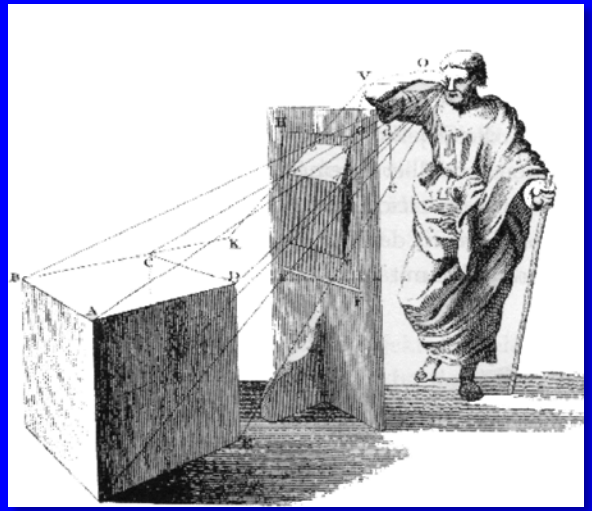
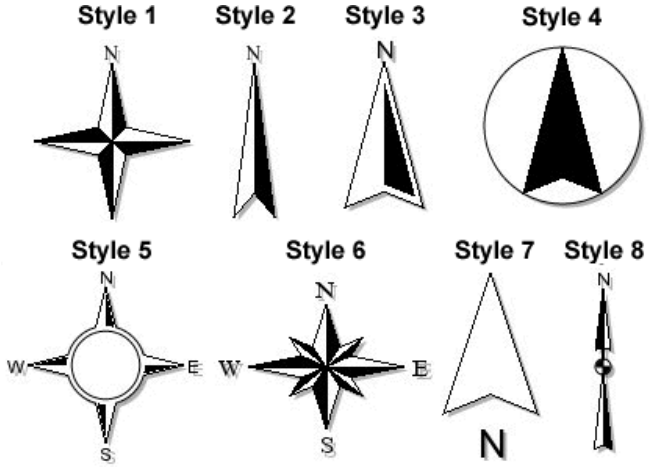
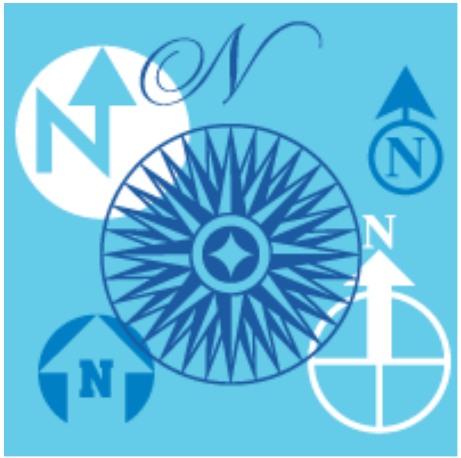
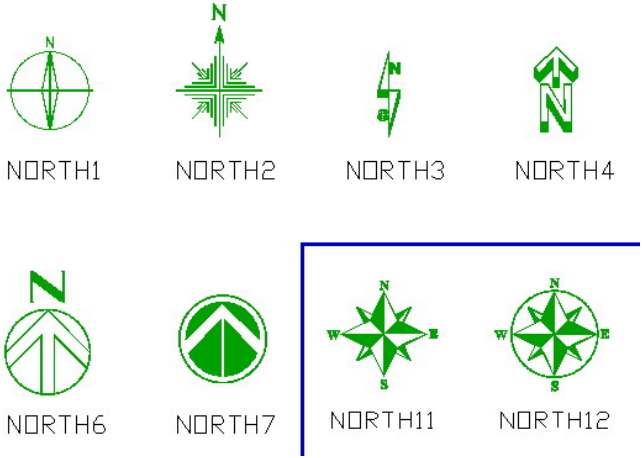


Impact of Drawings on Building and vice versa







Designing for solar conditions requires that you are aware of the orientation of the site. If you don't have one of these on your plan *from the beginning*, then, *you are not aware.*

It is a nice touch to personalize your design for these!

SCALE BAR 1:1250

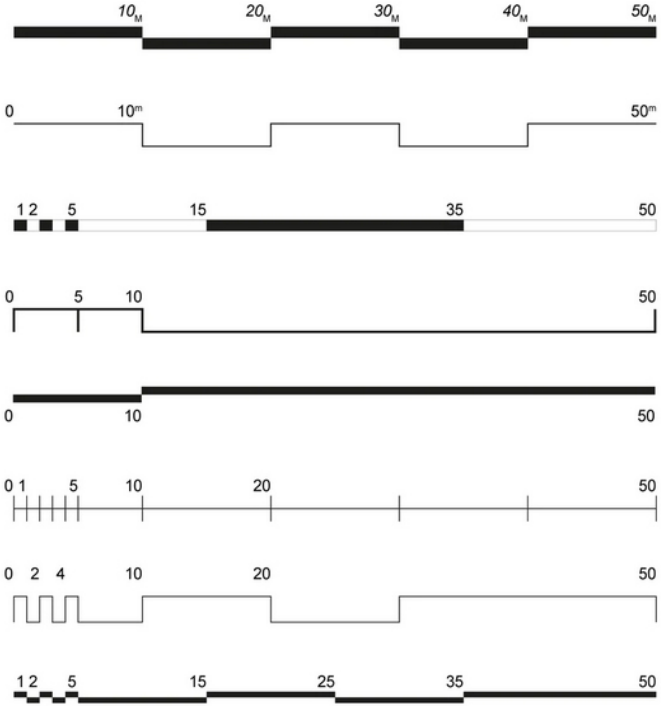
SCALE BAR 1:1000

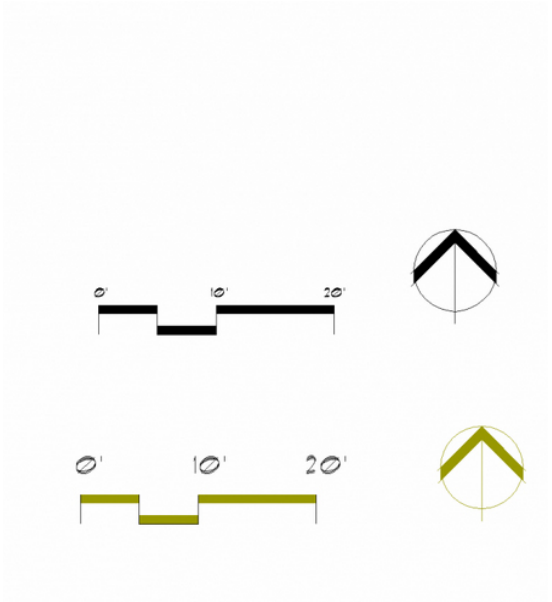
SCALE BAR 1:500

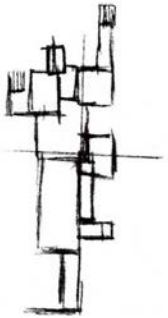
SCALE BAR 1:250

SCALE BAR 1:100

SCALE BAR 1:50



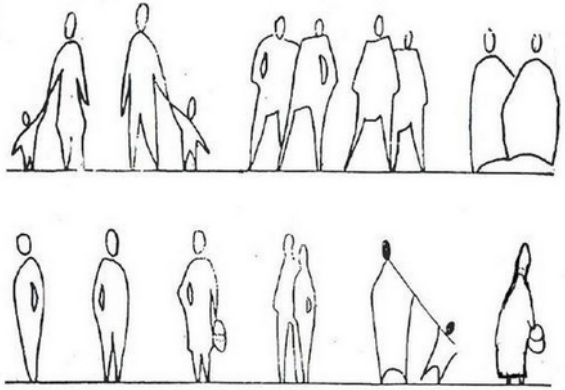


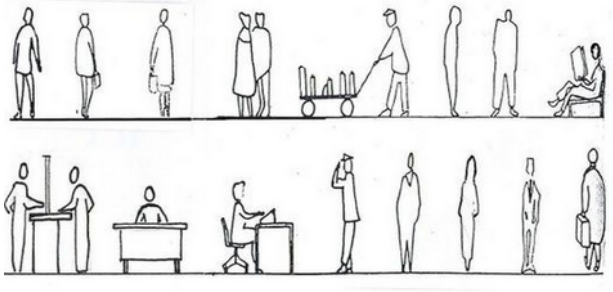


Theo van Doesburg

Le Corbusier

Steven Holl



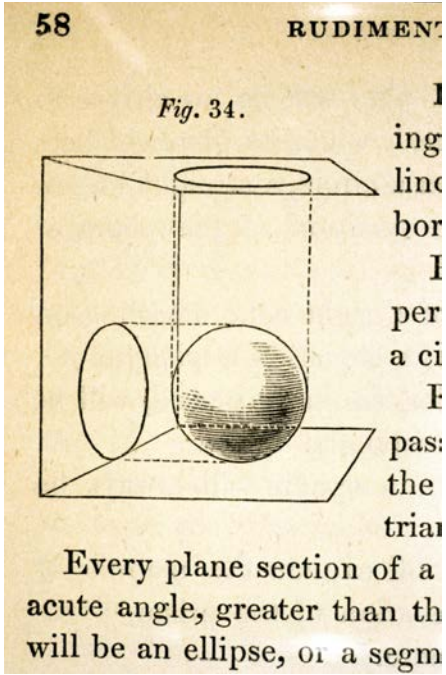


Danger!!!

The following images are being used as examples of DRAWING METHOD ONLY.

Do NOT copy the details. They have been drawn from “everywhere” and are likely WRONG for our climate and situation.

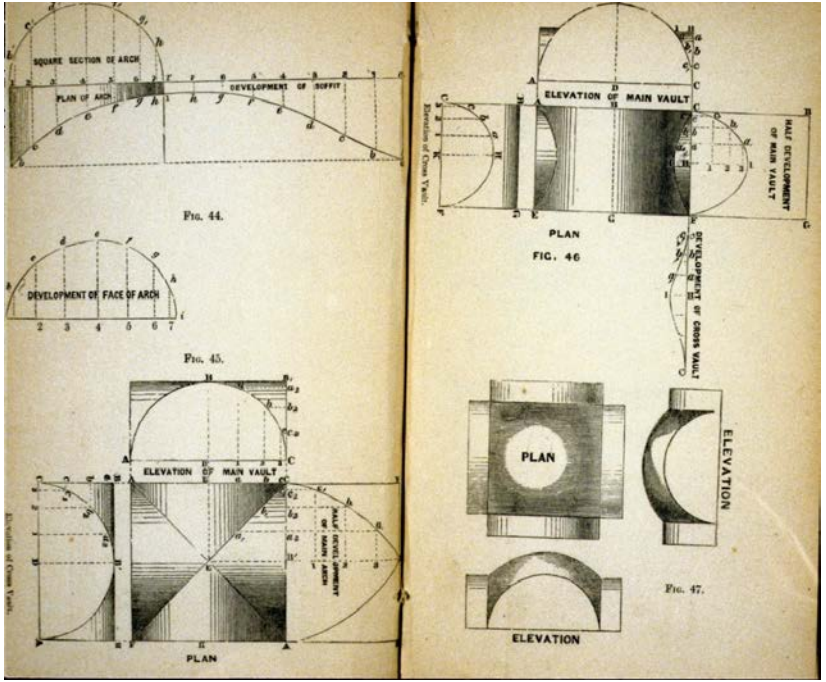
stereometry…



58 RUDIMENT

Fig. 34.

Every plane section of a
acute angle, greater than th
will be an ellipse, or a segm



Basic Equipment

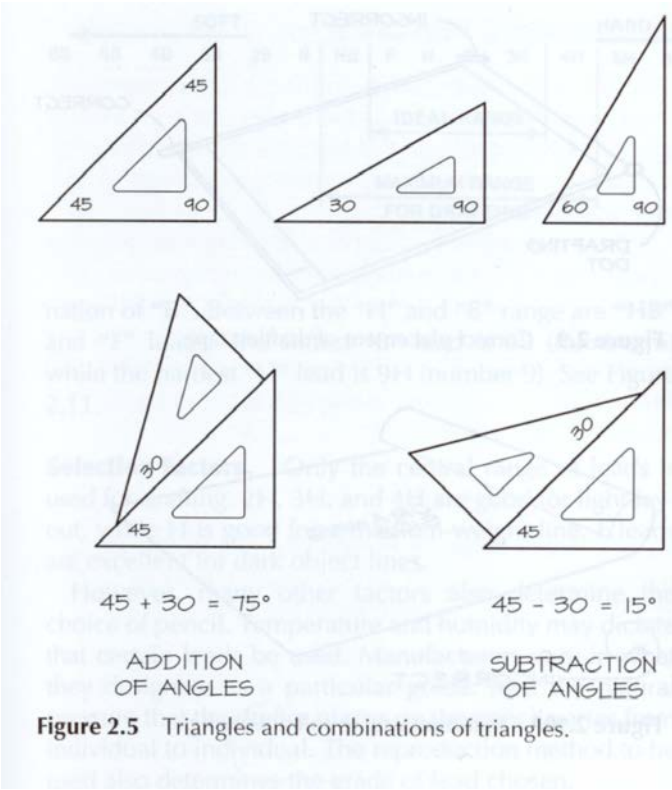
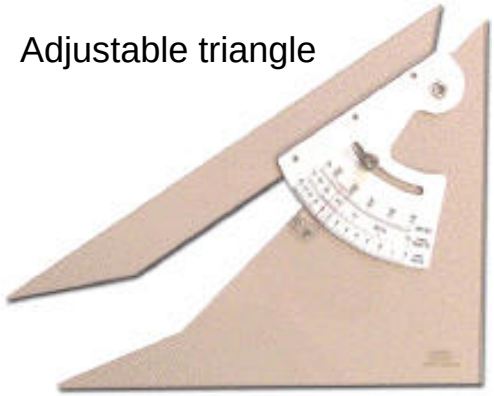


Figure 2.5 Triangles and combinations of triangles.

Adjustable triangle



Scale

relationship of drawings

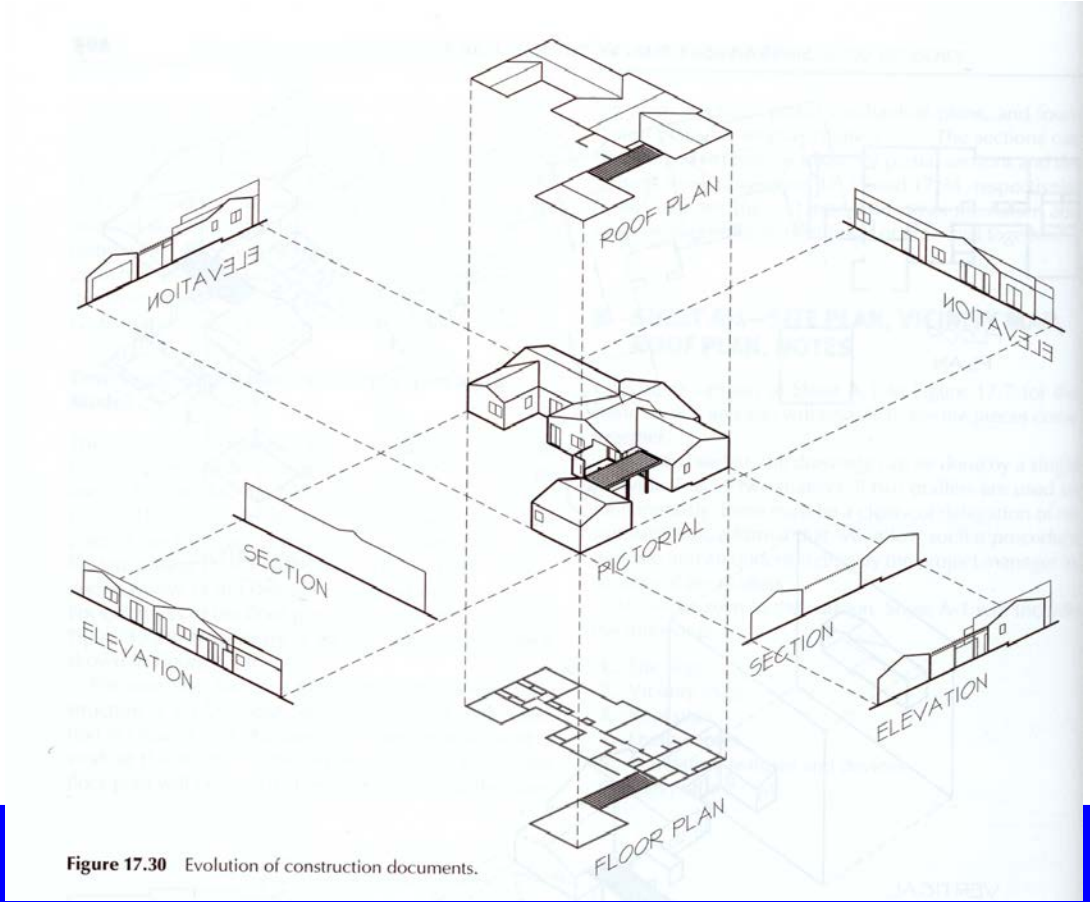
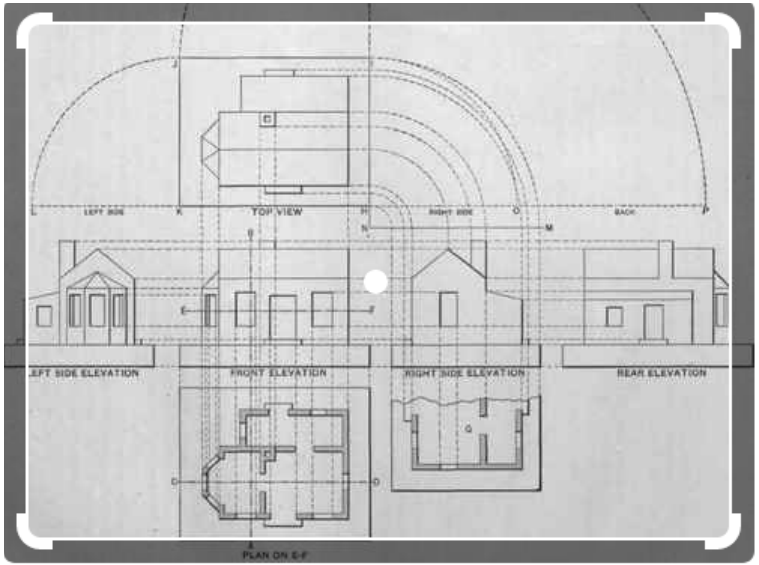
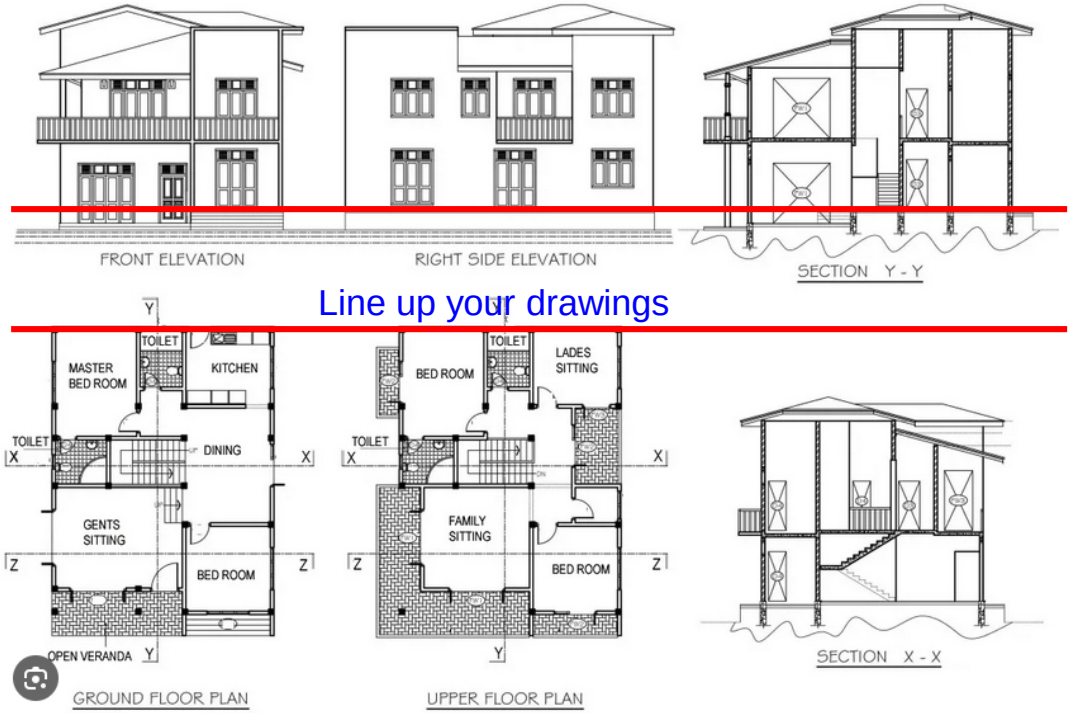


Figure 17.30 Evolution of construction documents.

The Orthographic Set of Drawings





RELATIONSHIP OF PLAN ELEVATION AND SECTION • Archi-Monarch

Visit

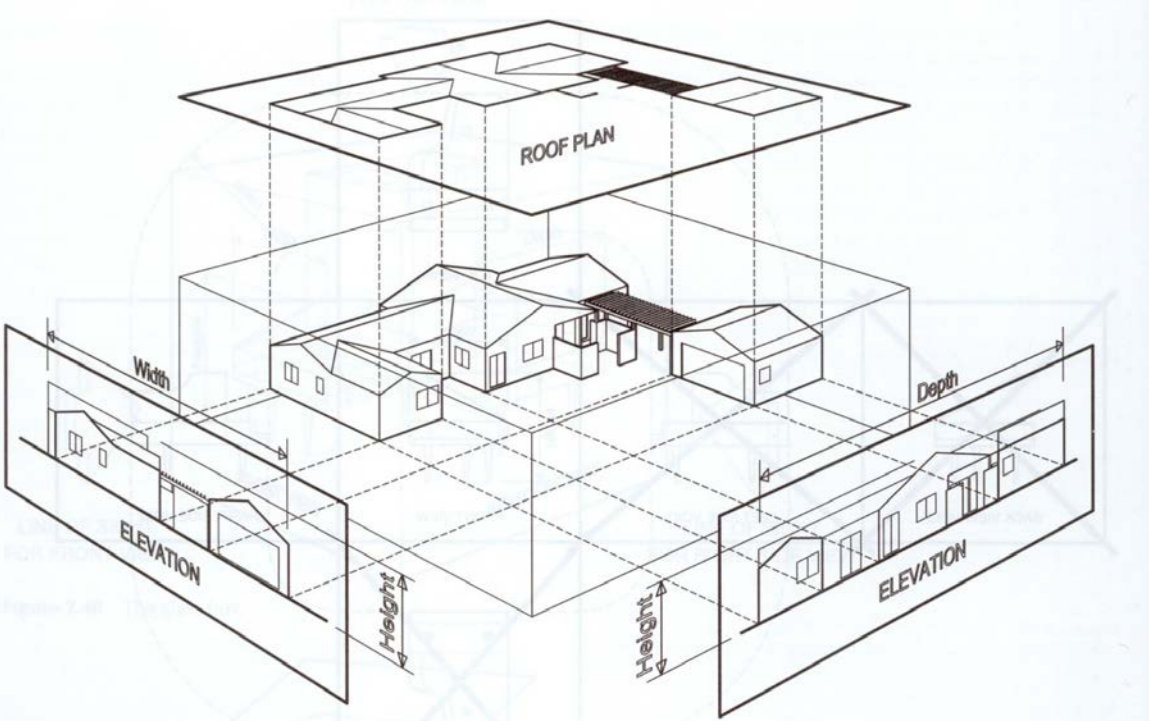
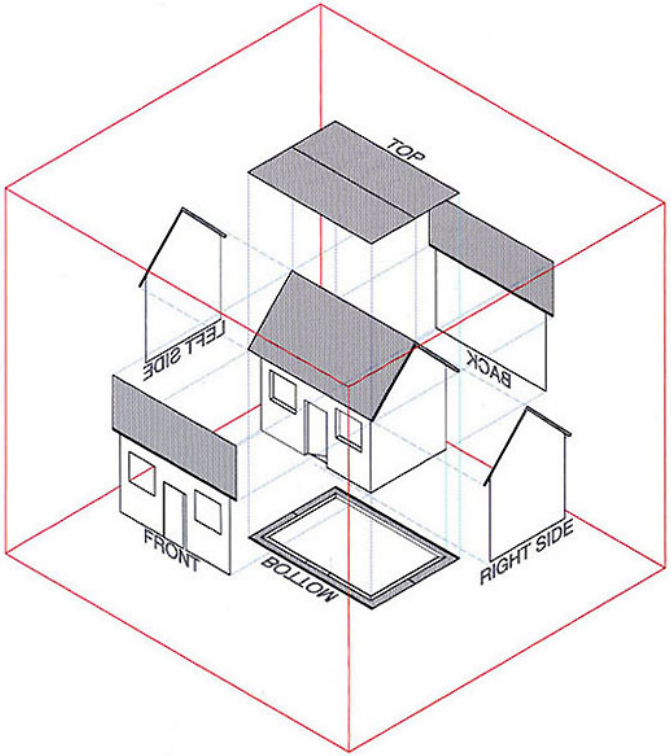


Figure 2.43 A multiview drawing of a structure.



