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Building
Technology III

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ARCH 2431 Building Technology III Steel Assembly & Building Information Modeling (BIM) with Revit

*Scavenger Hunt
Overview, Orient to View, Detail Views,
Sheets and Plotting –
For 11 x 17 paper, Miro & Blackboard Archive*

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Scavenger Hunt Assembly Search Assignment

Assignment

Description

- Pinups 1 to 5
- Revit Tasks
- Miro Pinups
- Rubric & Grading
- Archive submission

New Views

Orient to View

Detail Views

- Sections
- Elevations
- Callouts

Sample Stair

Sheet 4 views

Duplicate Views

Sheets

- New sheet
- Add Views

Plotting

- PDF to 11x17 paper
- PDF to MIRO posting
- PDF to Blackboard

Create new views to investigate an assembly -

Create groupings of four (4) coordinated views (plan, elevation, section & isometric) on a sheet at the appropriate scale.

Complete additional research into the assembly in order to determine how to annotate and dimension the details.

Follow plotting instructions at the end of this tutorial

- Plot to 11 x 17 paper
- Plot to MIRO posting
- Plot to Blackboard
- **Pinup #1** –
 - Create a minimum of two sheets with existing views
- **Pinup #2** –
 - Create 6 new sheets – 3 with existing views & 3 scavenger hunt assembly studies
- **Pinup #3** –
 - Continue to develop 3 assembly studies in Revit
 - Add 3 related boards of research images – one for each study
- **Pinup #4** –
 - Final presentation of 3 scavenger hunt assembly studies
- **Pinup #5** –
 - Final pinup “Best” Scavenger Hunt Assembly Study



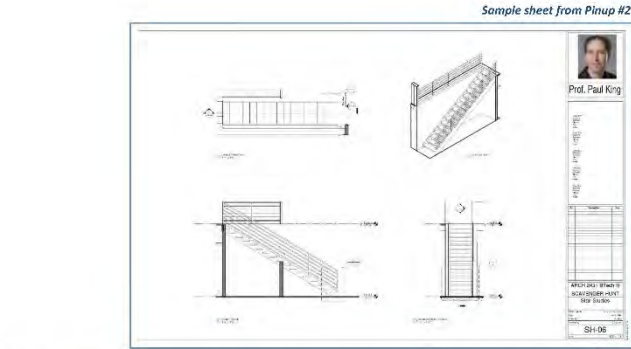
Overview:

This studio assignment will introduce the concept Building Information Modeling (BIM) using the Revit program. *All of the semesters Studio Assignments combined, represent 30% of your final grade.* Working with the sample file provided, we will explore the organization of a Revit file, learn the interface and commands, and format various views on title blocks. We will look to represent building assemblies using groupings of four (4) related views – a plan, two elevations or one elevation & one section and an isometric. Remember that our focus this semester is on the creation of construction documents and not presentation drawings. To clarify construction, we will consider materials (adding hatch patterns) and connections and add annotation (notes/leader & dimensions) as appropriate. The term “scavenger hunt” describes your search through the existing Revit file, for good assembly subjects. Select an assembly and ask yourself – How is it built?

Our printed work will be reviewed in a series of class pinups using Mira.com or live pinup on the wall.

- **Pinup #1** – Create a minimum of two (2) sheets and add any existing views. Use existing scales.
 - Number the sheets SH-01 & SH-02. Name it based on what is on each sheet.
- **Pinup #2** – Create Six (6) new sheets.
 - On the first set of three (3) sheets-format perspectives, full floor plans & exterior elevations. Use existing scale. Number these sheets SH-03 Perspectives, SH-04 Floor Plans & SH-05 Exterior Elevations.
 - On the second set of three (3) sheets- create three scavenger hunt assembly studies. These will include enlarged drawings or callouts (minimum scale of 1/4" =1'-0"). The first assembly for everyone will be the interior stair. Each student must identify two additional assemblies. Number these sheets SH-06 Stair Study, SH-07 "Second Study", SH-08 "Third Study". Pick appropriate names for studies 2 & 3.
- **Pinup #3** – Continue to develop three Revit (3) sheets – add three (3) related boards of research.
 - Leaving the perspectives, full floor plans and exterior elevations behind, we will focus on the three (3) sheets of "Scavenger Hunt Assembly Studies." We will continue to develop sheets SH-06, SH-07 & SH-08 – we will not be creating new sheets in Revit.
 - For this pinup you will be expected to add materials designations using hatch or detail items, as well as annotation including notes/leaders & dimensions.
 - Also consider if there are any portions of this study that will need to be further enlarged to be explained. Minimum scale for this next level of enlargements is to be 3/4" =1'-0". Common scales for studies at this level of detail are 1/4", 1/8" and 3/8" to the foot.
 - If you require extra sheets for any study, add a suffix to the number. SH-07 becomes (SH-07.1 & SH-07.2)
 - For each study you are required to locate photographs that illustrate how the subject of the study could be built. The pinup will now include six (6) boards – three sheets printed from Revit and three boards of the same dimensions –formatted with associated photographs.
- **Pinup #4** – Final pinup of three (3) "Scavenger Hunt" assembly sheets.
 - We will continue to develop sheets SH-06, SH-07 & SH-08. Make modifications to your studies based on comments made during pinup #3. For these studies, in addition to the first group of four (4) views (plan, elevation/section, isometric), include at least one additional group of four (4) views (plan, elevation/section, isometric) to detail an additional portion of the assembly.
 - All details are to include materials designations and annotation (notes/leaders & dimensions)
- **Pinup #5** – Final pinup best "Scavenger Hunt" assembly. This may be one or more sheets.
 - Taking your best study, rework it to make it the best sheet you can. Consider comments from Pinup #4.
 - Keep the sheet number for this study. Create additional sheets as needed.

