



ARCH 2431 BUILDING TECHNOLOGY III

STUDIO ASSIGNMENT: SCAVENGER HUNT STEEL STAIR ASSEMBLY

Overview:

This studio assignment will introduce the concept Building Information Modeling (BIM) using Revit software. 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.

Remember our focus this semester is the creation of construction documents and not presentation drawings. To clarify construction, we will consider materials (adding hatch patterns to illustrate), how components connect, and we will add annotation (notes/leader & dimensions) as appropriate to clarify their assembly. The term “scavenger hunt” describes your search through the existing Revit file, for good assembly views. Consider the interior stair and ask yourself – **How is it built?**

STEEL STAIR ASSEMBLY STUDIES (7 days)

We will explore the construction and detailing of a steel stair. We will represent assemblies using **groupings of four (4) related views – 1 plan, 2 elevations or 1 elevation & 1 section and 1 isometric.** Each student is required to research the assembly and be able to identify specific parts of the stair including:

- The Steel Stringer
- The Tread – (may be of a material other than steel)
- The Steel Newel Posts (supports the bottom, intermediate and top of the railing)
- The Steel Balustrade (these are the smaller vertical baluster posts – as an alternate you can provide wire cable system)
- The Railing (may be of a material other than steel)

Our primary focus is to understand each of these elements and how they connect to each other. You will then create a 3D parametric model of your assembly and represent your solution on sheets with multiple views with dimensions & annotation.

Work will be reviewed in a series of class pinups using Miro.com or live pinup in the classroom. All sheets use a 22 x 34 title block. Keep sheets numbered/named in sequence. If for any sheet type (i.e. Plans) you require additional sheets – number these in sequence (SH-01.1, SH-01.2, etc.)

Day 1: In Class Work

- Introduction to Building Technology III : Steel construction
- Introduction to Revit interface and file types
- Setup your own 22x34 title block with selfie
- Create Multiple sheets (SH-01, SH-02, SH-03) – name and number. Format existing & new views on sheets
- Print to PDF – one pdf for each view.
- Post to MIRO

Day 2: Pinup #1 – Pinup three (3) sheets – all from the existing model, begin new Revit model

- SH-01 Plan Views (1/4” scale)
- SH-02 Exterior Elevation Views (same scale as the plans)
- SH-03 Stair Assembly (1/2” scale) 5 views – 1 plan, 2 elevations, 1 section, 1 isometric
 - Use the existing model in the file provided and include 5 new views at ½” scale.
- **In Class: Pinup Review**
- **In Class: Begin to develop research using Pinterest. Add to new sheet SH-04 Research**
- **Answer each of the questions:**
 - How does the stringer connect to the building – how is it secured?
 - How does the tread attach to the stringer?
 - How does the newel post attach to the stair or building?
 - How do the balusters connect or the wire cable system work?
 - How does the railing attach?
- **In Class: Begin new Revit project file and start 3d model of stair assembly. Add to SH-05 Stair Assembly**
 - This will be a placeholder model to allow you to layout your sheets
 - Import your titleblock family.

Day 3: Pinup #2 – Correct layout of the first three sheets (SH-01 to 03) based on class critique, add 2 new sheets (SH-04 & 05)

- Pinup **SH-01, SH-02, SH-03** **(these will be given a final letter grade in class!)**
- Pinup **SH-04 & SH-05** for review.
- **SH-04 Stair Assembly Research**
- **SH-05 Stair Assembly (1/2" scale) – New Sheet (5 views – 1 Plan, 2 elevations, 1 section, 1 isometric)**
 - Continue to develop the 3D model of your stair in your new Revit file
 - Layout views at 1/2" scale. (5 views – 1 plan, 2 elevations, 1 section, 1 isometric)
- **In Class: Pinup Review**
- **In Class: Continue to add Images from online research for each required detail condition. Add to SH-04**
- **In Class: Continue to develop your 3d Stair Study Model. Add to SH-05**
- **In Class: Create new sheet SH-06.1 Stair Assembly Details (1 1/2" scale)**
 - Identify conditions you need to explain in detail and create groups of 4 views for each – Basic layout of views aligned and well formatted. If you cannot fit these one single sheet (which is likely) – create additional sheets and number/name in sequence. (SH-06.2 Stair Assembly Details 2, etc.)
 - How does the stringer connect to the building? – How is it secured?
 - How does the tread attach to the stringer? Is there a riser?
 - How does the newel post attach to the stair or building?
 - How do the balusters connect or how does the wire cable system work?
 - How does the railing attach?