Drawings: Sketches

Sketches are quick hand drawings to convey the “concept”.

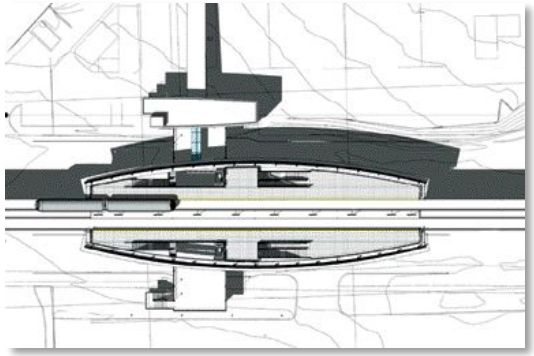
Roughly to scale.

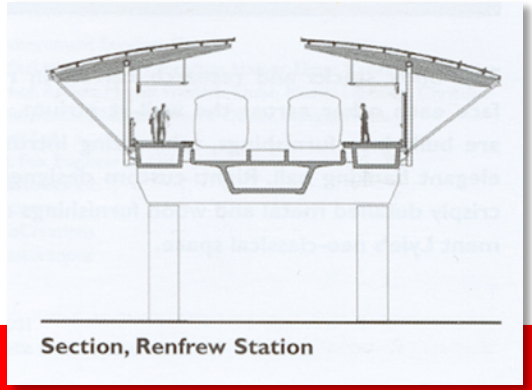
Daniel Libeskind’s *classic* Napkin Sketch for the Addition to the Royal Ontario Museum in Toronto.

Design Drawings

Design drawings show the building in more detail, with accurate sizes, but with minimal technical information.

They usually have a sense of materiality and reflect the actual scale and physical location of the project.

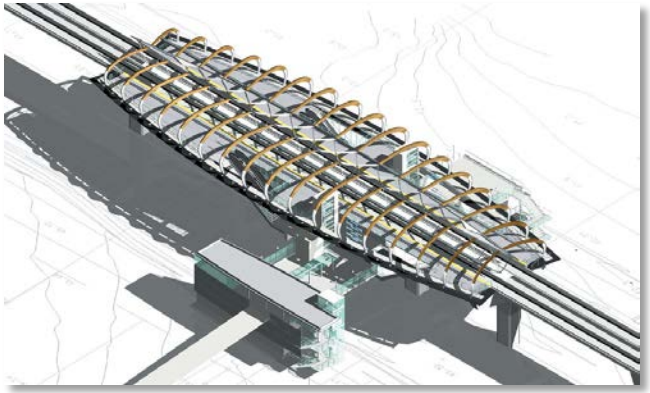




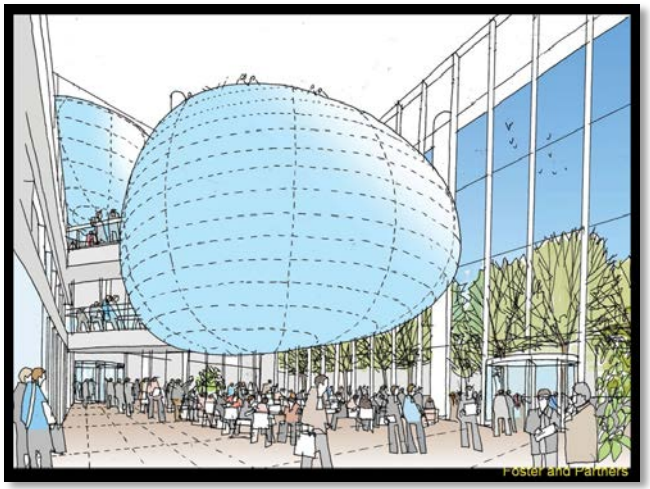
Section, Renfrew Station

Renderings:

Renderings whether done by computer or by hand give us a 3-D feel of the finished building.



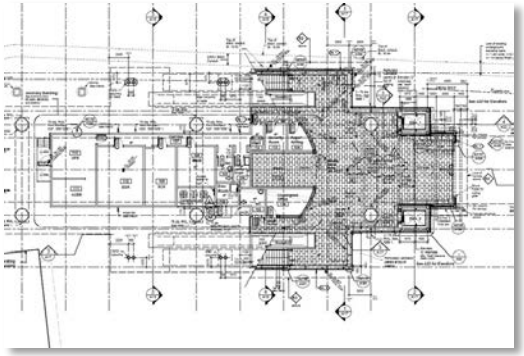
Brentwood Skytrain Station: Busby

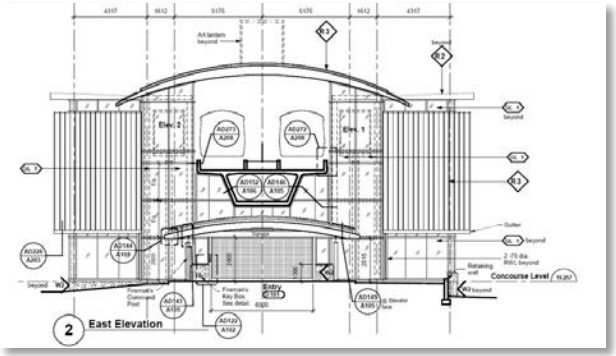


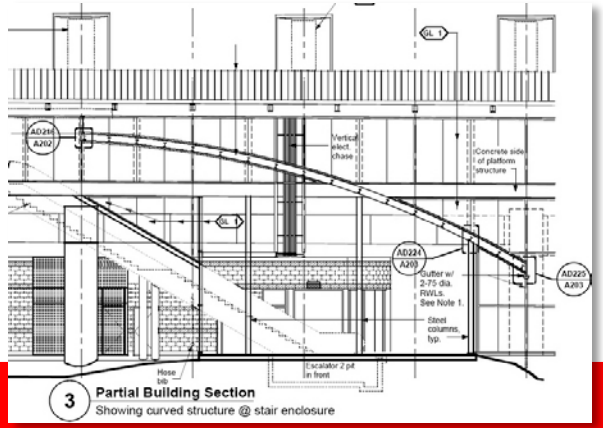
Leslie Dan Pharmacy Building: Foster

Contract Drawings:

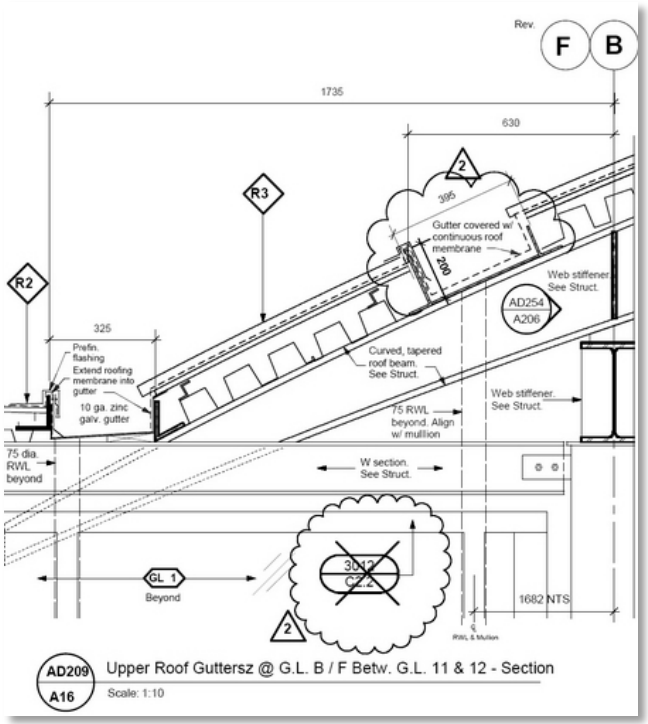
As these form the legal agreement to construct, they are loaded with technical information.

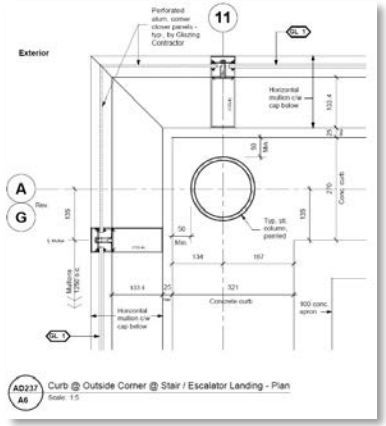


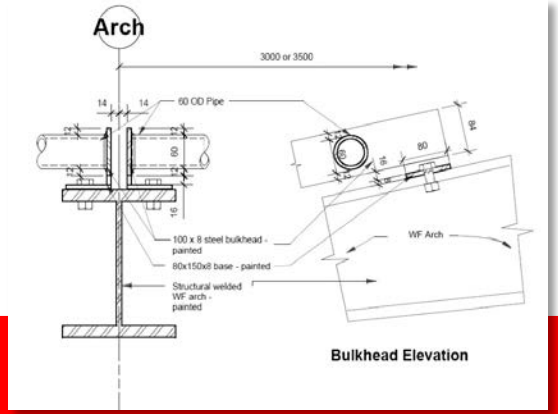




Construction Details:







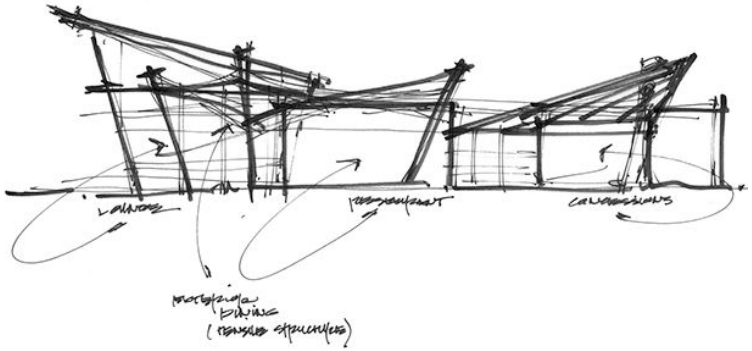
Types of Drawings: Preliminary Design

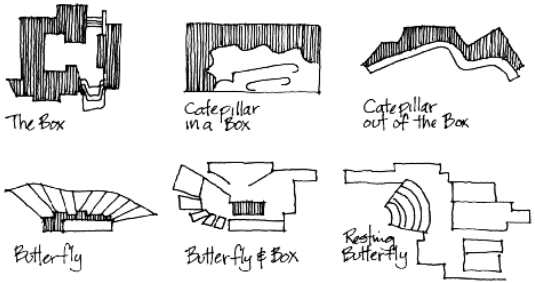
Preliminary Design (Presentation Drawing)

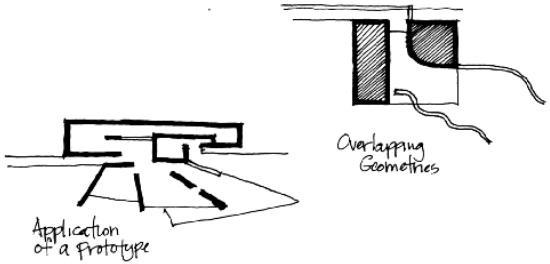
Types of Drawings: Hand Sketches of plans, sections, elevations, or 3D views, sketched diagrams, Parti (“big idea”) drawings

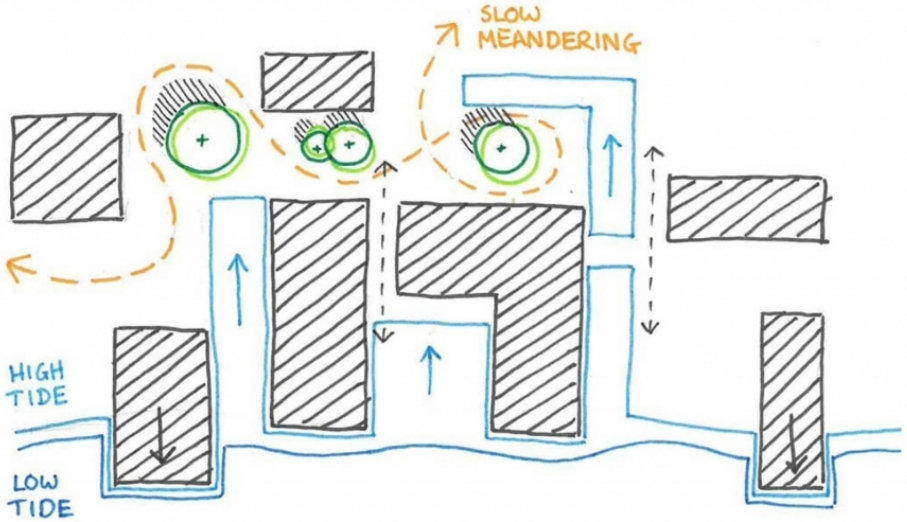
Expectations: Low accuracy, high expression of ideas and feelings, thick or messy lines, not necessarily to scale, colour is welcome and encouraged, think ‘architectural doodling’

Uses: Winning a competition, publishing in a journal, research proposals, communication with clients at initial meetings




The Box
Caterpillar in a Box
Caterpillar out of the Box
Butterfly
Butterfly & Box
Resting Butterfly


Overlapping Geometries
Application of a Prototype

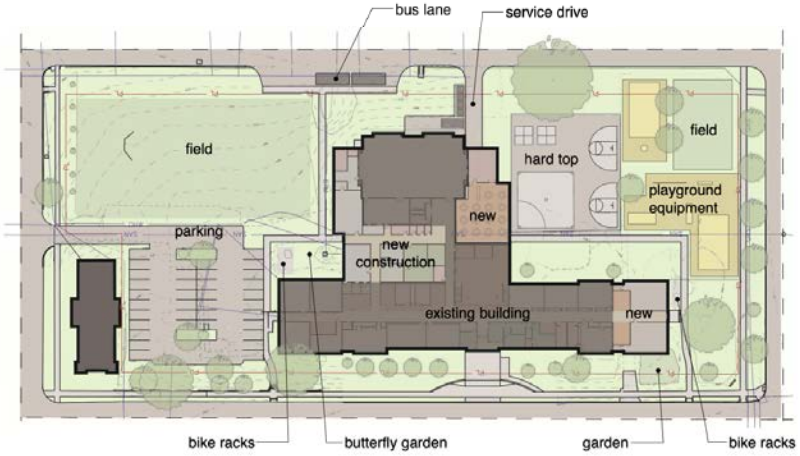

SLOW MEANDERING
HIGH TIDE
LOW TIDE

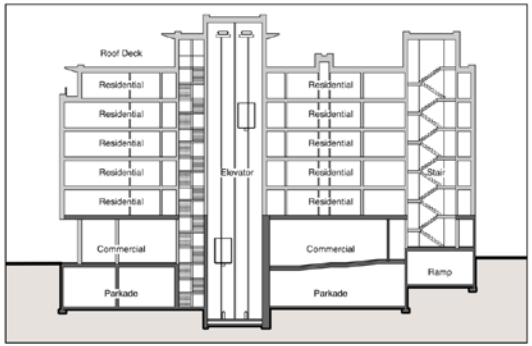
Types of Drawings: Schematic Design

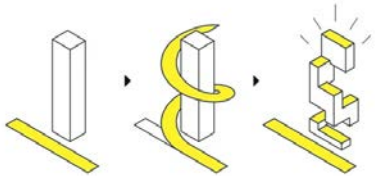
Schematic Design (Presentation Drawing)
Types of Drawings: digitally or hand-drafted drawings of plans, sections, elevations, details, 3D images, diagrams

Expectations: true to scale, expressing ideas more than decisions, straight and more accurate lines, colour lives only in diagrams and 3D images

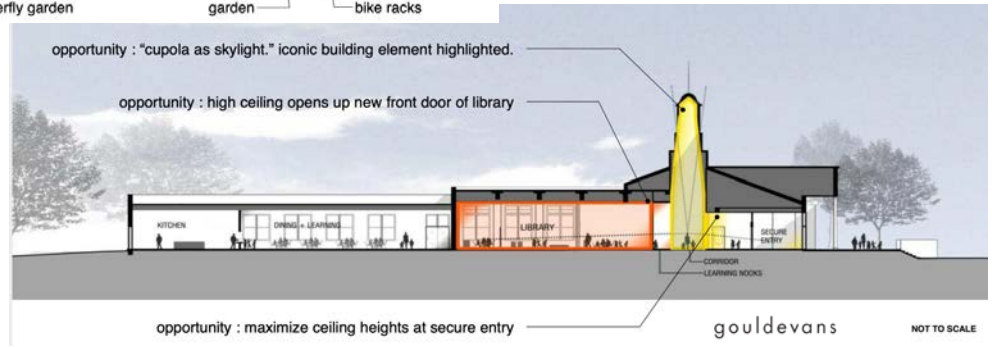
Uses: sharing ideas with other designers, confirming ideas work when drawn to scale, winning a competition, communicating with clients





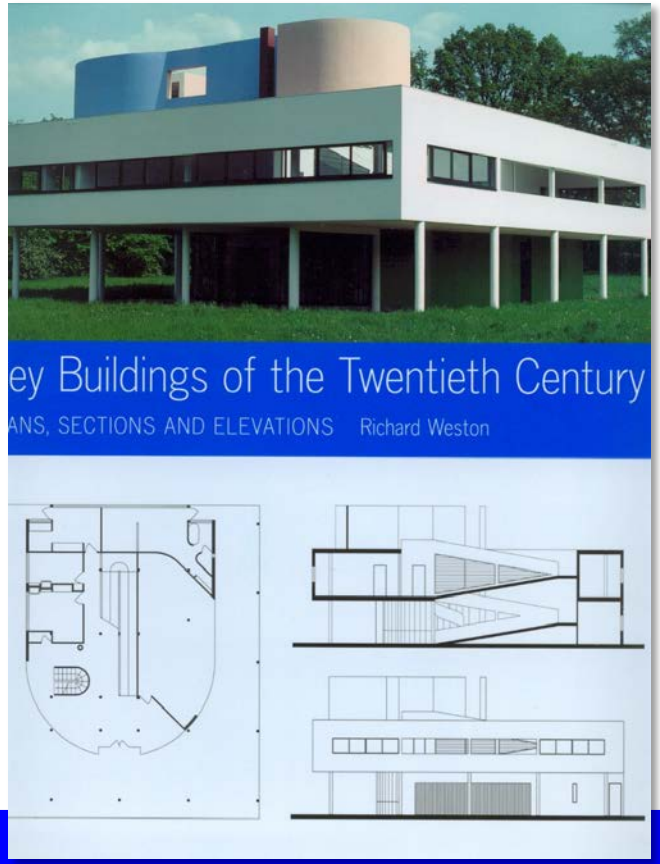


Paolo Venturella



From Andrea Atkins, AE Prof

Schematic Design Drawings

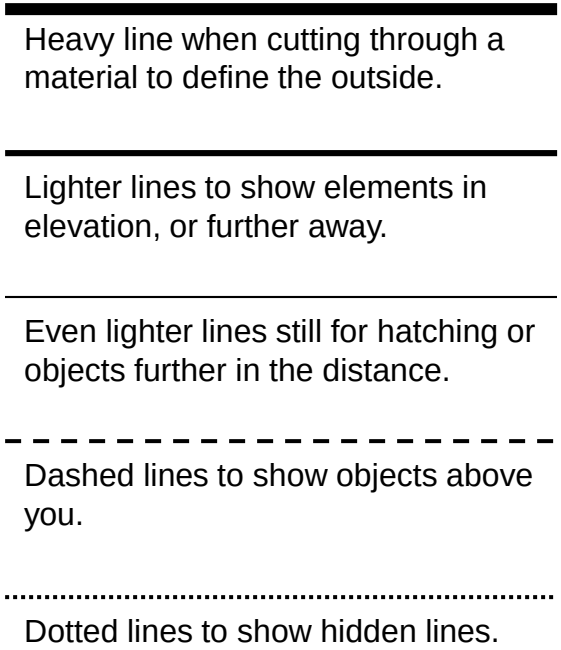


- Typically using poche for walls and floors shown in section and plan
- Differentiate thicknesses of walls and floors to show outside (thick) vs interior partitions (thin)
- Some materiality shown in elevations through hatching

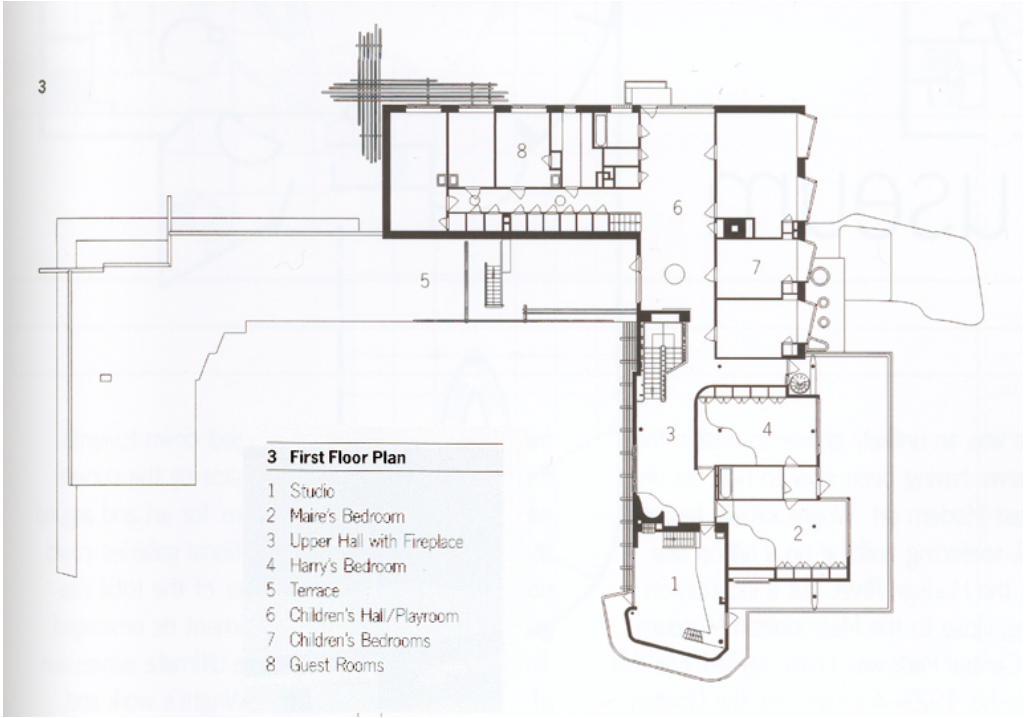
lines

Lineweights are differentiated, whether you are drawing in ink or pencil, by hand or with CAD.