Scavenger Hunt Assembly Search Assignment



Revit Specific Tasks:

- **Customize the titleblock.** Using a 22 x 34 titleblock – make a copy of this family and add course and individual information to the titleblock. You may have to adjust locations of lines, etc.
- **Add Personal Information** – Remove the Autodesk Logo in the top right corner of the title block and add a recognizable portrait photo of yourself to the sheet. Below this add your name. Make sure it is large enough to be legible. If your name is long, it can be on two lines. You may have to adjust lines on the titleblock for it to fit.
- **Add Class Information** – Add the Course Number & Name (ARCH 2431 Building Technology III) using the “Owner” and “Project” fields. Add the Professors Name (Prof. King, etc.) and the semester (Fall 2020) below your name.
- **Add Sheet information** – For each sheet, add a sheet number and a title. For the date drawn add the deadline date.
- **Duplicating views** – Since we have multiple pinups, you may need to include the same view on more than one sheet. To do this you will need to “duplicate” the view. Review the duplicate options. (with detailing or as a dependent)
- **Dimension and Text Styles** – Notes and dimensions text, should be 1/8” tall. Create new styles as needed.
- **Project Browser Cleanup** – When you create new views either using duplicate or creating new views as callouts, sections or elevations, be certain to rename these views appropriately.
- **Revit File Name** – Each of you must rename your Revit file in the format (Firstname.Lastname ARCH2431 Scavenger Hunt Studies Semester-Professor.rvt) File name for a student named Louis Sullivan in Prof. King’s Fall 2020 class would be (Louis.Sullivan ARCH2431 Scavenger Hunt Studies FA20-King.rvt)

MIRO & Pinups -

- We will be conducting “virtual pinups”, using a shared pinup board hosted on [Miro.com](https://www.miro.com). We may also conduct a live pinup in the classroom. You will not be required to create an account to work with Miro. The pinup space will be provided for you with a single frame for each of you. You will need to rename this frame to claim your pinup space and you will duplicate and place each additional sheet below, creating a vertical column of sheets for each student.
- To post your work in Miro - print each sheet from Revit to a separate PDF and then paste it onto the frame.
- MIRO Frames listing – as you add new sheets you will need to create or copy a frame. Rename and re-sort the order your own frames, so they are always in order. It helps to name your slides sequentially. King-01, King-02, etc.



Sample Miro.com Pinup Board



Grading & Rubric:

- **Grading:** Pinup # 1 will be graded as complete/incomplete. Pinup #2 & Pinup #3 will be given a preliminary grade (A/B/C/D). Pinup #4 & #5 will be given final letter grades – these count most toward your overall semester grade.
- **Rubric:** Assignments are graded on the following criteria. Additional criteria may be given during class discussions.
 - **Completeness of submission & deadlines:** Proper file name, sheet name/number and format of titleblock
 - **Good selection of study subjects & appropriate views.** Coordinated sets of four (4) views are best. (Plan, two Elevations or an Elevation & Section and an Isometric). Scales for the group of four typically match.
 - **Annotation & appropriate scale of views.** Use a scale that clearly represents the information and allows for proper annotation to be added including, hatch patterns, detail items, notes/leaders & dimensions.
 - **Formatting and organization** – Are the sheets laid out well, organized and numbered properly? Do views align, is there limited wasted (white) space? Are detail views numbered sequentially?
 - **Level of detail** – Do the studies show enough to explain the construction? This requires that drawings exist at multiple scales (1/8” or 3/4”) with a second set of callout details at larger scales. (1 1/2”, 3” or 6”)
 - **Demonstration of the mastery of the Revit software.** Good control over views, proper organization of project browser, creation and organization of sheets with title blocks, proper printing to PDF, etc.
 - **Oral Presentation** – Students ability to describe what has been drawn.

Archive & Graded Submission:

- In addition to class Miro pinup boards, each student will need to post the following completed assignments in blackboard. For these submissions, you must combine the individual PDF files into a single PDF and then upload this to the proper directory in blackboard. You must also include your Revit file.
- **Proper naming conventions** – For your final submissions your PDF and your Revit files must be properly named, or you will not receive full credit.
- **Meet all deadlines** – do not be late!
- Failure to submit the archive file on a timely basis may lower your grade.
 - **Pinup #4** – Final pinup of three (3) “Scavenger Hunt” assembly sheets.
 - **Pinup #5** – Final pinup best “Scavenger Hunt” assembly.

