

MODEL SETUP FOR RENOVATION PROJECTS

INSTRUCTIONS AND TUTORIALS

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INTRODUCTION

This document outlines a recommended Vectorworks® workflow for creating demolition and phased construction plans. In many cases, architectural projects deal with the existing building conditions, such as renovations of building and connection of new construction to the existing building. Also, commonly in architectural projects, the documentation must reflect multi-phase construction, such as design-built construction delivery or traditional design-bid-built with several phases.

This document demonstrates how to set up files in both a 2D workflow and a BIM workflow, to successfully provide required documentation (2D output) such as a demolition plan or phasing plan for renovation projects.

To allow you to test the various concepts discussed in this tutorial, example files are provided with this document.

PART ONE

LAYERS AND CLASSES FOR RENOVATION PROJECT

OVERVIEW

Renovation projects are somewhat different than new building projects. For renovation projects, there is an added complexity on how to model the building elements to correctly represent the information on a sheet or as you design in a design layer view.

For renovation projects, the status of existing, demolition, and new objects should be visually represented by attributes such as line color, line type, fill color, and/or hatches. In addition, for phased construction projects, there may be a need to further break down these three statuses into phase one and two of construction.

SETTING UP LAYERS AND CLASSES

The organization of your files must start with layers and classes, as described in the following sections.

DESIGN LAYERS

Design layers in Vectorworks are used to organize your file in a working space by zones, types, or level. For example, you can have one design layer for each floor of the building, or when working on large, square-foot building you may want to “split” the model in zones to facilitate team work or control file size. With the recent project sharing feature, splitting the scenario is less common, as the entire model is part of the same file. Regardless, design layers are necessary to control the visibility of the model for generating floorplans, elevations, sections, and 2D details.

LAYERS AND CLASSES FOR RENOVATION PROJECT (CONT'D)

EXAMPLE OF TYPICAL DESIGN LAYERS FOR A NEW BUILDING (NOTE EACH DESIGN LAYER IS REPEATED FOR EVERY FLOOR, SUCH AS 2-CEILING, 2-FLOOR, 2-SLAB...)		
DESIGN LAYER NAME	OBJECTS DESIGN LAYER CONTAINS	PURPOSE
1-Ceiling	Ceiling objects for the first floor	Used to generate the first-floor reflected ceiling plan (RCP) sheet
1-Floor	Floorplan objects for the first floor	Used to generate the first-floor floorplan and RCP sheets
1-Slab	Slab object	Used when creating the section/elevation viewports of the model (this layer would generally be set to invisible in a plan view sheet layer)

EXAMPLE OF TYPICAL DESIGN LAYERS FOR A RENOVATION PROJECT		
DESIGN LAYER NAME	OBJECTS DESIGN LAYER CONTAINS	PURPOSE
2-Ceiling	Ceiling objects for the second floor	Used to generate the second-floor RCP sheet
2-Floor New	Floorplan objects for the second floor	Used to generate the second-floor construction plan and RCP sheets
2-Floor Existing	Floorplan objects for the second floor	Used to generate the second-floor demolition plan, construction plan and RCP sheets
2-Floor Demo	All demolished objects for the second floor	Used to generate the second-floor demolition plan
2-Slab	Slab object	Used when creating the section/elevation viewports of the model

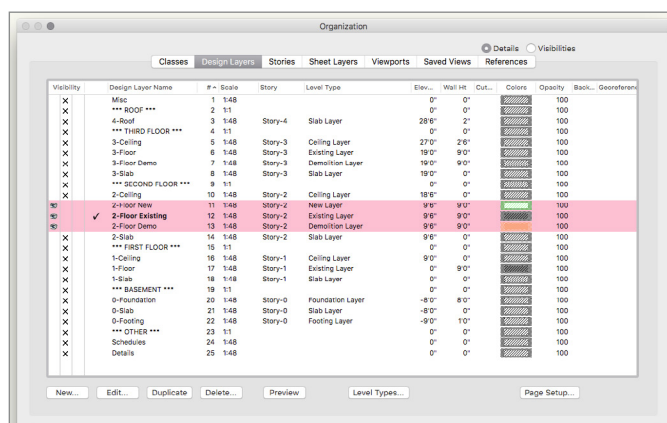


FIGURE 1
Example of design layers for a renovation project

LAYERS AND CLASSES FOR RENOVATION PROJECT (CONT'D)

Or, when managing too many design layers is an issue, at a minimum **two design layers** per floor is recommended: one layer for the demolished objects is necessary and one combined **existing and new layer**.

EXAMPLE OF TYPICAL DESIGN LAYERS FOR A RENOVATION PROJECT (WITH COMBINED EXISTING AND NEW BUILDING ELEMENTS IN A SINGLE DESIGN LAYER)		
DESIGN LAYER NAME	OBJECTS DESIGN LAYER CONTAINS	PURPOSE
3-Ceiling	Ceiling objects for the third floor	Used to generate the third-floor RCP sheet
3-Floor	Floorplan objects for the third floor	Used to generate the third-floor demolition plan, construction plan and RCP sheets
3-Floor Demo	All demolished objects for the third floor	Used to generate the third-floor demolition plan
3-Slab	Slab object	Used when creating the section/elevation viewports of the model

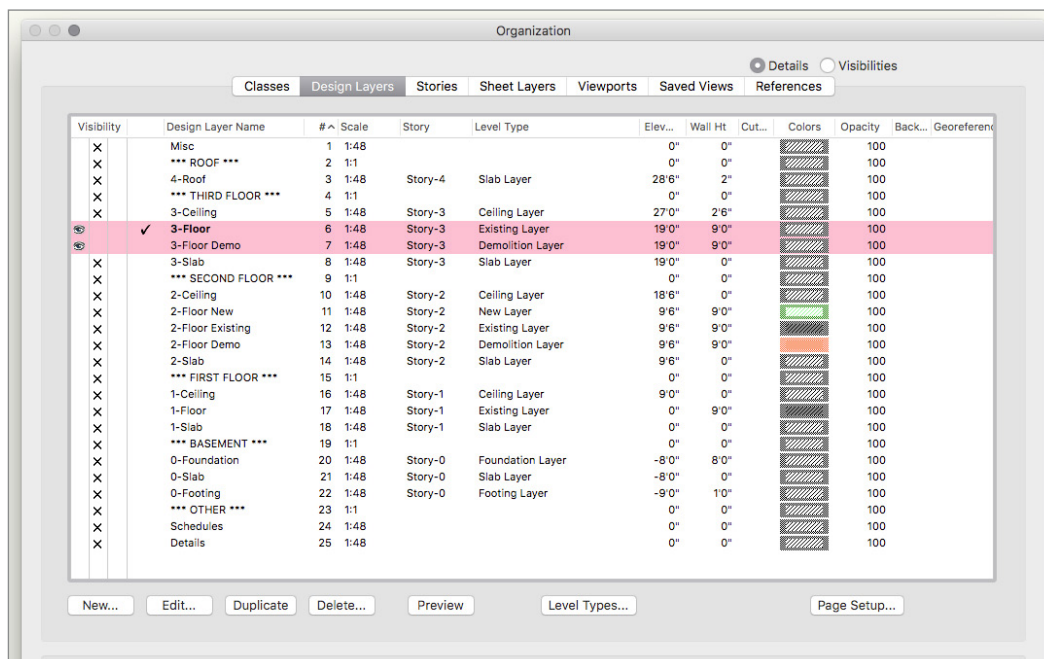


FIGURE 2
Example of design layers for a renovation project (combined existing and new building elements in one single design layer)

LAYERS AND CLASSES FOR RENOVATION PROJECT (CONT'D)

Comments:

- When working strictly in a 2D workflow, some layers such as the “Slab” layer may not be needed. This can also vary when using the project sharing feature.
- When modeling or drafting with project sharing you must take into consideration that everything is in one central file and must be easily controlled for visibility. For example, a ceiling layer makes a lot of sense for either a 2D or 3D workflow.
- The hierarchy of design layers provides the ability to show a group of objects on top of other objects, eliminating some issues when objects are overlapping each other. For example, a space object could be “duplicated” directly on top of another space object when a room is being replaced by a new room designation and number. In this case, a demolition layer is needed to host one of the space objects, and you can show/hide the objects as needed.

When working in multi-phase construction projects, adding more design layers can help manage the visibility of objects by phase.

EXAMPLE OF TYPICAL DESIGN LAYERS FOR A RENOVATION PROJECT WITH TWO CONSTRUCTION PHASES (NOTE EACH DESIGN LAYER IS REPEATED FOR EVERY FLOOR, SUCH AS, FLOOR DEMO-2, FLOOR EXISTING-2, FLOOR NEW-2...)

DESIGN LAYER NAME	OBJECTS DESIGN LAYER CONTAINS	PURPOSE
1-Ceiling PH2	Ceiling objects for the first floor	Used to generate the first-floor RCP phase 2
1-Ceiling PH1	Ceiling objects for the first floor	Used to generate the first-floor RCP phase 1
1-Floor New PH 2	Floorplan objects for the first floor	Used to generate the first-floor floorplan phase 2 and RCP sheets
1-Floor New PH 1	Floorplan objects for the first floor	Used to generate the first-floor floorplan phase 1 and RCP sheets
1-Floor Existing PH 2	Floorplan objects for the first floor	Used to generate the first-floor floorplan phase 2 and RCP sheets
1-Floor Existing PH 1	Floorplan objects for the first floor	Used to generate the first-floor floorplan phase 1 and RCP sheets
1-Floor Demo PH 2	All demolished objects for the first floor	Use to generate the first-floor floorplan phase 2
1-Floor Demo PH 1	All demolished objects for the first floor	Use to generate the first-floor floorplan phase 1
1-Slab	Slab object	Used when creating the section/elevation viewports of the model

LAYERS AND CLASSES FOR RENOVATION PROJECT (CONT'D)

Creating and using design layers allows you to visualize groups of objects using layer color, so when working on the project, you can see directly which objects are existing, new, or scheduled to be demolished.