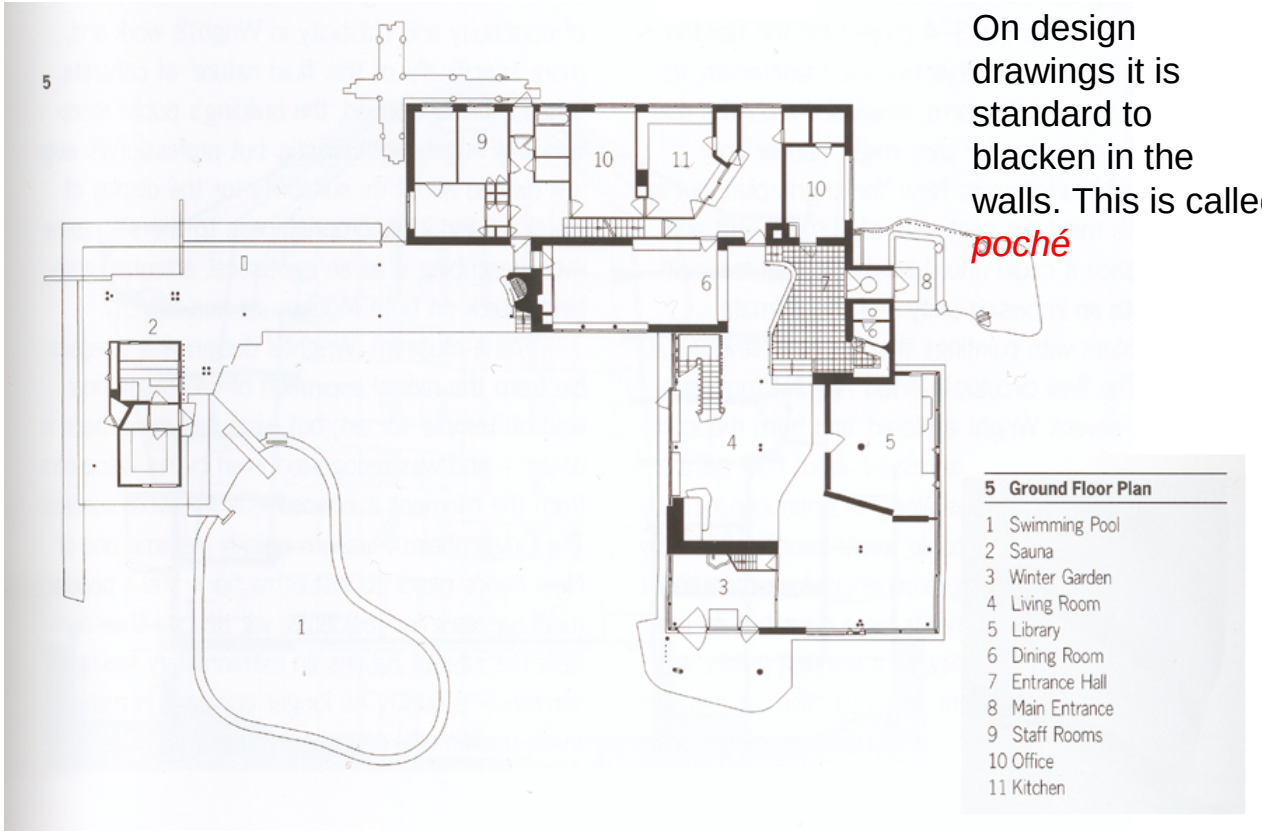
This makes the drawing read better.



villa mairea – alvar aalto

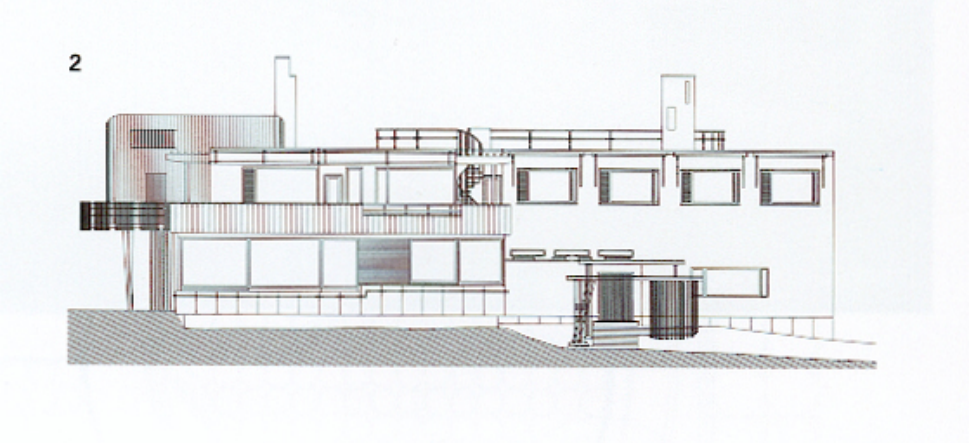


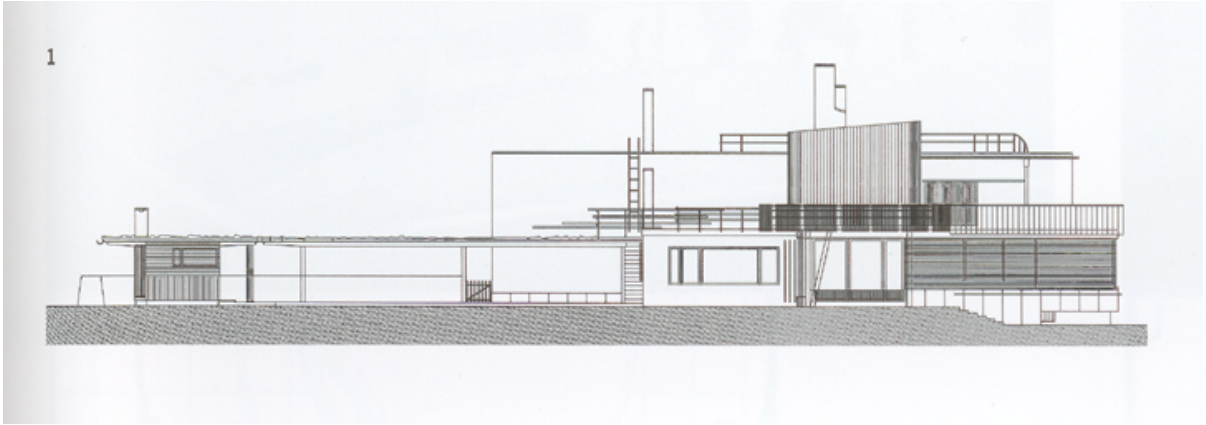
Note: a floor plan is actually a sectional view of a building, the cut taken at 4’ or 1.2 m, looking down.



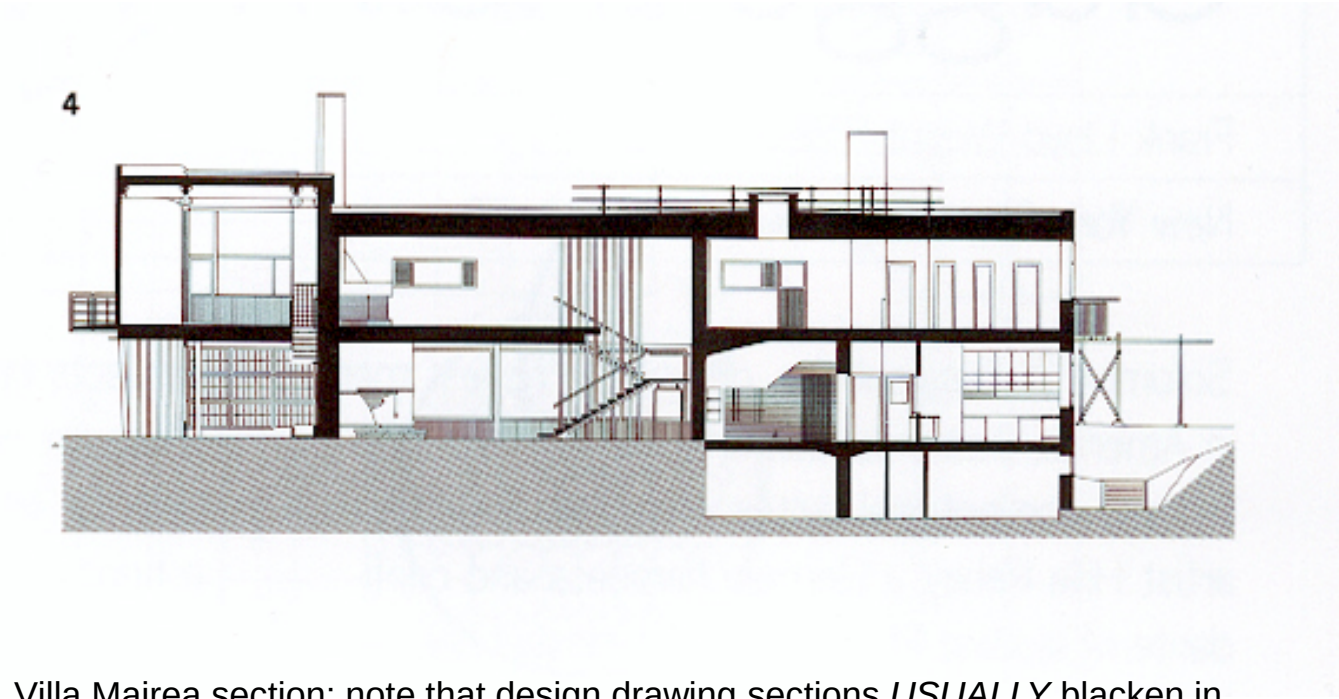
On design drawings it is standard to blacken in the walls. This is called *poché*

Note rooms are labeled via numbers and a key. Walls are blackened in to create a better graphic and purposefully do not show materials.



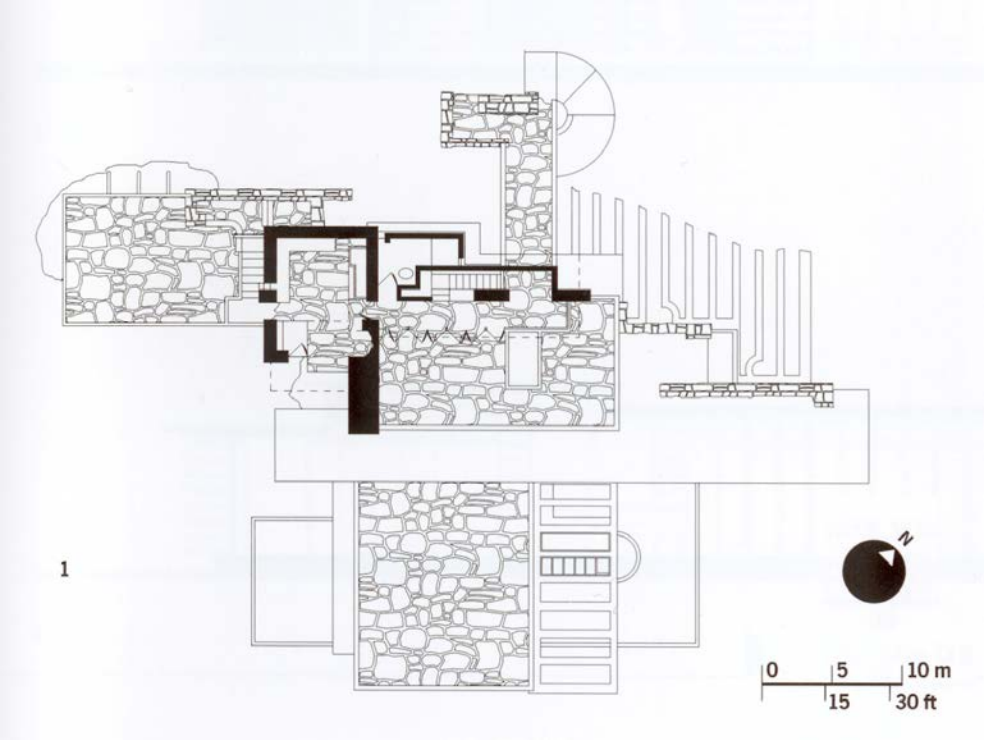


Villa Mairea elevations: note materials are hatched but not labeled.

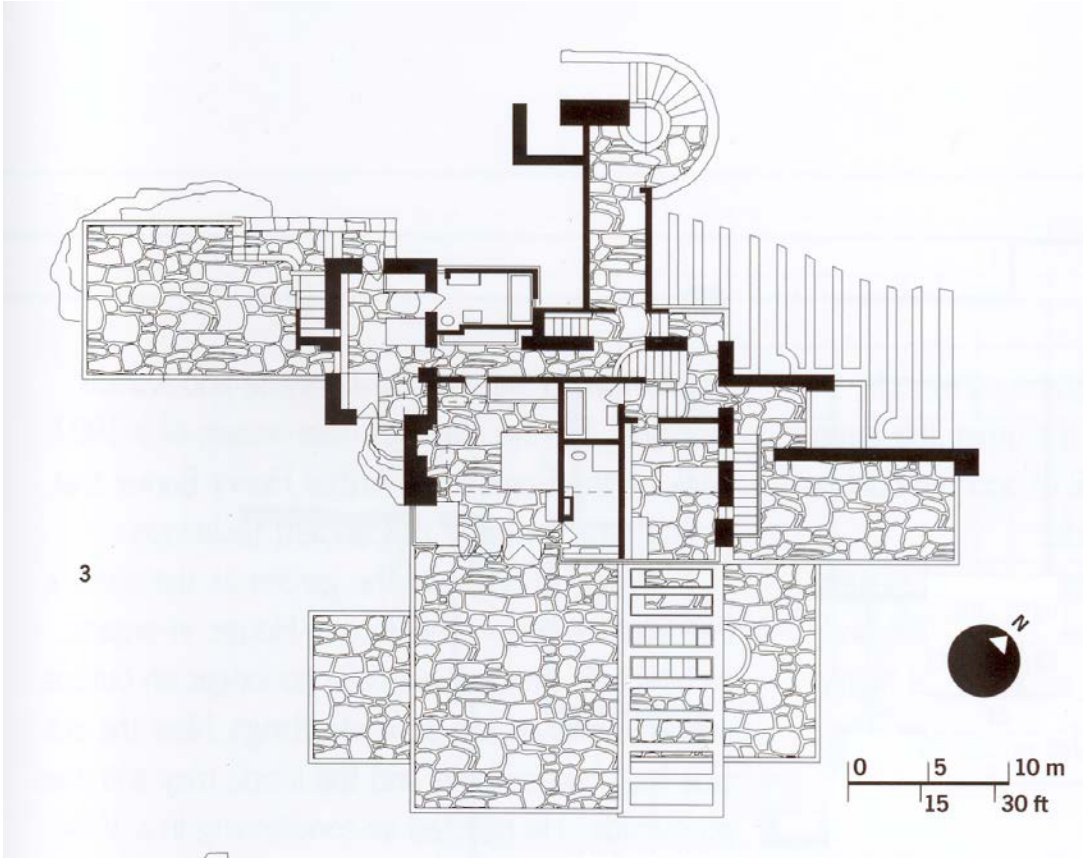


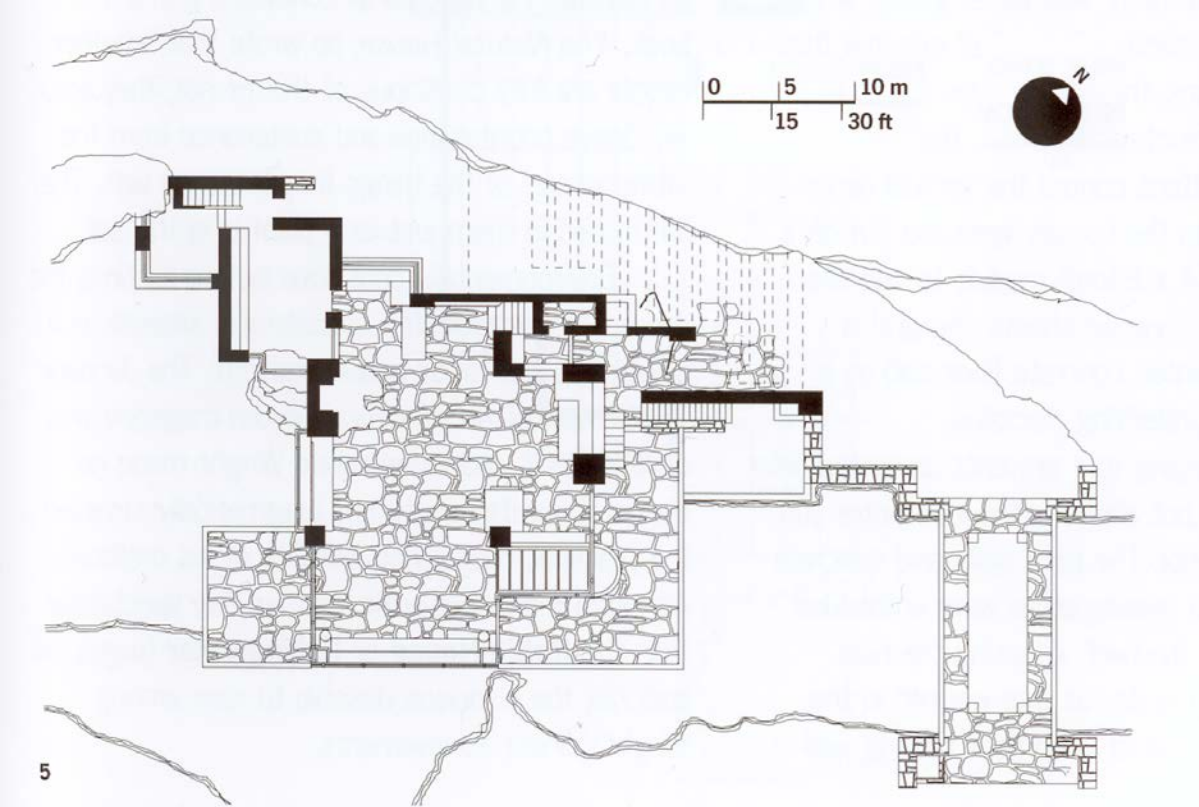
Villa Mairea section: note that design drawing sections *USUALLY* blacken in their walls so that materiality is purposefully not shown.

falling water – frank lloyd wright

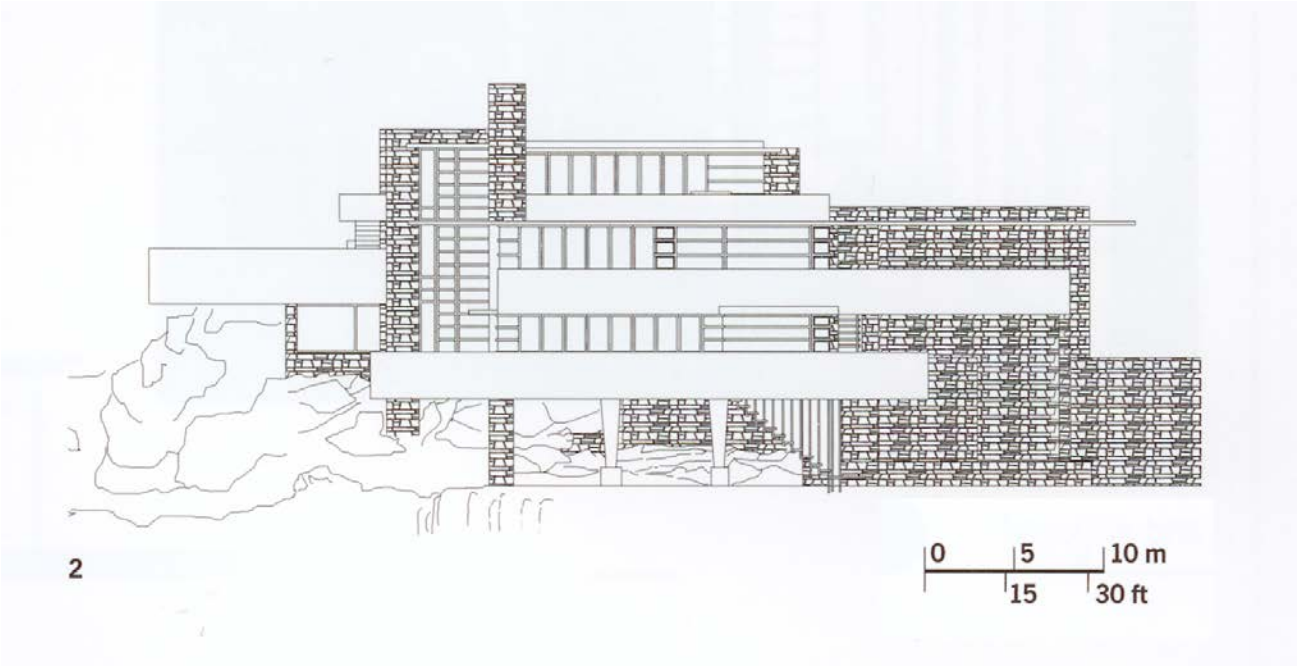


Note!! North arrow and graphic scale

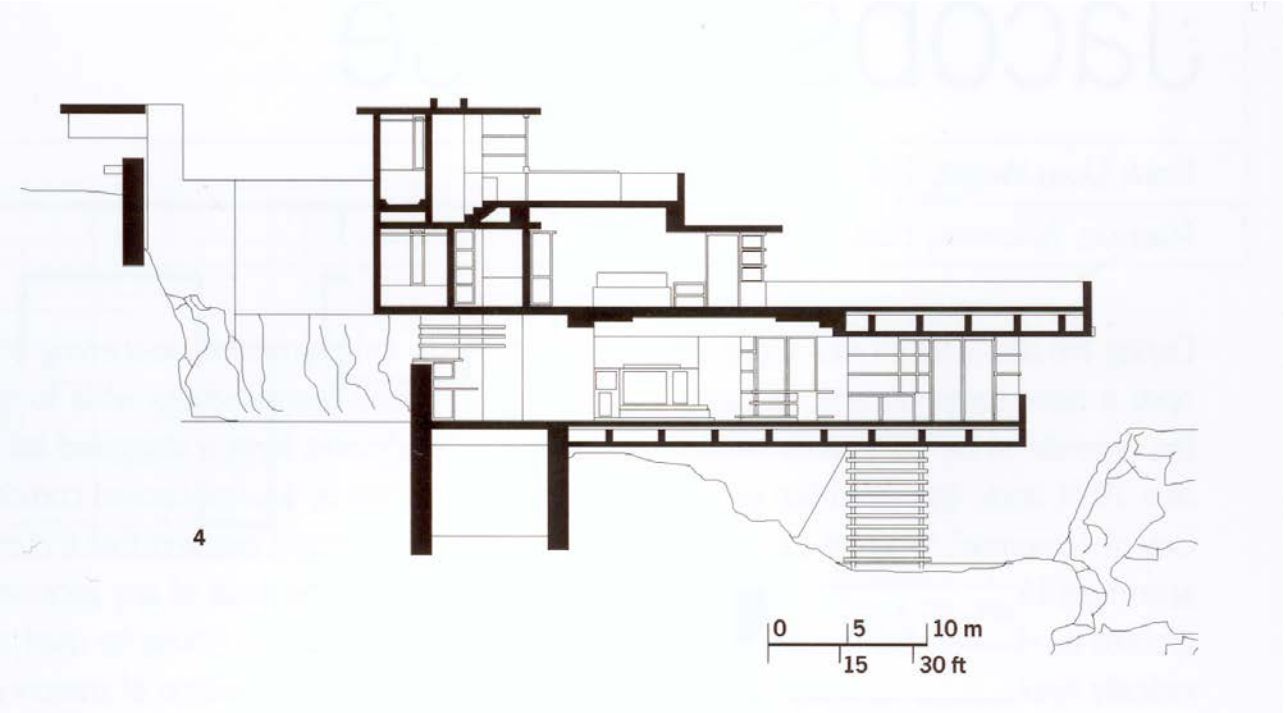

3
N
0
5
10 m
15
30 ft



Hatching of materials in the plan view is contrasted by the blackness of the walls.



