Revit MEP: Wants, Needs, Wishes

`5` Electrical Riser/Single-Line Diagrams

Discipline: **Electrical** / Classification: **Desired Functionality** / Pain Factor: **Crippling**

Problem: Revit has the capability of creating a full electrical system, ranging from the devices and branch panels to main switchgear. There is enough information to build simple system diagrams, but Revit completely lacks this ability.

Proposed Solution: A new View Type (named "System Diagrams") should be introduced, which would combine the functions of a Schedule and a Drafting View, meaning that it would populate with the data from the project and also allow a user to create annotative elements (i.e. Lines, Text, Tags) in the view.

It would be simply impossible to create a static appearance that would satisfy the infinitely diverse standards of different countries (let alone different firms), therefore, the appearance of these Views (for both graphics and data) would have to be controlled by highly customizable templates, similar to the way that Electrical Panel Schedules are.

For the most part, Electrical Equipment that is included in the View (which would follow the same filter methods as a standard schedule), could be displayed as if viewed from the front OR symbolically, by a Generic Annotation family. Elements would be arranged according to location (left-to-right order based on a specified direction, like 'east') and level. They would also have the option to be separated by Location (Space Number and Name). Furthermore, the spacing between graphic elements should be a specifiable value. Electrical wiring would be drawn between elements according to the system connections, would have a customizable appearance, and would be eligible for Wire Tags.

Comments: The above is very vague and non-specific. This would require extreme effort and extensive research to develop properly. However, the ability to create these diagrams is essential to making Revit a fully capable program.

`4` Panelboard Mains and MCB Rating

Discipline: **Electrical** / Classification: **Development Flaw** / Pain Factor: **Major**

Problem: Electrical panelboards possess two parameters, "Mains" and "MCB Rating", which are define as Instance and Type Parameters, respectively. These Parameters Types are **reversed**. The mains value of panelboards tend to be of a more constant value, whereas main breakers will be more diverse as they are sized more precisely to a panelboard's total load. This is suspected to be a programming mistake, as the parameter "Mains Type" is in fact a Type Parameter.

Proposed Solution: Change "Mains" to be a Type Parameter, and change "MCB Rating" to be an Instance Parameter.

Electrical - Circuiting	
Mains (default)	200.00 A
MCB Rating	150.00 A
Mains Type	

Should be...

Electrical - Circuiting	
Mains	200.00 A
MCB Rating (default)	150.00 A
Mains Type	

`3` Five-Wire Distribution System

Discipline: **Electrical** / Classification: **Desired Functionality** / Pain Factor: **Moderate**

Problem: Revit cannot create a 5-wire distribution system, the fifth wire representing a dedicated neutral wire.

Proposed Solution: Modify to allow a user to set the 'Wires' value of an Electrical Distribution System to 5 Wires.

Electrical Settings

- Hidden Line
- General
- Wiring
- Voltage Definitions
- Distribution Systems
- Cable Tray Settings

	Name	Phase	Configuration	Wires	L-L Voltage	L-G Voltage
1	120/208 Wye	Three	Wye	4	208	120
2	120/208 Wye (5W)	Three	Wye	5	208	120
3	480/277 Wye	Three	Wye	4	480	277

Work-Around: Create a separate Tag that shows a static value in lieu of reporting the actual "Number of Wires".

Revit MEP: Wants, Needs, Wishes

3 Incorrect Transformer Data

Discipline: **Electrical** / Classification: **Development Flaw** / Pain Factor: **Moderate**

Problem: The values of the parameters "Number of Phases" and "Number of Wires" are incorrectly retrieved from the data of the secondary connection rather than that of the primary connection. This means that if the panelboard on the secondary side of a transformer has a different number of phases or wires, the reported data will be wrong.

Proposed Solution: The "Number of Phases" and "Number of Wires" parameter values should be pulled from the data of the primary electrical distribution system.
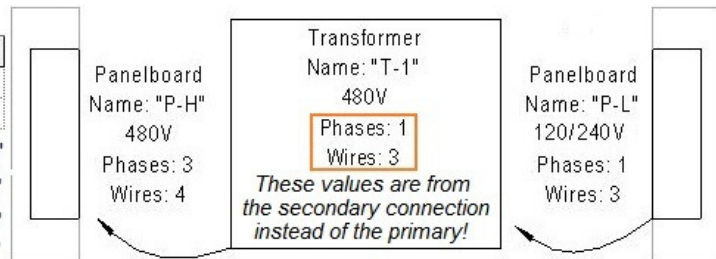

Work-Around: Create a dedicated Electrical Equipment Tag for transformers that either displays a static text value or reports Shared Parameters in lieu of reporting the actual "Number of Phases" and "Number of Wires" parameters.

