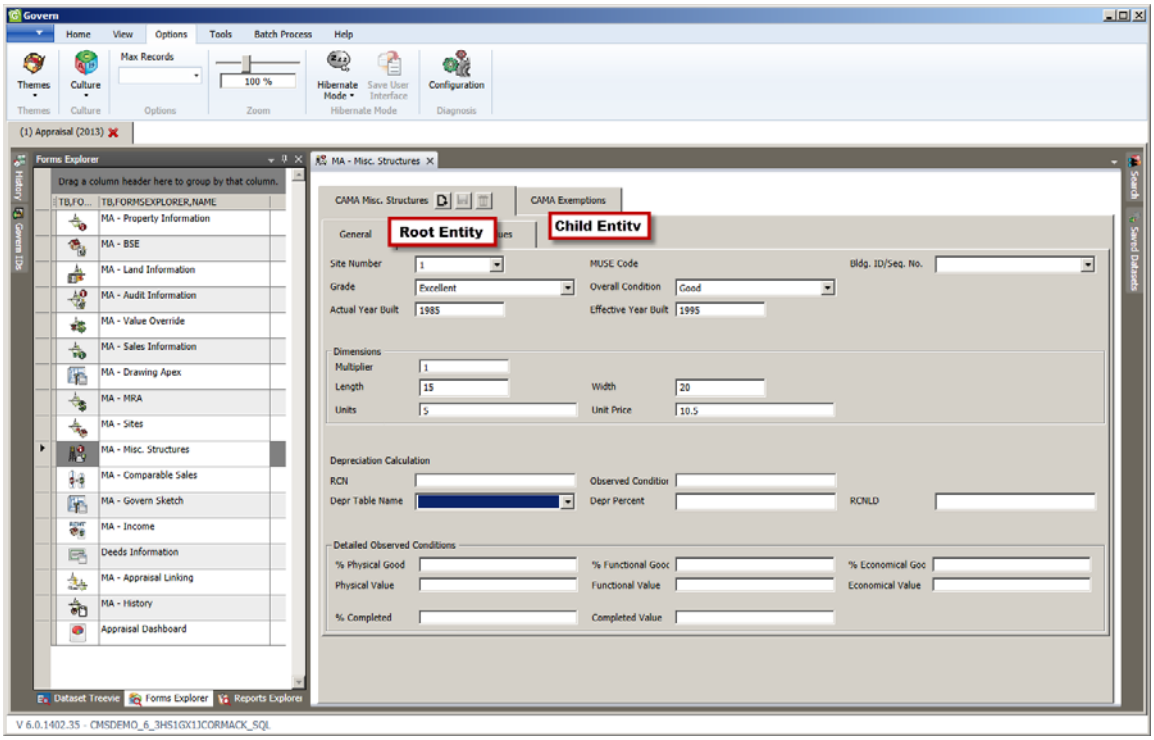


The Entities Explorer lists the following:

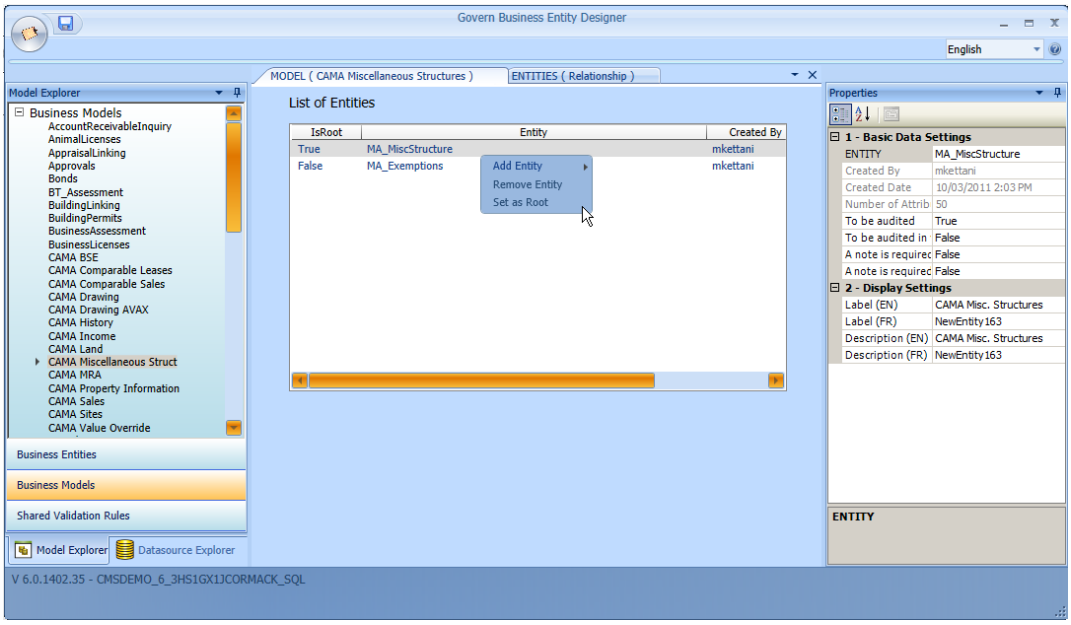
Root Entity

The Root Entity is listed at the top of Entities Explorer. The word (Root) appears beside it. This is the main entity in the Govern form.

The following screenshot displays the Root Entity for the Miscellaneous Structures form.



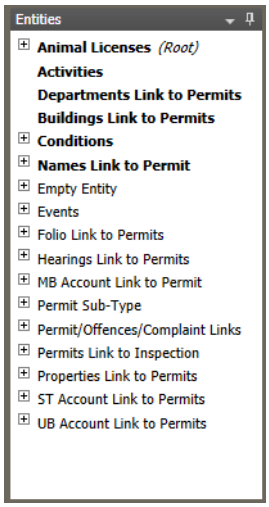
One entity in each business model is designated as the Root Entity in the BED. This is displayed in the following screenshot.



The Root Entity cannot be deleted from the form in the OFD.

Other Entities

All entities that are part of the business model, on which the current form is based, are displayed In the Entities Explorer.



The entities that are included in the current form appear in bold.

Attributes

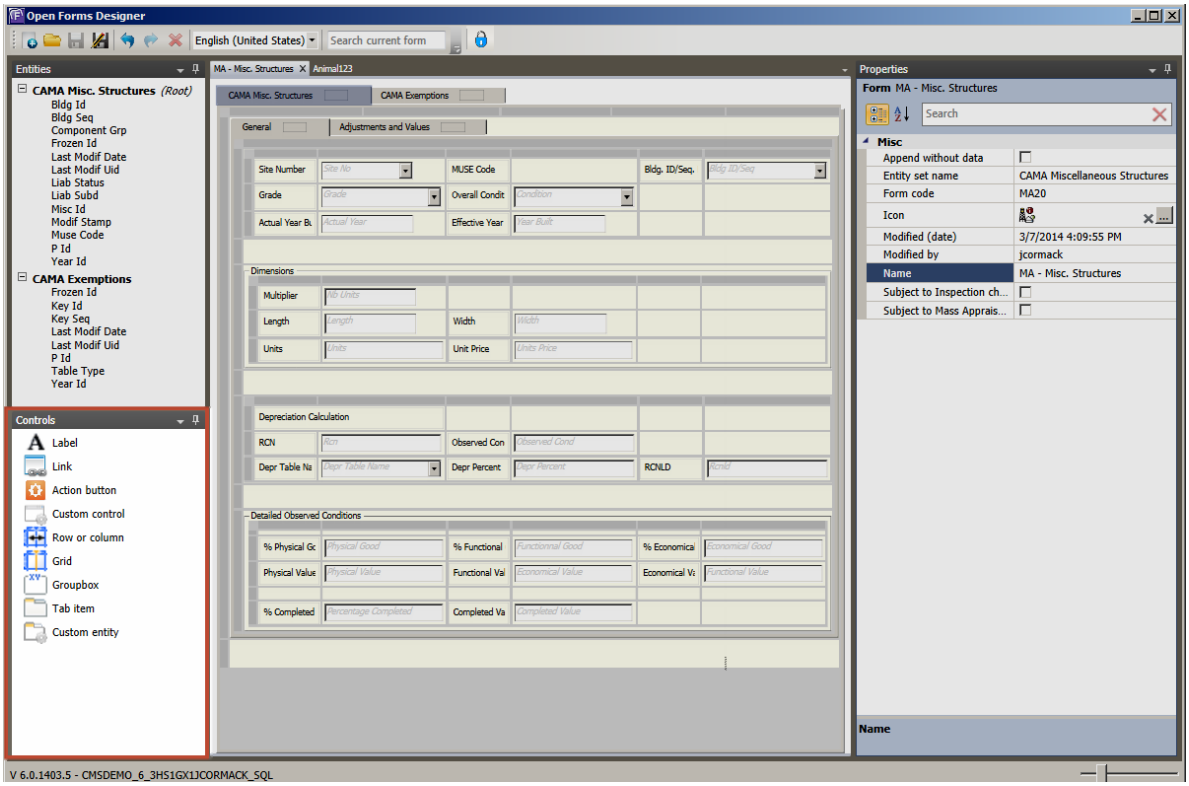
If you expand an entity, you can view the list of the attributes that are not selected for the form.

You can select any of these attributes and add them to the applicable entity in the OFD Editor. *See Creating a Govern User Form on page 33*.

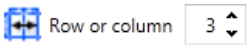
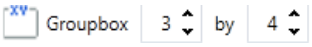
OFD Controls

Overview

The OpenForms Designer includes a series of controls, or design elements, that you can add to a layout. These are listed in the Control Explorer located in the lower left of the interface, by default.



The following table presents a brief overview of the OFD Controls. To use an OFD control, select it in the Controls Explorer and drag and drop it into position in the OFD Editor:

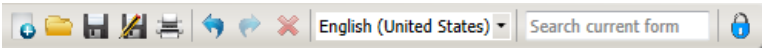
Control	Description
	Labels are used to describe the attributes or other items on the form. They are automatically added when you create a form or add an entity to an existing form. If you add attributes manually after the form is created, you need to add the labels separately.
	Add a link to open a Govern user form, a query, the QueryTool, GISView, a report, or a command.
	Add a grid as a frame for a group of fields or other items on the form.
	Add any number of Rows or Columns anywhere on the form, including inside another control, such as a grid, groupbox, or tab.
	Add a Groupbox to group fields or other items together. A groupbox is a grid with a frame around it and a label above it.
	Add a Tab to a series of tabs to separate similar items. Each tab includes a grid. You can add action buttons to a tab within an entity.
	Add a Custom entity. This control is reserved for use by Harris Govern.
	Add a Custom Control in order to perform customized actions.
	Add an Action Button to add an action button or action to the entity. The action can be performed manually when the user clicks the button or automatically, associated with the New, Save, or Delete button. Note: Standard Windows functions such as save, delete, and create are added by default. Other actions are specific to a form and are added through the Controller.

For more information about using the controls, see Adding Controls and Layout Items on page 50.

OFD Title Bar Icons

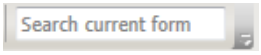
Overview

This section describes the OpenForms Designer icons, located at the top left of the interface.



The following table provides a brief description of each icon:

Icon	Description
	Click the **Create a New Form** icon to create a new model or user data entry form for Govern OpenForms.
	Click the **Open a Form** icon to open an existing form. The existing forms are listed in a separate window. Also, if you want to Delete a Form, click on this icon and delete the form from the secondary window.
	Click the **Save** icon to save the current form or new modifications.
	Click the **Save As** icon to save a copy of the active form.
	Click the **Undo Multiple Actions** to return to the previous state, before the last action. For example, if you added a control that you don't want, click this icon to remove it. You can click this icon multiple times if you want to reverse multiple actions.
	Click the **Redo Multiple Actions** to repeat an action that you deleted or removed with Undo icon. For example, if you removed an attribute an attribute that you want, click the Redo icon to add it back. You can click the Redo icon multiple times to repeat all the actions.
	Click the **Delete** icon to remove the selected item from the form. You can delete multiple items using the [`Shift`] and [`Ctrl`] keys on your computer keyboard.

Drop-down Lists	Description
	Expand the **Culture** drop-down list to change the culture to Canadian English, US English, or Canadian French.
	Enter text in the **Search** text box and click the [`Enter`] icon to locate and highlight a label, an attribute, or any text on the current entity. If the entered text is not found, the text box turns red. 
	Click the **Security** icon to define permissions for the entity and the controls. Permissions are defined by Type (Normal or Alternative), Profile, and Role or User.

Creating a New Form

Overview

The OpenForms Designer is used for creating the user forms for Govern OpenForms. These user forms are based on the business models created in the Business Entity Designer.

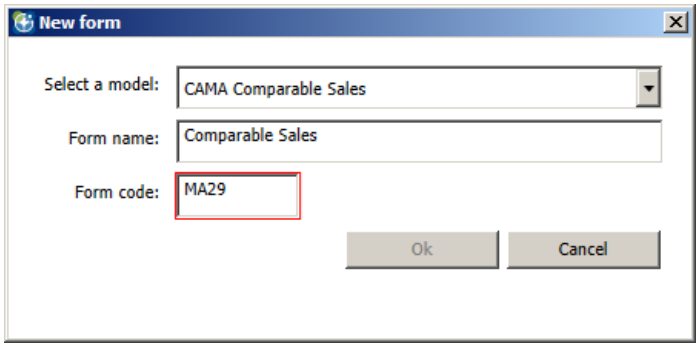
When you create a new user form, you need the following information.

- Name of the business model created in the BED.
- Name that you want to give to the form.
- Code that you want to use for the form. It is recommended to use the codes created by MS Govern.

To begin:

1. Click the **New** icon .

   The *New Form* window appears:



   The required fields are outlined in red before they are completed. *For details, see Creating a Govern User Form on page 33*.

Opening an Existing Form

Overview

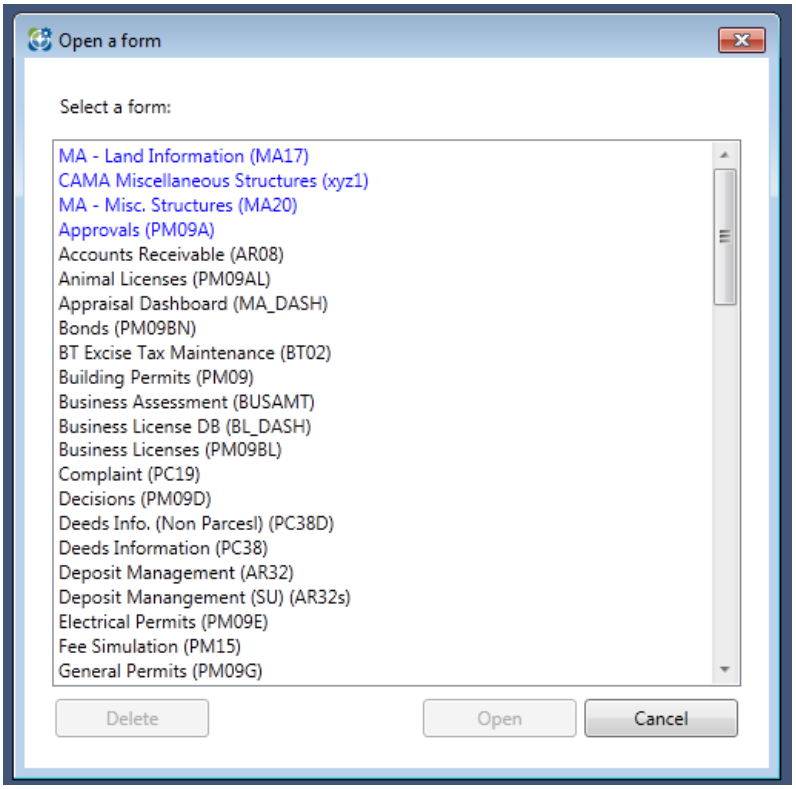
You can open an existing form and make any number of modifications to it. As you make updates and changes, you can view the results in Govern in real time.

You could also create a copy of a form if you want to test a layout without affecting the existing form.

To begin:

1. Click the **Open** icon .

   The **Open a Form** window appears.



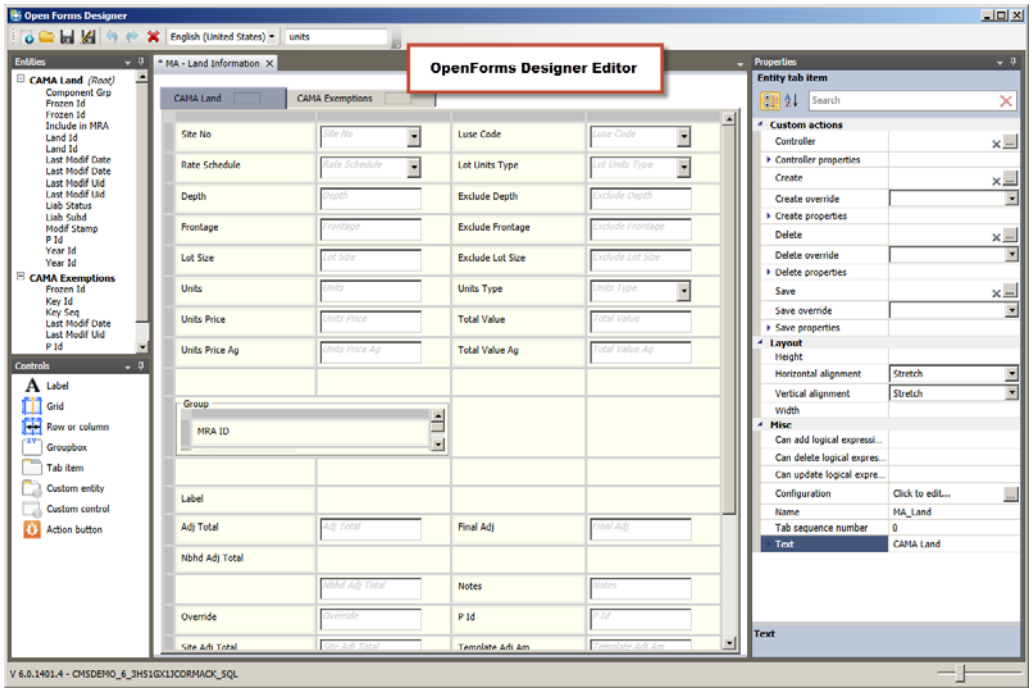
   All the forms previously created in the OFD are listed.

The forms that you worked on most recently are highlighted in blue and listed in chronological order, according to the last time that they were modified. This makes it easier to find the form you need.

All other forms are listed in alphabetical order by name. The name is assigned by the person who created the form.

2. Select the form that you want to modify.
3. Click **Open**.

   Your form is displayed in the OFD Editor.



The OFD Editor is displayed in the center of the interface. Each entity in the form has a separate tab, across the top. The root entity is displayed in the leftmost position.

The Entities pane lists all the entities added to the form. The unused attributes–those not added to the form–are listed under each entity.

The available controls are listed in the lower left. The properties for the form are listed on the right.

See Adding Controls and Layout Items on page 50.

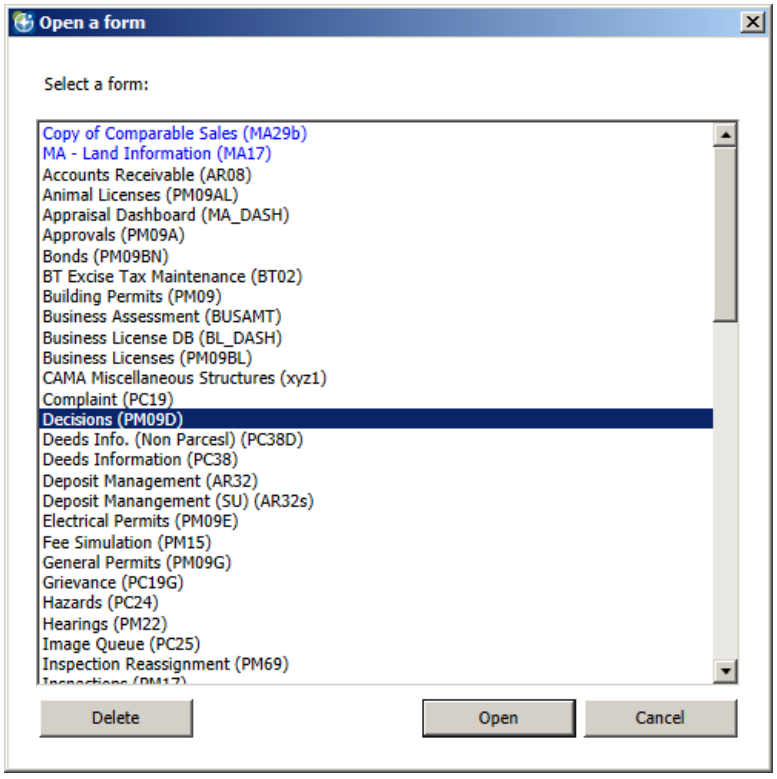
Deleting a Form

Overview

Use the following procedure to delete any form that was previously created in the OpenForms Designer. Forms are deleted from the Open a Form window.

To delete a form:

1. Click the **Open** icon to display the *Open a Form* window.



2. Select the form that you want to delete.

   You can select multiple forms using the `[Shift]` and `[Ctrl]` keys on your keyboard.

3. Click the **Delete** button.

   A warning message is displayed.

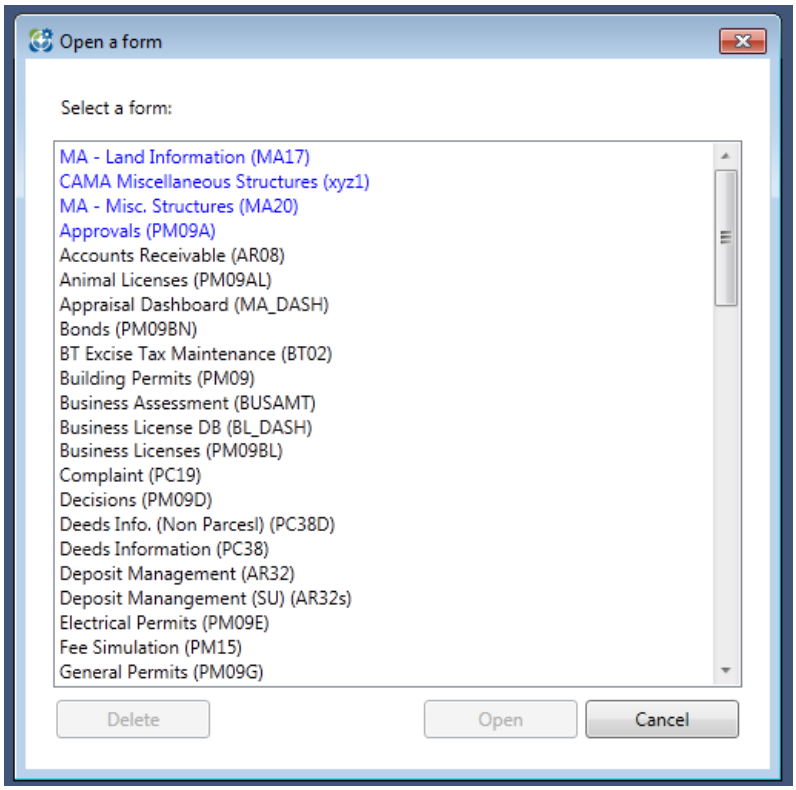
4. Click **Yes** to continue.

Saving the Current Form

Overview

Click the **Save** icon to save the current form or any modifications made to the form.

When you open the Open a Form window, the form that you saved most recently appears at the top of the list and is highlighted in blue. This makes it easy to pick up where you left off.



Note: If a form is displayed at the top of the list in blue, it is not displayed with the other forms in black.

The forms created in the Govern OpenForms Designer are saved to the VT_USER table, TABLE_NAME.FORM, by code, long, and short description.

You can also view the list of OFD forms in the User Validation Editor in Govern New Administration (GNA). Select **Special** under **Table Type**. Then, select **FORM** and click **Codes**.

You can modify the name, or the short, long, or full descriptions in English or French. You cannot modify the code.

Saving a Copy of the Form

Overview

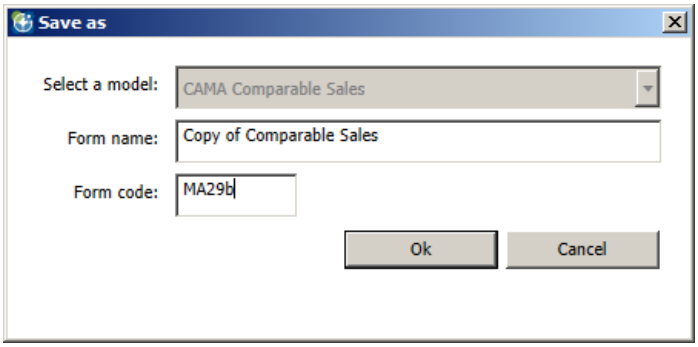
Use the **Save as** icon to save a copy of the current form.

When you are setting up your user forms, it is recommended to make copies of the standard forms. Then, add, change, or delete attributes as required. Also, saving a copy of a form can be can be useful if you want to create two forms that are based on the same business model but have different purposes. For example, you could have you could save a copy of a long CAMA or Land Management form for use in the field on a mobile. Remove the attributes that are not required in the field.

To begin:

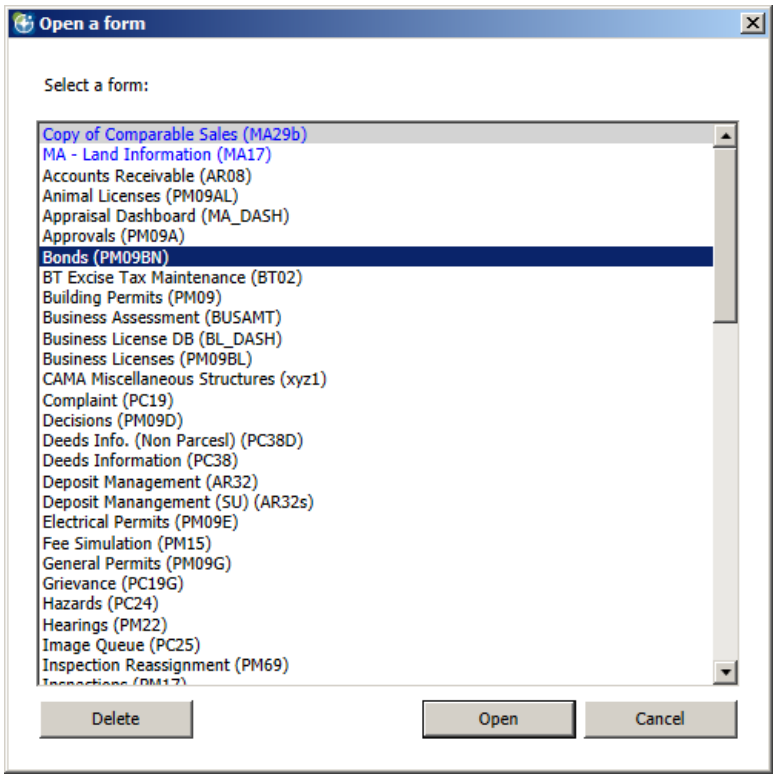
1. Launch the OpenForms Designer.
2. Open the form that you want to copy.
3. Click the **Save as** icon .

   The Save as form is displayed.



   The **Select a model** field is disabled.
4. Enter a new name in the **Form name** text box or accept the default.
5. Enter a unique code for the model in the **Form code** text box.
6. Click **OK**.

Your new form is saved to the top of the list in the *Open a Form* window.



This makes it easy to open the form again and continue to work on it.

Undo / Redo Multiple Actions

Overview

The OpenForms Designer includes a Multiple Undo and a Multiple Redo tool. These tools are applicable to actions performed in the OFD Editor.

Undoing Multiple Actions

Click the **Undo Multiple Actions** icon  to reverse your last action. For example, if you added a label that you do not want, click this icon to remove it. You can click the Undo icon multiple times if you want to reverse multiple actions. You can continue to use this tool to reverse actions, even after the entity was saved, up until the time that the form was opened.

You can also undo items, using the standard Windows shortcut `Ctrl + Z`.

Actions that Can Be Undone

All actions, or modifications, made in the OFD Editor, during the current session, can be reversed with the Undo feature. Examples include:

- Adding or deleting an attribute to or from an entity.
- Adding or deleting control to or from an entity.
- Any action that was performed after the form was opened, even if the form was saved multiple times.

Actions that Cannot Be Undone

Actions, or modifications, made outside the OFD Editor, or outside the current session, cannot be reversed with the Undo feature. Examples include:

- Saving a form.
- Deleting a form.

Redoing Multiple Actions

Click the **Redo Multiple Actions** icon  to recall the last action that you reversed with the **Delete** or **Undo** icon. For example, if you deleted a label that you really want, click the Redo icon to add it back to the entity. You can click the Redo icon multiple times to repeat all the actions that you undid in the correct session.

Actions that Can be Redone

All actions, or modifications, that were undone by clicking the Undo or Delete icons can be redone.

Actions that Cannot be Redone

Actions, or modifications, made outside the OFD Editor, or outside the current session, cannot be reversed with the Redo feature. Examples include:

- Changing a property in the Properties Explorer, if that property was closed.
- Saving or deleting a form.
- An action that was undone before the form was closed and reopened.

Deleting an Item

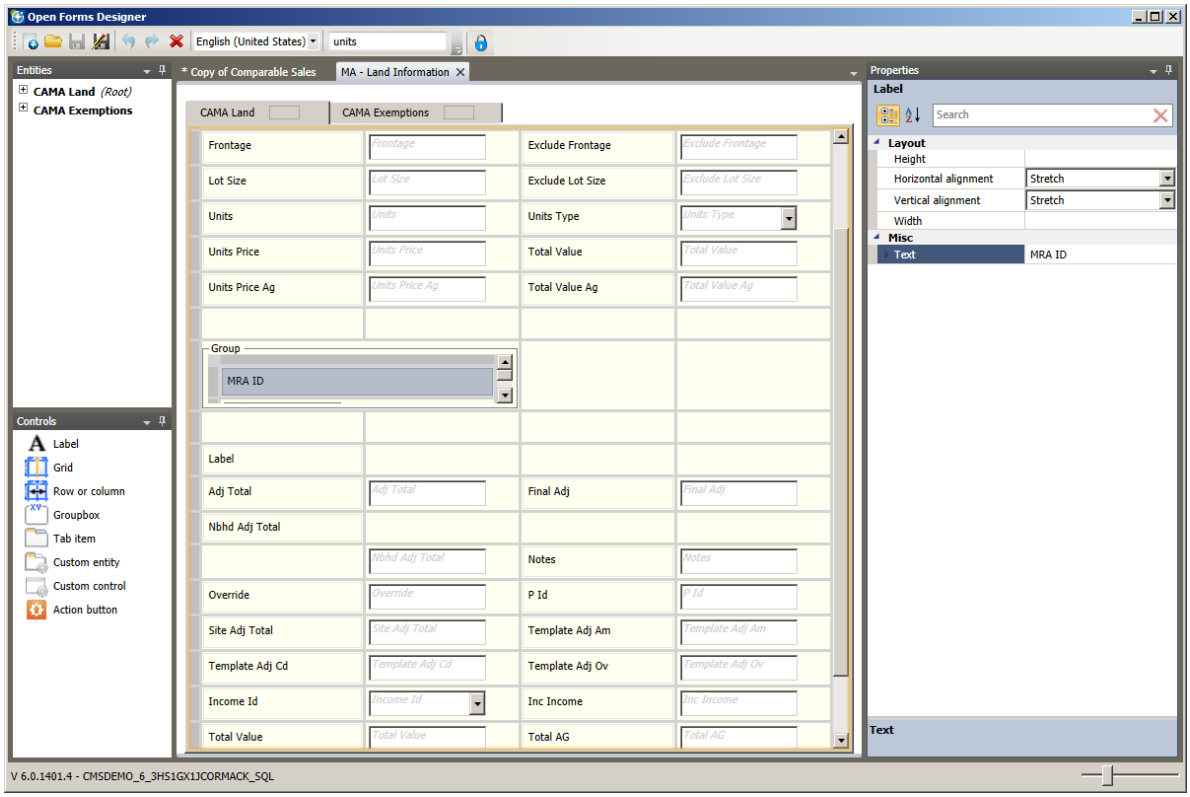
Overview

The OpenForms Designer includes a **Delete** icon ✖ at the top of the interface.

The icon has the same functionality as the [`Delete`] key on your computer keyboard.

You can delete any item that is selected in the OFD Editor from the form, including the entities. To delete an entity, select the corresponding tab at the top or the form.

Note: The root entity cannot be removed from the form in the OFD.



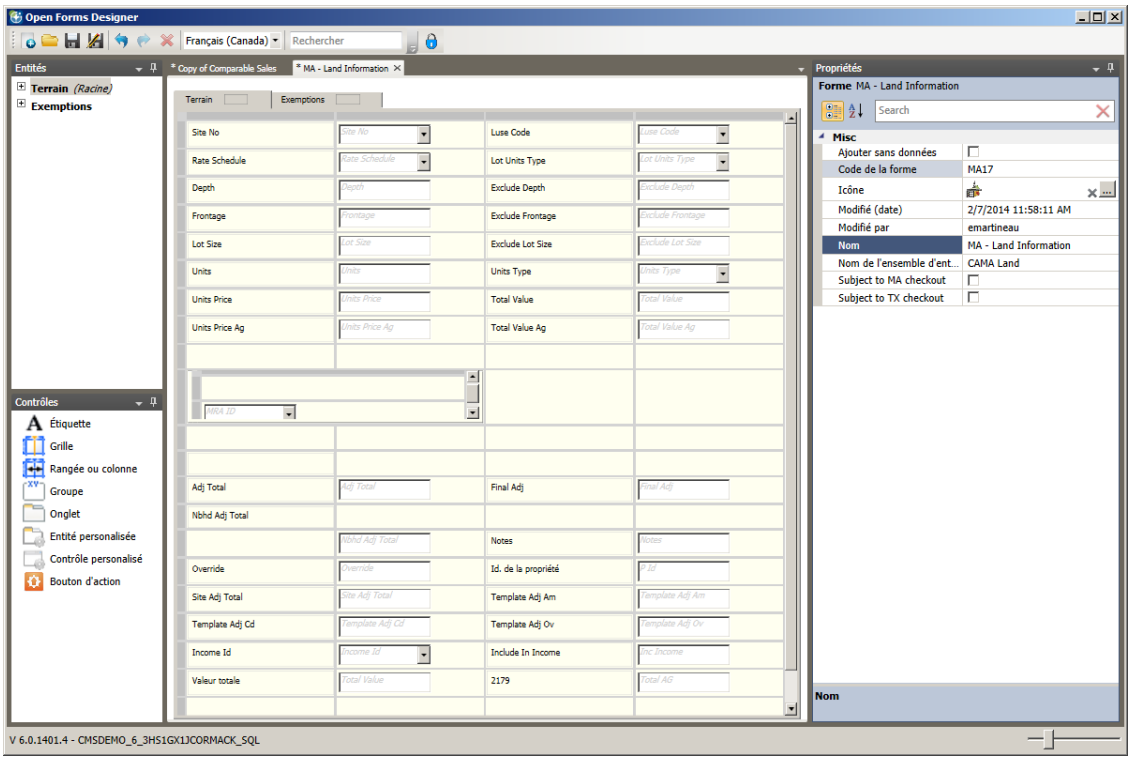
It is not enabled for items in the Property Explorer.

Changing the Culture

Overview

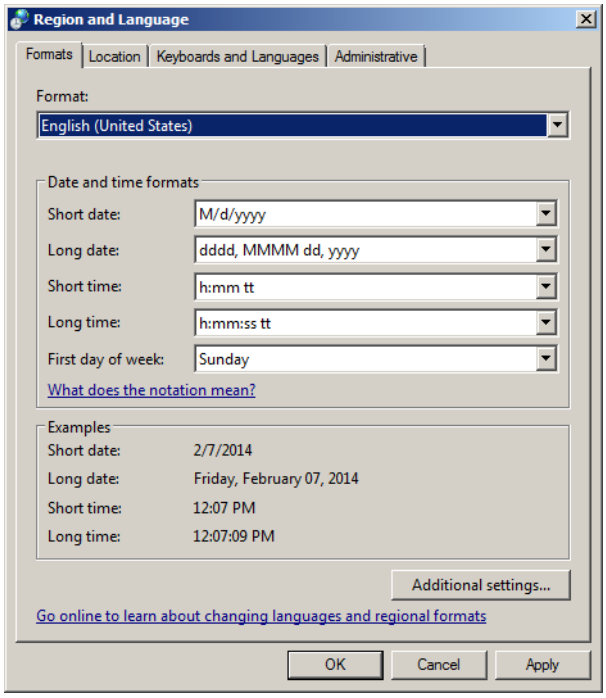
The OpenForms Designer includes a drop-down list for changing the culture. In the default version, there are three choices: English (United States), English (Canada), and Français (Canada).

The following screenshot shows the OpenForms Designer in French (Français). Note that the labels are as assigned in the Property Explorer.



The culture includes the language and the Windows Regional Settings. For the language, there are two choices: English and French (Français). These are taken from the OpenForms Resource files. These files are included in the deployment. The Windows Regional Settings can be viewed and / or modified from Windows Control Panel. They include the date, time, and currency formats.

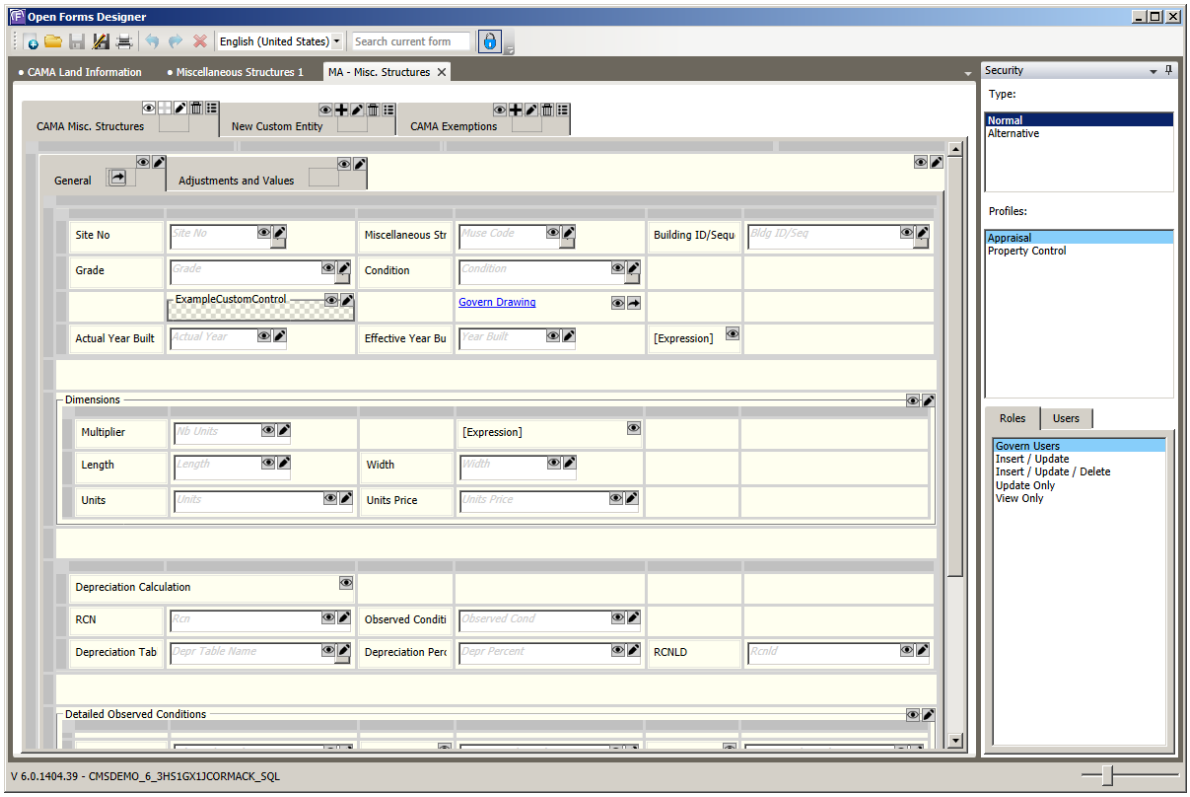
The following screenshot displays the Windows Regional Settings for American English.



Security Permissions

Overview

You can define the security permissions directly in the OpenForms Designer (OFD) when you are creating the form. Permissions are set by Type, by Profile, and by Role or User.



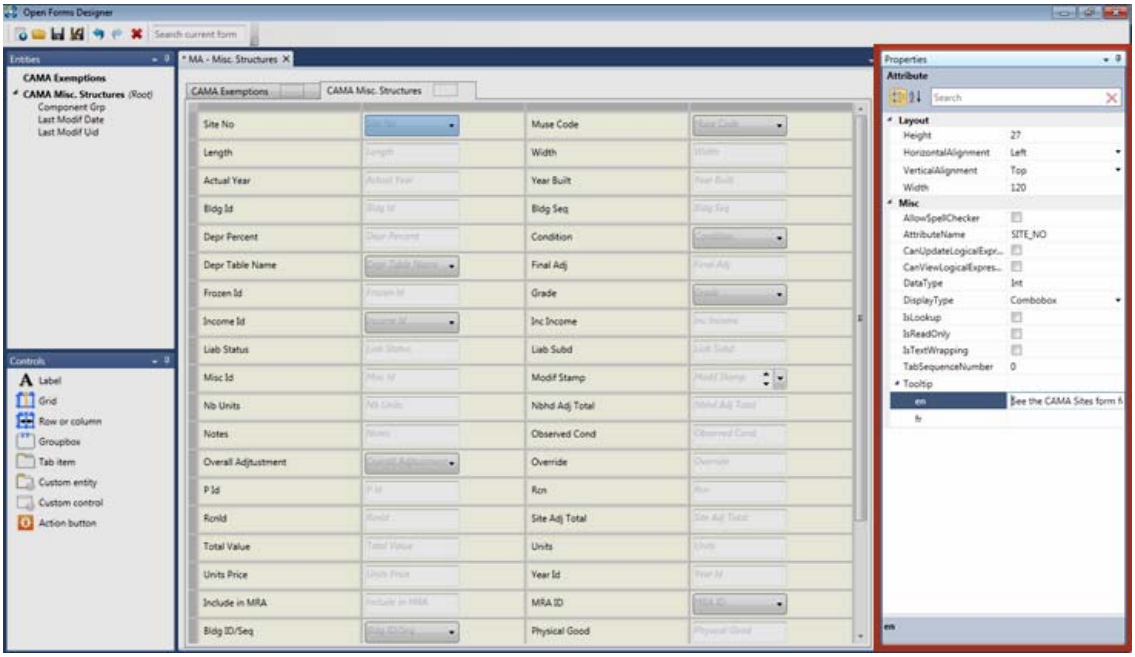
For details, see Security in the OpenForms Designer on page 200.

Defining Properties

Overview

The OpenForms Designer Properties window provides details about the entity, the attributes, and all other items added to the form.

You can perform a search to easily locate an OFD property.



For further details, see Defining the Properties on page 161.

Chapter 2: Creating a Govern User Form

Overview

The OpenForms Designer is used for creating the user forms for Govern OpenForms. These user forms are based on the business models created in the Business Entity Designer.

This chapter provides the procedures for the following:

- Creating a New User Form on page 34
- *Setting Up an Entity on page 37*
- Saving a Copy of a Form on page 48

Prerequisites

The first step in the process is to create the business models, entities, and attributes in the Govern Business Entity Designer (BED). Ensure that the following requirements are in place before beginning:

- Govern 6 deployment
- Govern 6 database
- Required business models, entities, and attributes
- The root entity is designated.
- Links are created between the entities and between tables.

Refer to the Govern Business Entity Designer guide for details about setting up business models and entities.

Creating a New User Form

Overview

When you create a new Govern user form in the OpenForms Designer, you assign a name and a code to the form. Then you select the attributes to display on the root entity.

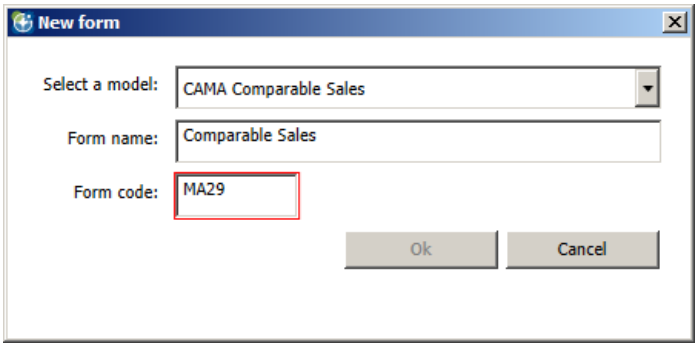
Before beginning, ensure that you have the following information:

- Name of the business model created in the BED
- New name for the form you are creating
- Unique code to identify the form
- List of the attributes that you want to display on the Root Entity.
- The order that you want to display the attributes

To begin:

1. Launch the Govern OpenForms Designer.
2. Click the **New** icon  at the top of the interface.

   The *New Form* window appears:



   The required fields are outlined in red.
3. Expand the **Select a model** drop-down list.

   All the business models created in the Business Entity Designer are listed.
4. Select a business model.
5. Enter a name for the form in the **Form name** field.

   This name appears in the Forms Explorer in the Govern application.

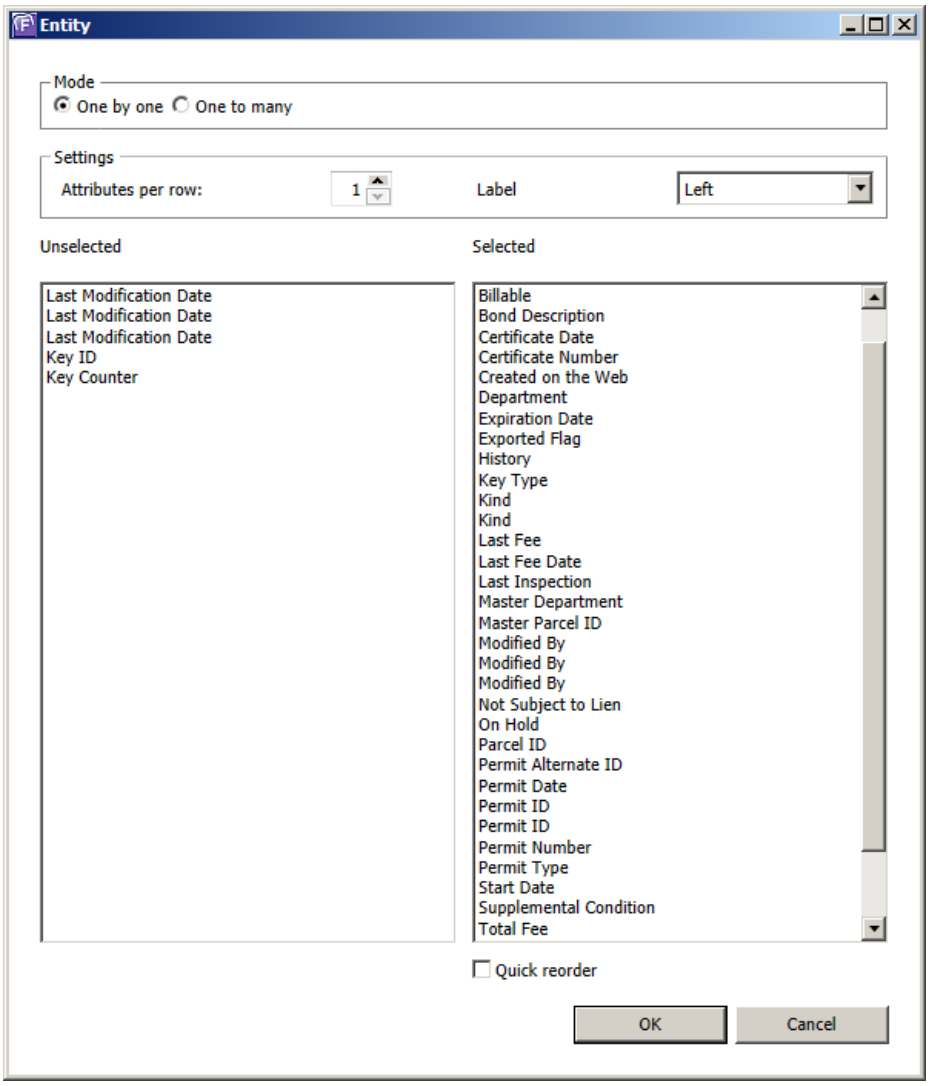
6. Enter a unique code in the **Form Code** field to identify the form in the Govern database.

   If information is missing or if the code is already in use, the applicable parameter is outlined in red and the **OK** button is disabled.

7. Click **OK**.

The new form is saved to the VT_USER table (TABLE_NAME.FORM) by code, long, and short description.

After you click **OK** on the New Form window, the *Entity* window opens. The Root Entity is automatically displayed in this form.



The *Entity* form appears for each entity that you add to the form. It is used for the following purposes:

- Defining the default mode; i.e., one by one or one to many
  For one by one, the default number of attributes per row and the default position of the labels.
- Setting the position of the labels.
- Defining the order for the attributes.

The Entity form appears for the root entity and whenever you drag an undefined entity to the OFD Editor.

Note: If you don't want to set up the Root Entity right away, you can close the entity form. To set up the entity at a later time, select it in the Entities Explorer and drag it to the top of the form. *See Setting Up an Entity on page 37*.

Setting Up an Entity

Overview

This section provides the procedures for the default setup and layout of an entity. Before performing these procedures, it is important to know the following.

- Which Mode: One by One or One to Many
  For One by One Mode: the number of attributes per row and the position of the labels
- Which attributes to include on the user form
- The order of the attributes on the user form
- The position the attributes on the user form

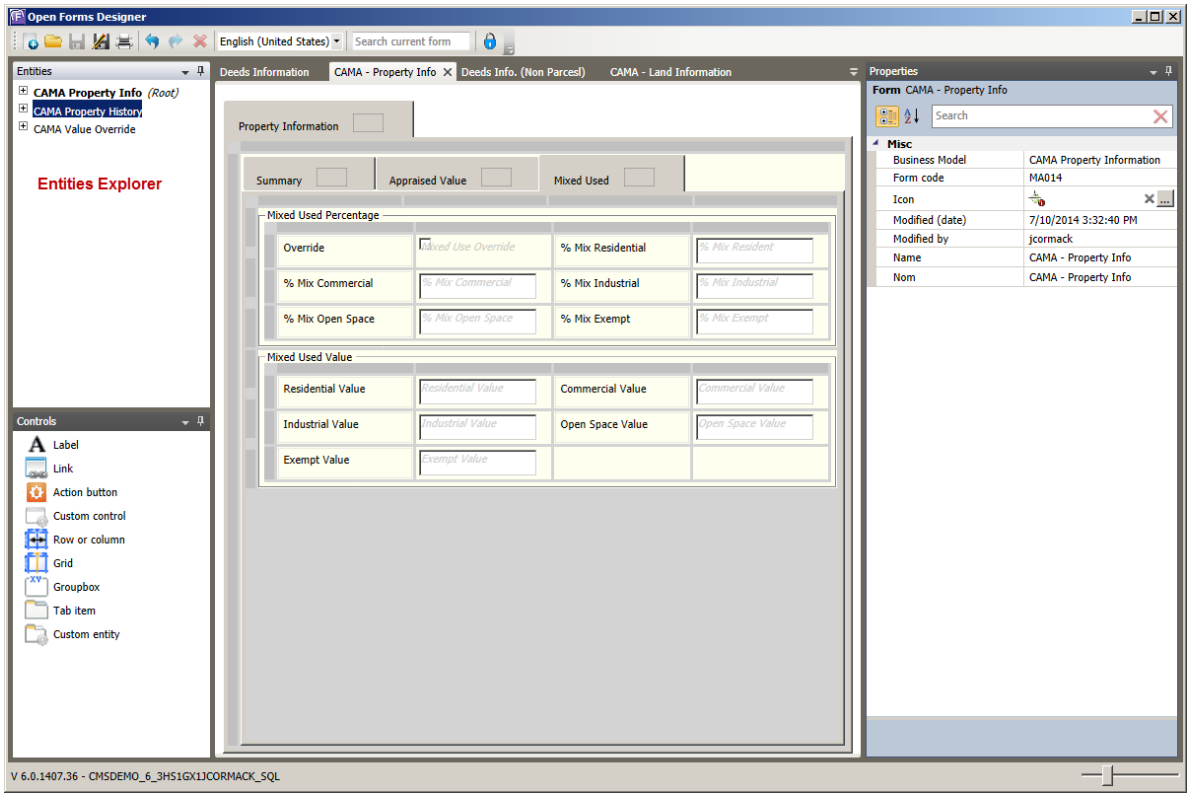
All these are set on the OFD Entity form.

Accessing the Entity Form

Note: The *Entity* form appears only once when you add the entity to the form. Later, you can make changes on the OFD form only.

To access the entity form:

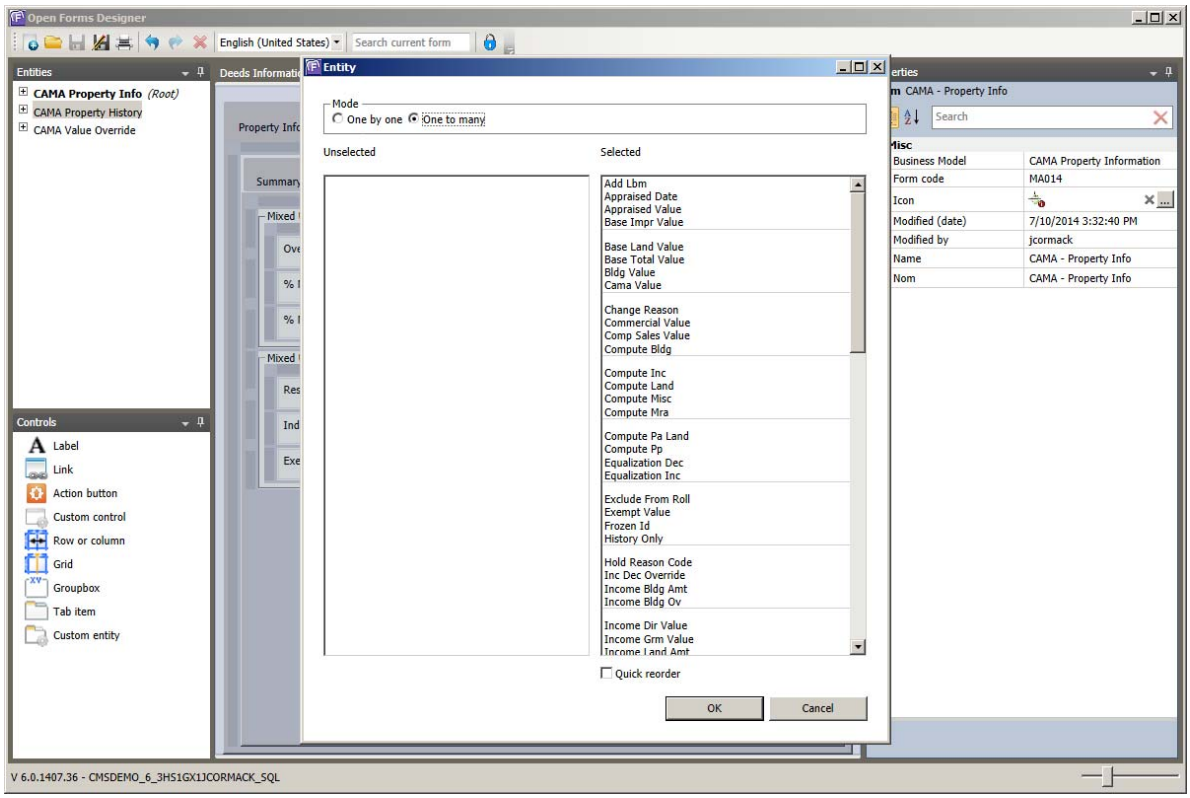
1. Launch the OpenForms Designer (OFD).
2. Open the model that you want to update.
3. All the entities in the model are listed in the Entities Explorer.



4. Select the entity that you want to update and drag it to the top of the form.

   Note: The cursor changes format when the entity is the right position.

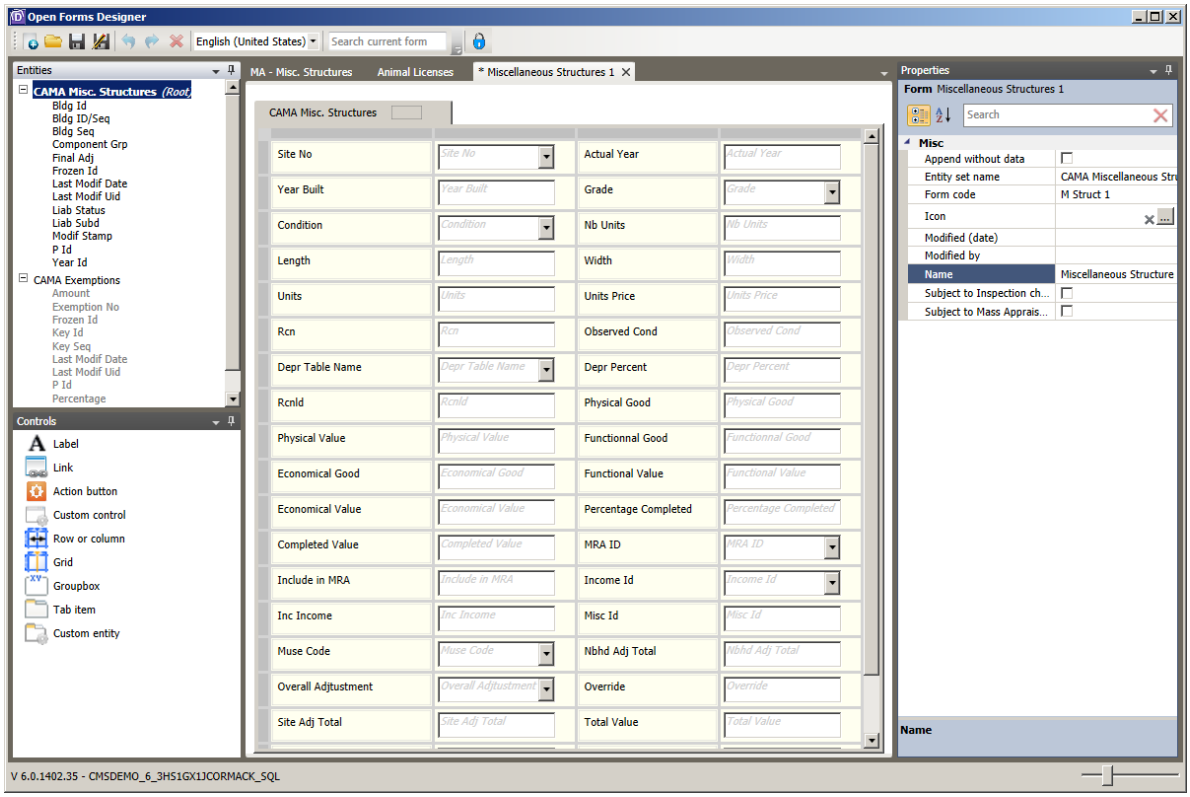
   The *Entities* form opens.



5. Select the mode: one by one or one to many.
6. If you select the one by one mode, define the number of attributes per row and the position of the labels.
7. Select the attributes that you want to display on the form.

   This can be modified later on the OpenForms Designer (OFD).
8. Select the order of the attributes.

   This can be modified later on the OpenForms Designer (OFD).
9. Click **OK**.

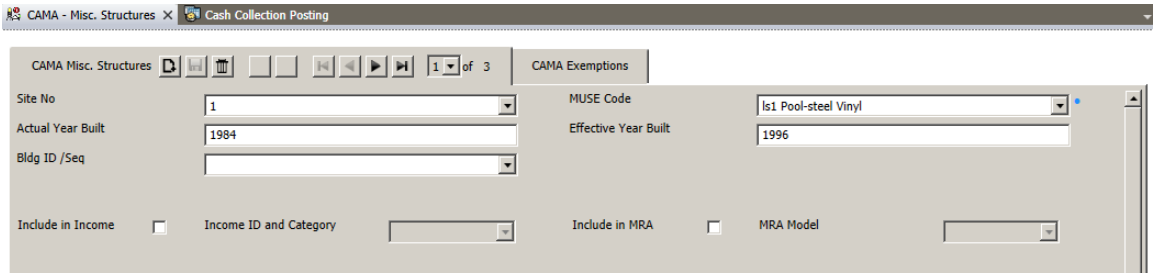


Selecting the Mode

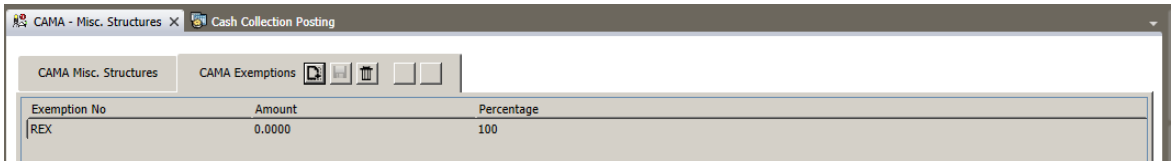
The first step is decide how you want to display the attributes on the form:

Note: The Mode can be selected on the Entity form only.

- **One by one**: This is the most common format. There is one value per field. *See Setting Up an Entity in One by One Mode on page 41*.



- **One to many**: This format is used for displaying multiple values per field. Attributes are listed in columns. *See Setting Up an Entity in One to Many Mode on page 45*

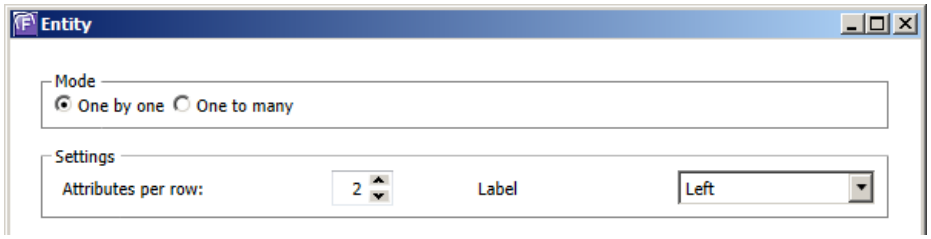


Setting Up an Entity in One by One Mode

In one-to-one mode, you need to set the following:

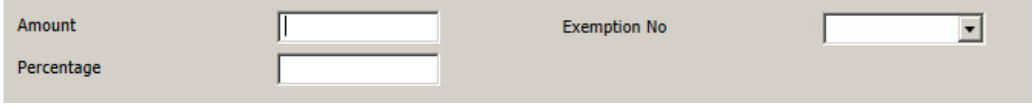
- Number of attributes per row
- Position of the labels
- Attributes to include on the form
- Position of the attributes on the form

After selecting One by One Mode, the next step is defining the number of attributes that you want to show on each row and where you want to position the labels.



Attributes per row: The first parameter at the top of the form is used for specifying the number of attributes per row. The default is two.

If you use the default setup with the labels on the left, four columns are created in the OFD Editor grid: two for the attributes and two for the labels corresponding to the attributes, as illustrated in the following screenshot:



Use the up and down arrows to increase or decrease the number of attributes that appear on the form.

Tip: The number entered in this parameter is used for the default. If you want more than two attributes per row for a specific group of fields, you can add a grid or groupbox later to the OFD Editor.

Label: Select one of the following options

- **None**: to create fields without labels.
- **Left**: to add labels to the left of the attributes.
- **Top**: to add labels above the attributes.

The option selected is used for the default. You can add, delete, or reposition labels, later, on the OFD Editor.

Selecting the Attributes for One by One Format

All the attributes that appear in the Selected column on the Entity form, appear on the user form. The next step is to move the attributes that you do not want to display on the form to the Unselected column.

Moving an attribute to the Unselected column does not remove it from the entity, it only removes it from the display.

Selected / Unselected: At first all the attributes are listed in the **Selected** column. Select the attributes that you do not want to display on the form. Drag them from the **Selected** to the **Unselected** column.

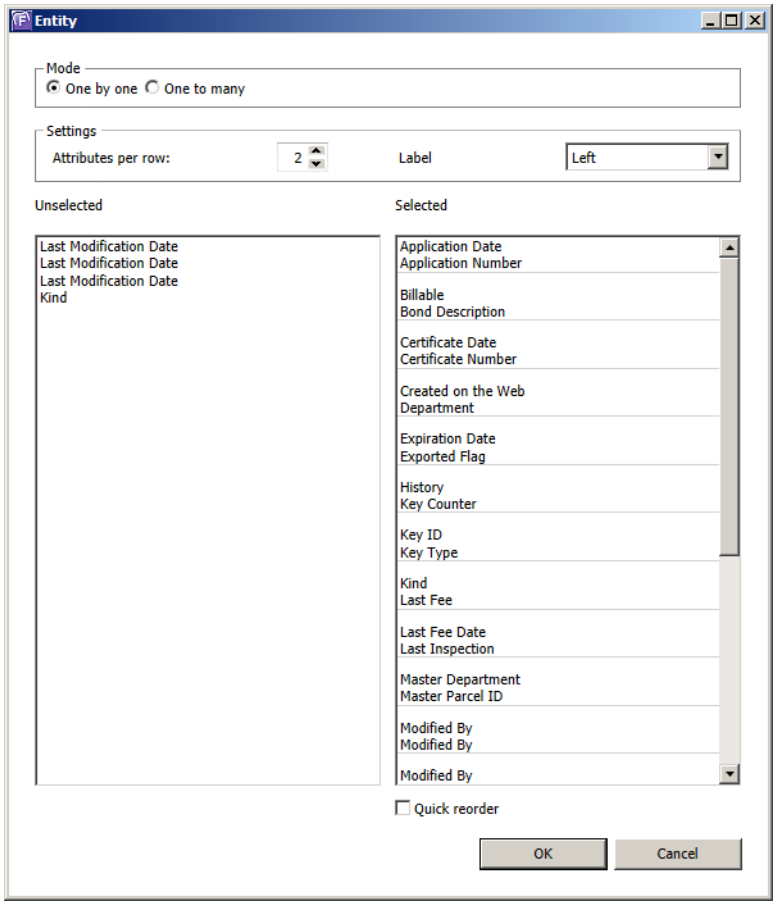
Note: You can drag and drop multiple attributes at the same time.