2



Again note that in a design drawing the walls are blackened in. The graphic scale allows the drawing to be reduced or enlarged and the scale still valid.

Types of Drawings: Design Development

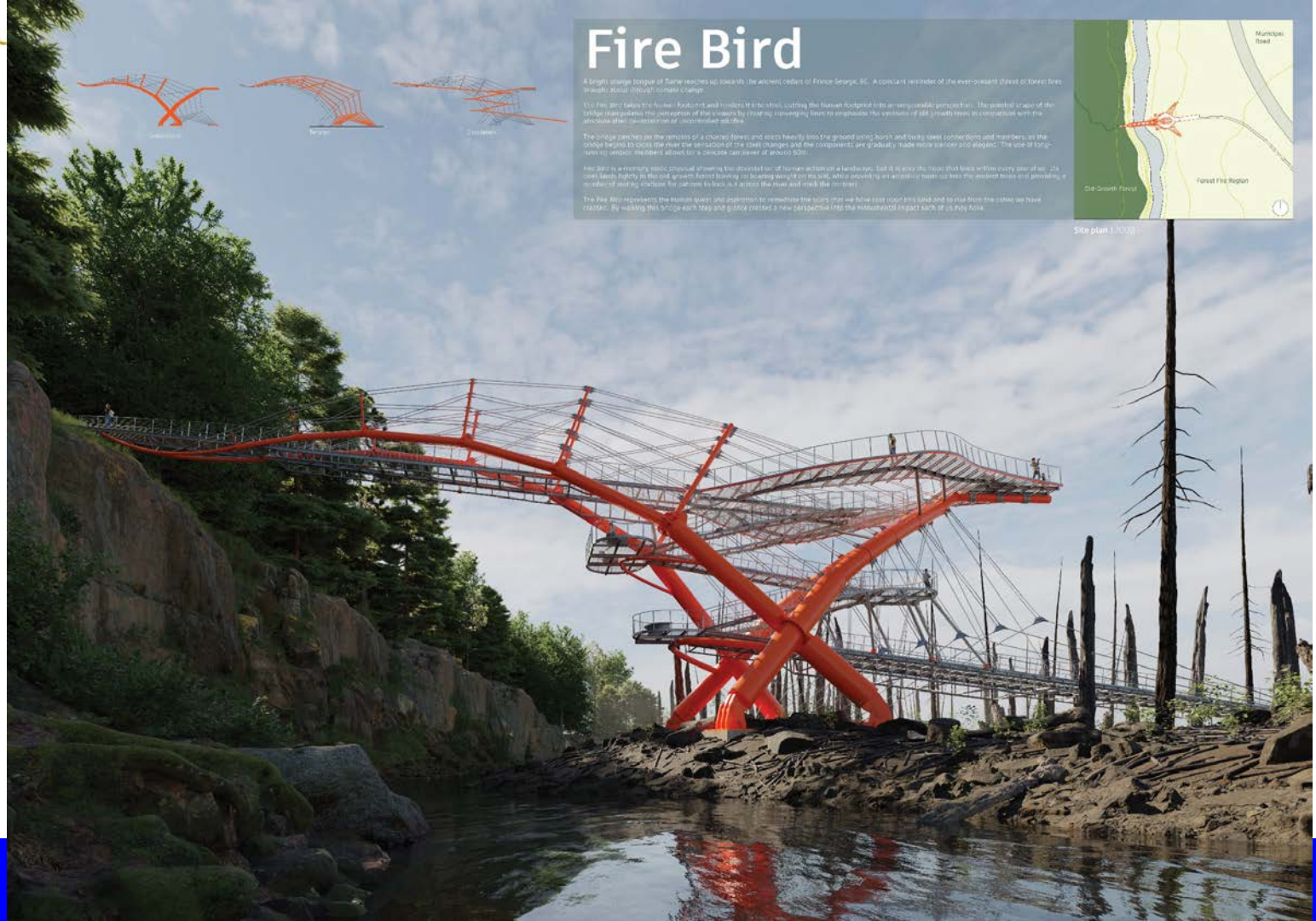
Design Development (Technical Drawing)
Types of Drawings: digitally drafted drawings of plans, sections, elevations, details, 3D images

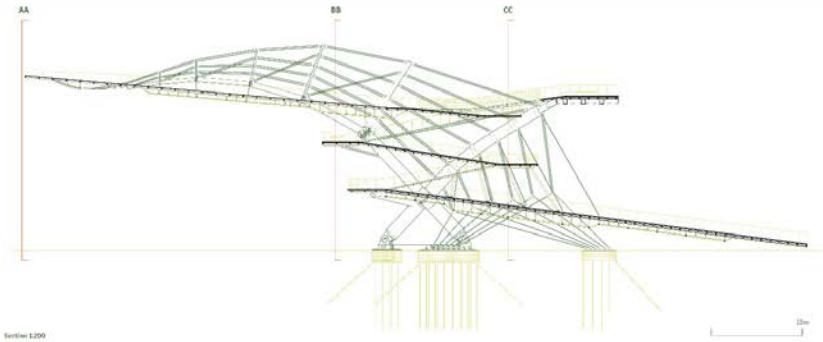
Expectations: increasingly detailed and accurate drawings showing confirmed decisions as they are decided, materials are partially known, dimensions are mostly correct, everything is to scale

Uses: sharing ideas with other designers, confirming ideas work when drawn to scale, preliminary cost estimates by consultants, preliminary co-ordination between consultants getting final sign-off from clients

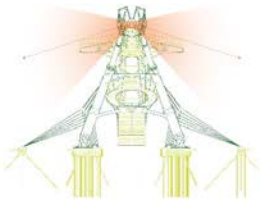
Competition Drawings

- Depends on the type of competition
- The one used for Arch 173/Arch 113 in Winter term is the CISC Student Steel Design Competition – A Pedestrian Bridge
- Competition sponsors want to see maximum use of their materials if it is a material sponsor
- Some competitions are more conceptual and the drawings more like schematic
- Materials sponsored competitions are much more detailed to show your knowledge of the material

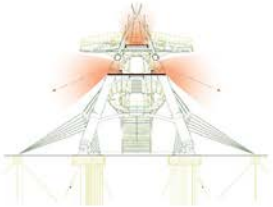

Fire Bird
A bright orange tongue of flame reaches up towards the ancient cedars of Prince George, BC. A constant reminder of the ever-present threat of forest fires brought about through climate change.
The Fire Bird takes the hollow footprint and renders it in steel, cutting the human footprint into an ever-possible perspective. The pointed shape of the bridge manipulates the perception of the viewers by creating converging lines to emphasize the vastness of old growth trees in comparison with the absolute alien devastation of uncontrolled wildfire.
The bridge perches on the remains of a charred forest and reacts heavily into the ground using harsh and bulky steel connections and members as the bridge begins to cross the river the sensation of the steel changes and the components are gradually made more slender and elegant. The use of long-span no verticals enables allows for a pinnacle cantilever of around 50m.
Fire Bird is a memory static physical showing the devastation of human action on a landscape, but it is also the hope that lives within every one of us. As cows lands butterfly in the old growth forest leaving no bearing weight on the soil, while providing an accessible route across the ancient trees and providing a number of resting stations for patrons to look out across the river and mark the moment.
The Fire Bird represents the human quest and aspiration to remember the scars that we have cast upon this land and to rise from the ashes we have created. By walking this bridge each step and glance creates a new perspective into the monumental impact each of us may have.
Municipal Road
Old Growth Forest
Forest Fire Region
Site plan 1:7000



Section 1:200



Elevation AA 1:150
The foam cut platform of the bridge offers a very delicate view of the transition into the old growth to visit while blocking as little of the experience of the threshold as possible through using a cantilevered structure.

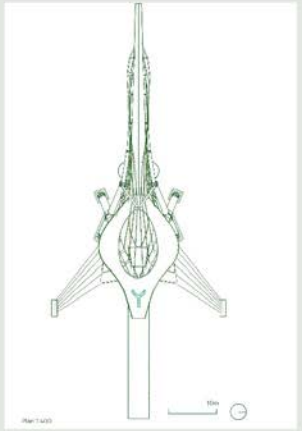


Section BB 1:150
The central viewing decks offer a moment to pause and experience the quickly tried and perspectives of the structure. The impact of the fire as well as the majesty of the ancient trees is exaggerated through the use of scaling exercises and forest perspective.

Section CC 1:150
The final series of viewing areas, located on the charred forest side of the bridge, offer wide panoramic and undisturbed views of the area to exhibit the severity of devastation which an unchecked wildfire can bring in the era of climate change.

Upon leaving the forest and resuming home the hiker is greeted by the dynamic shape of the bridge which clearly frames the difference between the two landscapes and the threats that these actions may bring to its health. The cantilevered nature of the bridge sits delicately on the forest floor that without bearing any of its weight on the delicate mossy turf

Viewing platforms and seating areas sit directly above the river and guide the view along its course to show the horrifying contrast between the burned out landscape and the ancient forest.

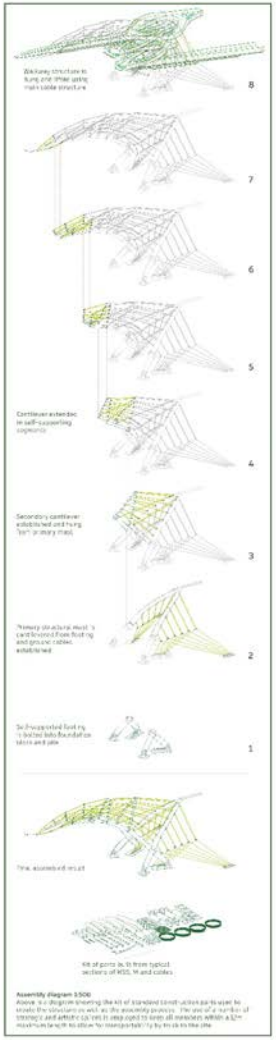


Plan 1:200

View out West side of bridge towards charred forest, the leading lines of the masts and cables emphasise the vast emptiness of the burn and the sheer contrast to the forest across from it.

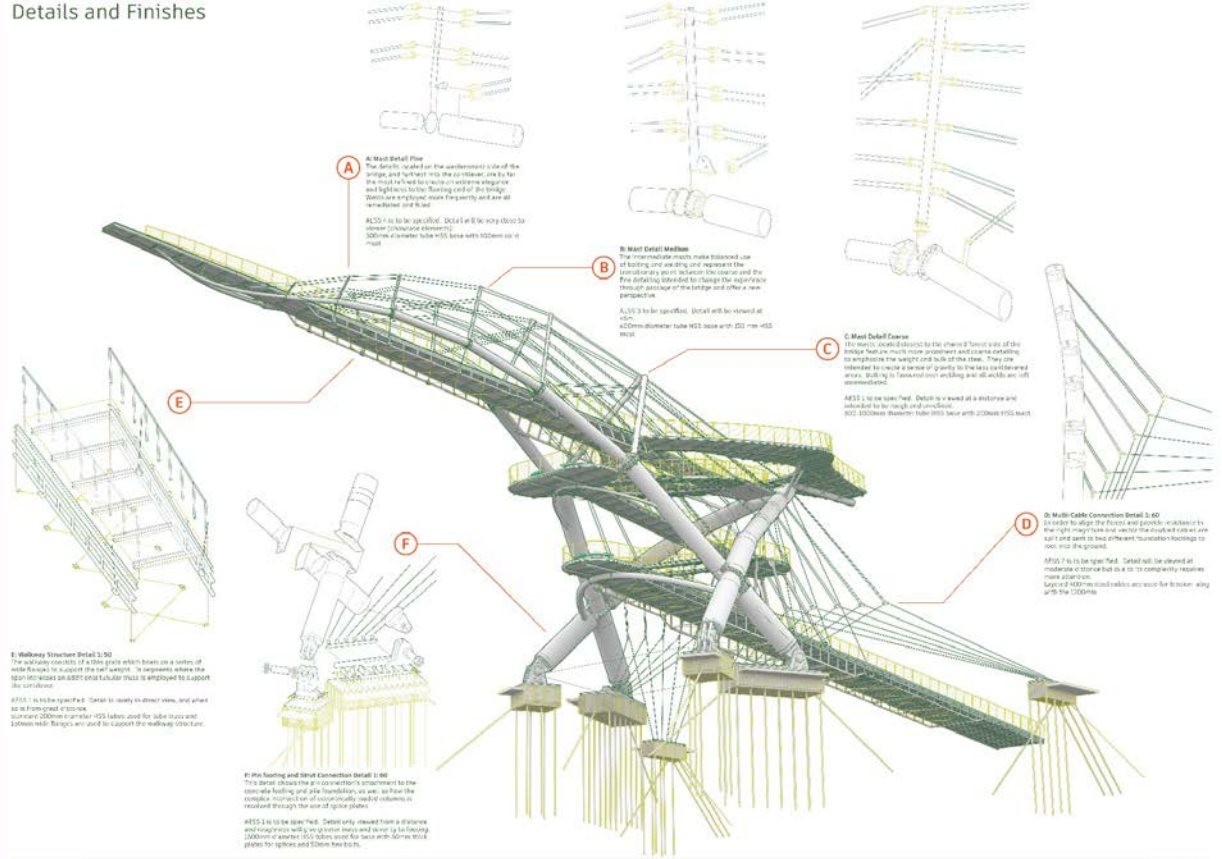
View out East side of bridge towards charred forest, the leading lines of the masts and cables emphasise the vast emptiness of the burn and the sheer contrast to the forest across from it.

Details and Finishes



Assembly diagram 1:500

Above: 3-D diagram showing the kit of standard construction parts used to create the structure as well as the assembly process. The use of a number of standard and artificial cut lengths is designed to limit all members within a 12m maximum length to allow for transportation by lorry to the site.



A: Mast Detail: Fine
The details located on the undercroft side of the bridge, and furthest into the cantilever, are by far the most refined to create an extreme elegance and lightness to the floating end of the bridge. Welds are employed more frequently and are all remediated and filled.

AESS 4 is to be specified. Detail will be very close to viewer (structural element). 500mm diameter tube HSS base with 300mm dia rib mast.

B: Mast Detail: Medium
The intermediate masts make balanced use of footing and welding and represent the transitionary point between the coarse and the fine detailing intended to change the experience through passage of the bridge and offer a new perspective.

AESS 3 to be specified. Detail will be viewed at <5m.
400mm diameter tube HSS base with 350 mm HSS mast.

C: Mast Detail: Coarse
The masts located closest to the shared 'west side of the bridge feature much more prominent and coarse detailing to emphasise the weight and bulk of the steel. They are intended to create a sense of gravity to the less cantilevered areas. Butt-ring is favoured over welding and all welds are left unremediated.

AESS 1 is to be specified. Detail is viewed at a distance and intended to be rough and unrefined.
900-1000mm diameter tube HSS base with 250mm HSS mast.

D: Multi-Cable Connection Detail 1:60
In order to align the forces and provide resistance in the right magnitude and vector the modified rakers are split and sent to two different foundation footings to root into the ground.

AESS 2 is to be specified. Detail will be viewed at moderate distance but as it is its complexity requires more attention.
Beyond 400mm individual welds are used for tension along with the 1200mm.

E: Walkway Structure Detail 1:50
The walkway consists of a thin plate which bears on a series of wide flanges to support the self weight. In segments where the span between bases an additional tubular truss is employed to support the cantilever.

AESS 1 is to be specified. Detail is visible in direct view, and when so is from great distance.
Dominant 200mm diameter HSS tubes used for tube truss and 300mm wide flanges are used to support the walkway structure.

F: Pin footing and Strut Connection Detail 1:60
This detail shows the pin connection's attachment to the concrete footing and pile foundation, as well as how the complex intersection of occasionally nested columns is resolved through the use of splice plates.

AESS 1 is to be specified. Detail only viewed from a distance and roughness will vary greatly from mass and never by be focused.
1200mm diameter HSS tubes used for base with 50mm thick plates for splices and 50mm hex bolts.

AESS Categories

Different category specifications are employed for efficiency but also for exercise. The AESS 'finish level' is used experimentally to control how the mass and structure of the building is felt by the visitor. As the structure gets more delicate towards the tip of the cantilever the finish and also increases (to AESS 3 or AESS 4) to further accentuate this feeling of lightness in the landscape.

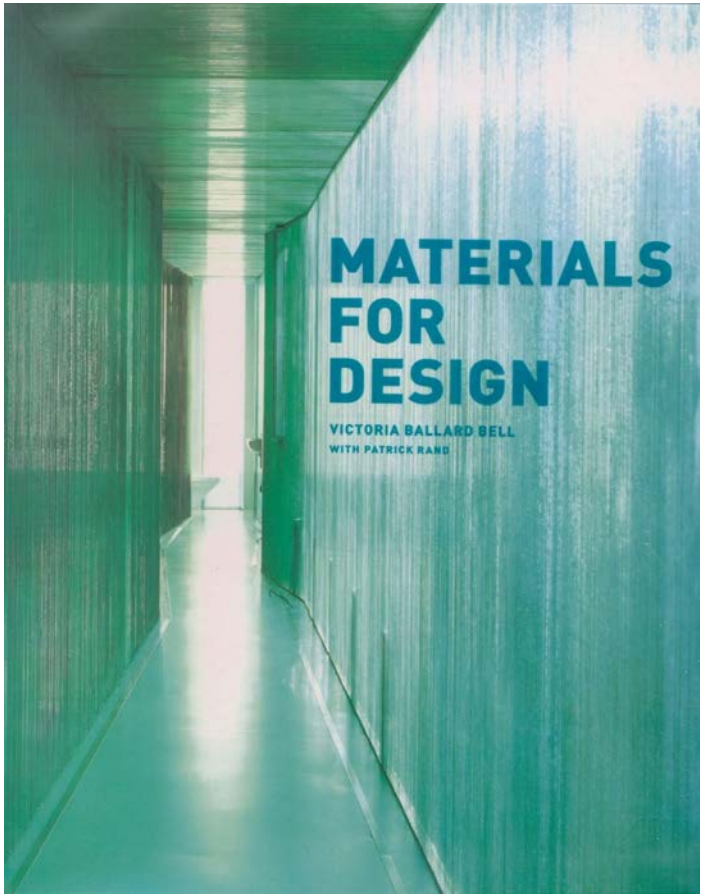
AESS 1
Surface preparation to SSPC-SP 6
Sharp edges ground smooth
Continuous weld appearance
Standard structural bolts

AESS 2
Visual Samples
One-half standard fabrication tolerances
Fabrication marks not apparent
Welds uniform and smooth

AESS 3
Mill marks removed
Butt and plug welds ground smooth and filled
HSS weld seam oriented for reduced

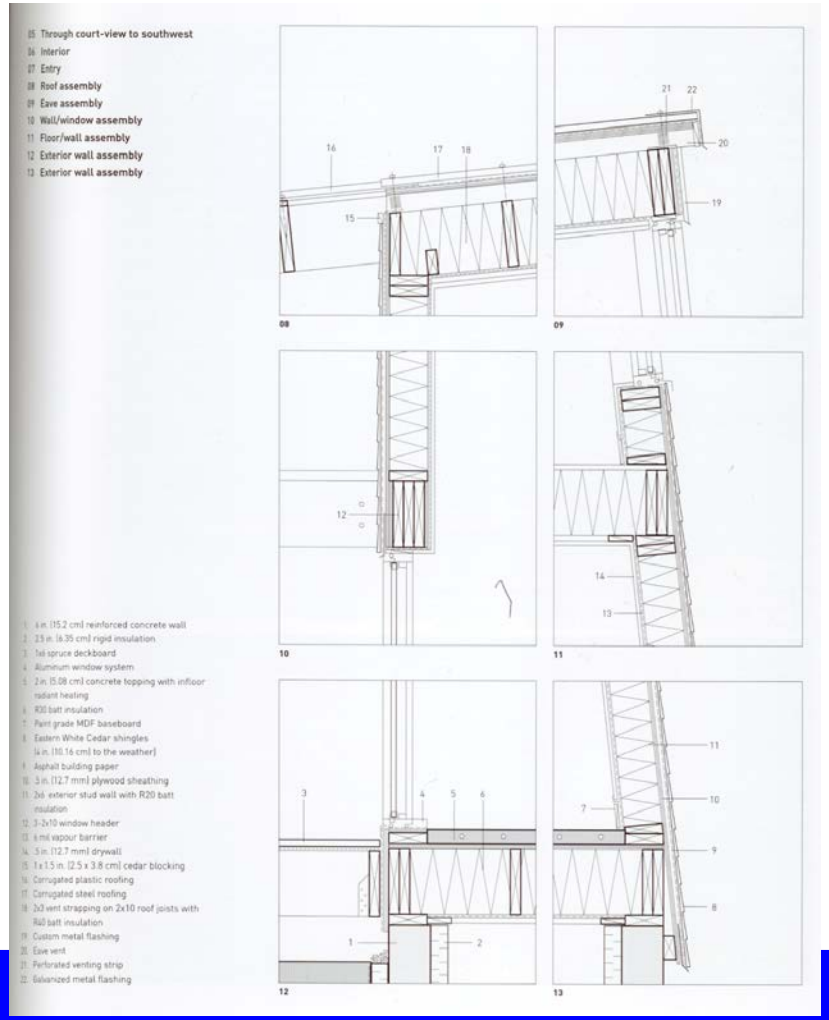
AESS 4
HSS seam not apparent
Welds contoured and blended
Surfaces filled and sanded
Weld show-through minimized

Finishes



“inbetween” Drawings

When you want a bit more technical detail than you are showing with a poche wall, but not the full contract information for a working drawing.

