Sheet Manager Tools

(Updated 2015-11-16 by Jinsol Kim)

Overview

The Sheet Manager Tools consists of two separate components, Sheet Data Editor and Sheet Data Manager, which read and write the same structure of database schema to communicate between those two components with database files.

The Sheet Data Editor is a stand-alone tool that has built as a ClickOnce application which can be installed and run on users' desktop. The Editor will provide features to create SQLite database files and manipulate contents of the data within individual windows for each corresponding tables *(See more details in 1. Sheet Data Editor)*.

On the other hands, **The Sheet Data Manager** is a Revit add-in tool that reads data from the database file generated by the Editor and create new elements or update existing elements of Sheets, Revisions, and Views in Revit *(See more details in 2. Sheet Data Manager (Add-In))*.

If a certain database is connected with the updater feature on, the add-in will register updaters that monitors all sheets and revisions elements and their parameters, so that if any of changes on those two categories of elements are detected, the modification will be applied to the connected database *(See details in 3. Data Updates)*
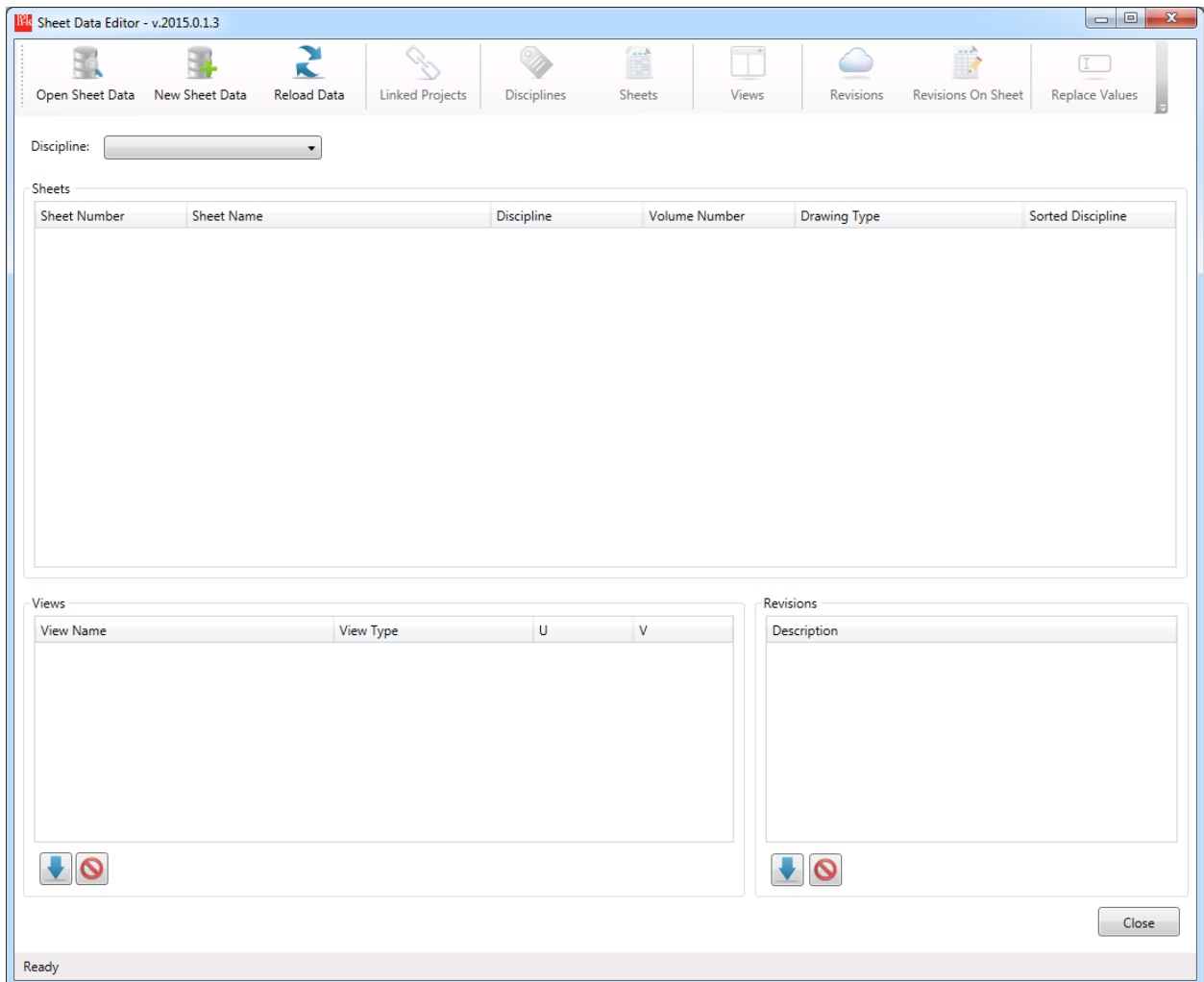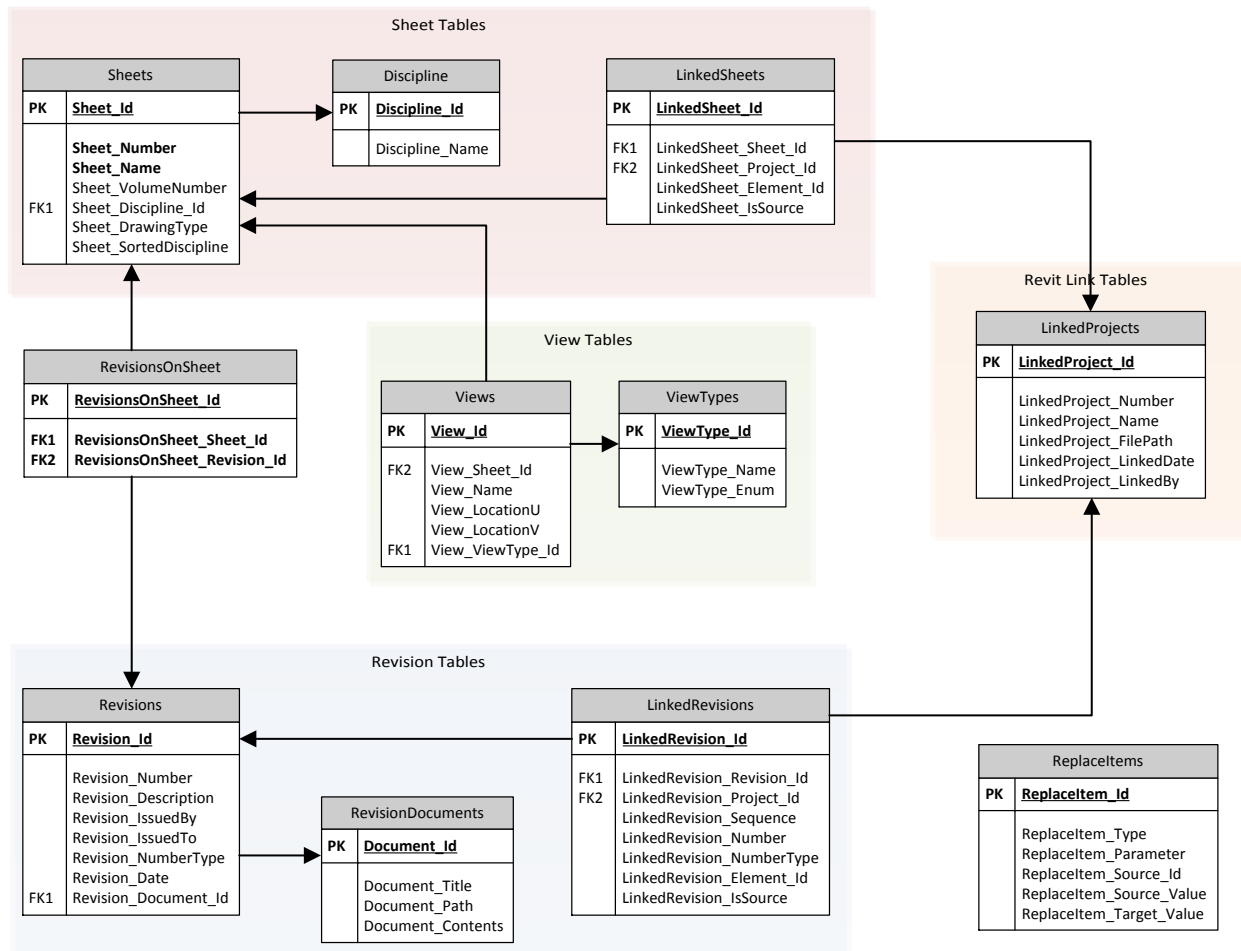
Contents