2 Secondary Distribution Selector

Discipline: **Electrical** / Classification: **Workflow Improvement** / Pain Factor: **Minor**

Problem: Whenever an electrical panel is selected, a pull-down list becomes available on the options bar, titled "Distribution System:", which enables the user to quickly choose an electrical distribution system in lieu of having to hunt through the instance's properties to find the parameter. When a transformer is selected (Category: Electrical Equipment, Part Type: Transformer), the same pull-down list is available. However, since transformers require a secondary distribution system, the user must still search the instance's properties for the appropriate parameter.

Proposed Solution: Whenever a user selects an electrical transformer, an additional pull-down list, titled "Secondary Distribution System:", should become available. This would be located to the right of the original pull-down list.
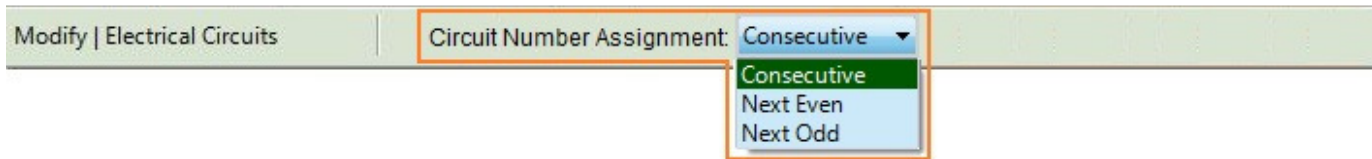
Revit MEP: Wants, Needs, Wishes

3 Circuit Numbering Sequence
Discipline: **Electrical** / Classification: **Workflow Improvement** / Pain Factor: **Moderate**

Problem: When new electrical circuits are created and connected to a panelboard, the next available circuit number is assigned to the circuit. When creating consecutive circuits, this count is "1, 2, 3, etc." under typical circumstances. However, many circuit numbers are assigned in such a way as to keep circuits in similar areas on the same side (left/right) of a panelboard, thus, are commonly assigned a circuit number in the order "1, 3, 5, etc." or "2, 4, 6, etc."

Proposed Solution: When a user is in the process of creating a new electrical circuit or otherwise editing an electrical circuit that has not yet been assigned to a panel, a new pull-down list should become available on the options bar, titled "Circuit Number Assignment", which would control how Revit will assign the next available circuit number. The three self-explanatory options on this new pull-down list would be "Consecutive", "Next Even", and "Next Odd", which would, when the circuit is connected to a panel, assign the next available circuit number that fits the selection. Additionally, Revit would retain the value of this setting until it is changed or the project is closed.

| Modify	Electrical Circuits		Circuit Number Assignment:	Consecutive ▼
				Consecutive
				Next Even
				Next Odd

3 Split/Merge Circuits
Discipline: **Electrical** / Classification: **Workflow Improvement** / Pain Factor: **Moderate**

Problem: During the design process (and as a result of scope of work changes to a project), we often encounter a situation in which we need to separate elements of an existing electrical circuit and create two separate circuits. Inversely, we also possess the need to combine elements of two or more existing electrical circuits into a single circuit.

Proposed Solution: The new commands, "Split Circuit" and "Merge Circuits", would be added to the contextual tab, "Modify | Electrical Circuits". Each of these commands would become available only when a single electrical circuit or multiple electrical circuits are selected, respectively. This means that they will never be available at the same time.

The "Split Circuit" command, which would only available when a single electrical circuit is selected, would prompt the user to select elements in the exact same fashion that one would remove elements from an electrical circuit. Upon completion, these 'removed' elements would be removed from the original circuit and re-assigned to a new electrical circuit which would inherit all properties of the original and then be connected to the same panel and assigned a circuit number as a new circuit.
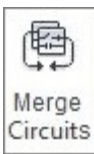
The "Merge Circuits" command, which would be available only when one or more circuits are selected, would first evaluate the properties of the selection and return an error if one or more of the circuits have incompatible properties (i.e. voltage) or if the new load would exceed limits. The user would then be prompted to select one of the selected circuits (via dialog box) to merge the other circuits into, thus creating a single electrical circuit.