Defining the Order of the Attributes

You can use the *Entities* form to set up the default order for displaying the attributes. You can modify the order later on but it is easiest to set the default order on the Entities form.

Positioning the Attributes: The order that the attributes are listed in the Selected column is the order that they appear on the Govern user form. Set up the attributes in the best order to facilitate data entry.

Rules are displayed on the Entity form to show how the attributes are displayed by row. For example, in the following screenshot, two attributes are displayed on each row. A rule is displayed under each pair of attributes.

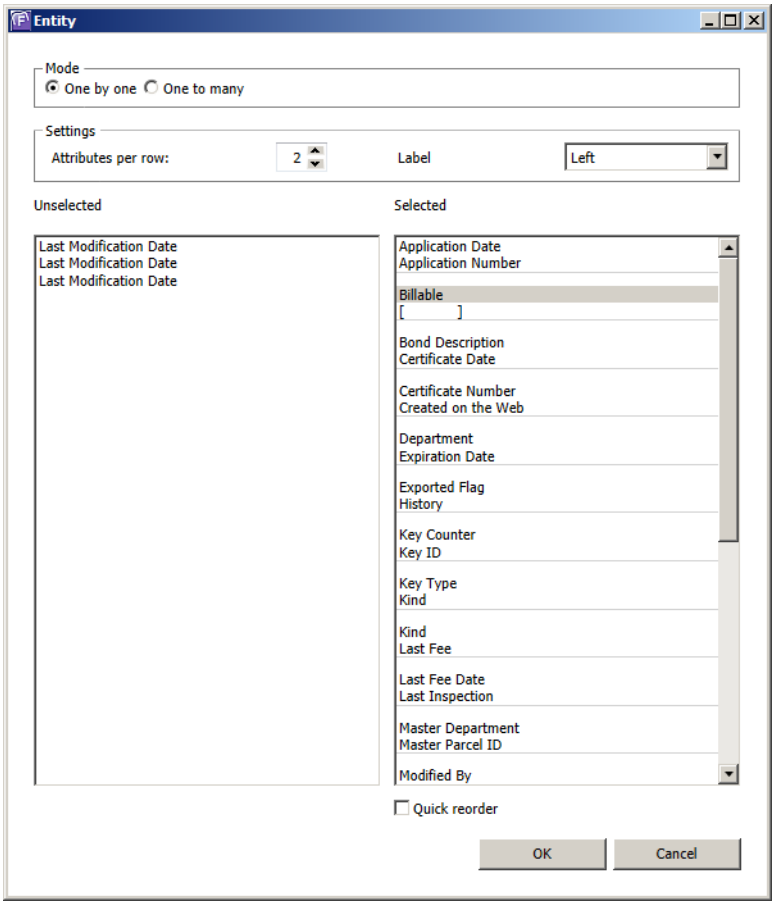


Note: You can reposition attributes on the OpenForms Designer editor, but it is easier to do on the *Entity* form.

Displaying One Attribute per Row: If you want to display only one attribute per row or if you would like at add an extra line between attributes, add a blank space using the `[Enter]` key on your keyboard.

To add a blank space:

1. Select an attribute.
2. Hit the `[Enter]` key on your keyboard.



3. Click **OK**.

The blank space is added after the selected attribute.

Quick Reorder

Quick Reorder: Use the **Quick reorder** option to automatically move the attributes into the required position instead of dragging and dropping each one into place.

To move an attribute with the Quick Reorder:

1. Select the **Quick Reorder** option.
2. Select the attribute that you want to move.
   - The first attribute that you select is moved to the top of the Selected column.

- The next attribute is moved directly underneath the first.
- The third is moved directly underneath the second, and so on.

3. Click **OK**.

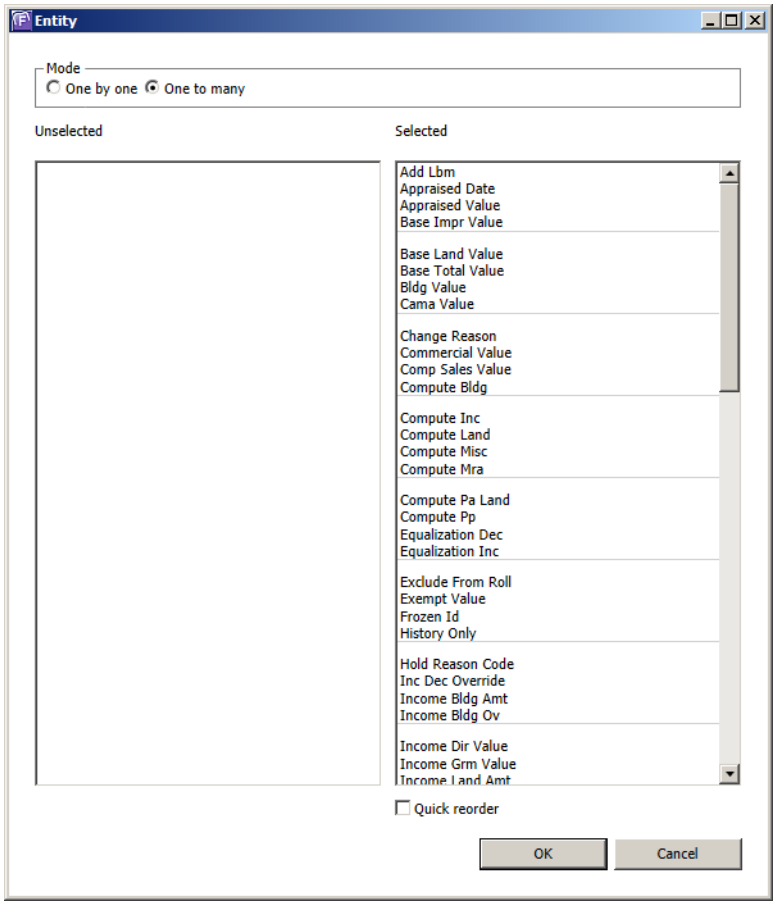
Setting Up an Entity in One to Many Mode

When you set up an entity for one to many format, you need to select the:

- Attributes to include on the form
- Position of the attributes on the form

Selecting the Attributes for One to Many Mode

As with the One by One Mode, all the attributes that appear in the Selected column on the Entity form, appear on the user form.



After selecting the One to Many Mode, the next step is to move the attributes that you do not want to display on the form to the Unselected column.

Moving an attribute to the Unselected column does not remove it from the entity, it only removes it from the display.

Selected / Unselected: At first all the attributes are listed in the **Selected** column. Drag the attributes that you do not want to display on the form from the **Selected** to the **Unselected** column.

For example, you would could move the Last Modification Date and User ID attributes to the Unselected column in order to hide them from view.

Positioning the Attributes on the Form

Positioning the Attributes: In One to Many Mode, the attributes are positioned across the top of the form as column headings. The order that the attributes are listed in the **Selected** column is the order that they appear on the Govern user form. By default, they are listed in alphabetical order. You can modify the default order, as required.

Tip: Set up the attributes to correspond with the order that the users would enter the data.

Quick Reorder

Quick Reorder: Use the **Quick reorder** option to automatically move the attributes into the required position instead of dragging and dropping each one into place.

To move an attribute with the Quick Reorder:

1. Select the **Quick Reorder** option.
2. Select the attribute that you want to move.
   - The first attribute that you select is moved to the top of the Selected column.
   - The next attribute is moved directly underneath the first.
   - The third is moved directly underneath the second, and so on.
3. Click **OK**.

Saving a Copy of a Form

Overview

You can save a copy of a form if you need a form that is based on the same business model as another.

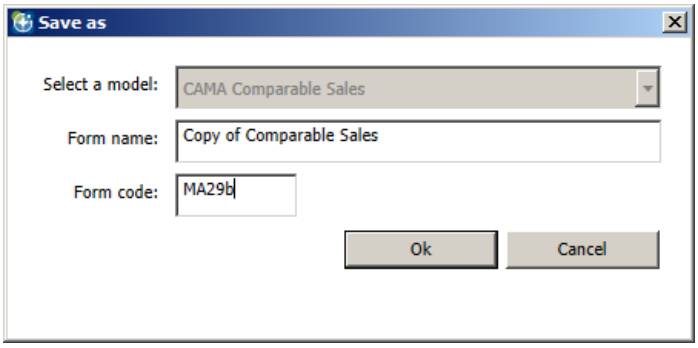
This could be useful for *mGovern – Your Mobile Solution*. For example, you could create a shortened version of one of the longer CAMA forms. An appraiser in the field does not necessarily need all the attributes as the appraiser in the office.

Note: The copy of the form is based on the same business model as the original form. You can remove entities or attributes, but you cannot add any that do not exist in the business model in the BED.

To save a copy of a form:

1. Launch the OpenForms Designer.
2. Open the form that you want to copy.
3. Click the **Save a Copy** icon

   This opens the *Save As* dialog box.



   The **Select a Model** field is disabled. The name of the active model is automatically entered in this field.

   The default name for the duplicated form begins with **Copy of** and is automatically entered in the **Form Name** field.

4. Change the name of the form in the **Form Name** field if required.

5. Enter a unique combination of alphanumeric characters to identify the duplicate form in the **Form Code** field.

   Tip: You may want to base the new Form Code on the code for the form you are copying and add an extra character, such as a *b*.

6. Click **OK**.

Chapter 3: Adding Controls and Layout Items

Overview

After adding the root and child entities to your new form as described in *Chapter 2: Creating a Govern User Form on page 33*, you can refine the layout for each entity on the form.

You can also use the procedures in this section for updating your layouts. The following topics are described.

Prerequisites

Before creating end user forms on the OFD Editor, you need to set up your business models in the Govern Business Entity Designer (BED). One entity within each business model must be designated as the Root Entity.

When you create a new form, the root entity is automatically added to the OFD Editor. From there, you can drag the child entities onto the OFD Editor. During these steps, you can specify the attributes that you want to appear on the form and the order in which you want them to appear. *For details on these steps, see Chapter 2: Creating a Govern User Form on page 33*.

Overview of the OFD Editor

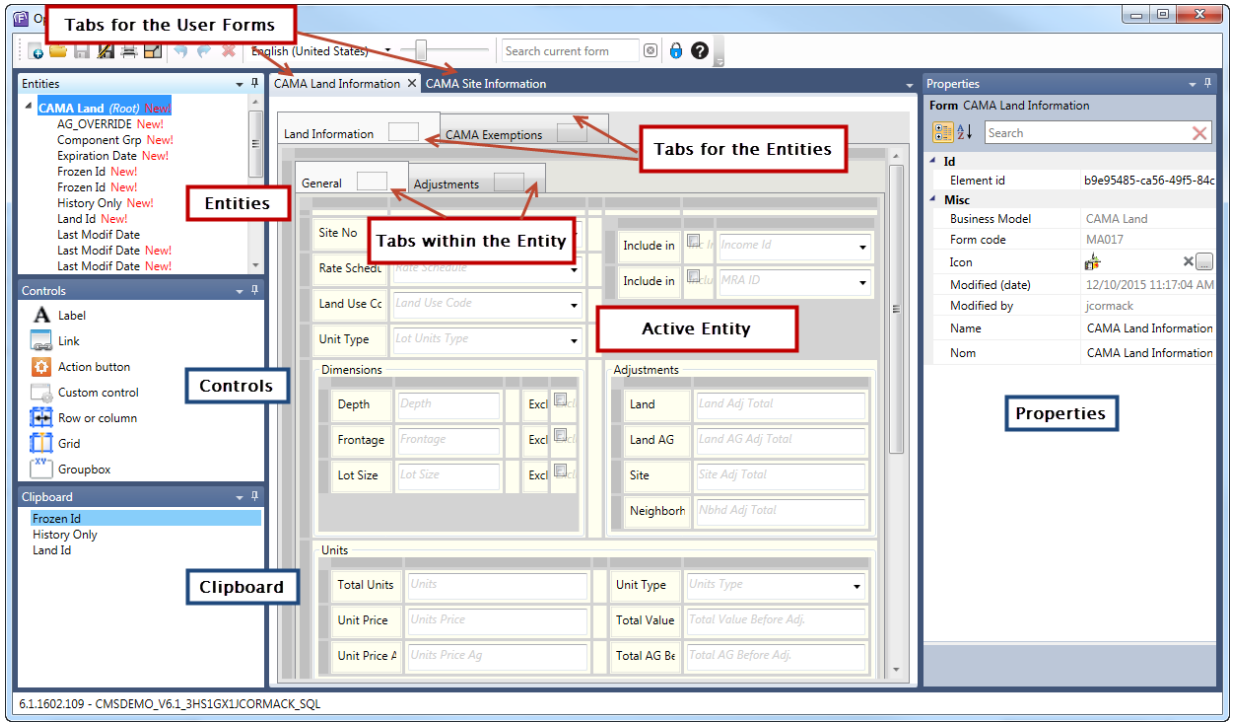
Overview

The OFD Editor is located in the center of the OpenForms Designer, by default.

To begin:

1. Launch the Govern OpenForms Designer.

2. Click the **Open** icon and open the form that you want to modify, if it is not already in the OFD Editor.



If user forms are already open in the OpenForms Designer, a separate tab is displayed for each across the top of the interface.

3. Open the entity in the form that you want to update.

The selected entity opens in the OFD Editor. This is the current or active entity.

A vertical scrollbar appears on the right of the editor if more space is required to show everything on the form. A magnification bar appears in the toolbar at the top of the interface. This is used for zooming in and out on the OFD Editor. It could be helpful if you want to zoom in on a link or groupbar for a demonstration.

If you have just added an entity to the form, the attributes and labels are listed in the number of columns set on the Entities form. The text on the labels is the same as the names of the attributes.

The layout for each entity is based on a grid. Each item takes up an entire cell within the grid, whether the item is an attribute or a control, such as a label, link, or groupbox.

Note: The label and the attribute that define a user data entry field are considered separate items. Each one requires a separate cell in the grid. Each has separate properties.

The first step is to ensure that all the attributes that you want to display on the entity in Govern appear in the OFD Editor. If you expand the entity in the Entity Explorer, located on the left of the OFD Editor, you can view all the attributes that were not selected on the *Entities* form.

Adding Margins

Overview

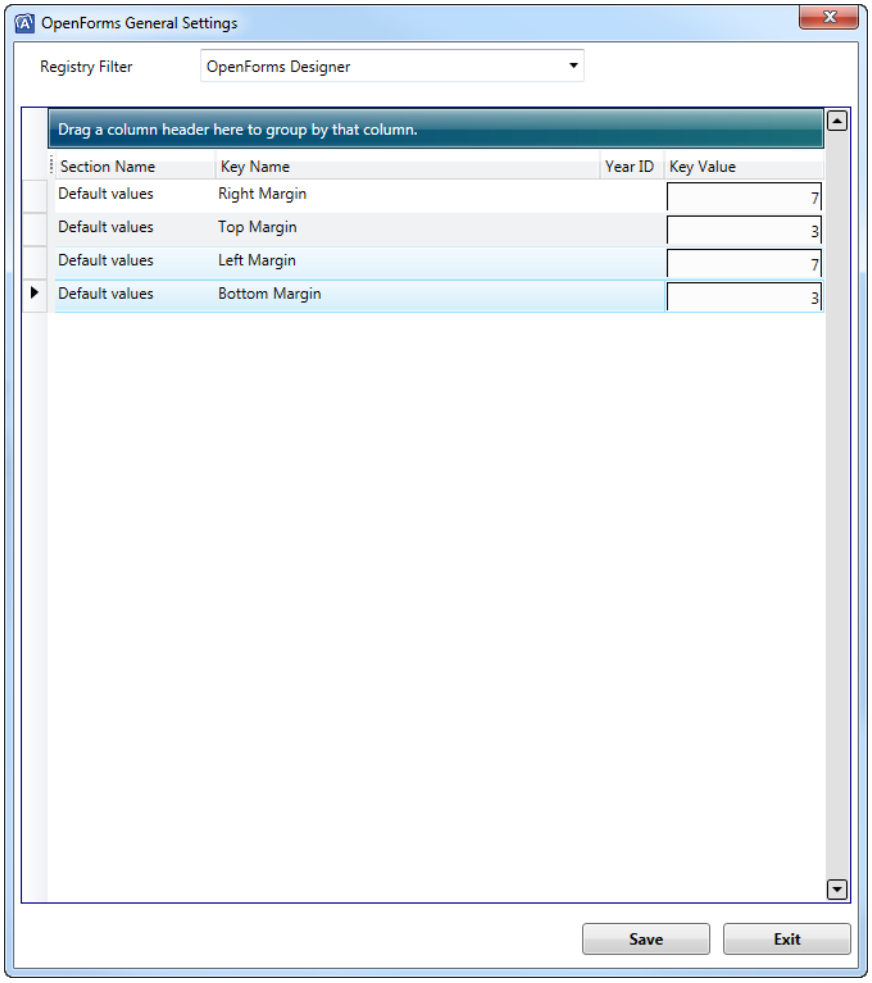
Before adding individual items to a form, use the following procedure to define the default margins to apply to all items on every form. This ensures consistency across all your user forms.

Defining Default Margins

Default margins are set up in GNA. They apply to all the items that you add to the forms.

To set up default margins:

1. Launch GNA.
2. Select **General Settings Editor** > **OpenForms General Settings**.
3. Select **OpenForms Designer** from the **Registry Filter**.



4. Enter default values for the right, top, left, and bottom margins.

   Recommended settings are as follows:
   - Right Margin: 7
   - Top Margin: 3
   - Left Margin: 7
   - Bottom Margin: 3

5. Click **Save**.

Defining Margins on a Form

The default margins that you defined in the **GNA** > **General Settings Editor** apply to all items on the form. If you have not defined defaults or would like to

override the defaults, you can define margins for individual items, such as labels, attributes, groupboxes, etc.

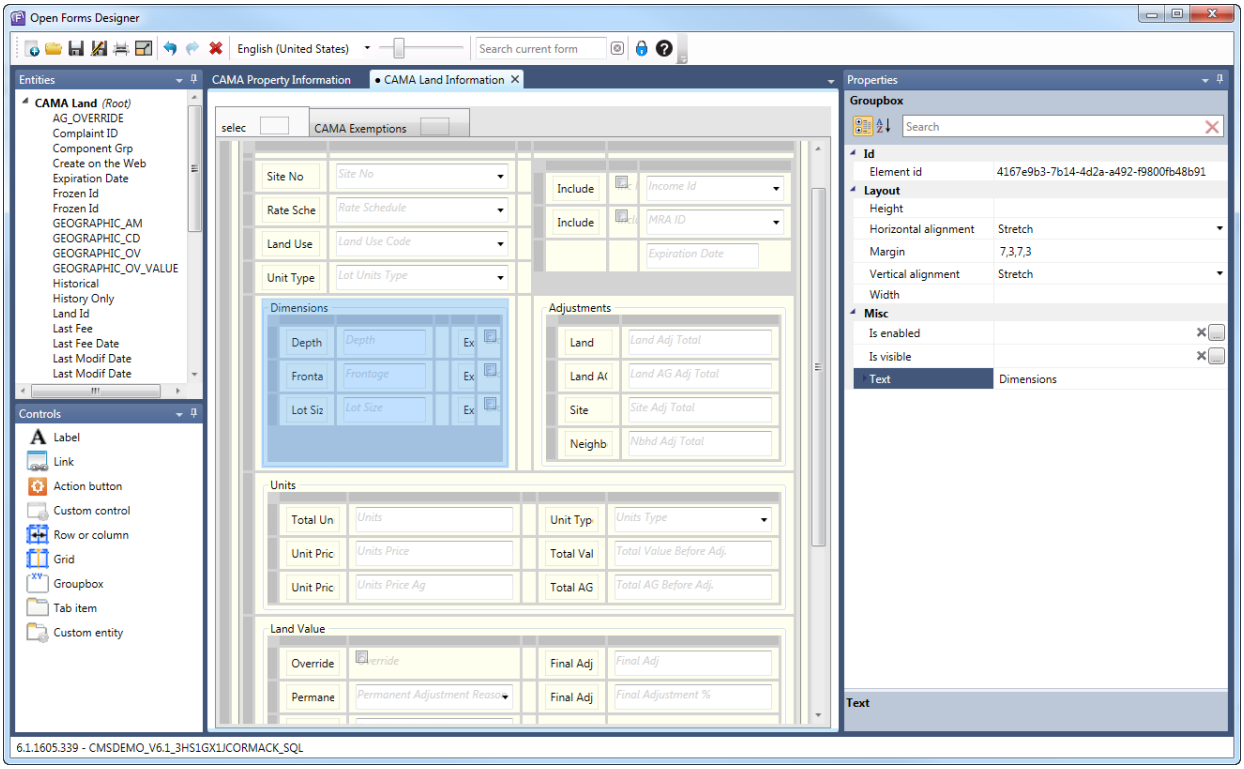
Margins can be applied to all items on a form with the following exceptions:

- Rows and columns
- Grids
- Action Buttons

Margins for items within a custom entity are predefined. They are not defined by the default settings in GNA.

To define margins on a form:

1. Launch the OFD.
2. Open the form that you want to modify.
3. Select the entity.
4. Select an item.



The default margins set in the GNA General Settings Editor are displayed in the **Margin** property.

These are displayed in clockwise order starting at the left:

- left, top, right, bottom

5. Enter new values for the margins in the **Margin** property.
6. Click **Save**.
7. Open the form in Govern to see how margins are applied.

Creating Text and Foreground / Background Styles

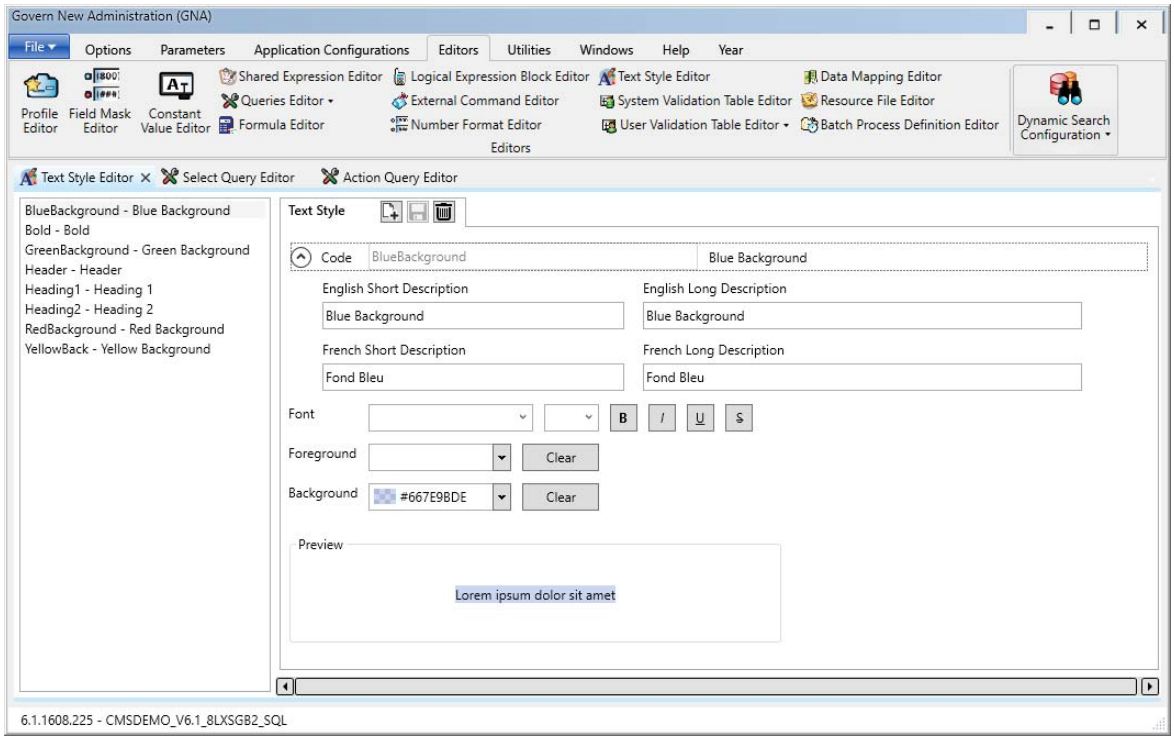
Overview

Use the Text Style Editor in GNA to create styles for the text that appears on your forms as headings or labels. You can also use it to create foreground and background colors for the items that appear on forms.

Accessing the Text Style Editor

To access the Text Style Editor:

1. Launch GNA.
2. Select **Editors** > **Text Style Editor**.

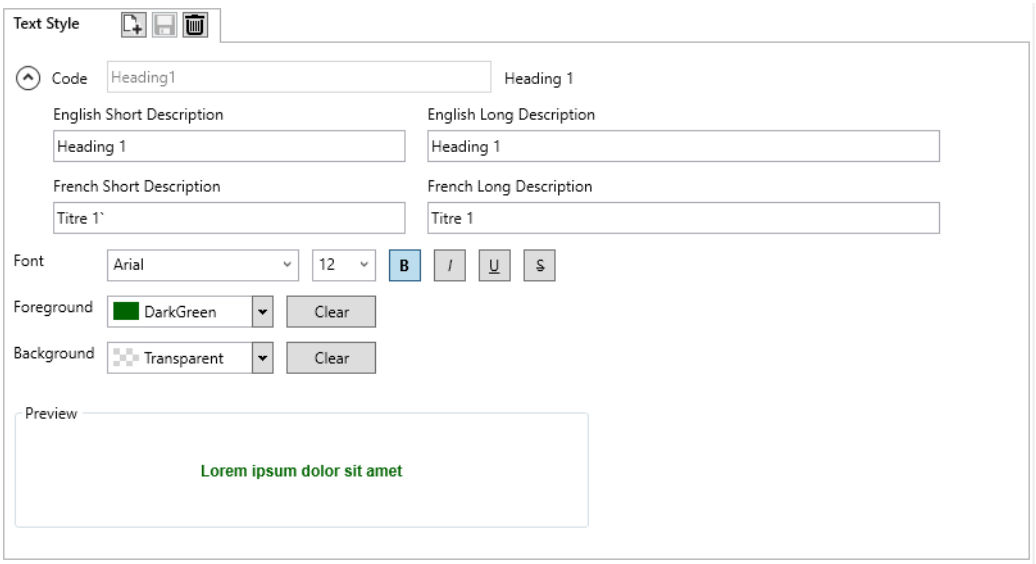


The styles that are already created are listed in the tree view on the left.

Creating a New Text Style

To create a new Text Style:

1. Click **New** on the Text Style Editor.



2. Enter a unique code in the **Code** field.

   The Code is required in the expression that you use to apply the style.

3. Enter short and long descriptions in the English and French **Short** and **Long Description** fields.

   The descriptions make it easier for users to search through existing styles.

4. Select a font from the **Font** drop-down list.
5. Select a font size from the drop-down list.
6. Select the **Bold**, **Italic**, **Underline**, or **Strike through** buttons to apply character styling.
7. Select a color from the **Foreground** drop-down list.

   The foreground color is applied as follows.
   - **Labels, Attributes**: To the text in the label
   - **Groupbox or tab**: All the text, for example all the labels, within the groupbox, tab, or other item

8. Select a color from the **Background** drop-down list.

The background color is applied as follows:

- **Labels, attributes**: to the area behind the text
- **Groupboxes, Tab Controls, Custom Controls**: Includes the area within the item, but excludes the attributes.
  Background color can be applied to attributes separately.
- **Rows, Columns, Grids, Tab Items, Custom Entities**: Background colors cannot be applied to these items.

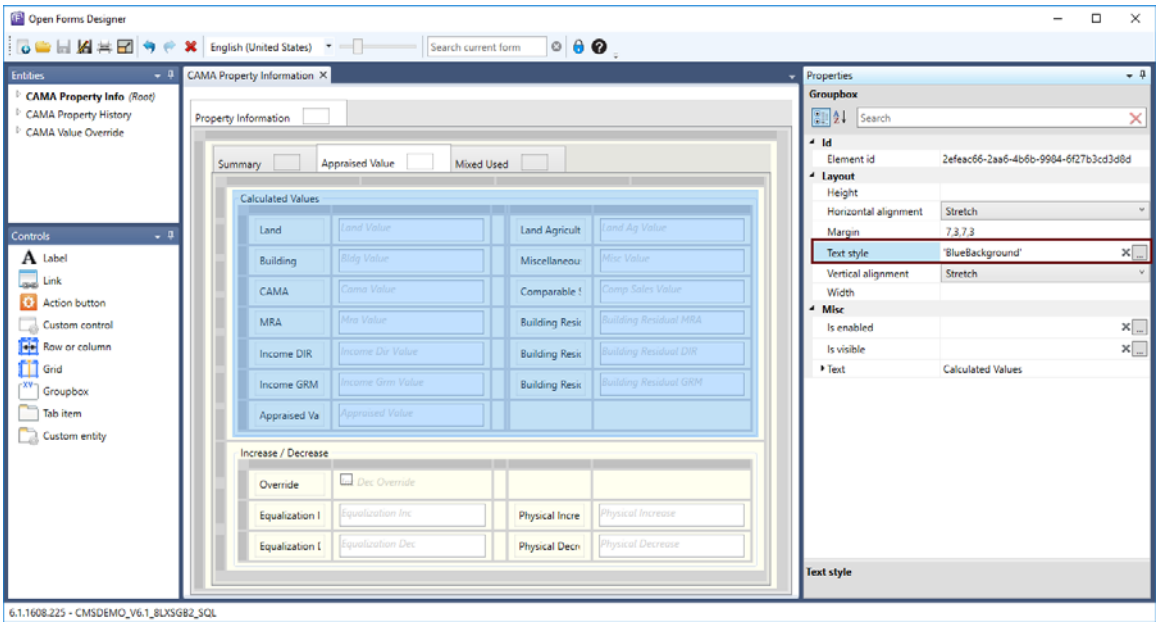
9. Click **Save**.

Applying the Text Styles

To apply a Text Style, add an expression to the Text Property in the Open Forms Designer, as described in the following procedure.

To apply a Text Style:

1. Launch the Govern OpenForms Designer (OFD).
2. Open the form to which you want to apply a text style.
3. Select the entity.
4. Select the item to which you want to apply the text style.



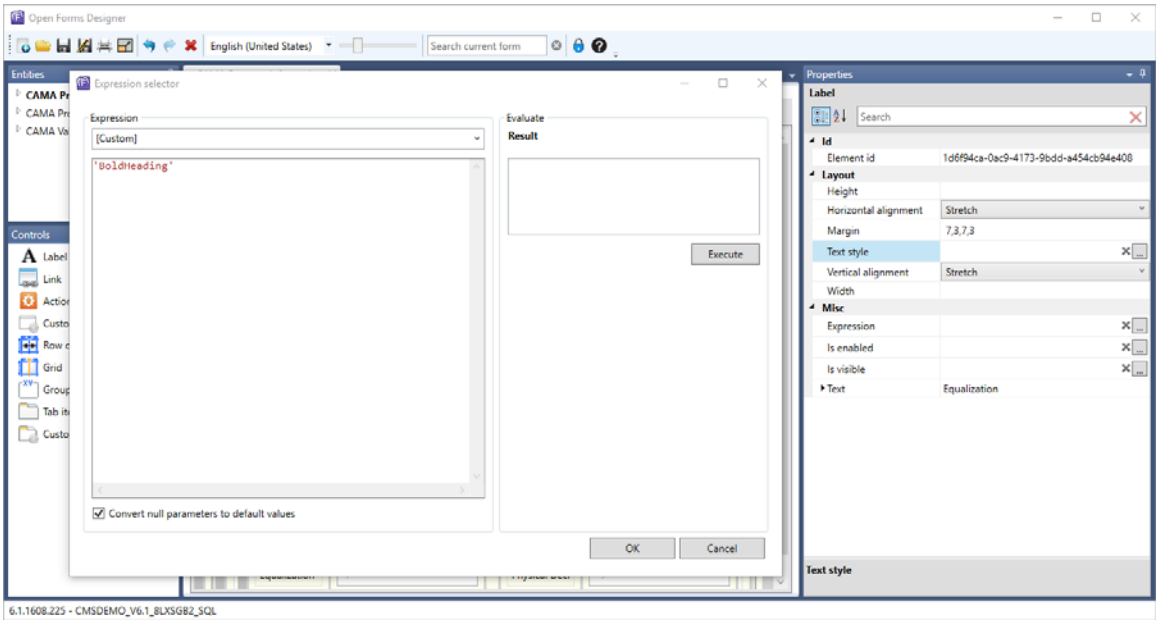
5. Select the **Text Style** property in the **Property Explorer** on the right.
6. Click the ellipsis button to open the Expression Selector.
7. Enter the expression in the Expression text box.
8. Click **OK** on the Expression Selector.
9. Click **Save** on the OFD form.

Scenario: Applying a Text Style to a Heading

You can apply a Text Style in order to create a Heading that stand out above a groupbox or gird.

To apply a text style to a heading:

1. Launch the Govern OpenForms Designer (OFD).
2. Open the form on which you want to add the heading.
3. Select the entity.
4. Select the **Label** in the **Controls** box.
5. Drag it above the groupbox or grid.
6. Select the label.
7. Enter a name for the label in the **Text** property.



8. Select the **Text Style** property in the **Property Explorer** on the right.
9. Click the ellipsis button to open the Expression Selector.
10. Enter the code for the heading surrounded by single quotation marks, or apostrophes, as in the following example:

```
'BoldHeading'
```

11. Click **OK** on the Expression Selector.
12. Click **Save** on the OFD form.

The same procedure can be used to add a text style to any item on the form.

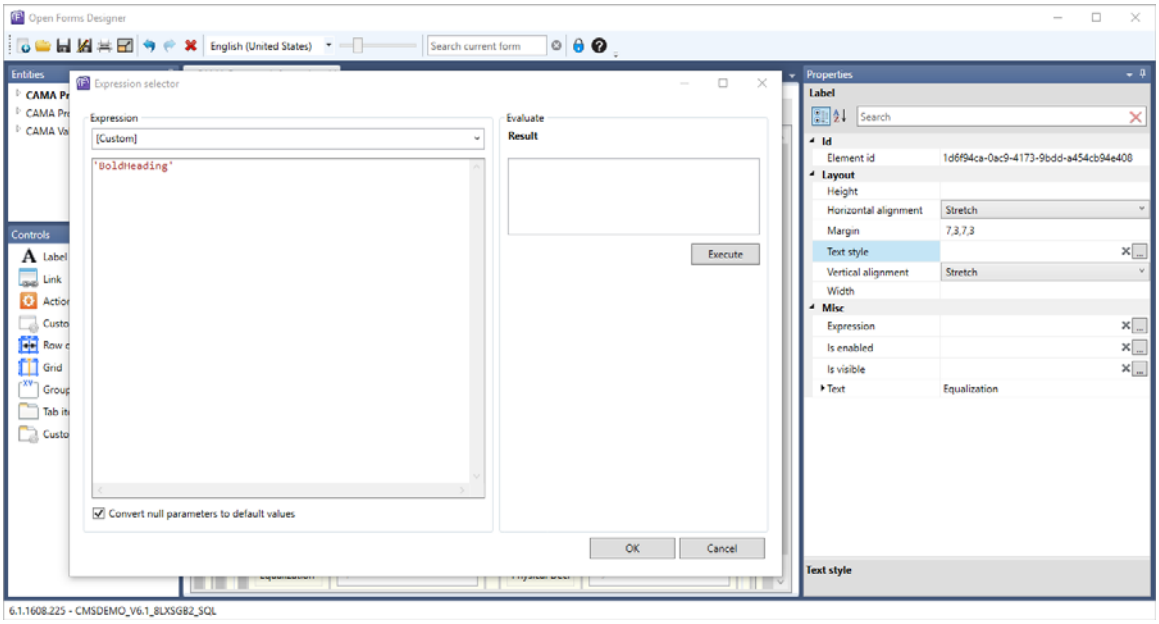
Scenario: Applying a Text Style under a Condition

You can add a Text Style to any expression in order to apply a text style under a condition. For example, you could use a text style to highlight a group box that contains fields that need to be filled only under certain conditions.

In the following example, the Correlated Values group box is highlighted when the Correlated Values method is selected on the CAMA Property Information form.

To apply a text style under a condition:

1. Launch the Govern OpenForms Designer (OFD).
2. Open the form on which you want to add the heading.
3. Select the entity.
4. Select the **Correlated Values** groupbox.

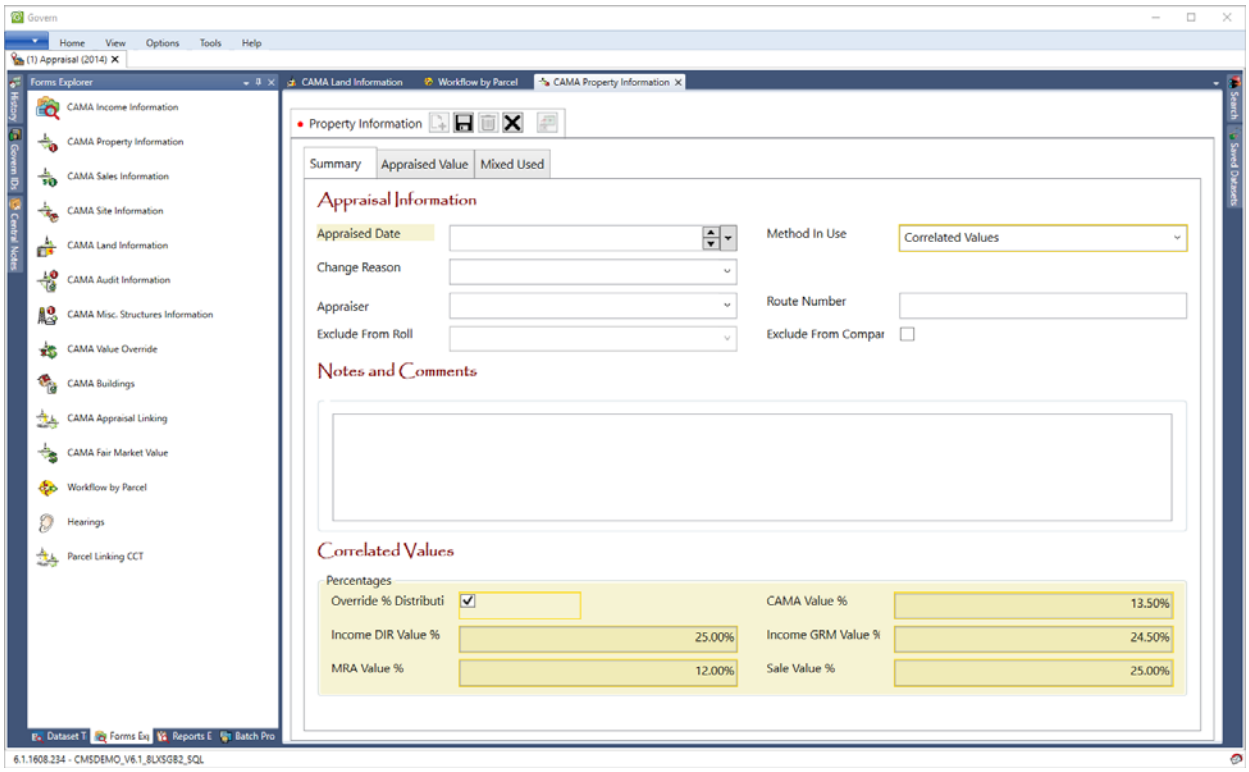


5. Select the **Text Style** property in the **Property Explorer** on the right.
6. Click the ellipsis button to open the Expression Selector.
7. Enter the following expression:

```
If(@attrMETHOD_IN_USE=5, 'YellowBack', '')'
```

   This expression is added to a Case statement. The code for the text style is enclosed in single quotation marks. It is applied if the Correlated Values method, which has the Code 5, is selected.
8. Click **OK** on the Expression Selector.
9. Click **Save** on the OFD form.

The following expression show the result of the expression in Govern.



Scenario: Applying Different Text Styles Under Different Conditions

This scenario is the same as the previous one, except that different text styles are applied according to the method selected.

The expression for this is as follows:

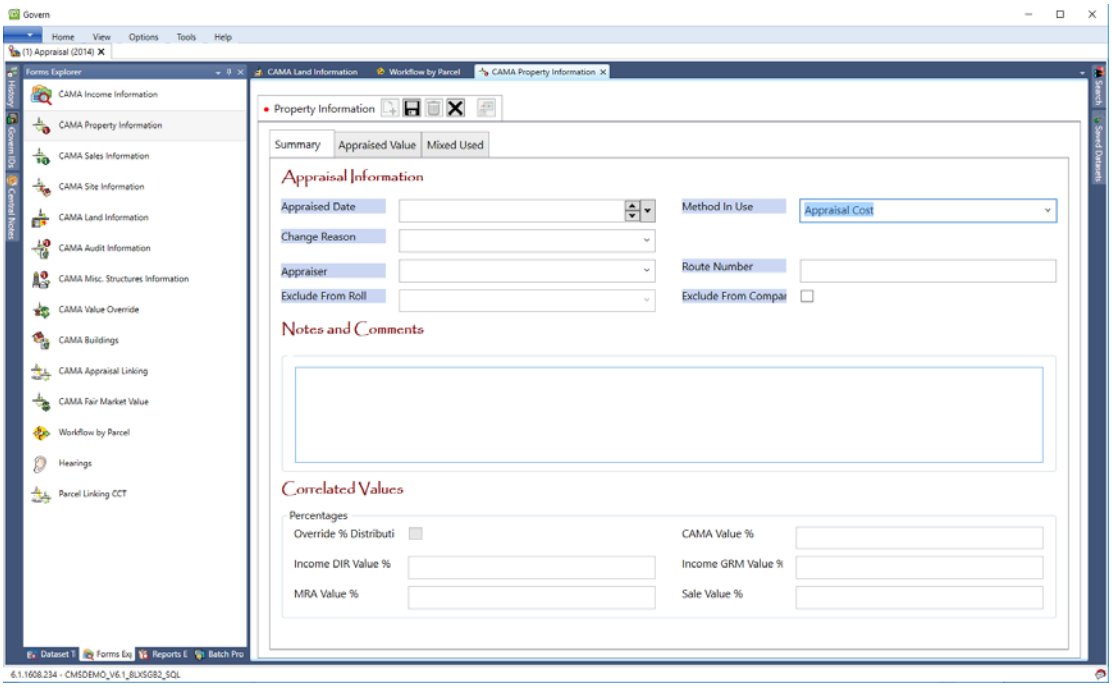
```
Case(True,
@attrMETHOD_IN_USE=1,'BlueBackground',
@attrMETHOD_IN_USE=2,'RedBackground',
@attrMETHOD_IN_USE=3,'GreenBackground')
```

This expression applies the following backgrounds, or highlights, to items in a groupbox according to the method selected:

- Appraisal Cost: Blue Background
- Comparable Sales: Red Background

- Income DIR: Green Background

The result in Govern is shown in the following screen shot:



Adding or Deleting Attributes

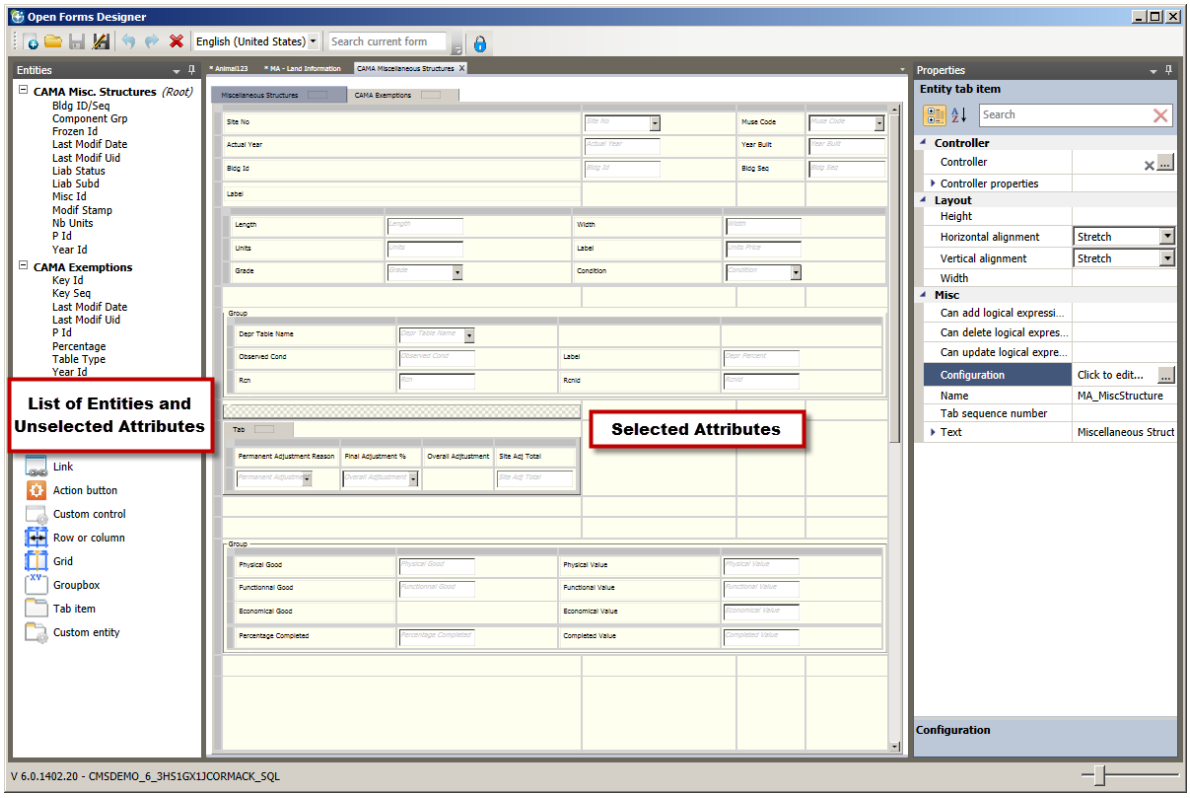
Overview

The previous section describes how to add and position the attributes on a form when you create a new entity. This step is performed on the *Entity* form, which is only available when you first create a new Govern user form or first add an entity to a form. This is described under *Chapter 2: Creating a Govern User Form on page 33*. This section describes how to add the attributes that were unselected at that time.

Adding an Attribute

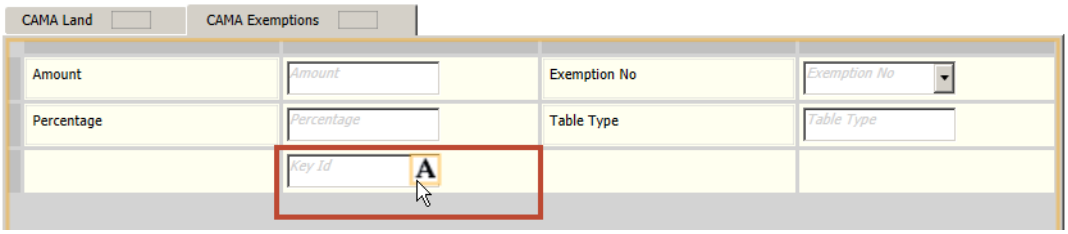
To add an attribute on the Editor:

1. Launch the Govern OpenForms Designer.
2. Open the form and the entity in the OFD Editor.



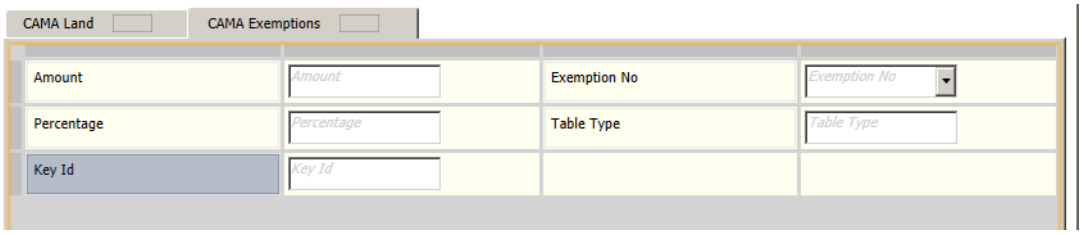
The Root Entity and all the Child Entities in the business model for the form are listed on the left. When you expand an entity, you can see the attributes that were not selected.

3. Select the attribute in the Entities Explorer.
4. Drag it to the required position on the OFD Editor.



5. Hover the mouse inside the attribute.
6. Select the text symbol.
7. Drag it to an empty cell.

   This is the new label.



8. Click **Save**.

Note: When you add attributes to the Entities form, the labels are added automatically beside each attribute. When you add attributes manually, through this procedure, you need to add the labels separately.

Tip: You can move an attribute to its applicable entity only. If you try to move an attribute from another entity on to the current entity, the tab for the selected entity opens automatically.

For example, in the preceding screen shot, there are two entities: Miscellaneous Structures and CAMA Exemptions. If Miscellaneous Structures is open and you try to move the Percentage–listed under CAMA Exemptions–to the Miscellaneous Structures tab, the Exemptions tab opens automatically and become the current tab. So, you can move the Percentage on to the Miscellaneous Structures tab only.

Deleting Attributes from the Form

To delete an attribute from the form:

1. Select the attribute on the OFD Editor.
2. Click the **Delete** icon at the top of the interface.

There is no warning when you delete an attribute. However, you can use the Undo or Redo tool to reverse the delete action.

The deleted attribute is removed from the OFD Editor and listed in the Entities Explorer under the applicable entity.

Note: You have to delete the attribute and the label for the attribute separately.

Defining Properties for the Attributes

For details about defining the attribute properties, see Defining Properties for the Attributes on page 182.

Moving Items on the Form

Overview

You can change the position of any item on the OFD Editor. This includes the attributes, labels, tabs, grids, rows and columns, links, and action buttons.

Note that each item is positioned in a separate cell and has a separate set of properties. There can be only one item per cell.

To change the position of an item:

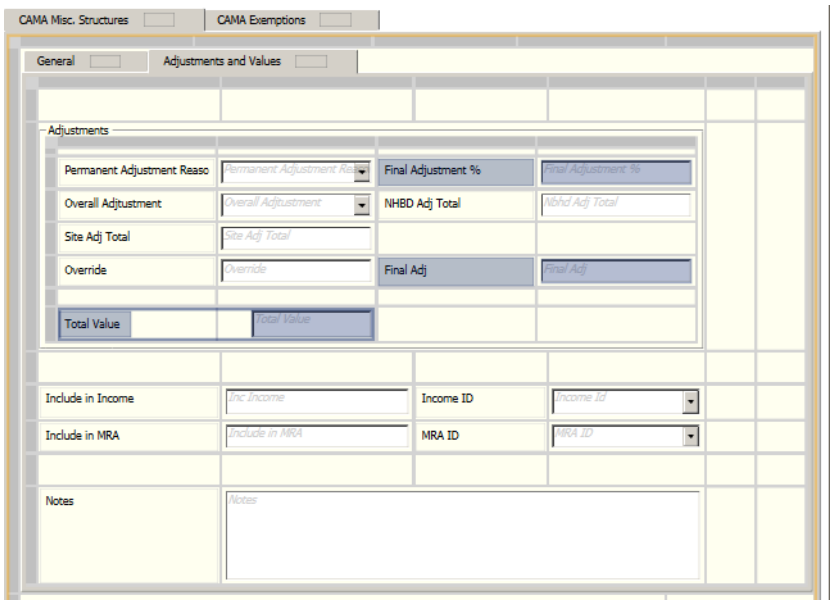
1. Select the item in the OFD Editor.
2. Drag it to the required position.
3. Drop it in place.

Tips

These tips apply to all items on the form, including labels, attributes, grids, tabs, links, rows and columns*, etc.

Selecting Multiple Items

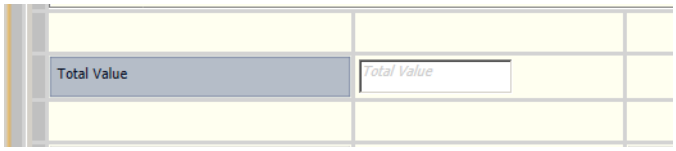
To select multiple items, use the `[Ctrl]` and `[Shift]` keys on your keyboard.



This would be useful if you want to move multiple items to another position or if you want to delete them all at once.

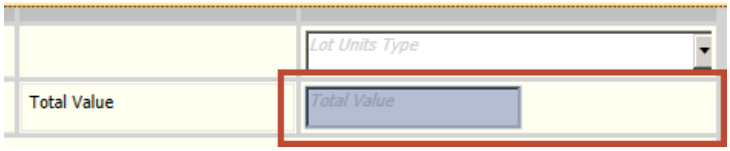
Selecting a Label

To select a label, click anywhere inside the cell.



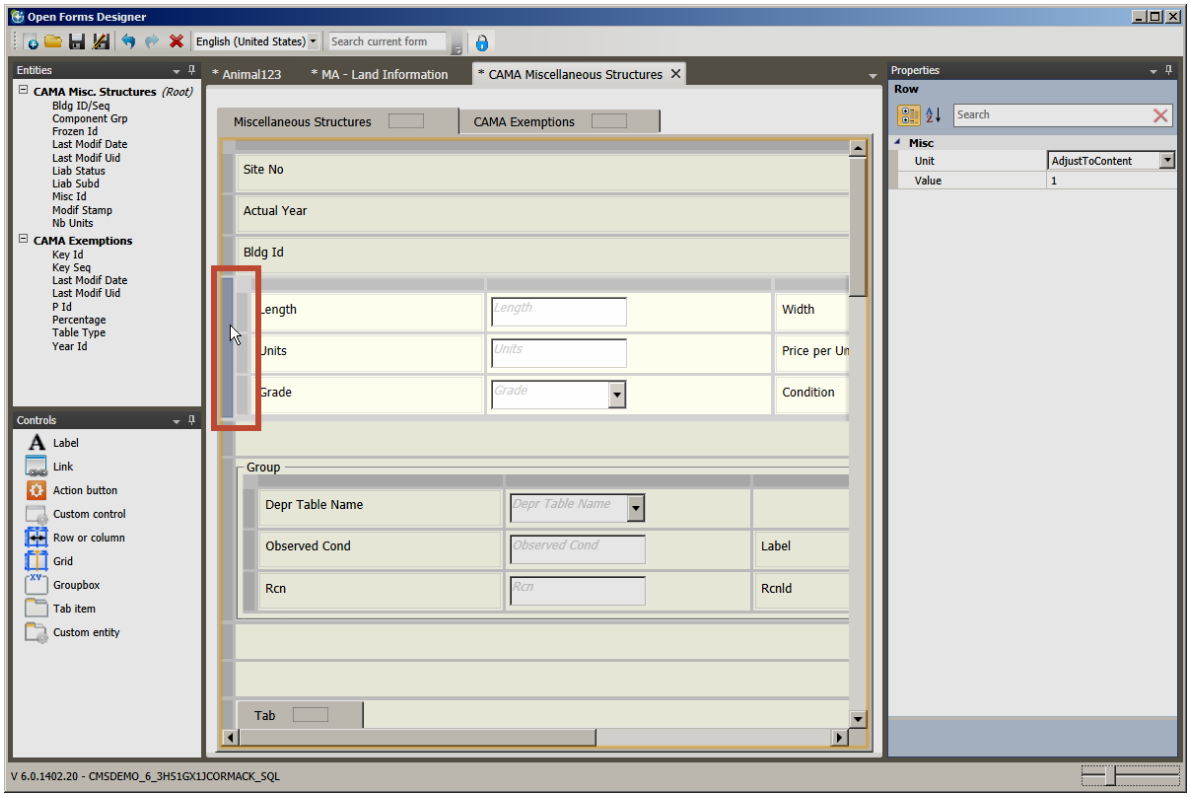
Selecting an Attribute

To select an attribute, you need to click inside the attribute in the cell.



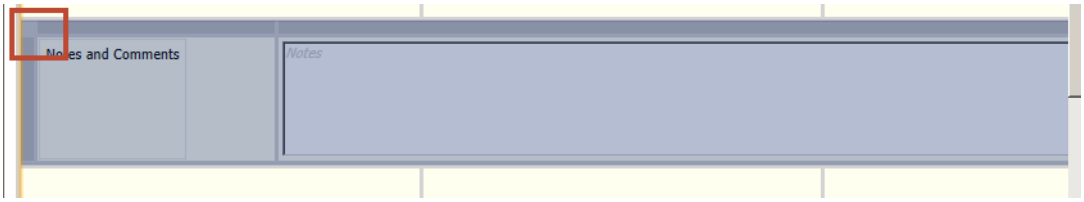
Selecting One or More Rows

To select one or more rows, select the border at the left of the rows. This is shown in the following screen shot:



Selecting a Grid

To select a grid, select the top left corner.



The grid contains rows and columns. You can select these and define the properties separately.

Selecting a Groupbox

The best place to select a groupbox is on the frame or the label above it.

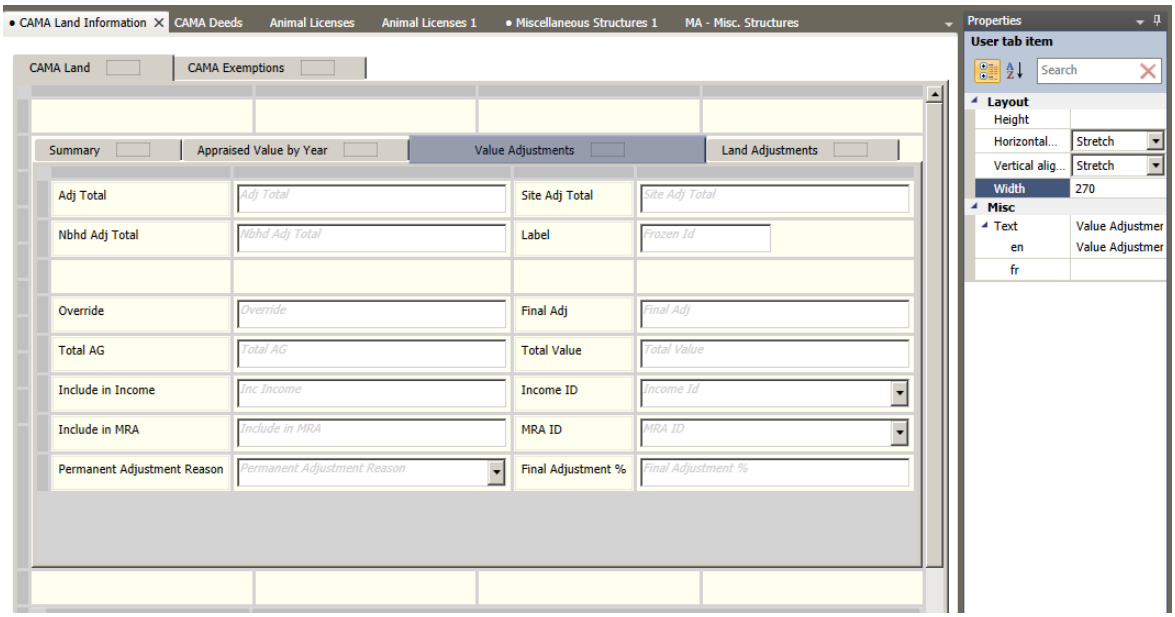
The groupbox contains a grid as well as rows and columns. You can select these and define the properties separately. If you want to define the scrollbar properties for the groupbox, you need to select the grid.

Selecting a Tab

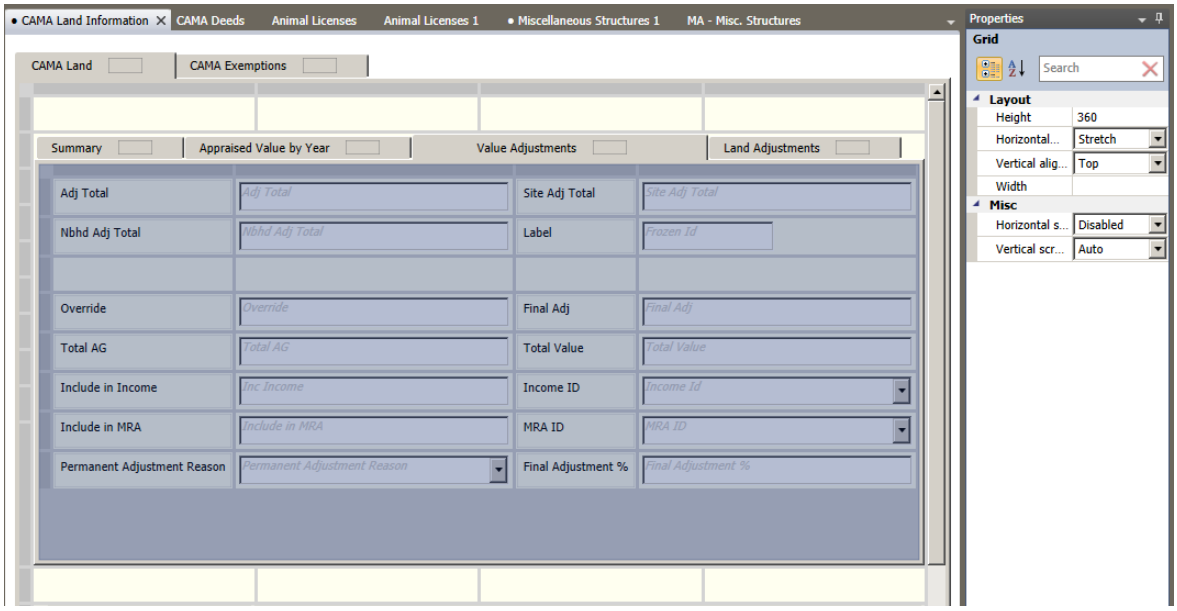
There are several places where you can define the properties for a tab.

If you select the divider, you can modify the dimensions of the divider. You can also move the tab to a new location by selecting the divider.

The heading User Tab Item appears in the Properties window.

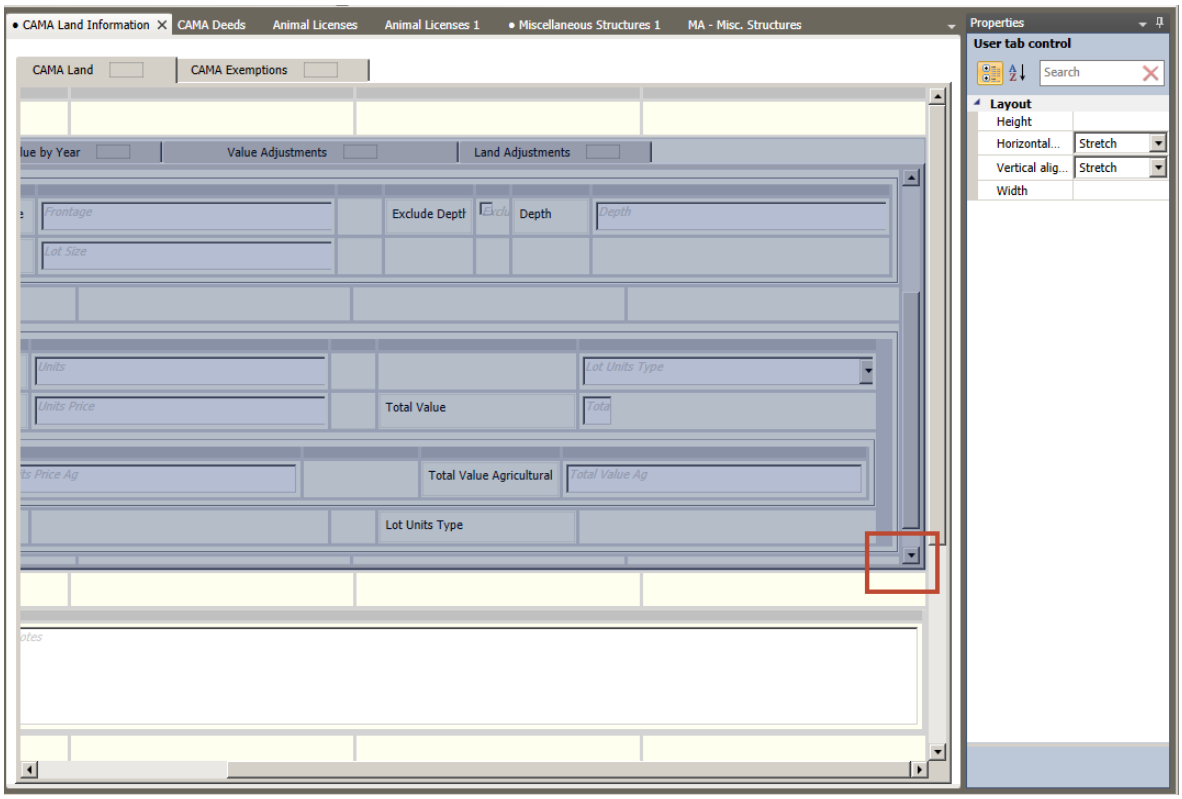


If you want to change the size of the tab, you need to select the grid, the columns, or the rows inside the tab.



Selecting a Group of Tabs

If you have multiple tabs that are configured together, the best place to select them is in the bottom right corner. The heading in the Properties Explorer is User Tab Control.



Moving an Item Horizontally

To move an item horizontally up or down on the form:

1. Select the item that you want to move.
2. Do one of the following:
   - Drag the item to an empty row.
     The item is positioned within the allocated space according to the Layout property. *For details, see Chapter 4: Defining the Properties on page 161*.
   - Drag the item to the border between two rows.
     A new row is created. The height of the row is proportional to the item.
     If you are moving one or more complete row, the number of rows and columns is retained and the layout is retained.