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New Views

Orient to View

Detail Views

- Sections
- Elevations
- Callouts

Sample Stair

Sheet 4 views

Duplicate Views

Sheets

- New sheet
- Add Views

Plotting

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Sheet 4 views

Duplicate Views

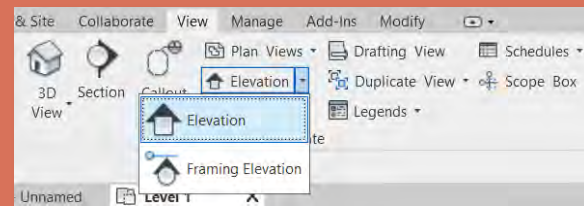
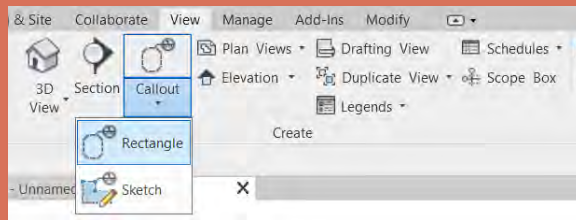
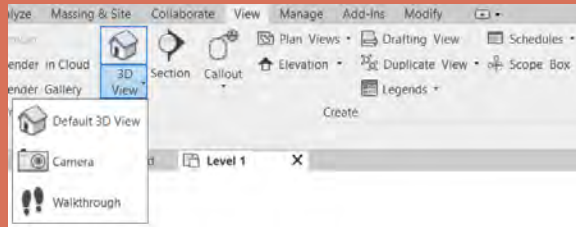
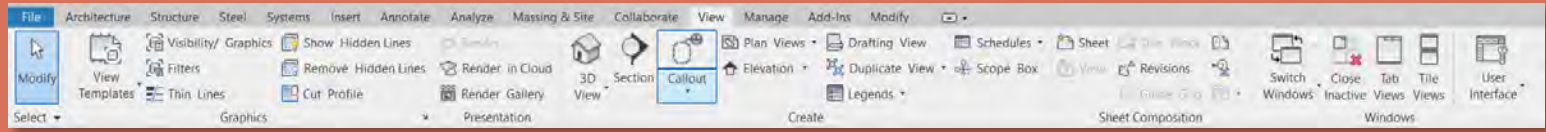
Sheets

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Creating New Views



- 3d Views –
 - Default 3D View (isometric)
 - Camera (creates a perspective)
 - Walkthrough (animation)
- Callout – (always 2x the scale)
 - Rectangle
 - Sketch (can be any shape)
- Elevation Views -
 - Elevation (interior or exterior)
 - Framing Elevation (structural)

Stair : Isometric View using "Orient to View"

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Sheet 4 views

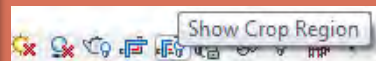
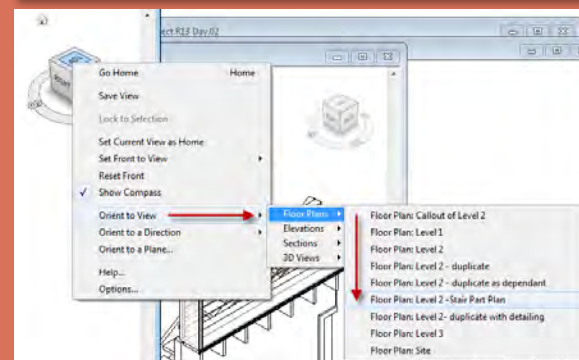
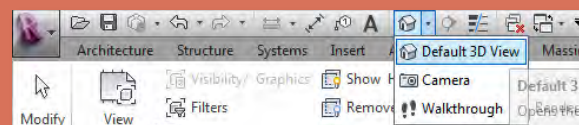
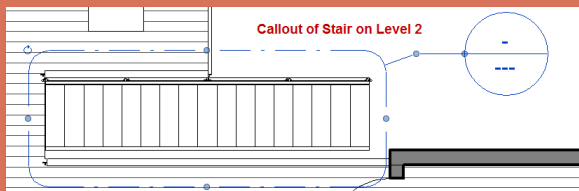
Duplicate Views

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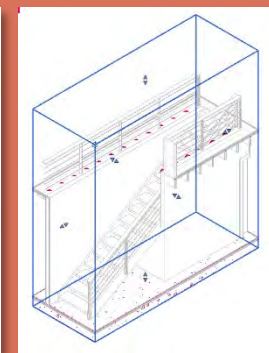
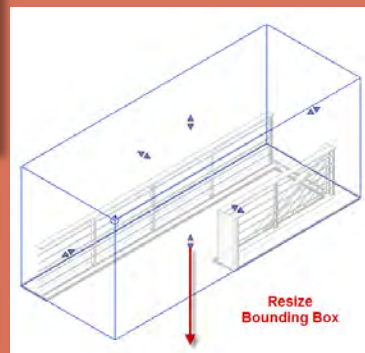