1. Sheet Data Editor

In the Sheet Data Editor, users can create a new database file to be connected to the sheet Data

Manager for the future use, and modify the contents of each individual items by creating relationships

between items.

1.1 Database Tables

The database schema defines 11 tables related to sheets, revisions, views and links to Revit elements.

Sheet Tables

Sheets

PK	Sheet_Id
	Sheet_Number
	Sheet_Name
	Sheet_VolumeNumber
FK1	Sheet_Discipline_Id
	Sheet_DrawingType
	Sheet_SortedDiscipline

Discipline

PK	Discipline_Id
	Discipline_Name

LinkedSheets

PK	LinkedSheet_Id
FK1	LinkedSheet_Sheet_Id
FK2	LinkedSheet_Project_Id
	LinkedSheet_Element_Id
	LinkedSheet_IsSource

Revit Link Tables

LinkedProjects

PK	LinkedProject_Id
	LinkedProject_Number
	LinkedProject_Name
	LinkedProject_FilePath
	LinkedProject_LinkedDate
	LinkedProject_LinkedBy

RevisionsOnSheet

PK	RevisionsOnSheet_Id
FK1	**RevisionsOnSheet_Sheet_Id**
FK2	**RevisionsOnSheet_Revision_Id**

View Tables

Views

PK	View_Id
FK2	View_Sheet_Id
	View_Name
	View_LocationU
	View_LocationV
FK1	View_ViewType_Id

ViewTypes

PK	ViewType_Id
	ViewType_Name
	ViewType_Enum

Revision Tables

Revisions

PK	Revision_Id
	Revision_Number
	Revision_Description
	Revision_IssuedBy
	Revision_IssuedTo
	Revision_NumberType
	Revision_Date
FK1	Revision_Document_Id

RevisionDocuments

PK	Document_Id
	Document_Title
	Document_Path
	Document_Contents

LinkedRevisions

PK	LinkedRevision_Id
FK1	LinkedRevision_Revision_Id
FK2	LinkedRevision_Project_Id
	LinkedRevision_Sequence
	LinkedRevision_Number
	LinkedRevision_NumberType
	LinkedRevision_Element_Id
	LinkedRevision_IsSource