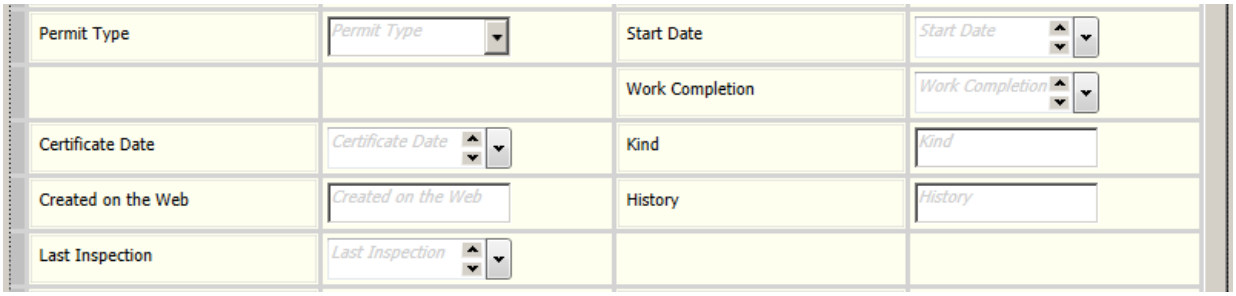
Moving an Item Vertically

To move an item vertically left or right on the form:

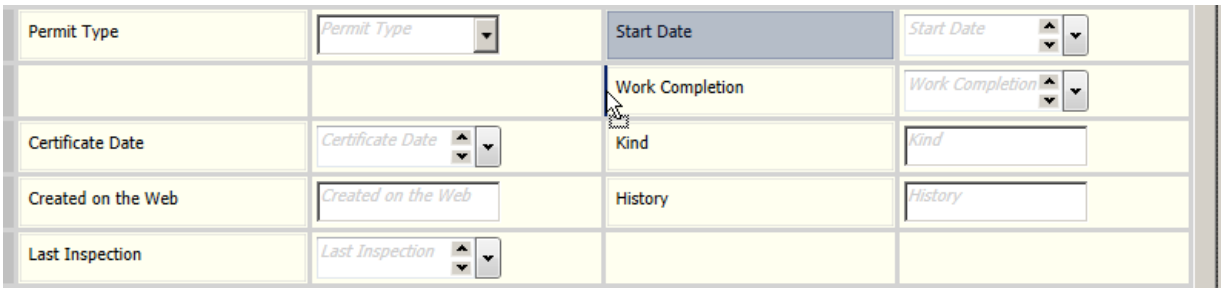
1. Select the item that you want to move.
2. Do one of the following:
   - Drag the item to an empty cell within a column.
     The item is positioned within the allocated space according to the Layout property. *For details, see Chapter 4: Defining the Properties on page 161*.
   - Drag the item to the border between two columns.
     The existing items are pushed to the next column on the right or to the next line in order to accommodate the item that you moved.

For example, in the following series of screen shots, the Start Date label is moved to the column between the blank cell and Work Completion. All items after Work Completion move one cell to the right.

Before the Move



Moving the Label



The label is moved to the border between two columns.

After the Move

All items move one cell to the right.

Labels

Overview

Labels are used to describe the attributes and other items on the form. They can be added above, below, right, or left of an attribute or any other item.

You may want to add a label above a grid in order to give it a heading or above a new section on the form. Groupboxes have built-in headings.

When you create a new form or add an entity to an existing form, labels for the selected attributes are added automatically. When you add an attribute manually, you need to add the label separately.

Like all items in the OpenForms Designer, each label takes up an entire cell on the grid and has separate properties. There can be only one item per cell.

Adding a Label

To add a label to the form:

1. Select the **Label** icon A Label under **Controls**.
2. Drag the label to the required position on the OFD Editor and drop it into one of the following positions. The label takes up the entire cell:
   - **An empty cell**: The new label is added to the cell.
   - **Border between rows**: A new row is created for the label. The label takes an entire cell in the row.
   - **Border between two columns**: Existing items are pushed to the right and if required onto the next line.
   - **On top of an existing item**: The new label replaces the existing item.
3. Click the **Save** icon at the top of the Editor.

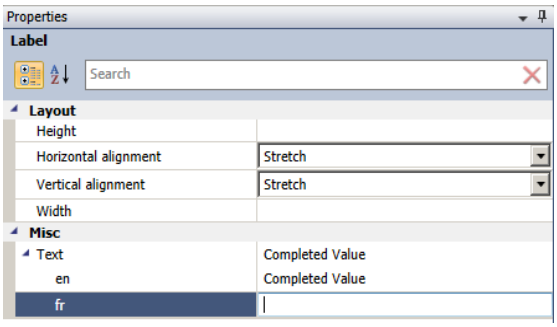
Defining the Properties for a Label

You can define the alignment and the text that appears on the label in the Properties Explorer.

To define the label properties:

1. Define the properties for the new label.

   When you select a label, the word **Label** appears at the top of the Properties Explorer.



   There are two sets of properties for the labels: layout, for the size and position, and miscellaneous, for the text.

   When you add a new label or select an existing one, the **Text** property is highlighted.

   Element ID: As with all items, the label has an element ID property. This provides reference in the log files.

2. Enter the text to display on the label in the **Text** field under Misc.
3. Expand the **Text** property.

   The new text is automatically added to the text box for the selected culture. For example, on the screen shot shown in step 1, the text is automatically added to the **English** property.

   Enter text for the second language.

4. Select one of the following from the **Horizontal Alignment** drop-down list:
   - **Left**: Aligns the label at the left of the cell. Some space is provided between the border and the text.
   - **Center**: Aligns the text at the center of the cell.
   - **Right**: Aligns the text at the right of the cell. Some space is provided between the border and the text.
   - **Stretch**: Aligns the text at the top and left of the cell. Increases the width of the column if the text is long and requires more space.
5. Enter a value for the height of the label inside the cell in the **Height** text box.

This measurement includes the text and a border around the text, as illustrated in the following screen shot. The default is 30.

The height does not affect the size of the font.

If you increase the height of the label, the height of the cell increases. However, if you decrease the height of the label, the height of the cell does not decrease below the default value.

6. Select one of the following from the **Vertical Alignment** drop-down list:
   - **Top**: Aligns the label at the top of the cell. Some space is provided between the border and the text.
   - **Center**: Aligns the text at the center of the cell.
   - **Bottom**: Aligns the text at the bottom of the cell. Some space is provided between the border and the text.
   - **Stretch**: Aligns the text at the top and left of the cell. Increases the width of the column if the text is long and requires more space.
7. Enter a value for the width of the label inside the cell in the **Width** text box.

   This measurement includes the text and a border around the text, as illustrated in the following screen shot.

   The width measurement does not affect the size of the font.

   If you increase the width of the label, the width of the cell increases. However, if you decrease the width of the label, the width of the cell does not decrease below the default value.
8. Enter an expression in one or all three of the following **Misc** properties if requried.Expressions can be added to labels in order to enhance the form in a variety of ways, such as displaying additional information, performing a calculation and display the result, making the label visible or read-only under specific conditions.*For details about expressions, see Adding Expressions on page 222*.
   - **Expression**: Click the ellipsis button ... to open the **Expression Selector**. Enter any type of expression in this field. Typically, expressions are added to labels in order to display information. For example, you may want to display the Parcel ID or the Name ID in this field.
   - **Is enabled**: Click the ellipsis button ... to open the **Expression Selector**. Enter an expression to make the label read-only, except under specific conditions. You can add any of the following examples:

- **Is visible**: Click the ellipsis button to open the **Expression Selector**. Enter an expression to make the label invisible, except under specific conditions. You can add any of the following examples:

For example, enter False in order to make the label read-only at all times. Enter an attribute

9. Click the **Save** icon to save the properties.

Deleting a Label

To delete a label:

1. Select the label in the OFD Editor.
2. Click the **Delete** icon.

There is no warning; however, you can use the Undo tool to reverse the Delete action.

Examples: Adding an Expression to a Label

Expressions can be added to labels in order to enhance the form in a variety of ways, such as displaying additional information, performing a calculation and display the result, making the label visible or read-only under specific conditions.*For details about expressions, see Adding Expressions on page 222*.

Displaying Information on the Form

You could add an expression in order to display the value of an attribute or a Govern ID.

For example, you may want to display the Parcel or Name ID on the form.

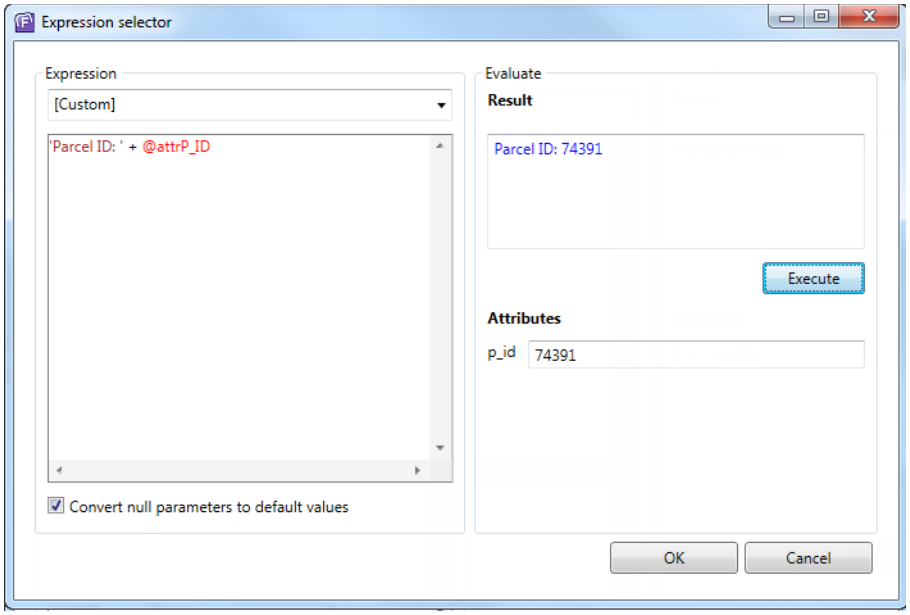
To display the value of an attribute on a form:

1. Open the form in the OFD.
2. Add a new column and row for the link.
3. Select the **Label** under **Controls**.
4. Drag it to the location you created in step 2.

5. Enter the following in the Properties Explorer for the link:

Layout: Select **Stretch** for the **Horizontal** and **Vertical Alignment** Properties.

Expression: Click the ellipsis button ... to open the **Expression Selector**.



1. Enter '**Parcel ID: ' + @P_ID**.

   Note that the text you want to display is enclosed in single quotation marks. A second expression is added with the plus sign (+). This displays the value of the attribute.
2. Enter a parcel ID in the **p_id** text box under **Attributes** to verify that the expression is correct.
3. Click **Execute**.
4. If the text and information that you want to display appears in the Result text box, click **OK**.

Text: Leave blank.

Making Information Visible Under Specific Conditions

The following scenario illustrates how to add a label that is visible only under a specific condition. In this case, Square Feet is displayed when square feet is

selected from the Land Units drop-down list. Otherwise, if another type of units is selected, the label is invisible.

To display a label under specific conditions:

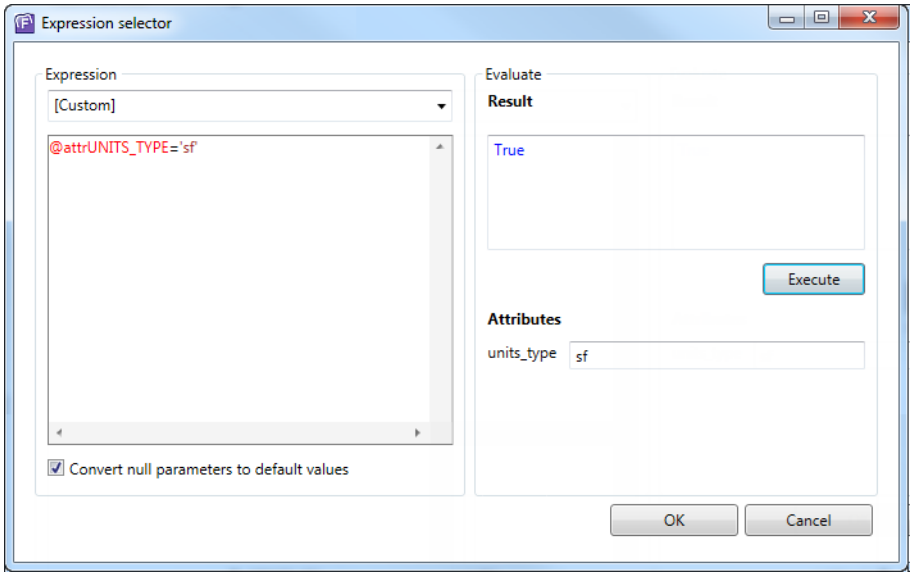
1. Follow the procedure under Displaying Information on the Form on page 79.
2. Enter the following properties:

Layout: Select **Stretch** for the **Horizontal** and **Vertical Alignment** Properties.

Expression: Leave blank.

Is Enabled: Leave blank.

Is Visible: Click the ellipsis button ... to open the **Expression Selector**.



1. Enter **@attrUNITS_TYPE='sf'**.

Note: To display the value of an attribute that is selected from a drop-down list, you need to enter the code, as it is saved in the database. In this case, the UNITS_TYPE is mapped to the MA_LAND UNIT TYPE validation table. The code for square feet is 'sf.'

2. Enter a **sf** in the **units_type** text box under **Attributes** to verify that the expression is correct.
3. Click **Execute**.
4. If **True** appears in the **Results** text box, click **OK**.

Links

Overview

You can add a link in order to open any of the following from the current form:

- Another User Form in the same Profile
- Report
- View Query
- External Command
- Query Tool
- Batch Process

The link can be added as an action button or text hyperlink.

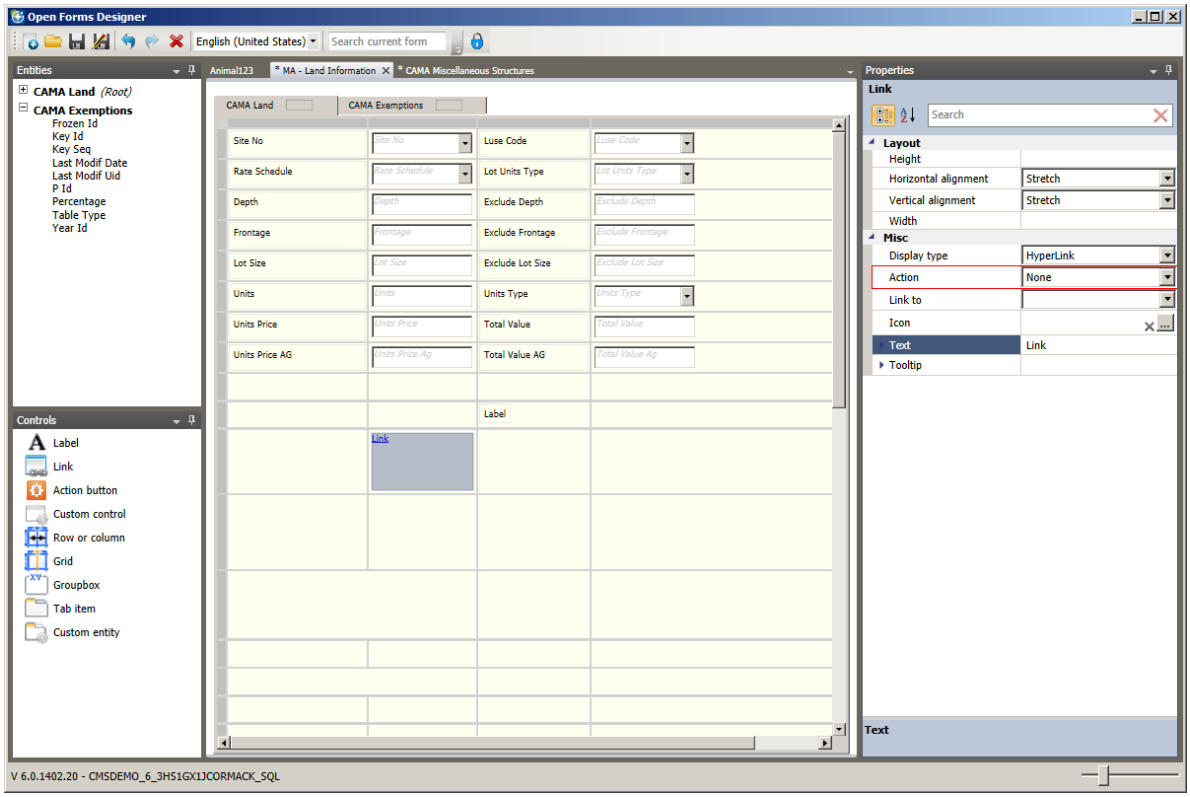
Adding a Link

To add a link to the form:

1. Select the **Link**  control from the tree view on the left.
2. Drag it to the required position on the form.

   The link is displayed in the selected cell in the OFD Editor.

   The **Action** property is automatically selected and outlined in red. This is a required property.



3. Configure the properties as described in this section.
4. Click **Save**.

Note: If the logged-in user does not have the required security permissions for the application, form, or batch process, a message appears and the item does not appear.

Defining the Properties for a Link

Select the link on the OFD Editor and modify the properties in the Properties Explorer. When the Link is selected the word **Link** appears at the top of the Properties Explorer.

Element ID: As with all items, the User Tab Item has an element ID property. This provides reference in the log files.

Layout: Adjust the height and width of the label in the **Layout** property under **Properties**.

Display Type: You can display the link in one of the following formats:

- Hyperlink
- Button

The following screen shot shows the two types of links. Both open the *CAMA Sales Information* form.

Hyperlink **Button**

In this example, when the user clicks on the link, the CAMA Sales Information form opens and becomes the current form

Action: Select one of the following actions. This is required:

Action	Description
OpenForm	Opens a Govern user form. Select the form from the **Link To** drop-down list. All forms are listed by code and name. **Note**: The form that you select must be in the same Profile as the current form. Otherwise, a message is displayed.
OpenReport	Runs a report and displays the results. Select the report from the **Link To** drop-down list. Reports must be defined in the Report Parameters Editor in GNA.
OpenViewQuery	Runs a query and displays the results. Select the query from the **Link To** drop-down list. Queries must be predefined in the GNA SQL Query Editor.

Action	Description
ExecuteCommand	Runs a predefined command to call another application, web site, etc. This requires prior setup. *For details, refer to the GNA External Commands Editor documentation.*
OpenQueryTool	Opens the Govern QueryTool that is integrated in Govern OpenForms. If the user does not have the access permissions, a message is displayed.
Open Batch Process	Opens the selected batch process. Select the batch process from the **Link To** drop-down list. All batch processes are listed by the code and name assigned in the *GNA Batch Process Editor*. **Note**: The form that you select must be in the same Profile as the current form. Otherwise, a message is displayed.

Link to: Select the form, query, command, or batch process from the drop-down list.

Icon: Click the ellipsis button and select the icon, you want to add, from a computer or network directory.

Is enabled: Click the ellipsis button to open the **Expression Selector**. Enter an expression to make the link read-only under certain conditions.

Is visible: Click the ellipsis button to open the **Expression Selector**. Enter an expression to hide the link under certain conditions.

Expressions evaluate to true or false. You could write **False** in the **Expression Selector** to make the link read-only or invisible under all conditions. Alternatively, you could write an expression to do this under certain conditions, such as when another value on the form is equal to a certain amount. *For details about expressions, see Adding Expressions on page 222*.

Text: The text entered in this field appears on the form. By default, it reads **Link**. You can modify this with an expression. Click the ellipsis button to open the **Expression Selector**.

To display text, you need to enter it inside single quotation marks; for example, 'Your Text'. You can add other expression syntax to the text in order to make it more specific. *See Scenario: Opening the Property Information from the Land Information form on page 87*.

Tooltip: Enter a tooltip, in English, French, or both, to display additional information when the mouse hovers over the link.

Deleting a Link

To delete a link:

1. Select the link in the OFD Editor.
2. Click the **Delete** icon .

There is no warning; however, you can use the Undo tool to reverse the Delete action.

Scenario: Opening the Property Information from the Land Information form

The following scenario illustrates how to:

- Create a link to open a new form without navigating away from the current form.
- Make the link invisible unless a specific condition is met.
- Add a tooltip to describe the purpose of the link.

In this scenario, a link is added to the Land Information form in order to open the Property Information form. The link is visible only if the Site Information Number is equal to one (1).

To create the link:

1. Open the Land Information form in the OFD.
2. Add a new column and row for the link.
3. Select the Link control under Controls.
4. Drag it to the location you created in step 2.

5. Enter the following in the Properties Explorer for the link:

Layout: Select **Stretch** for the **Horizontal** and **Vertical Alignment** Properties.

Display Type: Select **Hyperlink**, rather than Button. In this scenario, text is added to the link in an expression.

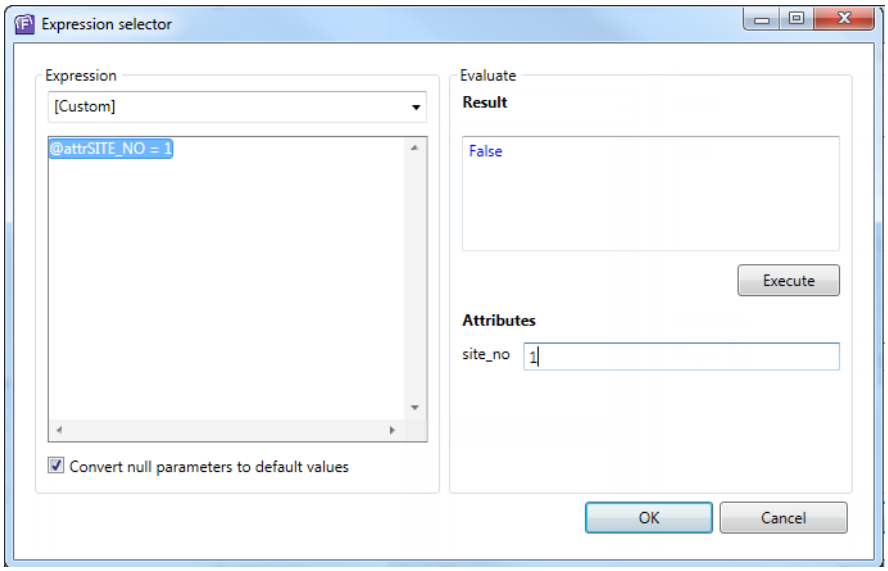
Action: Select OpenForm.

Link to: Select the **CAMA Property Information**.

Icon: Leave blank.

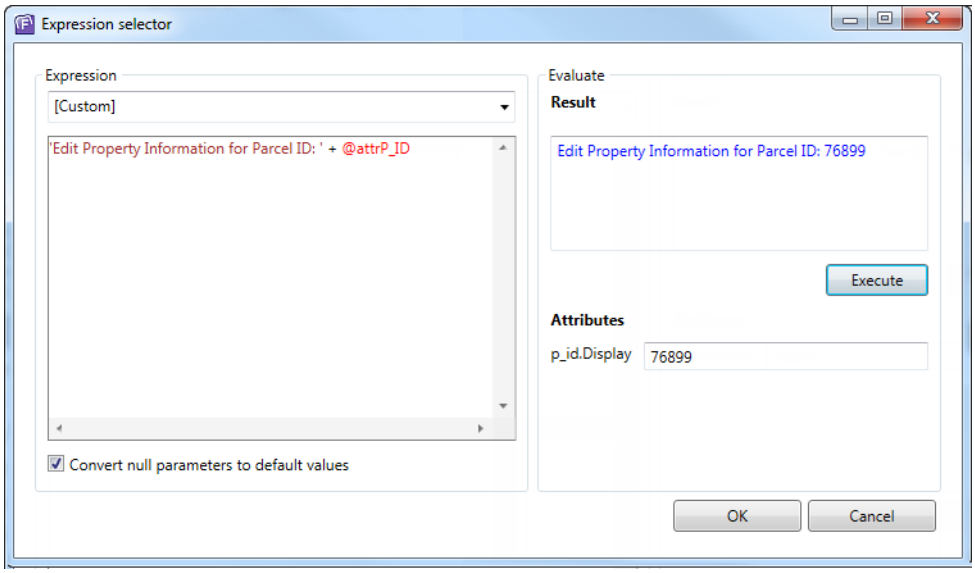
Is Enabled: Leave blank.

Is Visible: Click the ellipsis button to open the **Expression Selector**.



1. Enter **@attrSITE_NO = 1**.
2. Enter **1** in the **site_no** field under **Attributes** to ensure that the expression is correct.
3. Click **Execute**.
4. If the result is **True**, click **OK**.

Text: Click the ellipsis button ... to open the **Expression Selector**.



1. Enter **'Edit Property Information for Parcel ID: ' + @attrP_ID**.

   Note that the text to display is enclosed in single quotation marks. A second expression is added with the plus sign (+).
2. Enter a Parcel ID in the **p_id** field under **Attributes** to ensure that the expression is correct.
3. Click **Execute**.
4. If the text you want to see is displayed in the **Result** text box, click **OK**.

For details about expressions, see Adding Expressions on page 222.

Tooltip: Enter **Open the CAMA Property Information form for the selected record**.

The Tooltip is automatically entered in the **en** field.

Saving your modifications: Click the **Save** icon to save the properties.

You can create a link in order to return to the *Land Information* form.

Action Buttons

Overview

Action Buttons can be added to the top of an entity only. They are used to perform an action. The standard action buttons, such as New, Save, and Delete are automatically added through the Controller. Other actions are specific to a form.

This section describes how to add a query to an action button.

The query can be executed automatically if you associate it with the new, save, or delete button on the entity. If this is the case, the action is independent of the action button. *See Execute Method on page 93*.

Adding a Query to an Action Button

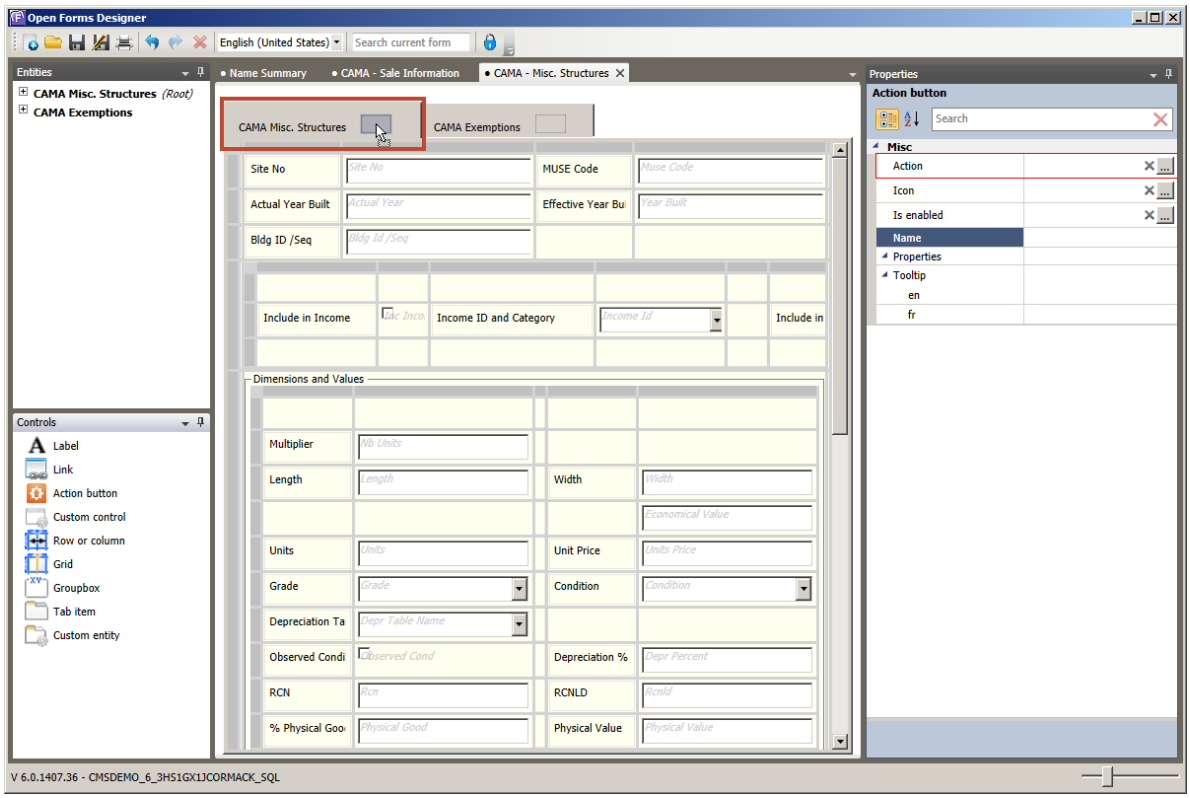
You can add a query to an action button. The query can be executed either manually or automatically, as described in this document.

An action button can only be added to the rectangle on the tab for the entity at the top of the form.

To add a query to an action button:

1. Launch the Govern OpenForms Designer.
2. Open the form that you want to update.
3. Select the entity to which you want to add the action button.
4. Select the action button under Controls.
5. Drag the action button to the rectangle on the tab for the entity.

   The cursor changes when the control is in the correct position on the form.



6. Release the Action Button Control.

   You can then define the properties in the Property Explorer.

Defining Properties for the Action Button Query

To define properties for an action button query:

1. Select the action button on the form to view the properties in the Property Explorer.

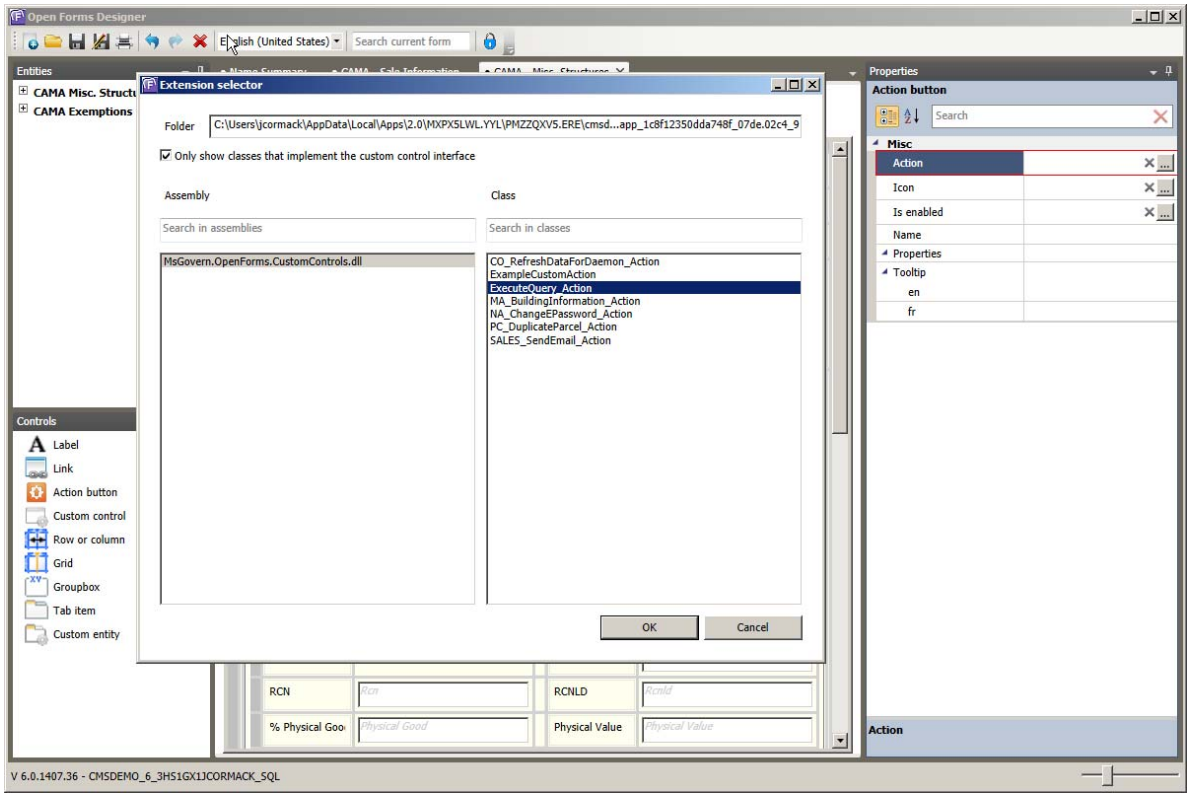
   Element ID: As with all items, the Action Button has an element ID property. This provides reference in the log files.

2. Complete the following parameters.

Action: To associate a query with the Action button:

1. Click the ellipsis button in the **Action** text box ....

   This opens the Extension Selector.



2. Select the **Only show classes that implement the custom control** interface option.
3. Select the **MsGovern.OpenForms.CustomControls.dll** on the left under **Assembly**.
4. Select **ExecuteQuery_Action** on the right under **Class**.

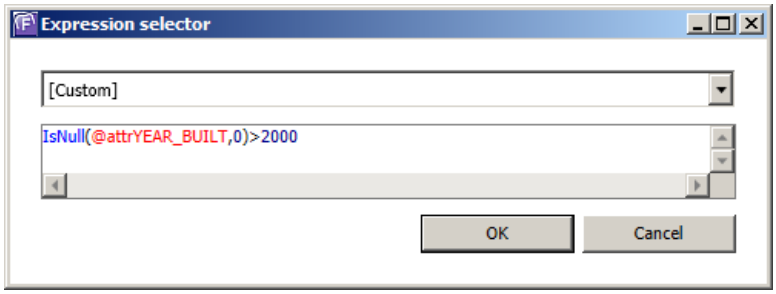
Icon: Select the ellipsis button ... in the **Icon** text box and add an image to the action button.

Any image file can be added.

Is enabled: If you want to enable the query under specific conditions only, you can write an expression for this. This parameter is optional.

To add this type of expression, select the ellipsis button ... in the **Is enabled** text box. This opens the Expression Selector.

You can write any expression that returns a True. For example, the following expression enables the action button on the CAMA Miscellaneous Structures form only if the effective year built is greater than 2000.



For further details about expressions, see Adding Expressions on page 222.

Note: This expression is applicable only if the action button is displayed. If the action button is hidden because of a condition set in the Execute Condition, then the expression does not apply.

For example, if you an expression attached to the **ExecuteCondition** property that hides the action button unless the Actual Year Built is greater than 1970, then the expression associated with the Isenabled property does not apply.

Typically, you would add the expression to only one property.

Name: Enter a Name if required. This step is optional.

Properties: Expand the Properties parameter.

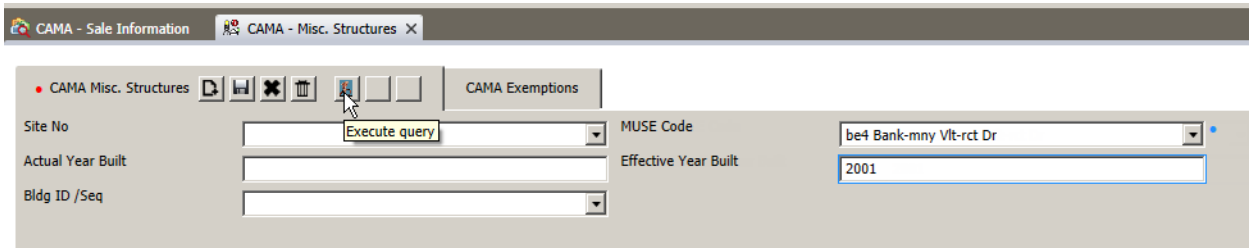
Execute Condition: If you want to attach a condition to the action button or to the action, enter an expression in the **Execute Condition** text box. If the Execute Method is set to manual, the action button is enabled only if the condition is true. If it is set to one of the automatic settings, the query is executed only if the condition is true.

Execute Method: The **Execute Method** is used to control the moment that the query is executed. Select one of the following:

- **Manual**: Select **Manual** to execute the query when the user clicks the action button.

- **Before Create / After Create**: Select one of these options to associate a query with the New button.
  Select Before Create to execute the query after the New button is pressed, but before the form is ready to use.
  Select After Create to execute the query after the New button is pressed and the form is ready to use.
- **Before Save / After Save**: Select one of these options to associate a query with the Save button.
  Select Before Save to execute the query after the Save button is pressed, but before the data are saved.
  Select After Save to execute the query after the Save button is pressed and the data are saved.
- **Before Delete / After Delete**: Select one of these options to associate a query with the Delete button.
  Select Before Delete to execute the query after the delete button is pressed, but before the data are deleted.
  Select After Delete to execute the query after the delete button is pressed and the data are deleted.

Tooltip: Enter a tooltip for your query. This is displayed in Govern when the action button is enabled and you hover your mouse over it.



Deleting an Action Button

To delete an action button:

1. Launch the Govern OpenForms Designer.
2. Open the form that you want to modify.
3. Select the entity with the action button.
4. Select the action button.
5. Click the **Delete** icon ✖ on the OFD toolbar.

Rows or Columns

Overview

The layouts for the Govern user forms are created on rows and columns inside a grid. The number of columns in this grid is set when you create a new form or add an entity to it. The number of rows depends on the number of attributes in the entity.

You can add any number of rows or columns to this basic grid once it is set up and open in the OFD Editor. You can also add design items, such as secondary grids, groupboxes, and tabs. These can be used to group together similar items and facilitate data entry. Once these items are in place, you can expand them by adding more rows and columns.

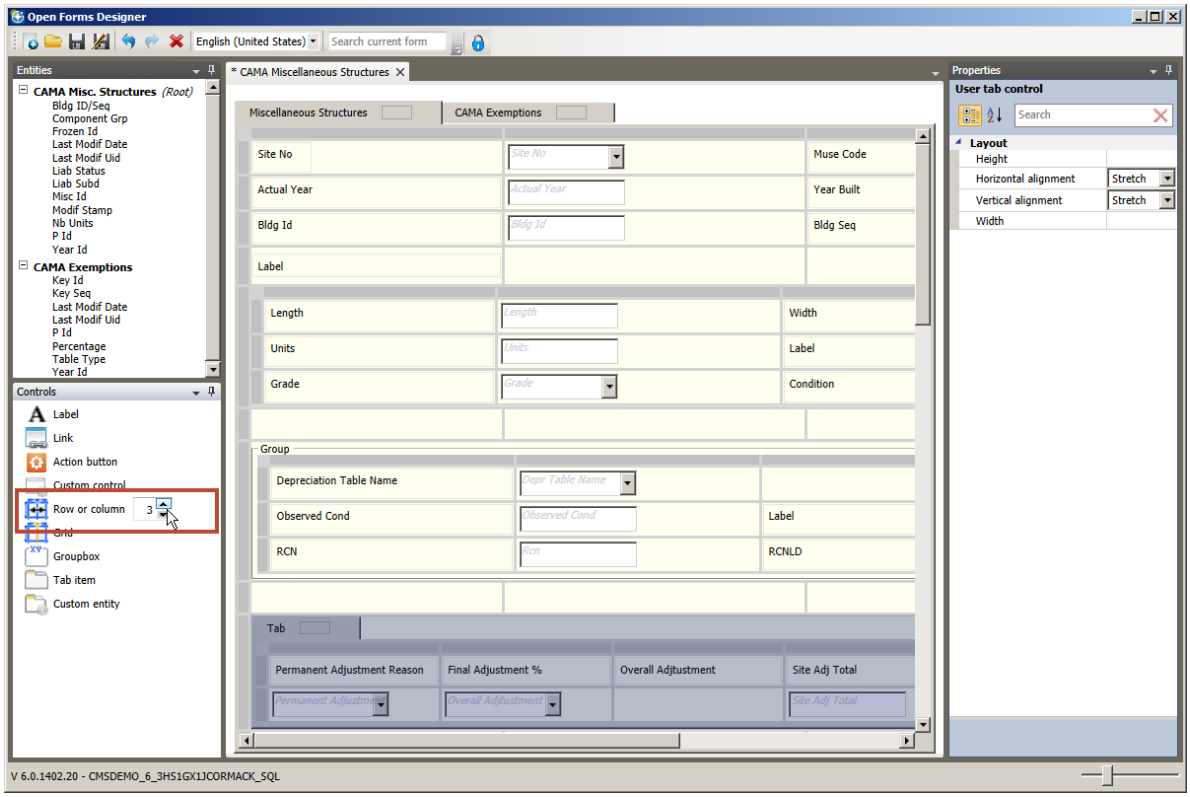
Each row and column has a separate set of properties, whether it is inside the basic grid or inside another item.

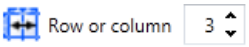
This section of the guide describes the following:

Adding Rows or Columns

To add rows or columns:

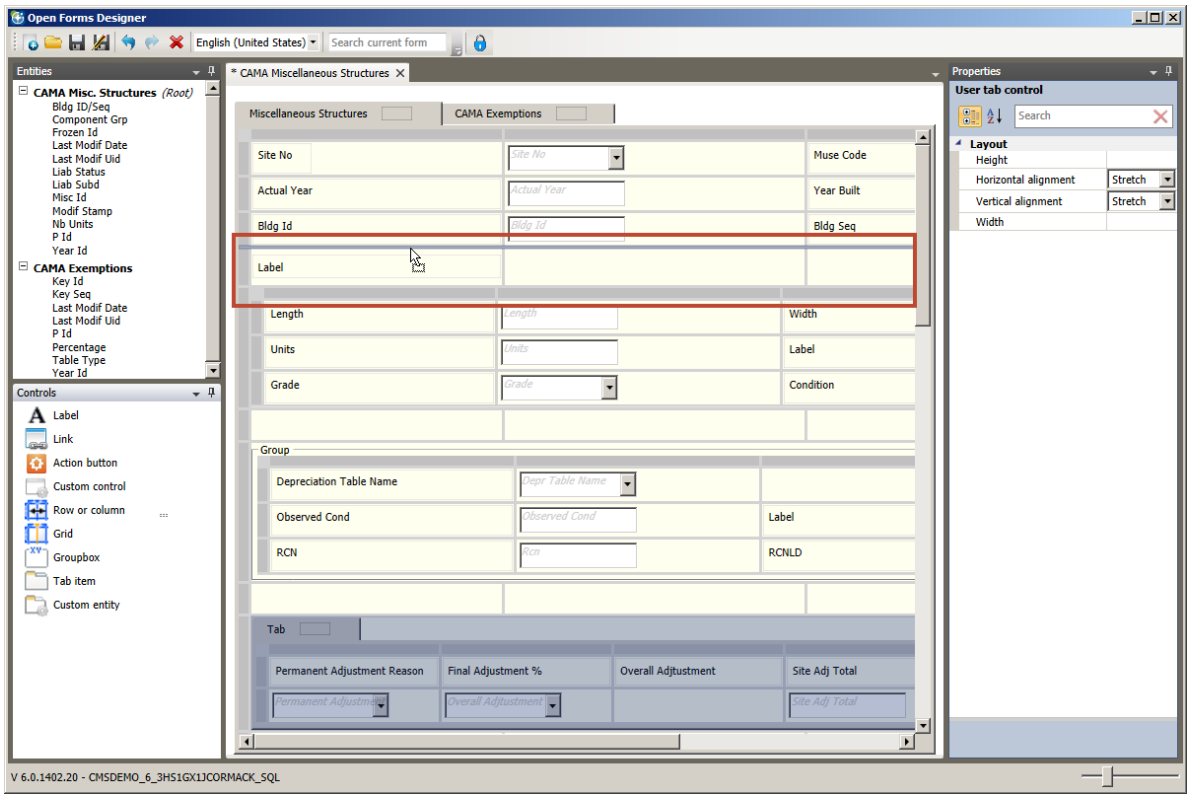
1. Launch the Govern OpenForms Designer.
2. Open the form and the entity that you want to modify.



3. Select the **Row or Column** control  in the Controls Explorer.

4. Use the up and down arrows  to select the number of rows or columns that you want to add.

5. Drag the control to the point where you want to add the new rows or columns.

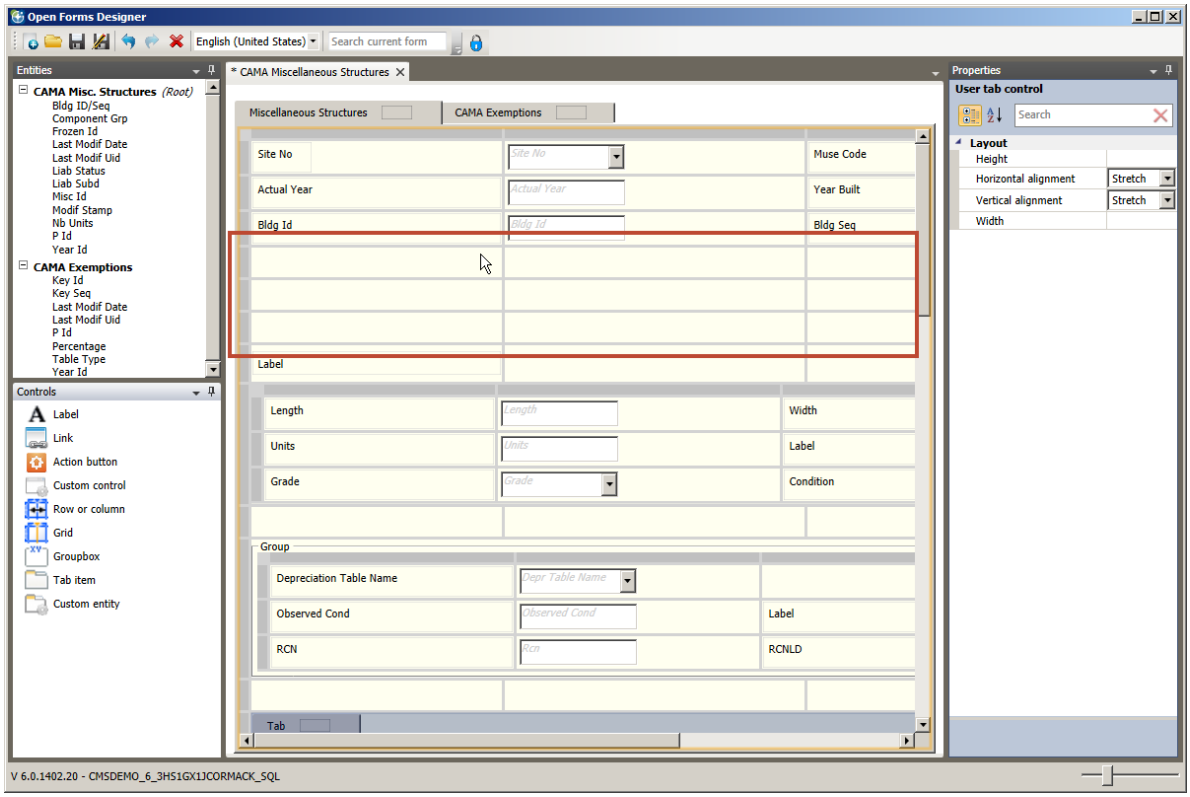


6. Do one of the following:
   - Select the border between two columns to add new columns.
   - Select the border between two rows to add new rows.

   The border is highlighted to show that you can add columns or rows at the selected point. The cursor format changes, as illustrated in the following screen shot:

Cursor while dragging the control on the form.

Cursor on a point where columns or rows can be added.



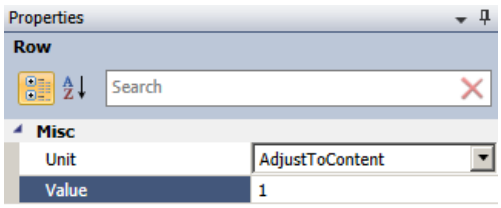
7. Release the mouse button to drop the new rows or columns into place.

   In the sequence shown in the screen shots in this procedure, three new rows are added.

8. Define the properties for the new rows or columns as described in the following section.

Defining Properties for Rows and Columns

When you add new rows or columns to the OFD Editor, the default properties are as follows:



Element ID: As with all items, rows and columns an element ID property. This provides reference in the log files.

Rows

- The **Unit** is set to **AdjsutToContent**.
- The **Value** is set to 1.

The height of new rows is the same as the default height of the existing ones.

Columns

- The **Unit** is set to **Proportional**.
- The **Value** is set to **1**. This means that each new column is equal to the others, and takes up an equal amount of the allotted space.

To adjust the properties for rows or columns:

1. Select one of the following from the **Unit** drop-down list:
   - **Fix**: If you want a set height or width for the selected row or column.
   - **AdjustToContent**: Select this option to adjust the height or width of the row or column according to the text or item that it contains.
   - **Proportional**: Select this option to adjust the selected row or column in proportion to the others. Then enter a value in the **Value** property.
2. Enter one of the following for the **Value**:
   - If the **Unit** is set to **Fix**, enter a value in the **Value** text box.
   - If the **Unit** is **AdjustToContent**, the **Value** is not applicable.
   - If the **Unit** is **Proportional**, enter the height or width of the new row or column in relation to the others.

You can use any combination of these properties. Following are some examples:

Scenario 1: Proportional

If you have two columns, you could select **Proportional** for both. Then, set the value of the first to **2** and the value of the second to **1**. In this scenario, the first column is always twice the size of the second.

Scenario 2: Adjust to Content and Proportional

If you have three columns, you could select **AdjustToContent** for the first. Then, select **Proportional** for the second and third. Set the second to **2** and

the third to **1**. In this scenario, the first column adjusts automatically according to the content that is entered. The second and third take up the remaining space and the second is always twice the size of the third.

3. Click **Save** to save the new or modified properties.

Deleting a Row or Column

You can use this procedure to delete a row or column anywhere on the OFD Editor, including inside a grid, groupbox, or tab.

To delete a row or column:

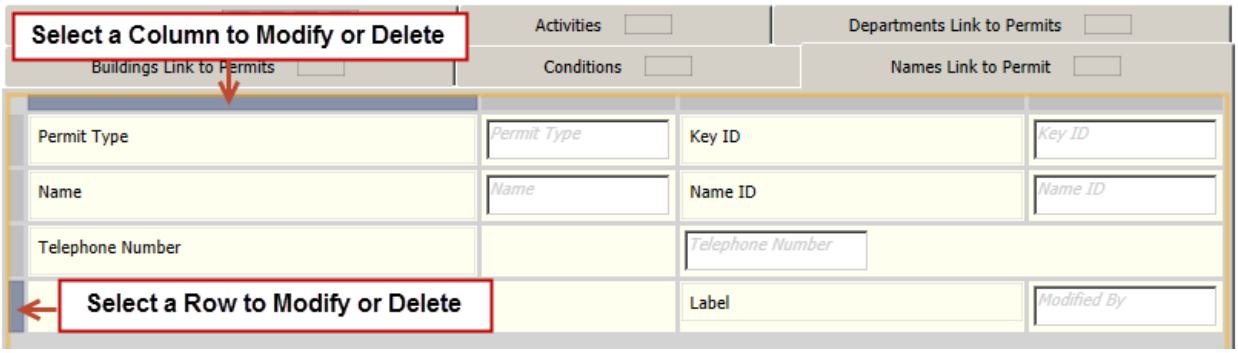
1. Select the row or column in the OFD Editor.

   The best place to select the row or column is on the border at the left of the row or the top of the column.

2. Click the **Delete** icon ✖.

There is no warning; however, you can use the **Undo** tool to reverse the Delete action.

You can delete more than one row and / or column using the `[Shift]` and `[Ctrl]` keys on your keyboard.



You could delete the row and column in the preceding screen shot at the same time. In this scenario, the leftmost column and the bottom row would be deleted.

Grids

Overview

A grid is used for the basic layout of the entities in the Govern user forms, as described under *Rows or Columns on page 95*.

You can add a secondary grid anywhere on the form in order to group together a number of similar attributes and labels or other items. This can be useful if you want a greater or lesser number of columns for a group of items or if you want the dimensions of specific rows and columns to be different from the rest of the form.

The design items that you add to the basic grid, such as a groupbox or a tab, contain a grid. Each grid has a separate set of properties. This includes the grid used for the basic layout, the grids within groupboxes, and the grids within tabs.

Note that each row and column within the grid has a separate set of properties.

Unlike a tab or a groupbox, a grid does not have a built-in label or title.

This section describes the following:

Adding a Grid

To add a grid:

1. Select the **Grid** control 

in the Controls Explorer.
2. Use the up and down arrows to select the number of rows or columns that you want in the grid.

Note: You can add extra rows or columns using the **Row or Column** control later on after the grid is in place.

3. Drag the control to the point where you want to add the gird.
4. Do one of the following:
   - Drag the control to an empty cell.

     Regardless of the number of rows or columns in the grid, the new grid takes up a single cell on the OFD Editor.
   - Drag the grid to the border between two rows.

     A new row is created for the grid above the selected border. The grid takes up a single cell in the new row.
   - Drag the grid to the border between two columns.

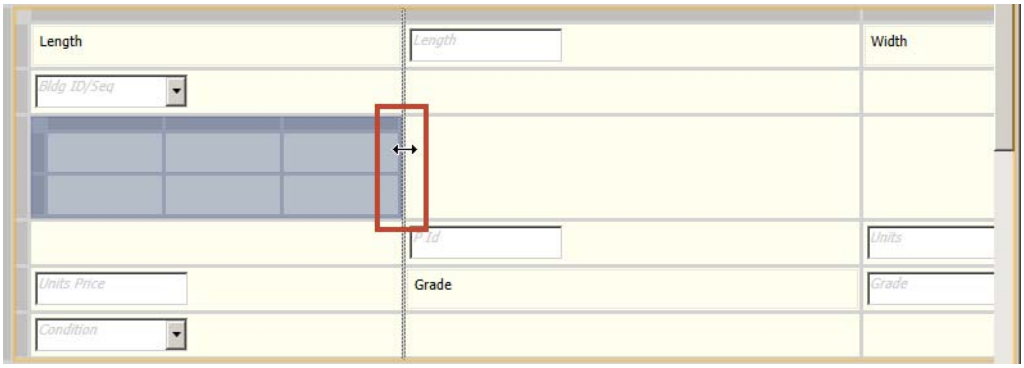
     A new column is created for the grid to the right of the selected border. The grid takes up a single cell in the new column.

     If you select the rightmost border, a new row is created.

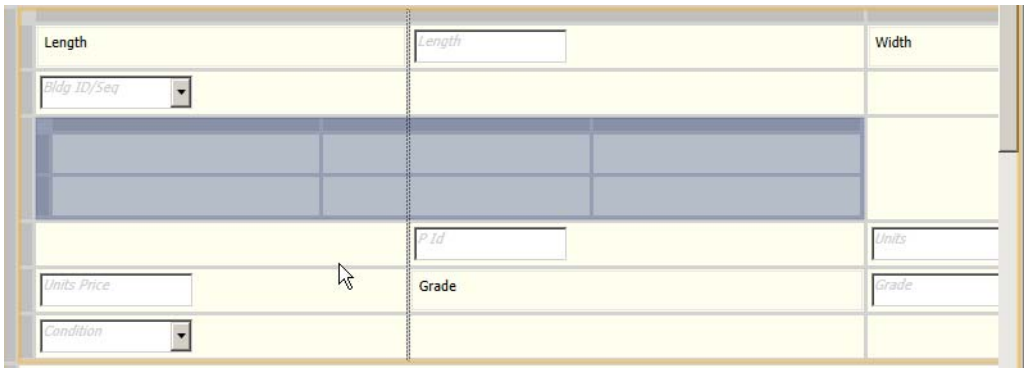
     The grid takes up a single cell in the row.
5. Double-click the border to the right or left of the grid to increase the width of the grid.

   This is illustrated in the following series of screen shots:

Double-click on the border:



Expand the width of the grid:



To increase the height of the rows, you can merge a number of rows or modify the height of the rows in the Properties Explorer.

6. Select the items that you want to add to the grid.

   You can add any of the following:
   - An attribute or label on the form.
   - An attribute listed in the Entities Explorer, as long as it is part of the current entity.
   - Any control, with the exception of the Action Button or Custom Entity.
   - Another grid or groupbox on the form.

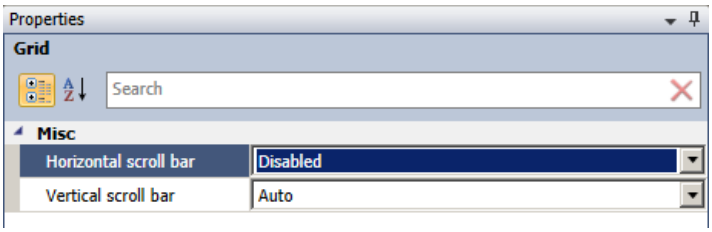
Defining the Properties for the Grid

The grid is made up of rows and columns. You can define the properties for the grid as a whole. Then, define the properties for each row and column separately.

To define the properties of the grid:

1. Select the grid.

   The word **Grid** appears at the top of the Properties Explorer.



Element ID: As with all items, the grid has an element ID property. This provides reference in the log files.

2. Select one of the following properties for the **Horizontal Scroll Bar** and for the **Vertical Scroll Bar**:
   - **Visible**: The scrollbar is always visible, but it is grayed out unless it is required.
   - **Auto**: The scrollbar appears when it is required; i.e., when the content is greater than the height or width of the cells within the grid.
   - **Hidden**: The scrollbar is not visible, but you can scroll through content using the arrow keys on your keyboard.
   - **Disabled**: The scrollbar is not visible and you cannot scroll through the content using any other method.

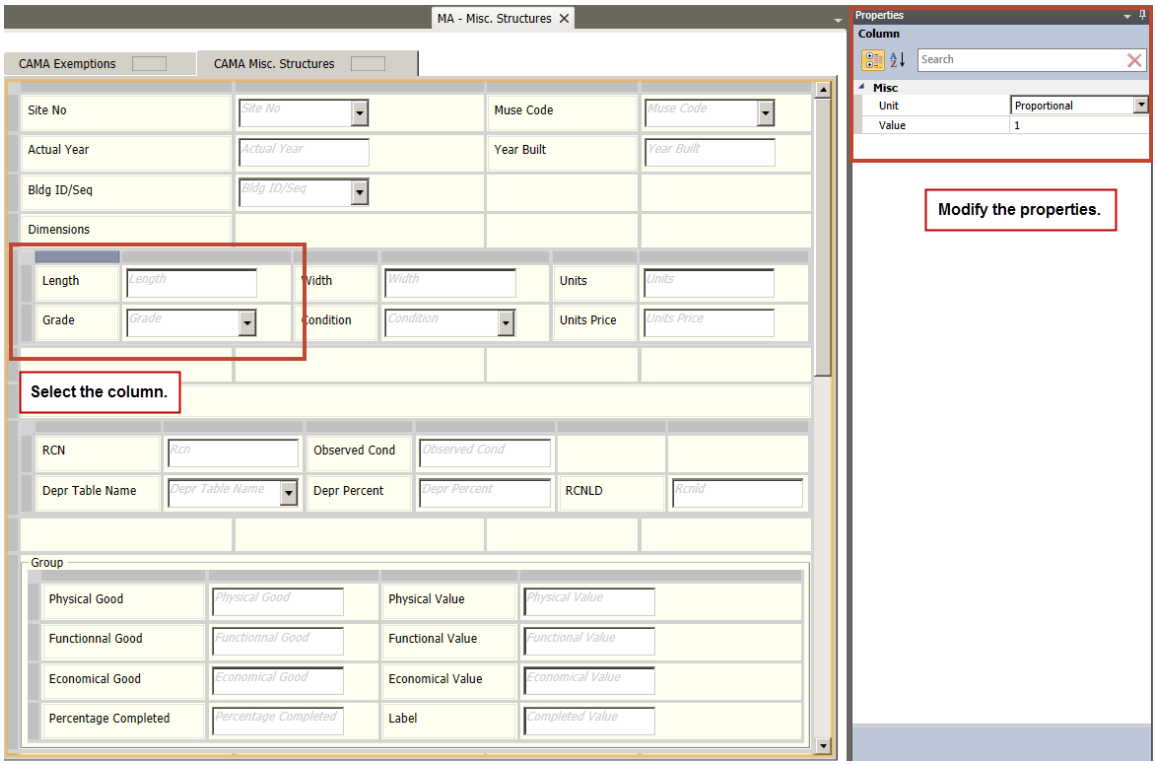
Note: If the Horizontal Alignment is set to Stretch and Wrap Text is enabled for a field, ensure that the **Horizontal Scrollbar** is **Disabled**. Otherwise the text does not wrap. *See Wrap Text on page 187*.

The Horizontal and Vertical Scrollbar properties are set at the Grid level. Both the Tab and the Groupbox controls contain a grid. For a tab, you may have a grid within a grid.

3. Click **Save** to save the properties.

Defining Properties for the Rows and Columns

The procedure for defining properties for the rows and columns inside the grid is the same as that for defining rows and columns outside the grid.



To define the properties for the columns and rows in a grid:

1. Select a column in the grid on the OFD Editor.
2. Modify the properties in the **Properties** pane.
3. Repeat steps 1 and 2 for each column.
4. Select the row in the gird.
5. Modify the properties for each row.
6. Repeat steps 4 and 5 for each row.
7. Click **Save**.

For details, see Defining Properties for Rows and Columns on page 98.

Deleting a Grid

To delete a grid:

1. Select the grid in the OFD Editor.

Tip: The best place to select a grid is the top left corner on the border.

2. Click the **Delete** icon .

There is no warning; however, you can use the Undo tool to reverse the Delete action.

You can delete rows or columns in the grid. The procedure is the same as deleting a row or column anywhere on the OFD Editor. *See Deleting a Row or Column on page 100*.

Groupboxes

Overview

You can add a groupbox anywhere on an entity.

It is useful for grouping together a small number of data-entry fields. It has a frame and a heading to make it stand out on a form.

A groupbox contains a grid and a grid contains rows and columns. Each of these items has a separate set of properties.

This section describes the following:

Adding a Groupbox

To add a groupbox:

1. Select the **Groupbox** control 

in the Controls Explorer.
2. Use the up and down arrows to select the number of rows and columns that you want to add.

   Note: The first number always refers to the rows and the second to the columns.

   You can add extra rows or columns using the **Row or Column** control at any time after the groupbox is in place.

3. Do one of the following:
   - Drag the groupbox control to an empty cell.

     Regardless of the number of rows or columns in the groupbox, the new groupbox takes up a single cell, by default. To modify this, see step 4.
   - Drag the groupbox to the border between two rows.

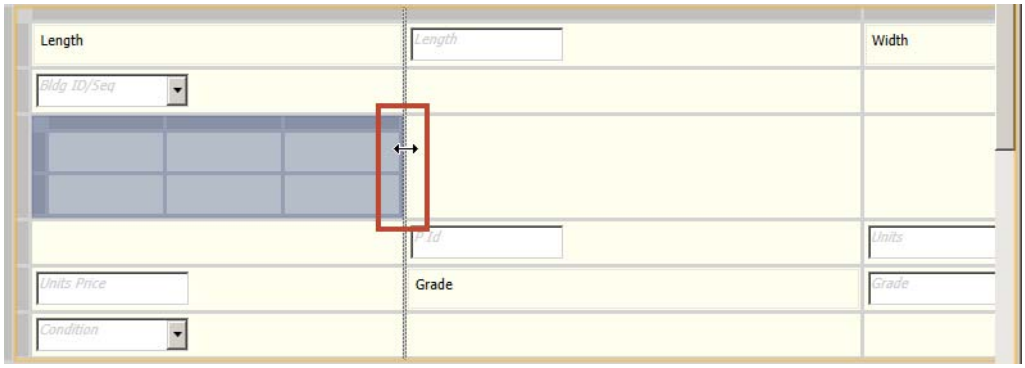
     A new row is created for the groupbox above the selected border. The groupbox takes up a single cell in the new row.

- Drag the groupbox to the border between two columns.
  The new groupbox is inserted in the cell to the right of the selected column. If there is an item currently in the cell, it is pushed to the right, as are all subsequent items. A new row is created, if required.

4. Double-click the border to the right or left of the groupbox to remove the border and increase the width of the groupbox.

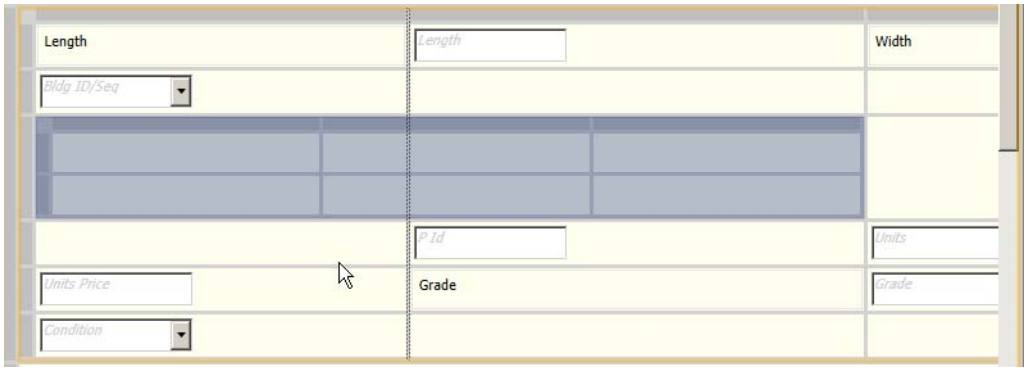
   This is illustrated in the following series of screen shots:

   Double-click on the border:



The cursor changes to a double arrow when you it is in the right place to expand the grid.

Expand the width of the groupbox:



   Use the same procedure to expand the grid across multiple rows or modify the height of the rows in the Properties Explorer.

5. Select the items that you want to add to the groupbox.

   You can add any of the following:

- An attribute on the form.
- A label on the form.
- An attribute listed in the *Entities* tree view, as long as it is in the current entity.
- Any control, with the exception of the Action button or custom entity.
- Another groupbox, grid, or tab on the form.

Add these items one at a time or select and add multiple items using the `Ctrl` and `Shift` keys on your keyboard.

Defining Properties for a Groupbox

The groupbox contains a grid. The grid is made up of rows and columns. You need to select and define properties for each of these items separately.

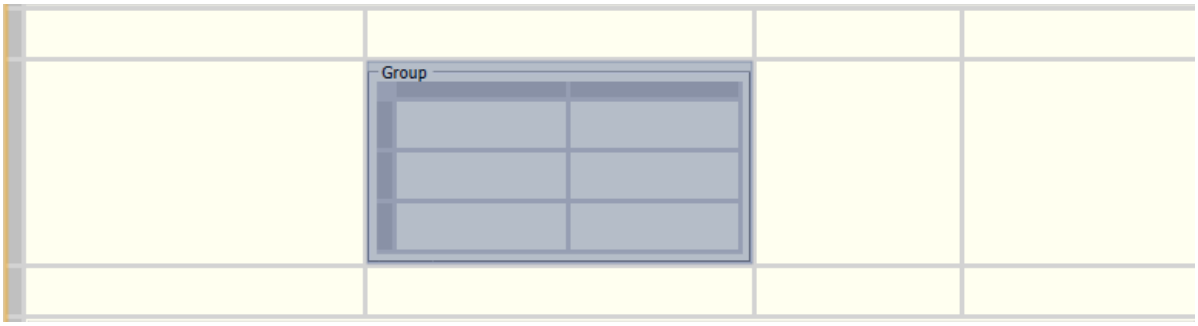
The properties are defined at the following levels:

- **Element ID**: As with all items, the groupbox has an element ID property. This provides reference in the log files. It is read-only.
- **Groupbox**:
  - Heading
  - Height and width of the groupbox
  - Alignment of the groupbox
- **Grid**:
  - Height and width of the grid
  - Alignment of the grid
  - Horizontal and vertical scrollbars
- **Column**:
  - Unit type
  - Value
- **Row**:
  - Unit type
  - Value

If there are labels and attributes, or other items, inside the groupbox, each one has a separate set of properties.