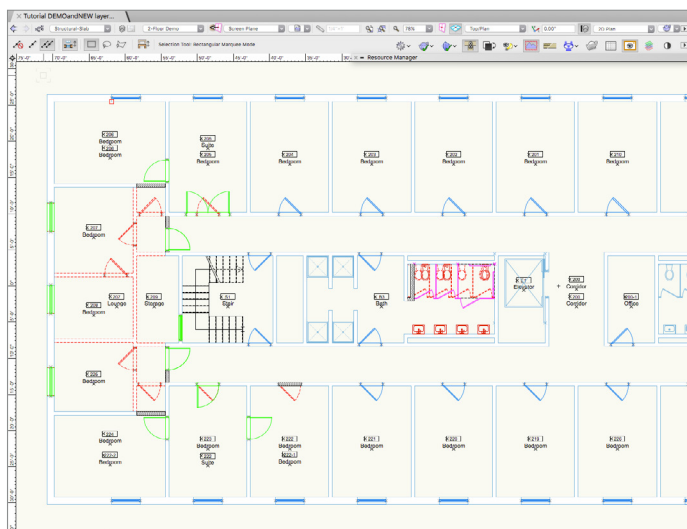


FIGURE 3a
Model view without layer color

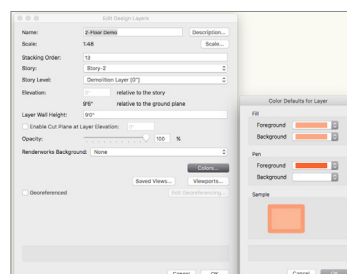


FIGURE 3b
Setting layer colors

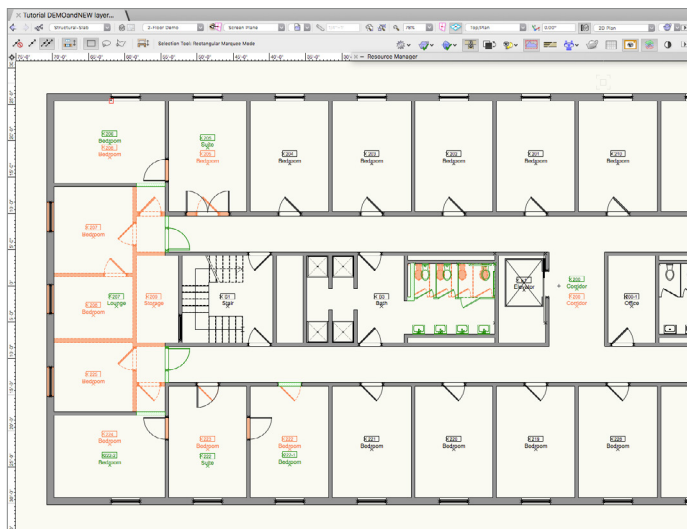


FIGURE 3c
Model view with layer color

LAYERS AND CLASSES FOR RENOVATION PROJECT (CONT'D)

Although the use of additional design layers is not an absolute necessity, it offers many advantages such as the ability to work with layer colors or to stack the objects appropriately to obtain the correct visual representation. Using only design layers to show these three groups of objects (existing, demolition, new) creates an issue for creating floor plans: for example, when an existing window is being replaced and inserted into an existing wall, you will need two windows, one to represent the demolished window and one to represent the new window. These two objects, if inserted in the same existing wall, need to be controlled by a different class to control the proper visibilities for demolition and new construction floor plans. Because of this behavior, the use of classes is just as critical as the design layers to have the ability to visually control and create the demolition and new construction plans.

CLASSES

Vectorworks classes are used to provide a higher level of visibility and control. Classes are also important, as they control the attributes of objects residing in that class. Object attributes include line and fill color, line weight, line type, textures, and more (see [FIGURE 5](#)). For generating the proper documentation such as demolition plans, phasing plans, and construction plans, the combined use of classes with design layers allows for the best control over visibility and appearance.

EXAMPLE OF TYPICAL CLASSES FOR A NEW BUILDING

- Ceiling
- Column
- Dimension
- Door
- Roof
- Slab
- Space
- Structural
- Wall
- Window

LAYERS AND CLASSES FOR RENOVATION PROJECT (CONT'D)

EXAMPLE OF CLASSES FOR A RENOVATION PROJECT

Add demolition classes as needed. Demolition items will have their own group of classes. Classes should be categorized by types of objects. To differentiate new versus exiting construction, it is recommended to create separate classes, such as, Door-New, Door-Existing. This will allow you to make the “new” door object — inserted in an existing wall — invisible when creating a demolition plan.

- Ceiling
- Column
- Demolition
 - Demo-Door
 - Demo-Main
 - Demo-Space
 - Demo-Wall
 - Demo-Window
- Dimension
- Door
 - Door-Existing
 - Door-New
- Existing Miscellaneous
- Roof
- Slab
- Space
- Structural
- Wall
- Window
 - Window-Existing
 - Window-New
- (add more classes as needed)

LAYERS AND CLASSES FOR RENOVATION PROJECT (CONT'D)

Note: when working strictly in a 2D workflow, create as many classes as you feel are required to provide the granularity necessary for the project or for your firm's standards.

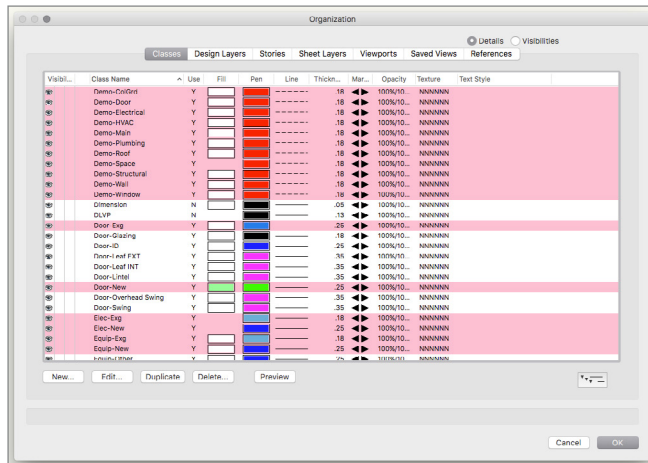


FIGURE 4
Example of demolition, existing, and new classes

The classes setup is important because it controls the appearance of objects. So, when designing you will be able to see the demolition objects versus the new objects if line and fill color are set up per your requirements. For example, all demolition objects are red in color with the same fill attribute (solid, pattern, or hatch), shown in **FIGURE 4**. Classes will also allow you to set up a viewport and change the class attributes using class overrides. With class overrides you will be able to graphically represent the various objects as desired. See **FIGURE 5a** and **5b** showing class overrides applied to a viewport. For more information on how to set up class overrides, see the section on using class overrides in the part one exercise of this document or click [here](#) to access the Vectorworks on-line [help menu](#).

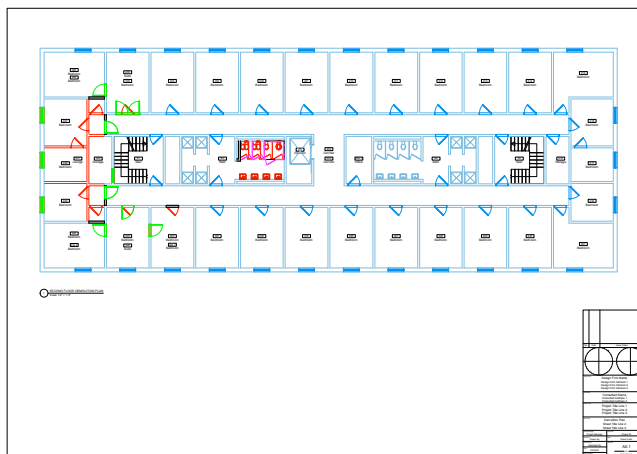


FIGURE 5a
Sheet layer viewport without class overrides

LAYERS AND CLASSES FOR RENOVATION PROJECT (CONT'D)

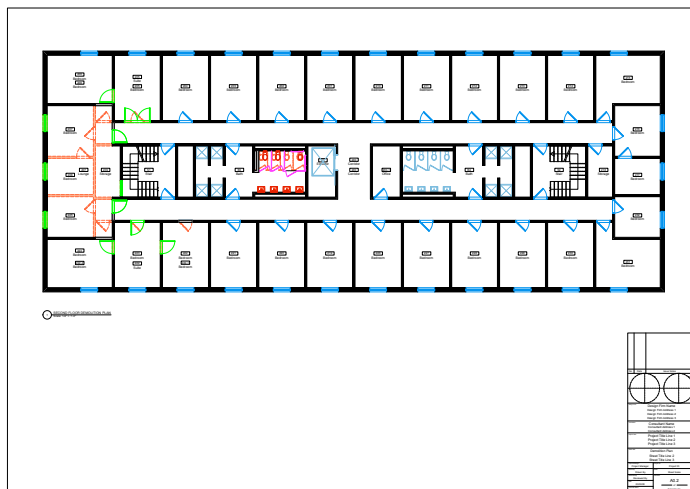


FIGURE 5b
Sheet layer viewport with class attributes overrides

Using both design layers and classes will give you the most flexibility in visualizing and creating the proper 2D documentation for construction documents. The example file included with this document uses this method. In the case of multi-story building, you can reduce the quantity of layers to two layers (one for demolished objects and one for new and existing objects) this will help with layer management.

CREATING OBJECT LIBRARIES (SYMBOLS)

We strongly recommend that you create a minimum set of symbol libraries that can be shared within your office. Having libraries will help with the graphic consistency of your drawing throughout all projects. When it comes to dealing with existing, demolished, and new building objects, all three are needed. For example, when working on a renovation project, you may have existing plumbing fixtures that remain and some that are replaced. In this case, one sink will have three instances with different graphic attributes.

