INTRODUCTION:

The Revit Model Review software has limited functionality for checking models for more advanced standards, such filter colors and hosting of elements. However, by modifying the standard Revit content families and types to include additional information, the limits of the REVIT MODEL REVIEW program can be supplemented. Also, some forms of "checking" can be better handled within the native Revit program.

Discipline Color:

Requirement:

Develop a check to determine if elements have been assigned the correct discipline color.

Solution:

Revit does not handle color the same way as AutoCAD. In order to assign a specific color to each discipline, it would be necessary that all family content be updated with a shared parameter called "Discipline Color" which is a material property. Once the parameter is added and applied to each family, the color would need to be set for each element in the model according to its discipline. We have created a check to check the value of the "Discipline Color" parameter.

The "Discipline Color" parameter can be applied to System Families (walls, ducts, pipes, etc.) within the project, but there is no way to override the visibility of the inherent material property in system families. For example, the magenta color can be applied to all elements that are classified in the return air system, but the return air ducts will still appear as gray.

Recommended Solution:

A solution to make better use of the built in capabilities of color filters in Revit would be to set up filters to allow one to quickly color selected components within a model. The filters could then easily be switched on or off. For example, all mechanical supply ducts could quickly be changed to show up as green and all return ducts could be set to show up as orange. The GSA BIM standard suggests using filters for MEP items, but filters could be created for other disciplines as necessary for a quick visual review of components. There is a limitation to setting up filters in Revit. There would need to be a filter set up for each view in Revit.

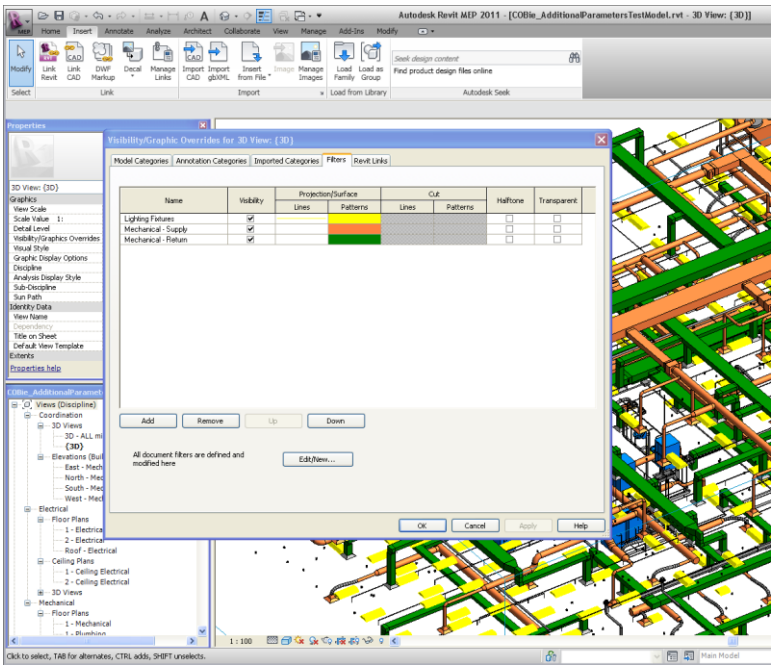

Figure 1 – Example Filters Usage for Quick review of System Types

We recommend using the Region 5 BIM Standards suggestion for discipline/element colors adding color filter requirements for windows, doors, and walls. Page 12 of the current GSA Region 5 BIM Standards includes the image shown below.

Name	Visibility	Projection/Surface	
		Lines	Patterns
Sanitary	☑		
High Pressure Steam	☑		
HVAC - Supply	☑		
HVAC - Return	☑		
HVAC - Exhaust	☑		
Domestic Hot Water Supply	☑		
Domestic Hot Water Return	☑		
Sanitary Vent	☑		
Industrial Waste	☑		
Storm Drain	☑		
Storm Drain (Overflow)	☑		
Natural Gas	☑		
Compressed Air	☑		
Medical Gas	☑		
Reverse Osmosis Water	☑		
Nitrogen	☑		
Propane	☑		
Fire Protection - Sprinkler	☑		
Fire Protection - C02	☑		
Fire Protection - Halon	☑		
Fire Protection - Inert Gas	☑		
Chilled Water Supply	☑		
Chilled Water Return	☑		
Low Pressure Steam	☑		
Medium Pressure Steam	☑		

Revit MEP View Filters

Figure 2 – Image from GSA BIM Standard Guidelines

Element Location (Interior element hosted in interior wall & exterior element hosted in exterior wall):

Requirement:

Develop a check to determine whether or not elements are placed in the correct host. This applies to doors only.