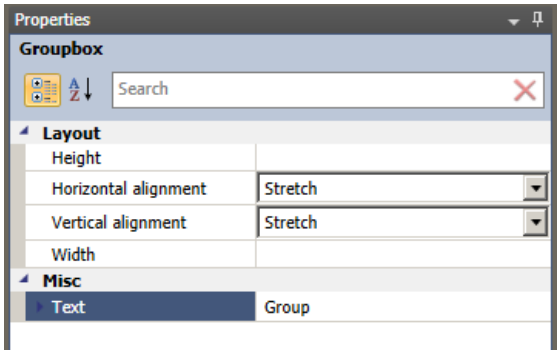
Defining Properties for the Groupbox as a Unit

To define the properties for the groupbox as a unit:



1. Select the groupbox.

   The heading **Groupbox** appears at the top of the Properties pane.



2. Select one of the following from the **Horizontal Alignment** drop-down list:
   - **Left**: Aligns the groupbox at the left of the cell.
   - **Center**: Aligns the groupbox in the center of the cell.
   - **Right**: Aligns the groupbox at the right of the cell.
   - **Stretch**: Aligns the groupbox in the center of the cell.
3. Enter a value in the **Height** text box. This is the height of the groupbox inside the cell.

   If you increase the height of the groupbox, the height of the row increases. However, if you decrease the height of the groupbox, the height of the row does not decrease below the default value.
4. Select one of the following from the **Vertical Alignment** drop-down list:
   - **Top**: Aligns the groupbox at the top of the cell.
   - **Center**: Aligns the groupbox in the center of the cell.

- **Bottom**: Aligns the groupbox at the bottom of the cell.
- **Stretch**: Aligns the groupbox at the top and left of the cell.

5. Enter a value in the **Width** text box. This is the width of the groupbox inside the cell.

   If you increase the width of the groupbox, the width of the cell increases.

   However, if you decrease the width of the groupbox, the width of the cell does not decrease below the default value.

   To expand the groupbox over multiple cells, double-click on the border between two columns. This removes the border.

6. Click **Save** to save the properties.

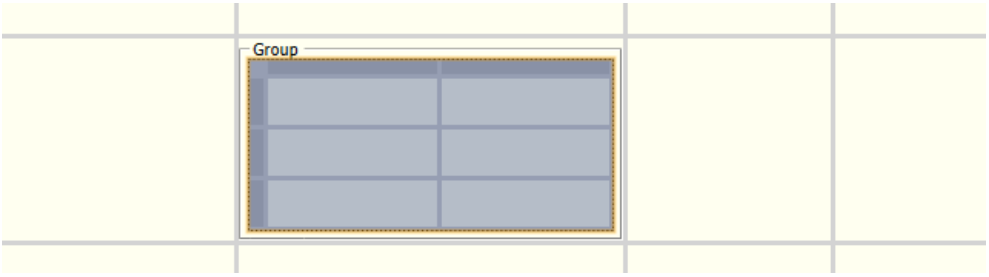
Defining the Grid Within a Groupbox Properties

The properties for a grid within a groupbox are separate from the properties for the groupbox. This scrollbars are part of the grid.

To define the properties for the grid:

1. Select the grid within the groupbox.

   Tip: The best place to select the grid is at the top left corner.



   The grid is highlighted in yellow when it is selected. The heading grid appears at the top or the Properties pane.

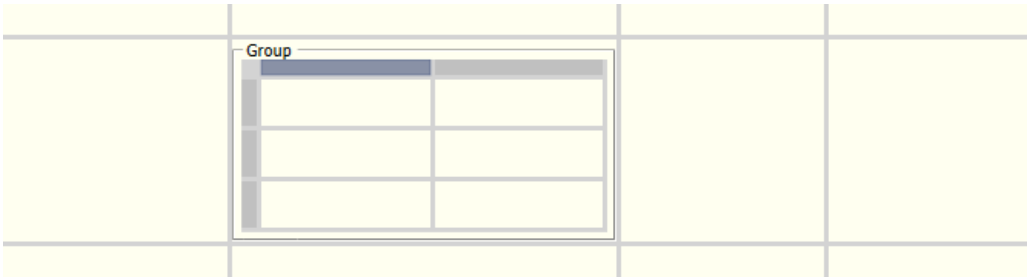
2. Define the properties for the grid as described under *Defining the Properties for the Grid on page 103*.

Defining the Properties for the Rows and Columns Within the Groupbox

The properties for each row and column within the groupbox – technically within the grid within the groupbox – are defined separately.

To define the properties for the rows and columns:

1. Select a column within the groupbox.



   The heading **Column** appears at the top of the Properties pane.
2. Modify the properties in the **Properties** pane.
3. Repeat steps 1 and 2 for each column.
4. Select the row in the gird.
5. Modify the properties for each row.
6. Repeat steps 4 and 5 for each row.
7. Click **Save**.

For details, see Defining Properties for Rows and Columns on page 98.

Deleting a Groupbox

To delete a groupbox:

1. Select the grid in the OFD Editor.

   The best place to select the groupbox is on the border at the left or the top of grid.
2. Click the **Delete** icon .

There is no warning; however, you can use the Undo tool  to reverse the Delete action.

You can delete the grid or any of the rows or columns inside the groupbox. The procedures are the same as deleting a row or column or a grid anywhere on the OFD Editor. *See Deleting a Row or Column on page 100* and *Deleting a Grid on page 105*.

Tabs

Overview

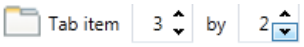
If an entity contains a lot of attributes, you can separate them onto different tabs. This makes it easier to find specific fields and facilitates data entry.

Like the groupbox, each tab contains a grid, which is in turn is made up of rows and columns. It includes a heading and can contain Action Buttons. Several tabs are added together.

On the OpenForms Designer, a group of tabs is called a Tab Item Control. A single tab within this group is called a User Tab Item.

Adding a Tab or Group of Tabs

To begin:

1. Select the **Tab Item** control 

in the Controls Explorer.
2. Use the up and down arrows to select the number of rows and columns that you want to add on the tab.

   Select the number of rows and columns according to the number of labels and attributes, and other items that you want to appear on the tab.

   Note: The first number always refers to the rows and the second to the columns.

   You can add extra rows or columns using the **Row or Column** control at any time after the tab is in place.

3. Do one of the following:
   - Drag the tab control to an empty cell.

     Regardless of the number of rows or columns inside the tab, the new tab takes up a single cell, by default. To modify this, see step 4.
   - Drag the tab to the border between two rows.

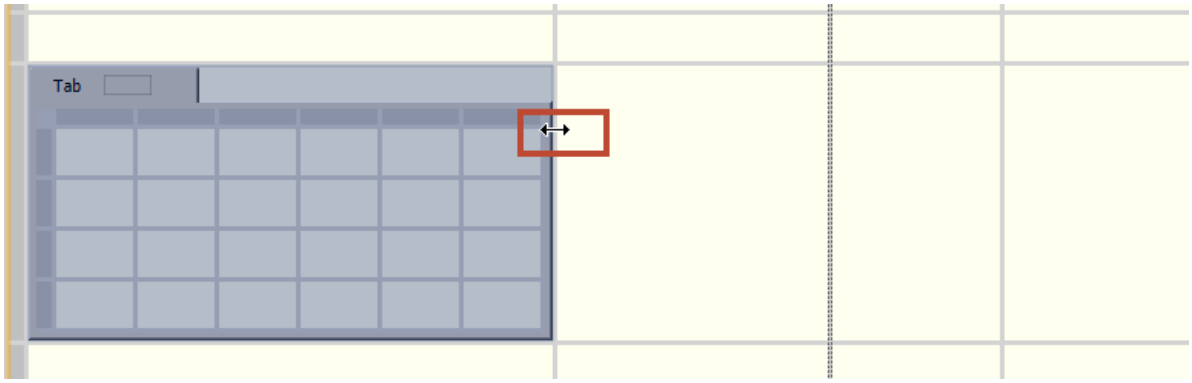
     A new row is created for the groupbox above the selected border. The tab takes up a single cell in the new row.
   - Drag the tab to the border between two columns.

The new tab is inserted in the cell to the right of the selected column. If there is an item currently in the cell, it is pushed to the right, as are all subsequent items. A new row is created, if required.

4. Double-click the border to the right or left of the tab to remove the border and merge two cells together.

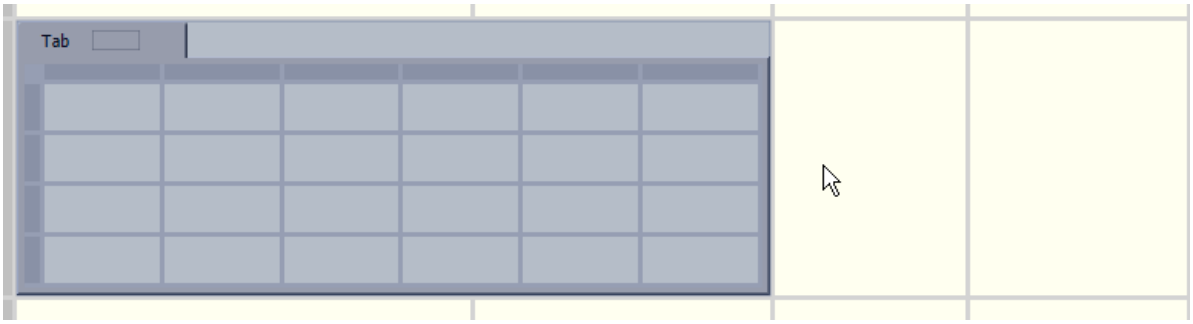
   This is illustrated in the following series of screen shots:

   Double-click on the border:



The cursor changes to a double arrow when you it is in the right place to expand the grid.

Expand the width of the tab:



Use the same procedure to expand the tab across multiple rows.

5. Select the items that you want to add to the tab.

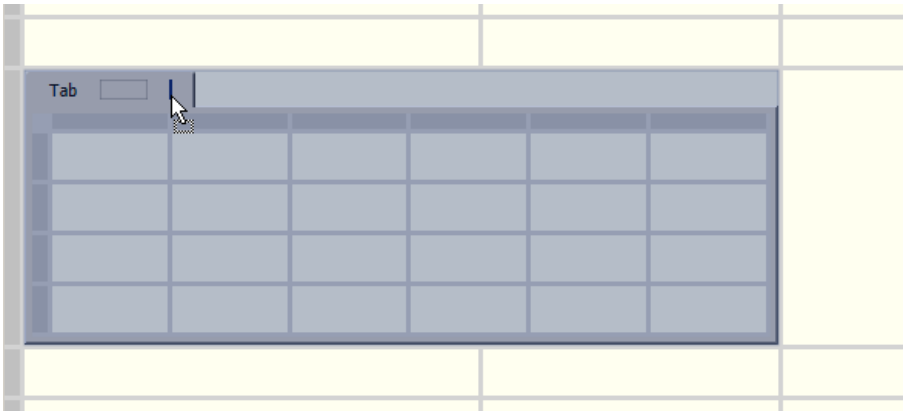
   You can add any of the following:
   - An attribute on the form.
   - A label on the form.

- An attribute listed in the *Entities* tree view, as long as it is in the current entity.
- Any control, including an Action button.
- Another tab, groupbox, or grid on the form.

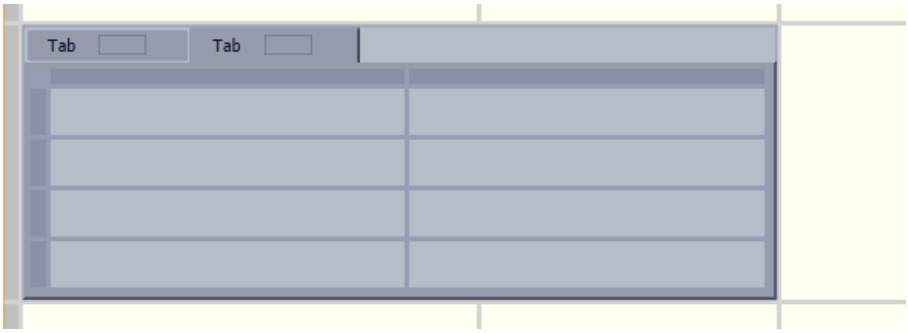
You can select the items one at a time or select multiple items using the `Ctrl` and `Shift` keys on your keyboard.

6. Select the tab control 

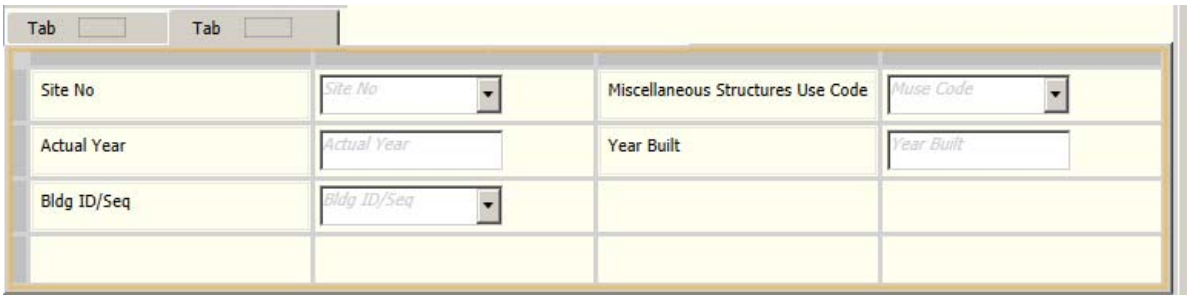
in the tree view to add a second tab beside the first.
7. Select the number of rows and columns that you want in the second tab.
8. Drag the tab control to the heading above the first tab.



9. Release the mouse button to drop the tab in place.



10. Move labels and attributes, and any other items onto the tab.



11. Click **Save**.

Defining the Properties of the Tab

You need to define properties for the group of tabs, as a whole, and for each tab item, separately. The group of tabs is called the *User tab control* and each tab is called a *Tab item*.

In addition, like the groupbox, the tab contains a grid. The grid is made up of rows and columns. You need to select and define properties for each of these items separately.

The properties for the tabs are defined at the following levels:

- **Element ID**: As with all items, the user tab controls and user tab items have element ID properties. These provide a reference in the log files and are read-only.
- **User tab control**:
  - Height and width of the group of tabs
  - Alignment of the group of tabs
- **User tab item**:
  - Heading
  - Height and width of the individual tab
  - Alignment of the individual tab
- **Grid**:
  - Height and width of the grid
  - Alignment of the grid
  - Horizontal and vertical scrollbars
- **Column**:
  - Unit type
  - Value

- **Row**:
  - Unit type
  - Value

If there are labels and attributes, or other items, inside the tabs, each one has a separate set of properties.

Defining the User Tab Control Properties

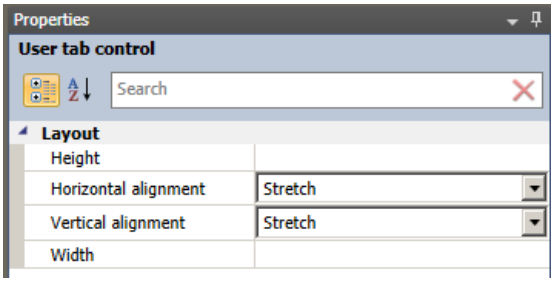
This section describes how to modify the properties of the group of tabs, as a unit.

To modify the properties of the user tab control:

1. Select the user tab control.

   Tip: The best place to select the user tab control is in the bottom right corner.

   The heading **User Tab Control** appears at the top of the Properties pane.



- **Element ID**: As with all items, the user tab control has an element ID property. This provide a reference in the log files.

2. Select one of the following from the **Horizontal Alignment** drop-down list:

- **Left**: Aligns the group of tabs on the left of the cell
- **Center**: Aligns the group of tabs in the center of the cell.
- **Right**: Aligns the group of tabs at the right of the cell.
- **Stretch**: Aligns the group of tabs on the center of the cell.

3. Enter a value in the **Height** text box. This is the height of the group of tabs inside the cell.

   If you increase the height of the group of tabs, the height of the row increases. However, if you decrease the height of the group of tabs, the height of the row does not decrease below the default value.

4. Select one of the following from the **Vertical Alignment** drop-down list:
   - **Top**: Aligns the group of tabs at the top of the cell.
   - **Center**: Aligns the group of tabs in the center of the cell.
   - **Bottom**: Aligns the group of tabs at the bottom of the cell.
   - **Stretch**: Aligns the group of tabs at the top and left of the cell.
5. Enter a value in the **Width** text box. This is the width of the group of tabs inside the cell.

   If you increase the width of the group of tabs, the width of the cell increases.

   However, if you decrease the width of the group of tabs, the width of the cell does not decrease below the default value.

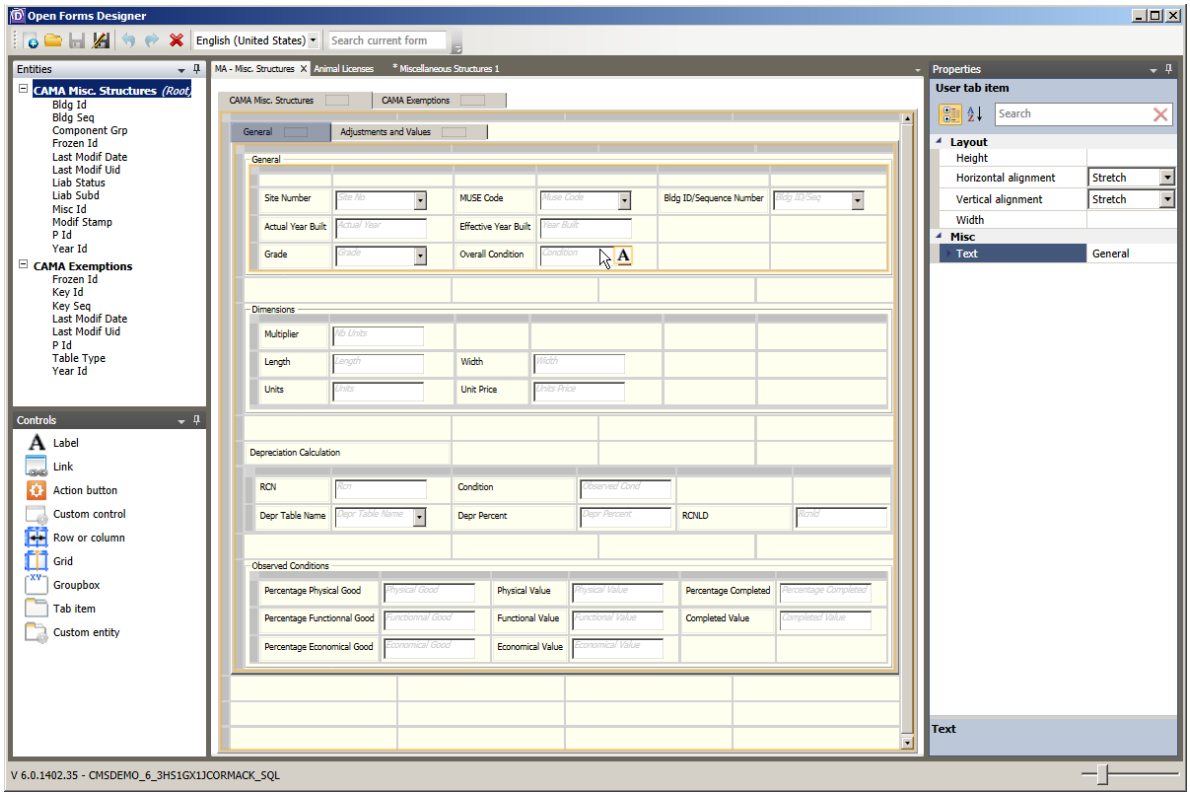
   To expand the group of tabs over multiple cells, double-click on the border between two columns. This removes the border.

6. Click **Save** to save the properties.

Defining the User Tab Item Properties

This section describes how to modify the properties of a single tab within a group of tabs.

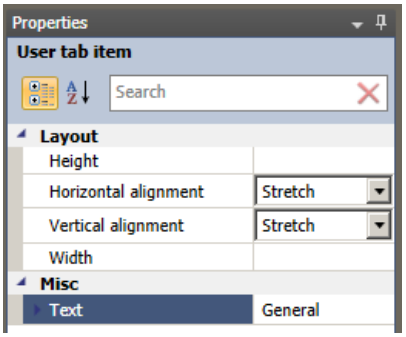
To modify the properties of a tab:



1. Select the tab on the OFD Editor.

Tip: The preceding screen shot shows the General tab selected within the CAMA Miscellaneous Structure entity.

The heading **User Tab Item** appears at the top of the Properties pane.



Element ID: As with all items, the User Tab Item has an element ID property. This provides reference in the log files.

2. Select one of the following from the **Horizontal Alignment** drop-down list:
   - **Left**: Aligns the tab at the left of the cell
   - **Center**: Aligns the tab in the center of the cell.
   - **Right**: Aligns the tab at the right of the cell.
   - **Stretch**: Aligns the tab in the center of the cell.
3. Enter a value in the **Height** text box. This is the height of the group of tab at the top of the form.
4. Select one of the following from the **Vertical Alignment** drop-down list:
   - **Top**: Aligns the tab at the top of the cell.
   - **Center**: Aligns the tab in the center of the cell.
   - **Bottom**: Aligns the tab at the bottom of the cell.
   - **Stretch**: Aligns the tab at the top and left of the cell.
5. Enter a value in the **Width** text box. This is the width of the tab at the top of the form.
6. **Is Visible** / **Is Enabled**: If required, enter an expression in the Is Visible or Is Enabled properties. Typically, these are used to add conditions to viewing and enabling the tab item. For example, you could write an expression to make a tab visible only when a specific value is entered in a prerequisite field. Users may be required to complete the fields in a tab only when a property
7. Click **Save** to save the properties.

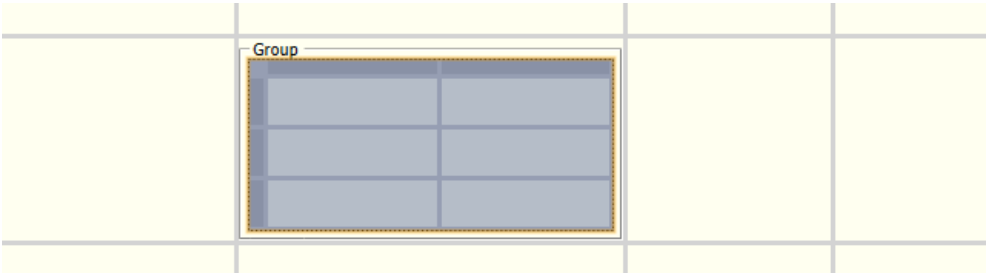
Defining the Grid Within a Group of Tabs Properties

The properties for a grid within a group of tabs are separate from the properties for the group of tabs. This scrollbars are part of the grid.

To define the properties for the grid:

1. Select the grid within the groupbox.

   Tip: The best place to select the grid is at the top left corner.



The grid is highlighted in yellow when it is selected. The heading grid appears at the top or the Properties pane.

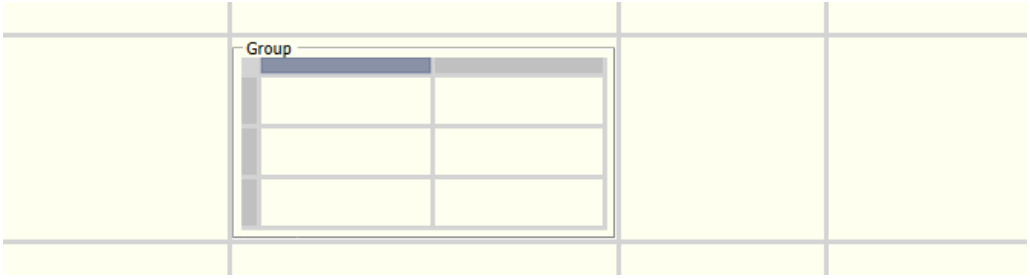
2. Define the properties for the grid as described under *Defining the Properties for the Grid on page 103*.

Defining the Properties for the Rows and Columns Within the Tab

The properties for each row and column within the grid within a tab are defined separately.

To define the properties for the rows and columns:

1. Select a column within the groupbox.



The heading **Column** appears at the top of the Properties pane.

2. Modify the properties in the **Properties** pane.
3. Repeat steps 1 and 2 for each column.
4. Select the row in the gird.
5. Modify the properties for each row.
6. Repeat steps 4 and 5 for each row.
7. Click **Save**.

For details, see Defining Properties for Rows and Columns on page 98.

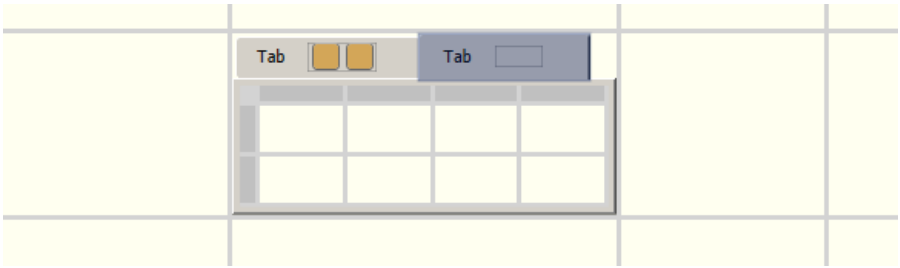
Deleting a Tab Item or Control

You can delete each tab item or the entire tab control.

Deleting a Tab Item

To delete a tab item:

1. Select the tab in the OFD Editor.



   The heading of the tab is selected and **User tab item** appears at the top of the Properties pane.

2. Click the **Delete** icon .

There is no warning; however, you can use the Undo tool to reverse the Delete action.

Deleting the Grid or Rows or Columns Inside the Tab

You can delete the grid or any of the rows or columns inside the tab.

Ensure that you have the correct item selected. When it is selected, the item is highlighted and the control name, such as Grid, Column, or Row appears at the top of the properties pane.

The procedures are the same as deleting a row or column or a grid anywhere on the OFD Editor. *See Deleting a Row or Column on page 100* and *Deleting a Grid on page 105*.

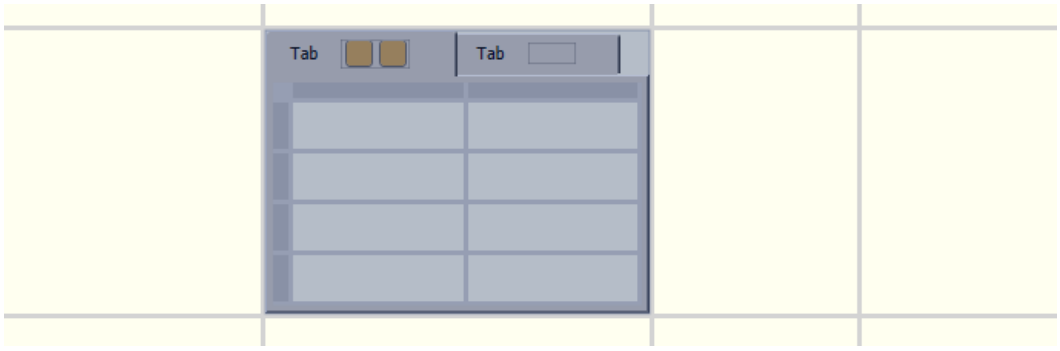
Deleting a Tab Control

You can select and delete all the tab items within the tab control at the same time.

To delete a tab control:

1. Select the tab control on the OFD Editor.

   Tip: The best place to select the Tab Control is in the lower right corner.



   All tabs are selected and the heading **User tab control** appears at the top of the Properties pane.

2. Click the **Delete** icon .

There is no warning; however, you can use the Undo tool to reverse the Delete action.

Adding a Custom Control

Overview

This section describes the ViewQuery Custom Control and provides several examples of how it can be used in Govern.

It includes the following sections:

Prerequisites

Before creating a ViewQuery Custom Control, ensure that you have the following:

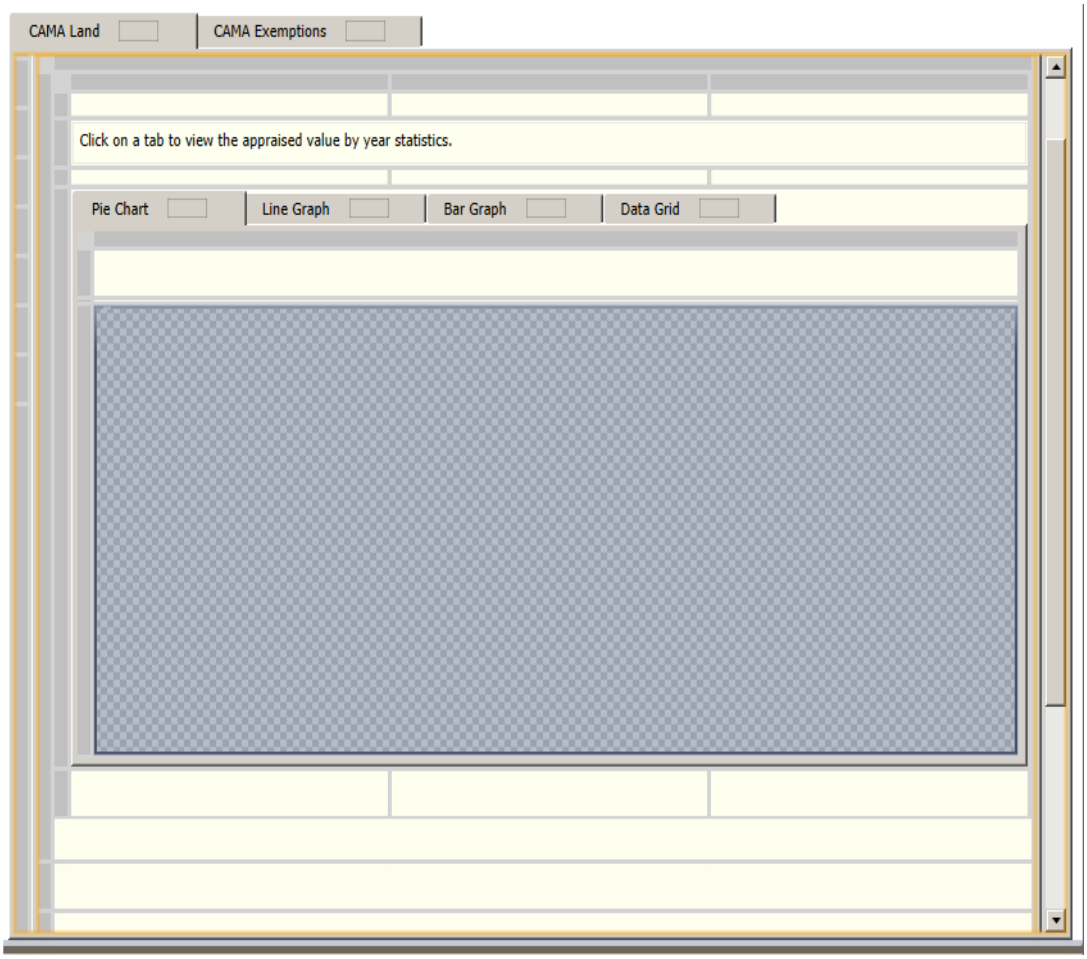
- A query that is set up to display information in a chart. This query must be saved in the SQL Query Editor in GNA. *Refer to the Govern New Administration (GNA) guide for details*.
- If a report is associated with the query it must be saved in the Report Editor in GNA. *Refer to the Govern New Administration (GNA) guide for details.*

Adding a Custom Control to an Entity

To add a custom control to an entity:

1. Launch the Govern OpenForms Designer.
2. Open the form and the entity.
3. Select the Custom control 

under Controls.
4. Drag it to an empty cell on the OFD Editor.



Defining the ViewQuery Custom Control Properties

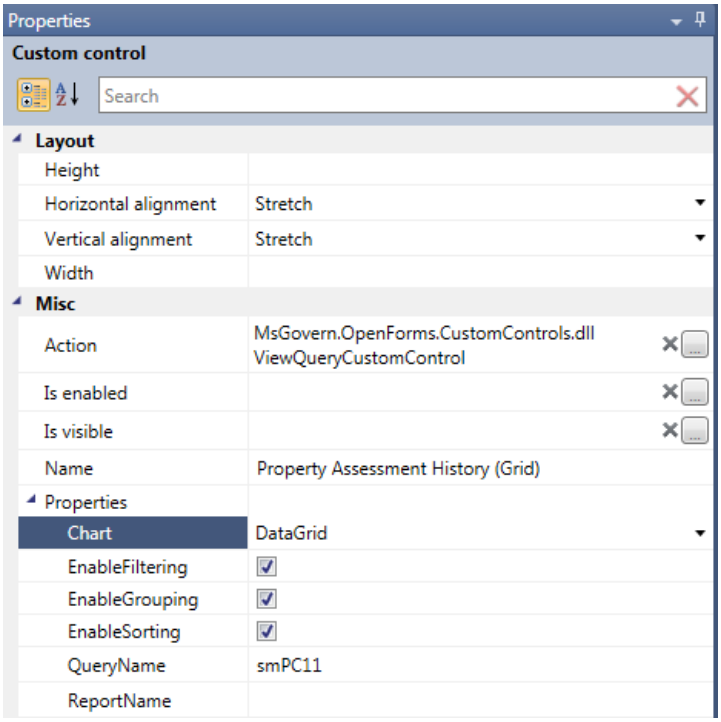
The ViewQuery Custom Control is used for displaying statistics as pie charts, line charts, column charts, or data grids.

There are two parts to the procedure. In the first part, define the general properties. In the second, define the properties for the type of chart that you want to display.

Defining the General Properties

To display a pie chart:

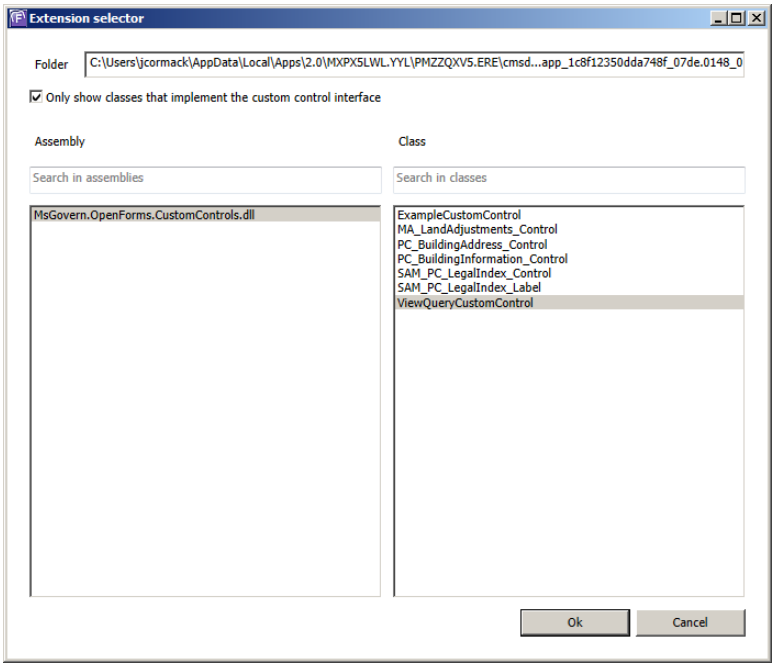
1. Add the custom control to the form as described in the previous procedure.



   Element ID: As with all items, the custom control has an element ID property. This provides reference in the log files.

2. Expand the **Layout** properties in the Property explorer.
3. Select one of the following under **Horizontal Alignment**:
   - **Left**, **Right**, or **Center**: to align the control at the left, the right, or in the center of the cell.
   - **Stretch**: to use all the horizontal space in the cell.
4. Select one of the following under **Vertical Alignment**:
   - **Top**, **Bottom**, or **Center**: to align the control at the top, bottom, or center of the cell.
   - **Stretch**: to use all the vertical space in the cell.
5. Expand the **Miscellaneous** properties in the Property explorer.
6. Select the ellipsis button ... beside the **Action** property.

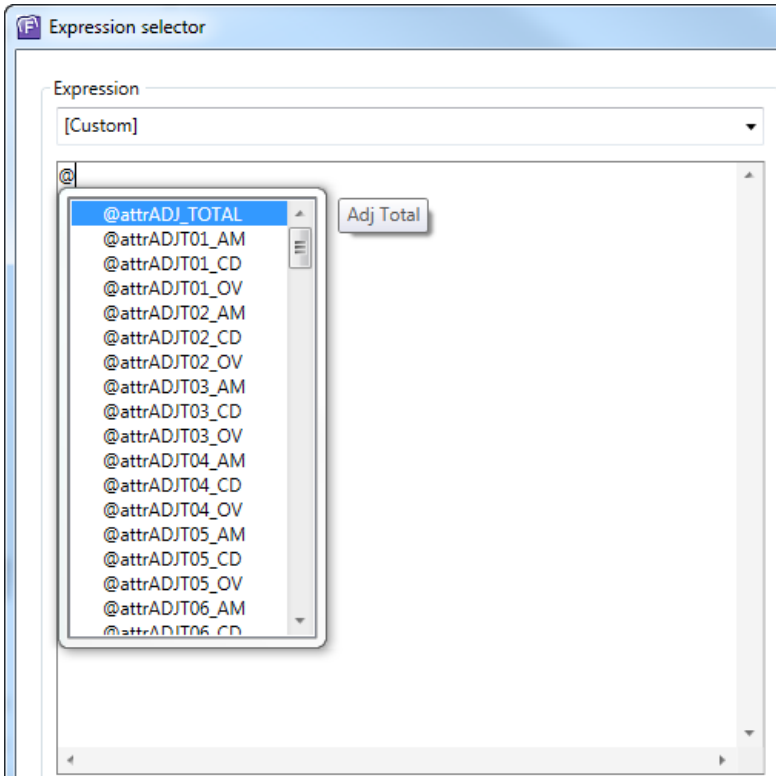
The *Extension selector* window opens.



7. Select **Only show classes that implement the custom control** interface to narrow the selection.
8. Select **ViewQueryCustomControl** in the **Class** list box.
9. Click **OK**.
10. You can use an expression to make a chart invisible or read-only except under a specific condition.

    To use an expression, click the ellipsis button ... beside the **Is enabled** or **Is visible** text box.

This opens the Expression Selector:



For details on creating expressions, see on page 199.

Click **OK** to close the Expression Selector.

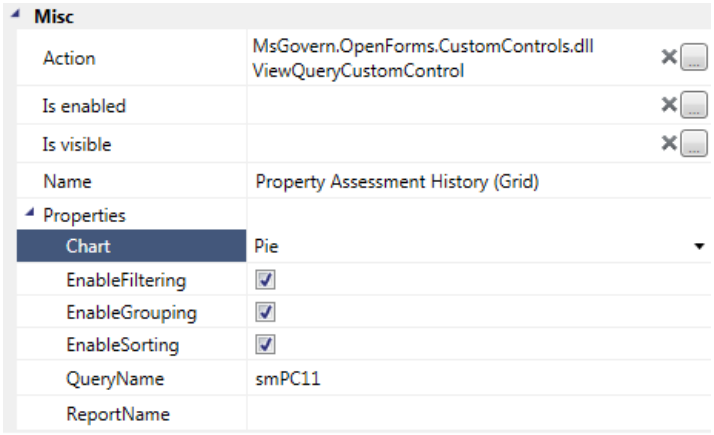
11. Enter a name for the chart in the **Name** text box.

    This is used to identify the chart.

Defining the Properties for a Pie Chart

To define the Pie Chart properties:

1. Expand the **Properties** section of the Property Explorer.

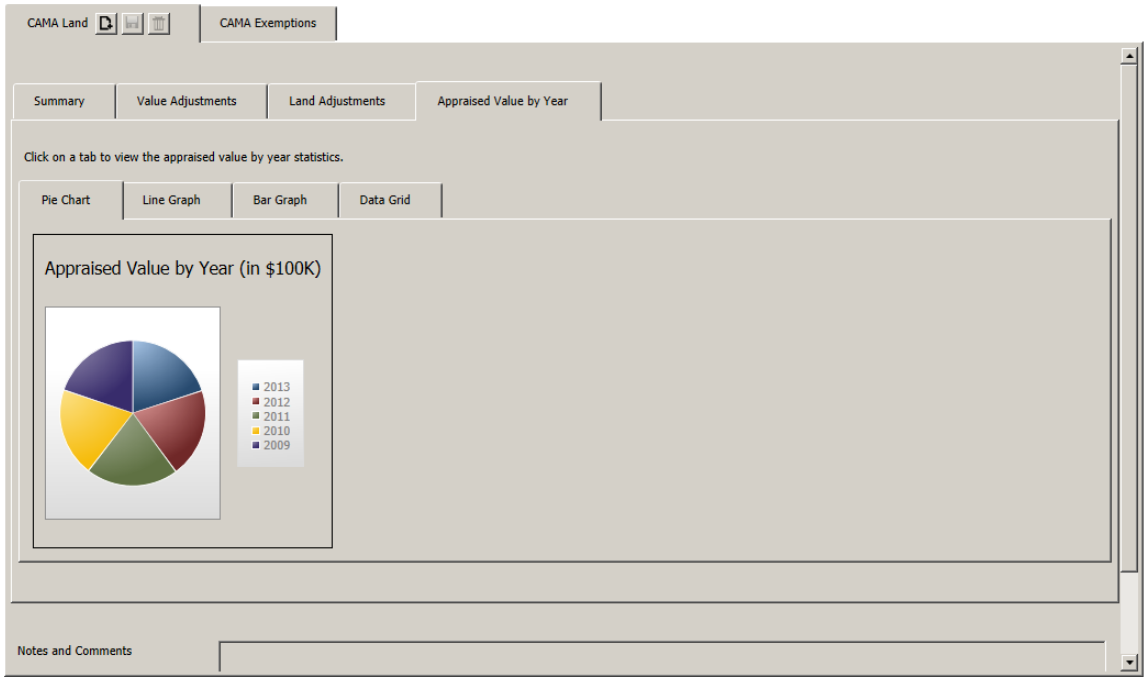


2. Enter a name for the control in the **Name** textbox.
3. Select **Pie** from the **Chart** drop-down list.
4. Enter the unique code for the query in the **QueryName** textbox.
5. Select any of the following options to add filtering, grouping, and / or sorting functionality.
   - Enable filtering: *See Filtering on page 135*
   - Enable grouping: *See Grouping on page 136*
   - Enable sorting: *See Sorting on page 137*.
6. If a report is associated with the query, enter the unique code for the report in the **Report Editor**.
7. Click **Save**.

Viewing the Results of the Pie Chart Query

To view the results of the Pie Chart query:

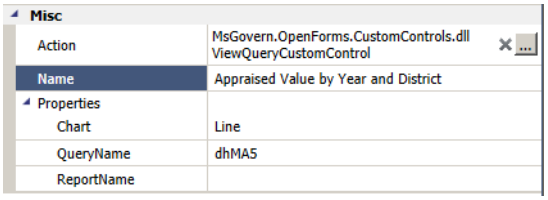
1. Launch Govern.
2. Open the form and the entity.



Defining the Properties for a Line Chart

To define the Line Chart properties:

1. Expand the **Properties** section of the Property Explorer.

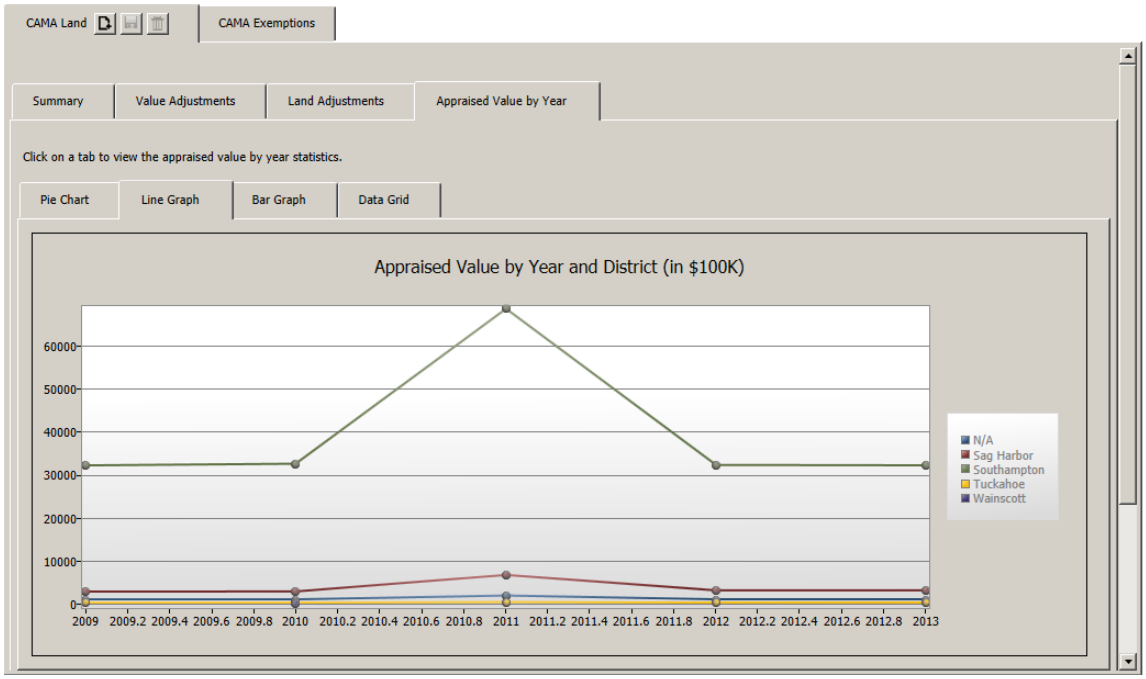


2. Enter a name for the control in the **Name** textbox.
3. Enter **Line** in the **Chart** textbox.
4. Enter the unique code for the query in the **QueryName** textbox.
5. If a report is associated with the query, enter the unique code for the report in the **Report Editor**.
6. Click **Save**.

Viewing the Results of the Line Chart Query

To view the results of the Line Chart query:

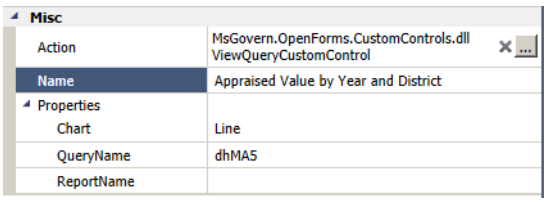
1. Launch Govern.
2. Open the form and the entity.



Defining the Properties for a Bar or Column Chart

To define the Column Chart properties:

1. Expand the **Properties** section of the Property Explorer.



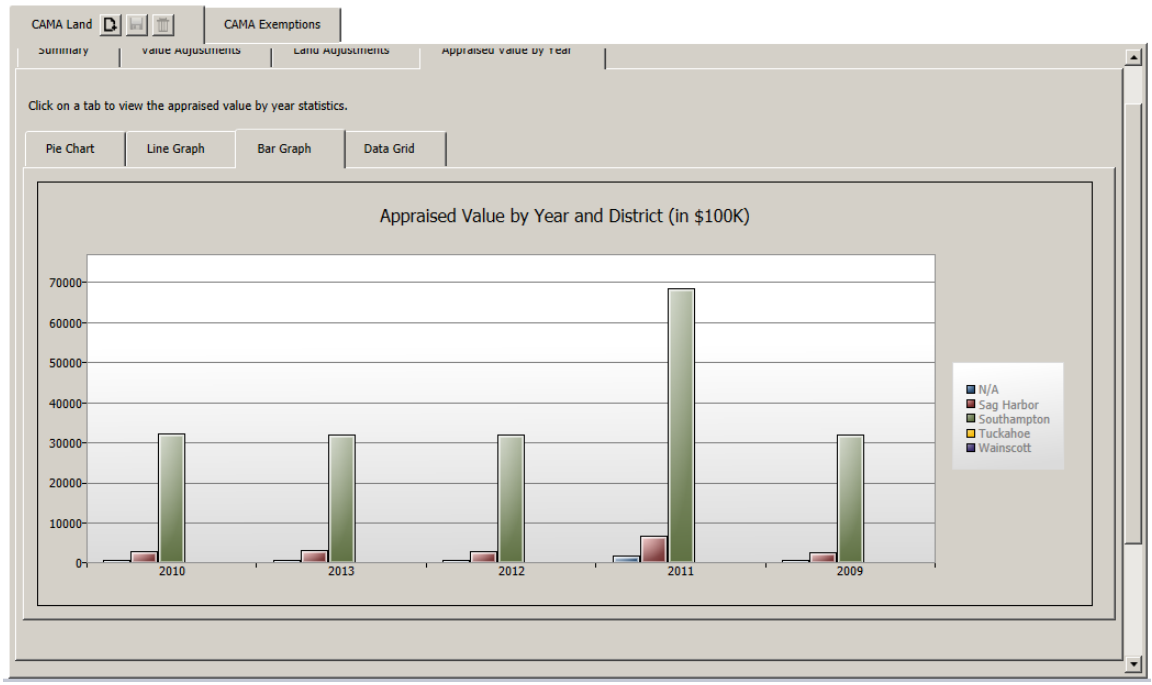
2. Enter a name for the control in the **Name** textbox.
3. Enter **Column** in the **Chart** textbox.

4. Enter the unique code for the query in the **QueryName** textbox.
5. If a report is associated with the query, enter the unique code for the report in the **Report Editor**.
6. Click **Save**.

Viewing the Results of the Column Chart Query

To view the results of the Column Chart query:

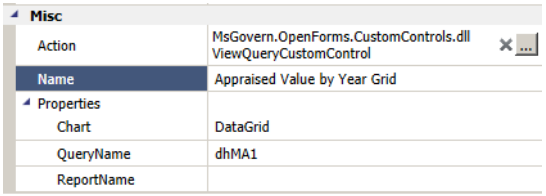
1. Launch Govern.
2. Open the form and the entity.



Defining the Properties for a Data Grid

To define the Data Grid properties:

1. Expand the **Properties** section of the Property Explorer.

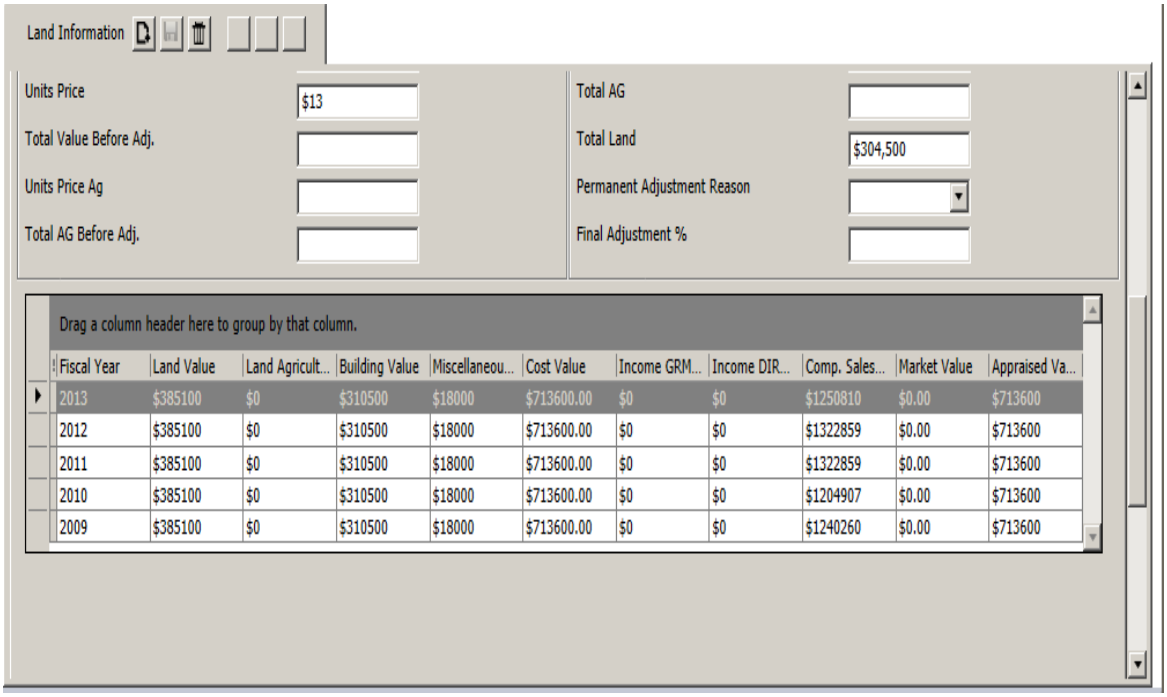


2. Enter a name for the control in the **Name** textbox.
3. Enter **DataGrid** in the **Chart** textbox.
4. Enter the unique code for the query in the **QueryName** textbox.
5. If a report is associated with the query, enter the unique code for the report in the **Report Editor**.
6. Click **Save**.

Viewing the Results of the Data Grid Query

To view the results of the Column Chart query:

1. Launch Govern.
2. Open the form and the entity.

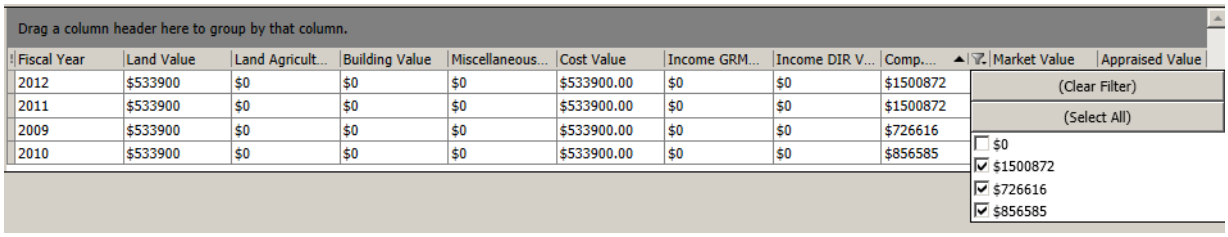


Filtering

If filtering is enabled for the Data Grid in the OFD properties, the user can filter the results displayed in the grid.

To filter the results of the grid in Govern:

1. Launch Govern.
2. Open the form and the entity that contains the grid.
3. Perform a search and load the results to the tree view.
4. Display the grid on the entity.



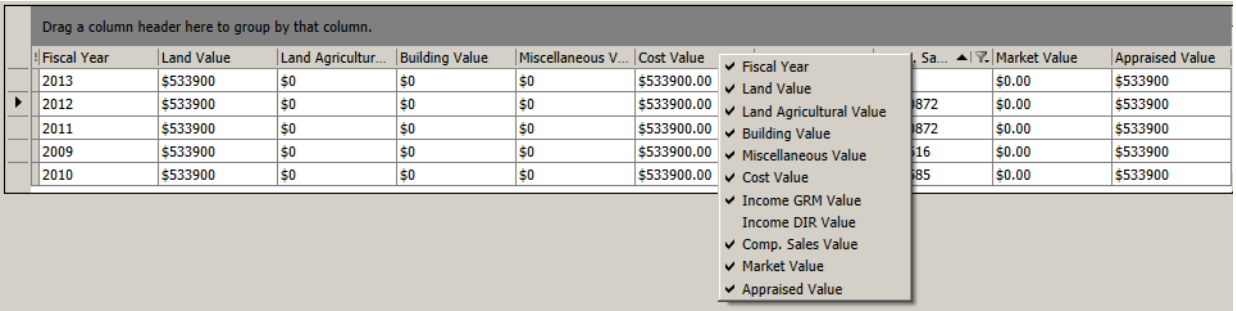
5. Select the filter icon in the column that you want to sort.
6. The items in the column are listed in a secondary window.
7. Select the values that you want to display.
8. Deselect the values that you want to hide.

Tip: All grids in Govern OpenForms have a built in filter for showing/hiding columns in a grid.

To hide a column in a grid:

1. Right-click on the grid.

   A context-sensitive menu is displayed.

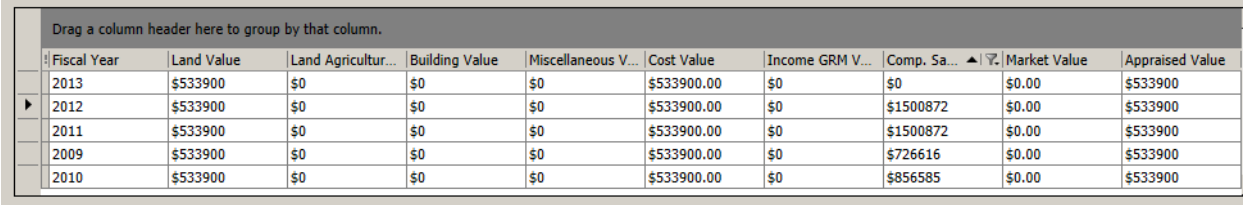


2. Deselect the items that you want to hide.
3. Select the items that you want to show.

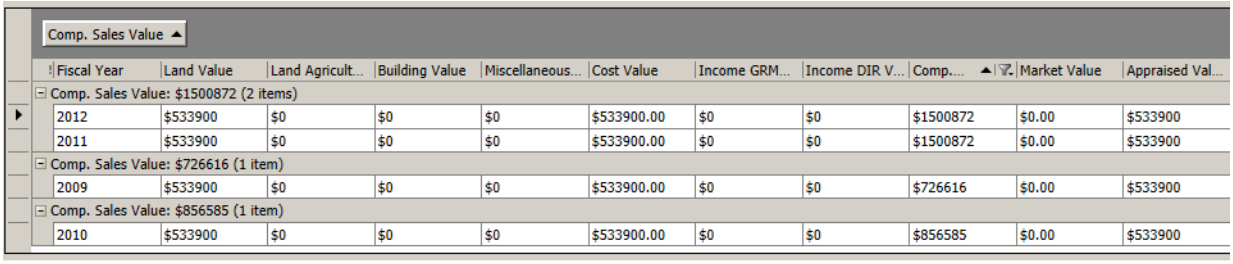
Grouping

To group the results of the grid in Govern:

1. Launch Govern.
2. Open the form and the entity that contains the grid.
3. Perform a search and load the results to the tree view.
4. Display the grid on the entity.



5. Select the column that you want to use for the grouping.
6. Drag it above the grid.



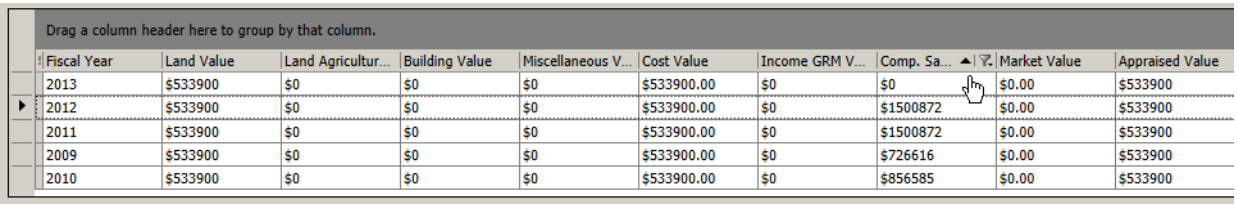
The results are grouped by that column.

Tip: You can use the arrow in the Grouping heading to sort the results.

Sorting

To group the results of the grid in Govern:

1. Launch Govern.
2. Open the form and the entity that contains the grid.
3. Perform a search and load the results to the tree view.
4. Scroll to the grid on the entity.
5. Click the up or down arrow above the column you want to use to sort the results.



Adding a Custom Entity

Overview

Custom entities are used for adding specific Govern-designed controls and functionalities to OpenForms. Web Browser Integration (WBI), as defined in the next section, is an example of a custom control that is added to a custom entity. The custom entity is added to a form.

Prerequisites

A custom entity cannot stand alone. It needs to be added to an existing form. The form must be added to the Profile.

You can add the same custom entity to multiple forms, and add the forms to multiple Profiles, if required.

Scenario

For an example of a custom entity, see *Adding Web Browser Integration on page 143*.

Adding Multiple Items to a User Form

Overview

Add multiple items to your user form, with the OpenForms Designer Clipboard. The following procedure describes how to copy attributes, Govern IDs, and controls to the clipboard and paste them to a new location on an entity.

The following items from the Entities and Controls explorers can be copied:

- From the Entities Explorer:
  - Attributes
  - Govern IDs
- From the OFD Editor:
  - Attributes
  - Govern IDs
  - Labels
  - Links
  - Tabs
  - Groupboxes
  - Custom Controls

Copy and paste multiple items to a form, using shortcut keys.

- Copy items to the OFD clipboard. *See Copying Items to the Clipboard on page 139*.
- Transfer items from clipboard to the form. *See Transferring Items from the Clipboard to the User Form on page 141*.

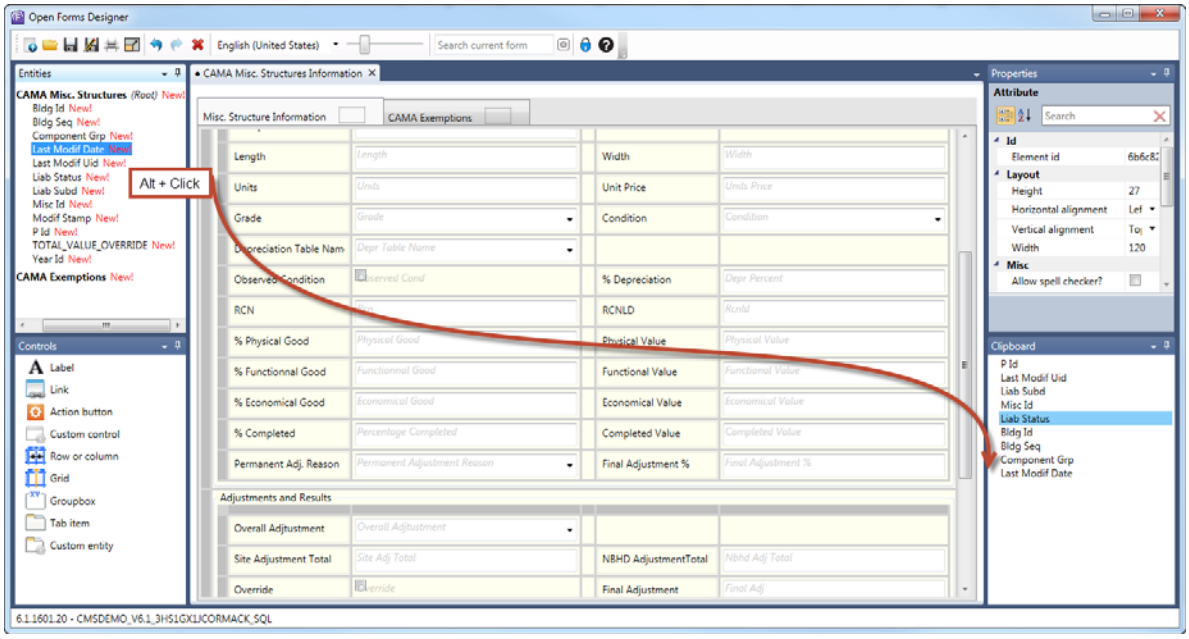
Copying Items to the Clipboard

You can add items to the clipboard from both the Entity Explorer and from the OpenForms Editor.

Copying Attributes from the Entity Explorer to the Clipboard

To open the clipboard and copy multiple items from the Entity explorer to it:

1. Launch the OpenForms Designer.
2. Open the required form and entity.
3. Select the required entity.
4. Add any required rows, columns, groupboxes, etc. for the new attributes.
5. Expand the entity in the Entities Explorer to the left on the OFD Editor.



6. Select an attribute in the list.
7. Hold down the [`Alt`] key and click the left mouse button.

   The Clipboard opens and the attribute is added to the top of the list.
8. Repeat steps 6 and 7 until you have added all required attributes to the clipboard.

   Each attributes or Govern ID is added to the end of list in the Clipboard.

Tip: You can hold down the [`Alt`] key while you click multiple times.

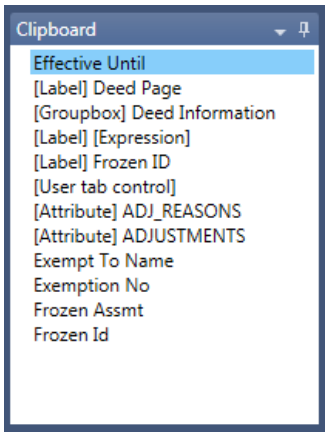
Copying Items from the User Form to the Clipboard

To copy multiple items from the OFD Editor to the Clipboard:

1. Launch the OpenForms Designer.
2. Open the required form and entity.
3. Select the required entity.
4. Hold down the `[Alt]` key
5. Select an item on the entity in the editor to move it to the Clipboard.

The item is added to the end of the list in the Clipboard. The type of item, such as label, groupbox, or attribute, is displayed beside each item that is added from the form. This is shown in the following screenshot.++

The type is not displayed beside the attributes and Govern IDs that are added from the Entity Explorer.



Transferring Items from the Clipboard to the User Form

To paste items from the clipboard to the entity:

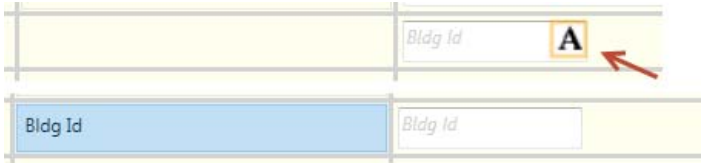
1. Position your cursor on the row and column where you want to add the first attribute.
2. Hold down the [`Ctrl`] and [`Alt`] keys and click the left mouse button.

3. Position your cursor in the row and column where you want to add the second attribute.

   Attributes are added in the order they are listed in the clipboard. The first attribute added to the clipboard is the first attribute added to the form.

Positioning a Label on the Form

When the attributes are transferred from the clipboard, the associated labels need to added manually.