ReplaceItems

PK	ReplaceItem_Id
	ReplaceItem_Type
	ReplaceItem_Parameter
	ReplaceItem_Source_Id
	ReplaceItem_Source_Value
	ReplaceItem_Target_Value

1.2 Create Database
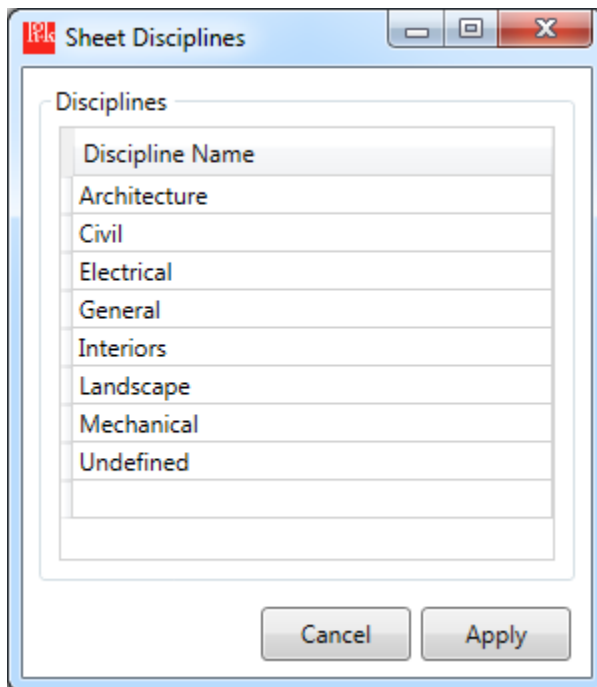
Open Sheet Data   New Sheet Data

You can either open an existing template database file or create a new file to start entering sheet items on the file. By Clicking New Sheet Data button, it will create the entire set of data tables in the file and connect to each components in the Editor.

1.3 Sheets and Disciplines Items

Discipline Items

Disciplines

- To add a discipline, enter a name in the last row and hit Enter key.

- To delete a discipline item, select the item and hit Delete key.

Sheet Items

Sheets

G009	COVER SHEET	Volume 1	General
			Architecture ▼

- To add a sheet item, enter sheet information and select a discipline from the drop-down menu at the last row and hit Enter to move next row.

  ** Sheet Number and Sheet Name fields are required and colored with red fill.

- To delete sheet items, select row headers (marked as a red rectangle above) and enter Delete key.

- To Auto-Fill like Excel spreadsheet, **right click** on a cell to be copied and drag and drop to a cell to fill auto-incremented values.

  If the initial cells contain numeric suffixes, the difference will be calculated from two first rows and will keep adding the amount for the rest of the rows. Default step is 1.

- To search items, select a column name from the drop down menu, and enter a search text and hit Enter or the search button. If empty string is entered, it will display the default view.

- Click the **Apply** button to save changes in the database.

1.4 Revisions and Matrix Items
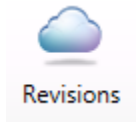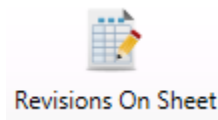

Revisions

Revision Items

- To add a revision item, enter revision information at the last row and hit enter.
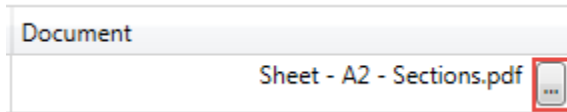
You can select a linked document to a revision item by clicking the […] button in the cell.

- To copy revision item, right click on the source cell and drag drop to the destination cell.

- To delete items, select row headers or individual cells and enter Delete key.

- Click the Apply button to save revision items in the database.

Revisions On Sheet

Revisions on Sheet Matrix

After creating sheet and revision items, you can define matrix between those two categories.

-Select revisions to be included on sheets and click the Apply button.

1.5 View Items

Views

View Name	Sheet Number	View Type	U	V
01 - Entry Level	A101	Floor Plan	0.3	0.3
02 - Level 2	A202	Floor Plan	0.5	0.5
03 - Level 3	A301 ▾	Floor Plan	0.1	0.1

- To add view items, enter view information at the last row and assign a sheet number from the

drop-down menu.

** View Name and UV location will be required for the view to be placed on the assigned sheet.
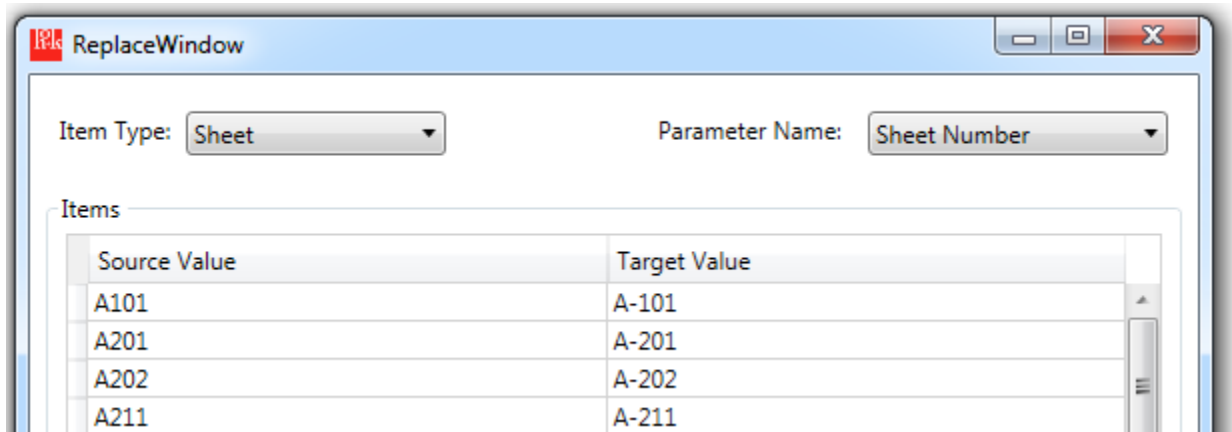
- To delete items, select row headers or cells and enter the Delete key.

