



ARCH 2431 BUILDING TECHNOLOGY III

STEEL BUILDING CASE STUDY & DRAWING SET

Overview:

This assignment will occupy a third of your semester and represents 30% of your final grade. Beginning with case study research, we will select an existing steel building and model this building to produce a set of well-coordinated construction documents using Revit. The first case study presentation requires each student to identify three steel buildings, one tower, one mid-rise and one low-rise. From this pinup presentation we will select subjects of our drawing sets. To facilitate the process of research students will be grouped into research teams, who will share information for a single building. While research may be shared, each student must develop their own set of Revit drawings.

As you research and draw look to investigate how the building was constructed and organized. There are many questions to consider. What materials is it made from and how is the building assembled? Where is the structure, what are the spans and how far apart are the columns? What is the exterior skin and how it is attached? Where are the mechanical components, the air intake, the mechanical room and how is fresh air circulated? Where are the main circulation components, the stairs and elevators and how do they facilitate safe egress from the building?

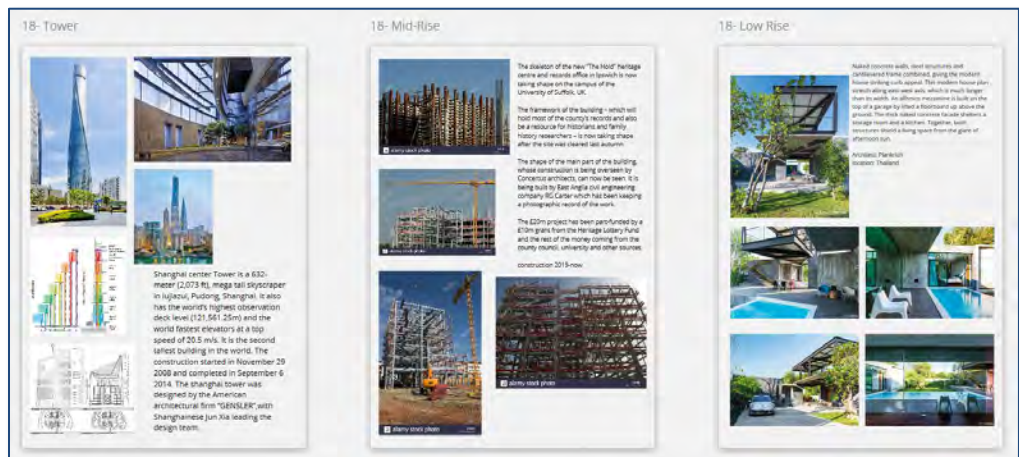
Selecting a Project

The chosen building must be a multi-story steel building that contains both elevator and stair cores. It is best if the façade contains two different materials and that the building includes a lobby/atrium with a double height space. These two criteria are helpful but not mandatory. Good choices are public buildings (Museums & Libraries) located in New York or the vicinity so they can be visited. Virtual visits of buildings outside of NY will be considered. You must be able to find enough detailed information about the building so you can model it in Revit. This includes full plans, sections & elevations that show structure and include dimensions. Consider reaching out directly to the architect, look to their websites and look for buildings that are well published. We will provide a list of buildings for consideration.



Sample Miro.com Pinup Board

We will pinup periodically as the project progresses to facilitate team and class discussions and lectures on topics related to the development of steel construction buildings will occur throughout the process. The first pinup will look at three scales of building, One Tower (10+ floors), One Mid-rise (3-8 floors), One Low-Rise (1-3 floors) – Either the Mid-rise or Low-Rise selection must come from the list of possible case study buildings provided – depending on the building you select. (see OpenLab)