2 Create New Circuit
Discipline: **Electrical** / Classification: **Workflow Improvement** / Pain Factor: **Minor**

Problem: Creating multiple electrical circuits one-by-one is very slow and arduous in Revit. A user must 1.) select an element, 2.) click the icon to create a new circuit, 3.) click on "Edit Circuit" to add elements for that circuit, 4.) and then click "Select Panel" or use the pull-down list to. Repeating these four steps over and over is very time consuming.

Proposed Solution: When an electrical circuit is selected, there should be a new button added to the contextual tab, titled "New Circuit", that would allow the user to create circuit a little more quickly. Upon activation, the current selection is deselect and the user is brought to the "Edit Circuits" function, and is prompted to select the elements to be added to the new electrical circuit. This new circuit will automatically be connected to the same panel that the previous electrical circuit was connected to. If no elements are selected, the circuit is not created. While editing the circuit, the user should have a new option, titled "Finish Circuit and Repeat", which would be located beside the

Revit MEP: Wants, Needs, Wishes

standard "Finish Editing Circuit" button. If activated, this command will finish the current circuit and begin a new one in the exact same fashion. This will allow the user to effectively skip steps 3 and 4, and step 1 with the repeat option.

Additionally, this tool would also be available when a panel is selected. This would allow for an alternate workflow which would be the reverse of the standard method: a user could circuit from the panel by selecting one and clicking "New Circuit" and then selecting elements as described above. This would increase the efficiency of mass-circuiting by increasing the speed at which a user can repeatedly create them.

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2 Quick Disconnect
Discipline: **Electrical** / Classification: **Workflow Improvement** / Pain Factor: **Minor**

Problem: When revising electrical circuits and switch systems, it is often an arduous process to reassign elements to a new circuit and/or switch system. Also, sometimes a need to remove many elements from their electrical circuit(s) and/or switch systems arises.

Proposed Solution: Three new tools, "Disconnect Power", "Disconnect Switch", and "Disconnect All", would be available on a fly-out menu located on the ribbon. Selecting one of these tools will prompt the user to select elements to be removed from their current electrical circuit, switch system, or both, respectively. The user could select one or more elements, and any circuits or switch systems that would result in being "empty" would be deleted. This tool would also disconnect any secondary electrical connectors.

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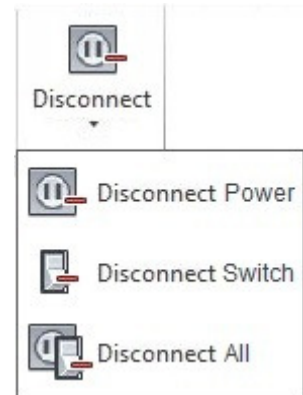
2 Match Connections
Discipline: **Electrical** / Classification: **Desired Functionality** / Pain Factor: **Minor**

Problem: Often, we desire to have to ability to quickly group a bunch of electrical elements (most commonly light fixtures) onto an existing circuit and/or switch system. Using the 'Edit Circuit' and 'Edit Switch System' method is slow.

Proposed Solution: A new command would be added, titled "Match Connections", which would function in a manner similar to Match Properties, except that the selected elements would inherit and be connecting into the same electrical circuit and switch system as the source element. This is provided, of course, that the selected elements are compatible with the source's electrical properties.

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1 Calculate Load of Selected
Discipline: **Electrical** / Classification: **Workflow Improvement** / Pain Factor: **Negligible**

Problem: When creating electrical circuits, it can be cumbersome to create the circuits only to find that the electrical load is too high or has a lot of leeway. Creating a circuit schedule or frequenting the panel schedule to check is slow.

Proposed Solution: A small icon ( ) should appear on the status bar just to the left of the selection filter tool whenever at least one elements with an electrical connector is selected. Upon clicking on this icon, Revit would display a dialog box that reports the sum of the apparent load of the selected elements' primary connectors. This report would be divided by voltage (giving separate totals) and by number of poles (more separate totals), according to the information within these connectors. In essence, this is a mini-schedule for fast, on-the-spot calculations.