Stair Callout:

1. Callout of Stair on Level 2 (scale 1/4")
2. Go to View
3. Adjust Scale to 1/2" = 1'-0"

Isometric Detail

1. Create Isometric View
2. Default 3D View > Viewcube > Orient to View > Stair Callout
3. View Cube > Home
4. Reveal Hidden Elements & Resize
5. Set Scale to 1/2" to match the plan detail
6. Duplicate View and Name it "Stair Isometric"
7. Adjust Crop region of view



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Sample Stair

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Duplicate Views

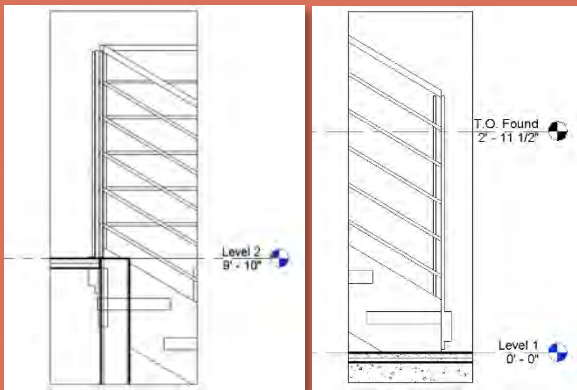
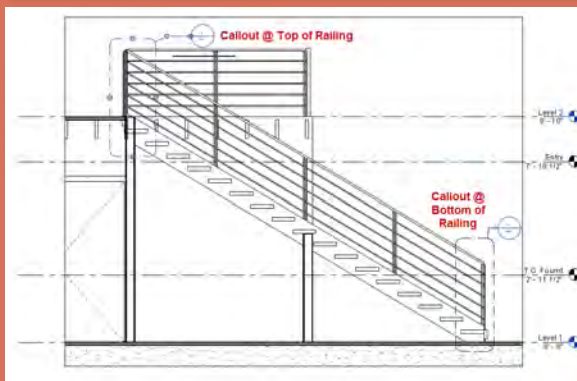
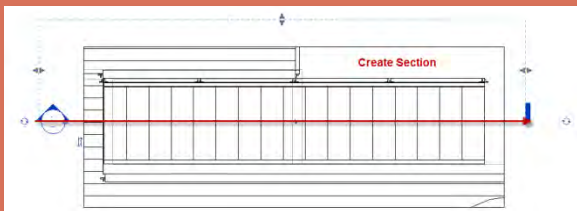
Sheets

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Stair : Section & Elevations & Callout Details



Stair Section:

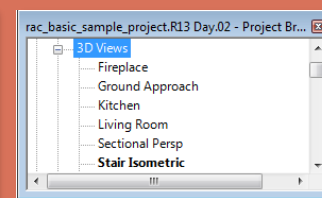
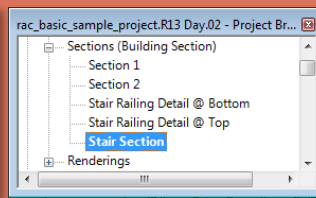
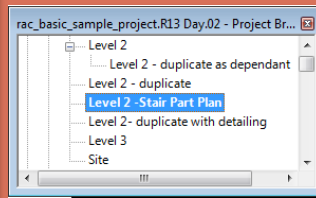
1. Section on stair callout (scale 1/2'')
2. Go to View
3. Adjust Crop Regions of View

Section / Elevation Callouts

1. Callout of "Stair Railing Detail @ Top"
Scale will be set to 1" = 1'-0"
2. Callout of "Stair Railing Detail @ Bottom"
Scale will be set to 1" = 1'-0"

Notes

1. Names of Views in project Browser
 - Level 2 – Stair Part Plan
 - Stair Section
 - Stair Railing Detail @ Top
 - Stair Railing Detail @ Bottom
 - Stair Isometric