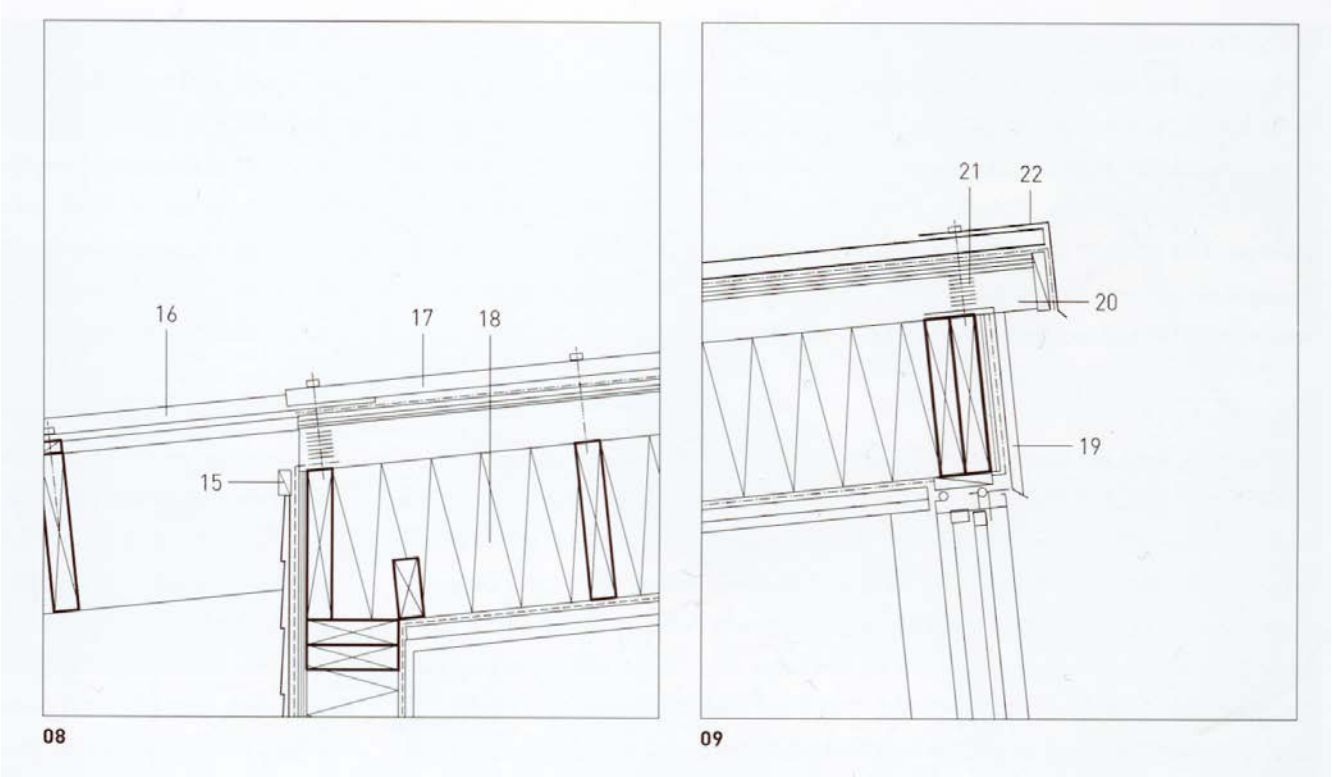


Brian McKay-Lyons Architect

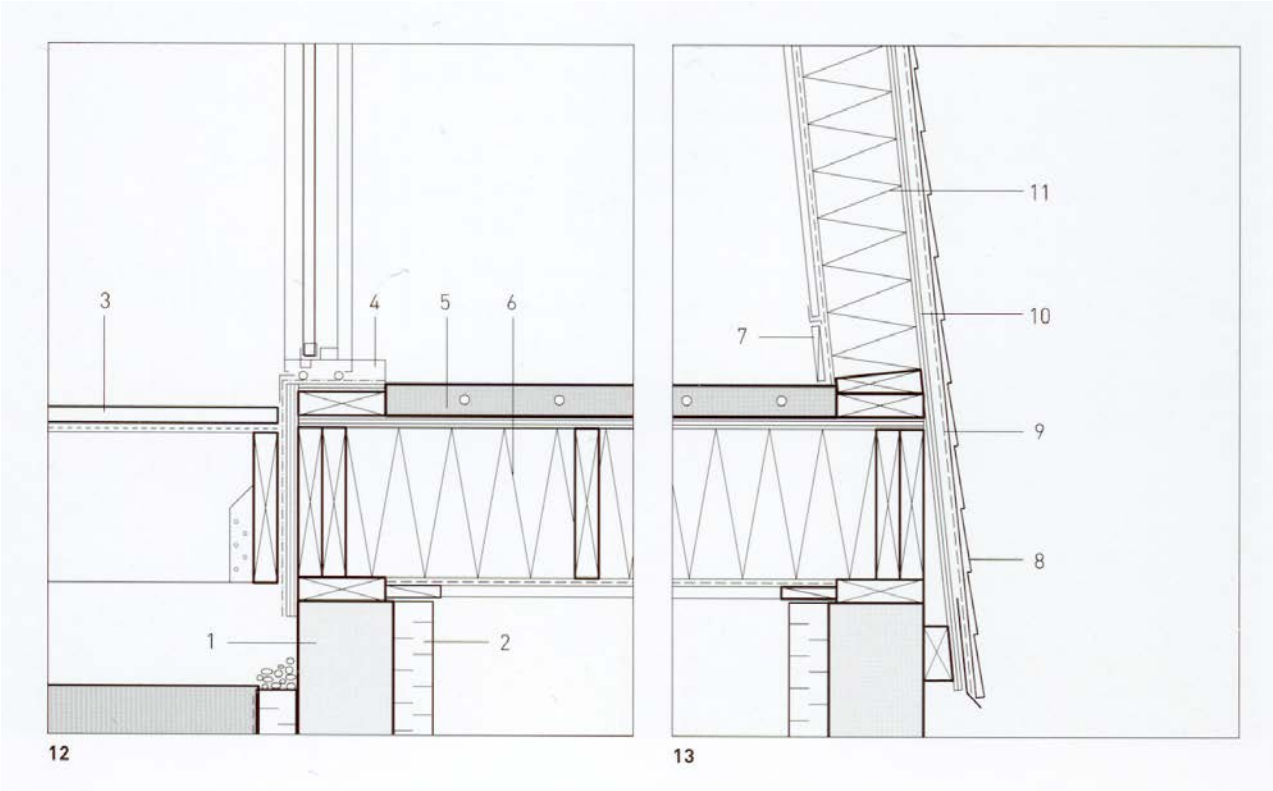
Messenger House II

Detail sections

Note how the overall building shape and continuity is inferred by the placement of the sections within rectangles, that line up, even though the content is “broken”.



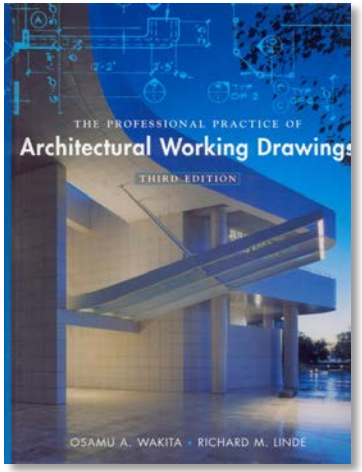
Dimension lumber is shown with an X through the middle to indicate it is structural. Not how confusing the numbering system is…



Batt insulation is shown as a series of light diagonals rather than the curvy hatching that is often seen on construction documents.

Types of Drawings: Contract Documents

Contract Documents (Technical Drawing)
Types of Drawings: digitally drafted drawings of plans, sections, elevations, details



Expectations: As close to perfect accuracy as possible, fully industry standard drawing convention, all drawings are to scale, and dimensions are correct, colour is not used to make copying easier, these are legally binding

Uses: Contractors bidding a project, Fabricators taking off information

lettering

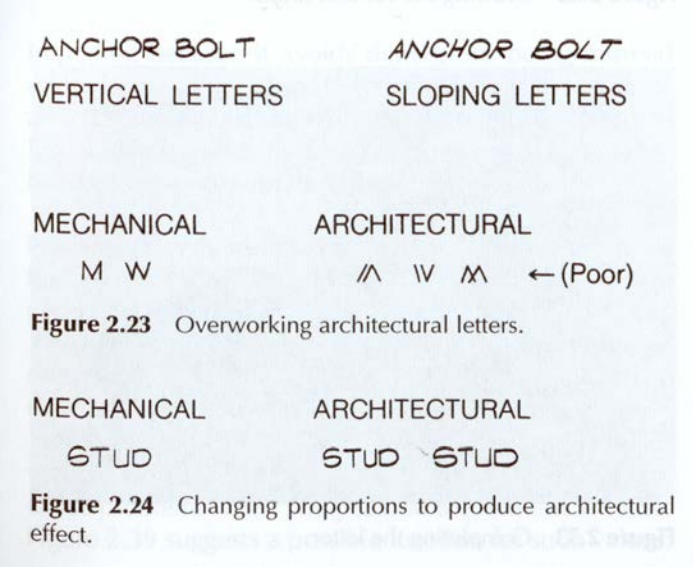


Figure 2.23 Overworking architectural letters.

Figure 2.24 Changing proportions to produce architectural effect.

Make guidelines and use a small triangle to ensure that your verticals are VERTICAL and not *SLOPED* or U*N*EV*E*N.

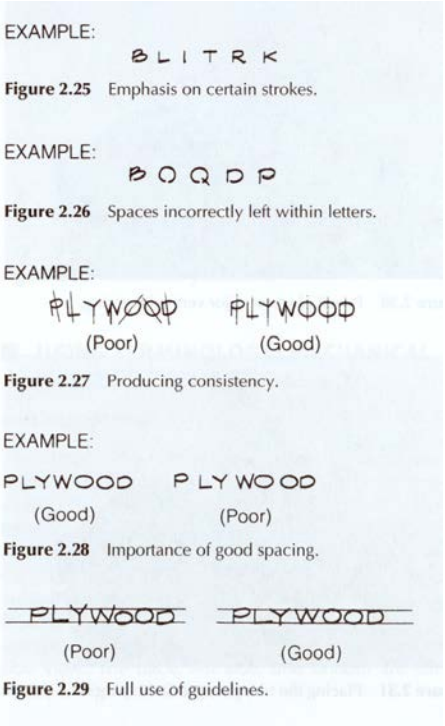


Figure 2.25 Emphasis on certain strokes.

Figure 2.26 Spaces incorrectly left within letters.

Figure 2.27 Producing consistency.

Figure 2.28 Importance of good spacing.

Figure 2.29 Full use of guidelines.

Lettering done on the computer should also be BLOCK style and very easy to read.

lines

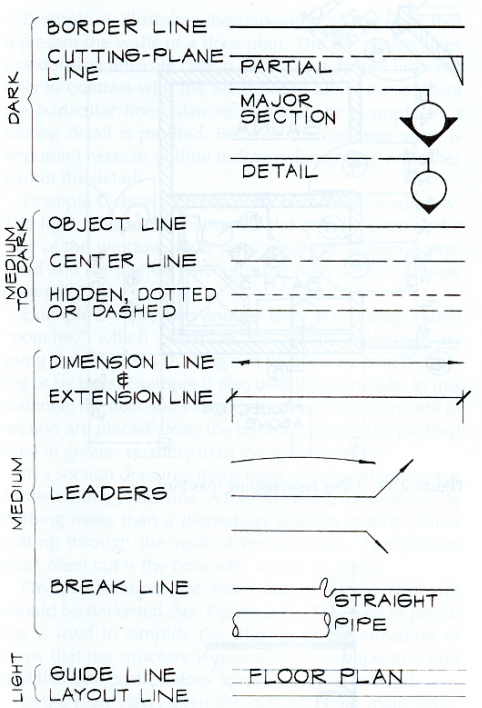


Figure 2.14 Vocabulary of architectural lines.

For contract documents

Heavy line when cutting through a material to define the outside.

Lighter lines to show elements in elevation, or further away.

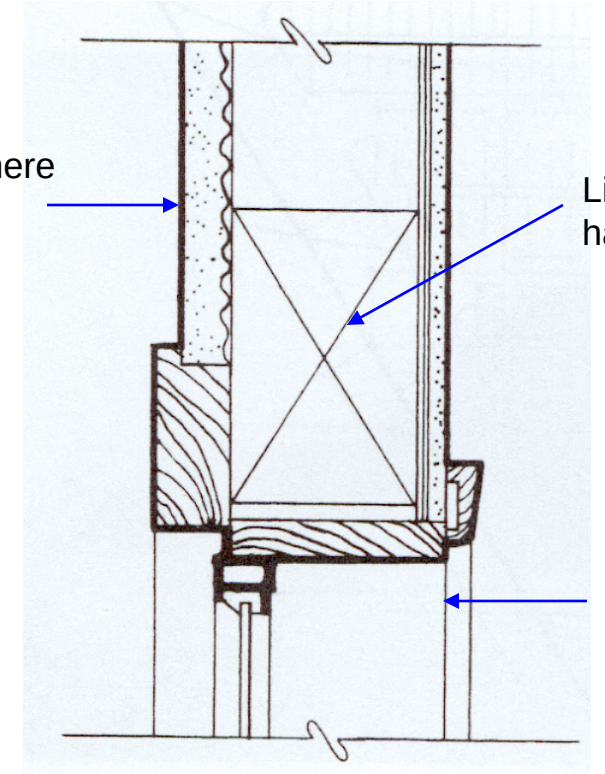
Even lighter lines still for hatching or objects further in the distance.

Dashed lines to show objects above you.

Dotted lines to show hidden lines.

Lines in general

line weight


Heavy outline where cut in section
Lighter lines for hatching
Lighter lines to show materials “beyond”

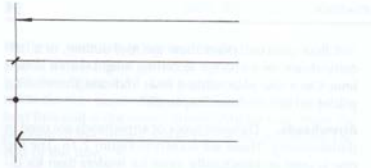


Figure 2.16 Types of arrowheads used in dimensioning.

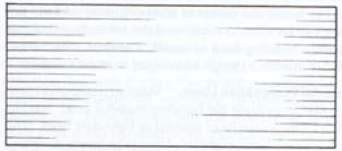


Figure 2.17 Tapered lines.

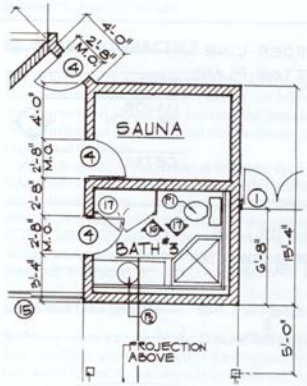


Figure 2.18 Lines representing masonry.

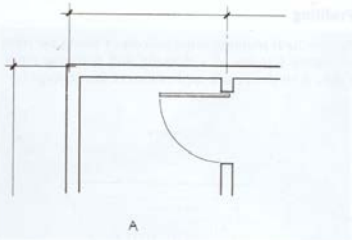


Figure 2.19 Profiling.

Showing different types of lines and line weights in various applications.

We differentiate so that the drawing communicates ideas more clearly.

On construction type drawings we do NOT blacken in the walls. The amount of material detail shown will depend on the scale of the drawing.

cartoon layout

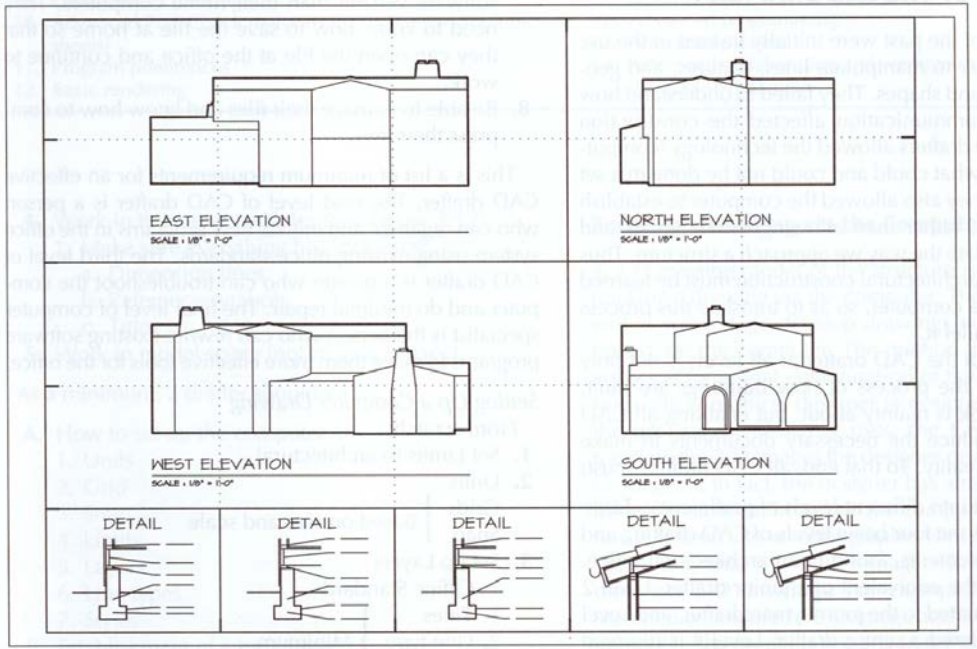


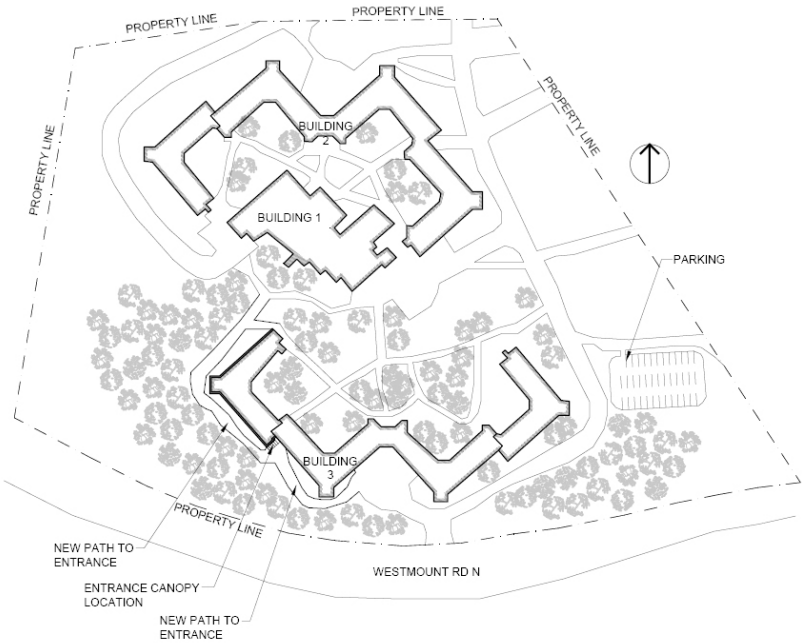
Figure 3.30 Sample cartoon/page layout. (Courtesy of Mike Adli, Owner; Nagy R. Bakhoum, President of Obelisk Architects.)

Before you do your final drawings, each page is roughed out to make sure things fit…

Basic Drawing Set

- Site Plan
- Floor Plan(s)
  - Basement, Ground, Second+ Floors, Roof
- Elevations
  - North, South, East, West
- Sections
  - Cross and Longitudinal
- Details
  - Wall sections of building + enlarged details
- Renderings

Site Plan



- North arrow
- Scale notation (numeric and graphic)
- Plan of simplified ground floor of buildings
- Landscaping, trees, walkways
- Dotted lines to show property limits
- Partial plan of adjacent buildings

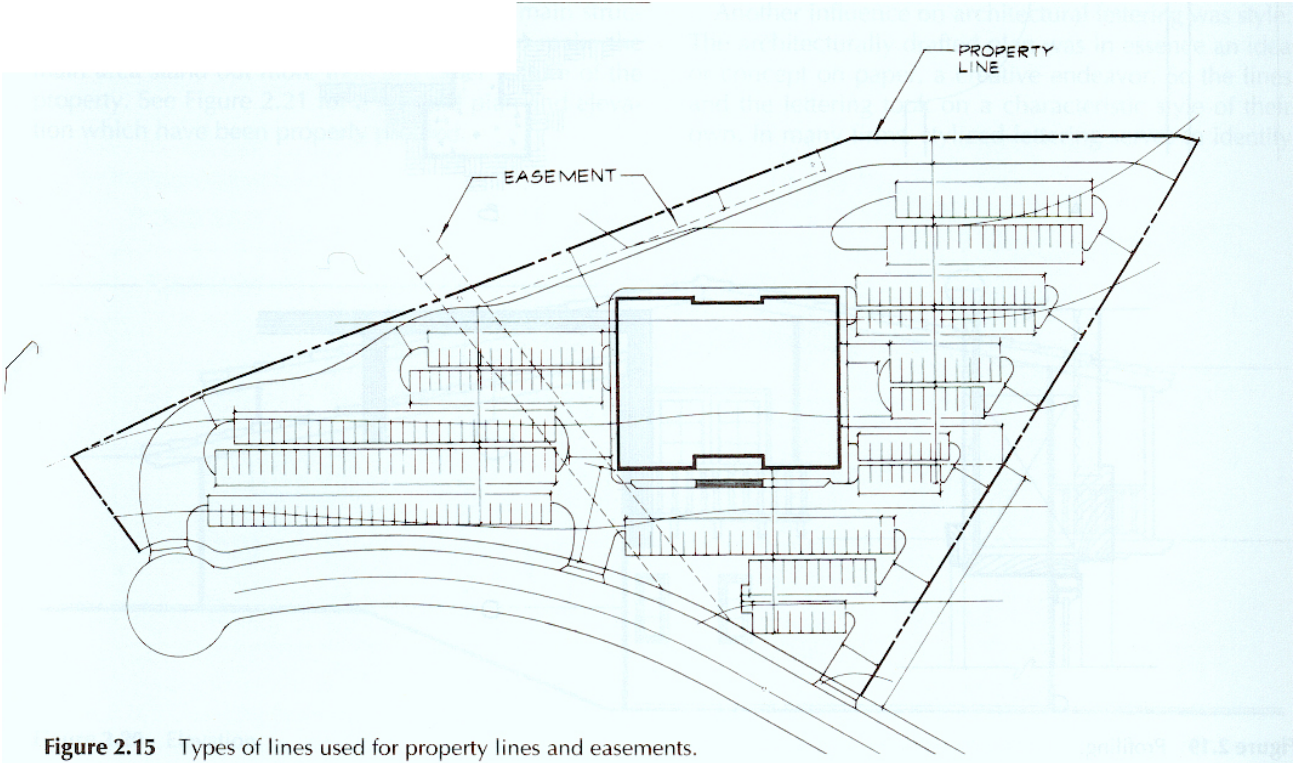


Figure 2.15 Types of lines used for property lines and easements.