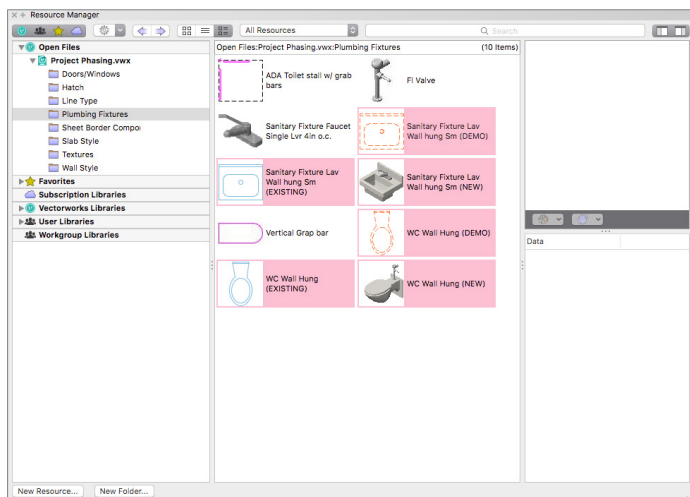


FIGURE 6
Example of plumbing fixture symbols. The same set of symbol libraries will be needed for any types of building elements such as light fixtures, vent registers, furniture, millwork, specialty equipment and so on...

LAYERS AND CLASSES FOR RENOVATION PROJECT (CONT'D)

CREATING OBJECT LIBRARIES (PIO STYLES)

When using standard plug-in objects, the creation of styles is not necessarily a “requirement” but we recommend using styles for new and existing objects, as it provides a quicker way to model or draw. When creating a Building Information Model (BIM), wall and slab styles will be needed for existing and new conditions. Note that an existing object style will change its graphic attributes when assigned to a demo class or existing class. This eliminates the need to duplicate these objects in your resources.

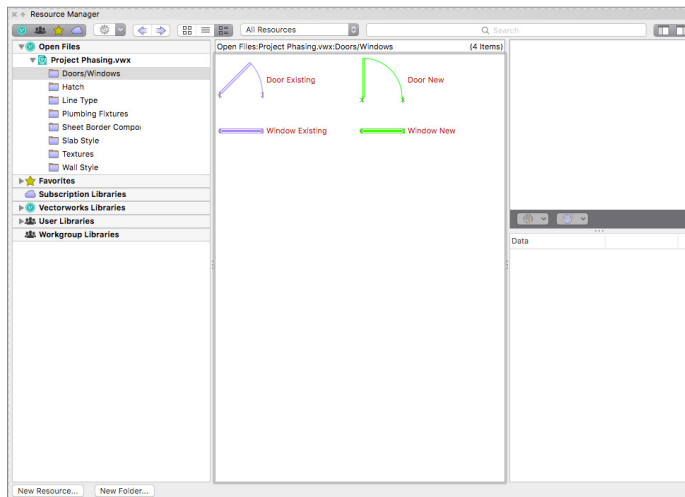


FIGURE 7

Example of door and window style; the same set of PIO styles will be needed for any type of building elements such as walls, slabs, cabinets, and so on...

Whether you are using a 2D or 3D workflow, the creation of symbol libraries is common sense, as it provides a greater level of efficiency and control. Symbols can easily be reported on a worksheet in Vectorworks, providing an additional level of sophistication to your drawings. The advantage of using 3D objects such as walls, slabs, doors, and windows is that these objects provide a high level of geometry and physical characteristics that can be used in various way throughout the design, construction, and building operation.

MODELING EXISTING, DEMOLITION AND NEW CONDITIONS

Once you have set up your template and libraries, you are ready to get started drawing/modeling the building. When dealing with an existing building, always start by modeling the current conditions. Draw walls, doors, windows, and any building elements necessary to provide an accurate background.

Note: When working strictly in a 2D workflow, 2D objects will behave in a similar way as hybrid 2D/3D objects. All objects attributes can be controlled by classes or layers.

LAYERS AND CLASSES FOR RENOVATION PROJECT (CONT'D)

When determining which elements need to be removed, select them and change their design layer and/or classes. When classes are set properly, the object should take on the assigned attributes of the new class. During this process, you will need to use tools such **Trim/Cut/Split**, as well as wall joins and caps to “clean” the floorplan and accurately represent where walls are being removed. For plumbing fixtures (or other symbols) select the symbol and replace it with the demo symbol accordingly.

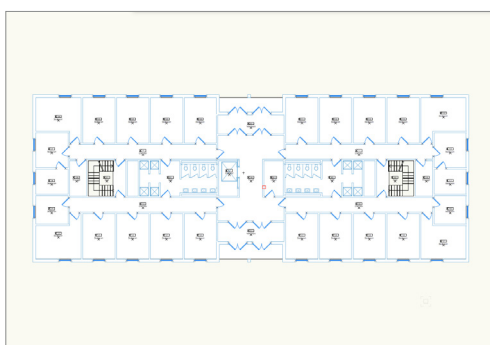


FIGURE 8a
Existing condition example

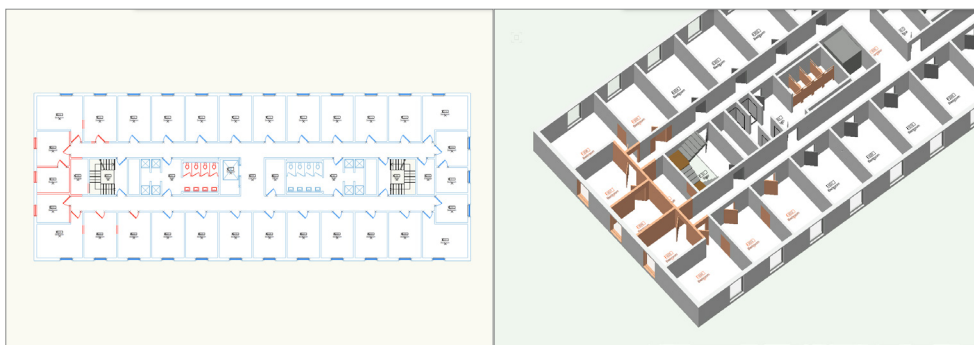


FIGURE 8b
Existing and demolished conditions

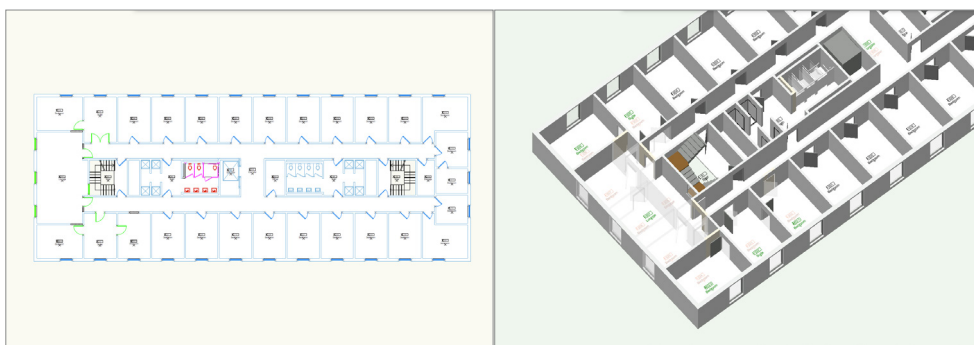


FIGURE 8c
Existing and new conditions

LAYERS AND CLASSES FOR RENOVATION PROJECT (CONT'D)

Note: once existing conditions are modeled or drawn, it is always a best practice to save a backup of the file in a safe location, so it can be re-called at a later phase if changes occur.

OBJECTS INSERTED IN WALLS

When objects such as doors and windows are inserted in walls, these objects are assigned to the same design layer as the wall. This behavior is important to understand for this workflow. For example, many projects will have exterior door replacement or window replacement (new doors/windows in existing wall), or you will need to remove a door/window and infill the opening (door/window demolition with wall infill). Often, you will want to cut a “hole” in an existing wall to install a new door/window (add door/window in existing wall). For these three instances, it is important to understand the following techniques:

INSERTING NEW OBJECTS IN EXISTING WALL OPENING (DOOR/WINDOW REPLACEMENT)

We refer to “opening” in a wall because it is the part of the symbol or plug-in object that controls on which layer a door (or window) object is located. If a new door is to be installed in an existing opening, the new door object would occupy the same opening as the existing door being replaced. Therefore, only the new door is required and can simply occupy the existing opening. The new door is inserted in the existing wall and must be located in its own Door-New class; this will allow for visibility control. Hide the Door-New class and you will see only the door opening in the wall.