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Sample Stair

Sheet 4 views

Duplicate Views

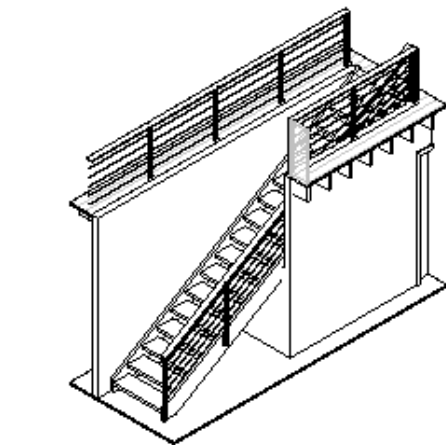
Sheets

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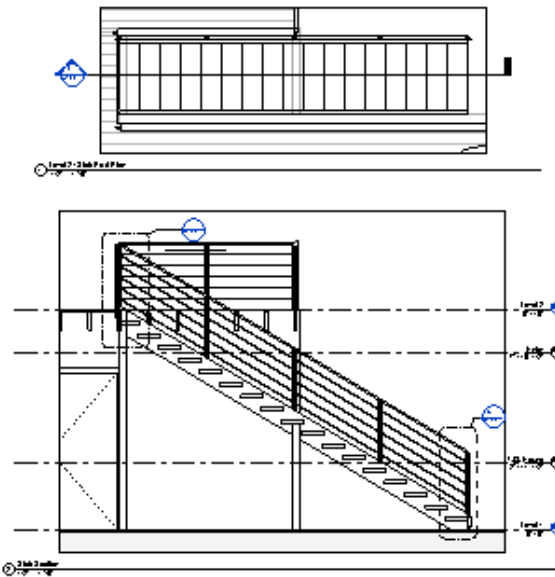
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Scavenger Hunt Stair Sheet – Sample Layout



3/16/2016



Drag Stair Views on to Sheet

- Level 2 - Stair Plan
- Stair Section
- Stair Railing Detail @ Top
- Stair Railing Detail @ Bottom
- Stair Isometric

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Duplicating Views

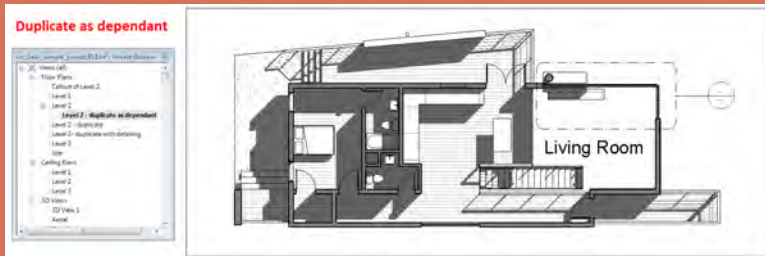
Duplicate View	Duplicate
Convert to independent view	Duplicate with Detailing
Apply Dependent Views...	Duplicate as a Dependent

Original View:



Duplicate as dependant:

- Identical in scale and annotation but can be cropped



Duplicate:

- Annotation not copied and view can be set to a different scale than original



Duplicate with detailing:

- Annotation is copied but can be edited independently & scale can be different



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Create a New Sheet

The process of creating a new sheet in Revit is shown through a series of screenshots:

- Project Browser:** The 'Sheets' folder is expanded, and the 'New Sheet...' option is selected.
- Load Family:** A dialog box shows the 'Titleblocks' folder. The file 'D 22 x 34 Horizontal.rfa' is selected. A preview window shows a sheet with dimensions '22 x 34'.
- New Sheet (Step 1):** The 'New Sheet' dialog box is open. The 'Load...' button is highlighted with an orange arrow and the word 'Load'.
- New Sheet (Step 2):** The 'New Sheet' dialog box is open. The 'D 22 x 34 Horizontal' titleblock is selected in the 'Select titleblocks:' list.
- Sheet View:** The final sheet is displayed in the software interface, showing the selected titleblock and a placeholder sheet named 'New'.

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Sample Stair Sheet 4 views

Duplicate Views

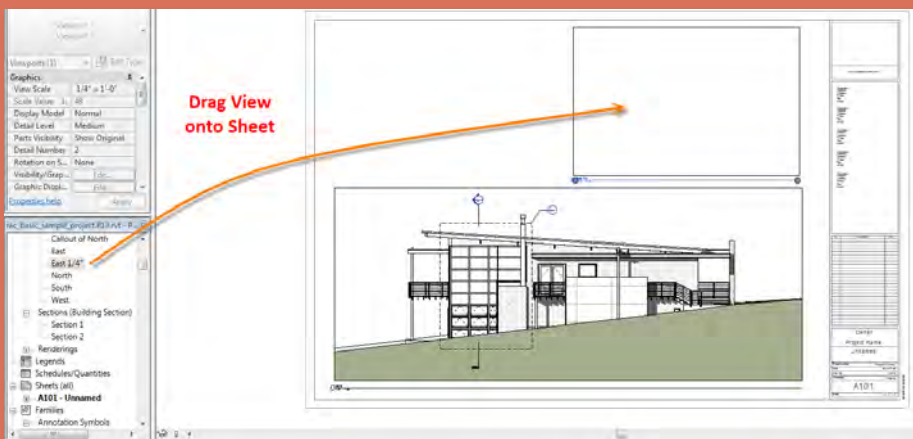
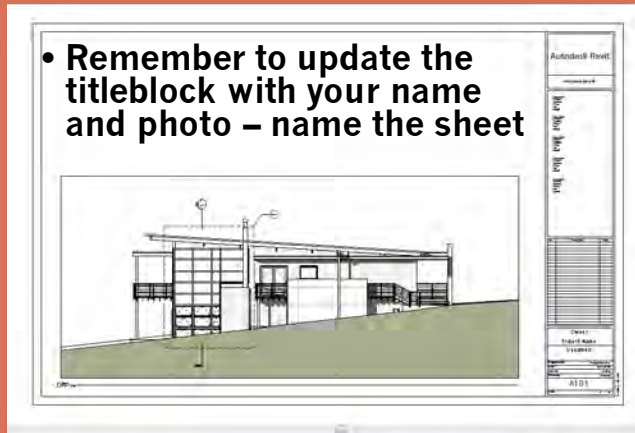
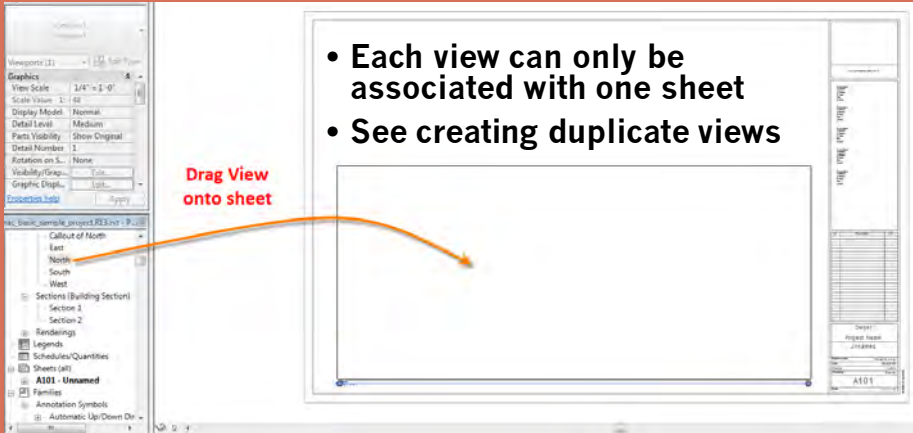
Sheets