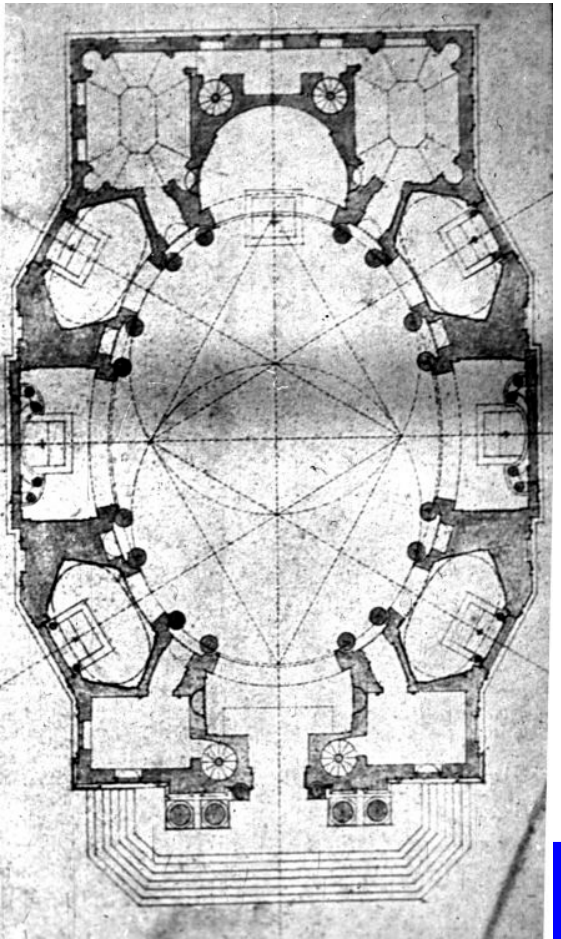
Different lines on a site plan…

Floor Plans

FLOOR PLANS
All about the walls, windows, doors, structural layout (columns)
North Arrow
Scale notation (numeric AND graphic)
Label plan by floor level (Basement, Ground, Second, etc)
Differentiated line weights emphasizing the exterior boundary of the wall elements
Doors and door swings (public doors swing outward)
Windows (no need to show operable but do include the frames and show the correct relationship to the insulation and exterior, show sills)
Lines indicating the elements that make up the wall materials (for construction drawings - for design drawings these are normally filled in black)
Dotted lines to indicate roof overhangs and ridge lines (if applicable, depends on the floor level)
Dotted lines to show overhead openings, skylights, etc.
For column based buildings, grid lines and bubbles
Overall exterior dimension sets (amount depends on nature of the project)
Indication of section cuts
Hatch wall materials as appropriate to the scale you are working on (larger scale more detail here)
Hatch floor materials very lightly if at all (don't detract from the wall information)


FR
CLOSET
KITCHEN
13' x 8'
DINING ROOM
12' x 12'
FP
BATH
8' x 6'
LIVING ROOM
23' x 14'
FOYER
9' x 10'
FAMILY ROOM
14' x 11'
FLOOR 1

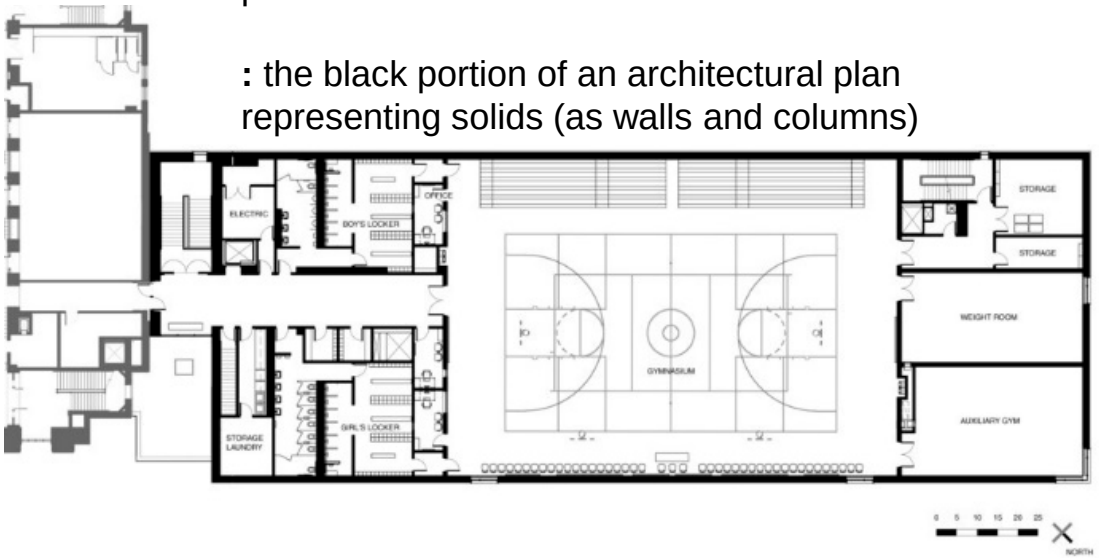
Walls Look Different Depending on Drawing Type



Design Drawings: poché

po·ché

: the black portion of an architectural plan representing solids (as walls and columns)



dimension lines

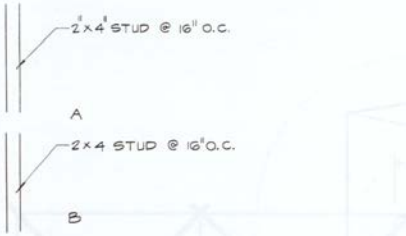


Figure 2.34 Net and nominal notation.

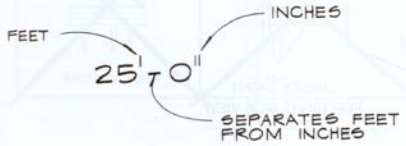


Figure 2.35 Expressing feet and inches.

Figure 2.36 Dimensions in a restricted area.

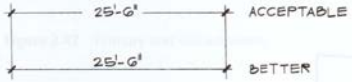


Figure 2.37 Placement of dimensions above or between dimension line.

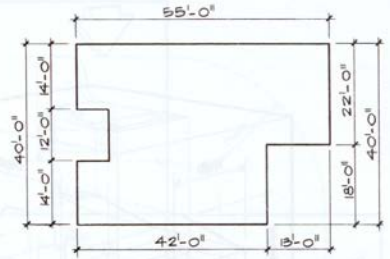


Figure 2.38 Dimensions read from bottom and from the right.

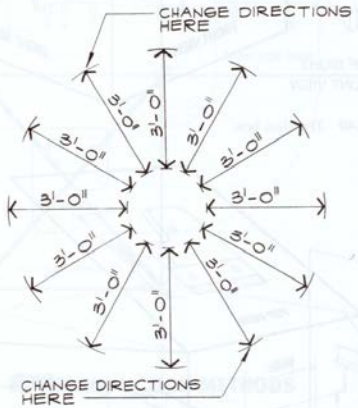
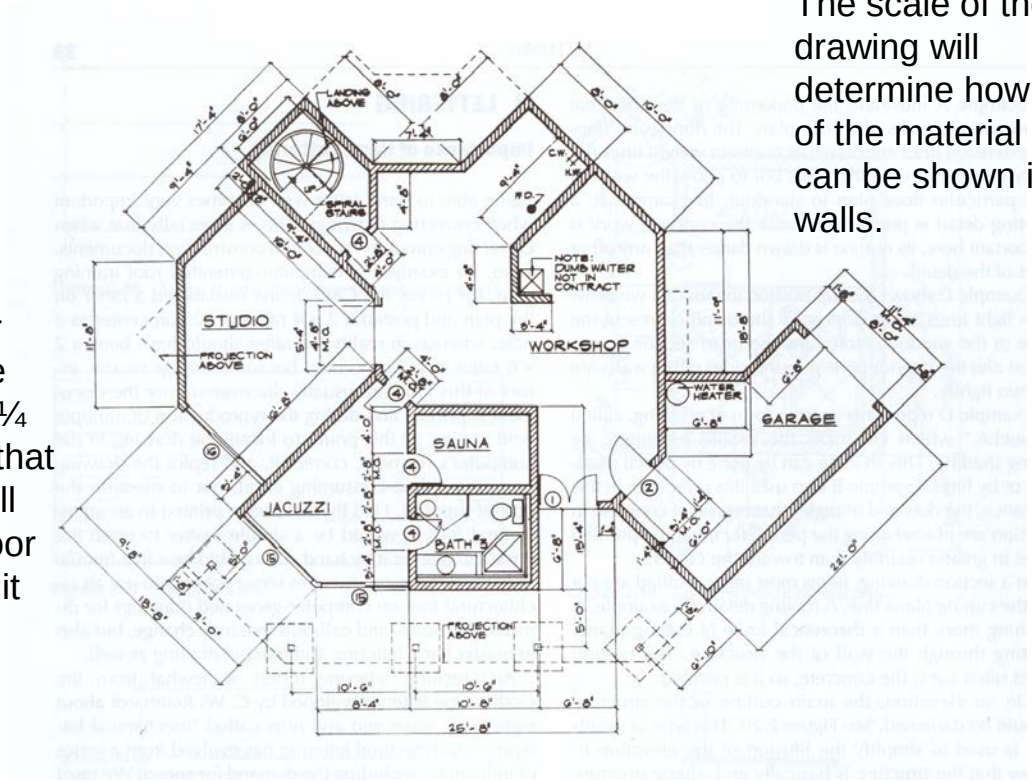


Figure 2.39 Dimension placement.

plan view



The scale of the plan drawing will determine how much of the material layers can be shown in the walls.

Note: door swings are shown as ¼ circles so that you can tell that the door does not hit anything.

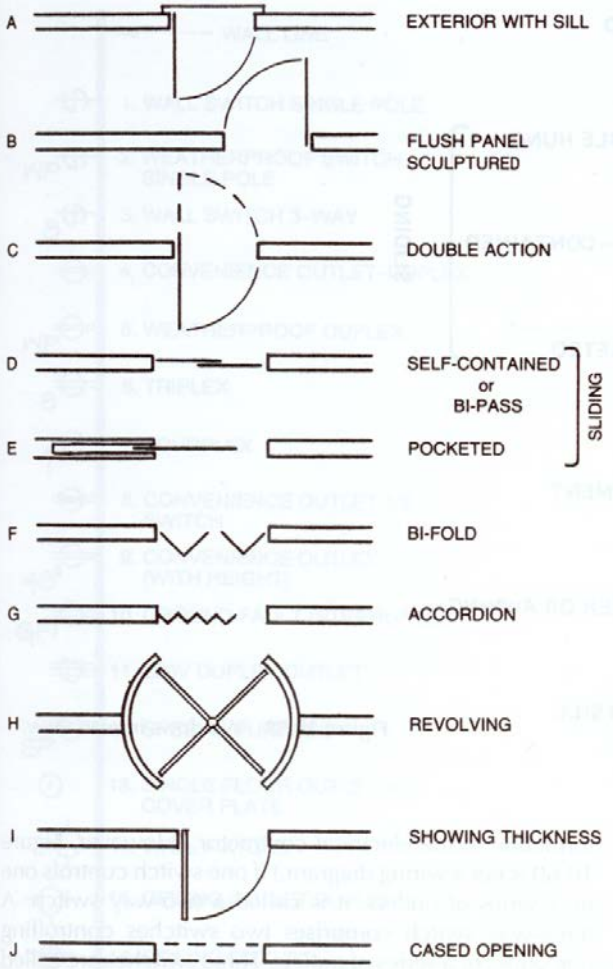


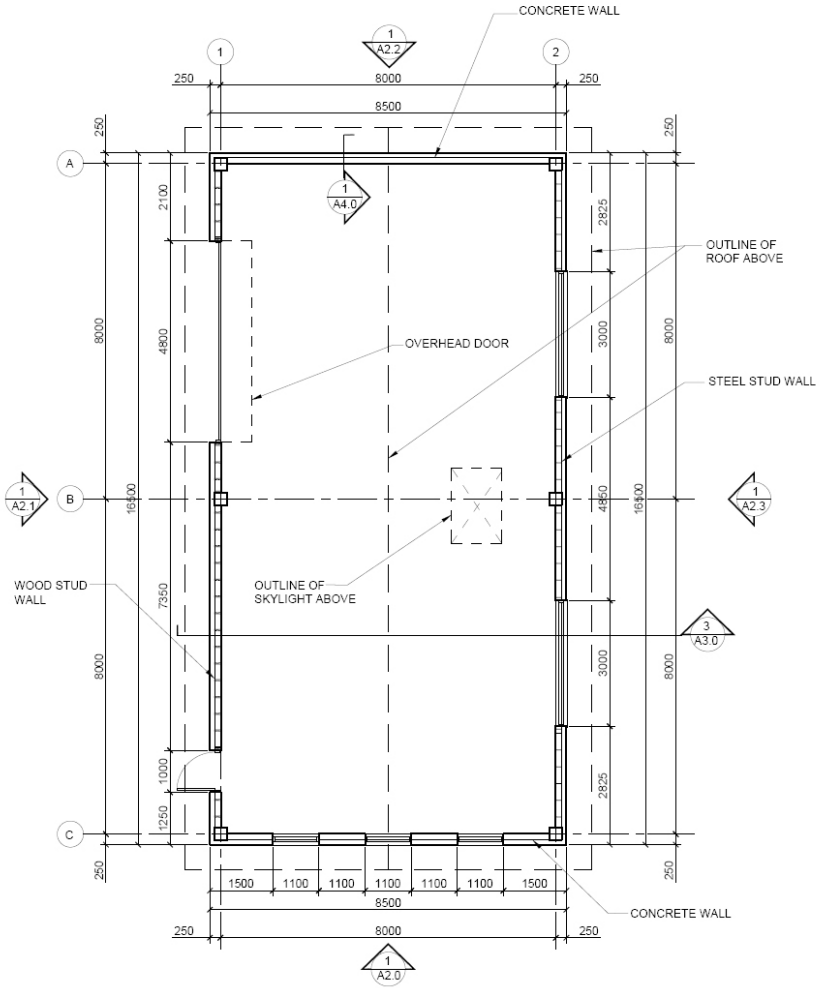
Figure 10.57 Doors in plan view.

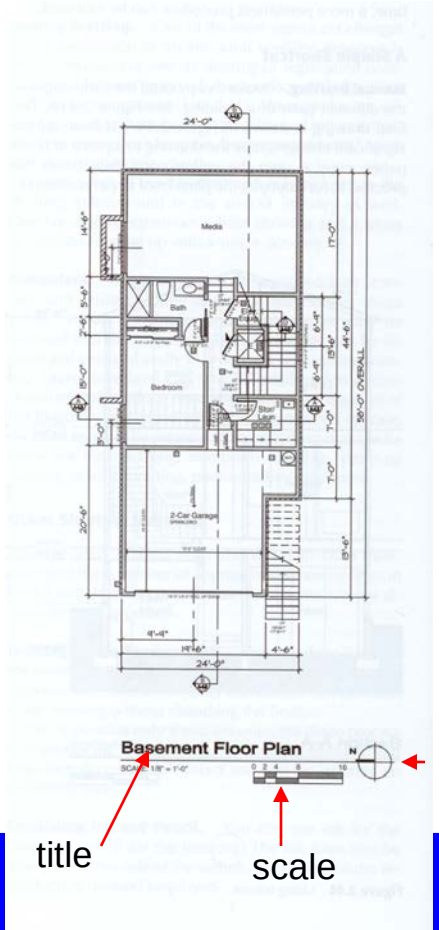
doors

The intention of the door swing is to show both what TYPE of door you are using as well as its PATH of motion.

It is always drawn OPEN.

construction plans

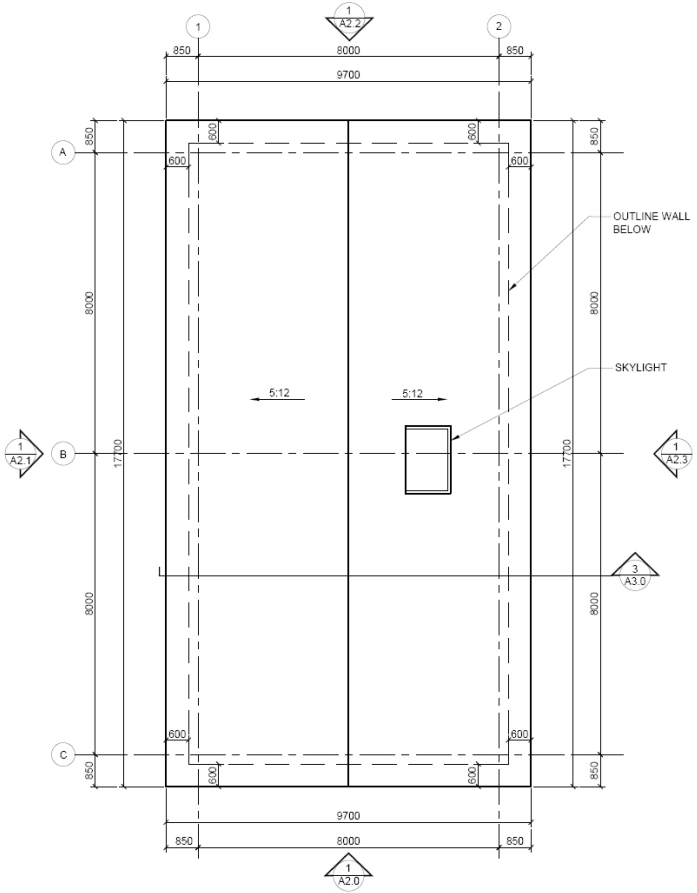


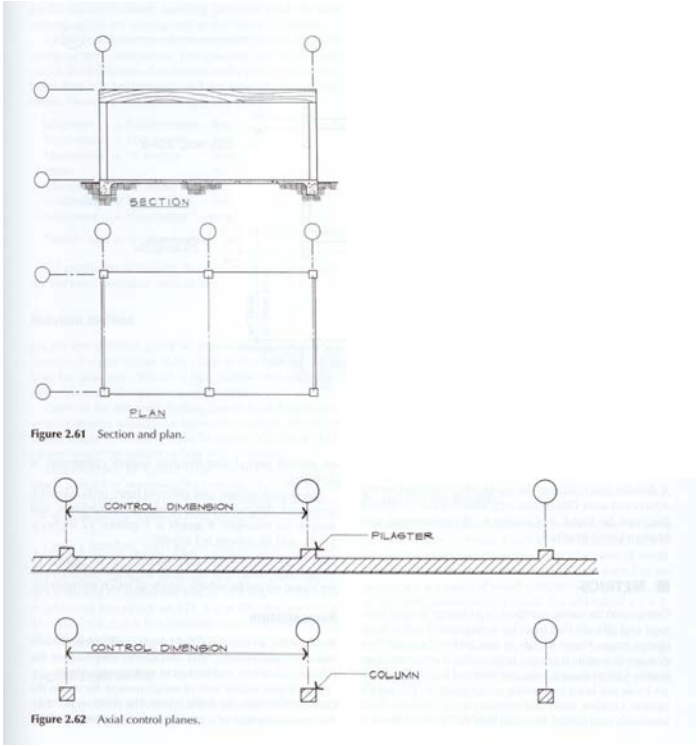


Note use of dimensions and walls are NOT blackened in as we have to show materials…

North arrow

gridlines





On buildings with columns or posts, gridlines are used to define the “bay size” and give the centre to centre dimensions for the contractor to lay out the job.

A letter or number goes in the bubble to create a “matrix” on the drawing. A column is noted as being at location C2, for example.

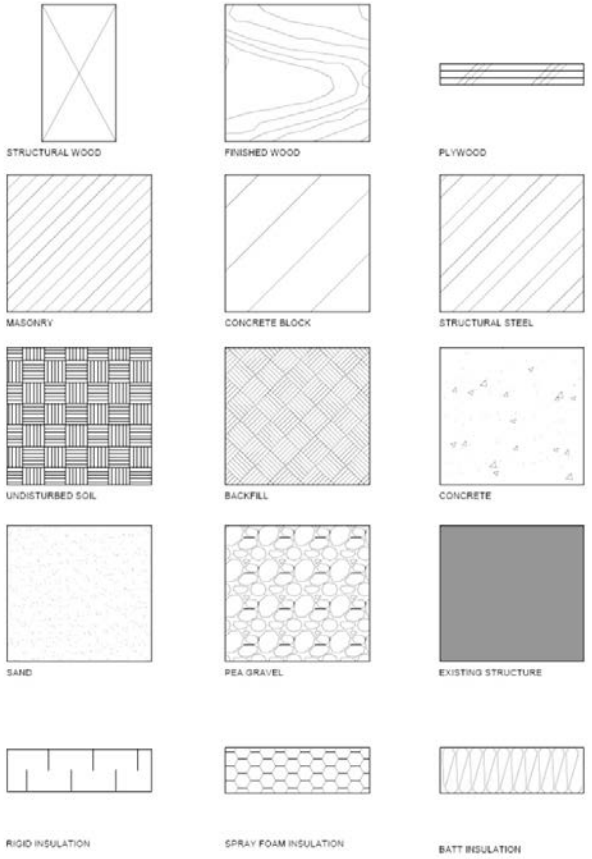
hatching…

Materials are hatched in the plan or section view so that it is easier to tell what they are.

Hatching does NOT substitute for labeling.

There are many different ways of hatching the same materials – so hatching is not a fail safe way to let the contractor know what material you want to use…

Do not get creative. Use the office standard.



section arrows

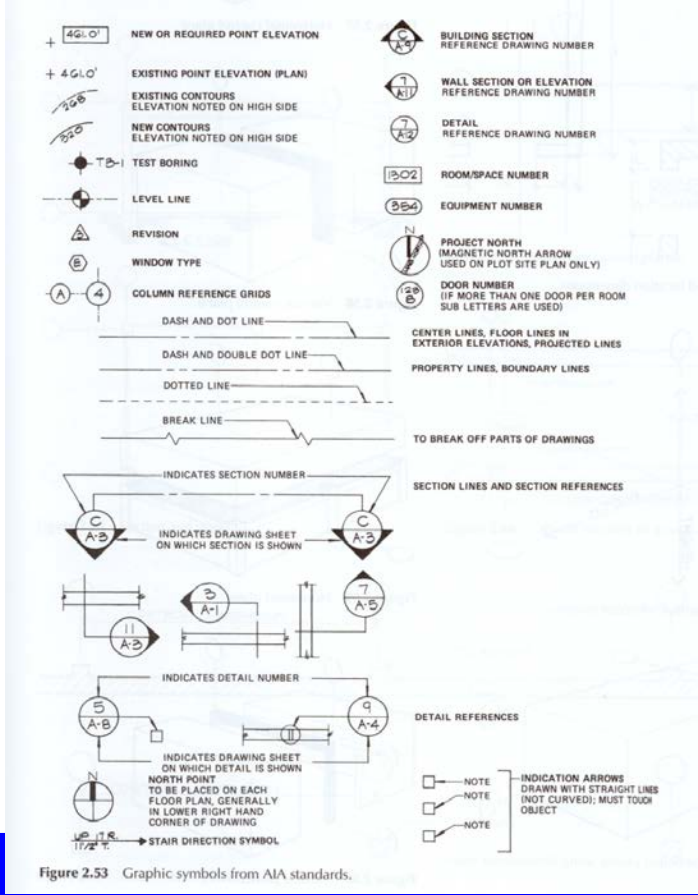


Figure 2.53 Graphic symbols from AIA standards.