Sample Miro.com Case Study Board

## **Pinup Requirements:**

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

- **\*Pinup #1** – (Individual) Three (3) Case Study Boards of steel buildings (Teams will be formed from this pinup)
  - One Tower (10+ floors), One Mid-rise (3-8 floors), One Low-Rise (1-3 floors)
- **Pinup #2** – (Individual) Detailed research of selected steel buildings (see options provided on OpenLab)
  - While you are grouped as a team – this first presentation requires individual research presentations.
  - Based on review during pinup #1, present additional research on your chosen buildings
  - In order to produce the drawings, you will need to find complete information that shows column locations and spans, floor to floor heights, indications of materials etc.
  - During pinup #2 we will narrow down the building choices and divide up into research teams.
- **\*Pinup #3** – (Team) presentation of selected steel buildings research
  - Team based presentation and discussion of research on their selected building.
  - Pinup must include a Revit Plan & Section of Building showing (Grids, Levels, Columns & Bldg. Perimeter)
- **Pinup #4.1, #4.2, #4.3 . . .** – (All Individual) a series of progress pinups are required on a weekly basis
  - As the building is developed in Revit, weekly progress is posted for each student in the class **Miro** board.
  - Pinups will include but will not be limited to the following:
    - Cover Sheet -A 000 (with drawings list, abbreviations, symbols & 3D views)
    - Floor Plans -A 100 series (includes walls, wall type designations, doors, door numbers & schedule, room names & numbers)
    - Reflected Ceiling Plans -A 200 series (RCP) (includes room names & numbers, ceiling materials, lights, mechanical supply & return, sprinklers, exit signs. A version of this will include color coded walls based on fire ratings)
    - Exterior Elevations -A 300 series (includes windows, curtain walls, exterior doors & materials designations for the façade)
    - Building Sections -A 300 series (includes two full building sections one in each direction – showing floor to floor levels, room names & numbers)
    - Details -A 400 series (includes plan & sectional details & callouts)
    - Occupancy & Egress -A 500 series (Occupancy identifies the area of rooms to determine the number of permitted occupants. Egress diagrams calculate door sizes and travel distances for rooms to egress stairs. As rated walls and exit signs are to be indicated this drawing is typically an overlay on the RCP.
    - Structural Drawings -S 100 series (includes plan & sectional drawings indicating only structural elements – steel & concrete, slab openings, shear walls, steel size designations)
    - **All drawings are to contain annotation (notes/leaders/dimensions & materials designation)**
- **\*Pinup #5** – (Individual) Structural Submission - Graded
  - Complete structural set pinup and final grading
- **Pinup #6** – (Individual) Pre-Final Architectural Set
  - Complete pinup of progress. Will be given a preliminary peer grade (A/B/C/D)
  - Primary focus of review will be on the A-100, A-200, A-300 series drawings but must also include preliminary versions of the A-400 & A-500 series drawings.
  - This set must include every drawing that will be part of the final set.
- **\*Pinup #7** – (Individual) Final Architectural Set- Graded
  - Complete pinup and final grading (A/B/C/D/+/-)

**\*Indicates Graded Archived Submissions**

### Revit Specific Tasks:

- **Customize the titleblock.** Using a 22 x 34 titleblock – customize this family and add course and individual information to the titleblock. You may have to adjust locations of lines, etc. Add Personal Information (portrait photo & name), Class Information (Course Name/Number & Professor) and Sheet Information (Sheet number/name) to all titleblocks
- **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 name your Revit file in the format (Firstname.LastName ARCH2431 Building Set Semester-Professor.rvt) File name for a student named Louis Sullivan in Prof. King's Fall 2020 class would be (Louis.Sullivan ARCH2431 Building Set FA20-King.rvt)

### MIRO & Pinups -

- We will be conducting “virtual pinups”, using a shared pinup board hosted on **Miro.com**. We may also conduct a live pinup in the classroom. It is recommended that you create a free MIRO account. The pinup space will be provided for you with a single starting 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. You must re-sort your frames to keep your own work together and in order.
- To post your work in Miro - print each sheet from Revit to a separate PDF and then paste it onto the frame.

### Grading & Rubric:

- **Grading:**
  - For the case studies- Pinup #1 will receive an individual grade, Pinup #3 will receive a team grade.
  - Drawings set grades will be individual (Pinup #5 structural set & Pinup #8 architectural set)
- **Rubric:** Assignments will be graded on the following criteria. Additional criteria may be given during discussions.
  - Completeness of submission & deadlines. Proper file name, sheet name/number and format of titleblock
  - Formatting and organization – Are the sheets laid out well, with appropriate views and information, organized and numbered properly? Do views align, is there limited wasted (white) space?
  - 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.
  - Level of detail – Do the studies show enough to explain the construction? This requires that drawings exist at multiple scales 1/8” or ¼” for plans with larger plans at ½”. Details at (½” or ¾”) with a second set of callout details at larger scales. (1 ½”, 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 Submission:

- In addition to class Miro pinup boards, each student will need to post the completed final 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. All of your Revit family files are embedded in your main project file and should not be uploaded as part of this submission.
- Failure to submit the archive file on a timely basis may lower your grade.
  - **Pinup #1** – 3 Case Study Boards of steel buildings – individual - Graded
  - **Pinup #3** – Team presentation of selected steel buildings research – One member of the team must post
  - **Pinup #5** – Structural Submission – individual - Graded
  - **Pinup #7** – Final Architectural Set- individual - Graded