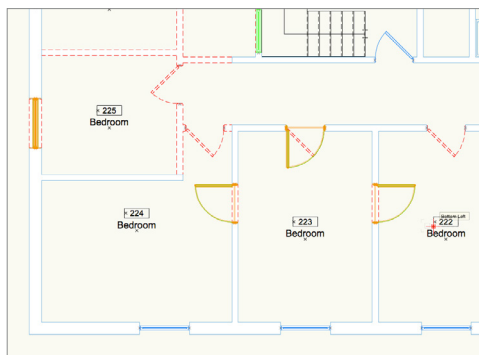


FIGURE 9a
New door object in existing wall; class Door-New set to visible (plan view)

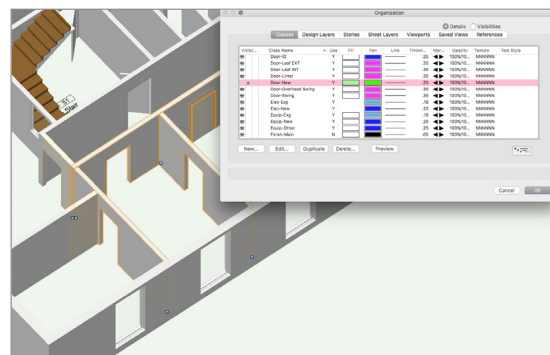


FIGURE 9b
New door object in existing wall; class Door-New set to invisible (3D view)

LAYERS AND CLASSES FOR RENOVATION PROJECT (CONT'D)

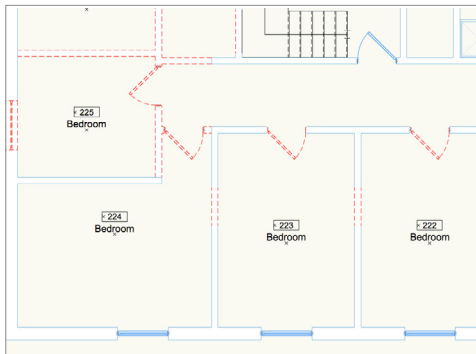


FIGURE 9c
Door-New class set to invisible (plan view)

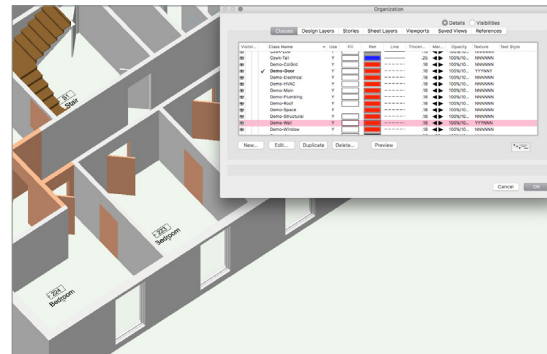


FIGURE 9d
Door-New class set to invisible and Demo-Wall set to visible (3D view)

To create the demolition plan, a “demo” door object must physically occupy the same space as the existing opening, but should not be “inserted” in the wall. We will refer this as a “floating object in wall.” This is necessary so the door being removed can be located on the “demolition layer and classes.” This will allow for providing the correct 2D representation of a demo plan.

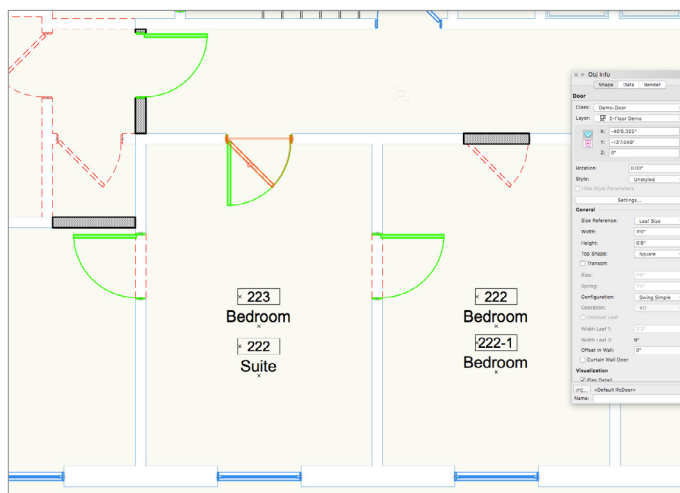


FIGURE 10
Floating door in existing opening; Door-New class set to visible

LAYERS AND CLASSES FOR RENOVATION PROJECT (CONT'D)

INSERTING NEW OBJECTS IN A NEW WALL OPENING (ADD DOOR/WINDOW IN EXISTING WALL)

This differs from the previous example because in lieu of placing a demo door object in the wall opening, you will place a wall object in the door opening. Select a new door style from the Resource Manager (or select the Door tool) and insert the new door in an existing wall, using a demo wall style and modifying the height to accurately show the extent of the wall needed to be removed. For example: if the dimension of the new door is 3'-0" x 7'-0", the opening will be 3'-4" x 7'-2", therefore the wall object (demo wall) will be 3'-4" x 7'-2".

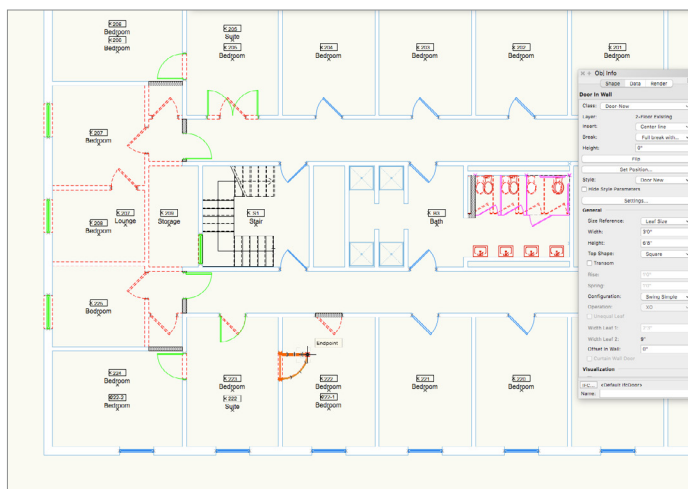


FIGURE 11a
New door object in existing wall

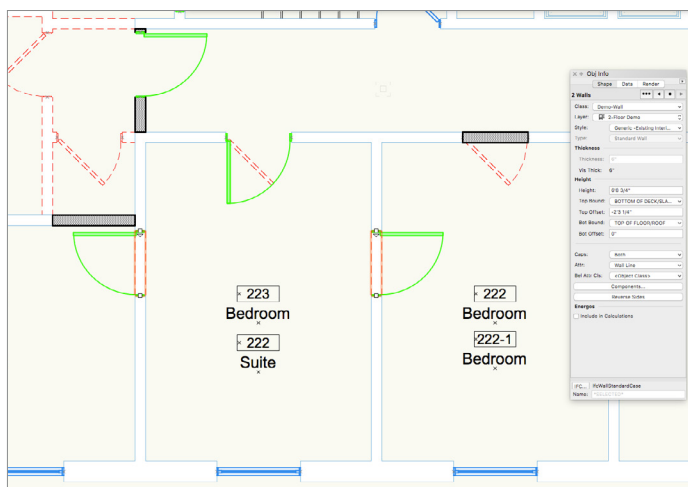


FIGURE 11b
New demo wall object in the new door opening

LAYERS AND CLASSES FOR RENOVATION PROJECT (CONT'D)

REMOVING EXISTING OBJECT IN EXISTING WALL (DOOR/ WINDOW DEMOLITION WITH WALL INFILL)

For this situation, the existing door will be changed to an “opening configuration.” This will allow for the placement of two floating objects; a demolished door (see [FIGURE 10](#)) and a wall infill.

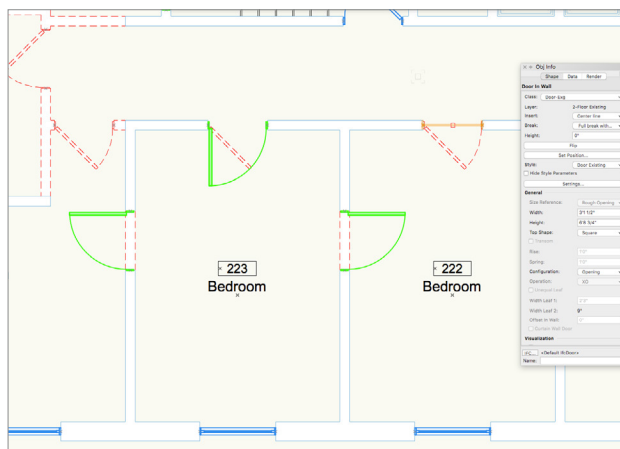


FIGURE 12a
Existing door configuration changed to cased opening

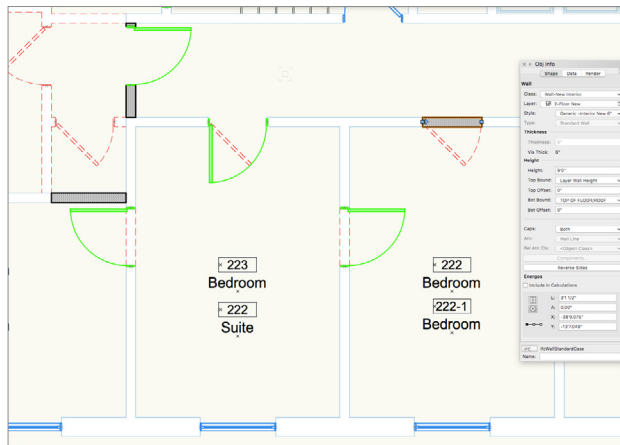


FIGURE 12b
New wall object is placed in the existing wall opening

Comments:

- These techniques apply to other types of objects (such as symbols) that can be attached to a wall. You can change the symbol behavior in the symbol options and deselect the **Insert in Walls** option.
- For positioning “floating doors and windows” in walls, you can “toggle off” the automatic wall insert mode in the Tool bar.

Using these three techniques, you will be able to use layer and class visibility to control the graphic attributes desired.

SETTING UP VIEWS AND VIEWPORTS FOR A DEMOLITION PLAN

[illegible]

Model Setup for Renovation Projects

LAYERS AND CLASSES FOR RENOVATION PROJECT (CONT'D)

When it comes to creating your 2D documents (in sheet layers), the viewport class and layers visibility will be used to correctly represent the demolition plans and construction plans.