- Click the **Apply** button to save the items in the database.

1.6 Replacement Items

Replace Values

Sheet Number

ReplaceWindow

Item Type: Sheet   Parameter Name: Sheet Number

Items

Source Value	Target Value
A101	A-101
A201	A-201
A202	A-202
A211	A-211

- To renumber sheets, select Sheet in the item type menu, and Sheet Number for the parameter name.

If sheets of which names are matched to the source value exist in the Revit, they can be replaced with

the assigned target values.

View Name

Item Type:	View	Parameter Name:	View Name

Items

Source Value	Target Value
01 - Entry Level	01_FP_Entry Level
02 - Level 2	02_FP_Level 2

- To rename views, select View as an item type and View Name as a parameter name.

If names of views defined in the source value are found in Revit project, they can be overwritten with
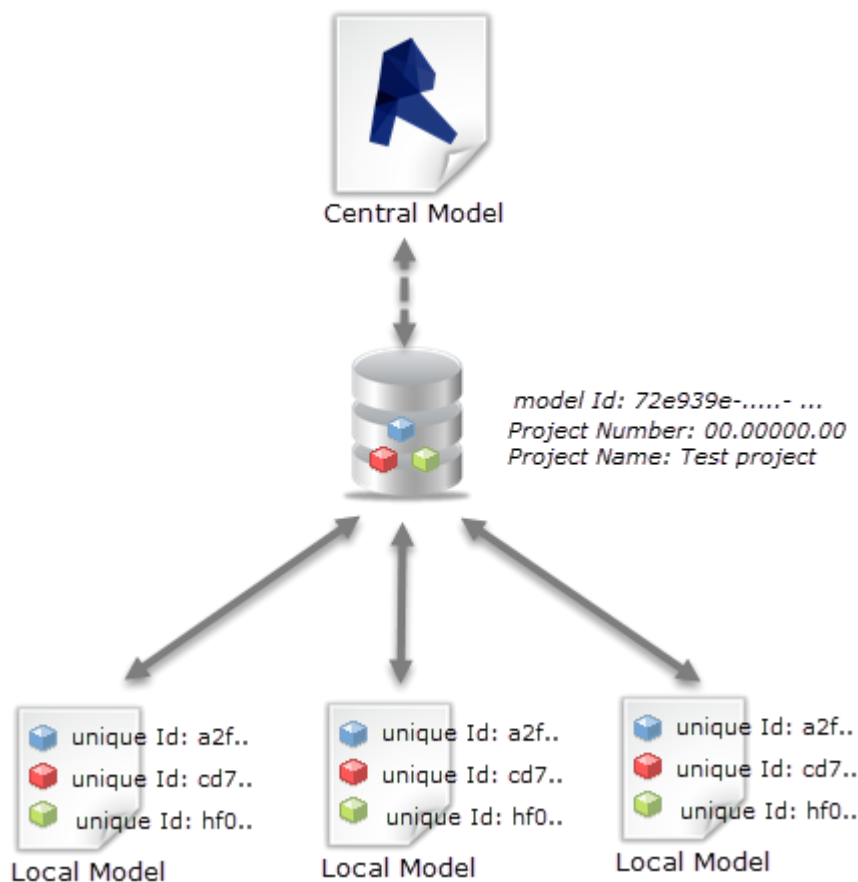
the target values.

2. Sheet Data Manager (Add-In)

Sheet Data Manager
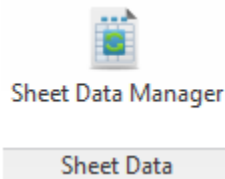
Sheet Data

Once the sheet data has been prepared by the Editor, users can connect the database to a certain Revit project to manage sheet and revision elements by synchronizing data between Revit elements and the connected database. When initializing the Sheet Data Manager, all existing sheet and revision elements not recognized by the database will be written in the database with the link information.

2.1 Revit Model Requirements

Project Information and Worksharing

Central Model

model Id: 72e939e-.....- ...
Project Number: 00.00000.00
Project Name: Test project

unique Id: a2f..
unique Id: cd7..
unique Id: hf0..
Local Model

unique Id: a2f..
unique Id: cd7..
unique Id: hf0..
Local Model

unique Id: a2f..
unique Id: cd7..
unique Id: hf0..
Local Model

If it's the first time to open the database in a certain Revit project, the Sheet Data Manager will record the project information and the central model path by creating a single **model ID** (as GUID) per a central model and storing the model ID in _Extensible Storage_. When users work on their own local files, and connect to the same database file, the local models will be given the equivalent model ID as the central model in order to share the status of linked items in the work-sharing environment.

- Enter a valid project number and a project name in Project Properties.