Day 4: Pinup #3 – Moving forward we will focus on Sheets SH-04 and higher only. We will not continue SH-01 to 03.

- Pinup **SH-04 & SH-05 & SH-06** for review. Always correct your layout based on class comments & critique
- **SH-04 Stair Assembly Research** (update your research as needed & repost)
- **SH-05 Stair Assembly (1/2" scale) 5 views – (1 Plan, 2 elevations, 1 section, 1 isometric)**
 - Continue to work on developing your model based on your continued research
- **SH-06.1 Stair Assembly Details (1 1/2" scale)**
 - Continue to work on developing your model based on your detail conditions.
- **In Class: Pinup Review**
- **In Class: Continue to develop all your work for sheets but focus on SH-05 & SH-06.**
- **In Class: Start larger details at 3" scale as needed and start sheet SH-07**
 - Identify conditions that require greater detail
 - Create groups of 4 views for each

Day 5: Pinup #4 – Focus on sheets **SH-05, SH-06 & SH-07**

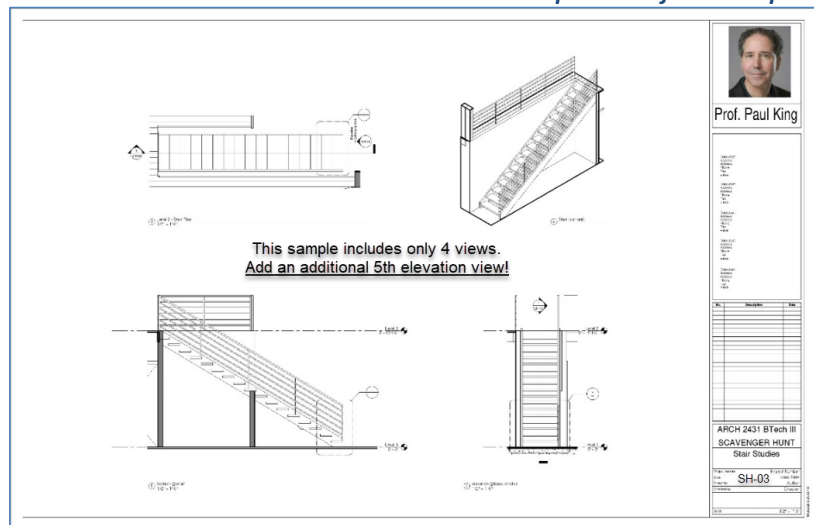
- Always correct your layout based on class comments & critique. Add dimensions and annotation
- **SH-05 Stair Assembly (1/2" scale) 5 views – Plan, two elevations, 1 section, 1 isometric**
- **SH-06.1 Stair Assembly Details (1 1/2" scale)**
- **SH-07.1 Stair Assembly Details (3" scale)**
- **In Class: Pinup Review**
- **In Class: Continue to develop your work.**

Day 6: Pinup #5 – Focus on sheets **SH-05, SH-06 & SH-07**

- Always correct your layout based on class comments & critique.
- **In Class: Pre-Final Pinup Review – this will be a longer review than the final review.**
- **In Class: Continue to develop your work.**

Day 7: Pinup #6 – Final Pinup sheets SH-05, SH-06 & SH-07

- **In Class: Quick in class review & Final Graded Pinup**
- **Blackboard uploads due by midnight** (must include a single PDF of your sheets and all Revit Project Files)
- **In Class: Introduction to next assignment**

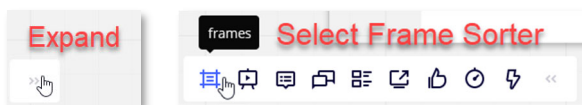


Revit Specific Tasks:

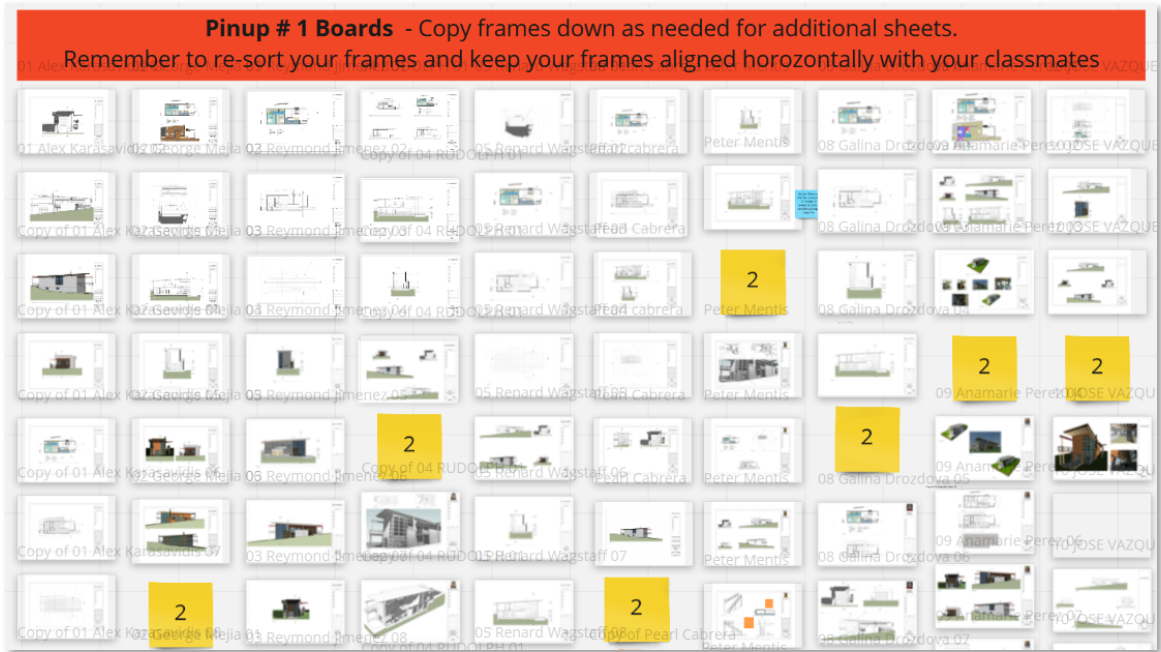
- **Customize the titleblock.** Using a 22 x 34 titleblock – make a copy of this family and add course and individual information to the titleblock, add selfie. You may have to adjust locations of lines, etc. – on the titleblock.
- **Add Personal Information** – Remove the Autodesk Logo in the top right corner of the title block and add a recognizable portrait photo (selfie) 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 or more. You may need to adjust 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/Spring 202X) 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) Be certain you are using a Revit Project File (.RVT) and not a Revit Template File (.RTE)

MIRO & Pinups -

- We will conduct “virtual pinups”, using a shared pinup board hosted on Miro.com. We may also pinup in class. 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 as a start. You will need to rename this frame to claim your pinup space and then 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 (with column for each student)



Grading & Rubric:

- **Grading:** All Pinups must be submitted before class begins. Uploading during class will not be permitted as this delays the start of class. Pinups are either graded as complete/incomplete or with a letter grade (A/B/C/D/F). Incomplete pinups will lower your final grade on the assignment.
- **Late Submission:** There are **no late submissions**. Work not submitted or pinned up on time will not be reviewed.
- **Rubric:** Assignments are graded on the following criteria. Additional criteria may be given during class discussions.
 - Oral Presentation – Students ability to describe what has been drawn. **This is most important!**
 - Completeness of submission & deadlines. Proper file name, sheet name/number and format of titleblock
 - Good selection of 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 properly named and numbered? Do views align, is there limited wasted (white) space? Are detail views numbered sequentially on the sheet?
 - Level of detail – Do the studies show enough to explain the construction? This requires that drawings exist at multiple scales ($\frac{1}{2}$ " or $\frac{3}{4}$ ") with a second set of callout details at larger scales as needed. (1 $\frac{1}{2}$ ", 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.

Archive & Graded Submission:

- In addition to class Miro pinup boards, each student will need to post completed assignments to 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 project file(s).
- **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! Always post your progress even when you are not complete!
- Failure to submit the archive file on a timely basis will lower your grade.