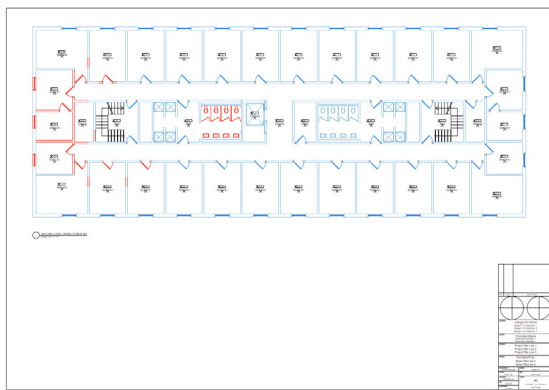


FIGURE 14a
Demo plan viewport



FIGURE 14b
Demo plan viewport using class overrides



FIGURE 15
Construction plan viewport

PART ONE

EXERCISE: SET UP A DEMOLITION PLAN

In this exercise, you will learn how to properly set up your file (or model) to easily create viewports for demolition and construction plans. Using our recommended workflow, you will learn how to:

- Create layers and classes needed for various phases
- Create PIO styles and symbols for various phases
- Create a demolition and construction plan

CREATE LAYERS AND CLASSES

Open the file “Project Phasing template.vwx” provided with this document. You will see that a standard template may not be “ready” for existing, demolition and new construction statuses.

Using the method described in Part one – layers and classes for renovation projects:

Open the Organization palette (**Tools > Organization**) and select the Design Layers tab. As you can see, some default design layers were created, but the file does not contain the layers needed for creating the three statuses of objects we discussed in part one (existing, demolished, new).

Right-click Layer 1-Floor and select **Duplicate**. This will create a duplicate of the design layer. Right-click again and select **Edit**. In the Edit Design Layers dialog box, you must change the name of the layer and story level type. Verify the story and height are correct accordingly to what floor of the building is affected by the demolition work. Repeat the same steps to create three design layers as shown in **FIGURE 16**.

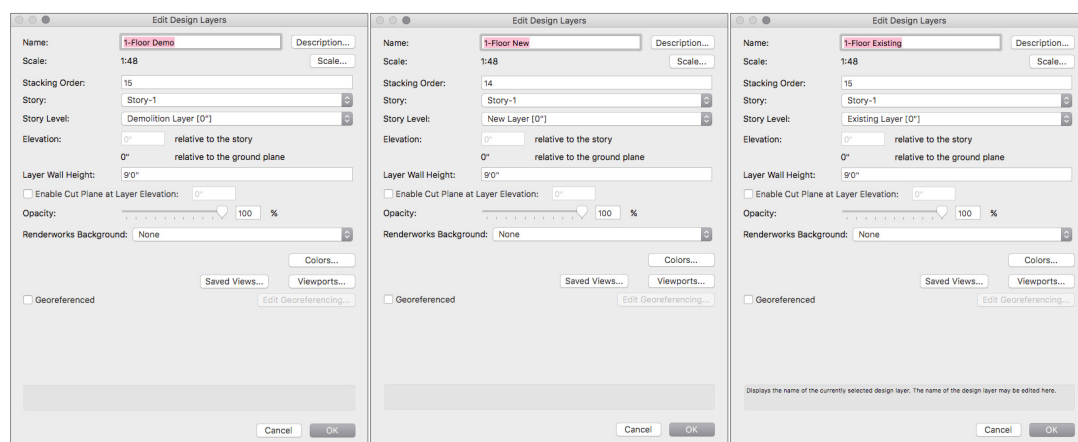


FIGURE 16
Create layers for demo, new, existing

EXERCISE: SET UP A DEMOLITION PLAN (CONT'D)

Note: If working in a 2D workflow, the **Story**, **Story Level**, Elevation, and **Layer Wall Height** associated with the new design layer is not relevant. In a 3D/BIM workflow, this information must be entered accurately to correctly visualize the object in a 3D view.

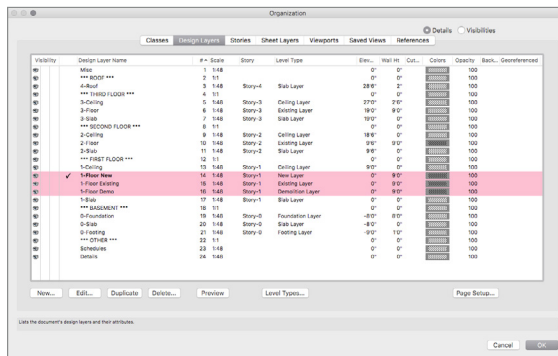


FIGURE 17
Added design layers showing existing, demolition, and new

In the Organization palette, select the **Classes** tab. As you can see, some default classes were created, but the file does not contain the classes needed for existing, demolished, and new objects we discussed in part one (existing, demolition, new).

Click the **New** button and create a new class named Demolition (or Demo as shown in **FIGURE 18a**). Select the default attributes (shown in **FIGURE 18b**); line and fill attributes will give you the flexibility to represent the demolished objects in a specific color or line type which can be based on your office standards.

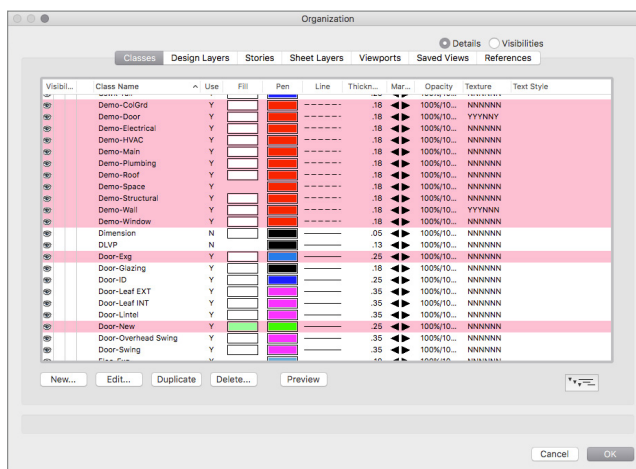


FIGURE 18a
Example of added classes for demolition items

EXERCISE: SET UP A DEMOLITION PLAN (CONT'D)

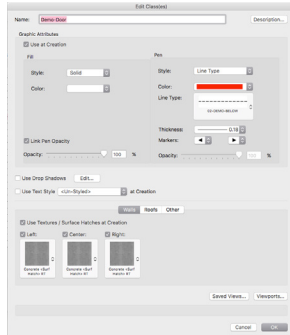


FIGURE 18b
Edit class attributes

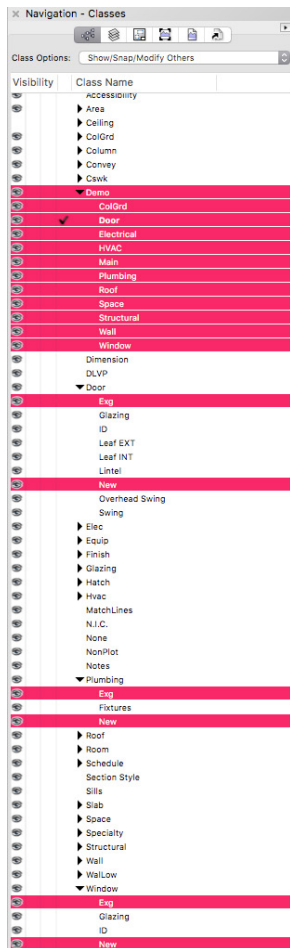


FIGURE 18c
Complete list of classes used for demolition, new and existing items

Notes:

- When working in a 3D/BIM workflow, we recommend you create as many classes as needed to control the visibility by object types: such as Demo-Door, Demo-Wall, Demo-Windows, etc.
- When working in a 2D workflow, the duplication of demo classes will be determined by the level of granularity and control desired when working in your file, one demolition class may be sufficient for all demolished items.

EXERCISE: SET UP A DEMOLITION PLAN (CONT'D)

CREATE PIO STYLES AND SYMBOLS

In the same file provided, you will find a few wall, door, windows and symbols. Select the Resource Manager and navigate to the active file. You will see these resources are available:

- Generic Wall
- Door-Existing
- Window Existing
- Plumbing Fixture: Sink Existing

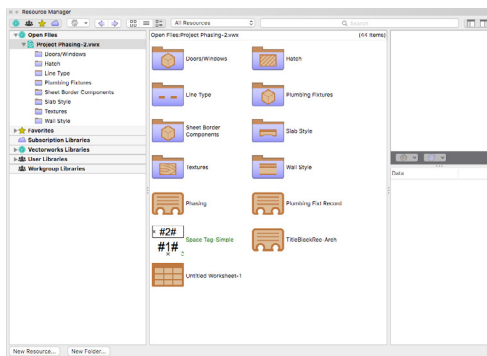


FIGURE 19
Resource Manager

In this segment, you will duplicate these symbols to provide the required symbols for modeling the project phases.

WALL

Wall styles can be set to take their attributes from the class to which they are assigned. In the case of existing walls and demolition walls, the components are often kept generic when creating construction plans. The new walls require more detail for displaying components such as a concrete block wall, insulation, or drywall. We recommend using separate wall styles for new construction. This will allow you to generate reports and schedule for partition types, or material take-offs.