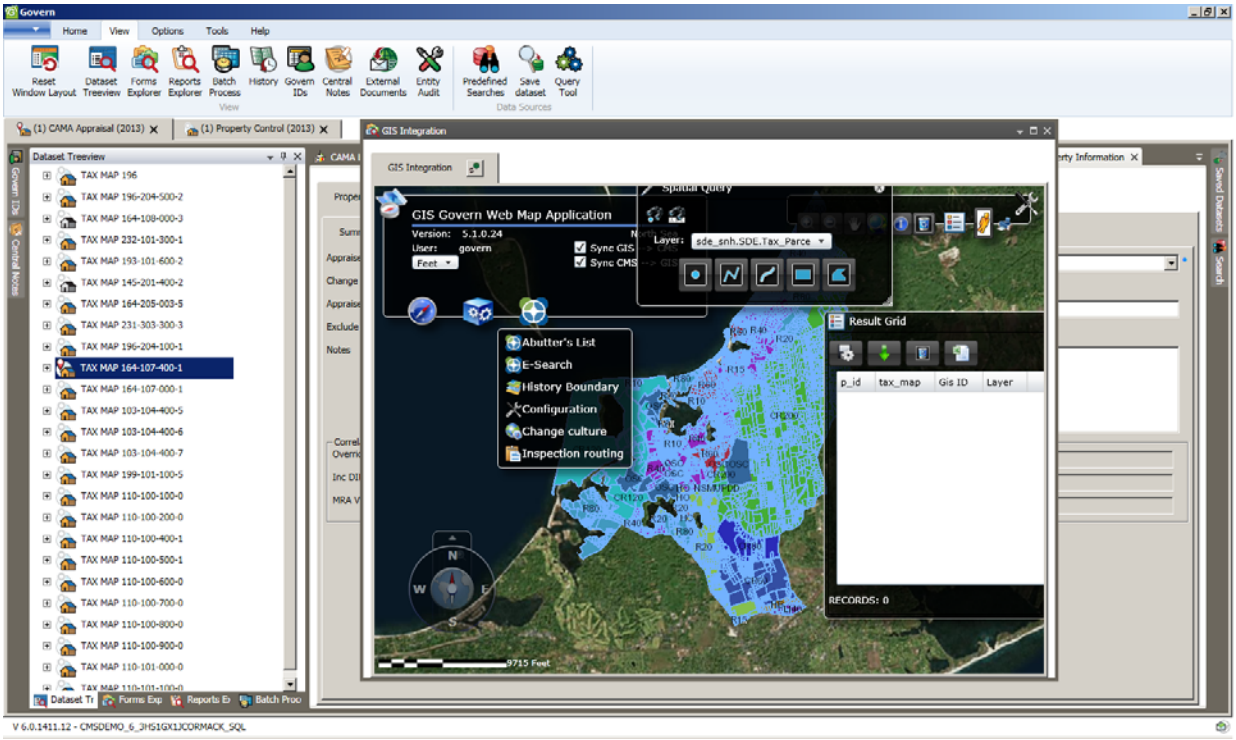
To add a label:

1. Hover your mouse inside the attribute.
2. Select the text symbol.
3. Drag and drop it onto the required row and column.

Adding Web Browser Integration

Overview

Web Browser Integration (WBI) is used for adding an interactive website to Govern OpenForms. For example, you could use WBI to add a Geographic Information Services (GIS) web browser interface, such as the Govern GIS Explorer, to a Govern user form. This is illustrated in the following screen shot.



WBI is supported by most websites. It is fully integrated with Govern. It implements predefined commands to add the following functionalities:

- Loading all records from the Govern tree view to the website
- Loading the active records in Govern to the website
- Replacing all records in the Govern tree view with a list provided by the website
- Replacing the active record in Govern with a list provided by the website

WBI is configured through a custom control added to a form and entity in the Govern OpenForms Designer (OFD). The recommended setup and configuration procedures are described in the following sections:

Getting Started

Overview

Before configuring Web Browser Integration, it is important to understand the following information and follow the procedures for the preliminary steps:

Business Rules for Web Browser Integration

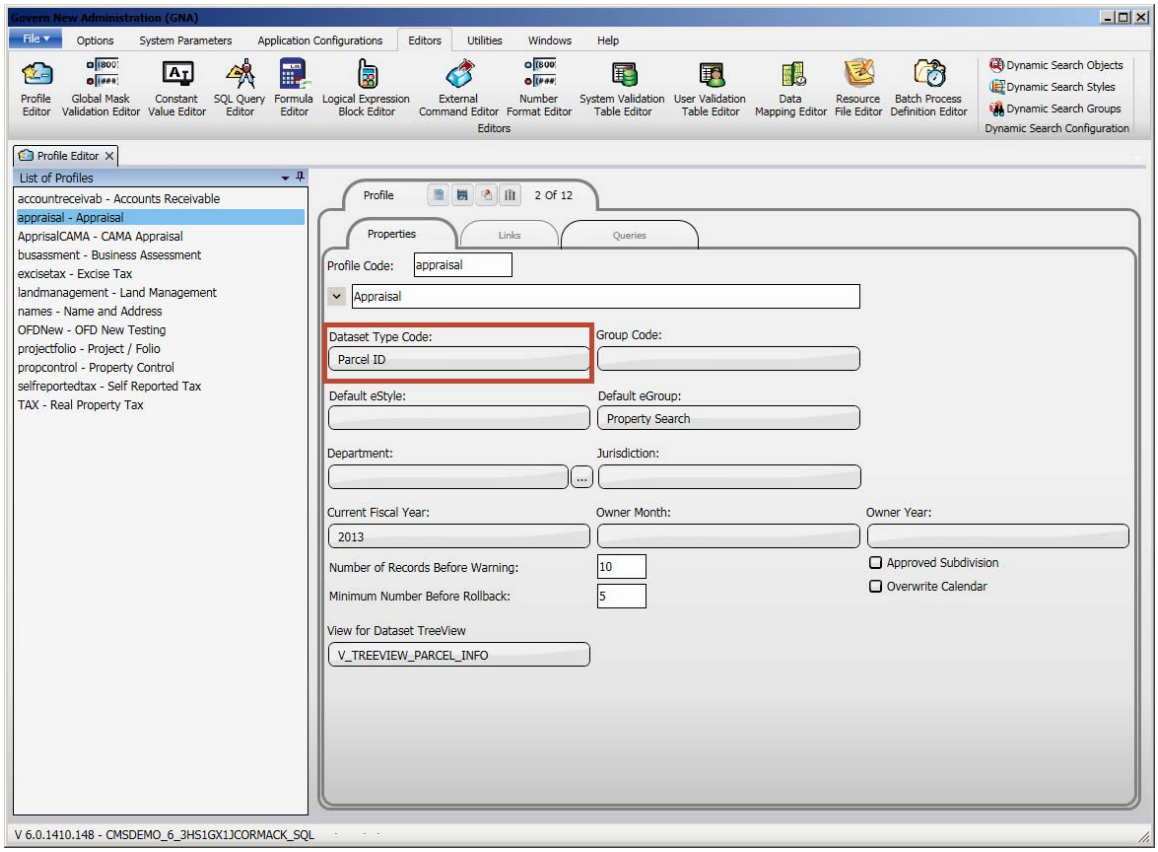
The WBI Integration is available as a Custom Control in the OFD. Custom Controls contain specialized code that performs specific actions. They can be added anywhere on an entity. In this case, the custom control is added to a custom entity because an integrated web site needs the space of an entire entity.

A custom entity cannot stand alone. It needs to be added to an existing form and linked to another entity in the form. It is recommended to use the Root Entity. The form must be added to Profile, like all forms, in order to make it available in Govern. You can add the same form to multiple Profiles.

The configuration for the WBI control is performed in the Govern OpenForms Designer (OFD). Security permissions are also defined in the OFD.

The following rules apply:

- The WBI control must be added to a custom entity.
- The custom entity must be added to an OpenForms form.
- The form must be added to a Profile.
- The **Dataset Type Code** for the Profile must be set to **Parcel ID (P_ID)** or the **Name ID (NA_ID)**, and must correspond to the value set for the **SelectedKeyType**.
  The Dataset Type Code is shown in the following screen shot:



Refer to the documentation on the GNA Profile Editor for details on the Dataset Type Code.

- The form to which the WBI control is added is always floating.

Best Practice

Although you can add the WBI custom control to any form, it is recommended to create a new business model in the Govern Business Entity Designer (BED) and add the SY_Empty entity to the model, as the root entity. Then, add the custom entity to the new model in the OFD.

This has the following advantages:

- If you use an existing Govern model, your changes are overwritten when you import updated models.
  If you create a new model with a new name, it is not overwritten.

- A custom entity with the Web Browser Integration is always floating. If you add it to a form with multiple entities, it could be confusing.
- The SY_Empty entity does not have many associated attributes and has no associated calculations.

Creating a New Model and Form for Web Browser Integration

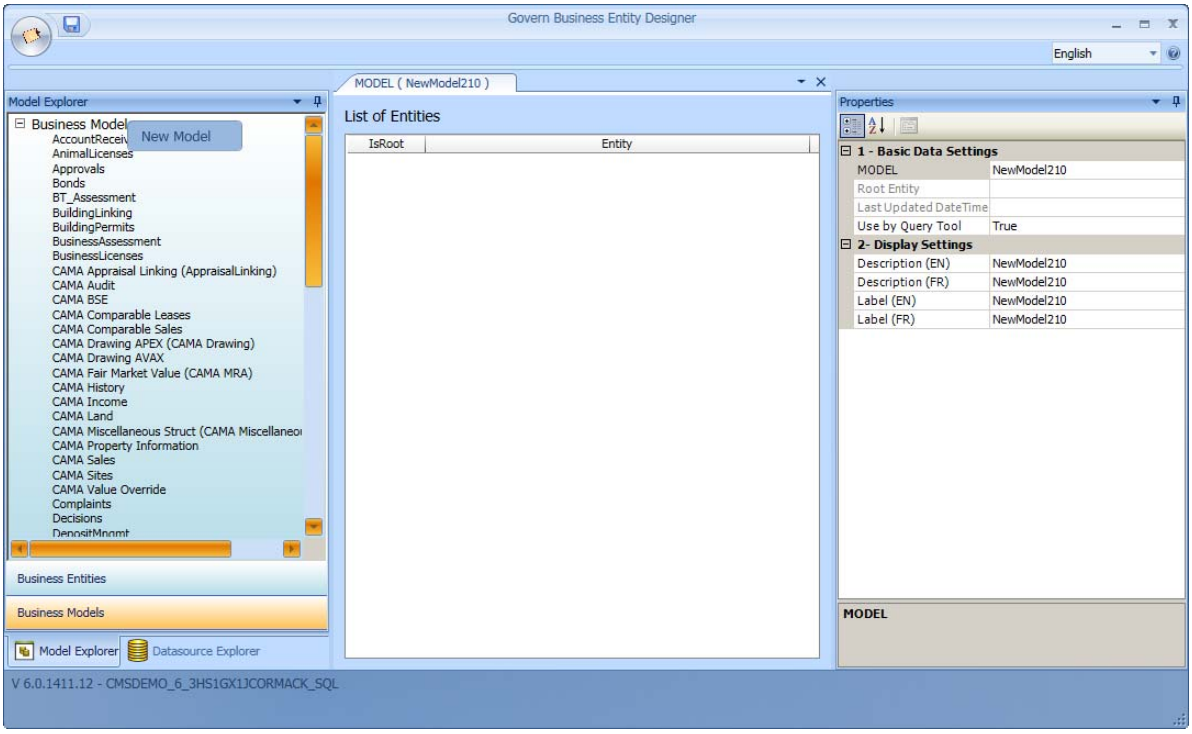
The following sections run through the procedures and best practices for creating a new business model and form for Web Browser Integration:

Creating the Business Model in the Business Entity Designer (BED)

The first step is to create a new model for Web Browser Integration and assign a unique name to it. This ensures that the model will not be overwritten when you import updated OpenForms models to your deployment.

To create a new business model:

1. Launch the BED.
2. Open the Model Explorer.



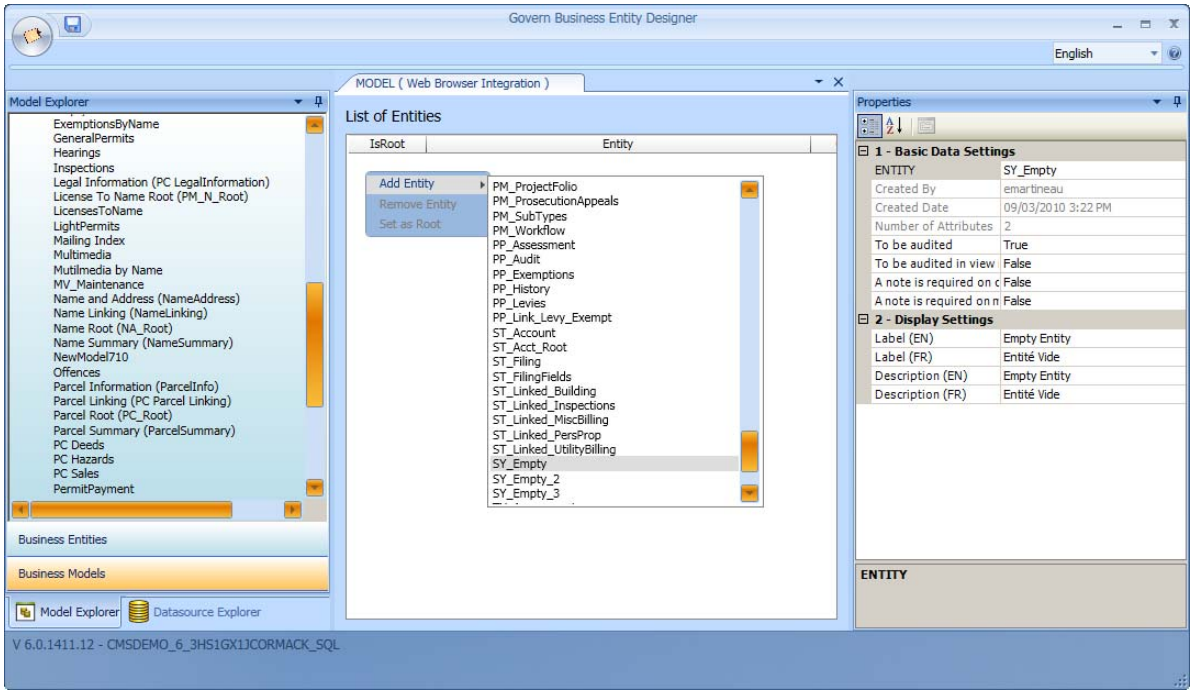
3. Right-click on the heading **Business Models** at the top of Model Explorer.
4. Select **New Model**.
5. Enter a name for model in the **Model** text box.
6. By default, all business models are available for use in the **QueryTool**. Select **False** in field if you do not want to run queries on the model in the QueryTool.
7. Enter **English** and **French Descriptions** in order to identify the model in the Business Entity Designer.
8. Enter **English** and **French Labels** in order to identify the model in the OpenForms Designer (BED)
9. Click **Save**.

Adding a Root Entity to the New Model

The WBI Controller is added to a Custom Entity. A root entity is required. If you are adding a Web site that uses name information for the integration with Govern, select an entity that includes the Name ID (NA_ID). Otherwise, if the integration is based on Parcel Information, select an entity that includes the Parcel ID (P_ID).

To add a Root Entity:

1. Open the business model in the BED.
2. Right click anywhere in the BED Editor and select **Add Entity**.



Tip: You can use SY_Empty for the Web Integration, in order to facilitate the process. It does not have many attributes associated with it and has no associated calculations.

You could also create a new entity.

3. Select the entity from the drop-down list.

   By default, the first entity added to a model is the Root Entity.
4. Click **Save**.

Note: If the entity is added to multiple business models, any changes that you make to the entity in one business model apply to the entity in all business models.

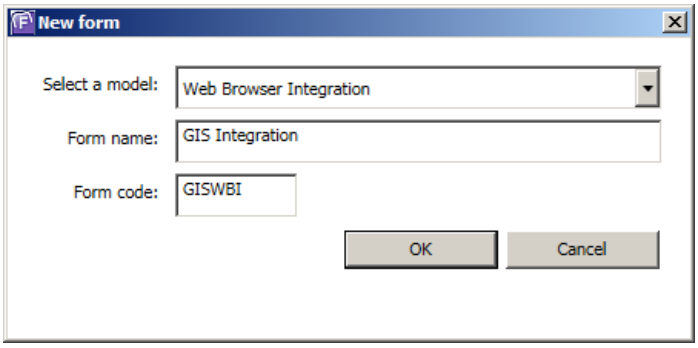
For example, if you add the SY_Empty entity to your model and change the **To be audited**. **Label**, or **Description** parameters, these changes apply to all models that contain SY_Empty.

Configuring the New Business Model in the OFD

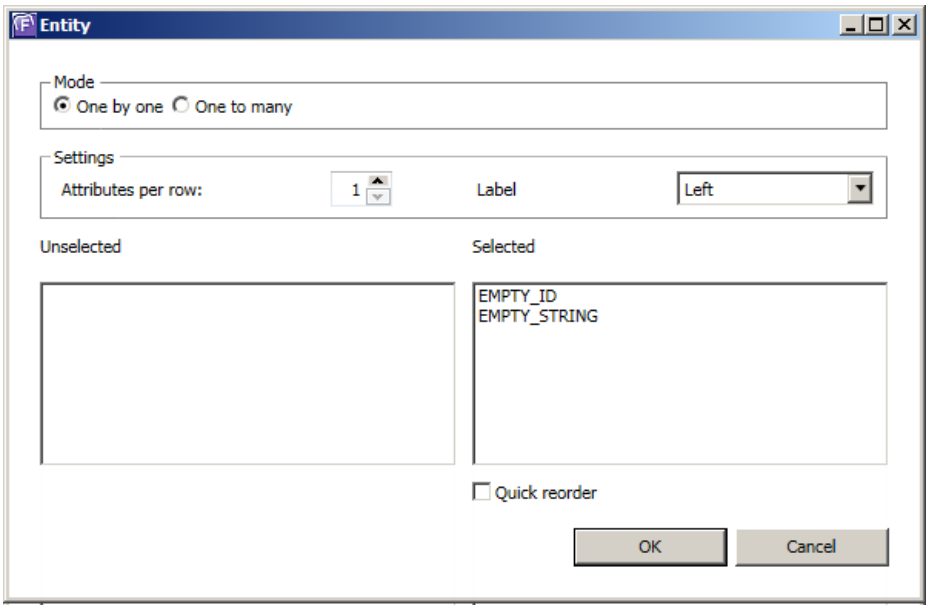
The next step is to configure the new business model to the OpenForms Designer (OFD).

To configure the new business model:

1. Launch the OFD.
2. Click the **New Form** icon  . This open the New Form dialog box.



3. **Select the model** you created in the BED.
4. Enter a **Form name**. This is used to identify the form in the OFD. You can change this name at any time.
5. Enter a code in the Form Code to identify the model in the database.
6. Click **Save**. This new form opens in the OFD.



The root entity is displayed. The idea is to hide the root entity; therefore, no specific setup is required on this form.

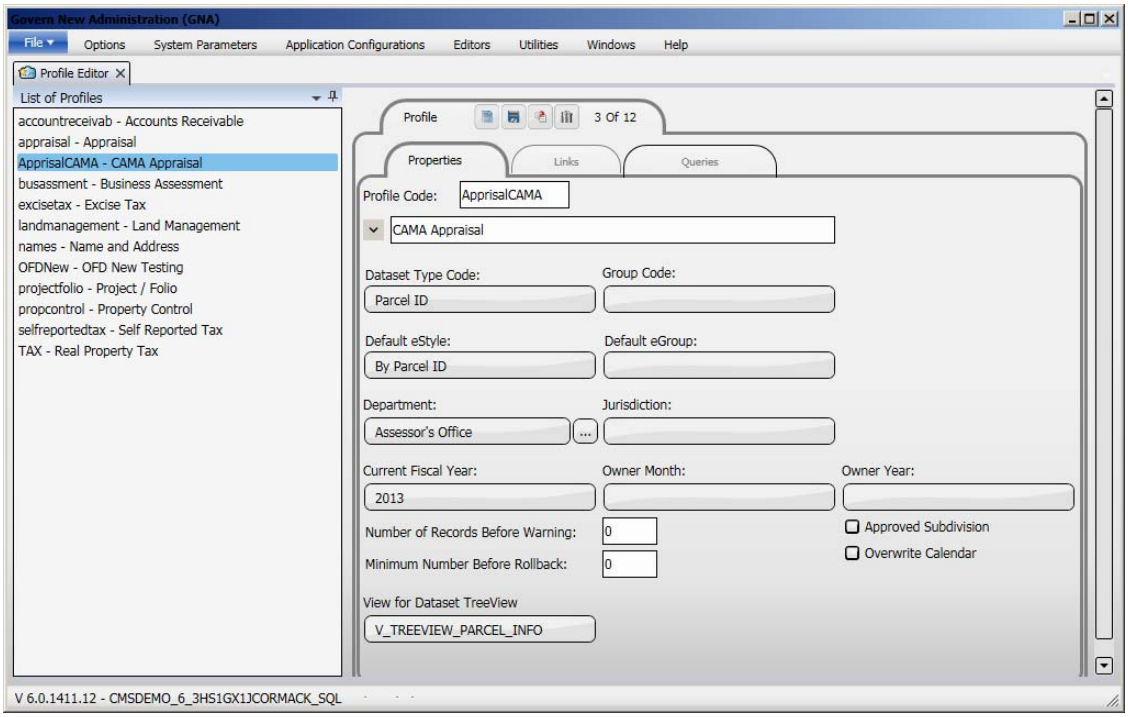
7. Click **OK**.

Adding the New Form to a Profile

The next step is to add the form that you just created to a Profile. This makes it available in Govern.

To add the new form to a Profile:

1. Launch Govern New Administration (GNA).
2. Open the Profile to which you want to add the new form.



- The **Dataset Type Code** must correspond to the value that you set for the **SelectedKeyType**. *See SelectedKeyType on page 155*.

3. Click the **Links** button on the Profile editor and select your new form.
4. Click **OK**.
5. Click **Save** on the Profile editor.

Refer to the documentation on GNA for further details.

Defining Security for the New Form

The initial access to view the form is defined in the Govern Security Manager (GSM).

To verify or set the security rights on executing the form:

1. Launch the GSM.
2. Expand your datasource connection key.
3. Select **Applications** > **Govern** > **Profiles** > the Profile you are using for the Web Browser Integration.

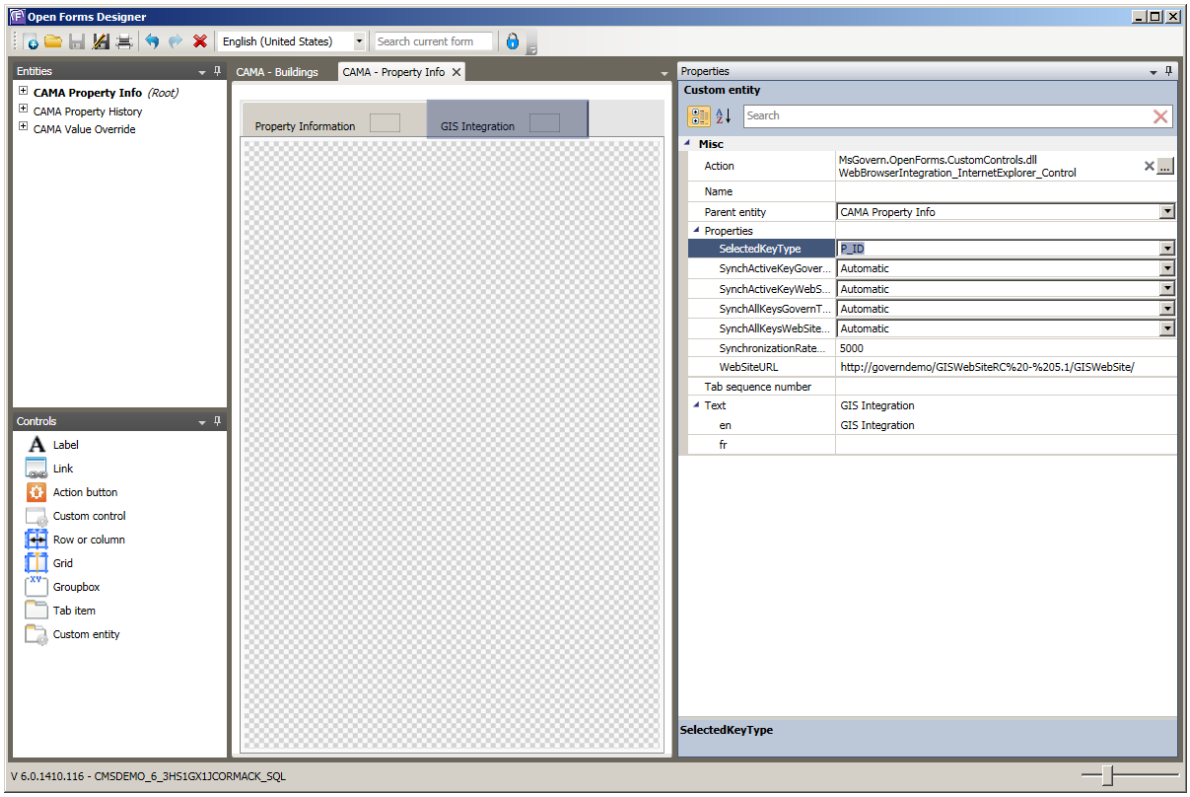
4. Select **OpenForms** > the form you are using for Web Browser Integration.
5. Select **Edit** or **Exclusions** and define the rights to execute the form.
6. Click **Save**.

Configuring the Custom Entity in the OFD

Overview

Perform the following steps to add an integrated website to a Govern form.

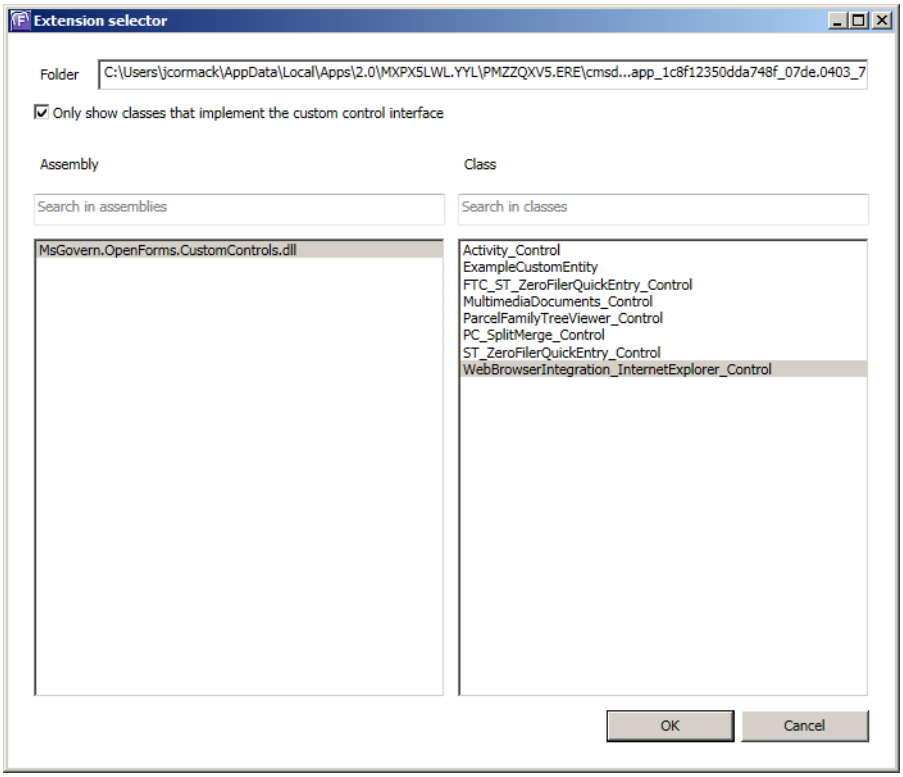
1. Launch the Govern OpenForms Designer (OFD).
2. Open the form to which you want to add the website.
3. Select the **Custom Entity** control in the **Controls Explorer** and drag it to the top of the OFD Editor, beside the other entities.



4. Define the following properties in the Property Explorer:

Element ID: As with all items, the label has an element ID property. This provides reference in the log files.

Action: Click the ellipsis button ... in the **Action** text box to open the *Extension Selector*.



- Select **Only show classes that implement the custom control interface**.
- Select **MsGovern.OpenForms.CustomControls.dll** under **Assembly**.
- Select **WebBrowserIntegration_InternetExplorer_Control** under **Class**.
- Click **OK**.

Name: This is used to identify the entity for the Help files. Enter a name if you are adding a custom help file for the entity.

Parent Entity: Select the root entity in the form as the Parent Entity.

SelectedKeyType: Select one of the following:

- **None**: If you select this option, there is no interaction between Govern and the website.

- **P_ID**: Select this option if you are using the P_ID as the link between Govern and the website.

  Note: The **Dataset Type Code** in the **Profile Editor** must be set to **Parcel ID (P ID)**, as well.

- **Tax_Map_Unformat**: Select this option to use the unformatted tax map number as the link between Govern and the website.

  Note: In this case, Govern uses the P_ID internally and the **Dataset Type Code** in the **Profile Editor** must be set to **Parcel ID (P ID)**.

- **NA_ID**: Select this option to use the Name ID (NA_ID) to establish the link between Govern and the website.

  Note: The **Dataset Type Code** in the **Profile Editor** must be set to **Name ID (NA ID)**, as well.

The following **Synchronization** parameters are used for loading records from Govern to the website and from the website to Govern. You need to set each parameter to automatic or manual synchronization.

- **Automatic**: Select **Automatic** to load the record, or records, automatically, without any user action. Records are refreshed according to the synchronization rate defined in the **Synchronization Rate (Milliseconds)** parameter.
- **Manual**: Select **Manual** to load all records when the user clicks an action button.

  The action buttons are included in the control, and appear at the top of the entity in Govern, when Manual is selected.

SynchActiveKeyGovernToWebSite: This parameter is used for loading the record that is currently open in Govern to the website. Select Automatic or Manual synchronization.

SynchAllKeysGovernToWebSite: This parameter is used for loading all the records that are currently in the Govern tree view to the website.Select Automatic or Manual synchronization.

SynchActiveKeyWebSiteToGovern: This parameter is used for loading the record that is open on the website to Govern. Select Automatic or Manual synchronization.

SynchAllKeysWebSiteToGovern: This parameter is used for loading all records from the website to Govern. It replaces the records that are currently in the Govern tree view. Select Automatic or Manual synchronization.

SynchronizationRateMilliSeconds: This setting is applicable to automatic synchronization only. It is used for setting the frequency at which the website is polled for new information. It is recommended to set it to 1,000 milliseconds (one second) or less.

WebSiteURL: Enter the URL of the website that you are integrating.

Tab Sequence Number: This setting is reserved for future use.

Save: Click the **Save** icon  in the OFD to save your configuration settings.

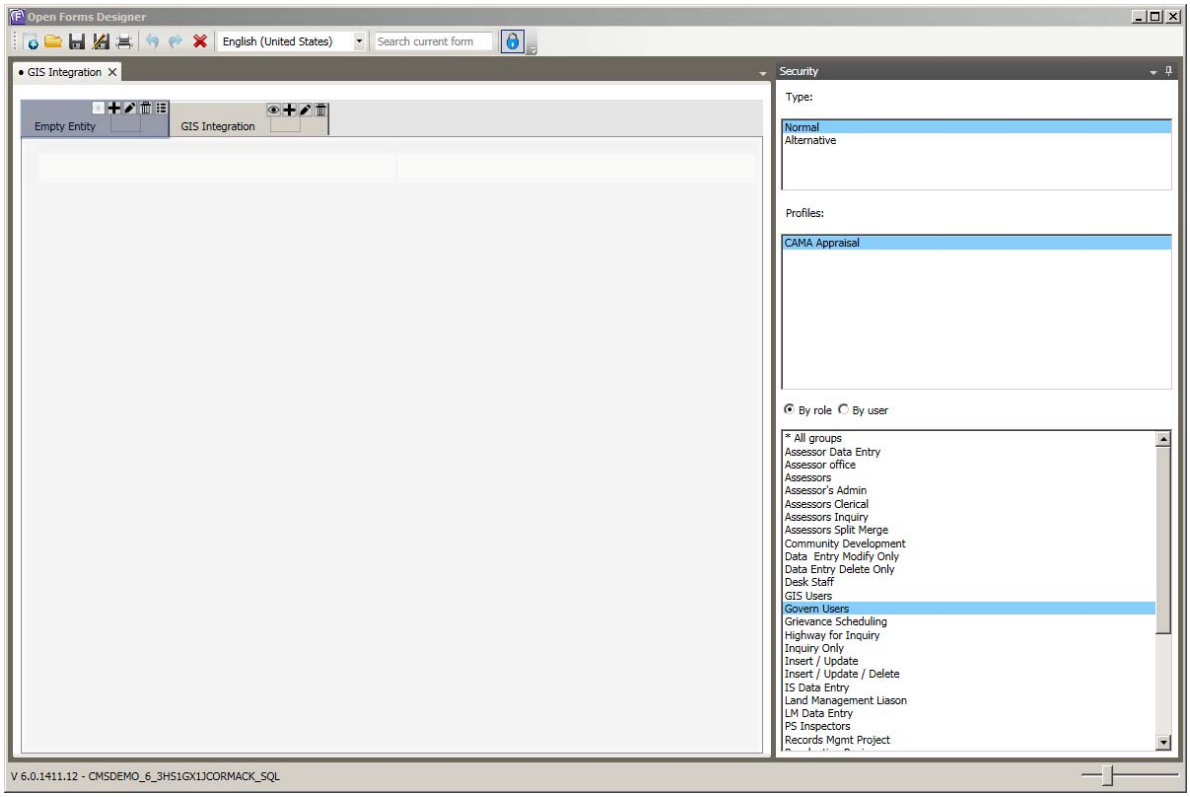
Hiding the Root Entity and Adding Security

You can set permissions and restrictions for viewing the custom entity that contains the integrated Web browser. The add, edit, delete, and browser rights are not applicable. You need to define security by type: Normal or Alternative, Profile, Role, and user. *For more information about security, see Security in the OpenForms Designer on page 200*.

To hide the root entity:

1. Launch the OFD.
2. Open the form you are using for Web Browser Integration.
3. Select the root entity.
4. Select the **Security** icon  .

   This opens the Security Settings page.



5. Select **Normal** under **Type**.
6. Select the **Profile** for the security rights you are configuring.
7. Select the **Role**.
8. Click the **View** icon to hide the feature .
9. Click **Save**.
10. Repeat the procedure in order to set the security rights for Alternative security and the other Profiles, Roles, and users.

Tip: By default, security for Alternative mode is the same as Normal. If a feature is available in Normal mode it is available in Alternative mode. If it is not available in Normal mode, it is not available in Alternative mode.

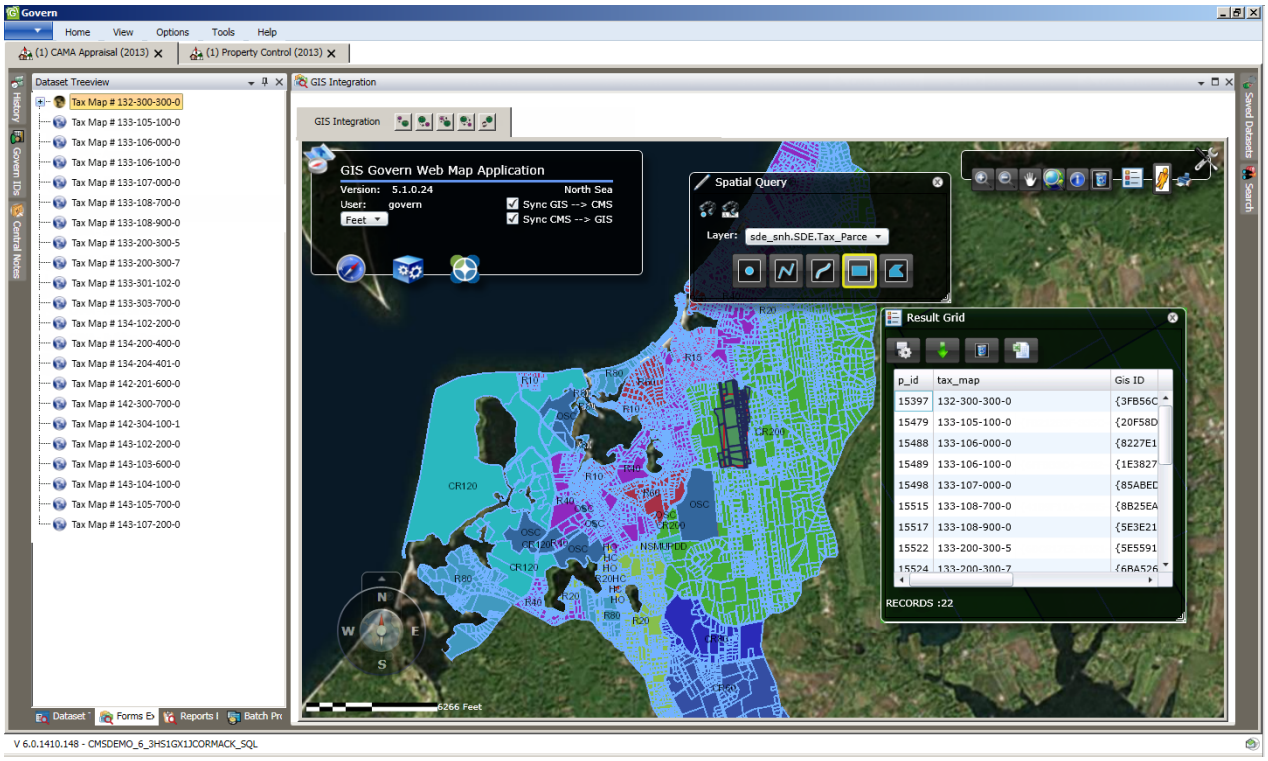
It is recommended to set up security on the Roles first. If specific users require specific security, you can define exclusions.

Viewing the Integrated Web Browser in Govern

Overview

Once the configuration is complete, you can view the integrated web browser in Govern.

The following screen shot displays the Govern GIS Explorer integrated into the Govern CAMA Property Information form via WBI.



In the screen shot, all parameters are set to Manual Therefore, all action buttons appear at the top of the entity.

- **Load the Active Record from Govern to the Website**: Click this icon to load the record that is currently active in Govern to the website. For example, if you have an integrated GIS browser, you could open a parcel in the Property Information form in Govern and view it on the GIS map.

-  **Load the Active Record from the Website to Govern**: Click this icon to load the active record from the website to Govern. For example, you could select a parcel on the GIS map and load it to the Govern tree view.
-  **Load All Active Records from Govern to the Website**: Click this icon to load all records from the Govern tree view to the website. For example, you could view all the property records that are currently in the Govern tree view on the GIS map.
-  **Load All Active Records from the Website to Govern**: Click this icon to load all active records from the website to Govern. This replaces all the records that are currently in the Govern tree view with a list of records from the website. For example, you could select a number of parcels on the GIS map and view them in the Govern tree view.
-  **Reload the website**: Click this icon to refresh or reload the website. The login page appears if applicable.

Note: For the synchronization parameters that are set to automatic, there are no action buttons.

Chapter 4: Defining the Properties

Overview

The properties for each item added to the OFD Editor are defined in the Properties window on the right of the OpenForms Designer. This window shows the properties for the item that is currently selected.

When you create a form, you need to define properties at each level, beginning with the form, and continuing with the entities and the attributes associated with the form. You need to define properties for each design element on the form as well. This includes the grids, the rows and columns, the groupboxes, the tabs, the links, and the labels. The properties vary according to the type of item that is selected.

The Property Explorer and the procedures for defining the properties are described under the following headings:

Property Search

The Properties Search is used for quickly and easily locating a property in the Properties pane. *See Properties Search on page 165*.

Form

The forms created in the Govern OpenForms Designer are displayed as end-user forms in Govern. They are based on the business models created in the Govern Business Entity Designer (BED).

For details on defining the properties for the forms, see Defining Properties for the Form on page 166.

Entity

The Entities are displayed as separate tabs on the Govern forms. They are created in the Govern Business Entity Designer (BED), where they are added to the business models. One entity is designated as the root. The data mapping is created and the links between models and between each entity are defined.

For details on setting the properties for the entities, see Defining Properties for the Entity on page 169.

Attribute

The attributes appear as text fields on the Govern user forms. Like the business models and entities they are created and are mapped in the Business Entity Designer.

For details on setting the properties for the attributes, see Defining Properties for the Attributes on page 182.

Label

Note the label has a separate set of properties from the attribute.

A label is used to describe an attribute or another item on the form. When you add a new entity to a form, default labels are automatically added for each attribute. The default text on the label is the name of the attribute, defined in the Govern Business Entity Designer (BED).

You can add a label anywhere on a form. For example, you may want to used labels to indicate different sections of the form.

For details on defining properties for the labels, see Labels on page 76.

Link

You can add a link in order to open any of the following from the current form: another user form in the same Profile; a report; a view query; an external command; the Govern Query Tool; or a batch process. A link can be added in the form of an action button or text hyperlink. *For more information about links, see Links on page 83*.

Action Button

Action Buttons can be added to the title bar of an entity. These are used to perform specific actions. The standard action buttons, such as New, Save, and Delete are automatically added through the Controller. *For more information about action buttons, see Action Buttons on page 90*.

Custom Control

Custom Controls can be added to form in order to integrate specific code. *For examples of custom controls and more information, see Adding a Custom Control on page 125*.

Rows and Columns

The layout of the Govern user forms is based on rows and columns inside a grid. The grids that you add to the form are composed of rows and columns. The groupboxes and tabs that you add to a from contain grids and those grids are composed of rows and columns. You can define the properties for these rows and columns separately.

For details on defining properties for the rows and columns, see Rows or Columns on page 95.

Grids

A grid can be added to a form in order to group similar items together. *For details on defining properties for the gird, see Grids on page 101*.

Groupboxes

Like the grid, a groupbox can be added to the form in order to group similar items together. Unlike a grid, the groupbox has a frame around it and a heading.

For details on defining the properties for a groupbox, see Groupboxes on page 107.

Tabs

If an entity contains a lot of attributes, you can add a series of tabs to it. The tabs serve the same purpose as grids or groupboxes in keeping similar items together. Tabs have separate headings and can have action buttons.

When you define the properties for the tabs, you need to define them at two levels, for the group of tabs together and then for each tab individually.

For details on defining the properties for the tabs, see Tabs on page 114.

Custom Entity

Custom entities have a set of properties that is different from standard entities. They are added to a form in order to integrate specific pre-defined code and functionality. *For an example of a custom entity, see Adding Web Browser Integration on page 143.*

Configuring the IDs

The *Entity Configuration* form is used for defining the attributes and system IDs that populate the user form from the search results. They are also used for filtering the records. At least one System ID is required for each form. *See Configuring IDs for the Entity on page 188*.

Expressions

The Expression Selector is new to Govern OpenForms 6.0. It is used for associating expressions with a Govern form. In a future release, an Expression Editor will be added to GNA. Eventually, this will replace the Logical Expression and Formula Editors.

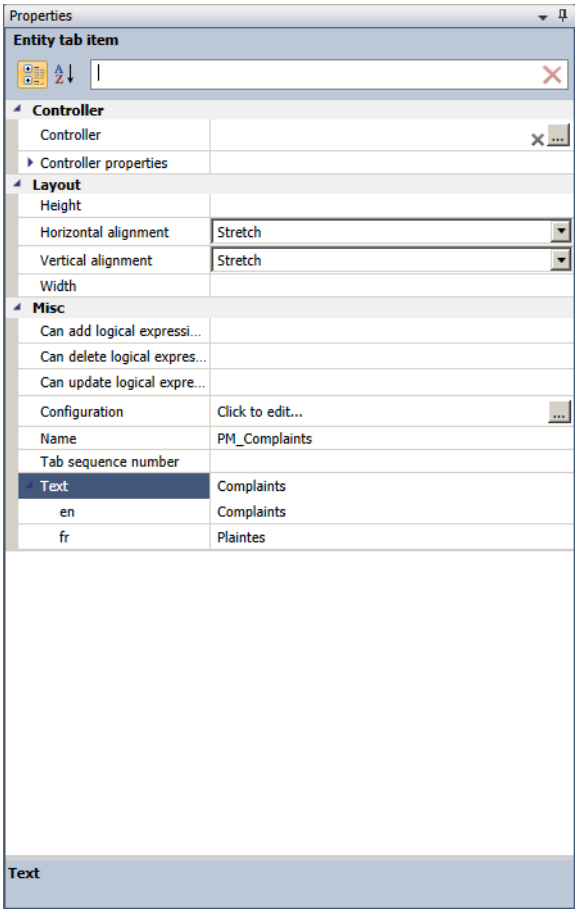
For details about creating expressions, see on page 199.

Properties Search

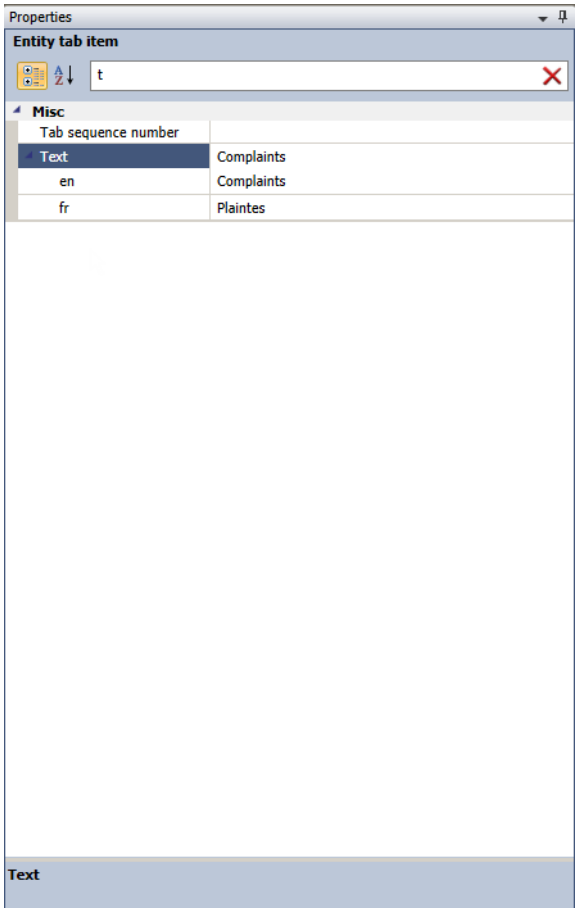
Overview

Use the Properties Search to quickly and easily locate a property in the Properties pane. Instead of expanding each category manually and looking for the property that you want to configure, enter the first letter or the first couple of letters, as required.

The following screen shots show the Property Search for the Text item.



Default Entity Properties



Search for Text in Entity Properties

You can search by full or partial words and the search is not case-sensitive. You do not need to press `[Enter]`. The search works immediately.

Defining Properties for the Form

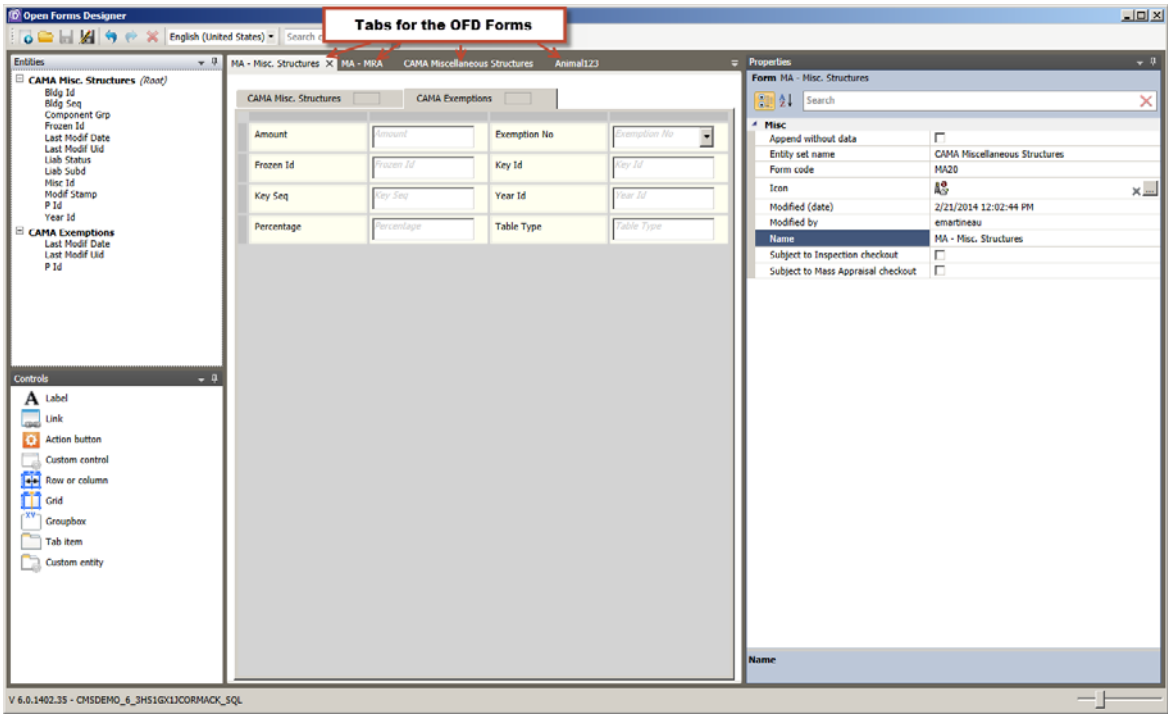
Overview

The forms created in the Govern OpenForms Designer are displayed as end-user forms in Govern. They are based on the business models created in the Govern Business Entity Designer (BED).

The properties defined at this level provide general information about the form, such as form name and code. These are provided for informational purposes and cannot be modified from the OpenForms Designer.

To view and define the properties for a form:

1. Launch the Govern OFD.
2. Open the form that you want to modify.
3. Select the tab for that form at the top of the OFD interface.

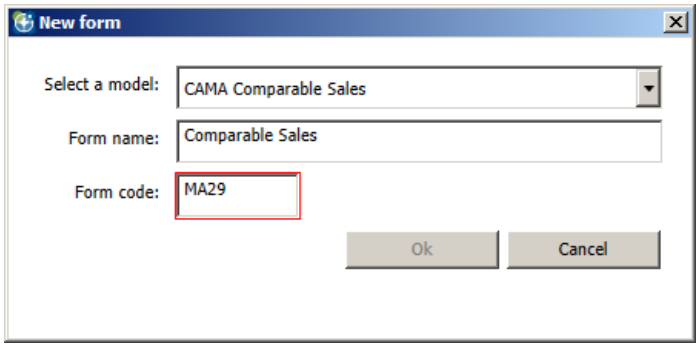


The heading **Form** appears at the top of the Properties pane with the name of the form.

4. Modify the properties as required.
5. Click **Save** to save your modifications.

Append Without Data: The option is disabled by default. Select it to allow new records to be created without data.

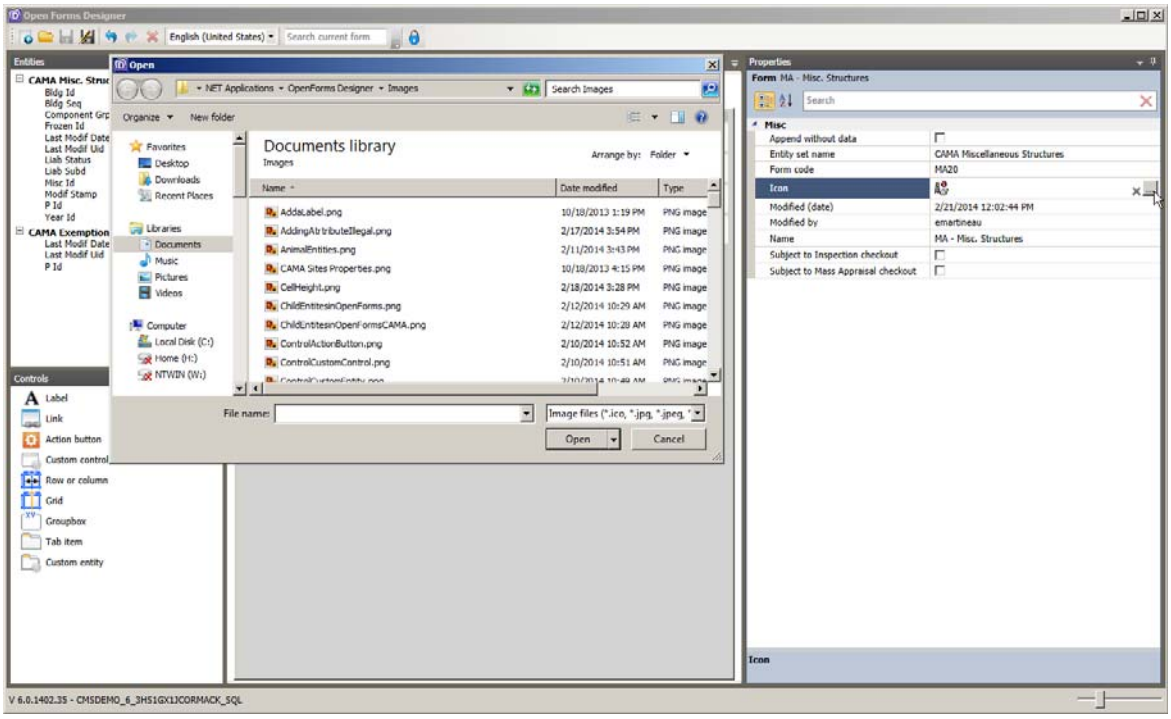
Entity set name: This is the name of the business model selected from the *New Model* form when the model was created. This property cannot be modified on the Properties pane.



For details, see Creating a Govern User Form on page 33.

Form Code: This is the code entered on the *New Model* form when the model was created. This code is unique and cannot be modified on the Properties pane. *See Creating a Govern User Form on page 33.*

Icon: Click the **ellipsis** button ... to open the Browse window.



Select an icon for the form. The icon is displayed in the Forms Explorer and on the tab for the form in Govern.

Modified (date): This parameter displays the date and time of the last modification made to the form on the OpenForms Designer.

Modified by: This parameter displays the user name of the person who made the last modification.

Name: This parameter displays the name of the form entered on the *New Model* form when the model was created. This name appears on the forms Explorer and on the tab for the form in Govern. You can modify the name of the form. *See Creating a Govern User Form on page 33.*

Subject to Inspection Checkout: Select this option to permit data from the form to be checked out by inspectors and imported to Govern Mobile for making modifications in the field.

Subject to Mass Appraisal Checkout: Select this option to permit data from the form to be checked out by appraisers and imported to Govern Mobile for making modifications in the field.

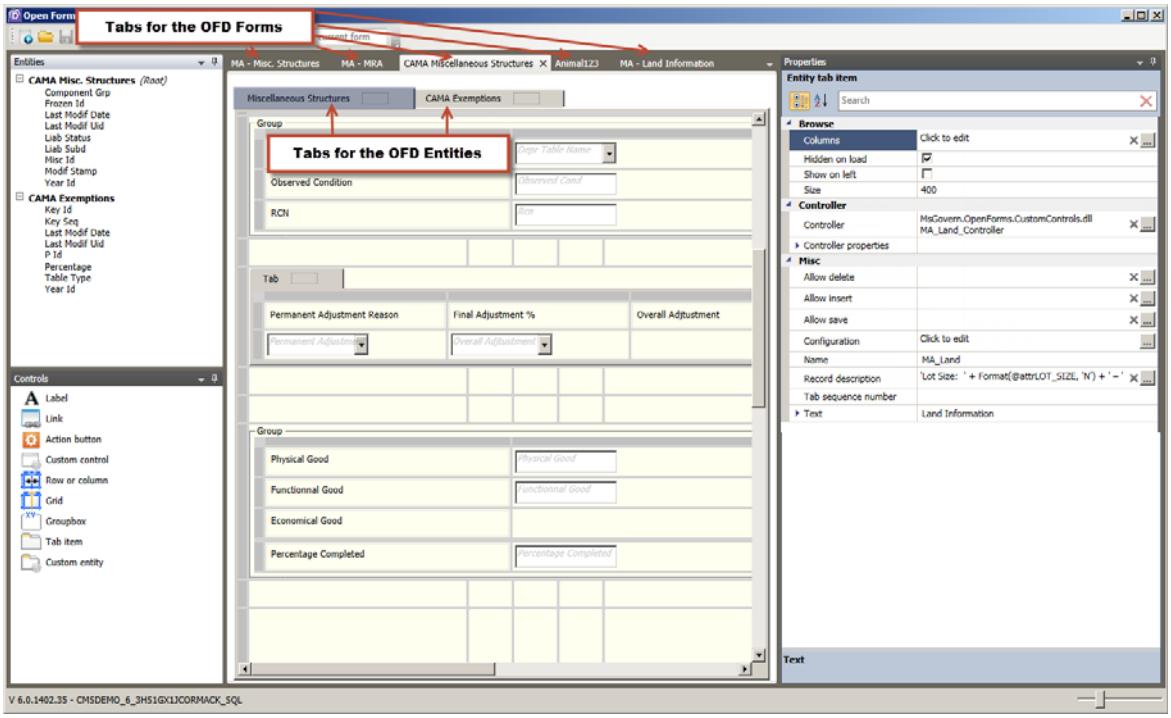
Defining Properties for the Entity

Overview

Entities, like business models, are created in the Govern Business Entity Designer (BED). They contain one or more database tables and the columns within the tables. The data mapping, the links between entities and tables are created in the BED. In the OFD, the entities are given shape so that they can be used on the Govern forms. This section describes how to define the entity properties in the OFD.

To define the properties of an entity:

1. Launch the Govern OFD.
2. Open the form that contains the entity you want to modify.
3. Select the tab for the form at the top of the OFD interface.
4. Select the tab for the entity.



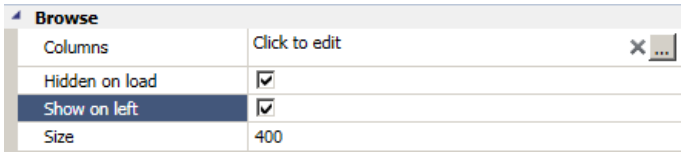
You need to define the properties for each entity separately.

The heading **Entity tab item** appears at the top of the Properties pane with the name of the form.

5. Modify the following properties, as required.
6. Click **Save**.

Browse

Use the Browse properties in the OFD to add a customized Browse screen to any entity. Display only the fields that you want to view. Define the size and set the position you like. Once defined, the Browse screen is always available for the entity, regardless of whether there are multiple records or only a single one for the selected name or property. You can add summary information to display the sum, average, minimum, or maximum value for the attribute.



Changes made to the Browse screen are displayed on the Govern form in real time. If the form is open in Govern, the changes are displayed when you click the **Refresh** button.

Columns

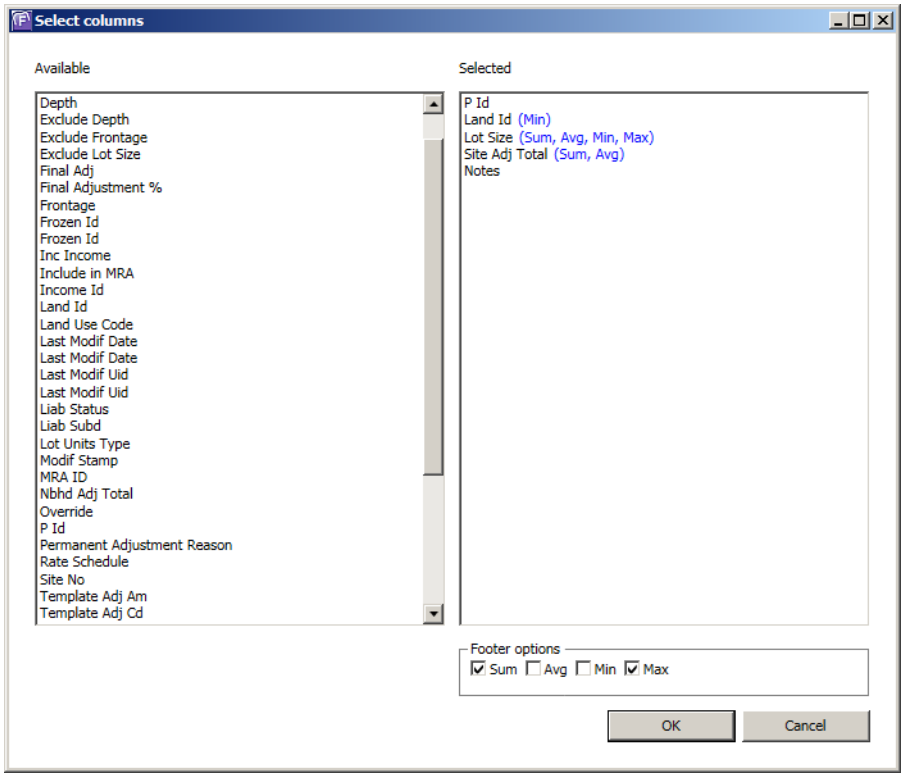
Click **Columns** to define the columns that you want to display. The columns are based on the attributes that are part of the entity. All the attributes can be selected. Typically, you would select only a few in order to show the key information for the record. For example, you may want to display only the record ID and the total value.

To select columns for the Browse screen of the entity:

1. Launch the Govern OFD.
2. Open the form that contains the entity you want to configure.
3. Select the entity.

4. Expand the **Browse** properties in the Properties Explorer.
5. Select the ellipsis button ... in the **Columns** text box.

   This opens the **Select Columns** window.



   All the attributes in the entity are listed in the **Available** column on the left. This includes the attributes that are displayed on the form and those that are not.

6. Select the attributes that you want to add to the Browse screen and drag them to the **Selected** column on the right.

   You can add summary information to a footer on the Browse screen.

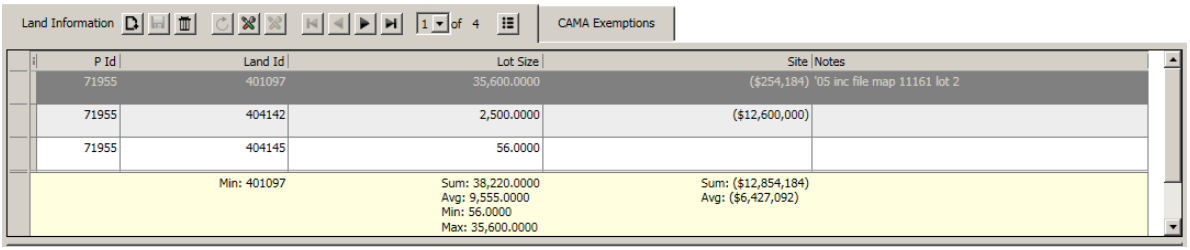
7. Select an attribute in the **Selected** column and select one or more of the following **Footer Options**. This creates a summary of all values for the attribute from all records for the selected property or name.
   - Select **Sum** to display the total of all values.
   - Select **Avg**. to display the average value.
   - Select **Min** to display the minimum value.
   - Select **Max** to display the maximum value.

You can select as many Footer Options as required. The options that you select are displayed in blue beside each attribute in the selected column, as shown in the previous screen shot.

Note: If the footer options are not applicable to an item, the checkboxes are disabled. For example, if a text field is selected, the average, total, minimum, and maximum are not applicable. Therefore, the checkboxes are disabled.

8. Click **OK**.

The following screen shot displays the Browse screen with a footer containing summary information, about the Land ID, the Lot Size, and the Site Adjustment, for the CAMA Land Information record.

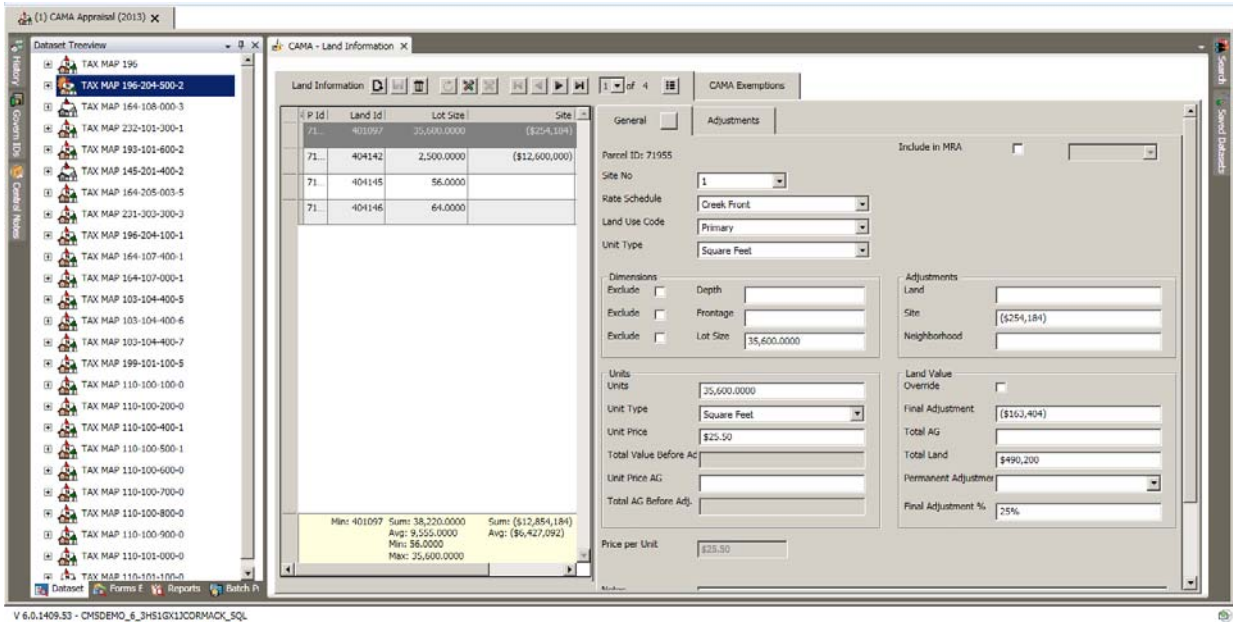


Hidden on Load

Select **Hidden on Load** to hide the Browse screen from view when the record is loaded to the form. Users have the option to open the Browse screen, at any time, by clicking the **Browse** button .

Show on Left

By default, the Browse screen is displayed above the record, as in the previous screen shot. Select **Show on Left** to display the Browse screen on the left. This is shown in the following screen shot.



Size

Enter the default size for the Browse screen.

Adding Security to the Browse Screen

The same security that is defined for the entity applies to the Browse screen. If users have permission to view a field on a form, they can view it on the Browse screen for the form.