Shared Parameters in Sheet
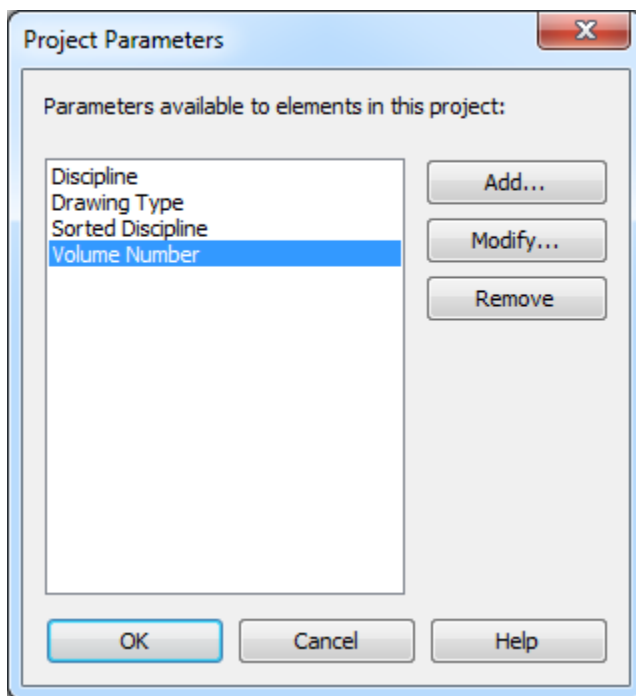
- From the HOK standard shared parameter file, add shared parameters under the HOK Title Sheets group to the Sheets category.
- Required Parameters: "**Discipline**", "**Drawing Type**", "**Sorted Discipline**", "**Volume Number**"

  (Shared Parameter File: V:\RVT2016\HOK Support\HOK Shared Parameters.txt)

2.2 Connect To a Database
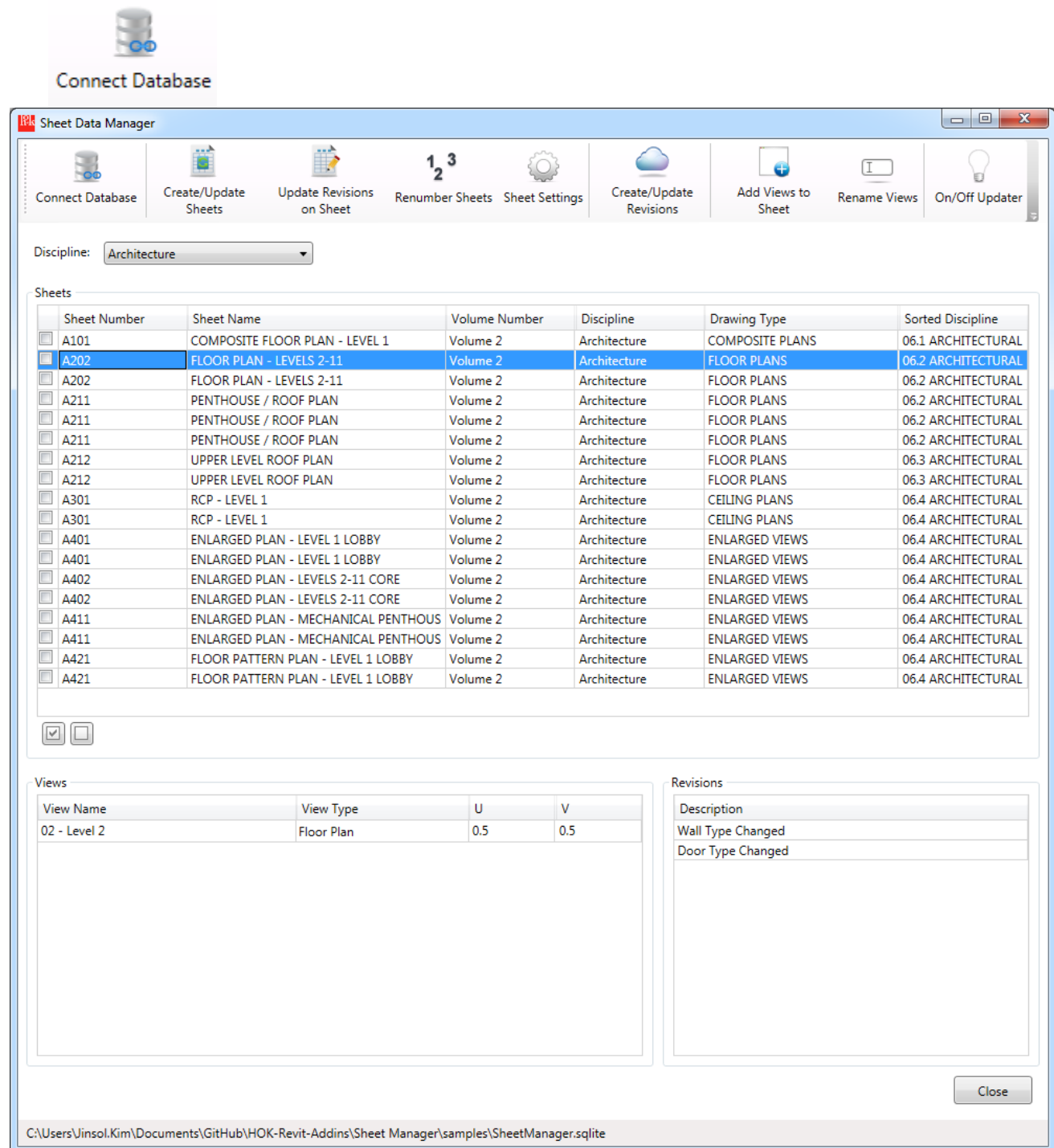
Connect Database

- Click the **Connect Database** button and open a database file generated by the Editor. The status label in the bottom of the window will show the currently linked database file.