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Adding Views to a Sheet



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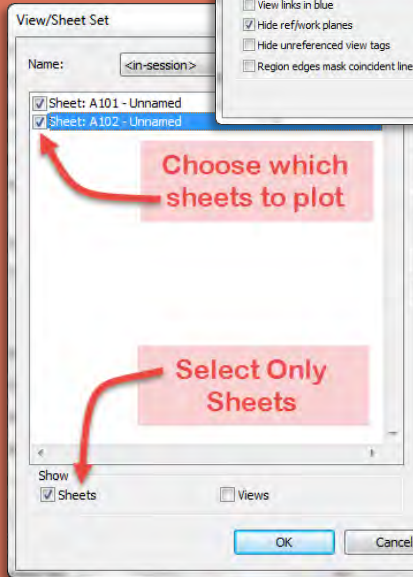
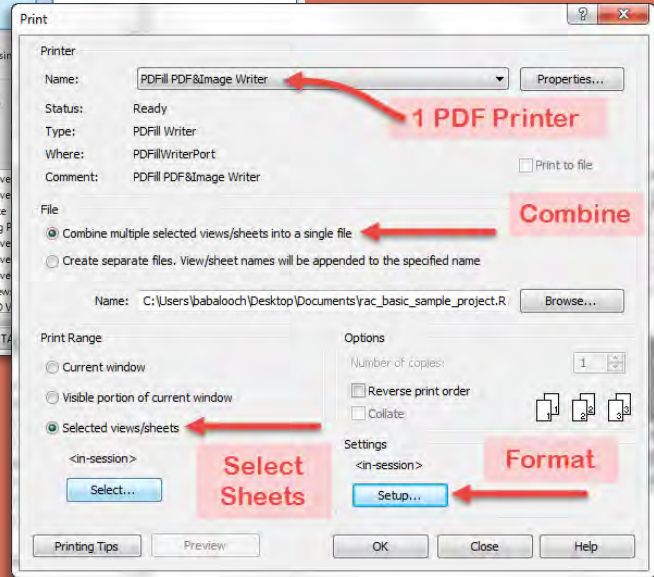
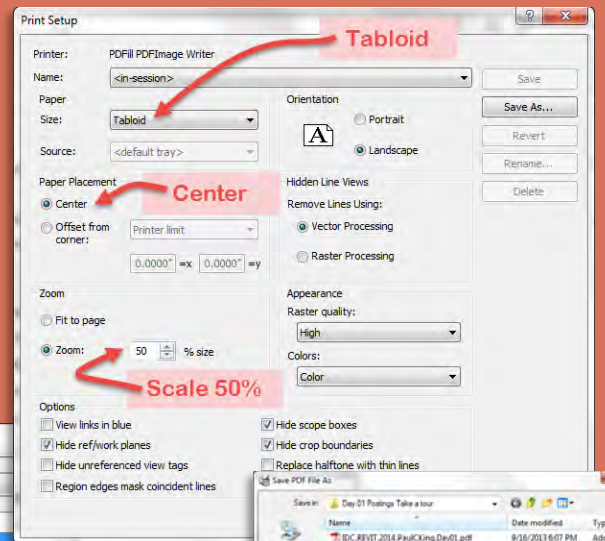
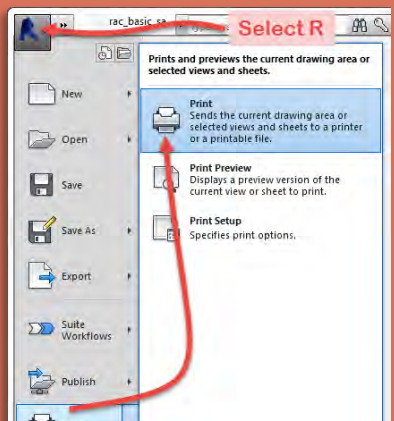
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To Plot to PDF & then to 11 x 17 paper

