ID 40
Residential Design

Drafting
Dimensioning
Fireplace Design
Project Phases:

- You have now taken a design project through the initial phases:
  - Client interview
  - Proposal (Scope of Services)
  - Programming
    - Initial product research, costing and estimating.
  - Concept/Schematic Design
    - Adjacency studies, bubble diagrams, furniture planning.
  - Design Development
    - Fine-tune preliminary approach and selections.
Phase Seven: Design Documentation

- The project is now ready to enter the construction phase and completion.
- **Design Documentation** involves:
  - Preparing detailed drawings.
  - Compilation and review of drawings and specifications provided by others.
  - Verifying code compliance.
  - Specifying finish materials. Ordering furnishings.
  - Preparing production schedules/time-lines.
Design Documentation:

- You must provide a full set of drafted documents to the contractor. A bound plan set must include:
  - Floorplan/Construction Plan
  - Electrical, Lighting, Ceiling Plan (or any combination).
  - Finish Plan and Finish schedule
  - Elevations
  - Furniture Plan
- The approach and organization is up to you.
- Plan sets may be hand-drafted or produced on CAD.
Drafting Basics:

- The built environment must be represented in a way that is accessible and measurable.
- Scale selection is based on many factors:
  - Size of the vellum.
  - Industry expectations.
  - Level of detail required.
- Residential projects are typically drawn in 1/4” scale.
- Commercial projects are much larger and must be shown in 1/8” to 1/16” scale.
The “Cutting Plane”:

- Observing the built environment from a “bird’s eye view” is the basic premise of drafting.
- Using an imaginary cutting plane, we slice the space at 4’ - 0” a.f.f. and throw the roof away.
- Looking down on the space, we visualize all the remaining elements in what’s called:
  ▼ Plan View
Plan View:

- There are many names describing the first sheet in a bound set of documents:
  - Floorplan
  - As-built Plan
  - Construction Plan
  - Demolition Plan

- Each name assigns a specific purpose to the initial plan view.
Line Weights:

- We draft with a series of lines that vary in thickness or weight.
- Every line weight carries its own meaning and creates the visual language of a drawing.
- There are 4 basic line weights:
  - Profile
  - Primary
  - Secondary
  - Grid
Cut elements and Line Weights:

- **Profile lines** are used to draft all the elements that have been “cut” when we sliced through the space.
- These lines are thick, dense and typically drafted with an “HB” lead.
- **Consistent quality is very important.**
- Since the graphite smears easily, you may want to add these lines at the very end...
Primary Weight Lines:

- Similar to the profile line, Primary lines are also thick and dense, (but the point of the lead is less blunt).
- **Primary lines** are used to represent elements below the imaginary 4’ - 0” cut line.
- These lines are also used when profile lines would be too thick to adequately represent the image.
  - Glass thickness within windows
  - Door thickness
Secondary lines:

- **Secondary lines** represent all the non-architectural elements on a plan.
  - Built-in cabinetry
  - Furniture
  - Elevation details

- Typically drafted with “H” lead, these lines are crisp and sharp.

- Secondary line weight is also used for all dashed lines.
Grid weight:

- **Grid lines** are used for:
  - Dimensioning
  - Leader lines
  - Door swings
  - Rendering texture and design details

- Using a sharply pointed “2H” or “4H” lead helps produce these fine lines.

- **Line quality is very important.** These lines must be visible when reproduced.
Dashed Lines:

- **Dashed lines** have symbolic meaning on drafted documents.
  - ▼ Long Dashes = Elements above the cutting plane: (Upper cabinets, skylights, shelving in closets, etc.)
  - ▼ Short Dashes = Elements below the cutting plane, and hidden elements: (Flooring changes, shelves within cabinetry, etc.)

- **Dashed lines** are drafted in secondary weight.
Drafting Review:

- Revisit your course materials from ID.15, and review your knowledge of drafting basics.
- Read the hand-outs given today and fully understand the proper use of line weights, poche techniques, and dimensioning.
- Ask questions to review any concepts that may be a little “rusty”....
Dimensioning:

- **Dimensioning** is the most important aspect of a drafted document.
  - Manual drafting is done by hand. There is always a margin of error.
- By dimensioning a plan, we call out the specific measurements to be used in the construction process.
- A contractor should never scale from a plan. He will build from the dimensions you provide.
  - Dimensions must be easily understood and accurate.
There are 3 levels of detail provided through dimensioning:

- **First String** = Openings
- **Second String** = Wall changes
- **Third String** = Overall length and width

Centerline symbols are used to visually indicate the spatial centering of objects.
First String Information:

- **First string dimensions** describe the location of openings (windows and doors):
  - ▼ New construction is dimensioned to the center of the opening.
  - ▼ The centerline symbol is used as the extension line for the dimension string.

- The dimension line is placed about 1/2” from the drafted walls of the plan.