2.3 Creating or Updating Sheets
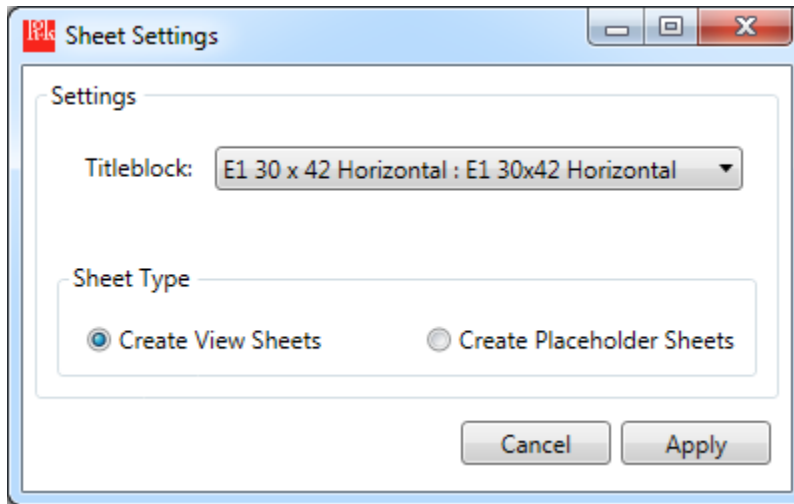
Sheet Settings

- Before creating sheets in the current Revit project, review the sheet settings to select a

 titleblock family and a sheet type.

Create/Update Sheets
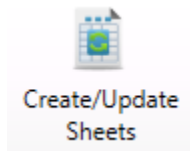
Discipline: Architecture

Sheets

	Sheet Number	Sheet Name	Volume Number	Discipline	Drawing Type	Sorted Discipline
☑	A101	COMPOSITE FLOOR PLAN - LEVEL 1	Volume 2	Architecture	COMPOSITE PLANS	06.1 ARCHITECTURAL
☑	A202	FLOOR PLAN - LEVELS 2-11	Volume 2	Architecture	FLOOR PLANS	06.2 ARCHITECTURAL
☑	A202	FLOOR PLAN - LEVELS 2-11	Volume 2	Architecture	FLOOR PLANS	06.2 ARCHITECTURAL
☑	A211	PENTHOUSE / ROOF PLAN	Volume 2	Architecture	FLOOR PLANS	06.2 ARCHITECTURAL
☐	A211	PENTHOUSE / ROOF PLAN	Volume 2	Architecture	FLOOR PLANS	06.2 ARCHITECTURAL

- To create sheets in Revit, select a discipline in which the sheet items belongs to, and select

 the check box of sheet items and click the command button Create/Update Sheets.

	Sheet Number	Sheet Name	Volume Number	Discipline	Drawing Type	Sorted Discipline
☐	A101	COMPOSITE FLOOR PLAN - LEVEL 1	Volume 2	Architecture	COMPOSITE PLANS	06.1 ARCHITECTURAL
☐	A202	FLOOR PLAN - LEVELS 2-11	Linked Sheet ElementId: 250411	Architecture	FLOOR PLANS	06.2 ARCHITECTURAL
☐	A202	FLOOR PLAN - LEVELS 2-11	Volume 2	Architecture	FLOOR PLANS	06.2 ARCHITECTURAL

- After creating sheets, gray text means the item is synchronized without discrepancies between the Revit element and the data in the database. When mouse-hovering, the tooltip text will provide more detail information of the status of the link.

2.4 Managing Revisions

Create/Update Revisions
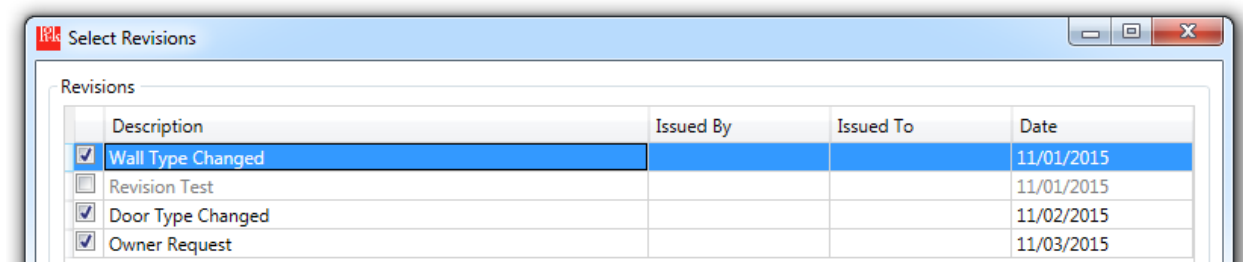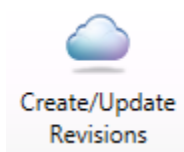
- To create or update revision items following the database, click the revision button and select revision items from the list and click the **Update** button in the bottom right corner.

Update Revisions on Sheet
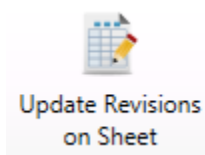
If sheet items and revision elements are linked correctly with the database (marked grey text), you can apply the revisions on sheet as defined from the Editor. In order to review the matrix, navigate to a sheet item from the main list and find revision items to be included.