Note: You can add fields to the Browse screen that are part of the entity but not included on the form. However, at this time, it is not possible to define security permissions for these fields.

You can also show or hide the Browse button for selected users or groups. *For details about security, refer to the Govern OpenForms Designer guide*.

Using the Browse Screen in Govern

The Browse screen can be made available to any entity in Govern. If it is configured, it is available for all records in the dataset tree view, regardless of whether there are multiple records or only a single one for the selected name or property.

It provides a summary of the data from all records.

Selecting a Record: You can scroll through the records in the Browse screen using your mouse or the navigational arrows on your keyboard.

When you select a record in the Browse screen, it becomes the current record.

Expanding the Browse Screen: When the Browse screen is set to the default size, you can expand it by right-clicking anywhere within the screen.

If the Browse screen is positioned on the left, it expands to the right in order to include all columns.

If the Browse screen is positioned on top, it expands downwards in order to include all records.

Contracting the Browse Screen: When the Browse screen is expanded, right-click anywhere within the screen to return to the default size.

Resizing the Browse Screen: You can resize the browse screen by dragging the right edge to the right or left or the bottom edge downwards or upwards.

Resizing the Columns: You can resize the columns in the Browse screen by moving the column edge right or left.

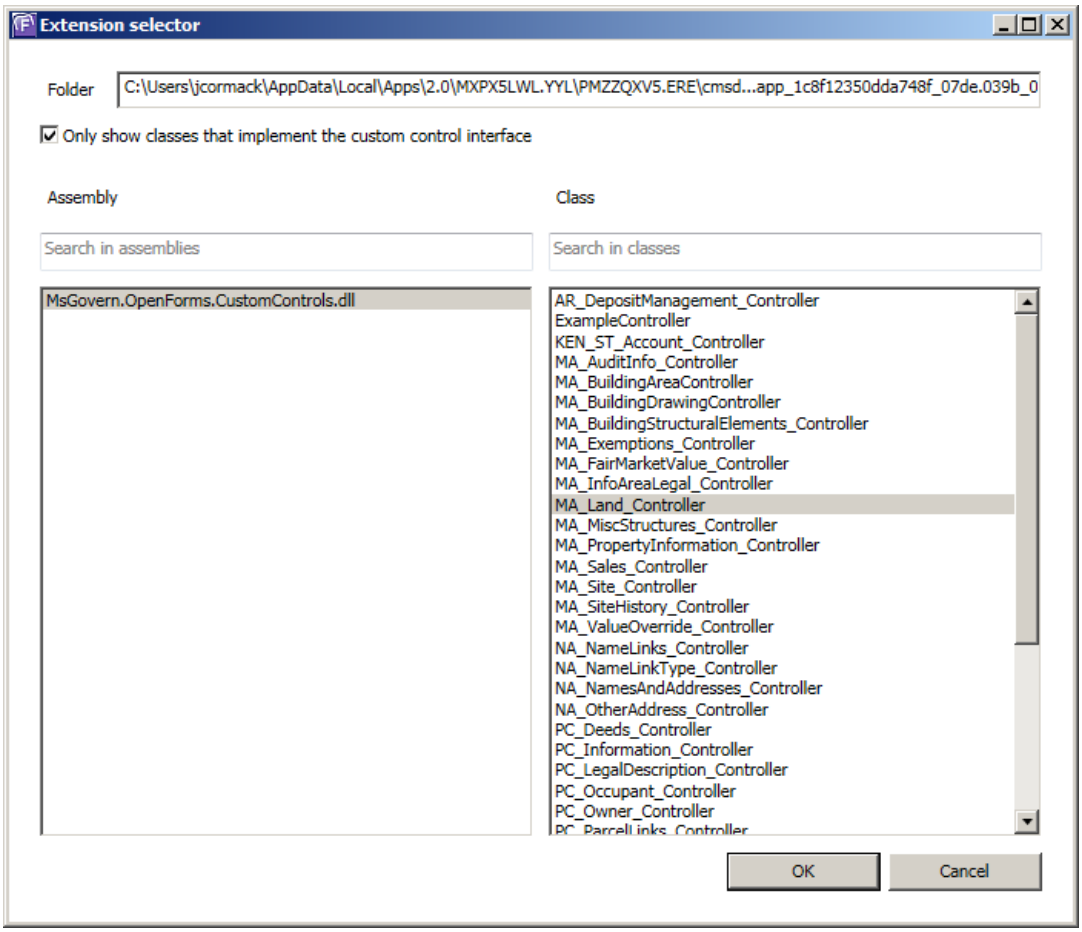
Controller

Controller: If a Controller exists for the entity, select it from the drop-down list. For information about the specific controller for each entity, refer to the specific documentation for the form.

To select the Controller:

1. Launch the OFD.
2. Open the form that contains the entity you are configuring.
3. Select the entity.
4. Select the ellipsis button in the **Controller** text box.

   This opens the **Extension Selector** window.



5. Select **Only show classes that implement the custom control interface**.

   This shows all the OpenForms controllers.

6. Select the required controller.
7. Click **OK**.

Controller Properties: Select the required properties for the controller as described in the document for the entity.

Miscellaneous

Allow Delete / Insert / Save

You can attach a condition to the save, delete, and / or insert functionality of a form, by adding an expression. For example, the following expression, can be added to the **Allow Save** property for the CAMA Land entity.

```
IsNull(@attrFINAL_ADJ_PERCENT,0) = 5
```

This would disable the Save button unless the Final Adjustment Percentage for the land is equal to five.

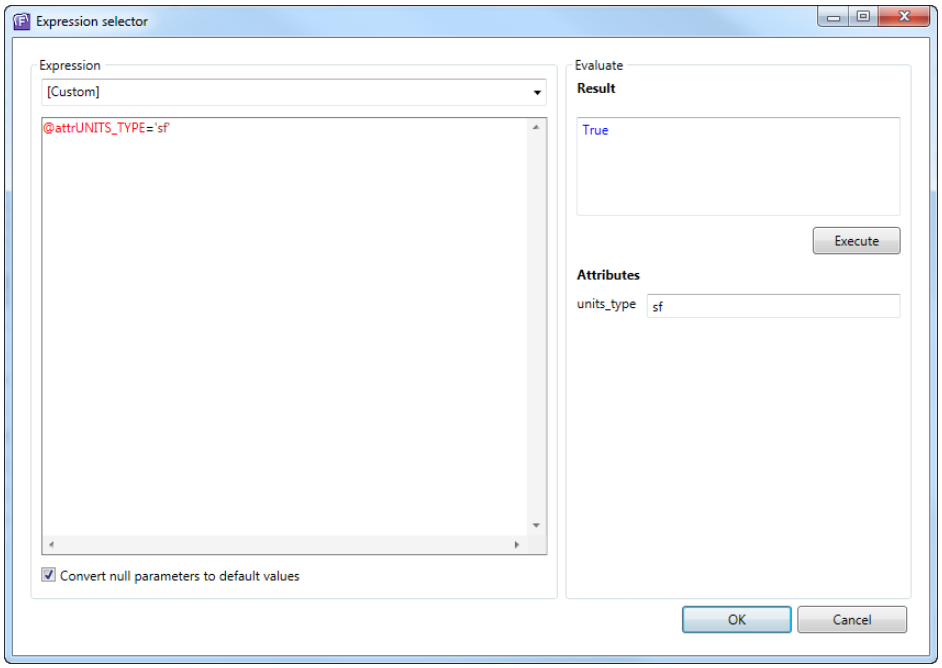
Note: You can also enable and disable fields through the Security Mode. If both an expression and security permissions are defined, the definition that is the most restrictive applies.

If you disable the Save button in the security settings and add the preceding expression, the Save button would always be disabled. Not being able to save at all is more restrictive than only being able to save under a specific condition.

To add an expression to the delete, insert or new, or save functionality of the entity:

1. Launch the OFD.
2. Open the entity.
3. Expand the **MIsc** properties in the Property Explorer.
4. Click the ellipsis button ... beside one of the following properties:
   - **Allow delete**: to add an expression to the **Delete** button
   - **Allow insert**: to add an expression to the **New** button
   - **Allow save**: to add an expression to the **Save** button

   This opens the *Expression Selector*.



5. Enter the expression.

   For further details about expressions, see on page 199.

6. Click **OK**.

Configuration

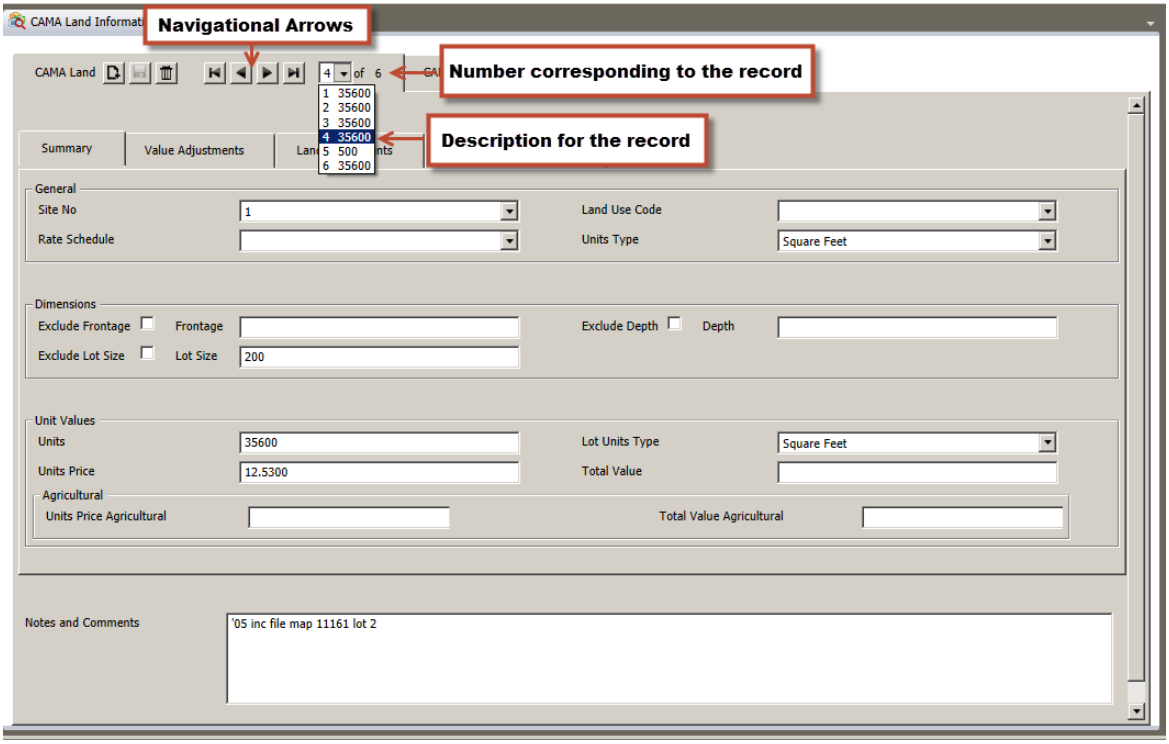
Click the **Ellipsis** button ... to set up the *key bindings* or the links between the data retrieved in a search and the data displayed on the form. See *Configuring IDs for the Entity on page 188*.

Name

This field displays the name of the entity as created in the Govern Business Entity Designer. This field cannot be modified on this form.

Record Description

The Record description property is used for displaying information in the Record description located at the top of the entity. This is illustrated in the following screen shot.



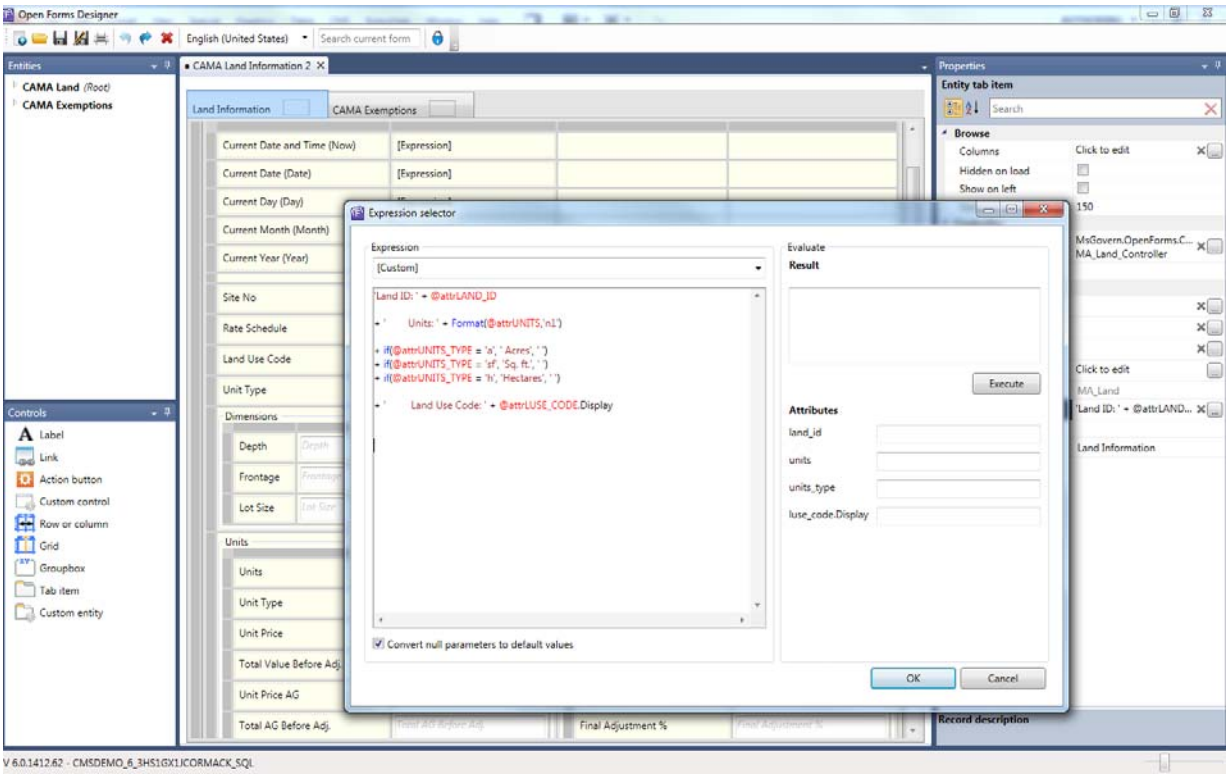
There are various ways of scrolling through multiple records in Govern:

- Using the previous, next, first, and last navigational arrows.
- Selecting the number corresponding to the record in the drop-down list.
- Selecting the description of the record. The description is the result of an expression, created in the Expression Selector:

To create an expression for the record description:

1. Launch the OFD.
2. Open the form and entity to which you want to add a description.
3. Expand the **Miscellaneous** property in the Properties Explorer.
4. Select the ellipsis button beside the **Record description** field ...

   This opens the *Expression Selector*.



5. Select **Custom** from the drop-down list at the top of the form.
6. Enter an expression.
7. Test the expression by entering data in the parameter fields and clicking **Execute**.
8. Click **OK**.

For further details about expressions, see Types of Expressions on page 226.

Tip: In order to align items in the Record Description, add spaces between items. The spaces must be enclosed by single quotes.

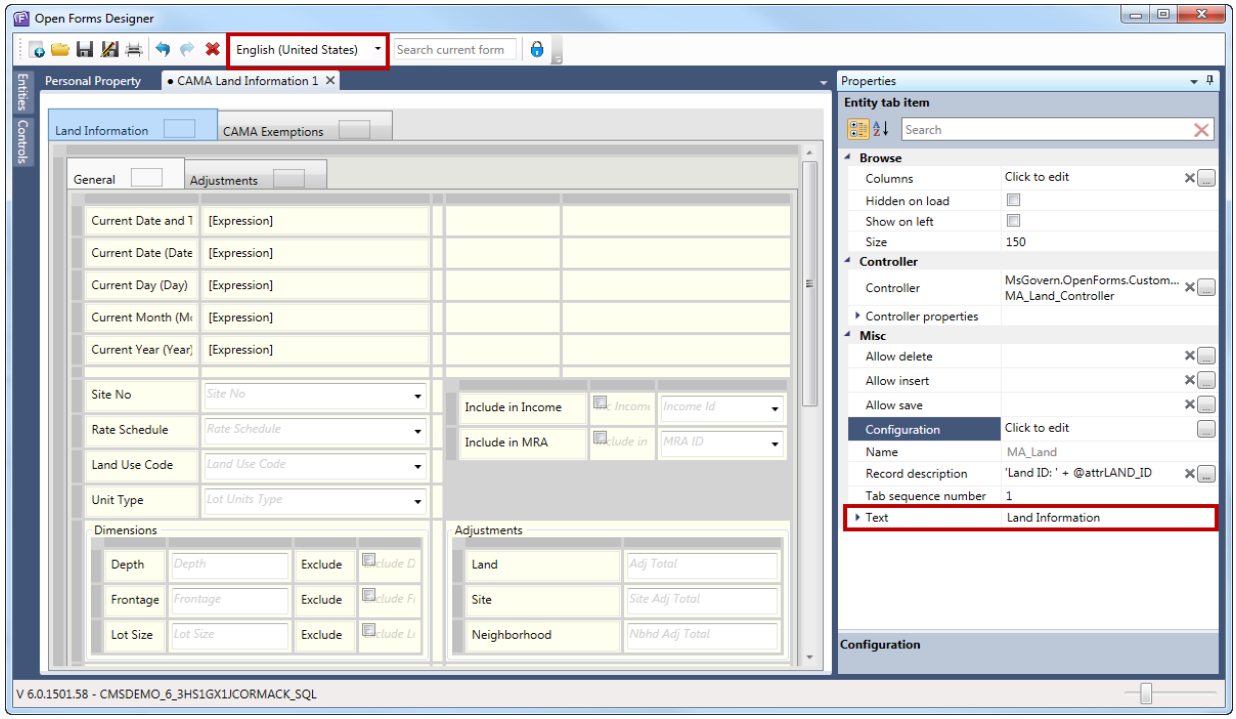
Tab Sequence Number

If there are multiple entities, enter a sequence number to define an order for how they are presented on the Govern form.

To enter a number, click inside the text box and use the up and down arrows. The first number that appears is zero (0), but you can use any number. The entity with the lowest number in your sequence is presented first.

Text

This field displays the name of the entity that appears in Govern. The name can be modified from the Text of English and French properties. In this scenario, the **Culture** is set to **English (United States)**.



Enter the name of the entity in the **Text** field.

Expand the **Text** parameter to see that your text is automatically entered in the English parameter.

Text	Land Information
en	Land Information
fr	

You can then fill in the **French** parameter.

Text	Land Information
en	Land Information
fr	Terrain

Defining Properties for the Attributes

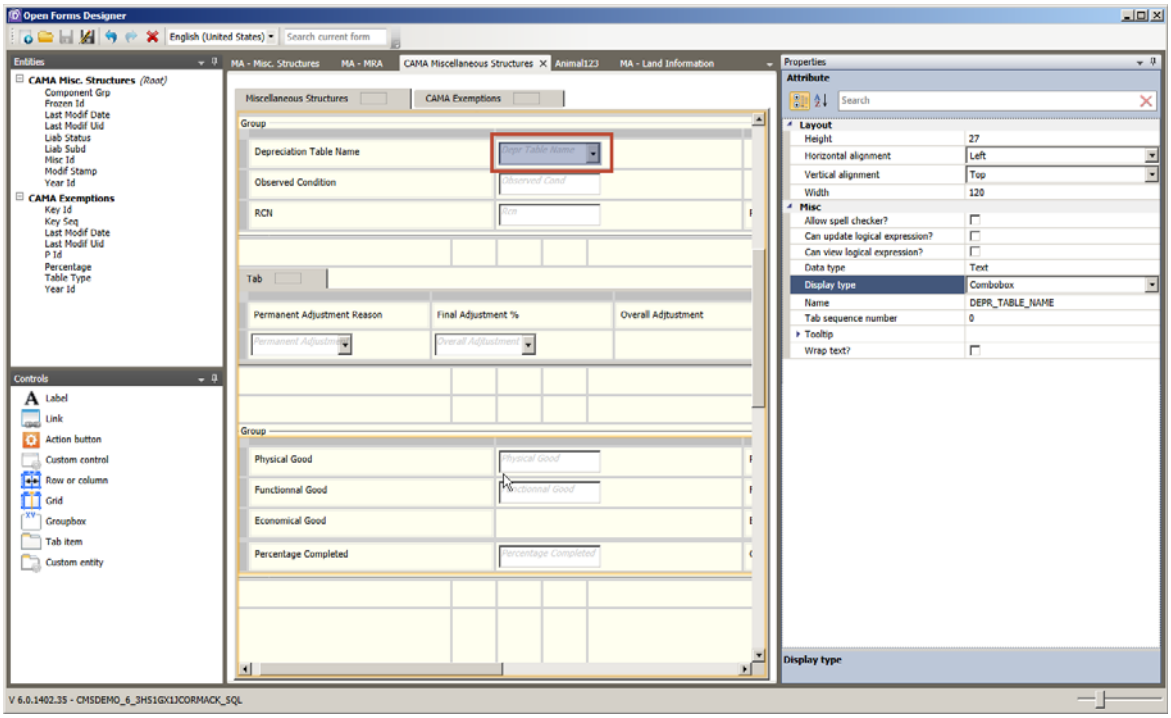
Overview

The attributes appear as text fields on the Govern user forms. Like the business models and entities they are created and are mapped in the Business Entity Designer.

This section describes how to define the properties for the attributes.

To define the properties for an attribute:

1. Launch the Govern OFD.
2. Open the form that contains the entity that you want to modify.
3. Select the tab for the form at the top of the OFD interface.
4. Select the attribute that you want to modify.



You need to define the properties for each attribute separately. Also, you need to define the properties for the labels separately from the attributes.

The heading **Attribute** appears at the top of the Properties pane with the name of the form.

Element ID: As with all items, the entity has an element ID property. This provides reference in the log files.

5. Modify the properties, as described in the procedure.
6. Click **Save**.

Layout

There are three properties for defining the alignment of attributes:

- Horizontal Alignment
- Vertical Alignment
- Text Alignment

The Horizontal and Vertical Alignment properties apply to the text box around the attribute. The Text Alignment property applies to the attribute only.

Horizontal Alignment

Select one of the following from the **Horizontal Alignment** drop-down list:

- **Left**: Aligns the attribute on the left of the cell. Some space is provided to separate it from the border.
- **Center**: Aligns the attribute at the center of the cell.
- **Right**: Aligns the attribute on the right of the cell.
- **Stretch**: Aligns the attribute at the top and left of the cell. Increases the width of the column if the text is long and requires more space.

Enter a value for the height of the attribute inside the cell in the **Height** text box. This measurement includes the attribute and a border around the text.

If you increase the height of the label, the height of the cell increases. However, if you decrease the height of the label, the height of the cell does not decrease below the default value.

Vertical Alignment

Select one of the following from the **Vertical Alignment** drop-down list:

- **Top**: Aligns the attribute at the top of the cell. Some space is provided between the border and the text.
- **Center**: Aligns the attribute at the center of the cell.
- **Bottom**: Aligns the attribute at the bottom of the cell.
- **Stretch**: Aligns the attribute at the top and left of the cell. Increases the width of the column if the text is long and requires more space.

Enter a value for the width of the label inside the cell in the **Width** text box.

This measurement includes the attribute and a border around the text, as illustrated in the following screen shot.

If you increase the width of the attribute, the width of the cell increases. However, if you decrease the width of the label, the width of the cell does not decrease below the default value.

Text Alignment

By default, all text attributes are left aligned and all numeric attributes are right aligned. This is set by the Text Alignment property.

This property is available for attributes only.

Select one of the following from the **Horizontal Alignment** drop-down list:

- **Left**: Aligns the text of the attribute on the left of the cell. Some space is provided to separate it from the border.
- **Center**: Aligns the text of the attribute at the center of the cell.
- **Right**: Aligns the text of the attribute on the right of the cell.
- **Justify**: Aligns the text of the attribute equally from the left to the right. If there are multiple words, they are aligned on both the left and the right of the cell.

Margins

You can add margins to the selected item in order to add space between it and the next item. Default margins can be defined in the General Settings Editor in GNA. They are applied to all items on the form with the exception of grids, rows, columns, and action buttons.

The margins for the selected item are set and viewed in a clockwise order, left, top, right, bottom.

Miscellaneous

Allow spell checker? Select this option if spell checking is appropriate for the attribute. For example, select this option for a Notes field.

Data type: This field displays the data type of the attribute, as defined in the database. It cannot be modified from this field.

Display type: The available display types vary according to the data type. For example, for a text field, you can select combo box. For an integer, you can select Text box or Check box. For Real, you can select text, Date Only, or Date and Time. Select the appropriate display type for the attribute.

Is enabled: An expression can be used to control whether or not an attribute is enabled. *For further information, see on page 199*.

Is tab stop: This checkbox is selected if a tab sequence number is entered. If you deselect this option, the tab sequence number is removed.

Is visible: An expression can be used to control whether or not an attribute is visible. *For further information, see on page 199*.

Name: This parameter displays the name of the attribute as defined in the Business Entity Designer. It cannot be modified on this form.

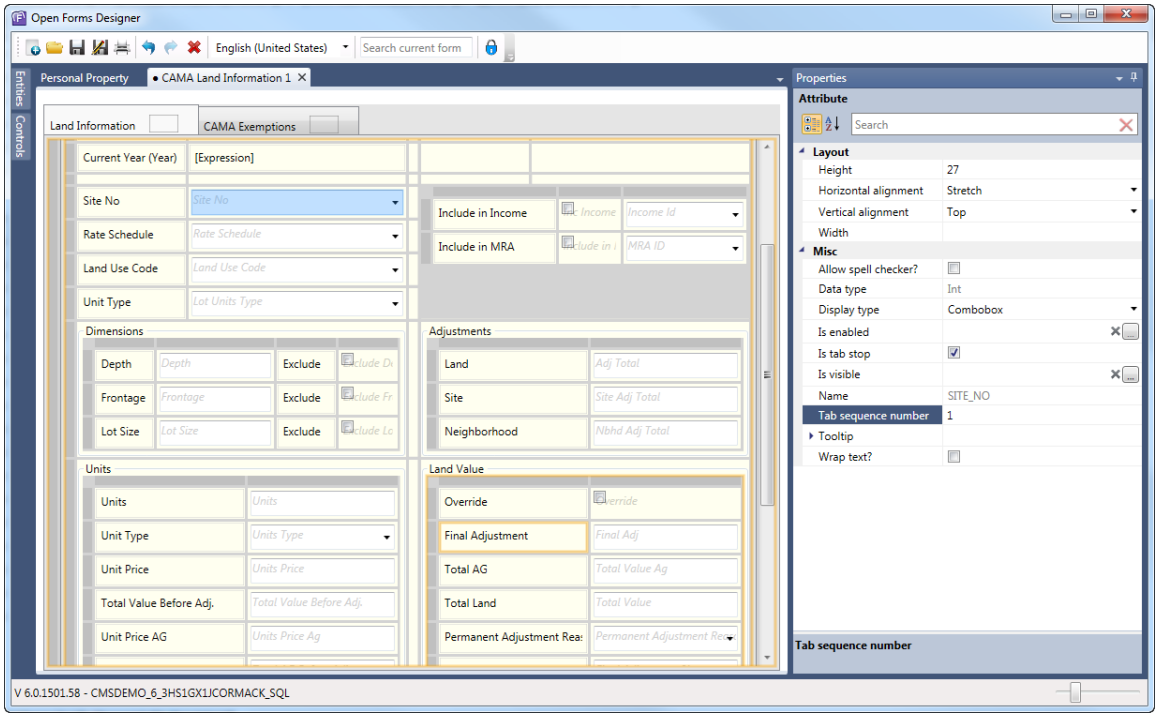
Tab sequence number: You can use the **Tab Sequence Number** is several ways, such as:

Setting the Focus on a Specific Attribute

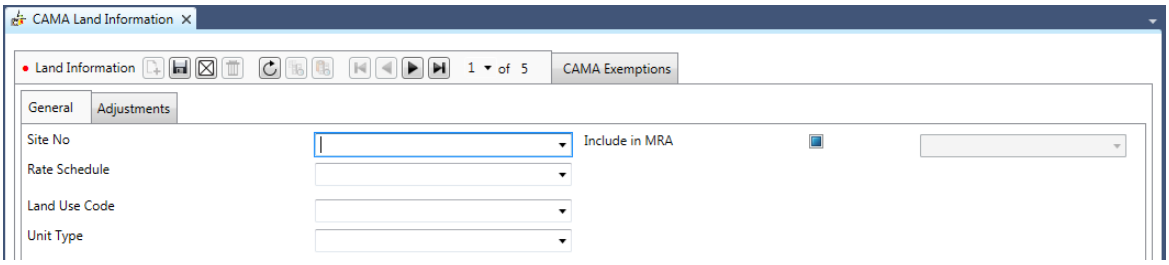
When the user clicks the **New** button on a Govern form, the attribute with the lowest **Tab Sequence Number** receives the focus.

This is illustrated in the following scenario:

- The administrator opens the CAMA Land Information form in the OFD and sets the **Tab Sequence Number** property of the **Site No.** parameter to the lowest sequence number.
- The lowest number is zero (0), but whichever number is the lowest in the sequence has the priority.



The user opens the form Govern and clicks the **New** button. The **Site No.** field is in focus.



Setting the Order for Multiple Fields

If there are multiple attributes on the form that are configured together, you can set up a tab sequence. The user can then navigate from one field to the next with the `[Tab]` key on the computer keyboard.

Tooltip: Expand the tooltip parameter to enter an English and French text to describe the attribute.

Wrap Text: Select this option if the attribute contains or accepts a lot of text. This is useful for a Notes field.

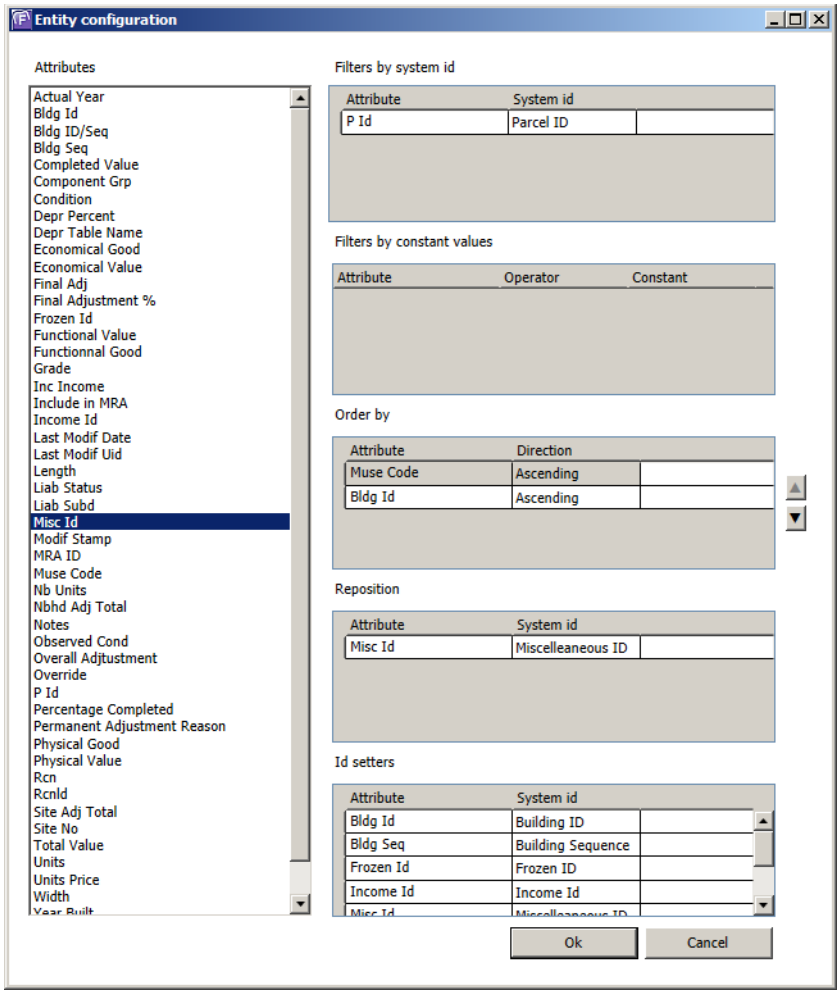
Note: If the Horizontal Alignment is set to Stretch and Wrap Text is enabled for a field, ensure that the Horizontal Scrollbar is Disabled. Otherwise the text does not wrap.

The Horizontal and Vertical Scrollbar properties are set at the Grid level. Both the Tab and the Groupbox controls contain a grid. For a tab, you may have a grid within a grid. *See Defining the Properties for the Grid on page 103*.

Configuring IDs for the Entity

Overview

The *Entity Configuration* form is used for defining the attributes and system IDs that populate the user form from the search results. They are also used for filtering the records. At least one System ID is required for each form.



The attributes in the selected entity are displayed in the left column. Note that all attributes are listed, regardless of whether they are selected or unselected for the user form.

The configuration is divided into the following sections. The **Filters by System ID** is required for the Root Entity. All sections are optional for the child entities.

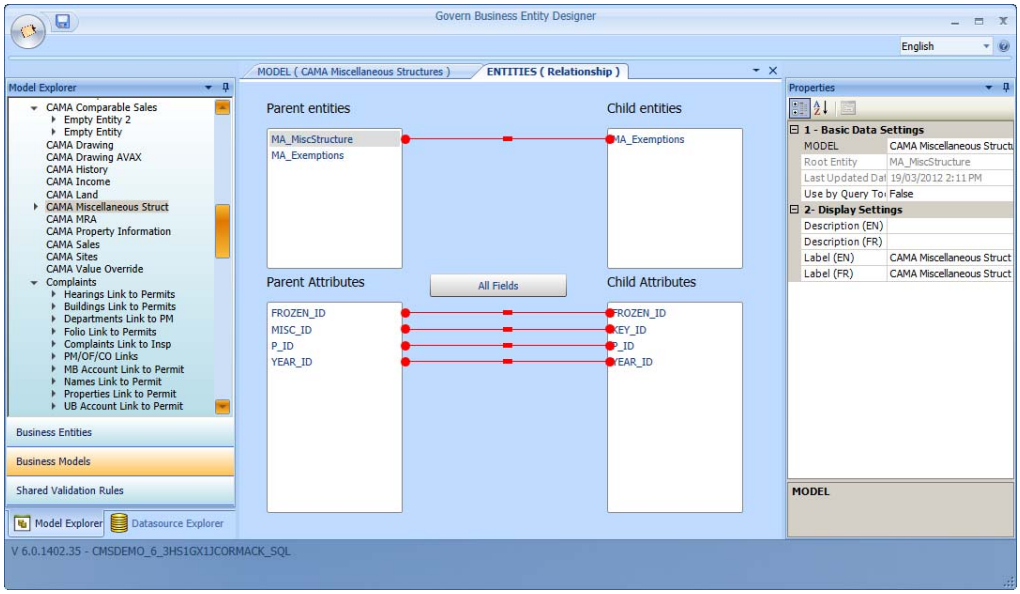
- **Filters by System ID**: At least one System ID is required for this filter for the root entity. This is the ID that links the data retrieved in a search to the Govern user form. *See Filter by System ID on page 189*.
- **Filters by Constant Values**: The Filter by Constant Value setting is optional. It is used in order to display only the records that match a specific value. *See Filter by Constant Value on page 191*.
- **Order by**: Select one or more attributes to use for defining the order to present the records when multiple records are retrieved. *See Order by on page 194*.
- **Reposition**: Select an attribute to use in presenting the first record. By default, records are presented by the System ID selected in the **Filter by System IDs** section. Define the Reposition setting if you want to use an alternate ID. *See Reposition on page 196*.
- **ID Setters**: The ID Setters are used for populating the Govern IDs. By default, all the system IDs used in the form are listed in the ID Setters section. *See ID Setters on page 197*.

Filter by System ID

At least one System ID is required for the root entity for every form. This is the ID that links the data retrieved in a search to the Govern user form. For the majority of entities, this is the Parcel ID (P_ID) or the Name ID (NA_ID).

Note: If a System ID is not set, an error message is displayed.

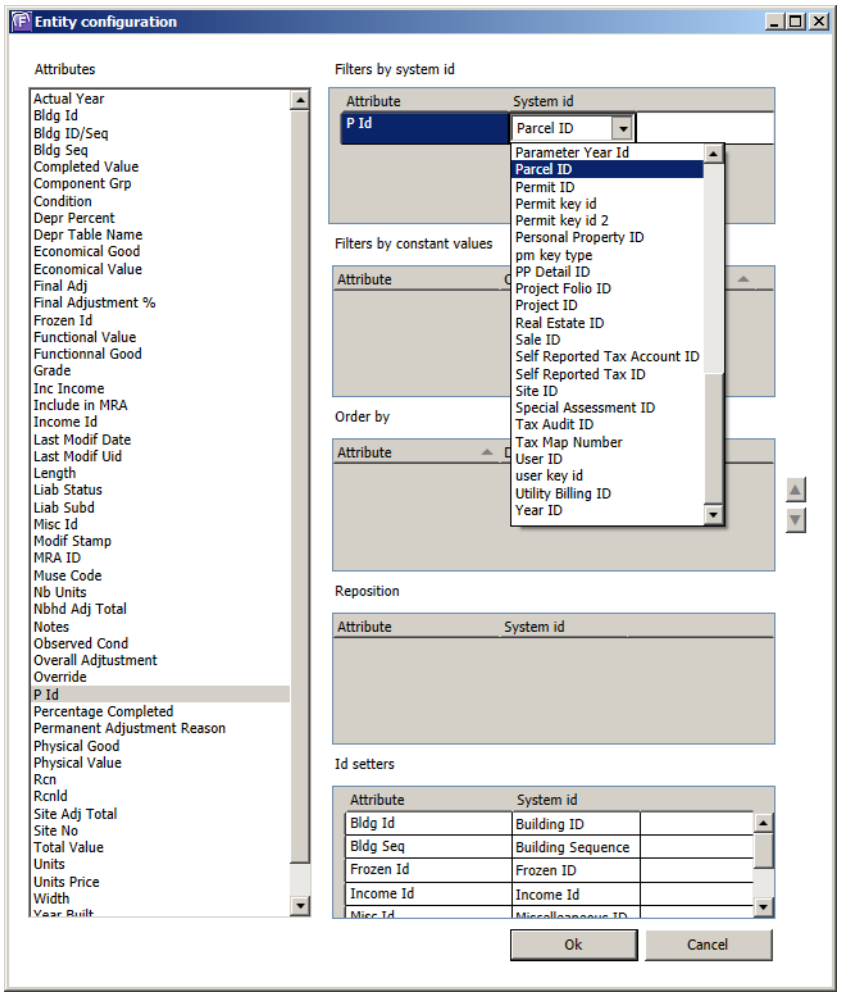
For the Child Entities, the link is created in the Govern Business Entity Designer (BED) on the Links tab. The following screenshot shows the links between the parent and child attributes of the CAMA Miscellaneous Structures entities.



For the Root Entity, use the following procedure to establish the link.

To define the System ID for the root entity:

1. Launch the OpenForms Designer.
2. Open the applicable form.
3. Select the attribute on the left, under **Attributes**.
4. Drag it to the **Filter by System ID** section on the right.



5. Select the ID for the attribute from the **System ID** drop-down list.
6. Click **OK** to save your selection.

Filter by Constant Value

The **Filter by Constant Value** setting is optional. It is used in order to limit the display to records that match a specific value. This can be useful in a variety of situations.

For example, the Govern user forms: PC19 (Complaint), PC19G (Grievance), PC19R (Request for Service), and PC19W (Workflow) are almost identical. All forms are based on the Business Model PC19 (Complaint). The only difference is the definition of the attribute KIND.

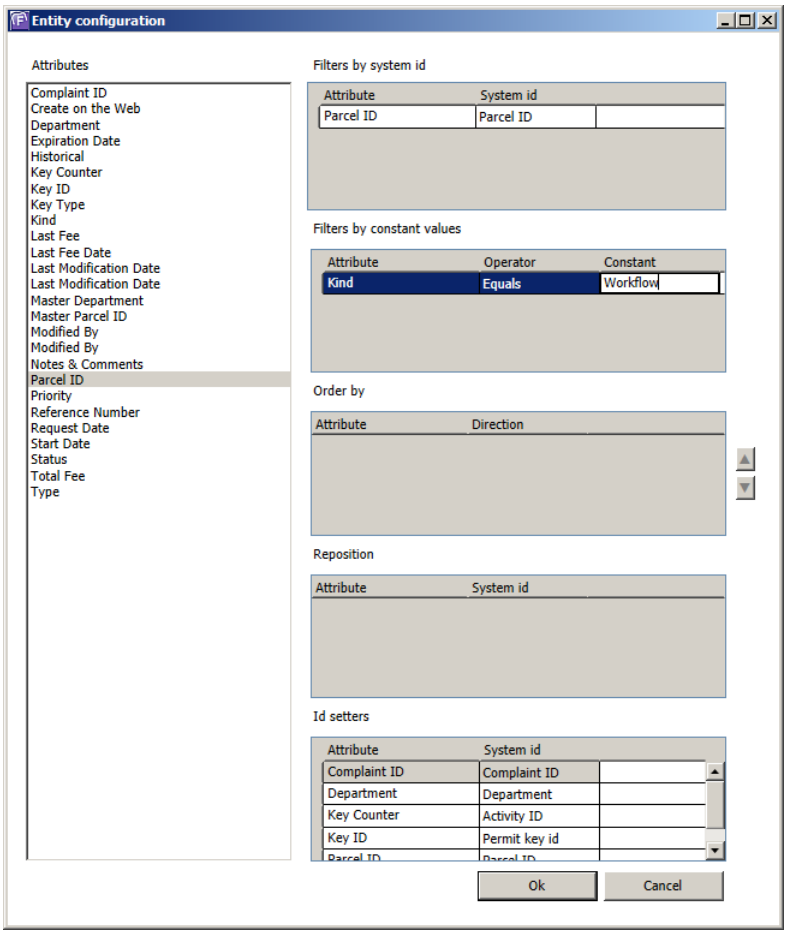
This is defined as follows:

- PC19 (Complaint): Kind = complaint
- PC19G (Grievance): Kind = grievance
- PC19R (Request for Service) Kind = req_serv
- PC19W (Workflow): Kind = workflow

To complete this setup, you would create the PC19 (Complaint) form in the OpenForms Designer. Then, create three copies of the form for the Grievance, Request for Service, and Workflow forms. Use the attribute Kind as a Constant Value and define it accordingly.

To define a constant value:

1. Launch the OpenForms Designer.
2. Open the applicable form.
3. Select the attribute on the left, under **Attributes**.
4. Drag it to the **Filter by constant value** section on the right.



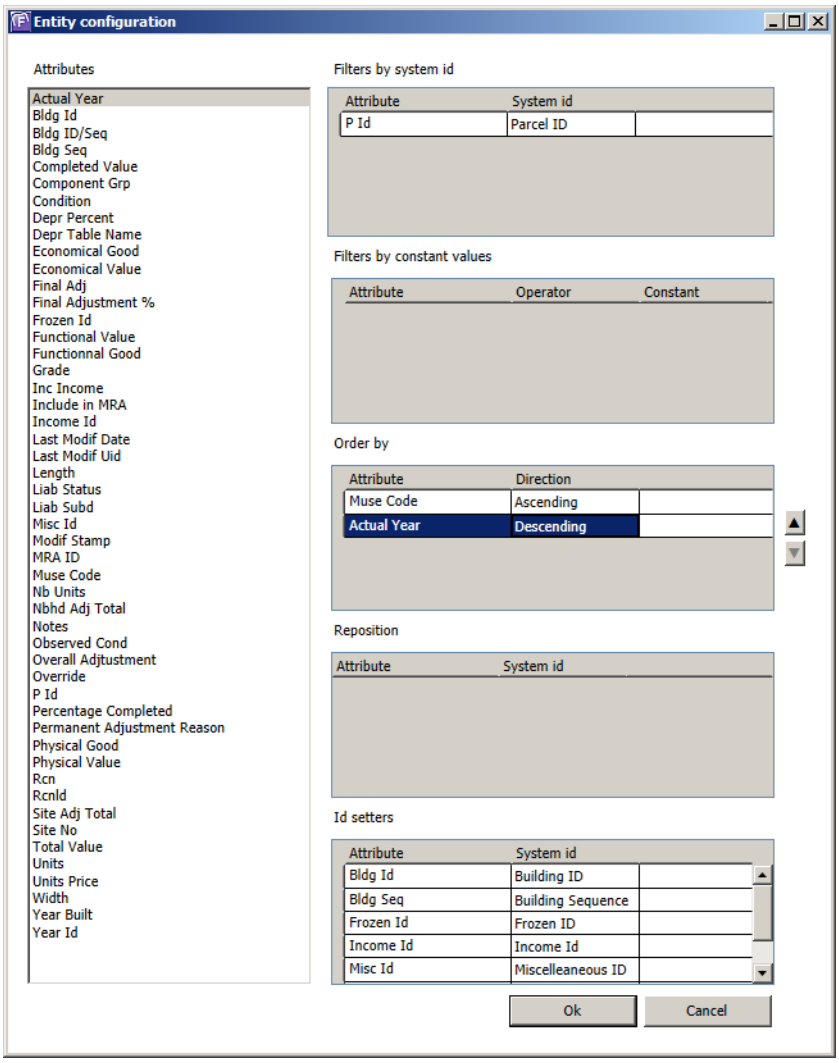
5. Select one of the following from the **Operator** drop-down list, according to how you want to use the constant value:
   - Equals
   - NotEquals
   - LessThan
   - LessThanOrEqualTo
   - GreaterThan
   - GreaterThanOrEqualTo
   - Contains
   - DoesNotContain
   - IsNull
   - IsNotNull
6. Enter a value in the **Constant** field.
7. Click **OK**.

Order by

Use the **Order by** setting to define the order of the records when multiple records are retrieved in a search. You can select one more attributes for this. For example, you may want to present records in chronological order, the most recent first, by parcel ID, permit ID, or by any other ID or combination of IDs.

To define the **Order by** filter:

1. Launch the OpenForms Designer.
2. Open the applicable form.
3. Select the attribute on the left, under **Attributes**.
4. Select the attribute or attributes that you want to use for ordering the records.
5. Drag them, one at a time, to the **Order by** list box and drop them in place.



6. Select **Ascending** or **Descending** from the **Direction** drop-down list.
7. Use the **Up** and **Down Arrows** to position the attributes in the **Order by** section according to which you want to use first to establish the order.

   For example, in the preceding screen shot, the Miscellaneous Structures Use Code (MUSE Code) is in the top position and the Actual Year Built (Actual Year) is the second position. The records are ordered first by MUSE Code and then by the Actual Year.
8. Click **OK**.

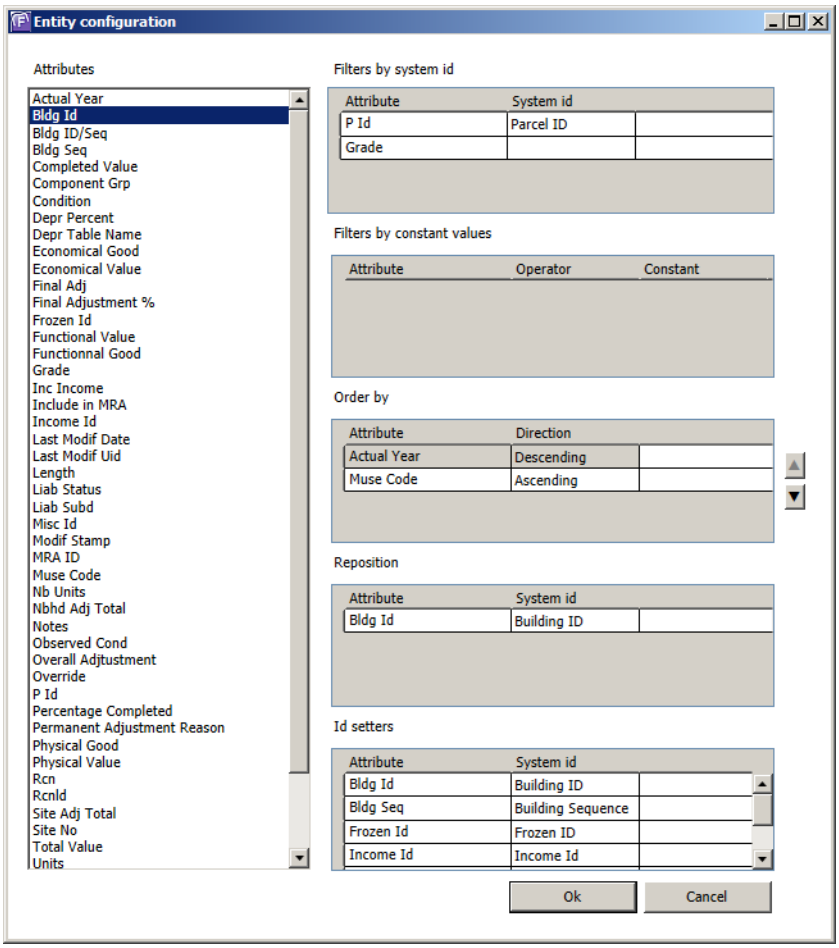
Reposition

By default, records are presented according to the System IDs selected in the **Filters by System ID** section.

If you prefer to present the records according to an alternate System ID, use the **Reposition** setting. For example, permit records could be filtered by Parcel ID (P_ID) and presented according to the Permit ID (PM_ID).

To define the Reposition setting:

1. Launch the OpenForms Designer.
2. Open the applicable form.
3. Select the attribute on the left, under **Attributes**.
4. Drag it to the **Reposition** section and drop it in place.

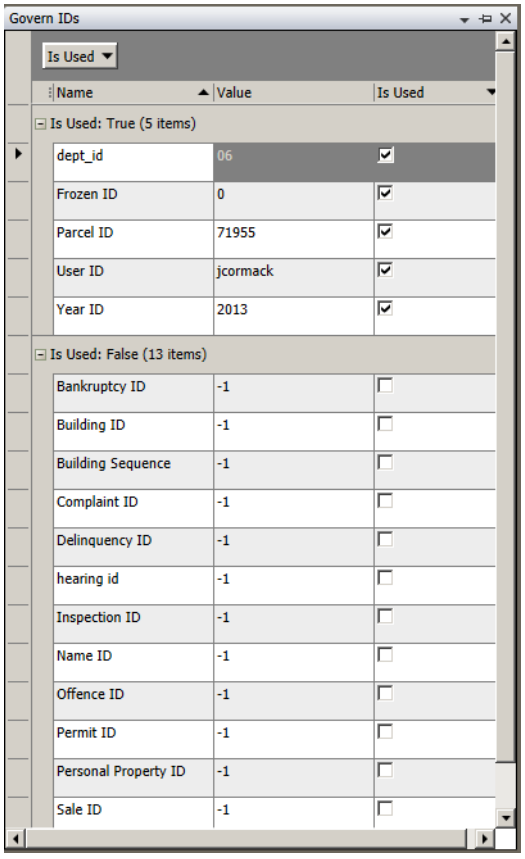


5. Select the corresponding system ID from the **System ID** drop-down list.
6. Click **OK**.

ID Setters

The ID Setters are used for populating the Govern IDs. By default, all the system IDs used in the form are listed in the **ID Setters** section.

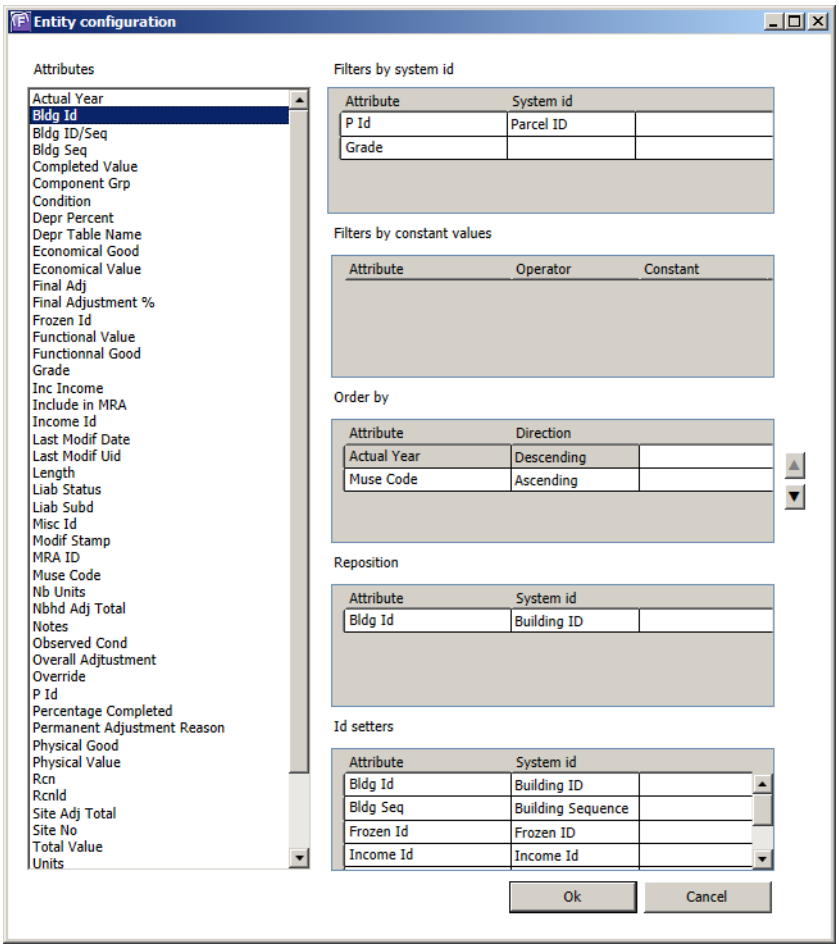
The following screen shot displays the Govern IDs used in the CAMA Miscellaneous Structures form.



Note that if there is no value for an ID in the current record, it is not displayed in the **Is Used** section of the Govern IDs panel.

To define the ID Setters:

1. Launch the OpenForms Designer.
2. Open the applicable form.
3. Select the attribute on the left, under **Attributes**.
4. Drag it to the **ID Setters** section and drop it in place.



5. Select the corresponding system ID from the **System ID** drop-down list.
6. Click **OK**.

Chapter 5: Security in the OpenForms Designer

Overview

You can define security permissions directly in the Govern OpenForms Designer (OFD). This is particularly useful when you are creating a form. It means that you can set the security permissions without having to open another application.

Access to the form can be defined in the Govern Security Manager (GSM). The two applications show the same information. The security that you define in the OFD is shown in the GSM and vice versa.

Note: Before applying security, it is important to understand how it works in Govern OpenForms. Just as when you are designing the layout of your form, you want to have an overview of the end result. Where do you want to apply security and how you want to apply it?

Security in the OFD is described in the following sections:

What's New in Govern OpenForms Security

Overview

The notes in this section are relevant for users who are upgrading from Govern OpenForms 5.1:

Previously, all security permissions were defined in the GSM. You can now provide access to a form in the GSM or in the OFD. Then, access to the entities and all controls are defined in the OFD.

Security permissions need to be defined in each form separately. Previously, the security defined at a higher level, such as the application or the profile was inherited by the form, the entity, and all controls. In other words, it was inherited everything that was part of the application or the profile.

You can write an expression in order to disable the save, delete, and insert functionality of a form, or the availability of a control. These can be disabled at all times or disabled by a condition. This is useful if you want the same condition to apply to all security types, profiles, roles, and users. *For details, see on page 199*.

Prerequisites

Overview

This section lists the information that you need in order to set the security permissions on a form.

Applications

Before defining the security for the form, you need to have access to the following applications in the Govern OpenForms Product Suite:

- **Govern**: to preview the forms and security permissions
- **Govern New Administration (GNA)**: to add the form to one or more profiles
- **Govern Security Manager (GSM)**: to view or modify user roles.

User Forms

You can set security permissions on each item on a user form, including tabs, groupboxes, labels, attributes, Ensure that the form and all the items are set up as required.

Profiles

Ensure that your profiles are created in GNA. Then, add the form to one or more Profiles before defining the security permissions. *Refer to the Govern New Administration (GNA) guide for details on Profiles*.

Note: If the form is added to multiple Profiles, you need to define the security for each one separately.

Roles and Users

Ensure that the user accounts for the deployment are set up in GNA and that the roles are defined in the GSM. Before defining security permissions, you need to know:

- The permissions that are required for each role.

- The user accounts that are assigned to each role
- How security permissions are applied in Govern OpenForms. *See Defining Security by Role and User on page 212*.

For further details on roles and users, refer to the Govern Security Manager (GSM) guide.

Before Setting Security Permissions

Overview

This section provides a few tips and points to consider before setting security permissions for Govern OpenForms.

Entities or fields are always disabled in Govern when:

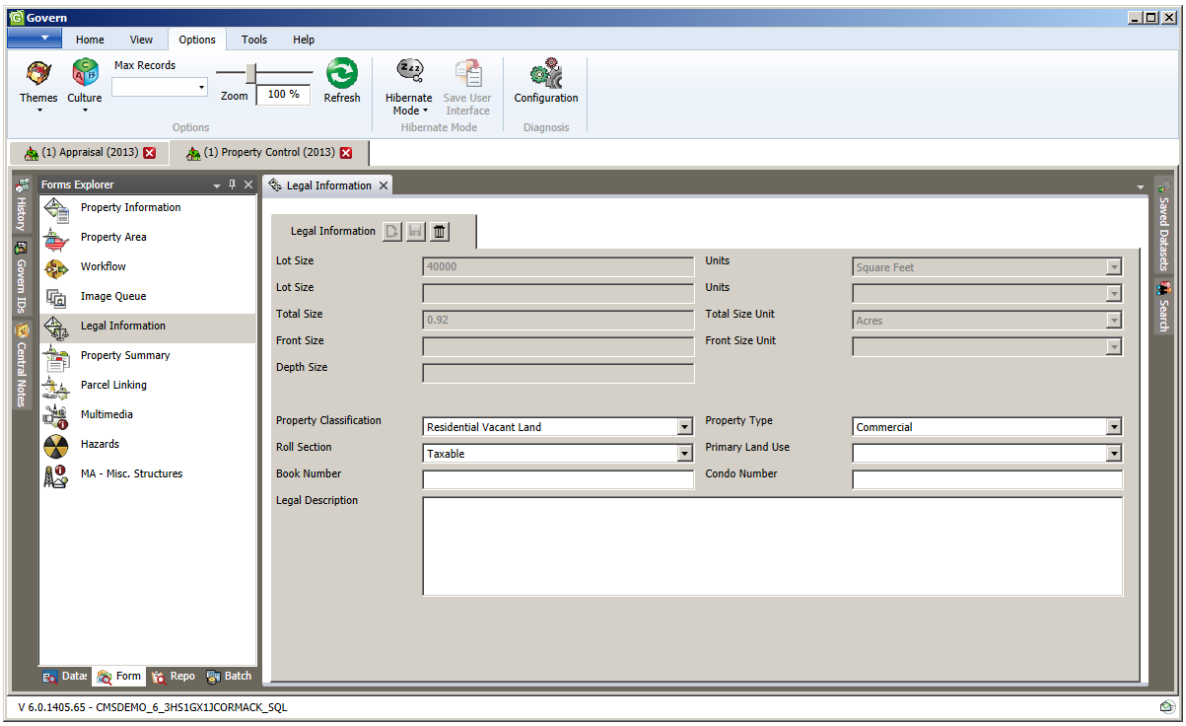
- No records are loaded to the Dataset tree view
- No data exist for the selected name or property record.

They can also be disabled by any of the following:

- Controllers
- Custom controls
- Expressions
- Security definitions

Fields can be disabled due to code written in the controller.

For example, the fields at the top of the Legal Information form are disabled as shown in the following screen shot.



The controller for the Legal Description disables these fields if CAMA is included in the deployment. This is described in the documentation for the entity.

Similar code can be included in the Custom Control.

You could also write an expression to disable fields at all times or disable them according to a condition. These expressions can be added at the entity level or to a control, such as a groupbox, tab, attribute, or label. An expression can also be added to an attribute in the Business Entity Designer (BED). *See on page 199*.

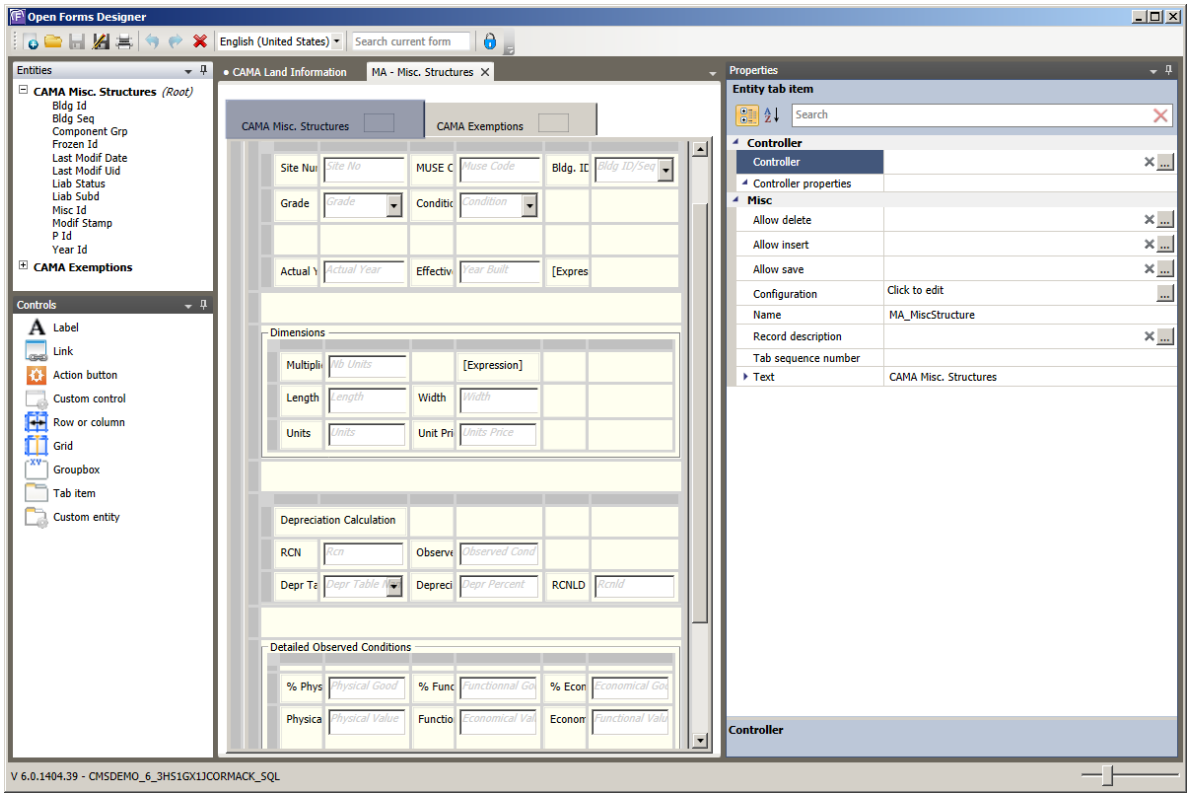
Finally, entities and fields can be disabled due to a security definition. This is discussed in the following sections in this chapter.

Accessing the OFD Security Settings

Overview

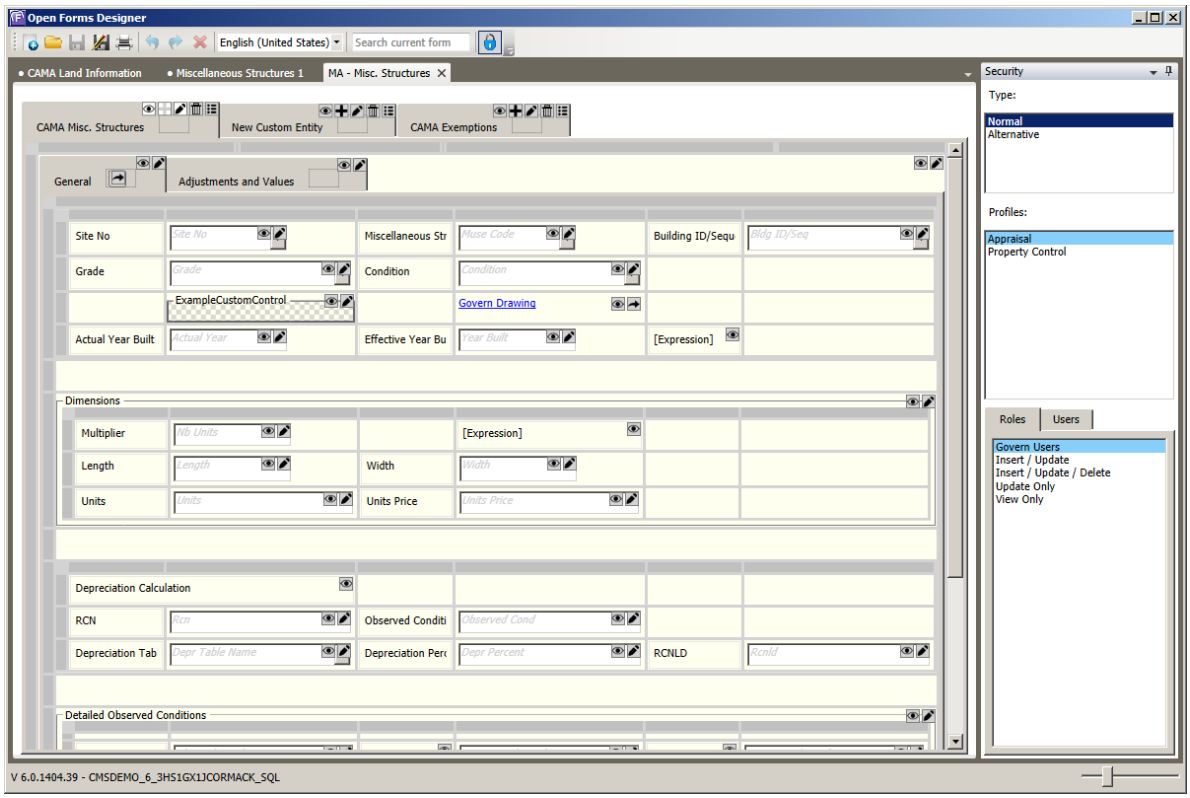
To access the OFD security settings:

1. Launch the OFD.
2. Open the form and the entity in the OFD editor.



3. Click the **Security** icon in the title bar.

   This opens the form in Security mode.