- Dimension text is written in 1/8” numerals.
Dimensioning Doors:

- To dimension interior door openings, we use a different method.
  - These dimensions refer to the framework of the opening. Do not include trim.
- Using 1/8” text, the size of each door is placed within the opening itself.
  - The width of the opening is recorded first.
  - The height of the opening is recorded next.
Other key facts:

- Use a centerline to indicate an opening clearly centered within a wall space.
- **Code requires a minimum clearance of 3” from the opening to the nearest wall.**
- Include a 2” threshold at all exterior doors.
  - ▼ **Drawn on the exterior side of the door.**
  - ▼ **Also shown at the interior door of the garage.**
- **Closet doors are not dimensioned. Instead you will provide information re: the wall location.**
Additional Considerations:

- An industry standard door is 3’ wide by 6’ high.
- However...not every interior door fits this profile. Select which size is appropriate to your needs:
  - Bedrooms and baths = 2’- 8”
  - Water heater closets, utility rooms = 2’- 6” to 2’- 4”
- Always draft the door in its fully open position.
- Use primary lines to draft the door thickness.
  - Typically 1” to 2” at 1/4” scale

Review the hand-out for instructions on drafting different door configurations.
Second String:

- **Second string dimensions** relate where the walls change direction, (creating rooms within the overall space).
  - **Residential** (wood-frame) construction is dimensioned to the “front of face” (f.o.f.) of each wall.
  - **Commercial** (steel-stud) construction is dimensioned to the center of each wall.

Interior designers always dimension interior spaces...
Third String Information:

- **Third string dimensions** relate the overall width and length of the entire space.
- When added together, the minor measurements must always equal these overall dimensions.
- Wherever overall dimensions are shared, it is only necessary to give the information once.
  - ▼ Record one dimension for the overall width.
  - ▼ Record one dimension for the overall length.
Closed Dimensions:

- Providing too much dimensioning information is as bad as providing too little.
- **Never** include every measurement for any given dimension string.
  - Called “closed strings”…over-dimensioning can cause change orders for the contractor if conditions can’t be met.
- Dimension only the most critical construction elements in your design.
  - Do not cause the contractor to make crucial design decisions in the field.
Final Reminders:

- Residential (wood-frame) walls are:
  - Interior walls = 4” thick
  - Exterior and Plumbing walls = 6” thick
- Always include labels on any unidentifiable elements within the plan. Use 1/8” text.
- Align titles with the overall width of the plan.
  - Underline the title with a profile weight line.
  - Always include a north arrow.
  - Be consistent with title placement and title block information.
Title Block Information:

- Each plan title must be included in the Title Block.
- Include the name of the client and/or project.
- Include the project address, (city and state).
- Center the information within the overall area
  - ▼ What lettering size is used for Titles, sub-titles, etc.?
- It’s always a good idea to include your company logo on every sheet.
Title Block Information:

- Also fill in the lower portion of the title block:
  - Job number
  - Drawn by
  - Scale
  - Date

- The **Revisions** area is used to document any changes made to the plans throughout the project.
  - Each revision is given a number that corresponds to a bubbled area on the plan.
  - The number is placed inside a small triangle.
Misc. information:

- **Stair Construction Codes:**
  - **Stair riser** = 7 3/4” maximum height.
  - **Stair tread depth** = 10”
  - **Width of stair (and landing areas)** = 3’ - 0” minimum.
Drafting Shower Stalls:

- When drafting the plan view of a shower stall:
  - Use angled lines to indicate the shower pan.
  - Use a small triangle to indicate the plumbing wall (shower head location).
  - There is a usually a 4” curb to keep the area water tight.
  - Draft the glass panel thickness within this 4” area.
  - Always draft the shower door fully open. Include a door swing line.
  - When appropriate join the bathtub and shower stall together to form one unit.
Fireplace Construction:

- The architect or contractor has the ultimate responsibility/liability for fireplace construction.
- Since the designer may be space planning a fireplace into the design, it is important to know a few facts.
- You have been given construction details and recommended dimensions for:
  - Typical fireplace layout
  - Double-sided or 2-way fireplace
  - Corner fireplace
Code Requirements:

- UBC requires that the hearth material must be distinguishable from the surrounding floor type.
  - The hearth can be level with the floor or raised.
- A fireplace opening that measures 6 sq. ft. (or less) requires that a hearth:
  - Extend 16” beyond the face of the opening.
  - Extend 8” to either side of the opening.
- A fireplace opening that is any larger requires that a hearth:
  - Extend 20” beyond the face of the opening.
  - Extend 12” to either side of the opening.
Hearth Construction:

- The hearth consists of two parts:
  - Front (or finish) hearth.
  - Back hearth (area underneath the fire).
- The front hearth must be non-combustible as a precaution against flying embers:
  - The materials do not need to resist intense, prolonged heat.
- The front hearth must project at least 16” from the front of the opening.
  - In rooms with wood flooring, the hearth in front of the fireplace should be supported on masonry.
Code Requirements:

- **Woodwork** or other combustible materials may not be placed within 6” of a fireplace opening.

- Combustible mantle material within 12” of the opening cannot project more than 1/8” outward for every 1” in vertical distance from the opening.
Firebox Construction:

- The fireplace front should be wider than the back.
- The upper back should tilt forward to meet the throat in order to throw heat into the room.
- The depth of the firebox should be 1/2 the height of the opening, (to a maximum 24”).
- The back of the firebox should rise 1/2 the height of the opening before sloping forward.
- The width of the firebox should be 2/3 the opening width.

The Designer is never responsible for the working construction of a fireplace.
Review These Materials:

- We have reviewed basic drafting techniques.
- We have learned about fireplace construction.
- Please review all of these hand-out materials throughout the semester.
- Ask questions regarding anything you don’t understand!!!!