Blue Text means the item has not been included to the sheet yet as the tooltip describes.

- Select the check box of sheet items and click the Update Revisions on Sheet button.

Revisions on Sheet in the properties of the sheet will be updated.

2.5 Placing Views on Sheets

Add Views to Sheet

If specific views are defined onto a sheet item, the view items will be displayed in the bottom left

corner by the selection of the sheet item. Since the database schema doesn't support the link

information of view items, the transient links between Revit elements and database items will be

created by the names of views.

Sheets

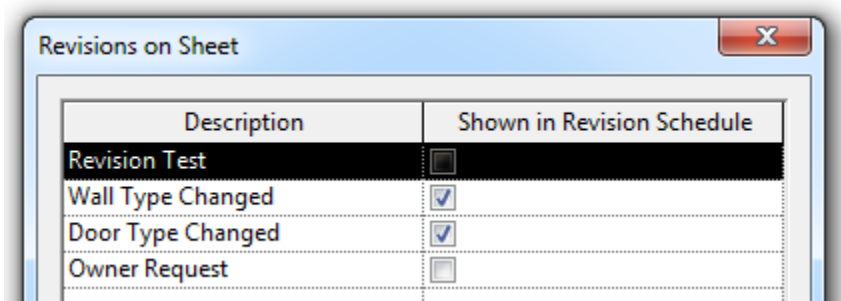| Sheet Number	Sheet Name	Volume Number	Discipline	Drawing Type	Sorted Discipline
A101	COMPOSITE FLOOR PLAN - LEVEL 1	Volume 2	Architecture	COMPOSITE PLANS	06.1 ARCHITECTURAL
A202	FLOOR PLAN - LEVELS 2-11	Volume 2	Architecture	FLOOR PLANS	06.2 ARCHITECTURAL
A211	PENTHOUSE / ROOF PLAN	Volume 2	Architecture	FLOOR PLANS	06.2 ARCHITECTURAL
A212	UPPER LEVEL ROOF PLAN	Volume 2	Architecture	FLOOR PLANS	06.3 ARCHITECTURAL
A301	RCP - LEVEL 1	Volume 2	Architecture	CEILING PLANS	06.4 ARCHITECTURAL
A401	ENLARGED PLAN - LEVEL 1 LOBBY	Volume 2	Architecture	ENLARGED VIEWS	06.4 ARCHITECTURAL
A401	ENLARGED PLAN - LEVEL 1 LOBBY	Volume 2	Architecture	ENLARGED VIEWS	06.4 ARCHITECTURAL
A402	ENLARGED PLAN - LEVELS 2-11 CORE	Volume 2	Architecture	ENLARGED VIEWS	06.4 ARCHITECTURAL
A402	ENLARGED PLAN - LEVELS 2-11 CORE	Volume 2	Architecture	ENLARGED VIEWS	06.4 ARCHITECTURAL
A411	ENLARGED PLAN - MECHANICAL PENTHOUS	Volume 2	Architecture	ENLARGED VIEWS	06.4 ARCHITECTURAL
A411	ENLARGED PLAN - MECHANICAL PENTHOUS	Volume 2	Architecture	ENLARGED VIEWS	06.4 ARCHITECTURAL
A421	FLOOR PATTERN PLAN - LEVEL 1 LOBBY	Volume 2	Architecture	ENLARGED VIEWS	06.4 ARCHITECTURAL
A421	FLOOR PATTERN PLAN - LEVEL 1 LOBBY	Volume 2	Architecture	ENLARGED VIEWS	06.4 ARCHITECTURAL

Views

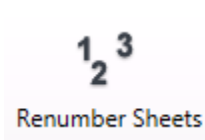| View Name	View Type	U	V
01 - Entry Level	Floor Plan	0.3	0.3

Revisions

Description
Wall Type Changed

- Select sheet items that contains mapped views and click the Add Views to Sheet button. The

  assigned views will be placed in the sheet with the U, V offset.
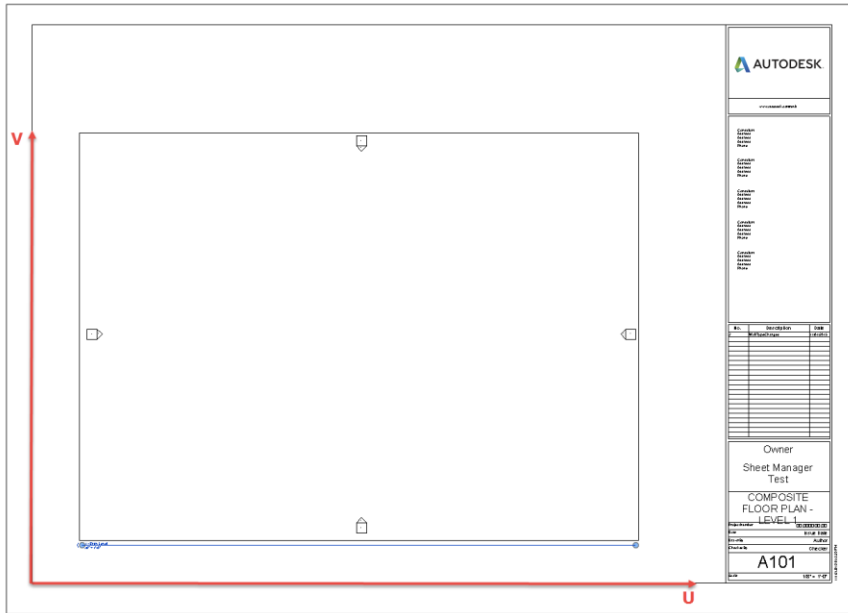
2.6 Replacing Parameter Values

Renumber Sheets

Renumber Sheets

Source Value	Target Value
A101	A-101
A201	A-201
A202	A-202
A211	A-211
A212	A-212

If maps for sheet numbers are created by the Editor (as in 2.6 Replacing Parameter Values), the Sheet Manager will find linked sheet items that matches to the source values and replace them with target value as new names of sheets.