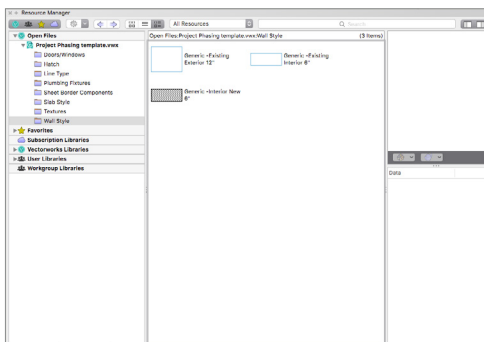


FIGURE 20a
Generic wall style setup

EXERCISE: SET UP A DEMOLITION PLAN (CONT'D)

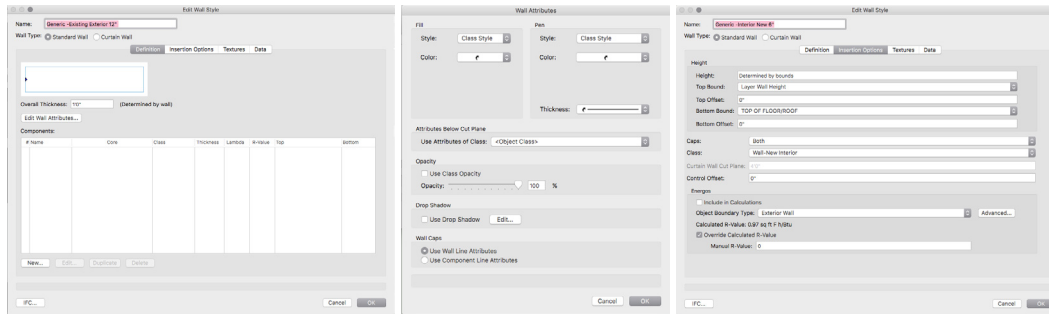


FIGURE 20b
New wall style setup

In the Wall Attributes dialog box, be sure to set the wall attributes to be "by class"

Wall style insertion option - you can set the default Class of the selected wall style

DOOR AND WINDOW

Like walls, door and window styles for new construction will be more detailed and contain information needed to generate reports and schedules. Existing and demo doors and windows can remain "generic." In your template file, you will see only one window style and one door style for existing construction. These styled objects have a different graphic representation (or attributes) from a new door or window. Create one new door and window style for new construction to obtain results similar to those shown in **FIGURE 21**.

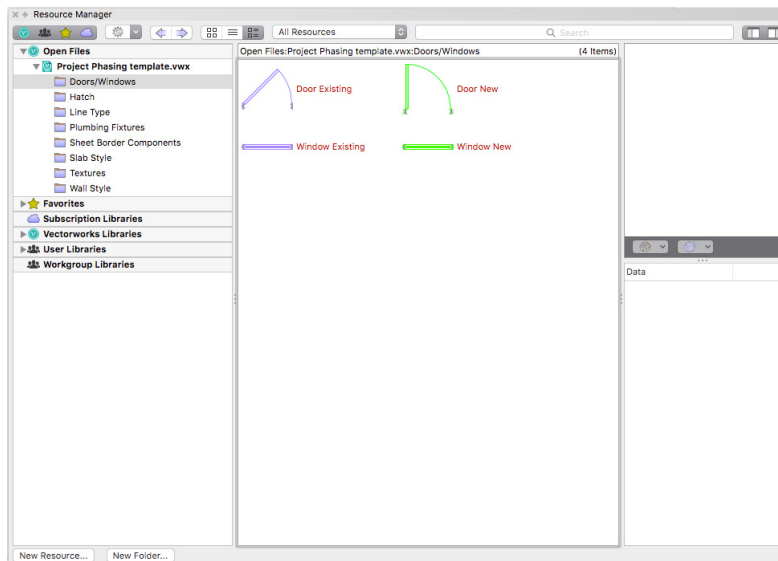


FIGURE 21
Duplicate existing door and window styles in the Resource Manager

EXERCISE: SET UP A DEMOLITION PLAN (CONT'D)

DUPLICATE PIO STYLE (RED SYMBOLS)

From the Resource Manager, right-click on one object style and select **Duplicate**. Right-click the duplicated object and select **Edit**. Rename the new resources and change their parameters as shown in [FIGURE 22](#).

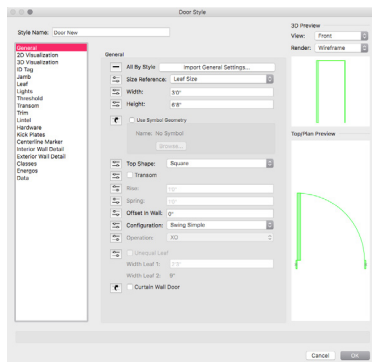


FIGURE 22
New door style

Note that door and window objects will inherit the class attributes by default.

CREATE SYMBOLS

For symbols, when dealing with the three typical statuses (existing, demolition, new), you must create (or duplicate) the resource for each phase: Sink-Existing, Sink-Demo and, Sink-New.

Follow the same step as described in Create PIO style (red symbols) for duplicating existing symbols in the sample file and create sink and WC symbols for demolition. At the end, you must have three sink and three WC symbols one for each status, similar to what is shown in [FIGURE 23](#).

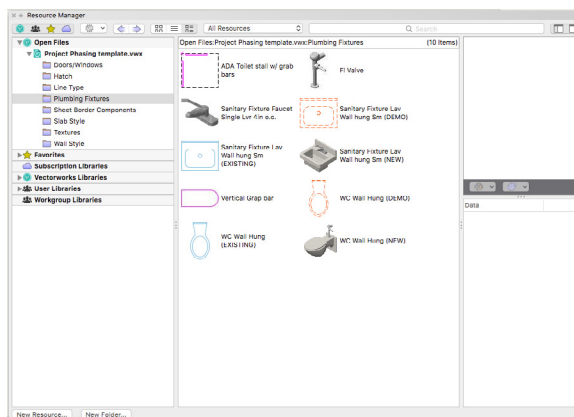


FIGURE 23
List plumbing fixture symbols needed

EXERCISE: SET UP A DEMOLITION PLAN (CONT'D)

CREATE DEMOLITION AND CONSTRUCTION PLAN

After creating the proper resources, you should be ready to start drawing/modeling the building. When dealing with the existing building, you must first model the current condition (existing). As your design progresses, you will be able to determine which building elements are to be removed, which remain and where new construction will be built. When modeling with this type of project it is important to be disciplined and use the proper classes, layers, and resources. This will simplify the process.

Once the model is completed you can set up the various sheet layers and viewports to generate the 2D documentation.

CREATE SHEET LAYERS

You will notice the template file contains two sheet layers

- A0 Demolition Plan
- A1 Construction Plan

For this exercise, we will use sheet A0 and A1 to create viewports for a demolition and construction plan.

Note: The file Project Phasing-1.vwx contains an existing model.
You can open it to continue with the following steps.

Before creating a viewport, we will set the layers and classes to the desired visibility. Using the Navigation palette or Organization palette, change the visibility to the desired setup. For a demolition plan set the “new” layer to invisible. Existing and demolition layer will be set to visible. In addition, you will need to hide the Door-New and Window-New Classes to invisible.

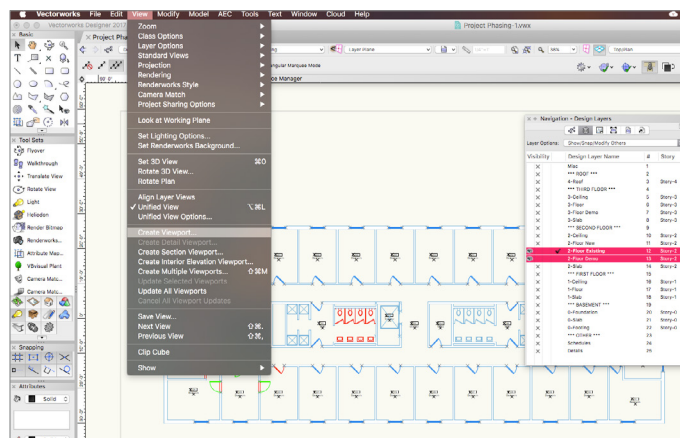


FIGURE 24a
Create Viewport command

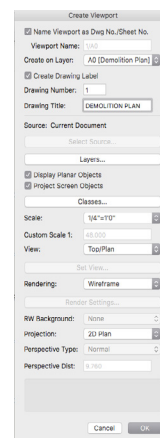


FIGURE 24b
Create Viewport dialog box

EXERCISE: SET UP A DEMOLITION PLAN (CONT'D)

Once the layers and classes visibilities are set, from the **View** menu, select **Create Viewport**. In the dialog box, make sure you select the appropriate sheet layer. In this case, select the A0 sheet layer for a demolition plan. Proceed with the other settings as shown in **FIGURE 24b** and click **OK**. Note: the viewport scale defaults to the same scale as the design layer. You can change the viewport scale either in the Viewport Settings dialog box or afterwards in the Object Info palette. Repeat the same steps when creating a construction plan on sheet A1, with class and layer visibilities as shown in **FIGURE 25**.

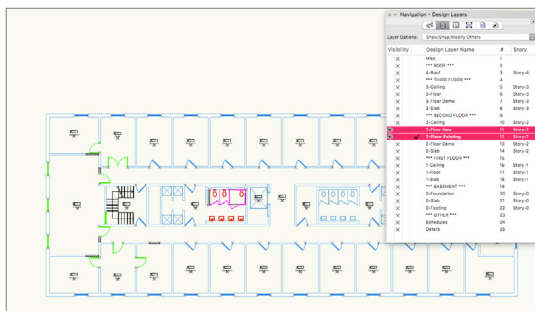


FIGURE 25
Construction plan layer visibility

USING CLASS OVERRIDES

You can use class overrides in a viewport to change the attributes of selected classes. For example, you can change the attributes of the demolition classes to use a specific color and fill to visualize this group of objects with specific attributes.

Select the viewport 1/A0 – Demolition Plan, click the **Classes** button from the Object Info palette. Select the demolition classes and double-click to edit their attributes. When done, you will notice an icon change to indicate which classes are overwritten.