If you need to download a PDF printer look for one at <https://download.cnet.com>

- Printing to 11 x 17 paper
- Print / Select a PDF Printer
- Select Multiple Sheets
- Combine into single PDF
- 22 x 34 to Tabloid - Landscape
- Center and Scale to 50%
- (50% means 11 x 17)
- Next print the PDF to the printer



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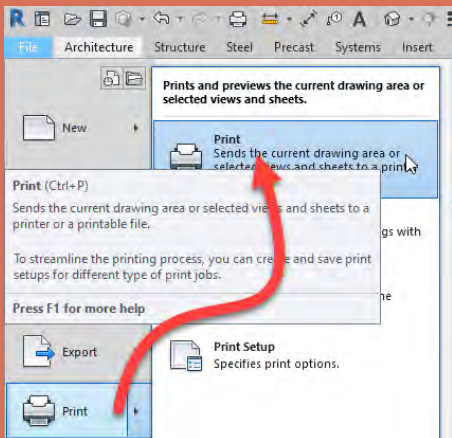
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Building Technology III

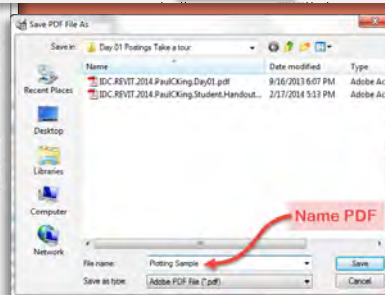
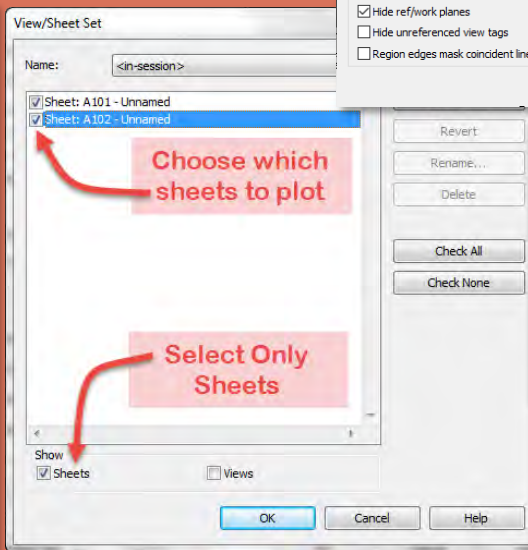
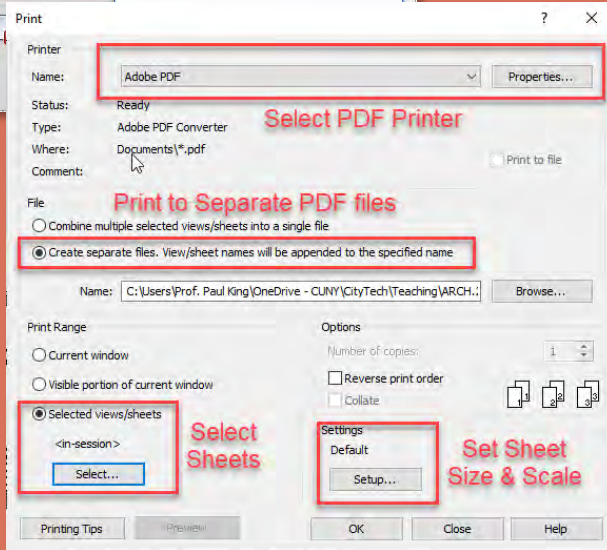
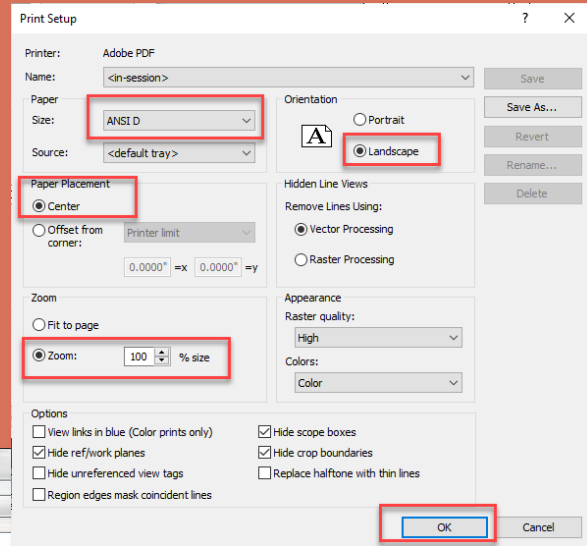
CityTech.CUNY.edu