When you are in Security mode, the Security Explorer is displayed on the right. This explorer has three list boxes for the following options:

- **Type**: Normal or Alternative
- **Profile**: the groups under which the forms are located, such as Appraisal, Property Control, Accounts Receivable, etc.
- **Roles** and **Users**: User groups and individual user accounts

Note: You must make a selection in each list box in order to see the security icons.

Defining Security by Type

Overview

There are two security types: Normal and Alternative.

Note: Ensure that you select the correct security type when you define the permissions.

If you are defining permissions for both types, it is recommended to start with normal security.

Normal Security

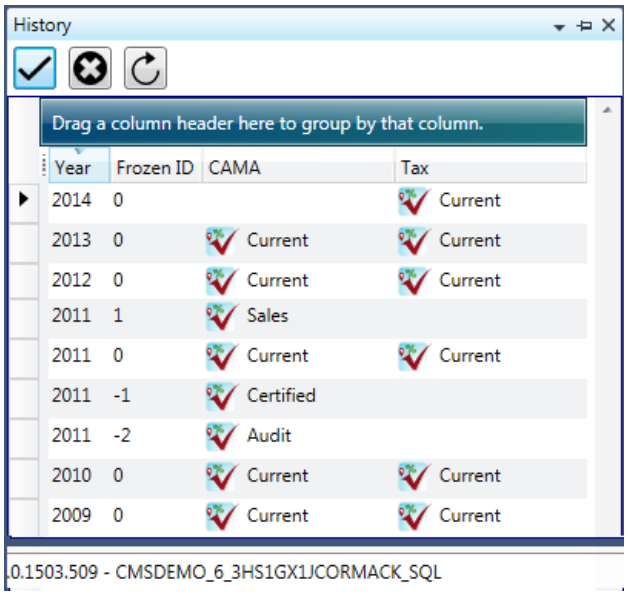
The Normal security type is the default. This is the security for the Frozen ID 0 of the default year of the Profile selected in the OFD.

The Default Year of the Profile is displayed on the tab for the Profile at the top of the application.

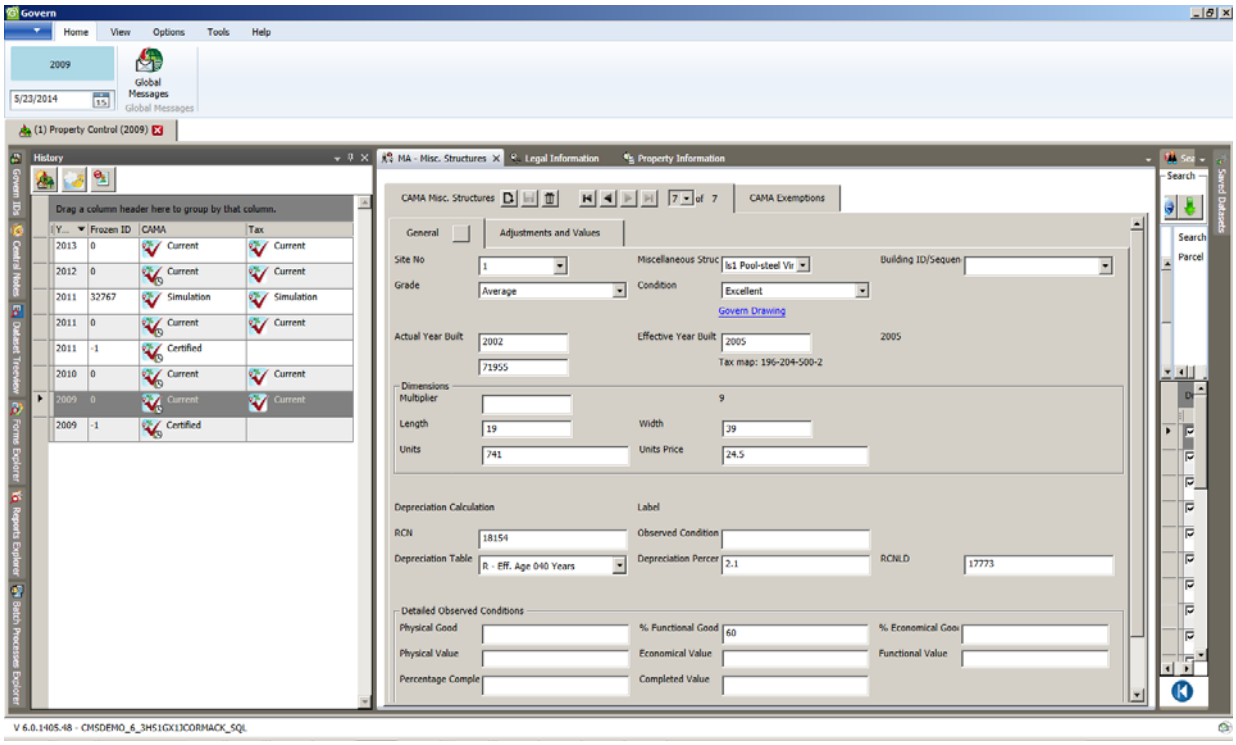
Alternative Security

Alternative security is used for all records other than the default. This includes records for closed years, future years, certified records, simulation records, original years, etc. In short, it covers all records that can be selected from the History panel.

The following is a screen shot of the History Panel. For details about this feature, refer to the documentation on the Govern user application.



When you open a record from the History Panel, the type of record is displayed on the Govern Ribbon. This is shown in the following screen shot.



Defining Security by Profile

Overview

Profiles are used for grouping together a number of forms. Typically, the forms are in the same module, such as Appraisal, Property Control, or Accounts Receivable.

As soon as you create a new form, you can add it to one or more Profiles. If you are managing data in multiple fiscal years, it could be useful to set up different Profiles and add the same form to all the Profiles from which it would be accessed.

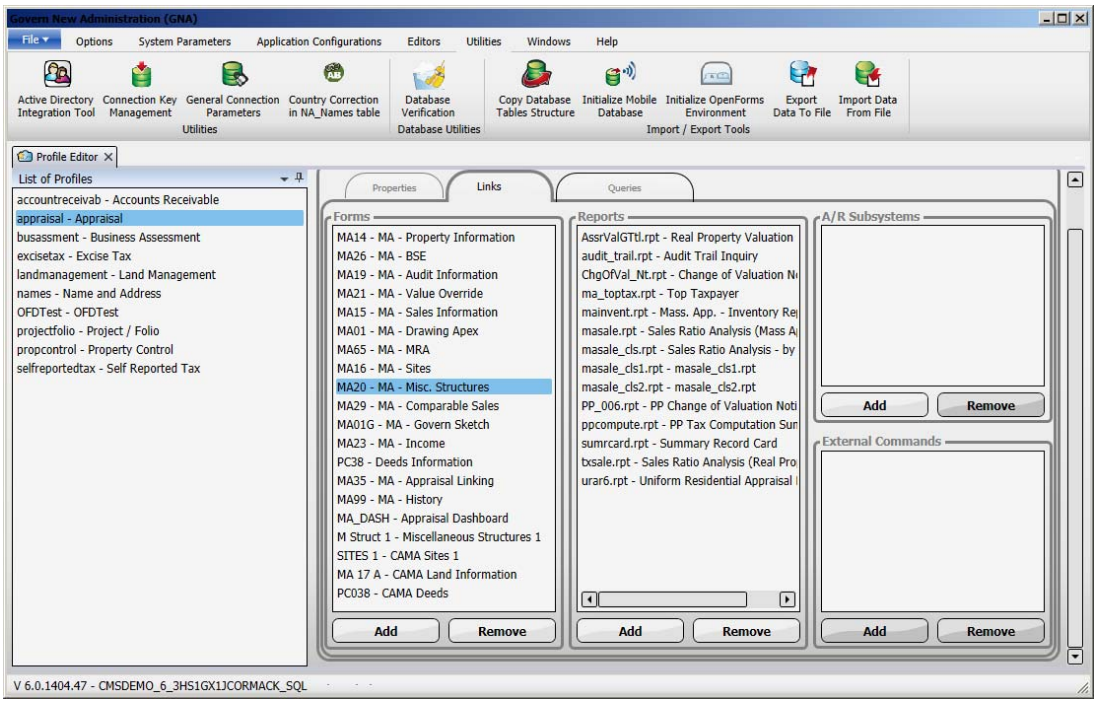
Note: If you the form is added to multiple Profiles, ensure that you select the correct one when defining the security.

You need to set the security for each Profile separately.

Adding a Form to a Profile

To add a form to a Profile:

1. Launch GNA.
2. Select **Editors** > **Profile Editor**.
3. Open the Profile where you want to add the form.
4. Select the **Links** tab.
5. Select **Add**.



Note: If the form is open in the OFD when you add it to a Profile, you need to close it before it appears in the Profiles list.

6. Select the form in the **Select the forms** window.
7. Click **OK**.

Verifying that the Form is Added to the Profile

To verify that the form is added to the Profile:

1. Launch the Govern OFD.
2. Open the form and the entity.
3. Switch to Security mode.
4. Ensure that all the Profiles are displayed in the Profiles list box.

Defining Security by Role and User

Overview

In Govern OpenForms, security can be defined by both role and user account. A role is a group of users to which a level of security is assigned.

Note: When you set up security permissions, ensure that you select the correct role or user account.

The following rules apply:

- A user can be a member of multiple roles.
- Each role can be assigned a different level of security.
- Permissions can also be assigned at the individual account level.
- If security is assigned at the user account level, it overrides any security assigned at the role level.
- If a different level of security is assigned to multiple roles, the definition that grants the highest permission is used.

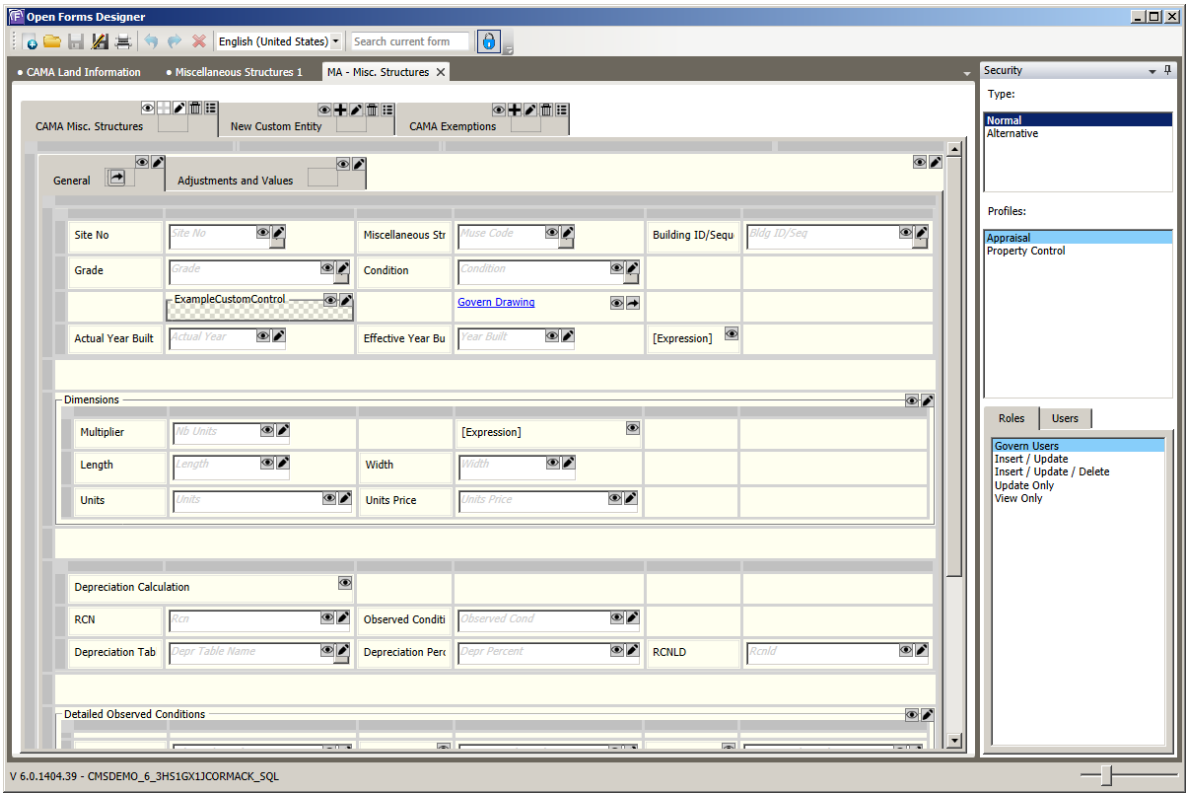
Recommended Procedure

Overview

In order to set the security for each Govern form, proceed as follows:

1. Launch the OFD.
2. Open the form and the entity in the OFD editor.
3. Click the **Security** icon in the title bar.

   This opens the form in Security mode.



4. Select a Security **Type**: **Normal** or **Alternative** in the Security Explorer.

   It is recommended to set up the Normal security first. By default, the security permissions defined for Normal security apply to the Alternative security.
5. Select a profile under **Profile** if the form is added to multiple profiles.

6. Do one of the following:
   - Click **Roles** and select the role for which you want to define security.
   - Select **Users** and select the user account for which you want to define security.

   Note: It is recommended to define security for the role, then define the exceptions for the individual user.

   Permissions assigned at the user account level override any permissions defined for the role.

   Once you select an item in each list box, the security icons are displayed. These are displayed at the entity level and for each control. They are displayed at the top right of the control or item.
7. Select the icon corresponding to the security that you want to set for the control or item.
8. Click **Save**.
9. Continue to define the security for each item on which you want to set explicit permissions. If a security permission is not explicitly set for an item, the Default security is applied. *See Default Normal Security on page 215*.
10. Repeat steps 7 to 9 in order to define the security for each role or user.
11. Select **Alternative** under **Type** and repeat steps 7 to 9 where applicable.

    The default permissions for the alternative security is applied if the security permissions are not explicitly set. *See Default Alternative Security on page 216*.
12. Repeat the procedure for each Profile.
13. Repeat the procedure for each role and user under each Profile and Security Type.

Using the Security Icons

Overview

The security icons are used to define permissions for the actions that users can perform. They can be defined at the entity level and on most controls, such as a tab, groupbox, label, or attribute.

The actions include View:  Insert:  Update:  Delete:  Browse:  and Link:  . Each one has to be defined separately on each control. The actions that they perform on each control are *described under Defining Security on the Entity and the Controls on page 218.*

There are three permissions for the security settings:

- **Granted**: Permission is given
- **Not Granted**: Permission is denied.
- **Undefined / Not explicitly set**: No permission is defined. When no permission is explicitly set, the default permission is granted.

These are applied as described in the following sections:

Undefined Not Explicitly Set

 When you open a new form in the OFD and switch to Security Mode, all the security icons: View, Insert, Update, Delete, Browse, and Link, are displayed on a gray background. The icons are clearly visible.

At this point, no security is explicitly set. The default security is applied.

Default Normal Security

In Normal Security, the **Is Granted** permission is the default. At this point the Not Explicitly Set permission is the same as the Is Granted permission.

Default Alternative Security

By default, the Alternative Security for each item is the same as the Normal Security. For example, if permission to view an attribute is denied in Normal Security, it is also denied in Alternative Security.

When you switch to Alternative Security, the permissions are Not Explicitly Set for Alternative Security. The default state is displayed. The icons are clearly visible on a gray background. Security is applied as follows:

Normal Security Setting		**Default Alternative Setting**	
Icon	**Permission**	**Icon**	**Permission**
	Granted		Granted
	Not Granted		Not Granted
	Not Explicitly Set (Is Granted)		Is Granted

You can set a different security permission for alternative security.

Recommended Procedure

It is easiest to define the security permissions for Normal Security first. Then, switch to Alternative Security and set the permissions that are different.

Granting Permission

If you want to grant permission to an item, you can use the default setting or double-click on the icon, under Normal Security.

When security is explicitly set to Is Granted, the background is white but the icon is clearly visible  .

For a description of how each permission is applied when granted, see *Defining Security on the Entity and the Controls on page 218.*

Denying Permission

To deny a permission on an item, click on the security icon. When permission is Not Granted (denied), the icons are not clearly visible and the background is white 

For a description of how each permission is applied when it is not granted, see *Defining Security on the Entity and the Controls on page 218.*

Defining Security on the Entity and the Controls

Overview

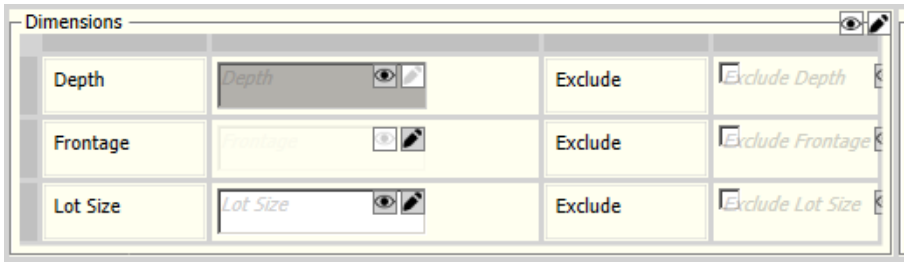
This section describes the security settings at each level. In the OFD. Security can be defined for the View, Insert, Edit, Delete, and Browse functionalities.

Note: Tooltips for the icons will be added in a future release.

Using the Icons to Define Security Permissions

The OFD gives you a preview of your security permissions as you set them.

For example, in the following screen shot, the Update icon is disabled for the Depth attribute. In the preview, it appears in gray. The View icon for the Frontage attribute is disabled. The attribute is not visible in the Preview.



Security by Item

The following table describes the security icons for each item:

- Entity or Custom Entity
- Tab Control (a group of tabs)
- Tab Item (an individual tab)
- Grid
- Rows and Columns
- Groupbox
- Label
- Link

- Action button
- Custom control
- Custom entity

Level	Icon	Setting and Result
Entity or Custom Entity		**Description:** View, Insert, Update, Delete, and Browse permissions can be defined at the entity level. The icons are located on the tab at the top of the form.
	 View	Granted: The entity is visible. Not Granted: The entity is not visible.
	 Insert	Granted: The **New** icon  is enabled in Govern. Not Granted: The New icon is disabled.
	 Update (Edit)	Granted: The **Save**  and **Cancel** icons  are enabled in Govern. Not Granted: The Save and Cancel icons are disabled. The Govern fields are visible but cannot be edited.
	 Delete	Granted: The **Delete** icon  is enabled in Govern. Not Granted: The Delete icon is disabled. The user cannot delete a record.
	 Browse	Granted: The **Browse** icon is enabled in Govern when there are multiple records. The secondary Browsing window is available. Not Granted: The Browse icon is disabled. The secondary Browsing window is not available. However, you can use the navigational arrows to scroll through multiple records and see the Record Descriptions if they exist.
OFD Controls		**Description**: The icons for the OFD Controls are located in the top right corner of the control. View and Update permissions can be defined for most controls.
Tab Control (a group of tabs)	 View	Granted: The Tab Control (or group of tabs) is visible. Not Granted: The Tab Control is not visible.

Level	Icon	Setting and Result
	 Update	Granted: The fields within the Tab Control (or group of tabs) are enabled. Not Granted: The fields within the Tab Control (or group of tabs) are visible but disabled.
Tab Item (an individual tab)	 View	Granted: The tab is visible and the fields are enabled. Not Granted: The tab is not visible.
	 Update	Granted: The tab is visible and the fields are enabled. Not Granted: The fields on the tab are visible but disabled. They cannot be updated.
Grid	N/A	**Note**: No security permissions are available for the grids.
Rows and Columns	N/A	No security permissions are available for rows and columns.
Groupbox	 View	Granted: The groupbox is visible and the fields are enabled. Not Granted: The groupbox is not visible.
		Granted: The groupbox and the fields within it are visible. Not Granted: The fields on the groupbox are visible but disabled. They cannot be updated.
Label		If the label is added from the OFD Controls panel, only the View icon is available. If the label is connected to an attribute, the security is connected to the attribute. If you disable the attribute, the label is disabled.
Attribute		Granted: The attribute is visible. Not Granted: The attribute is not visible. If a label is connected to the Attribute, the label is hidden as well.
		Granted: The attribute is enabled. Not Granted: The attribute is visible but disabled.
Link		Granted: The link is visible in Govern. Not Granted: The link is not visible on the Govern form.

Level	Icon	Setting and Result
	 Link	Granted: The link is enabled and open the required item, such as a batch process, form, or query. Not Granted: The link is visible but disabled in Govern.
Action button	 Action	Granted: The icon is enabled and performs the action. Not Granted: The icon is visible but disabled in Govern.
Custom control	 View	Granted: The custom control is visible. Not Granted: The custom control is not visible.
	 Update	Granted: The custom control is enabled. Not Granted: The custom control is visible but disabled.
Custom entity		The permissions for the Custom Entity are the same as the Entity or Custom Entity. Permissions on the fields and other items in the entity cannot be set from the OFD.

Chapter 6: Adding Expressions

Overview

Expressions are used in Govern OpenForms, version 6.0 and above to perform a wide variety of tasks within a Govern entity, such as:

- Performing a validation
- Performing a mathematical operation
- Performing a computation
- Executing a selection query
- Displaying the value of an unselected attribute on a form
- Attaching a condition to an entity or control; i.e., enabling it or making it visible only if a certain condition is met

The correct syntax must be applied as described in this document.

Expressions can be added at the entity level and on most controls in the OFD. They can also be associated with a calculated value for an attribute or a validation rule in the Business Entity Designer. Expressions that are added to the OFD are not saved in the database.

This section describes the use of expressions in Govern. It contains the following topics:

General Procedures for Adding Expressions

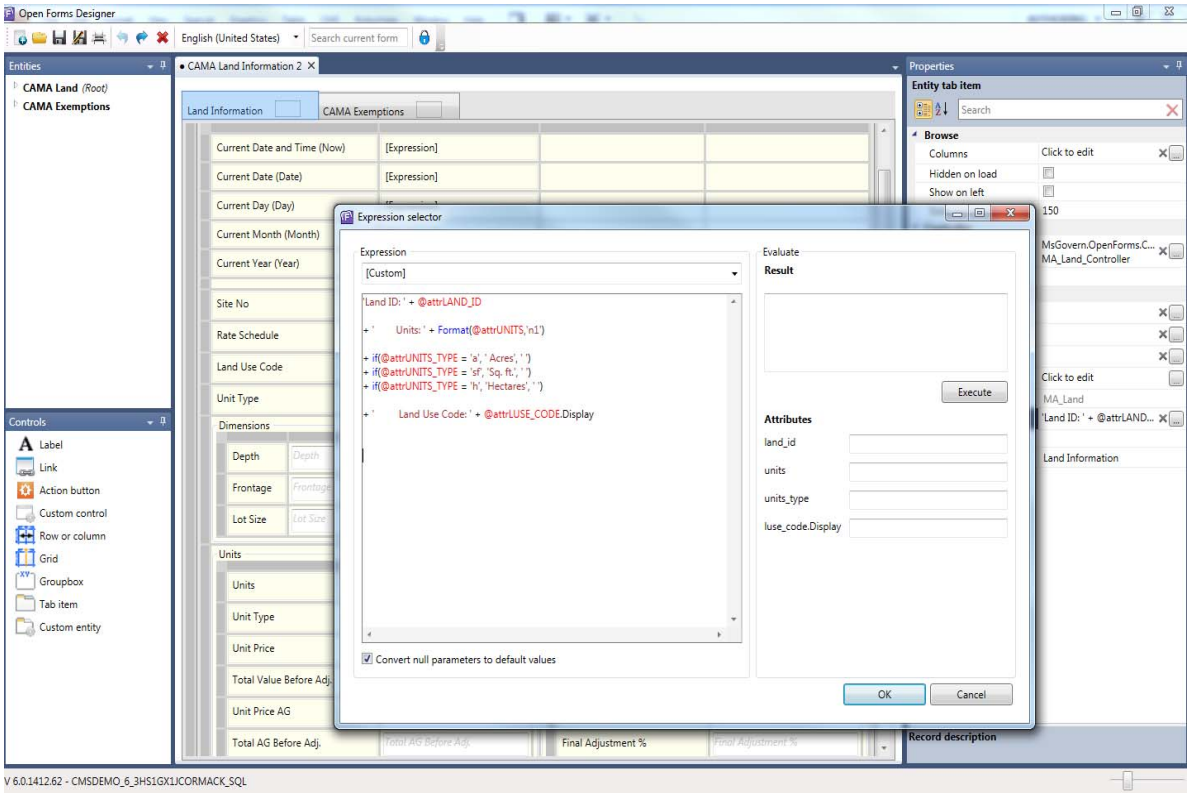
Overview

Expressions are added through the Expression Selector. This is available in the Properties Explorer for the entity in the OFD and for most controls. The procedure is similar. You can also refer to the Govern Business Entity Designer documentation for details on using an expression as a validation rule, or adding an expression to a calculated field.

To add an expression:

1. Launch the OFD.
2. Open the applicable form and entity in the OFD Editor.
3. Select the control or item to which you want to add the expression, such as a label, a link, a groupbox, a tab, or an action item.
4. Select one of the following properties, depending on the item and the type of expression that you want to add:
   - Expression: for attaching any expression to the item.
     This is available for labels.
   - Is enabled: to disable the item or to enable it only under a specified condition.
   - Is visible: to hide the item or to show it only under a specified condition.
5. Click the ellipsis button in the text box of the property you selected in step 4.

   This opens the Expression Selector.



6. Enter the expression.

   For example, the expression in the preceding screen shot could be used to enable or show the selected property only if the Effective Year Built of a building is greater than 2000.

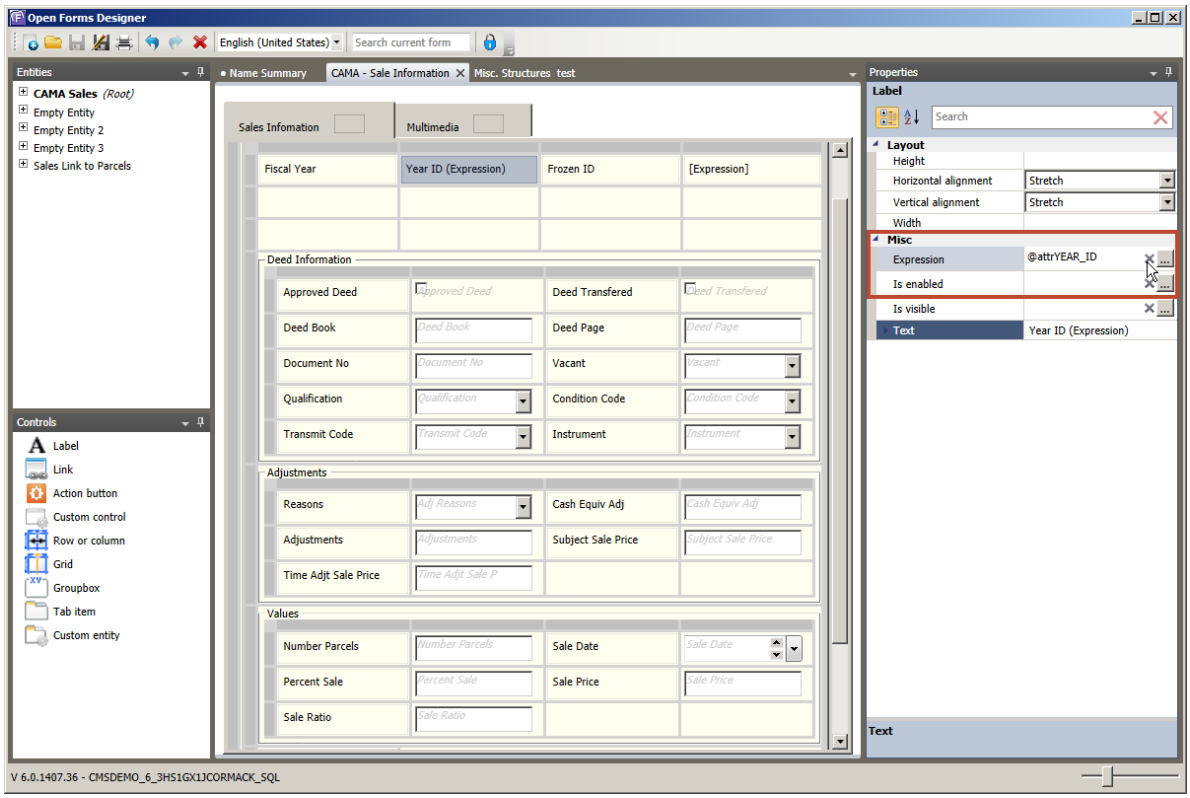
7. Click **OK**.

The Expression Selector is also available for the calculated value of an attribute and validation rules added in the Business Entity Designer. *Refer to the Govern Business Entity Designer (BED) guide for details*.

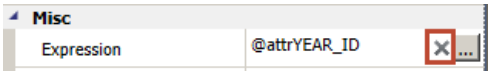
Deleting an Expression

To delete an expression:

1. Launch the OFD.
2. Open the applicable form and entity in the OFD Editor.
3. Select the item with the expression on the editor.



4. Do one of the following:
   - Click the **Delete** icon in the Expression property text box to delete the expression.

   - Click the **Delete** icon on the toolbar to delete the whole item.

5. Click **Save**.

Types of Expressions

Overview

Several types of expressions can be used, including expressions that display an attribute or Govern ID, Govern expressions, standard expressions, formulas, and queries. These are described in the following topics:

Showing an Attribute or Govern ID

You can add an expression that displays an attribute or Govern ID. This can be useful if you want to show an attribute or Govern ID that does not appear on the current form or the current tab. You can also make it easy for users to select a record by displaying an attribute in the Record Selector at the top of the form.

This section describes the following:

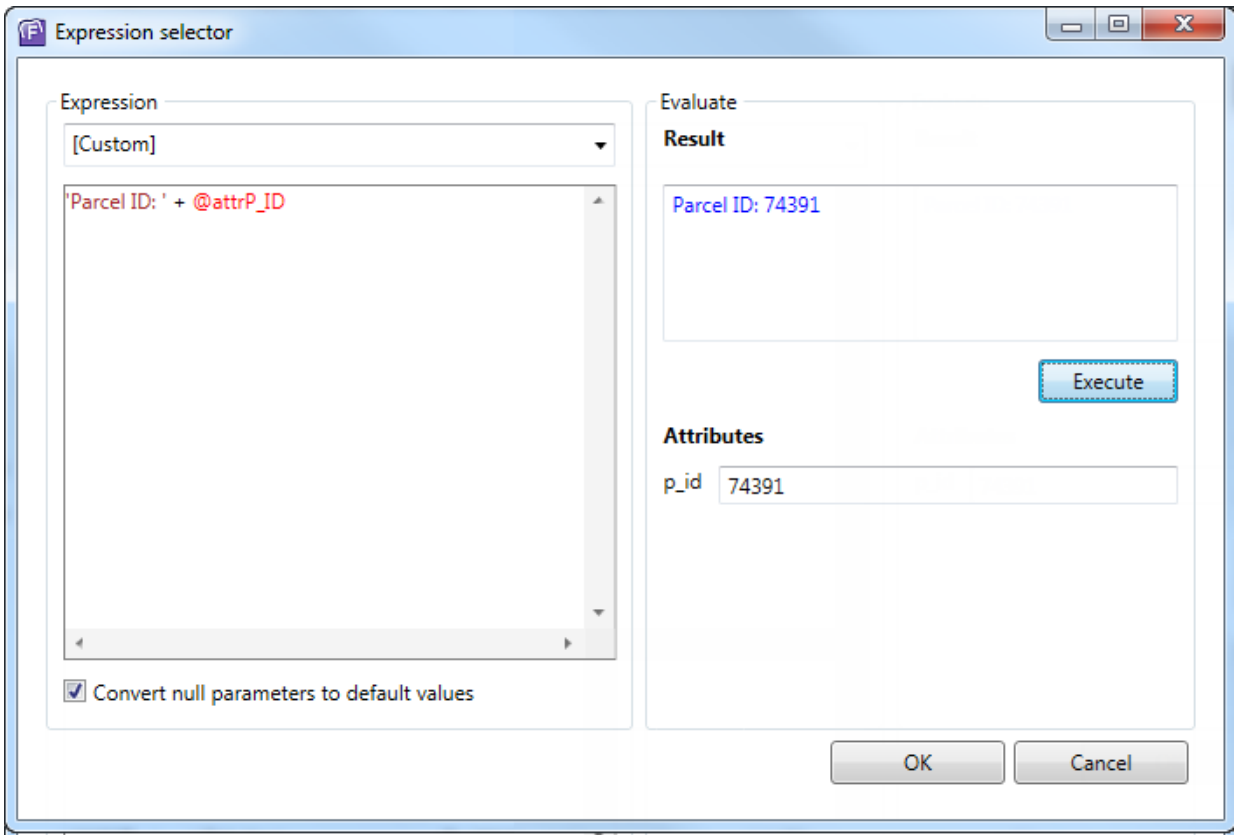
Syntax

The syntax to show an attribute or Govern ID is as follows:

```
@ AttributeName; for example, @attrADJ_TOTAL

or @GovernIDName; for example, @attrFROZEN_ID
```

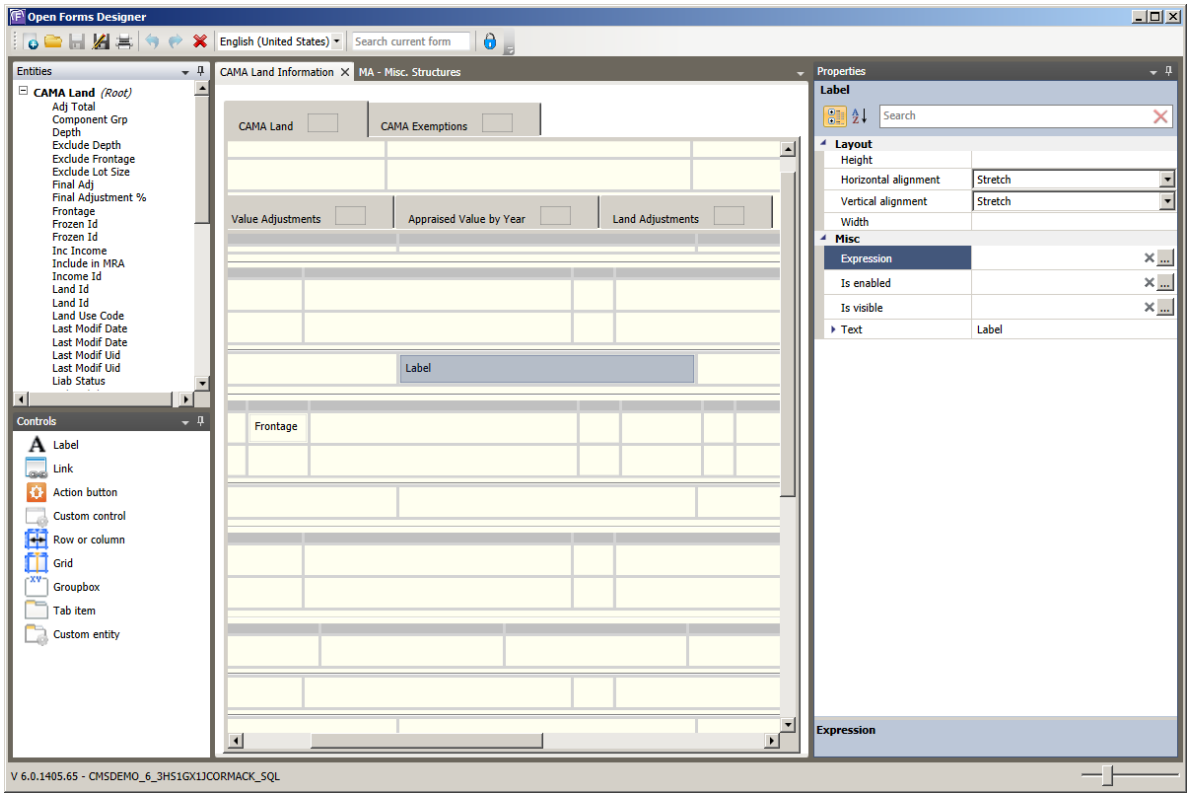
Showing an Attribute or ID on a Label

In the following screen shot a label is added to a form to display the Parcel ID:

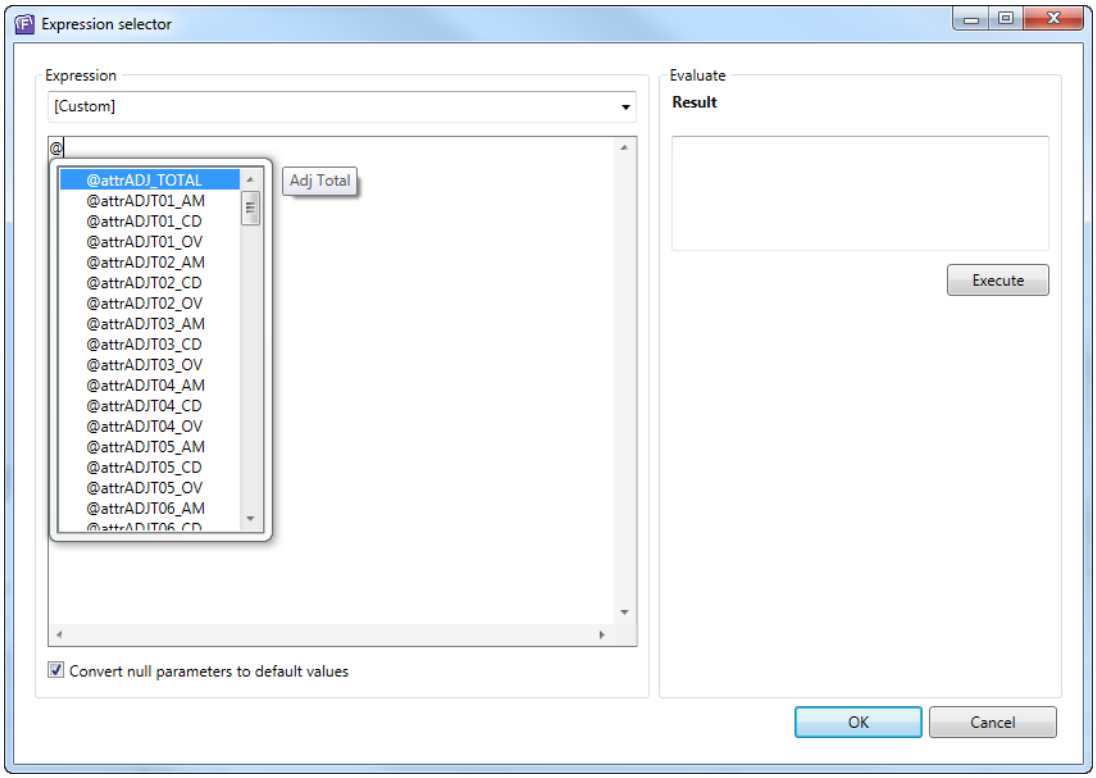


To write the expression:

1. Open the form and the entity in the OFD.
2. Add a label to the entity.



3. Select the **Expression** property in the Property Explorer.
4. Click the ellipsis button ... to open the *Expression Selector*.



5. Hit the commercial at-sign (@) on your keyboard.

   A drop-down list displays the following:
   - All the attributes in the entity, including those not selected for the form
   - All Govern IDs in the entity

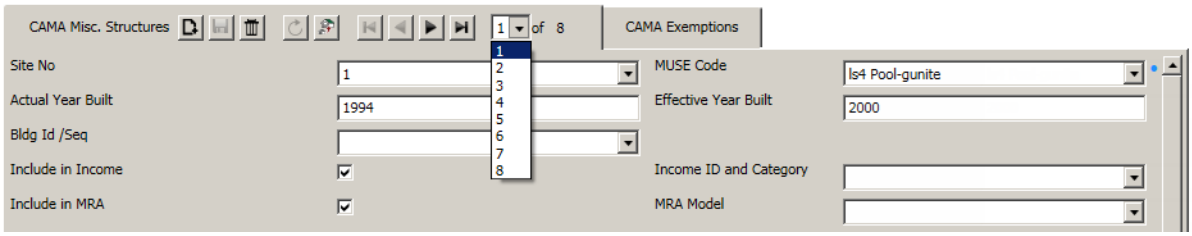
   As you scroll through the list, a tooltip displays the name of each attribute and ID.

6. Select an attribute or Govern ID in the list.
7. Click **OK** on the Expression Selector.
8. Click **Save** on the OpenForm Designer.

The result of the expression is displayed in Govern the next time you open the form. If the form is already open, click the **Refresh** button in Govern

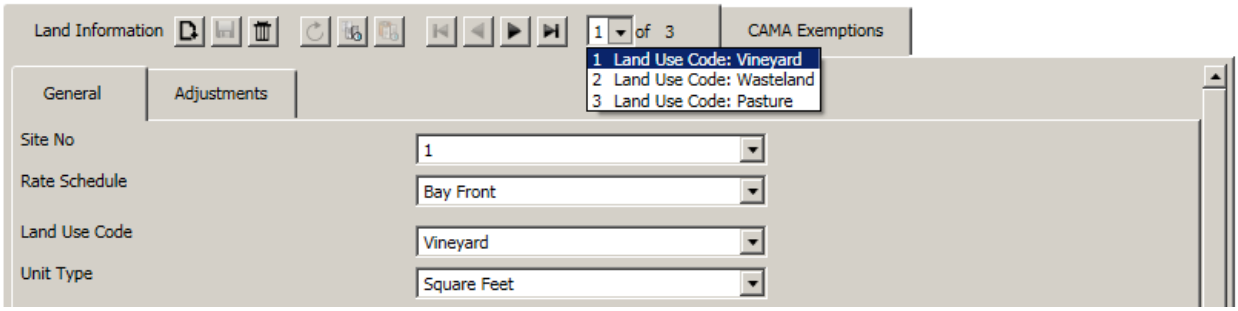
Showing an Attribute in the Record Selector

By default, the Record Selector at the top of the Govern forms displays only the number associated with the record. This is illustrated in the following screen shot.



You can add a meaningful description, with an expression, to the number and make it easier for your users to find the record they want.

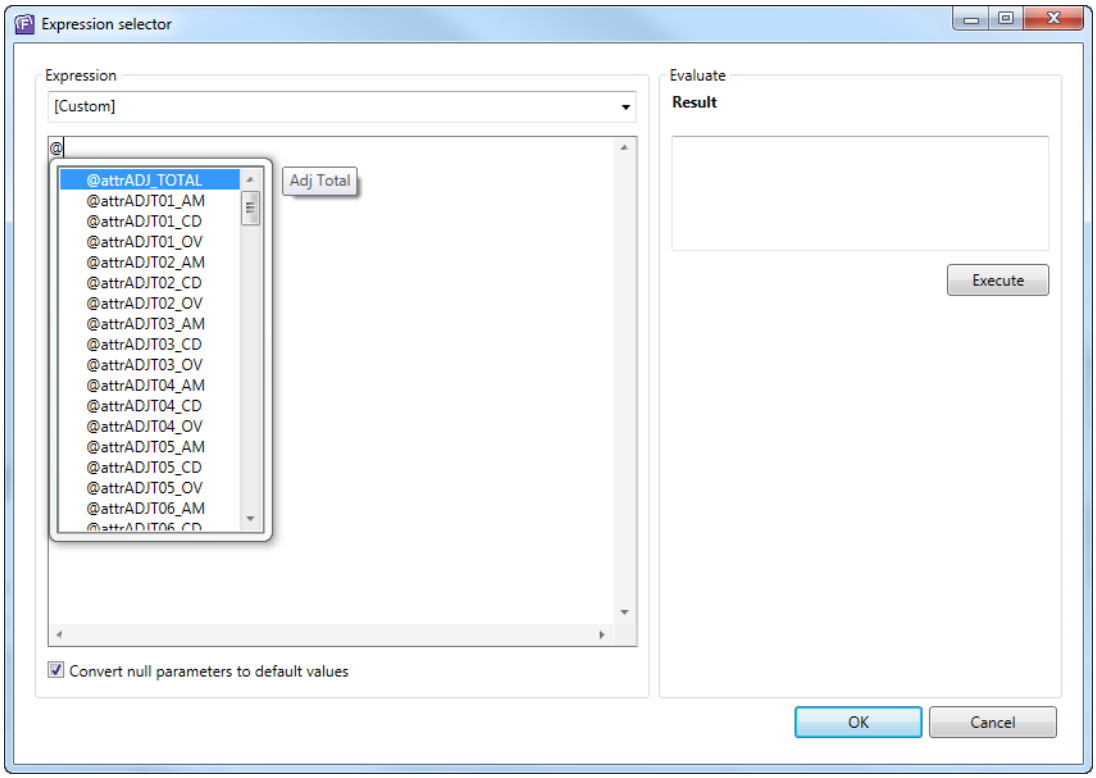
For example, you could show one or more key attributes or values. For example, by displaying the Total Land Value on the CAMA Land Information, you can make it easy for users to select all records that have a specific appraisal value.



To display the value of an attribute in the Record Description:

1. Open the entity in the Govern OpenForms Designer.
2. Select the entity to view the properties for the entity in the Property Explorer.
3. Select the **Record Description** property in the Property Explorer.
4. Hit the commercial at sign (@) on your keyboard.

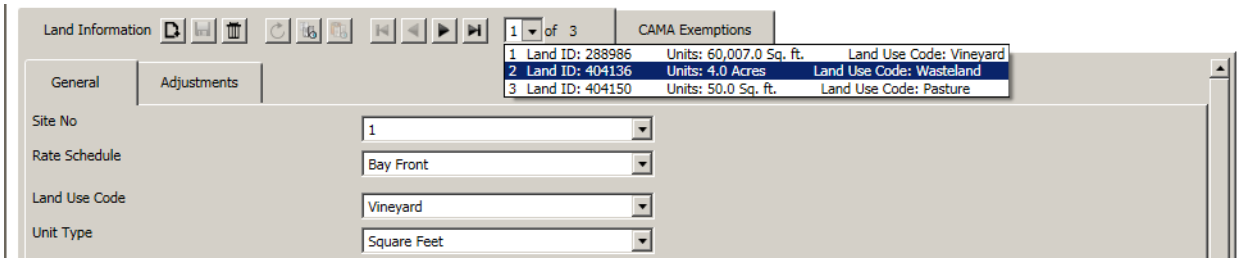
   A drop-down list displays the following:
   - All the attributes in the entity, including those not selected for the form.
   - All Govern IDs in the entity



5. Select an attribute or Govern ID in the list.
6. Click **OK**.

Showing Multiple Attributes in the Record Selector

You can display multiple attributes in the record description that is displayed in the record selector.



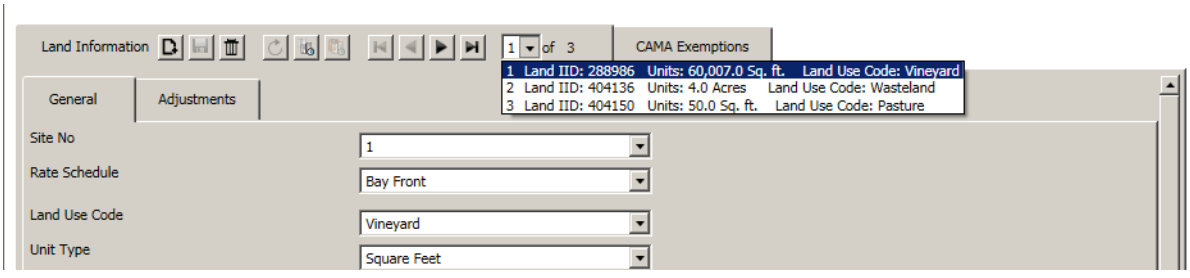
To do this, use the plus sign (+) between each expression type or part of the expression. The following example illustrates how to use the syntax.

```
'Land IID: ' + @attrLAND_ID

+ '   Units: ' + Format(@attrUNITS,'n1')

+ if(@attrUNITS_TYPE = 'a', ' Acres', ' ')
+ if(@attrUNITS_TYPE = 'sf', 'Sq. ft.', ' ')
+ if(@attrUNITS_TYPE = 'h', 'Hectares', ' ')

+ '   Land Use Code: ' + @attrLUSE_CODE.Display
```

In this example:

- A description is added to each attribute. Text descriptions are enclosed in single quotation marks (‘).
- The Format function is used in order to display values and amounts more clearly. *For details about the Format function, see Applying Formatting to Expressions on page 255*.
- If clauses are used in order to show descriptions of the unit type. In this case, these are based on the selection in the Unit Type text box. If the unit type is acres, show acres. If the unit type is square feet, show square feet, etc.
- The Display syntax is used in order to show the description associated with the Land Use Code. *For details, see Displaying the Field Description on page 260*.

The result of this expression is shown in the following screen shot:



Adding a Govern Expression

The Govern expressions are:

- IsNull

- Substr
- Case

These can be included in a longer expression or used as a stand-alone expression:

IsNull. For example, IsNull (@attrP_ID, 0) returns 0 if the parcel ID (P_ID) is null.

IsNull is a requirement for all expressions that could return Null values.

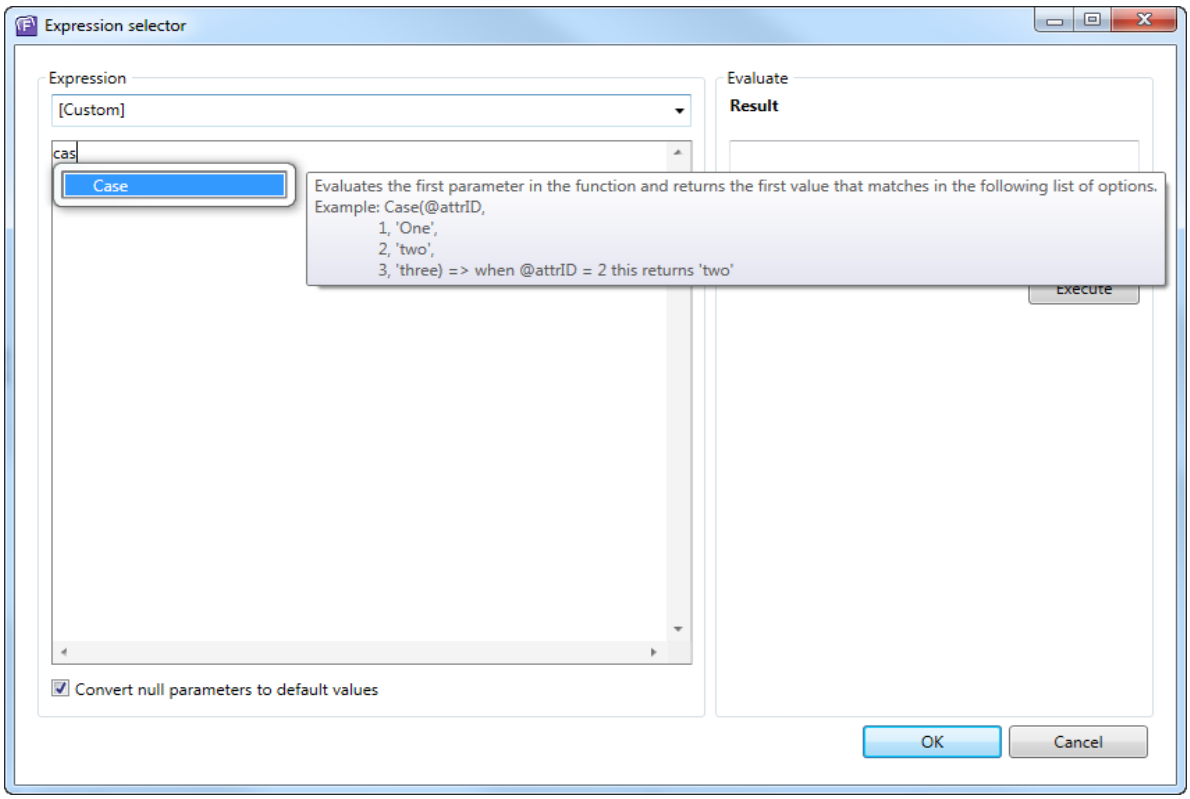
For example, the following expressions show how the Building DIR< GRM, and MRA rates are calculated. IsNull is added to include records that do not have these values.

BUILDING_DIR:
ISNULL(@attrINCOME_DIR_VALUE, 0) - ISNULL(@attrLAND_VALUE, 0)
BUILDING_GRM:
ISNULL(@attrINCOME_GRM_VALUE, 0) - ISNULL(@attrLAND_VALUE, 0)
BUILDING_MRA:
ISNULL(@attrMRA_VALUE, 0) - ISNULL(@attrLAND_VALUE, 0)

Substr. For example, SUBSTR('MSGovern', 3, 6) returns six characters from the third position of the string 'MSGovern'. It returns Govern.

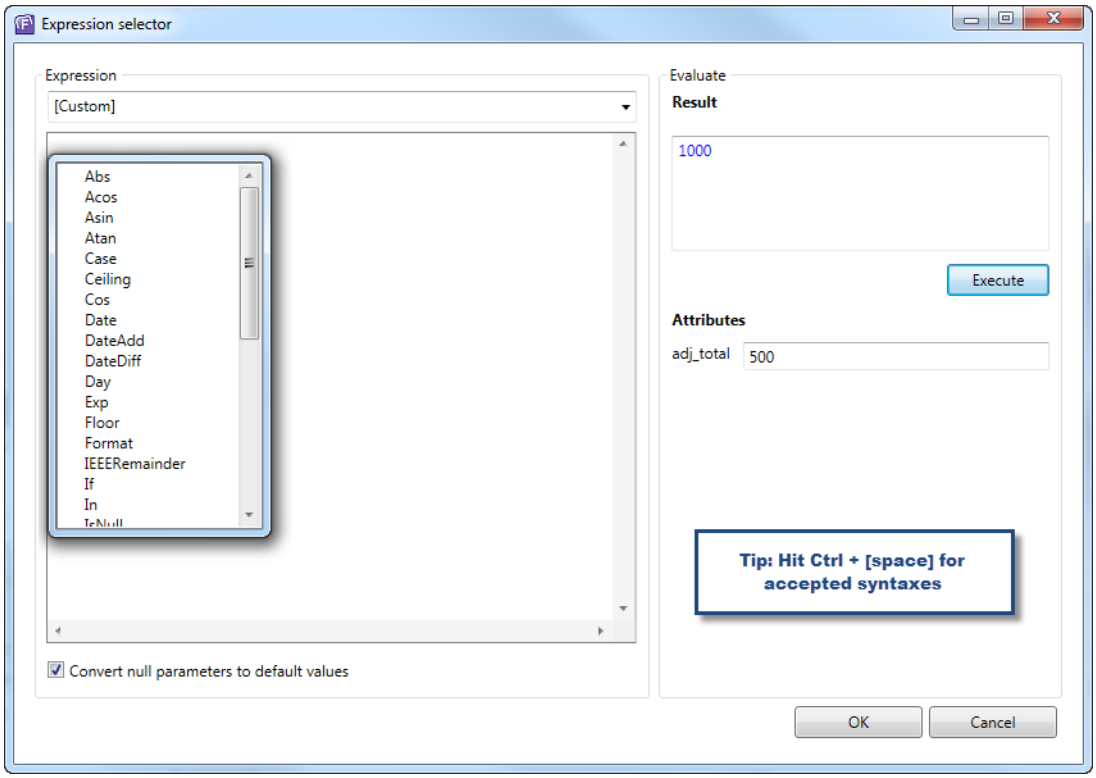
Case. For example, Case(@idYEAR_ID,
2000, 0,
2001, 1,
2002, 2)
Returns 0 if the YEAR_ID is 2000, 1 if it's 2001, or 2 if the year is 2002.

When you begin entering an expression in the *Expression Selector*, a tooltip appears displaying the correct syntax for the expression and provides an example. This is illustrated in the following screen shot:



Alternatively, you can hit the Control key [Ctrl] then the space bar on your computer keyboard to view a list of all the accepted expression syntaxes.

```
[Ctrl] + [space]
```



Converting Logical Expressions or Formulas

If you have an existing user form with a logical expression or formula, you need to convert it to the new syntax in order to use it. Otherwise, a message stating that the logical expression or formula is not supported appears in the log files.

Adding a Query

A query can be added to an expression in order to select data from the Govern database and display it on a user form or in the Govern Ribbon. The following rules apply:

> As a best practice, write queries that return only one row and one column.

- The query must be a Selection Query and must be predefined in the Select Queries Editor in GNA.

- If multiple results can be retrieved from a query, the first column and first row are returned.
- A query can include a cache value.
- The default cache value for a query is five minutes. You can change this, as described in the next section: Syntax for Queries on page 236. The maximum cache value is 720 minutes (12 hours).
- A query can include a column name.

  By specifying the column names, you can use the same query multiple times on a form and return multiple values. This increases performance over writing multiple queries to return different values from the same table. *For a scenario illustrating this, see Adding the Column Name to a Query to Display Multiple Values on page 239*,

Syntax for Queries

The section provides the syntax for queries. Examples follow:

Basic Query

`Query('QueryName')`:

Returns the value in the first row and first column of the query results.

Basic Query with Specific Cache

```
Query('QueryName', n)
```

Returns the value in the first row and first column of the query results. n is the number of minutes that a cached value remains valid, with a maximum cache of the specified number of minutes.

Note: The maximum cache value for a query is 720 minutes (12 hours).

Basic Query with Specific Column

`Query('QueryName', 'ColumnName')`:

Returns the value in the first row for the specified column from the query results.

Basic Query with Specific Column and Cache

```
Query('QueryName', 'ColumnName', n)
```

Returns the value in the first row for the specified column from the query results, with a maximum cache of the specified number of minutes.

Examples of Queries

The following query returns the Parcel ID (P_ID) from PC_PARCEL.

```
Select * from PC_PARCEL
where P_ID = P_ID
```

This query is predefined in the Select Queries Editor in GNA.

The following list of examples illustrates the different ways that this query can be added to an expression.

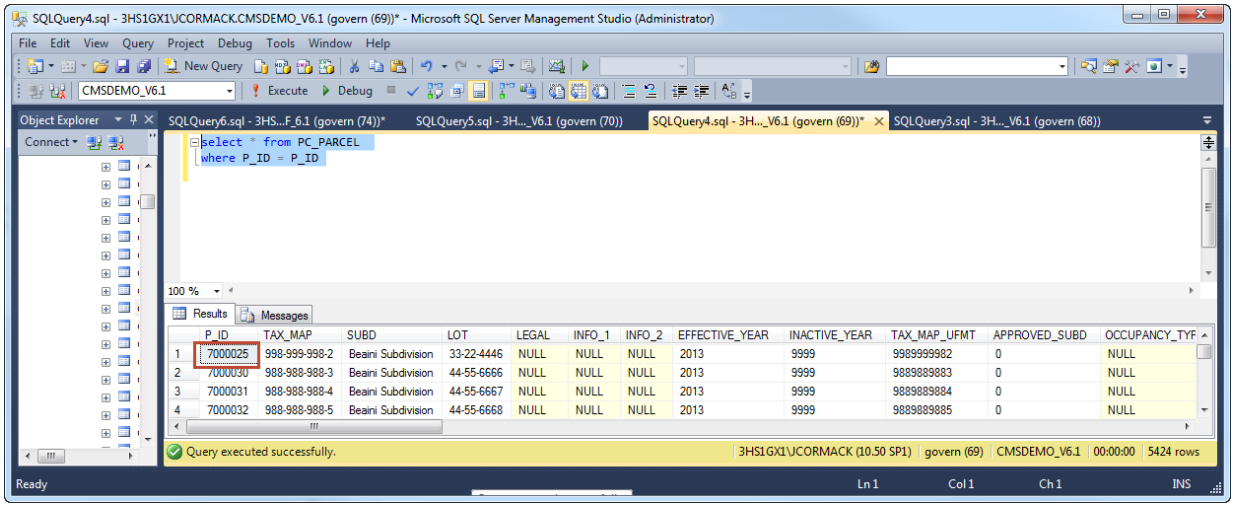
Example 1: Basic Query

Expression:

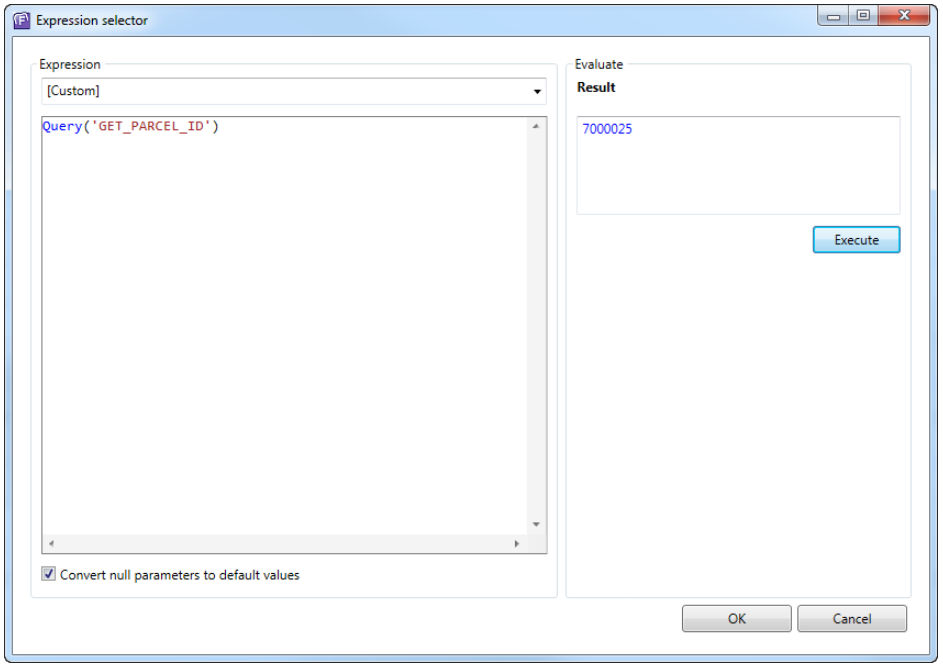
```
Query('GET_PARCEL_ID')
```

Results:

This expression returns the first row and first column from the table: PC_PARCEL



The result can be viewed in the Expression Selector:



Example 2: Basic Query with Cache

Expression:

```
Query('GET_PARCEL_ID', 2)
```

Results:

The results of this expression are the same as the first example, but the results are valid for a maximum of two minutes.

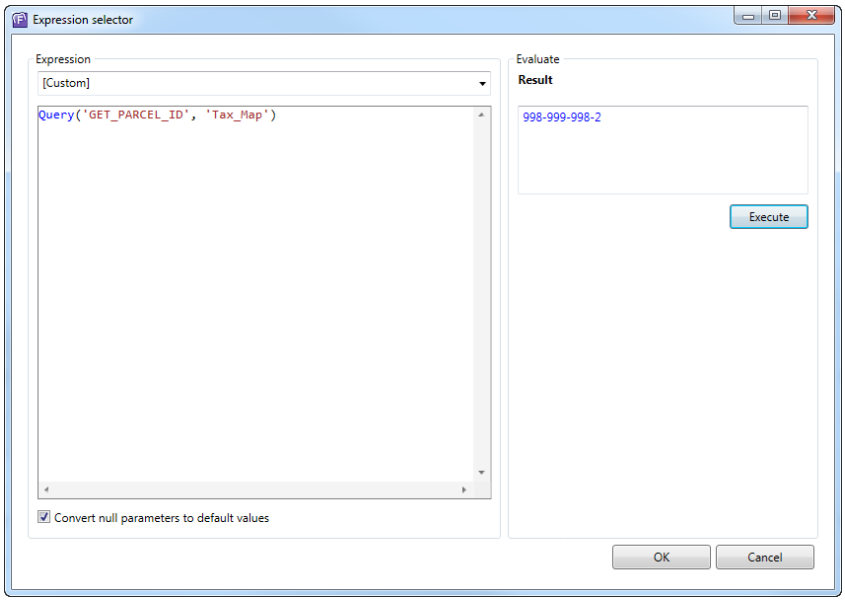
Example 3: Basic Query with a Specified Column

Expression:

```
Query('GET_PARCEL_ID', 'Tax_Map')
```

Results:

The expression returns the tax map number from the first row of PC_PARCEL. You can view the results in the Expression Selector.



Example 4: Basic Query with a Specified Column and Cache

Expression:

```
Query('GET_PARCEL_ID', 'Tax_Map', 2)
```

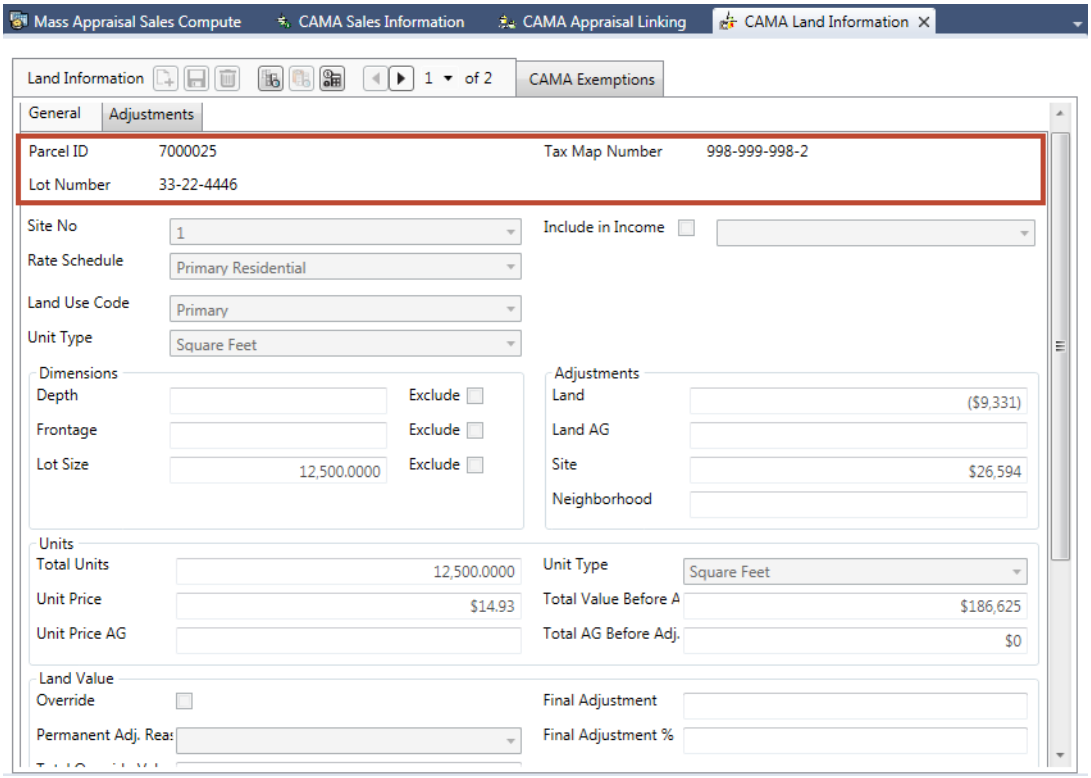
Results:

This expression returns the tax map number from the first row of PC_Parcel. The result is valid for two minutes.