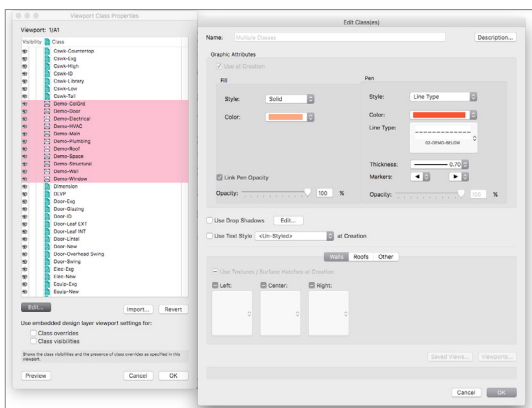


FIGURE 26a
Setting class overrides



FIGURE 26b
Viewport with class overrides display

PART TWO

DATA VISUALIZATION FOR PHASING PLAN

OVERVIEW

Data visualization is a recent feature added in Vectorworks 2017. The idea is that when attaching a custom record format to any object, you can assign a set of specific attributes to this record using the data visualization function of a sheet layer viewport.

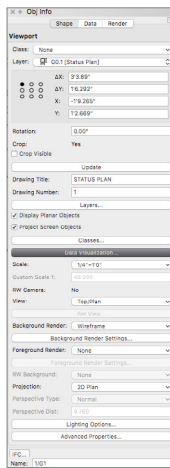


FIGURE 27a
Object Info palette Data Visualization button

This workflow does not remove the need to use classes and layers to represent the object status (existing, demolished, and new) as described in part one of this document, but it provides an additional level of granularity for representing additional details for the phasing of a project, which would eliminate the duplication of these design layers and classes needed for this type of project. For example, perhaps the renovation project is being built in two phases. In a case like this, you may want to show areas of building affected during phase one and two. To do so, you would assign a “status and phase” record to each object to control their appearance on a 2D drawing.

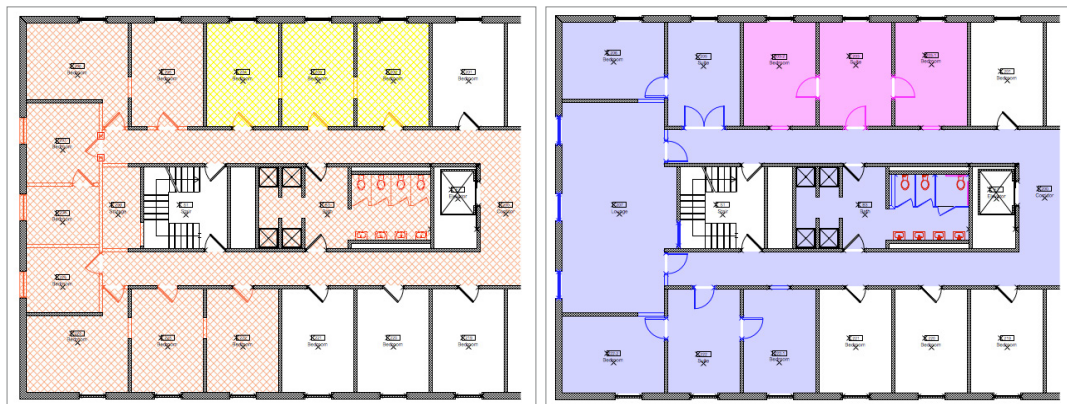


FIGURE 27b
Example of phasing plans using data visualization

DATA VISUALIZATION FOR PHASING PLAN (CONT'D)

CREATE CUSTOM RECORD (STATUS AND PHASE)

The first step for using data visualization is to create a custom record format from the Resource Manager. For our example, we want to be able to represent the object status (existing, demolition, new), and construction phases (phase 1 and 2). The custom records will include the following:

Status: Existing – Demolition – New
Phase: Phase 1 – Phase 2 – Phase 3

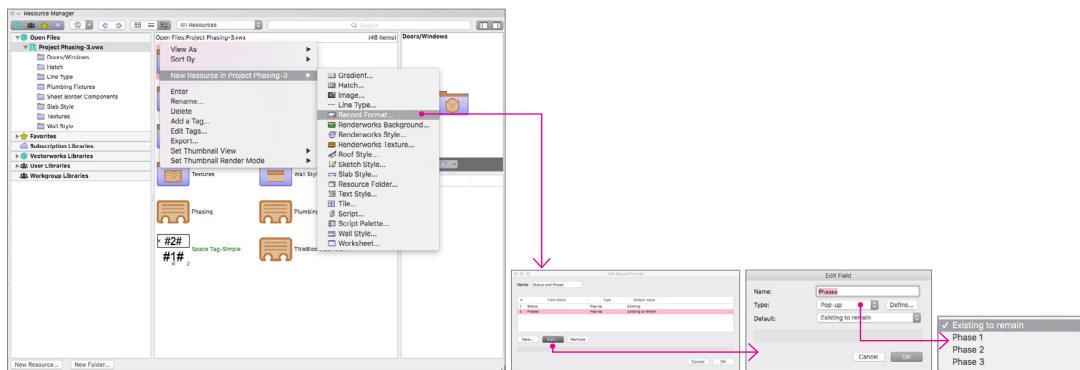


FIGURE 28
Create custom record from Resource Manager

APPLY CUSTOM RECORDS

When created, you can apply the record to the various objects you wish to visualize. For example, you can select all demolition objects by layers, or classes and attach the record from the Data pane of the Object Info palette.

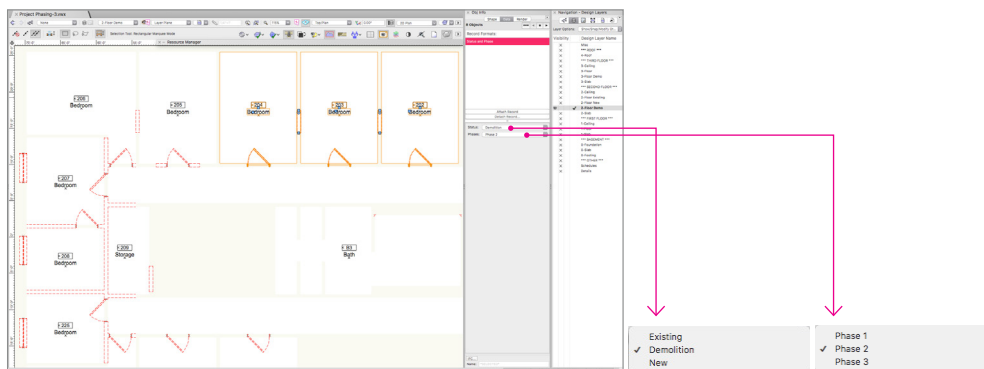


FIGURE 29a
Attach record using Object Info palette Data pane

DATA VISUALIZATION FOR PHASING PLAN (CONT'D)

Note: When using symbols, you can pre-assign this record to them. If you intend using this workflow we recommend you assign the custom record to your current libraries. To attach records to a symbol; right-click on the symbol within the Resource Manager, and select **Attach Record**.

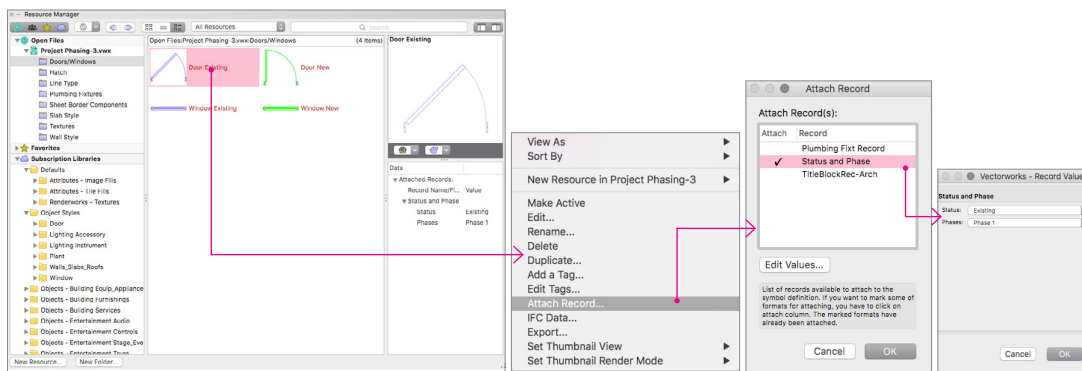


FIGURE 29b
Attach record using the Resource Manager

SETTING UP VIEWPORTS FOR A PHASING PLAN USING DATA VISUALIZATION

Creating a viewport is the same process we reviewed in part one of this document. The viewports classes and layers visibility will be used to correctly represent the demolition plans, and construction plans.

Note that when using data visualization with a viewport, class overrides must be turned off. Select classes with overrides and click the **Revert** button in the viewport class properties.

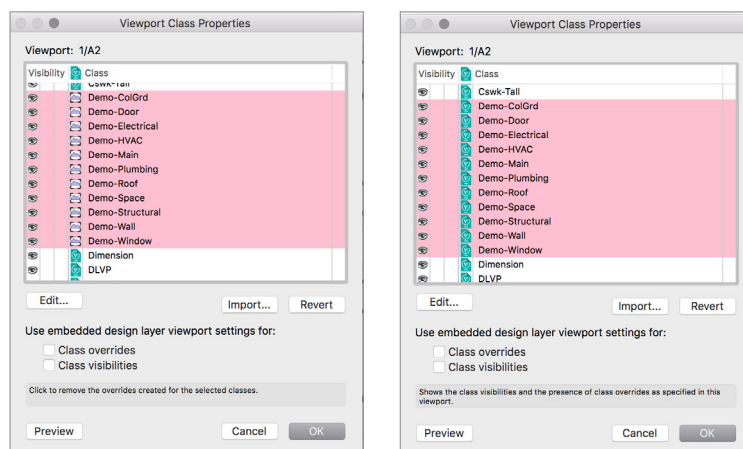


FIGURE 30
Viewport class overrides reverted to default

DATA VISUALIZATION FOR PHASING PLAN (CONT'D)

When a viewport is selected, select **Data Visualization** in the Object Info palette. By enabling data visualization in the upper left corner of the dialog box, you will have access to all records available for edit. You can assign (or change) a set of specific attributes to objects with a record. For this example, we are using the phasing record. Each value and field of the selected record is listed and available to modify.