Select linked sheet items from the main window, and click the Renumber Sheets button.

	Sheet Number	Sheet Name
☑	A101	COMPOSITE FLOOR PLAN - LEVEL 1
☑	A202	FLOOR PLAN - LEVELS 2-11
☑	A211	PENTHOUSE / ROOF PLAN
☑	A212	UPPER LEVEL ROOF PLAN

The renumbered sheet items will be written in the database and will be displayed the updated values in the main window.

	Sheet Number	Sheet Name
☐	A-101	COMPOSITE FLOOR PLAN - LEVEL 1
☐	A-202	FLOOR PLAN - LEVELS 2-11
☐	A-211	PENTHOUSE / ROOF PLAN
☐	A-212	UPPER LEVEL ROOF PLAN

Rename Views

Rename Views
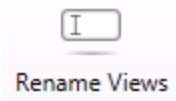
Like the process of renumbering sheets above, view names can be replaced based upon the maps created from the Editor.

If existing views match with names in the set of source values of the maps, the Sheet Data Manager will find the view and replace the name of view as the assigned target value.

3. Data Updates

The Sheet Data Manager contains a feature of Dynamic Model Update to be able to simultaneously transfer data between the Revit elements and the database based upon the changes happening in the model. If this feature is turned on by users, the Updater will be triggered in the following circumstances.

- When creating a **sheet** element in the model,

- When changing values in one of **sheet** parameters among "**Sheet Number**", "**Sheet Name**", "**Discipline**", "**Drawing Type**", "**Sorted Discipline**", "**Volume Number**" is changed,

- When deleting a **sheet** element if it is a source item in the database,

- When creating a **revision** element in the model,

- When changing values in one of **revision** parameters among "**Revision Sequence**", "**Revision Number**", "**Revision Description**", "**Revision Date**", "**Issued To**", "**Issued By**"

- When deleting a revision element if it is a source item in the database,

When a database file is connected to a Revit project, the Sheet Data Manager will create a unique model ID and store the ID in the model in order to identify the project and trace the history of events of the synchronization.

3.1 Connection to Multiple Models

The sheet data can be transferred from one project to another by liking the same database between two different projects. If the complete sets of sheets are prepared in a source model, and if the target model requires equivalent information to create sheet elements, the database can play a role as a medium that connects between those two projects.

In order to implement, the source model should be connected to an empty database file, and the updater should be activated so that the database can be synchronized when any changes are made on sheet or revision elements in the model.
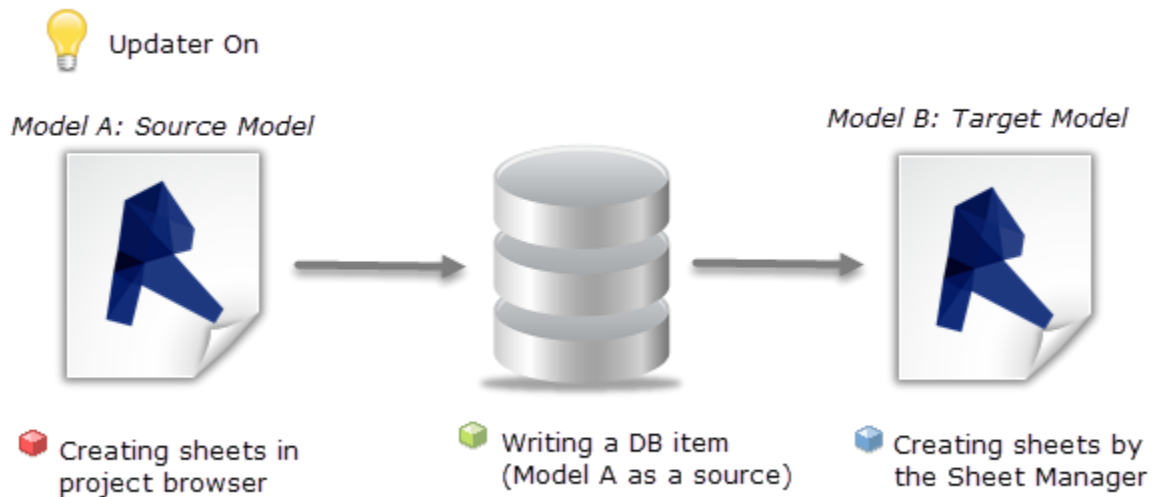
Once the list of sheet elements are ready both in the source model and the linked database, users can open a target model and populate the identical sheet elements by connecting the same database through the Sheet Data Manager.

** Items created by Model A will be marked as source items in the database, therefore, if any sheet elements in Model B originated from the database are deleted, they won't affect to the database items.

3.2 Reloading Data in Sheet Data Editor

When a single database is being used by multiple clients, changes made by each client will be continuously applied to the database. In the middle of the process, the current state of data can be displayed in the Sheet Data Editor through the Reload Data button.