Adding the Column Name to a Query to Display Multiple Values

In this scenario, the tax map number, parcel ID, and lot number are added to the Land Information form. These data are all found in the table PC_PARCEL. They can be returned with the query GET_PARCEL_ID.

```
Select * from PC_PARCEL
where P_ID = P_ID
```



To configure this scenario:

1. Launch the OFD.
2. Open the Land Information form, or any user form.
3. Drag a label to the top of the form.
4. Enter **Parcel ID** for the **Text** property.
5. Drag a second label beside it.
6. Click the ellipsis button ... in the **Expression** property.
7. Enter the expression:

```
Query('GET_PARCEL_ID")
```

8. Repeat steps 3 to 7, with the following entries:
9. Enter **Tax Map Number** in the **Text** property.
10. Enter the expression:

```
Query('GET_PARCEL_ID', 'TAX_MAP')
```

11. Enter **Lot Number** in the **Text** property.
12. Enter the expression:

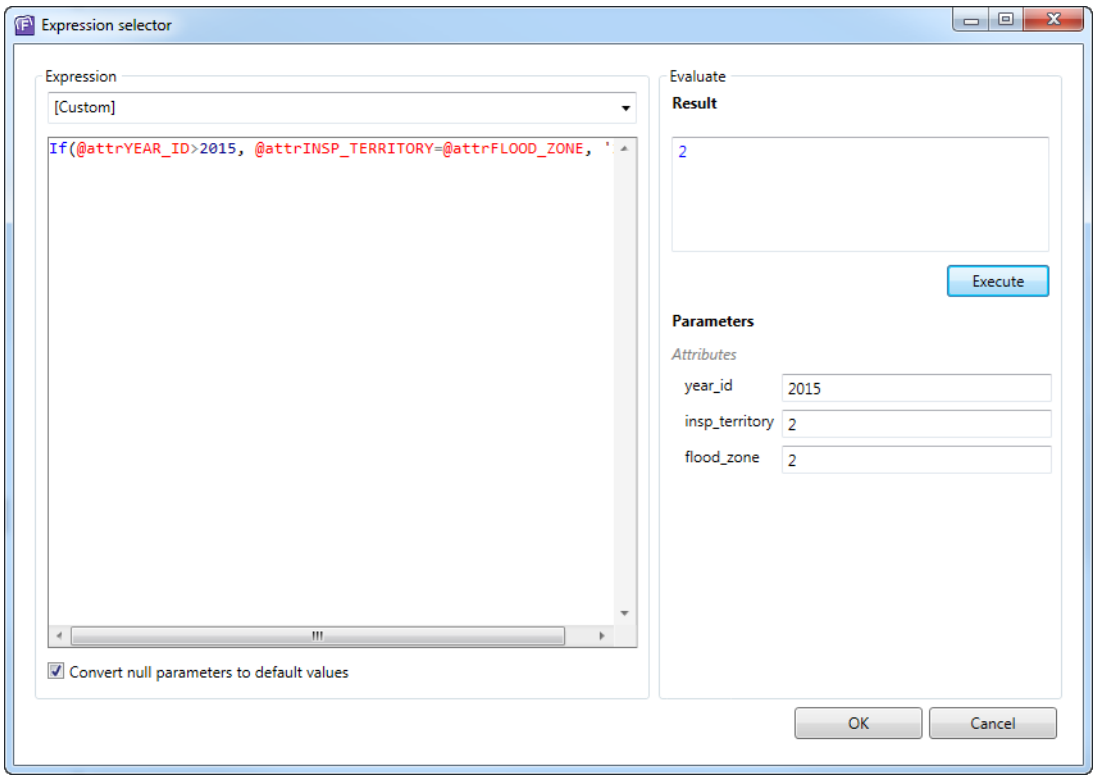
```
Query('GET_PARCEL_ID', 'LOT')
```

13. Click **Save**.

You can verify each expression with the Evaluate options on the Expression Selector.

To verify your expression:

1. Enter your expression in the Expression Selector.
2. If any parameters appear on the Expression Selector, enter values in the **Parameter** fields.
3. Click the **Execute** button.



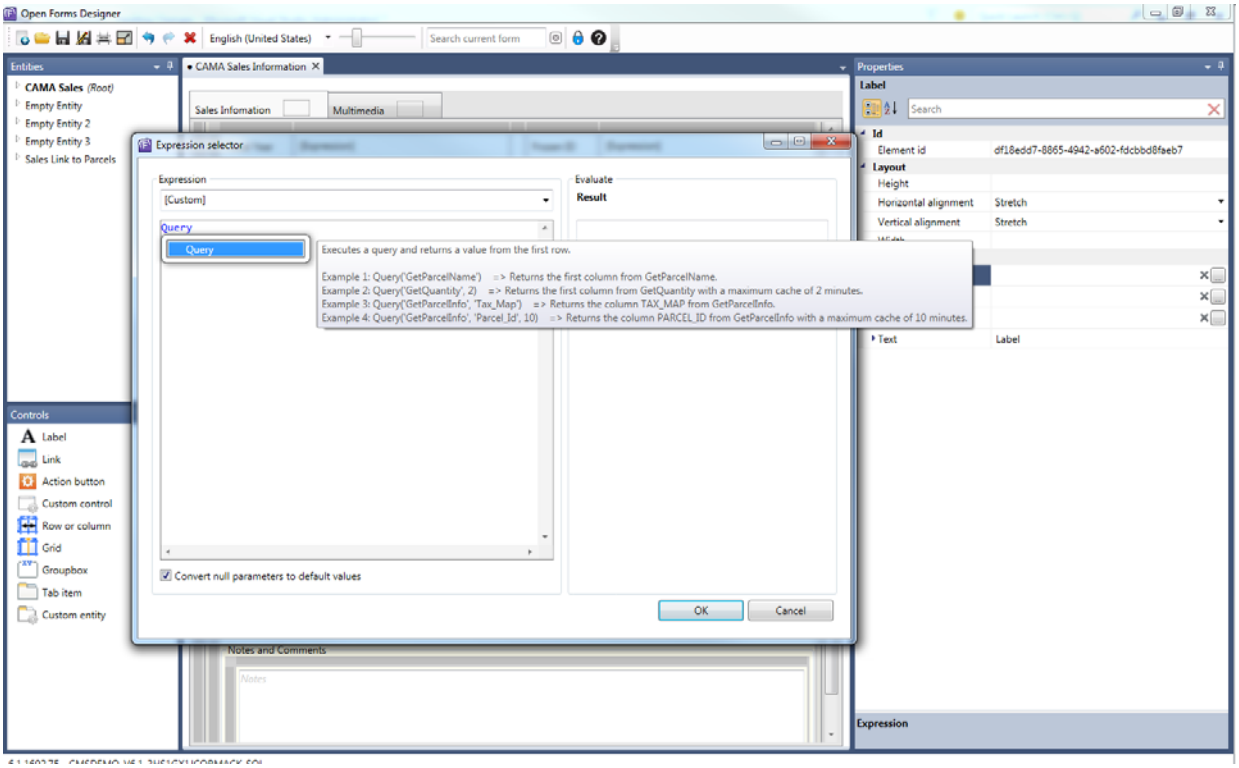
One of the following occurs:

- If the expression is valid, the result appears in the **Result** field.

- If the expression is not valid, an error message appears in the **Result** field.

4. Do one or the following:
   - Click **OK** to save the expression.
   - Click **Cancel** to close the Expression Selector without saving.

Tooltip



If multiple records are returned for the query, the result from the first row is returned.

The query returns a value and saves this value to the cache. The value in the cache is used as long as it is no older than the number of minutes specified in the query.

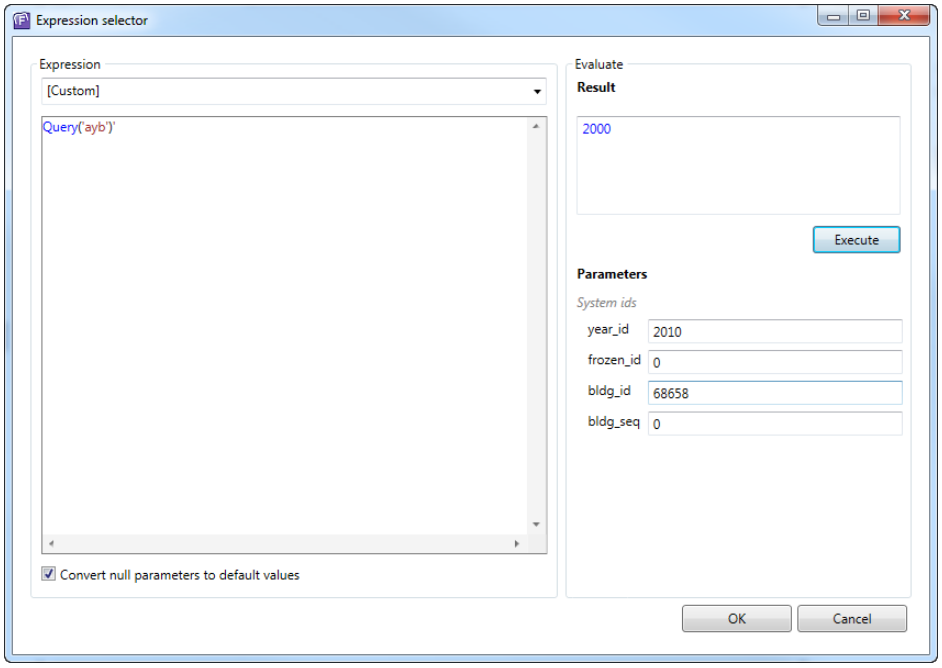
The example, Query('GetQuantity', 2), would use a value that is saved in the cache for two minutes or less.

Testing a Query

As with all expressions, you can test the logic of the query used in the expression with the Evaluate feature. When you enter an expression, the parameters that the query contains are listed on the right under evaluate.

To test the expression:

1. Enter the expression in the Expression Selector.



2. Enter values for the parameters in the **Parameters** text boxes.

   In this case, the parameters are system IDs.

3. Click **Execute**.

The result of the expression is displayed in the **Result** test box. Possible results include the following:

- Null if parameters are missing.
- The value returned by the query.

For example, the query displayed in the screen shot returns the actual year built for the specified year, frozen ID, building ID, and building sequence.

```
SELECT YEAR_BUILT FROM MA_BUILDINGS WHERE YEAR_ID =
@idyear_id AND FROZEN_ID = @idfrozen_id AND BLDG_ID =
@idbldg_id AND BLDG_SEQ = @idbldg_seq
```

All system IDs must be entered for this query.

Other parameters contained in the query could include constants and attributes.

Note: The parameters must be included in the entity that is selected for the query.

Note: If you are using a query in an expression and that query retrieves a value, ensure that the value is up-to-date. It is recommended to run the Mass Appraisal Batch Compute before running queries that affect rates and values.

The following example illustrates this point.

The query named GetSalesCount is used to retrieve the number of property sales:

```
SELECT COUNT(*)
FROM PC_LK_PARCEL_SALE
WHERE P_ID= @attrP_ID
```

For the land, in this example, a rate is defined by the following expression:

```
{ SalesCount = Query('GetSalesCount' }
If(SalesCount > 1000, 10.5, 12.5)
```

If the sales count is greater than 1,000, the applicable rate is 10.5. Otherwise it's 12.5. If one new sale is added when you have 1,000 sales, the rate changes and consequently this changes the value of the property. However, the property would not be recomputed automatically, in this case.

Adding a Mathematical Expression

The following links provide lists and descriptions of all the expression types that are supported:

http://ncalc.codeplex.com/wikipage?title=functions&referringTitle=Home

http://ncalc.codeplex.com/wikipage?title=operators&referringTitle=Home

In order to view the tooltips for these expressions, you need to enter the first few letters that match the type of expression. Then, select the expression from a drop-down list.

Adding an Expression to a Govern Form

Overview

An expression can be added to a Govern form in the OFD as described under the following headings. Also, an expression can be added to an attribute in the Business Entity Designer (BED). If it is added in the BED, it applies to all copies of the form.

In the OFD, expressions can be added at various levels, as described in the following topics:

- Adding an Expression at the Entity Level on page 246
- Adding an Expression to a Control on page 248

Adding an Expression at the Entity Level

You can add an expression to the save, delete, and insert functionality of an entity.

You can write an expression to set these properties to false or to associate a condition with the functionality.

Note: You can also define security for the icons that control these functionalities on the form. If both an expression and security permissions are defined, the definition that is the most restrictive replaces the other.

For example, the following expression, can be added to the **Allow Save** property for the CAMA Land entity.

```
IsNull(@attrFINAL_ADJ_PERCENT,0) = 5
```

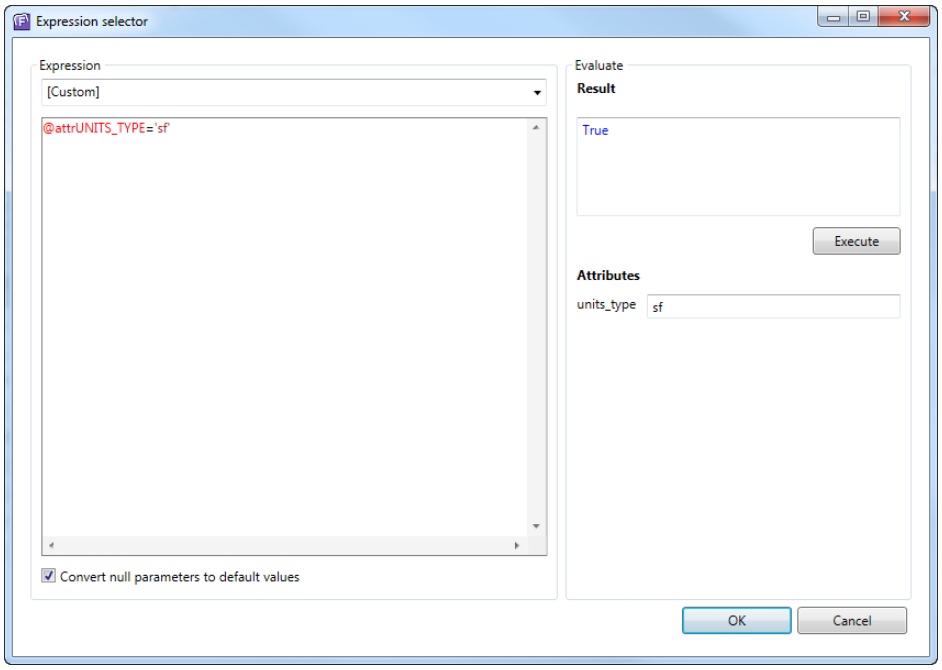
This would disable the Save button unless the Final Adjustment Percentage for the land is equal to five.

If the **Save** button were disabled in the security settings, then this would override the expression. Not being able to save is more restrictive than only being able to save under a specific condition.

To add an expression to the delete, insert or new, or save functionality of the entity:

1. Launch the OFD.
2. Open the entity.
3. Expand the **MIsc** properties in the Property Explorer.
4. Click the ellipsis button ... beside one of the following properties:
   - **Allow delete**: to write an expression for the **Delete** button
   - **Allow insert**: to write an expression for the **New** button
   - **Allow save**: to write an expression for the **Save** button

   The *Expression Selector* opens.



5. Enter the expression.
6. Click **OK**.

Results

If you enter the word **False**, in the *Expression Selector,* for:

- **Allow delete**: the **Delete** button is disabled in Govern.

- **Allow insert**: the **New** button  is disabled in Govern.
- **Allow save**: the **Save** button  and all data entry fields are disabled in Govern.

You could also write an expression that attaches a condition for allowing or disabling any of these functionalities.

Adding an Expression to a Control

You can add an expression to the following controls:

- Label
- Link
- Action button
- Custom control
- Groupbox
- Tab item

Expressions at this level are used to set conditions for enabling the control or making it visible. As with the expressions at the entity level, you can define security for the control. The same rule applies: the most restrictive definition is used. As illustrated in the following example, you could write an expression to make the Land Adjustments tab visible only when the unit type is set to square feet. You could then add a security permission to hide the tab from the Clerks role at all times. In this case, the security permission would apply for the role because it is more restrictive.

IsVisible

The following expression can be added to the **Is Visible** property of a tab in the CAMA Land entity.

```
@attrUNITS_TYPE='sf'
```

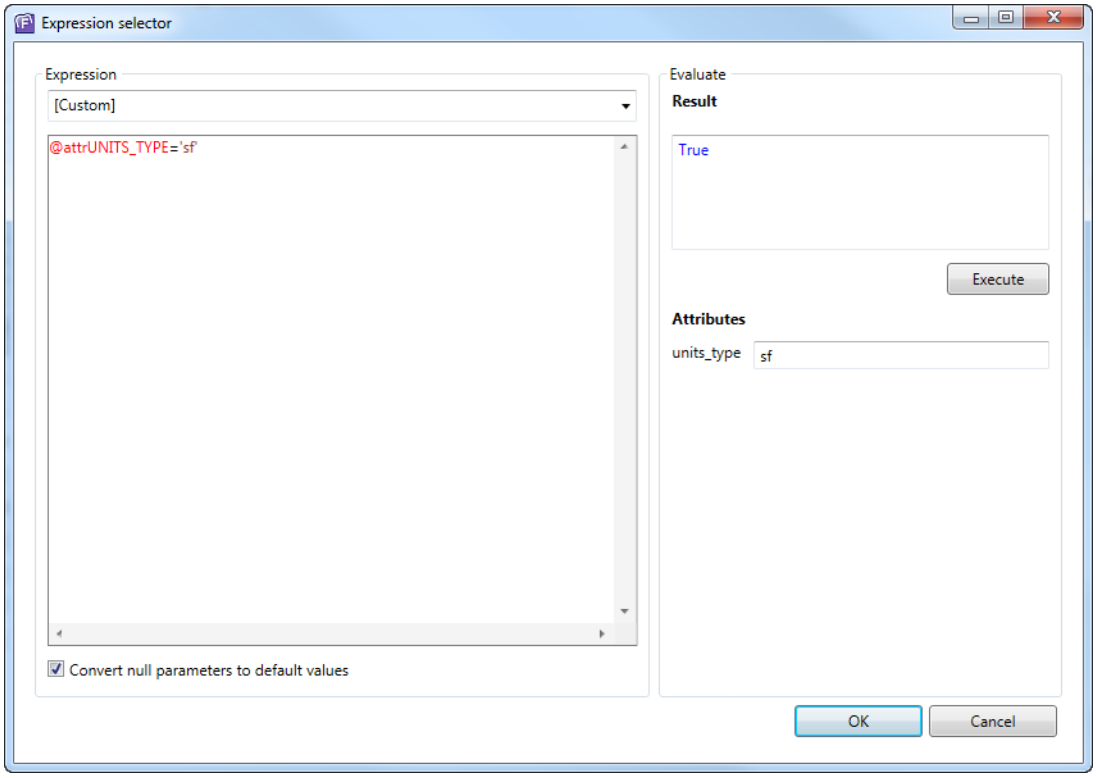
This makes the tab visible only when the unit type is set to square feet. You could then have other labels and attributes inside the tab. These would only need to be configured if the condition were met.

If the view permissions for the tab were removed in the security settings, then these would override the expression. Not being able to view a tab is more restrictive than being able to view it under a specific condition.

To add an expression to a control:

1. Launch the OFD.
2. Open the entity.
3. Select the control.
4. Expand the **MIsc** properties in the Property Explorer.
5. Click the ellipsis button ... beside one of the following properties:
   - **Is enabled**: to enable the control according to an expression.
   - **Is visible**: to make the control visible according to an expression.

   This opens the *Expression Selector*.



6. Enter the expression.
7. Click **OK**.

IsEnabled

The same procedure and logic applies to the IsEnabled parameter for a control. An expression can be used to make the control read-only.

Testing the Expression

You can test the logic of the expression with the Evaluate feature. When you enter an expression, the attributes that it contains are listed on the right under evaluate.

To test the expression:

1. Enter the expression in the Expression Selector.
2. Enter values for the attributes in the Attributes text boxes.
3. Click **Execute**.

The result of the expression is displayed in the **Result** test box. Possible results include the following:

- True or False if the expression evaluates to true or false.
- The result of a calculation; for example, the sum of two attributes.
- The value of an attribute

Adding Text in an Expression

Overview

This section describes several ways of displaying text, or a string, in an expression.

- Single Quotation Marks
- String Syntax
- Substring

It also describes the syntax that can be applied to text.

- Length of a String
- Comparing Strings
- Converting to Uppercase or Lowercase

Single Quotation Marks

The easiest way to display text, or a string, with an expression is to enclose it in single quotation marks.

For example, ‘Govern OpenForms’ returns Govern OpenForms.

String Syntax

You can use the string syntax to add text to an expression.

For example, Str(Govern OpenForms) returns Govern OpenForms.

Substring

Use the substring syntax to return a partial string.

Returns a substring of the first parameter from the x-th character defined by the second parameter on a length defined by the third parameter.

For example, Substr('Govern OpenForms', 7,9) returns OpenForms.

Note that characters in the substring are counted from zero, starting index zero. You can use the Evaluate feature on the Expression Editor to see how the characters are counted.

Length of a String

Use the length syntax to return the number of characters in a string.

For example, Len('Govern OpenForms') returns 16.

Note that characters in the length are counted from one, starting index one. Use the Evaluate feature of the Expression Editor to test this.

Converting to Uppercase or Lowercase

Use the upper and lower syntaxes for converting text, or strings, to upper or lowercase, respectively.

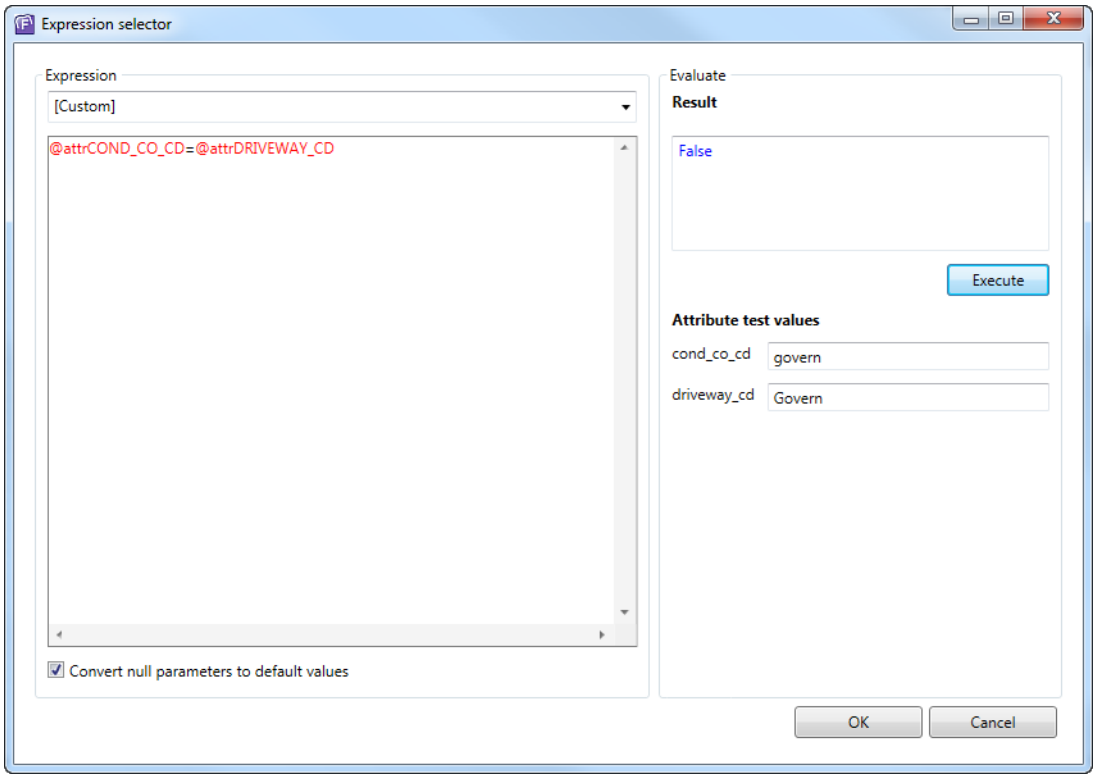
For example, Upper('Govern OpenForms') returns GOVERN OPENFORMS.

For example, Lower('Govern OpenForms') returns govern openforms.

Comparing Strings

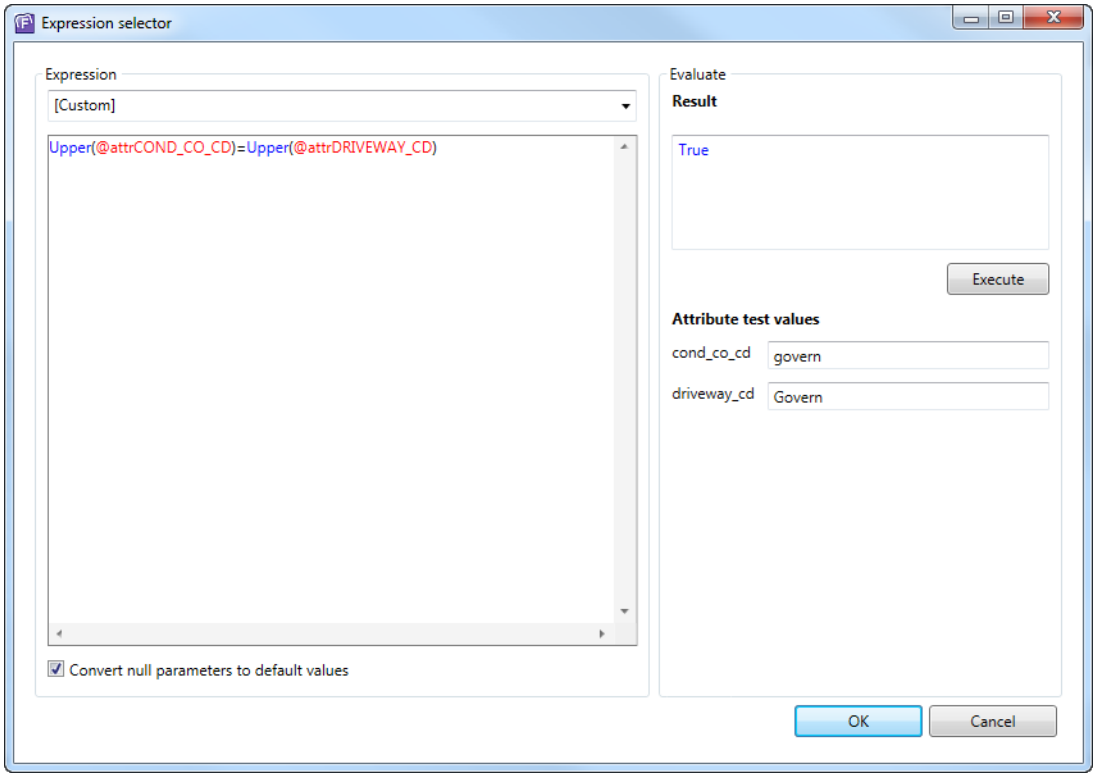
Strings are case-sensitive. This is important to note when you compare strings or use them in an expression. The following scenario illustrates how you can use the upper syntax to ensure that results are not changed due to difference in upper- of lowercase.

The first example compares two attributes that have the text data type.



The result is False because the case is different for the two attributes.

If you add the Upper syntax to the expression, the results are equal.



Applying Formatting to Expressions

Overview

Multiple number and date and time formats are available. There are both predefined and user-defined types. The lists can be viewed on the Microsoft Developer website.

This section describes how to apply formatting to the number, date, and time attributes that you are displaying as a result of your expressions. If you want to display a value or a date and time in a label, or on the record description, you can use the Format function.

For example, if you want to display the Total Land Value with currency formatting, use the following syntax:

```
Format(@attrTOTAL_VALUE, 'c')
```

Format is the function and the second parameter describes how the attribute is formatted.

Available Format Types

Click the following links to view a list of the available formats on the Microsoft Developer Network website:

Numbers

Use predefined numeric formats or create user-defined numeric formats.

Dates and Times

Use predefined date/time formats or create user-defined date/time formats.

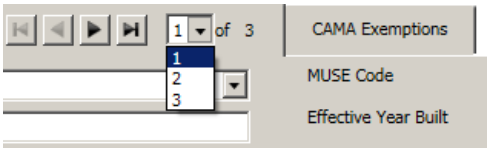
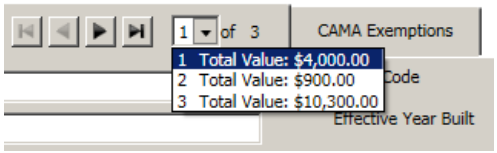
Date and Time Serial Numbers

Use date and time formats or numeric formats.

Examples: Using the Formatting Function

The scenarios in this section provide examples of common expression formats that can be used throughout the user forms.

The following series of screen shots shows the default Record Description and a record description with the Total Land Value. The Record Description is displayed when there are multiple records. It is used to facilitate record selection. Displaying a year or a value is more helpful than the number assigned to the record. *For details about the Record Description, see Defining Properties for the Entity on page 169*.

	
Default Record Description	**Record Description with Expression**

Displaying a Currency Value

This expression shows the currency format type in the Record Description.

Text is added to the label in order to let the users know what value they are viewing. *See Displaying Text with the Formatted Expression on page 259*.

In this example, the Total Miscellaneous Structure Value is displayed in the Record Description in Currency format.

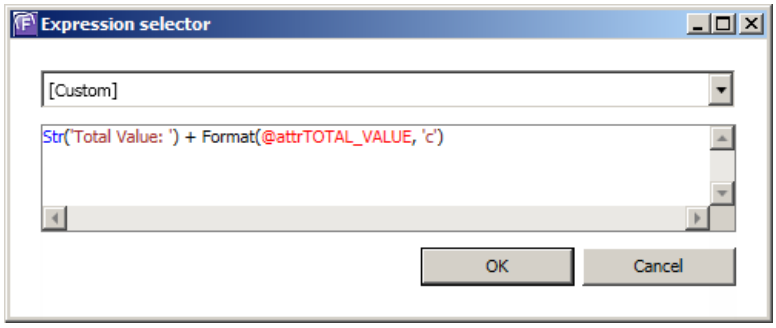
To apply the currency format type:

1. Launch the OFD and open the *CAMA Miscellaneous Structures* form.
2. Select the *Miscellaneous Structures Information* entity.
3. Click the ellipsis button beside the **Record Description** property in the Property Explorer.

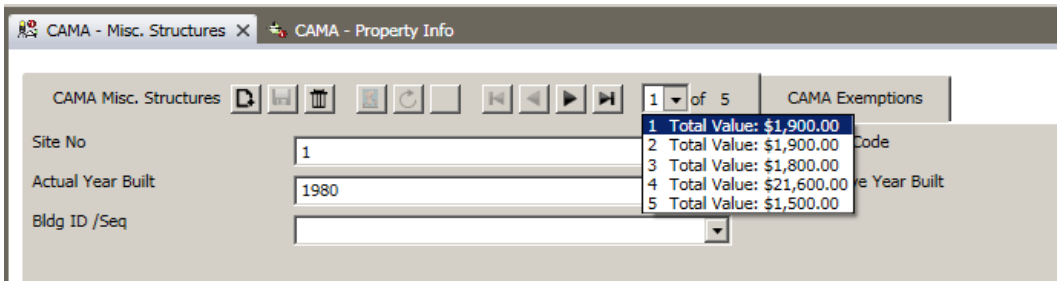
   This opens the **Expression Selector**.

   Enter the following expression.

Note: Str('Total Value: ') + Format(@attrTOTAL_VALUE, 'c')



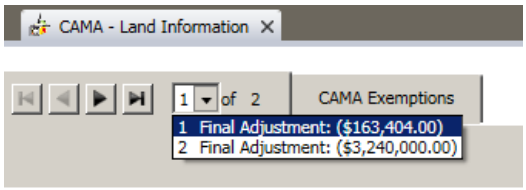
This displays the following in the Record Description.



Displaying a Negative Currency Value

The format for negative currency values is the same as for positive. Negative values are displayed in parentheses.

This is shown in the following screen shot:



Displaying a Percentage

To display a percentage in the Expression result, the following user-defined format is recommended:

```
FORMAT(@attribute, '0 \\%')
```

For example:

```
FORMAT(@attrFINAL_ADJ_PERCENT, '0 \\%')
```

This format displays the percentage correctly.

The predefined format, called **Percent** (see predefined numeric formats), multiplies the value by 100. Therefore, if you were to enter 10% in the Final Adjustment field, it would be multiplied by 100 and 1,000 would be displayed. This would be inaccurate.

Applying Formatting to a Date or Time

To display a date or a date and time in the Record Description, you can select any of the Predefined date and time formats (see predefined date/time formats). The long, short, or medium date and time are displayed according to the Regional Settings selected on your computer.

The following screen shot shows the **Effective Date** in the **Record Description** of the *Building Information* form, using the long date format:

To apply this formatting:

1. Launch the OFD and open the *CAMA Buildings* form.
2. Select the *Building Information* entity.
3. Click the ellipsis button  beside the **Record Description** property in the Property Explorer.

   This opens the **Expression Selector**.

   Enter the following expression.

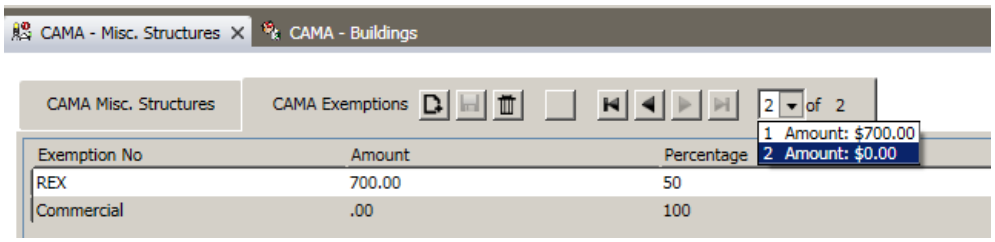
   ```
   'Effective Date: ' + Format(@attrEFFECTIVE_DATE, 'D')
   ```

4. Click **OK** on the Expression Selector window.

5. Click **Save** on the OpenForms Designer.

Applying Formatting in the One-to-Many Format

The same Format function can be used in entities that are set to One-to-Many. The following example shows the Format function applied to the Amount in the Building Exemptions entity.



Displaying Text with the Formatted Expression

The examples in this section show the formatted expressions with a text label beside them. The label describes the value for the users.

To add a text label, you can do one of the following:

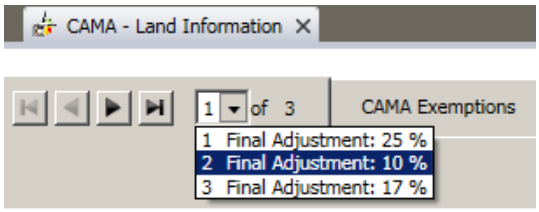
- Add the text to the expression with a plus sign (+), as follows:

```
‘Final Adjustment: ‘ + Format(@attrFINAL_ADJ_PERCENT, '0 \\%')
```

- Include the text in the Format function, as follows:

```
FORMAT(@attrFINAL_ADJ_PERCENT, 'Final Adjustment: 0 \\%')
```

The result is the same.



Displaying the Field Description

Overview

The **Display** expression syntax can be used to show the short or long description that appears on a form. For example, if you want to display the value of a combo box ion a label or in the Record Selector, you could add the Display syntax to the normal attribute. This is created by Govern.

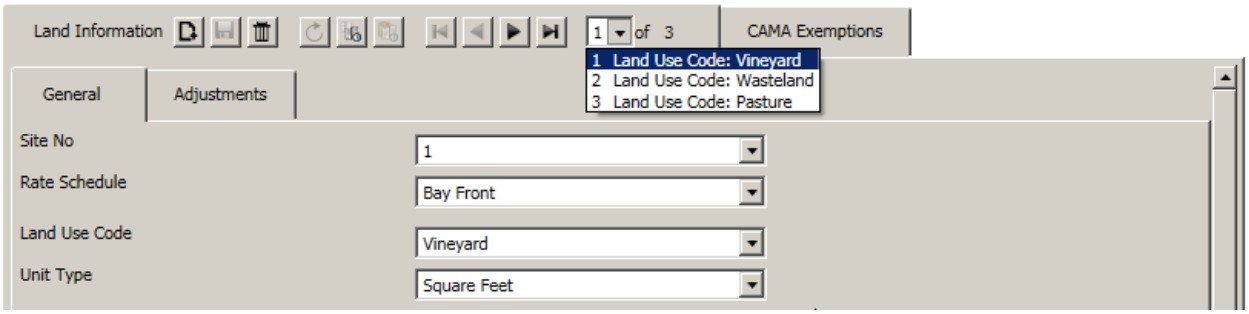
The syntax is as flows:

```
.Display
```

For example, the following expression shows the value selected for the Land Use Code:

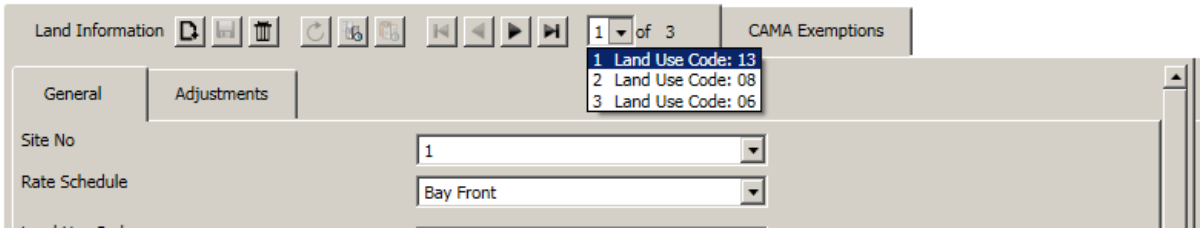
```
'Land Use Code: ' + @attrLUSE_CODE.Display
```

The text inside the single quotation marks is used for identification.



Without the Display syntax, this expression displays the numeric code associated with the Land Use Code. This is how it is saved in the database.

```
'Land Use Code: ' + @attrLUSE_CODE
```



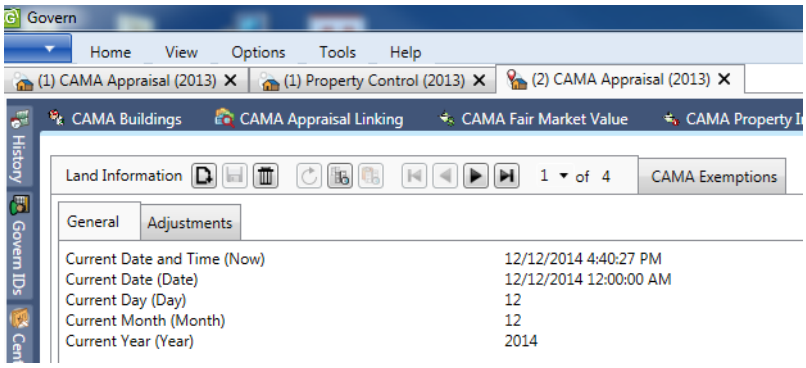
Displaying a Calculated Date Field

Overview

Several options are available for date fields. They can be categorized as follows:

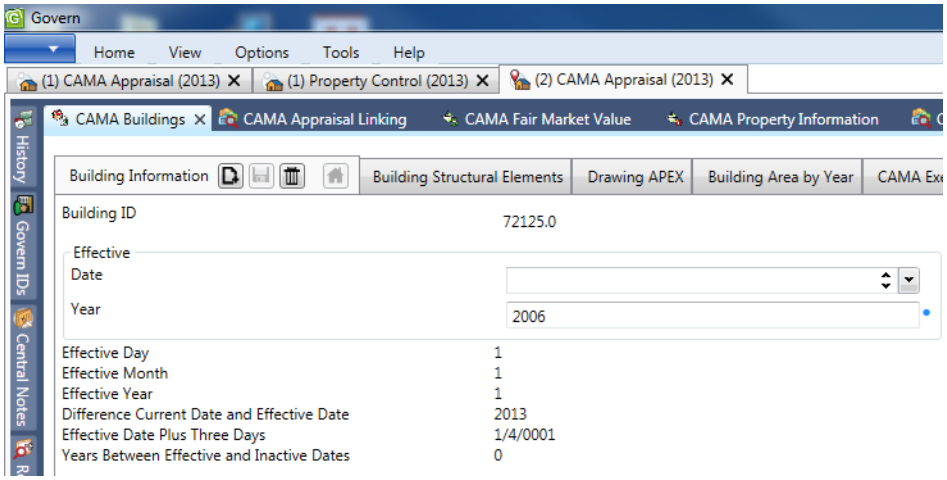
- Displaying a date or a component of a date, such as the day, month, year, or time.

  The following screen shot shows the results of expressions that display dates:



- Adding or subtracting a value to or from a date or a part of a date, such as adding two days to the current date, or showing the difference between two dates.

  The next screen shot shows the results of expressions that calculate dates:



The following table lists the accepted syntaxes for date expression and provides examples. Attributes, system dates, or Govern IDs, such as the Year ID can be used in these expressions.

Expression Syntax	Description	Example
Now()	Displays the current date and time.	12/1/2015 3:24:36 PM
Date()	Displays the current date if used alone.	12/1/2015 3:24:36 PM
Date(@attr)	Displays the full date of the associated attribute if one is included in the expression.	Date(@EffectiveDate) 1/31/2015 5:29:36 PM
Format(Date())	At this time, the Format syntax is required for this expression in order to hide the time.	Format(Date(@EffectiveDate), 'd') 12/1/2015
Day()	Displays the current day.	1
Day(@attr)	Displays the day of the associated attribute if one is included in the expression.	Day(@EffectiveDate) 1
Month()	Displays the current month.	12
Month(@attr)	Displays the month of the associated attribute if one is included in the expression.	Month(@Effective Date) 12
Year()	Displays the current year.	2015
Year(@attr)	Displays the year of the associated attribute if one is included in the expression.	Year(@EffectiveDate) 2015

Adding a Positive or Negative Value to a Date

You can use the following syntax to add or subtract a value to a date. For example, you could add two days to the current date. The syntax for this is

```
DateAdd()
```

Add the part of the date that you want to update, the value, and the date that you want to update in the parentheses.

For example: DateAdd('day', 2) adds two to the current day.
If this is December 1, 2014, the result is December 3, 2014.

The following parts of date can be used:

- Day
- DayOfYear
- Hour
- Minute
- Month
- Quarter
- Second
- Weekday
- WeekOfYear
- Year

If you are adding the DateAdd() syntax to a text field, add the string or a format syntax.

For example: Str(DateAdd('day', 2))

or Format(DateAdd('day', 2), 'd') adds two to the current day.
If this is December 1, 2014, the result December 3, 2014 is displayed.

You could also add three hours, four weeks, or five months. In other words, you could add or subtract any value to any of the following parts of dates:

Displaying an Interval Between Dates

You can use the following syntax to display an interval between two dates. For example, you may want to show the difference between the effective date of a record and the current date. The syntax for this is

DateDiff('DatePart', @attr1, @attr2)

where DatePart is the part of the date or time that you want to update, such as, the hour, minute, day, week, or year.

Add the part of the date that you want to update, the value, and the date that you want to update in the parentheses.

> For example: DateDiff('day', @EffectiveDate, @InactiveDate) displays the number of days difference between the effective date and the inactive date of the record.
> If this is December 1, 2014, the result is December 3, 2014.

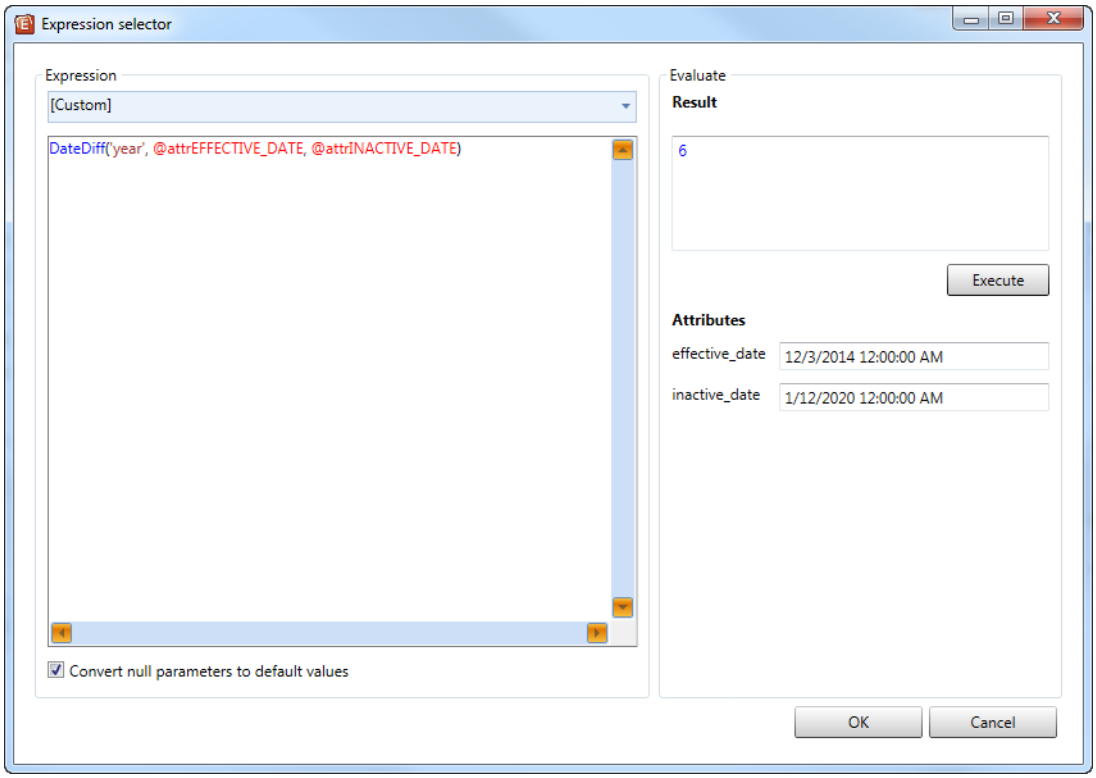
The following components of a date can be used in an expression:

- Day
- DayOfYear
- Hour
- Minute
- Month
- Quarter
- Second
- Weekday
- WeekOfYear
- Year

Adding the Expression

To add an expression to a default value:

1. Open the business entity.
2. Select the attribute.
3. Click the ellipsis button  in the **Default Value** field to open the Expression Selector.



4. Enter the expression in the Expression Selector.

   The attributes that are used in the expression are displayed on the right.
5. Enter typical dates in the effective and inactive date fields.
6. Click **Execute** to test the expression.
7. Click **OK**.
8. Click **Save** in the Business Entity Designer.
9. Open the form in Govern to view the expression.

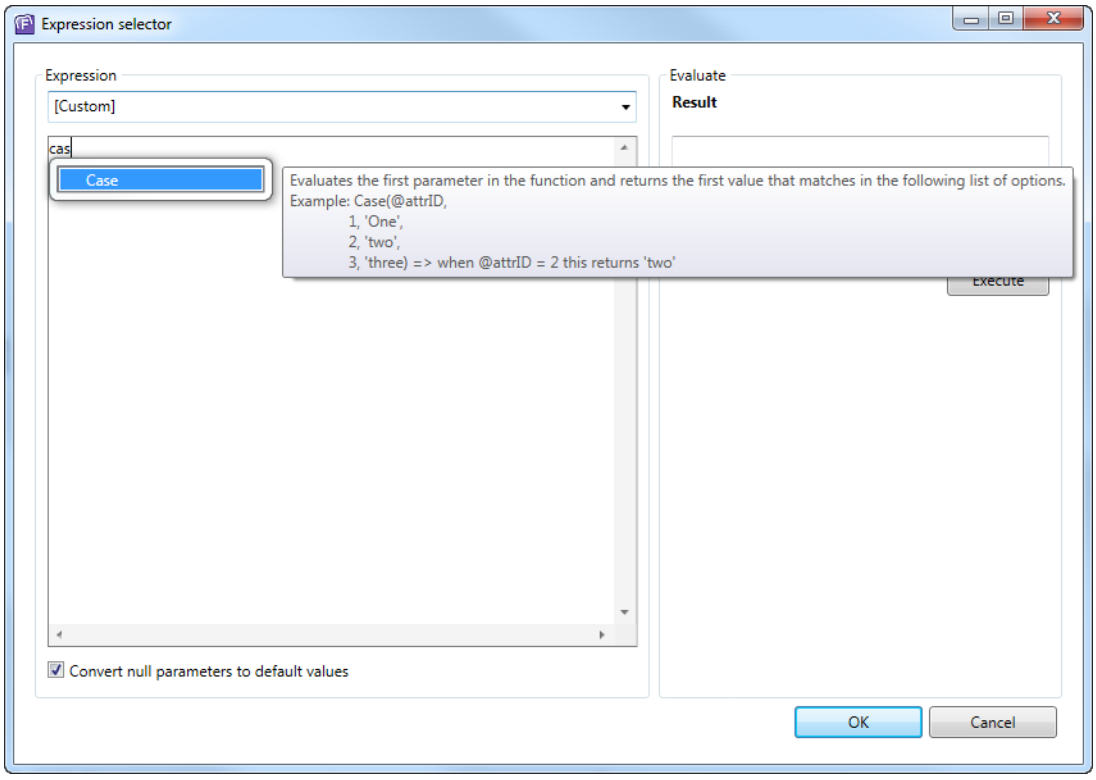
For Further Reference

Overview

A listing and description of the available formats are available from the following links:

Govern Expressions

All Govern expressions as well as the standard expressions are added in tooltips in the Expression Selector. When you enter the first couple of characters, the correct syntax is displayed.



Note: Hit `[Ctrl] + [space]` to view a list of all accepted syntaxes.

Mathematical Expressions

The following links provide lists and descriptions of the supported expression types:

http://ncalc.codeplex.com/wikipage?title=functions&referringTitle=Home

http://ncalc.codeplex.com/wikipage?title=operators&referringTitle=Home

Format Function

The available formats can be viewed from the following lists:

Numbers

Use predefined numeric formats or create user-defined numeric formats.

Dates and Times

Use predefined date/time formats or create user-defined date/time formats.

Using a Variable

Overview

You can add a variable to an expression.

The first step is to declare the variable.

To add a Variable, use curly brackets ({ })to declare it.

For example,

```
{
  variable = Month()
}

variable * 10
```

Returns 100, if the month is October.

It is not necessary to write the word variable. For example, the following are all variables:

```
{
  variable = Day();
  Subtotal = 1*5;
  Total = Subtotal+2;
  }
```

….

Appendix A: Expression Quick Reference

Overview

This section is provided as a reference. It has two parts:

- Allowed Expressions on page 271
- Where to Add an Expression on page 280

For details about expressions and how they are used in the Govern OpenForms Designer, see *Adding Expressions on page 222*.

For details about how expressions are used in the *Govern Business Entity Designer*, refer to the *Govern Business Entity Designer*.

To view the list of Allowed Expressions, open the Expression Selector and hit `[Ctrl] + [space]`

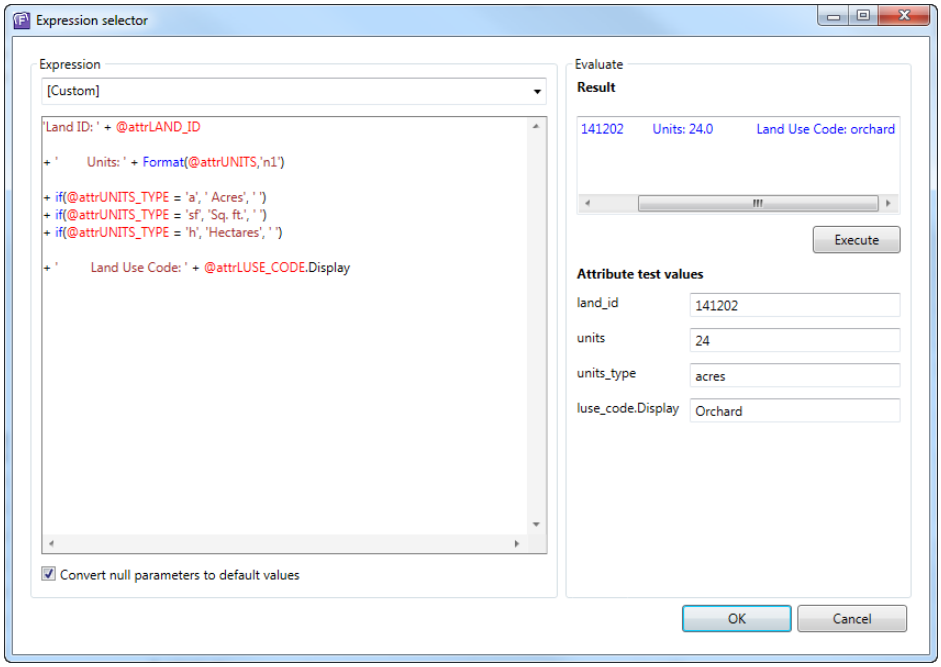
General Information

All expressions evaluate to true. For example, the default expressions, available in several controls, Is Visible and Is Enabled, are True by default, making the control visible and enabled on the form.

To combine multiple expressions together, use the plus sign (+) For example,

```
'Land ID: ' + @attrLAND_ID + '       Units: ' + Format(@attrUNITS,'n1') +
if(@attrUNITS_TYPE = 'a', ' Acres', ' ') + if(@attrUNITS_TYPE = 'sf', 'Sq.
ft.', ' ') + if(@attrUNITS_TYPE = 'h', 'Hectares', ' ') + 'Land Use Code: ' +
@attrLUSE_CODE.Display
```

To test your expression, use the Evaluate feature on the Expression Selector. This is available for every expression. When you write an expression, new attribute test fields are added to the Expression Selector. Enter some test values and click Execute. This saves you the time required to open the form in Govern, enter test values, and run the expression. This feature is illustrated in the following screen shot.



Convert Null Parameters to Default Values

Select this option to convert the Null parameters in the database to default values. This option is selected by default. It is used to facilitate the computation. However, for some expressions, it is better to disable this option. You can test the expression using the Evaluate feature and view the difference between enabling and disabling this option.

Allowed Expressions

Overview

This section lists the expressions that are allowed in Govern OpenForms. The same interface is used for adding expressions throughout the Govern OpenForms Product Suite.

The list of expressions is available if you open the Expression Selector and hit [Ctrl] + the space bar. When you begin typing the first couple of letters of a syntax, a tooltip appears. The tooltip provides the same information as the following list.

Expression	Description	Example Syntax	Result
Abs	Returns the absolute value of a specified number.	Abs(-1)	1
Acos	Returns the angle whose cosine is the specified number.	Acos(1)	0
Asin	Returns the angle whose sine is the specified number.	Asin(0)	0
Atan	Returns the angle whose tangent is the specified number.	Atan(0)	0
Case	Evaluates the first parameter in the function and returns the first value that matches in the following list of options.	Case(@attrID, 1, 'One', 2, 'two', 3, 'three')	when @attrID = 2 this returns 'two'
Ceiling	Returns the smallest integer greater than or equal to the specified number.	Ceiling(1.5)	2
Cos	Returns the cosine of the specified angle.	Cos(0)	1

Expression	Description	Example Syntax	Result
Date	Returns the current date or the date part of a given date and time.	Date() Date(@attrDATE) Date(#11/26/2014 3:34:05 PM#)	Returns the current date. Returns the date part of an associated attribute. Returns 11/26/2014
DateAdd	Adds to the current date and time the given number of years, quarters, months, weeks, etc. (either positive or negative). The list of available date parts is {Day, DayOfYear, Hour, Minute, Month, Quarter, Second, Weekday, WeekOfYear, Year}. The case is insensitive.	DateAdd('year', 2) DateAdd('year', 2, @attrDATE) =>. DateAdd('month', -2) => Returns the current date and time - 2 months. DateAdd('year', 2, @attrDATE) => Returns the given date and time + 2 years. DateAdd('month', -2) => Returns the current date and time - 2 months.	Returns the current date and time + 2 years. Returns the date and time of the attribute + 2 years

Expression	Description	Example Syntax	Result
DateDiff	Calculates the difference between two given dates and times (either positive or negative). The list of available date parts is {Day, DayOfYear, Hour, Minute, Month, Quarter, Second, Weekday, WeekOfYear, Year}. These are case-insensitive. See http://msdn.microsoft.com/en-us/library/microsoft.visualbasic.dateinterval(v=vs.110).aspx for more details about this list.	DateDiff('year', @attrDATE1, @attrDATE2) DateDiff('week', @attrDATE1, @attrDATE2) DateDiff('minute', @attrDATE1, @attrDATE2)	Returns the number of years between the dates and times of two associated attributes. Returns the number of weeks between the dates and times of two associated attributes. Returns the number of minutes between the dates and times of two associated attributes.
Day	Returns the current day or the day part of a given date.	Day() Day(@attrDATE) Day(#11/26/2014 3:34:05 PM#) Day(#11/26/2014#)	Returns the current day Returns the day part associated with an associated attribute. 26 26

Expression	Description	Example Syntax	Result
Display	Returns a string representation of the attribute value.	'Land Use Code: ' + @attrLUSE_CODE.Display	Returns the item selected from the Land Use Code drop-down list.
Double	Returns the double representation, or a copy, of the value.	Double(“7”)	7
Exp	Returns e raised to the specified power.	Exp(0)	1
Floor	Returns the largest integer less than or equal to the specified number.	Floor(1.5) Floor(3.5) Floor(-3.5)	1 3 -4
Format	Formats the first parameter using the style defined in the second parameter.	Format(@attrAMOUNT, 'c') Format(123.45, '0000.0')	Returns the value in the attribute AMOUNT formatted as currency. Returns 0123.5
HasValue	If the field contains a value, the expression returns True. Returns False if the parameter is Null or empty.	HasValue(@attrBLDG_VALUE)	Returns True if a value is entered in the Building Value field. If the field is empty or Null, returns False.
IEEERemainder	Returns the remainder resulting from the division of a specified number by another specified number.	IEEERemainder(3, 2)	-1

Expression	Description	Example Syntax	Result
If	Returns a value based on a condition.	If(4/2 = 2, 'abc', 'def')	'abc'
In	Returns true if an element is in a set of values.	In(@attrId, 4, 5, 6)	true when @attrId is 4, 5 or 6
IsNull	If the parameter is Null, the expression returns the second parameter. Otherwise the first parameter is returned.	IsNull(@attrID, 0)	If @attrID is Null, a 0 is returned.
IsNullOrEmpty ( )	If the parameter is Null or Empty, the expression returns the second parameter. Otherwise the first parameter is returned.	IfNullOrEmpty(@attrID, 0)	If @attrID is null or Empty a 0 is returned
IsNullOrWhiteSpace ( )	If the parameter is null Or Empty Or White Spaces, it returns the second parameter. Otherwise the first parameter is returned.	IfNullOrWhiteSpace(@attrID, 0)	If @attrID is NULL or Empty or White Spaces, a 0 is returned
Len	Returns the length of the specified string. Note that characters in the length are counted from one, starting index one. Use the Evaluate feature of the Expression Editor to test this.	Len('Main Street')	Returns 11
Ln	Returns the natural (base e, Euler constant) logarithm of a specified number.	Ln(1) Ln(e)	Ln(1) returns 0. Ln(e) returns 1.
Log	Returns the logarithm of a specified number.	Log(1, 10)	0
Log10	Returns the base 10 logarithm of a specified number.	Log10(1)	0

Expression	Description	Example Syntax	Result
Lower	Converts all letters in the specified string to lowercase.	Lower('Main Street')	Returns main street.
Max	Returns the larger of two specified numbers.	Max(1, 2)	2
Min	Returns the smaller of two numbers.	Min(1, 2)	1
Month	Returns the current month or the month part of a given date.	Month() Month(@attrDATE) Month(#11/26/2014 3:34:05 PM#) Month(#11/26/2014#)	Returns the current month. Returns the month part of an associated attribute. 11 11
Now	Returns the current date and time.	Now()	11/26/2014 3:34:05 p.m.
Pow	Returns a specified number raised to the specified power.	Pow(3, 2)	9
Query	Executes a query and returns the first value in the first row. **Note**: As a best practice, write queries that return only one row and one column.	Syntax: `Query('QueryName')` Example 1: Query('GetParcelName')	Returns the result from GetParcelName.
		Syntax: `Query('QueryName', n)` Example 2: Query('GetQuantity', 2)	Returns the result from GetQuantity with a maximum cache of 2 minutes.

Expression	Description	Example Syntax	Result

		Syntax:
		
		`Query('QueryName', 'ColumnName')`
		
		Example 3:
		
		`Query('GET_P_ID', 'Tax_Map')`
			Returns the tax map number from the first row of the results.

		Syntax:
		
		`Query('QueryName', 'ColumnName', n)`
		
		Example 4:
		
		`Query('GET_PARCEL_ID', 'Tax_Map', 2)`
			Returns the tax map number from the first row of the results, with a maximum cache of two minutes.

Round	Rounds a value to the nearest integer or specified number of decimal places. The mid number behavior can be changed by using EvaluateOption.RoundAwayFromZero during construction of the Expression object.	Round(3.2222, 2)	3.22
Round 0	Use the zero (0) to rounds to 0 decimal places using banker's rounding: The value is rounded to the nearest even number.	Round(15.5,0) Round(16.5,0)	16 16
Sign	Returns a value indicating the sign of a number.	Sign(-12)	-1
Sin	Returns the sine of the specified angle.	Sin(0)	0

Expression	Description	Example Syntax	Result
Sqrt	Returns the square root of a specified number.	Sqrt(4)	2
Str	Returns the string representation of a value.	Str(5)	'5'
Substr	Returns a substring of the first parameter from the x-th character defined by the second parameter on a length defined by the third parameter. Note that characters in the substring are counted from zero, starting index zero. You can use the Evaluate feature on the Expression Editor to see how the characters are counted.	Substr('abcdef', 2, 3)	'cde'
Tan	Returns the tangent of the specified angle.	Tan(0)	0
Truncate	Calculates the integral part of a number. No rounding is applied.	Truncate(1.7)	1
Upper	Converts all letters in the specified string to uppercase.	Upper('Main Street')	Returns MAIN STREET
Year	Returns the year part of a date.	Year() Year(@attrDATE) Year(#11/26/2014 3:34:05 PM#) Year(#11/26/2014#)	Returns the current year. Returns the year part of an associated attribute. 2014 2014

For Further Reference

For further reference, refer to the following:

Numeric Formats

For numeric formats, see http://msdn.microsoft.com/en-us/library/y006s0cz(v=vs.90).aspx or http://msdn.microsoft.com/en-us/library/4fb56f4y(v=vs.90).aspx

Date Formats

For date formats, see http://msdn.microsoft.com/en-us/library/362btx8f(v=vs.90).aspx or http://msdn.microsoft.com/en-us/library/73ctwf33(v=vs.90).aspx

Dates and Date Parts

For dates and date parts, see http://msdn.microsoft.com/en-us/library/microsoft.visualbasic.dateinterval(v=vs.110).aspx for more details about this list.

Where to Add an Expression

Overview

The table on the following page lists the levels (form, entity, and attribute), and the controls (label, link, action button, groupbox, tab, etc.) and shows where you can add an expression for the user forms. Detailed information and examples are provided in the *Govern OpenForms Designer* and *Business Entity Designer* guides. This section provides a brief overview:

- **Form / Business Model**: Govern user forms are based on the business models created in the Business Entity Designer (BED). Expressions cannot be added to a business model or a user form (OFD form). They can be added to a business entity – a divider within a form – and to most controls.
- **Business Entity**: Business Entities are created in the Business Entity Designer (BED). They must be added to business models. You can add an expression as a validation rule in the BED, or the Record Description or the enabling or visibility properties in the OpenForms Designer (OFD).
- **Custom Entity**: Custom Entities are created in the OpenForms Designer (OFD) in order to add specialized controls or code to the form. You cannot add an expression to a Custom Entity. However, the custom entities must be added to a form with a root entity. You can add expressions to the root entity of the form.
- **Attribute**: Attributes are the data entry fields on a user form. They are created in the BED and added to business entities. They are mapped to database columns or can be stand alone. You can add an expression to an attribute as a default value, a calculated value, or as a validation rule in the BED, or the enabling or visibility properties in the OFD.

  Tip: If you want to perform a calculation that is not saved to the database, but is displayed on a form, you can create a stand-alone attribute or add a label to the form and add an expression to the label.

- **Controls**: Expressions can be added to the enabling or visibility properties of labels, links, action buttons, custom controls, groupboxes or tabs. They cannot be added to grids, rows, columns, or to custom entities.

For further information, see the *Govern OpenForms Designer* and *Business Entity Designer* guides.

Level	Application	Type		
Form	OFD	N/A		
	BED	N/A		
Entity	OFD	Allow Save, Allow Delete	Allow Update	Record Description
	BED	Validation Rule		
Attribute	OFD	IsEnabled	IsVisible	
	BED	Validation Rule	Default Value	Calculated Value
Label	OFD	IsEnabled	IsVisible	Expression (Any)
	BED	N/A		
Link	OFD	IsEnabled	IsVisible	
	BED	N/A		
Action Button	OFD	IsEnabled		
	BED	N/A		
Custom Control	OFD	IsEnabled	IsVisible	
	BED	N/A		
Row or Column	OFD	N/A		
	BED	N/A		
Grid	OFD	N/A		
	BED	N/A		
Groupbox	OFD	IsEnabled	IsVisible	
	BED	N/A		
Tab	OFD	IsEnabled	IsVisible	
	BED	N/A		
Custom Entity	OFD	N/A		
	BED	N/A		

Index

U

V

W

Z