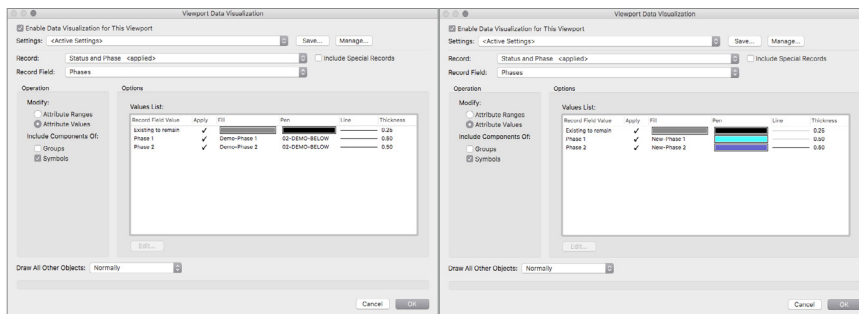


FIGURE 31a
Example of Viewport Data Visualization dialog box

The example below shows the result of using data visualization for a demolition and construction plan by construction phase. The legend can easily be added in the annotation layer of the viewport by assigning the record to a simple rectangle object. Whether you are using a 2D or a 3D/BIM workflow, Data visualization can be used for various types of representations such as a 3D plan view or 2D plan view.



FIGURE 32
Example of viewports using data visualization

USING RECORD FOR BIM COLLABORATION AND IFC EXPORT

Creating a custom record for (status and phases) will give you the ability to export this information for the IFC4 format. For more information about IFC export, refer to “Sharing your Model with IFC” document. See the other resources and information section at the end of this document.

PART TWO

EXERCISE: SET UP A PHASING PLAN

In this exercise, you will learn how to use a custom record and set up a viewport using the data visualization function to generate demolition and phasing plans. Using our recommended workflow, you will learn how to:

- Create a custom record
- Create a phasing plan and demolition plan

CREATE CUSTOM RECORD

To start this exercise, open the file “Project Phasing 3.vwx” provided with this document. You will see that a standard template may not be “ready” for existing, demolition, and new construction statuses.

To create a custom record format, select **New Resource** from the Resource Manager and select **Record Format**.

Once created, the record must be attached to each object. Using the **Custom Selection** command or design layers’ visibility, you can select all demolition objects, attach the record by right-clicking on the record in the Resource Manager and selecting **Apply**. Or, from the Object Info palette Data tab, click **Attach Record**, and select the phasing record.

CREATE PHASING PLAN AND DEMOLITION PLAN USING DATA VISUALIZATION

Two sheet layers were created in the “Project Phasing 3.vwx” file with specific viewports on sheet G0 and G0.1. These viewports do not have data visualization enabled. In this segment, you will assign various attributes to specific viewports to obtain the following results:



FIGURE 33
Sheet layer G0 – phasing plans

EXERCISE: SET UP A PHASING PLAN (CONT'D)

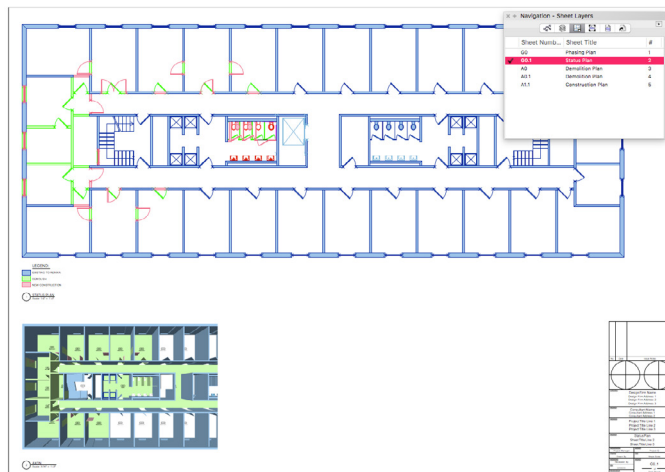


FIGURE 34
Sheet layer G0.1 – status plan

TO SET UP DATA VISUALIZATION:

1. Select sheet layer G0.1 and select the Status Plan viewport.

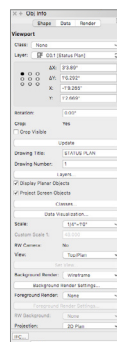


FIGURE 35
Object Info palette for viewport

2. Click the **Data Visualization** button in the Object Info palette to open the Viewport Data Visualization dialog box.

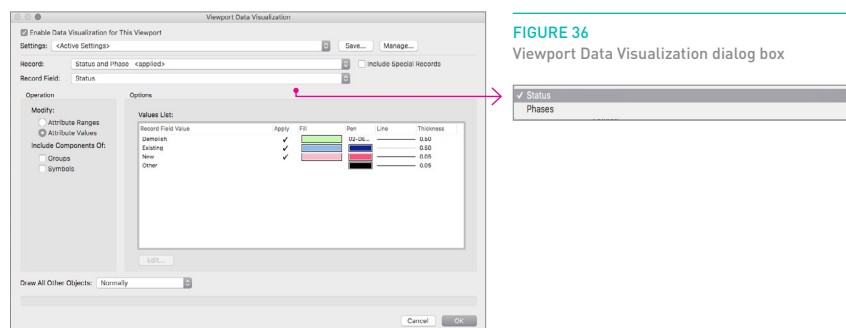


FIGURE 36
Viewport Data Visualization dialog box

EXERCISE: SET UP A PHASING PLAN (CONT'D)

FROM THE VIEWPORT DATA VISUALIZATION DIALOG BOX FOLLOW THESE STEPS:

1. Select **Enable Data Visualization for This Viewport**
2. Select Status in **Record File** (of any custom record you created)
3. The **Values List** displays each record available for the viewport. Double-click or select the value and select **Edit**. Change the attributes as shown on **FIGURE 37**.

Note: ensure that a check mark is displayed in the **Apply** column for each value you wish to use.

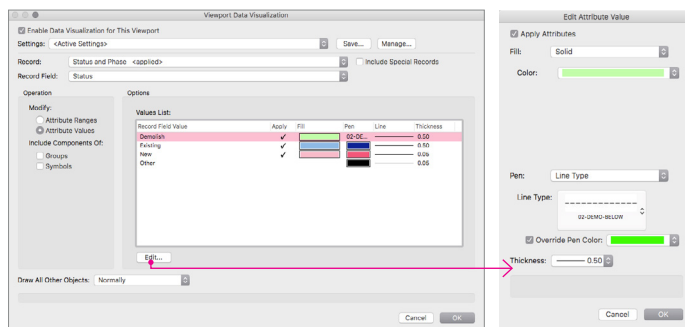


FIGURE 37
Edit Attribute Value dialog box from the Values List

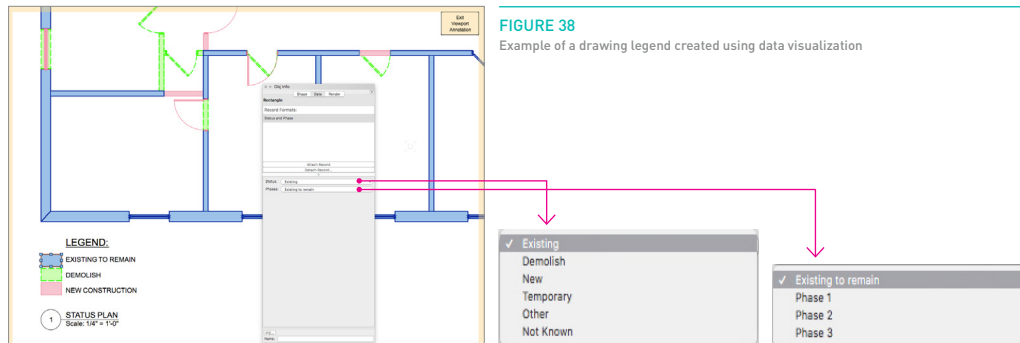


FIGURE 38
Example of a drawing legend created using data visualization

CREATE THE DRAWING LEGEND FOR THE STATUS PLAN VIEWPORT:

1. Double-click on the viewport and in the dialog box that opens, select to **Edit Annotations**.
2. Select each rectangle, and from the Object Info palette Data pane select the **Status and Phase** record and click **Attach Record**. In the Object Info palette, below the list of records displays the record information pertaining to this record. Select the **Status** Existing and **Phase** Existing to remain from the drop-down menu. Repeat these same steps for the rectangles representing "Demolish" and "New Construction." When finished, click **Exit Viewport Annotations**. The rectangles should change their appearances to match the selected data visualization attributes.

SUMMARY

There are many ways to achieve the desired result with Vectorworks. Whether you are using a 2D workflow or a 3D/BIM workflow, when working on renovation projects, we recommend you create template files and libraries that suit your specific needs with the proper classes and layers, as well as object/symbol libraries that will facilitate the process. You will need to create the proper classes with specific attributes to view the building objects by status or phase.

Your template should include at a minimum:

Layers:

- Floor layer
- Demolition layer

Classes:

- Demolition-Door
- Demolition-Window
- Demolition-(other)
- Door-Existing
- Door-New
- Window-Existing
- Window-New

Wall style:

- Generic-Existing
- Generic-New

Window and Door (and other PIO) Styles:

- Generic-Existing
- Generic-New

Symbols (2D/3D hybrid)

- Fixture-Existing
- Fixture-Demo
- Fixture-New

SUMMARY (CONT'D)

For your reference, you can open the file “Project Phasing-4.vwx” for the completed example file.

Click [here](#) download all tutorial files related to this workflow document.

OTHER RESOURCES AND INFORMATION

[Data visualization – a tutorial](#)

[Sharing your model with IFC](#)

LEARN MORE

about how Vectorworks can help you
implement and develop BIM workflows.

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