Recommended Solution:

The recommended solution at this time would be to include doors types in the template preset for exterior or interior use by applying the correct Uniformat assembly code, and as a way to organize the elements within the project browser window, include a prefix of either EXT or INT for all families. This naming convention also needs to be applied to the walls since the check looks for this prefix in those components. This requires that all the standard GSA wall and door families be renamed, but it would help tremendously in organizing and accessing information as well as providing the necessary criteria for REVIT MODEL REVIEW to analysis.

The proposed family naming convention for exterior and interior types should be set up in the following way:

- EXT – Single Flush Door
- INT – Single Flush Door
- EXT – 12" – Single Wythe CMU Bearing
- INT – 4-7/8" – Metal Stud and Gyp. Bd.

Another important parameter that should be set includes the UniFormat assembly code. This information can be used by outside programs to help with cost estimating as well as automating specifications.

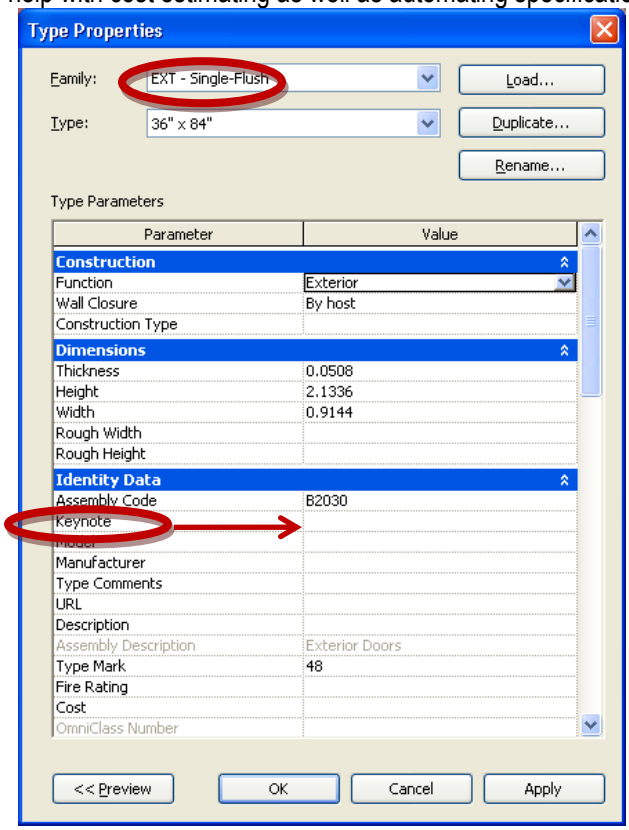

Figure 3 – Type Properties Dialog Box

Element Location (Vertical Position in Space):

Requirement:
Develop a check to determine if light fixtures are placed at the correct height.

Recommended Solution:
Create elevation work levels that light fixtures can be hosted to within the MEP model. These levels markers would only be used for coordination and could simply be turned off through the use of filters. Since the architect is typically responsible for developing ceiling heights for a project, it is recommended that the work levels be created by the architect and that the MEP engineer utilize the copy monitor feature in Revit to monitor changes to the reference ceiling height levels. This will allow the MEP consultant to keep track of any ceiling height changes and allow them to quickly update their monitored levels as necessary.