To post to MIRO - Plot as separate PDF's

If you need to download a PDF printer look for one at <https://download.cnet.com>

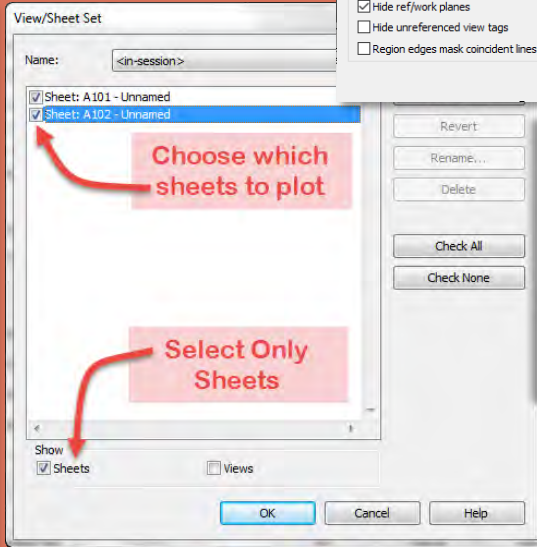
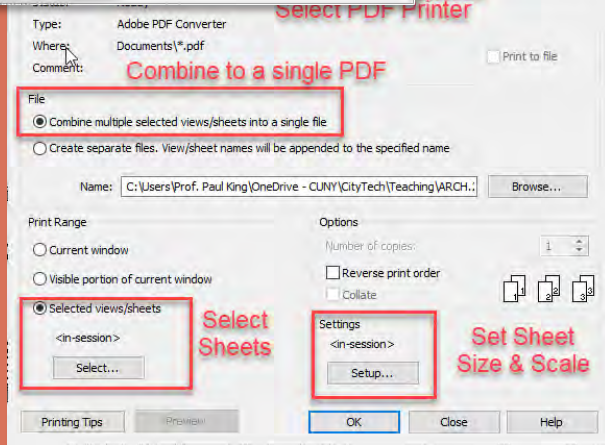
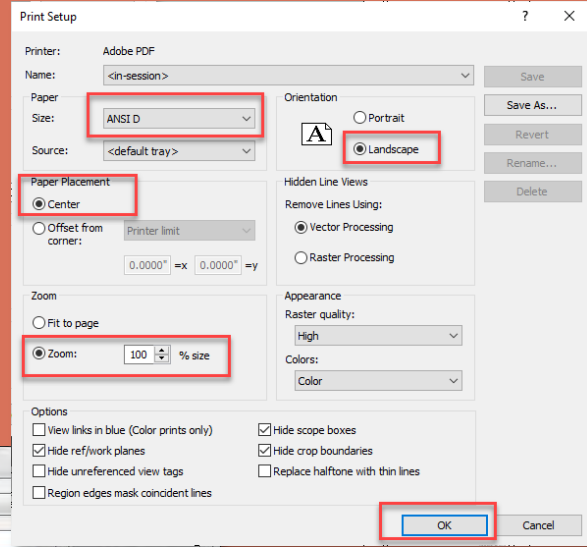
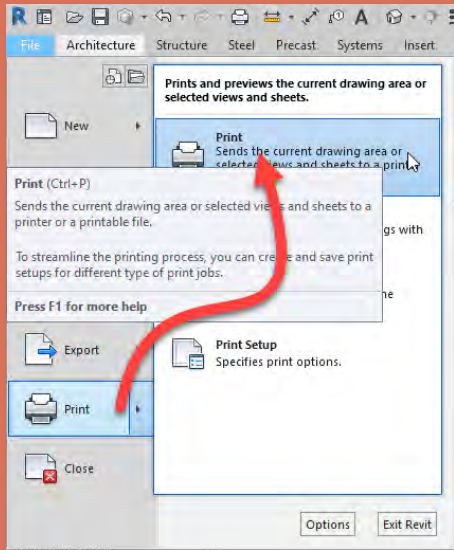


- Print / Select a PDF Printer
- Select separate Sheets
- ANSI D (22 x 34) Landscape
- Center and Scale to 100%
- Then print the PDF
- Next post your individual PDF's into the MIRO board



To post to Blackboard- Plot as one PDF

- Print / Select a PDF Printer
- Select Combine to single file
- ANSI D (22 x 34) Landscape
- Center and Scale to 100%
- Then print to a single PDF
- Make sure the file is named properly
- Upload your Revit file and PDF to Blackboard



Scavenger Hunt

Assignment Description

- Pinups 1 to 5
- Revit Tasks
- Miro Pinups
- Rubric & Grading
- Archive submission

New Views

Orient to View

Detail Views

- Sections
- Elevations
- Callouts

Sample Stair

Sheet 4 views

Duplicate Views

Sheets

- New sheet
- Add Views

Plotting

- PDF to 11x17 paper
- PDF to MIRO posting
- PDF to Blackboard



That's all Folks!