Arrows are used to show where sections are cut through the building and which direction the cut is examining.

They are given letters and numbers that also include the page number in the drawing set.

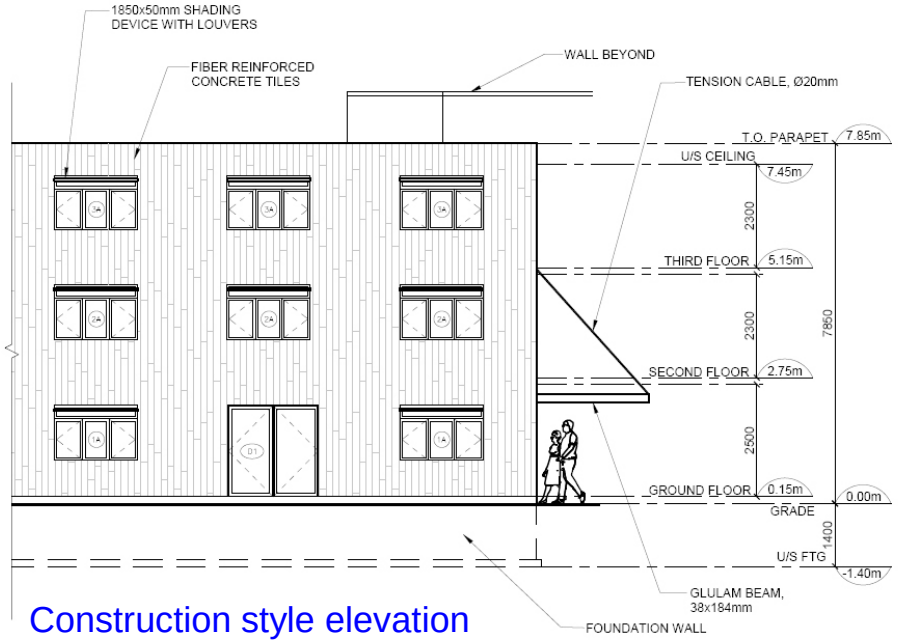
For design/construction drawings we often invent something more graphic.

A

Elevations

ELEVATIONS	
All about the exterior materials, glazing, heights	
NO North Arrow (irrelevant)	
Label elevations by cardinal direction (North, South, etc)	
Scale notation (numeric AND graphic)	
Accurately depict the arrangment of windows, doors and different façade materials	
Vary line weights. Outline entire building more heavily. Hatch is the lightest weight.	
Lightly hatch and label façade materials	
Indicate operability of doors and windows	
Dot in foundations and footings below grade	
Show vertical heights (note top of floor levels and roof/parapet top)	
Do NOT include any horizontal dimensions, those only go on the plan view	
Indication of section cuts	
Indication of column grid bubbles if applicable	

This list will be simpler for design vs construction drawings



Construction style elevation

elevation

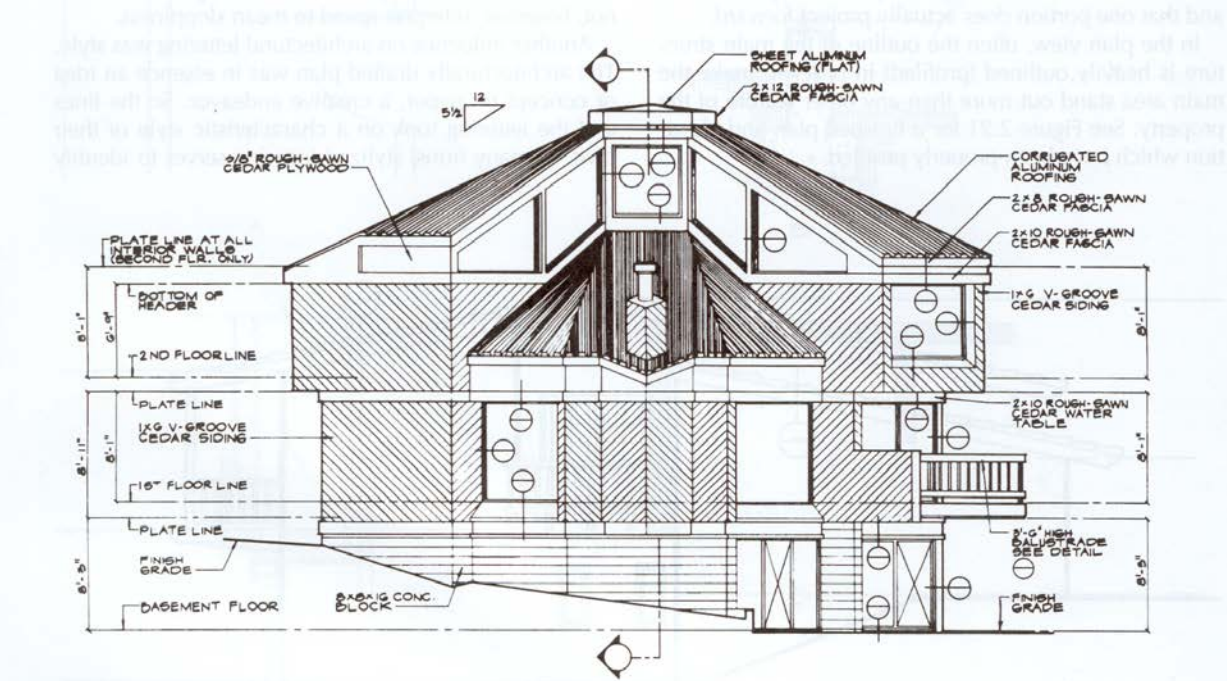
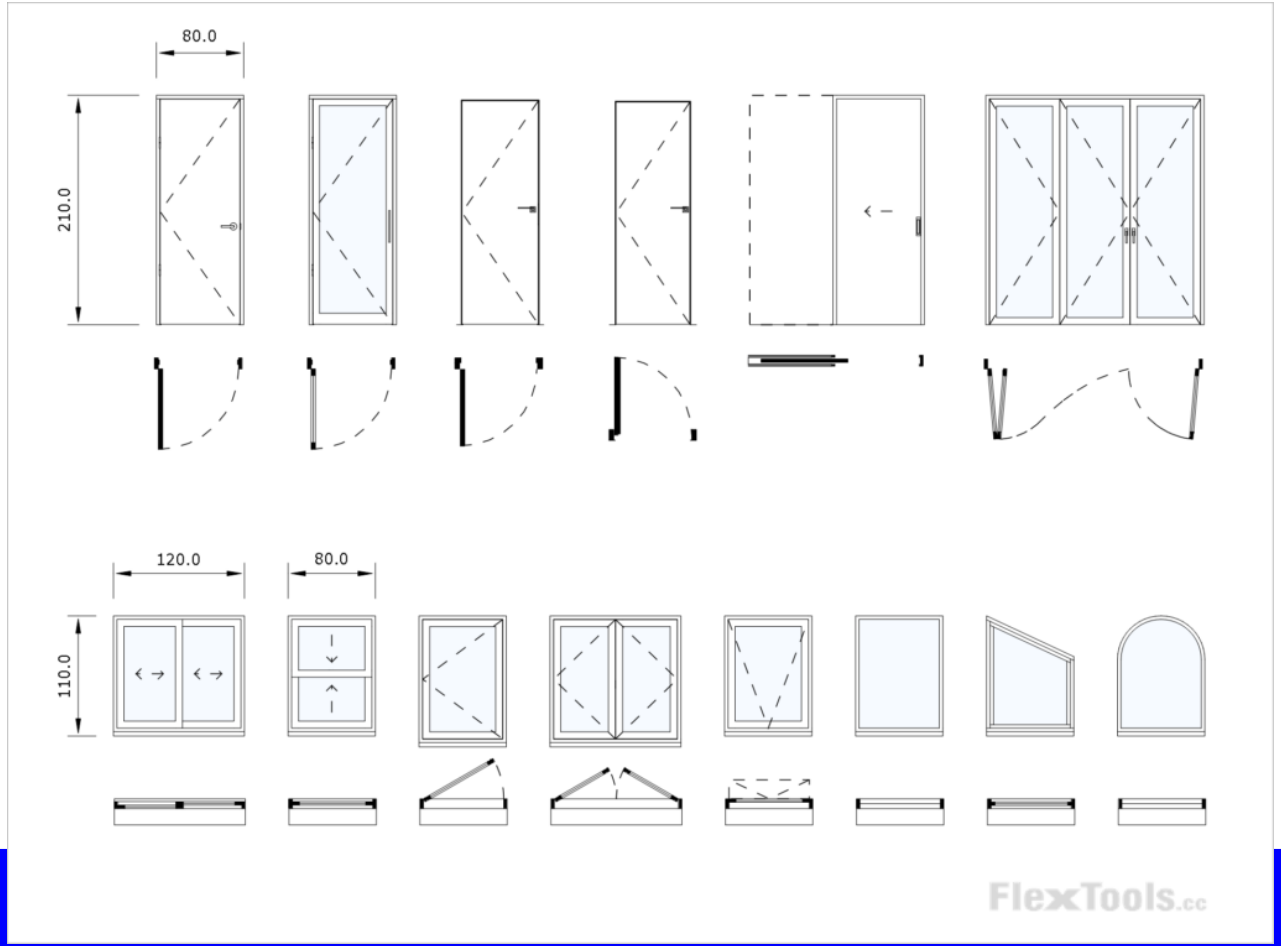


Figure 2.21 Correctly profiled plan and elevation.

Construction elevations will show heights

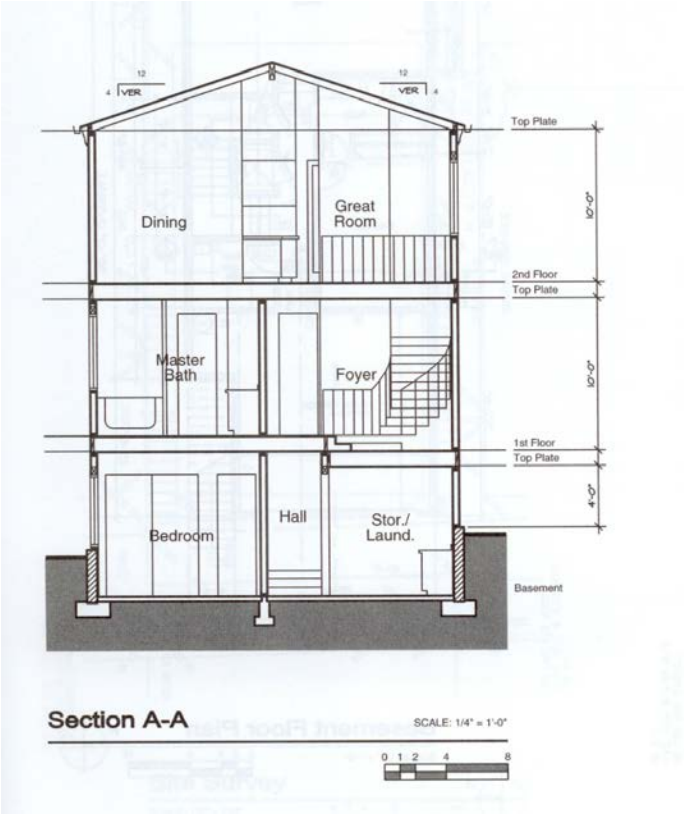
Design elevations will not but instead put in some scale figures to provide a scale.

Windows and Doors in Elevation and Plan

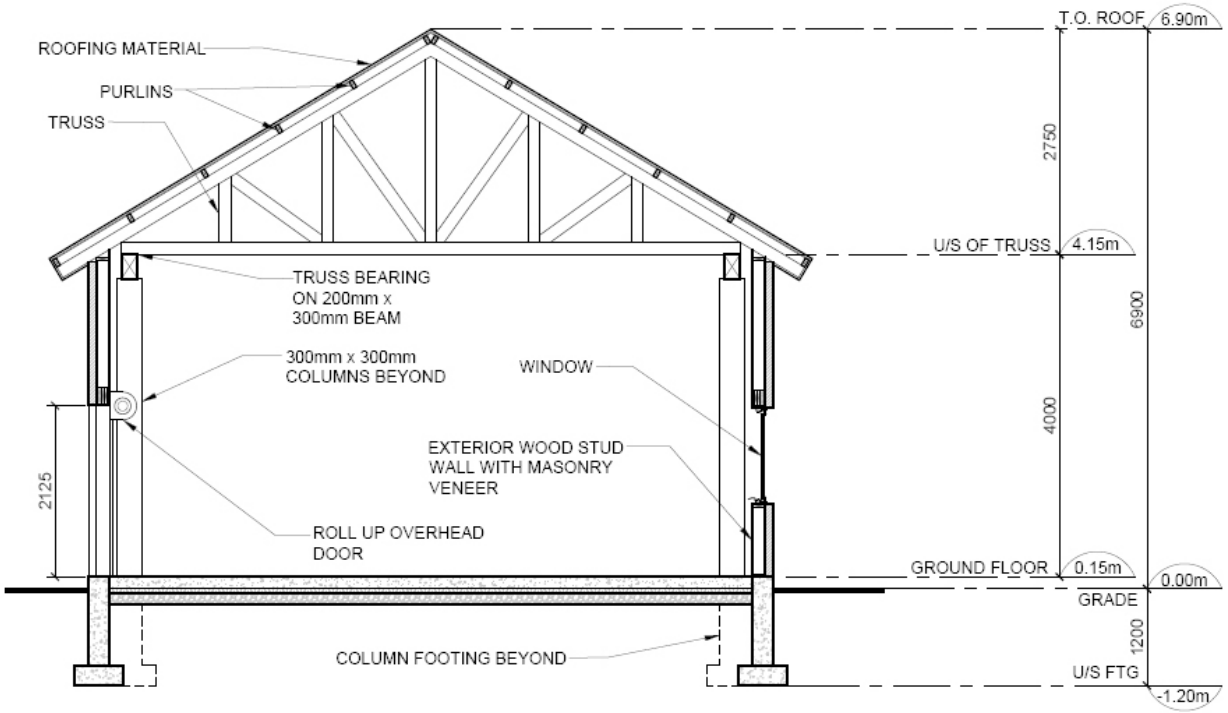


Building Sections

WALL SECTIONS (1:20)
All about materials and details of how the foundations, floors, wall assemblies, windows, roof fit together. For smaller projects they will not produce details so this has to convey everything to the builder to build the project.
NO North Arrow (irrelevant)
Drawing titled clearly to match section cut indications on plan and elevations
Vary line weights. Outside of section is darkest, hatch is lightest.
Hatch materials with industry standard hatch.
DO NOT hatch materials in elevation beyond.
Label heights: bottom of footing, top of ground, second, etc floors, top of parapet, peak of roof (these are bubble to the side markers)
Include dimension string outside the building to indicate window sill and head heights. These are attached to the bubble type markers mentioned above.
Clearly indicate existing REV structure as separate from new construction
Label all assemblies with assembly notation. (All different wall types, floor, ceiling, foundation)
Put separate notes to unique elements in the wall.
Arrange notes so that they are clear and do not criss cross note lines

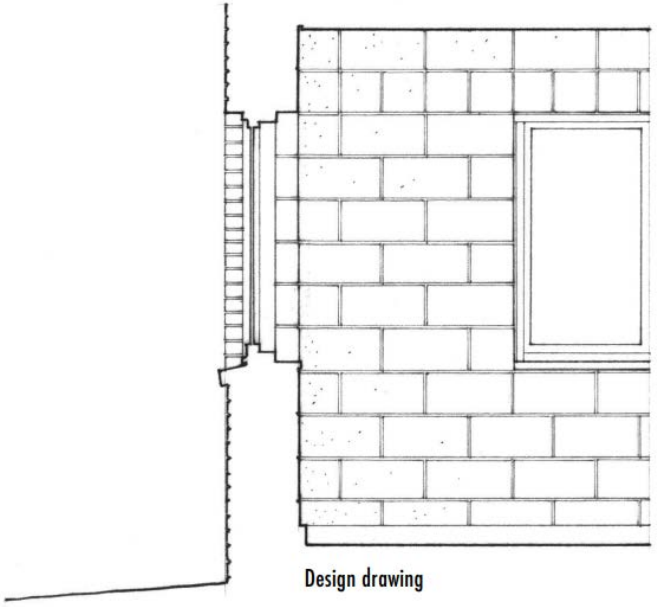


Cross section

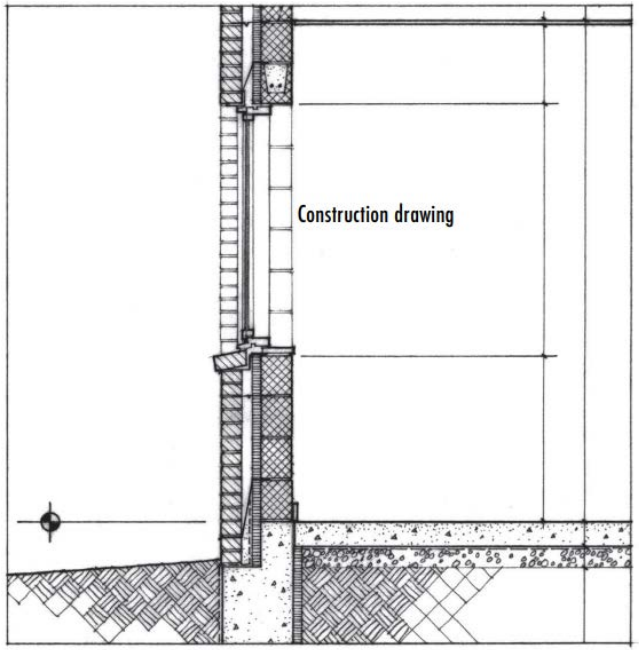


- Design sections will look very different than construction sections, again
- poché vs detailed material layers
- How much detail you show depends on the drawing scale

Design Drawings vs Construction Drawings

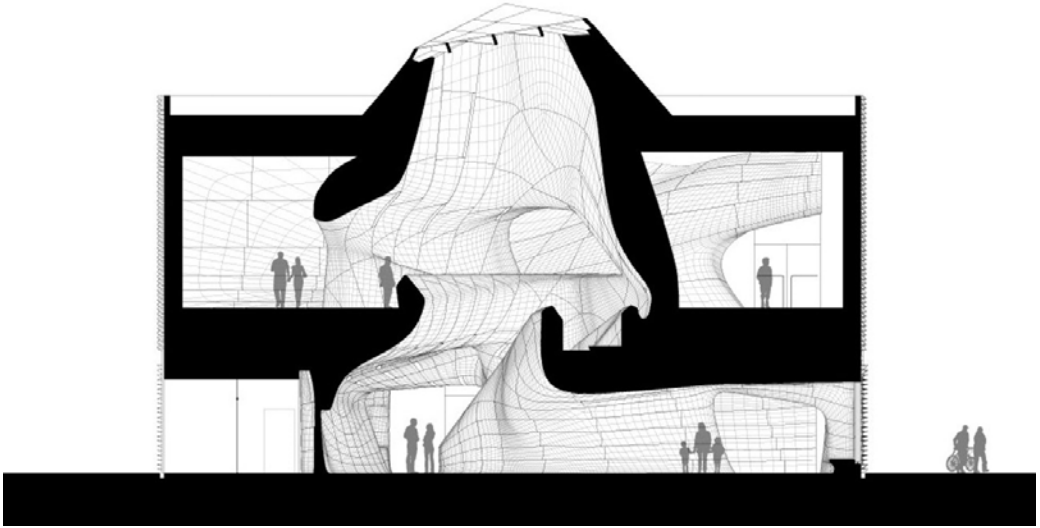


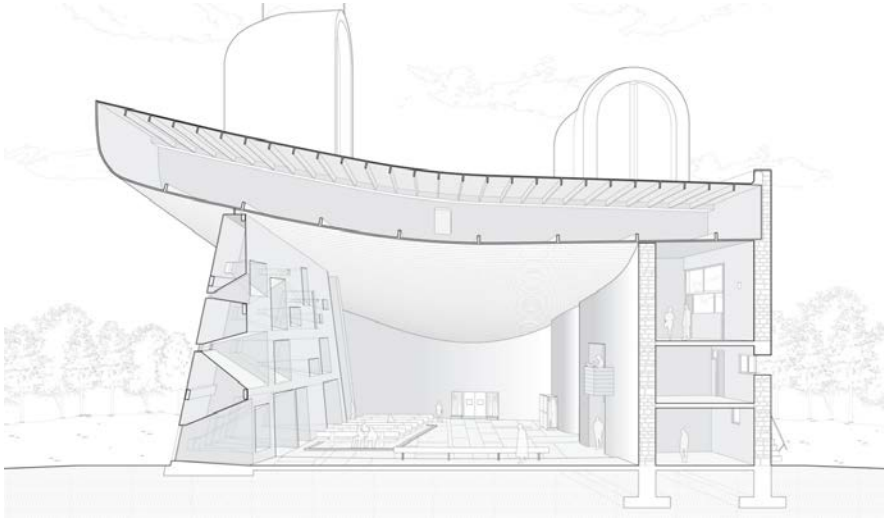
Ching: Architectural Graphics Illustrated



Form vs detailed material layers – note that the overall thicknesses are still the same!

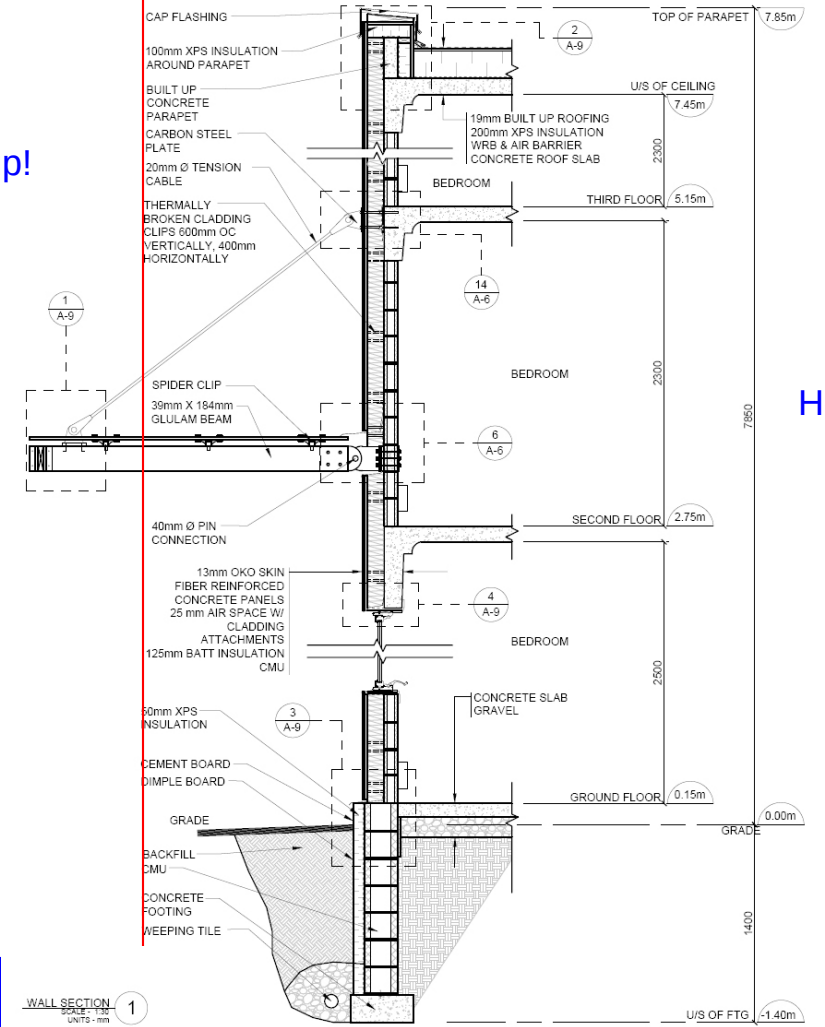
Building Sections





Putting *scale figures* in a section very quickly tells the viewer the size of the space

Everything lines up!