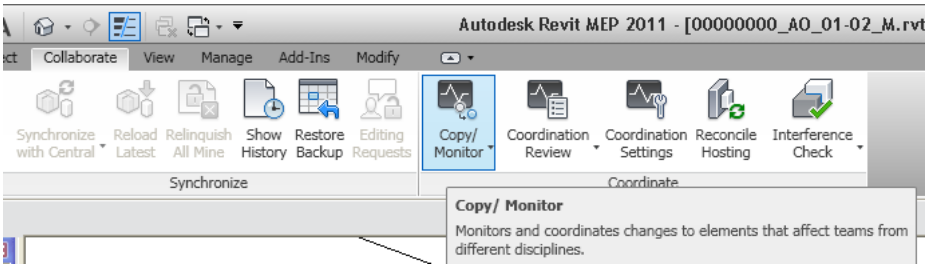

Figure 4 – Copy/Monitor tool location

This would help ensure that no light fixture elements show up as “Orphaned”. An “Orphaned” host type happens either when the link to an architectural model containing a ceiling is removed OR upon reloading a linked architectural model where the ceiling has been deleted and replaced. Using ceiling mounted light fixture families is not recommended since the ceiling element would need to be in the active MEP file; ceiling based families cannot be hosted to ceilings in linked models in the 2011 version of Revit.

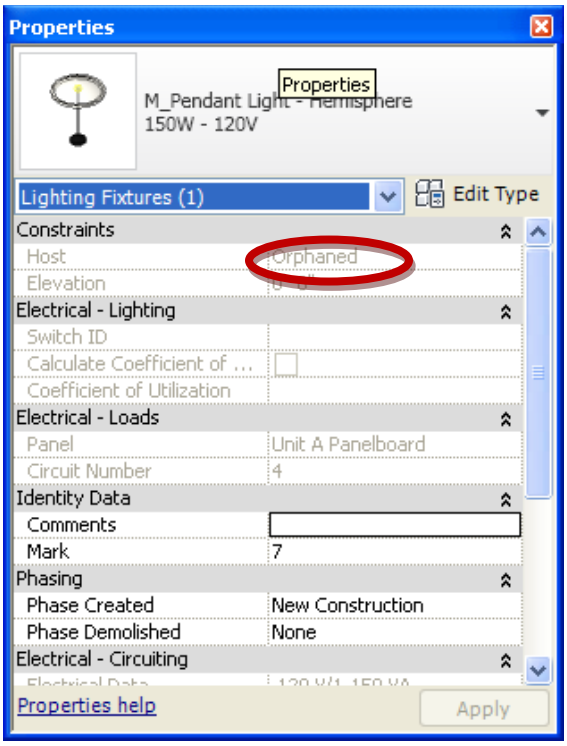

Figure 5 – Orphaned Fixture

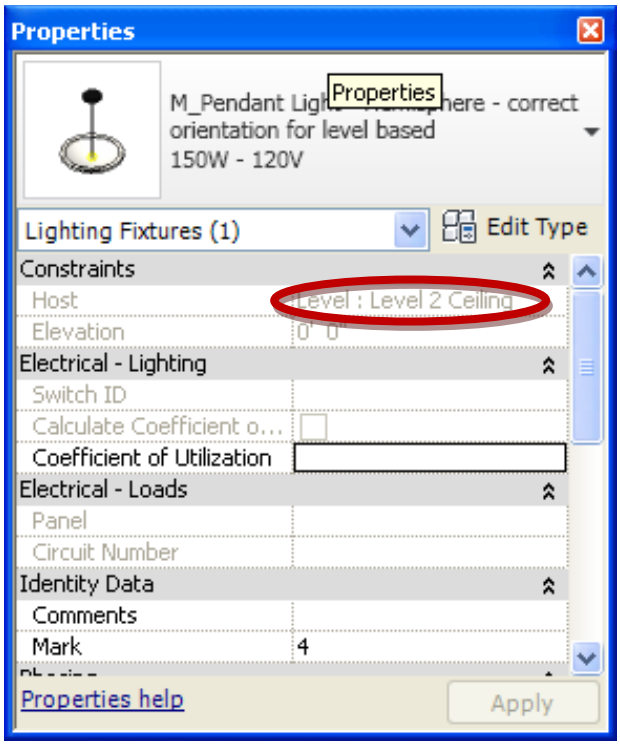

Figure 6 – Fixture Assigned to Work Plane