Heights and floor level markers

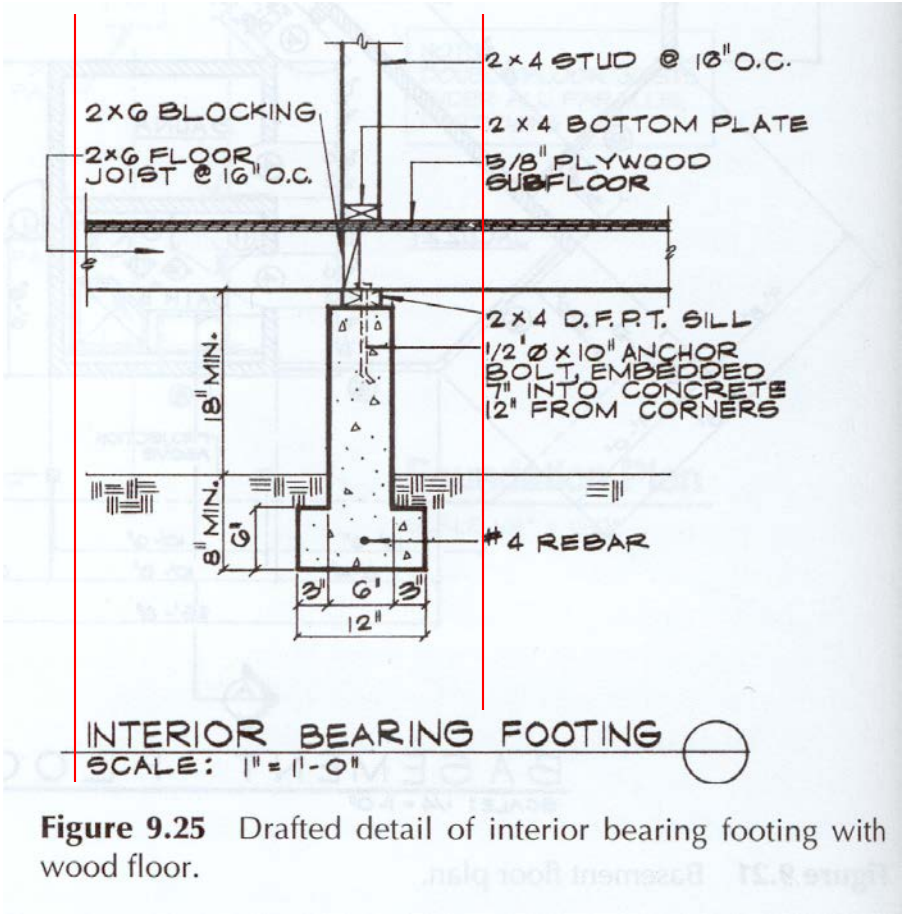


Figure 9.25 Drafted detail of interior bearing footing with wood floor.

Note how the labels are all lined up to make the drawing look organized…

Yes, neatness counts.

Sketch Sections

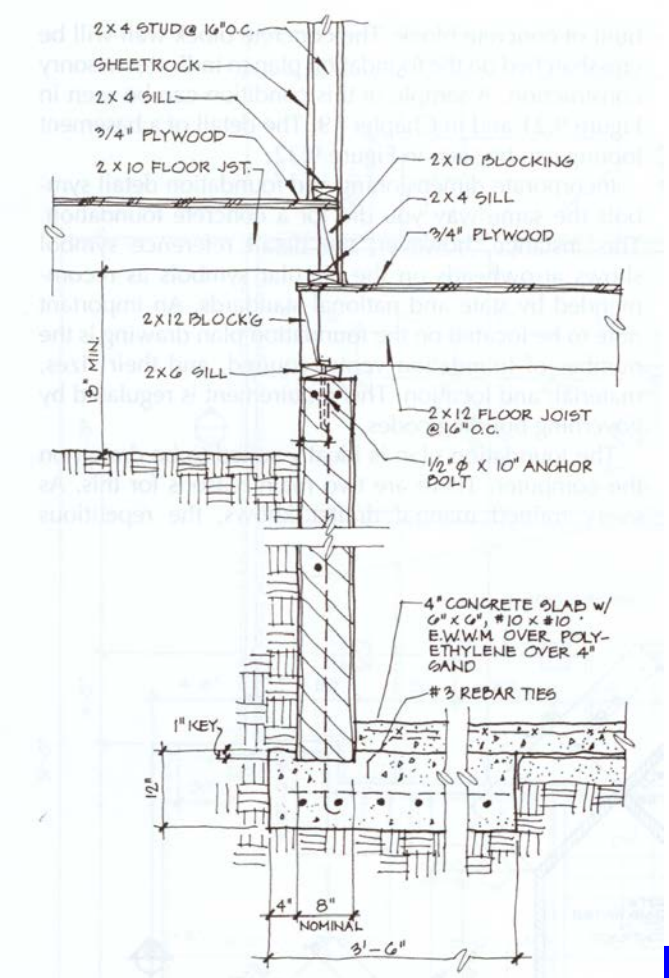


Figure 9.22 Concrete block wall and basement—wood floor.

This is a “sketch section”.

This is what you might rough out before you do the final drawing to see if things work.

With a bit of experience you will be able to draw by hand “to scale” without measuring…

This detail is missing insulation!!!

Key Plan

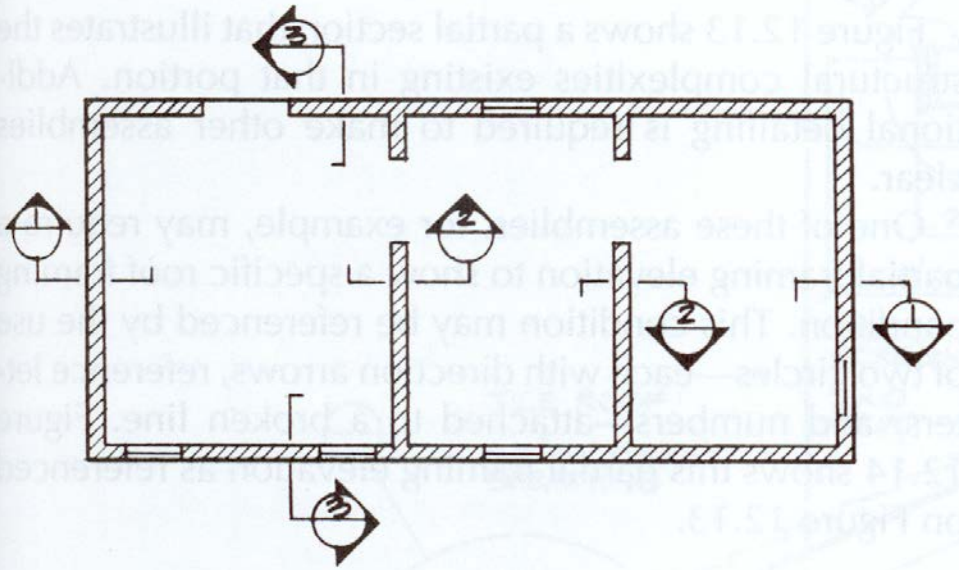


Figure 12.8 Floor plan—industrial building.

This is the plan key for the next set of drawings. It shows where the sections are cut.

Key Plan from previous slide

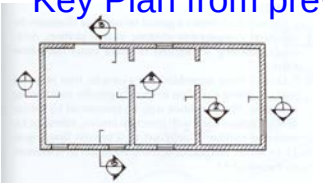


Figure 12.8 Floor plan—industrial building.

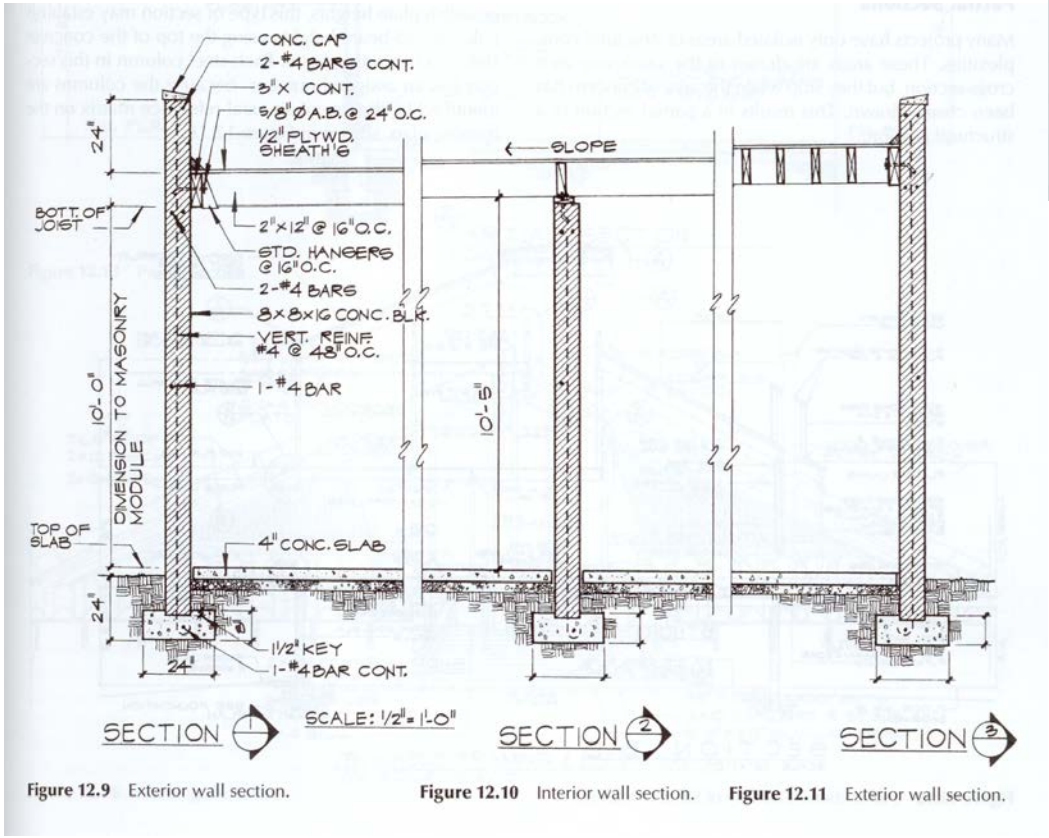
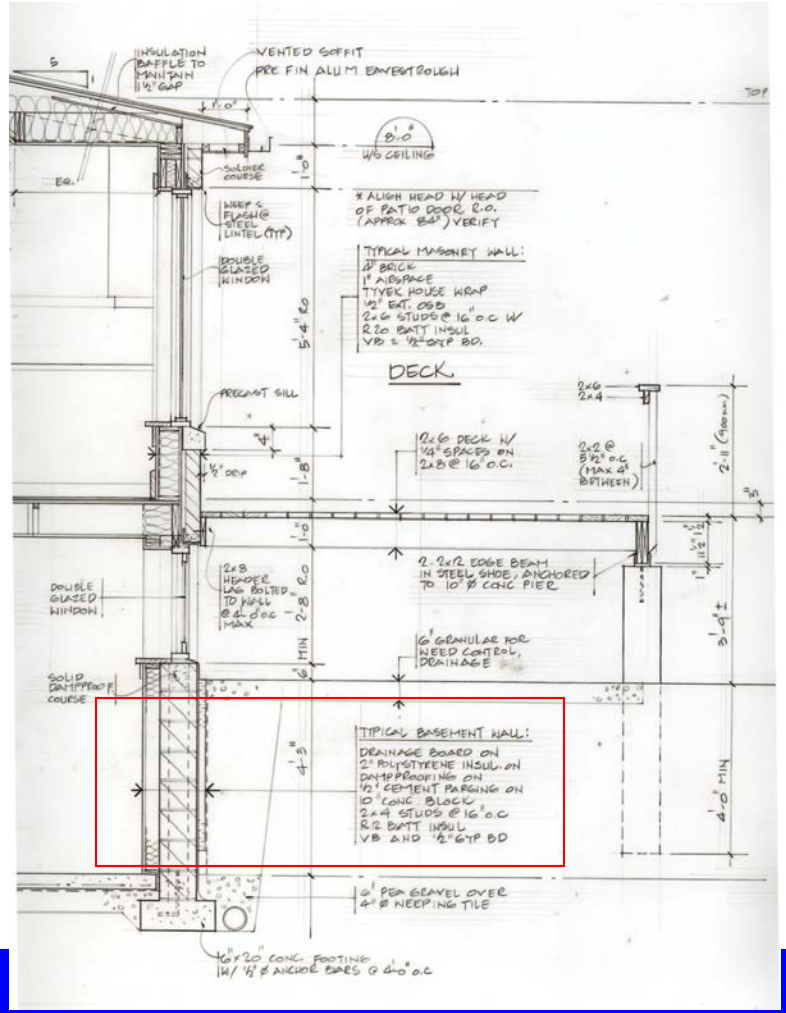


Figure 12.9 Exterior wall section. Figure 12.10 Interior wall section. Figure 12.11 Exterior wall section.

When we put multiple sections on a drawing we usually make them “line up” so that we can take advantage of overriding height dimensions.

Also adds overall clarity.



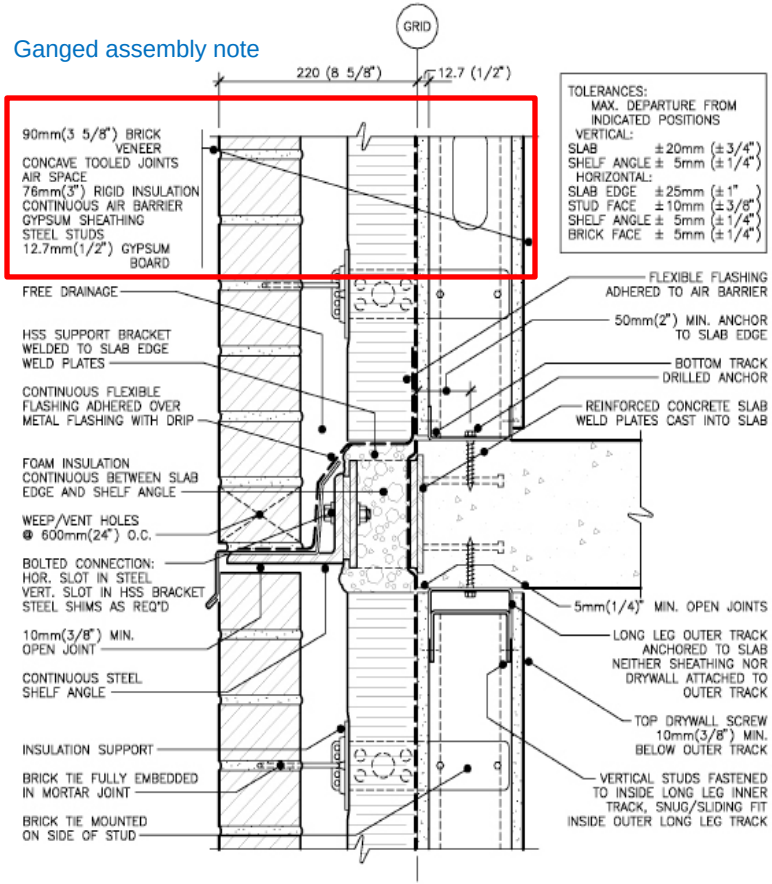
This is an actual contract document detailed section that illustrates my preferred method of “ganging” the notes for each “assembly”.

This prevents a veritable spiderweb of arrows criss crossing all over the drawing noting materials.

It also allows the contractor to know the general makeup of key building elements.

Hand drafted by Terri a long time ago!

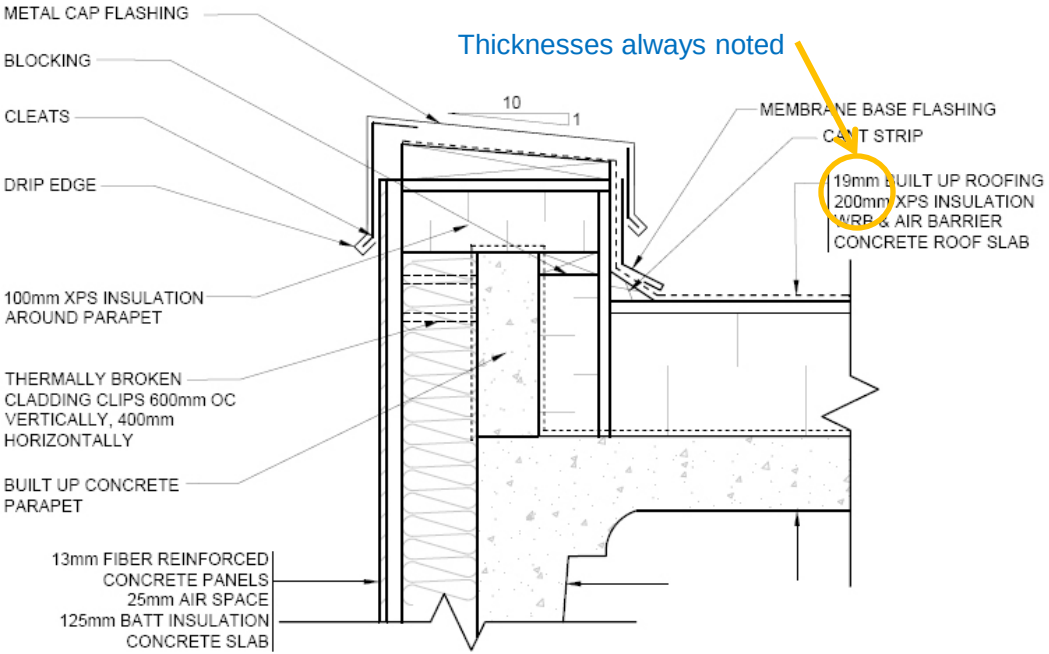
Ganged assembly note



Construction Drawings: Large Details

All of the specification information required to order materials and build the building

Enlarged details

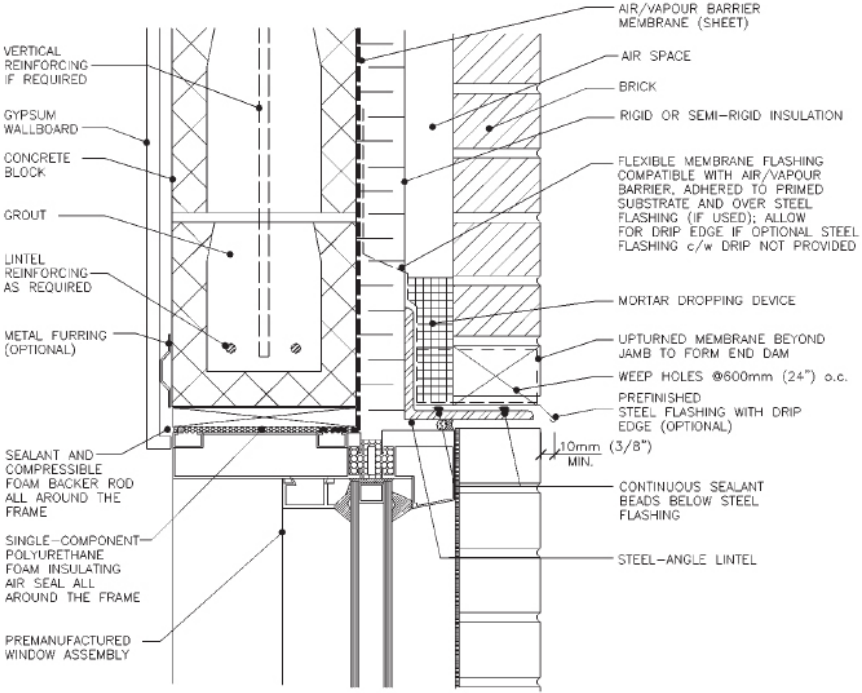


Typical scale is 1:5

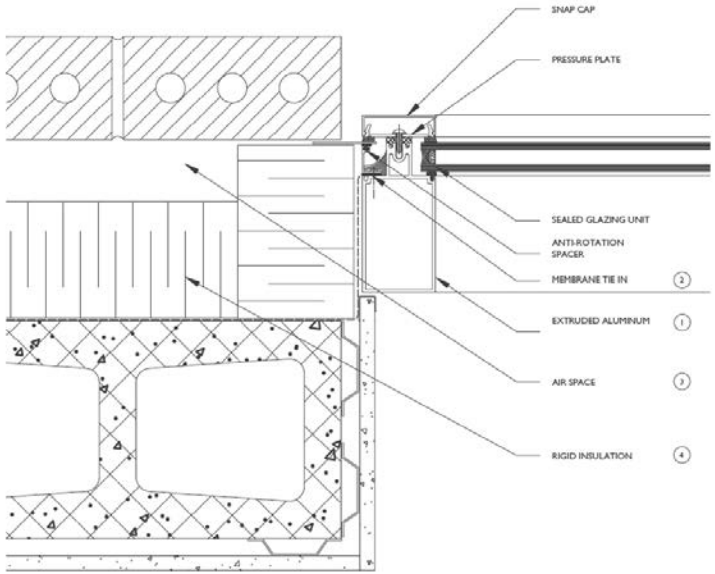
Information that cannot be drawn in the building section is drawn at a larger scale in detail drawings.

Basic rule, the larger the scale, the more information you are supposed to show.

These will be the primary subject of the weekly sketch for Arch 173 next term.

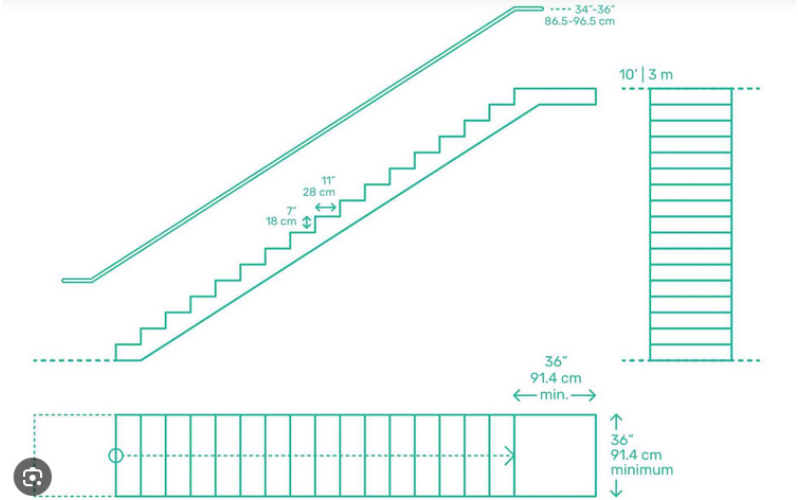


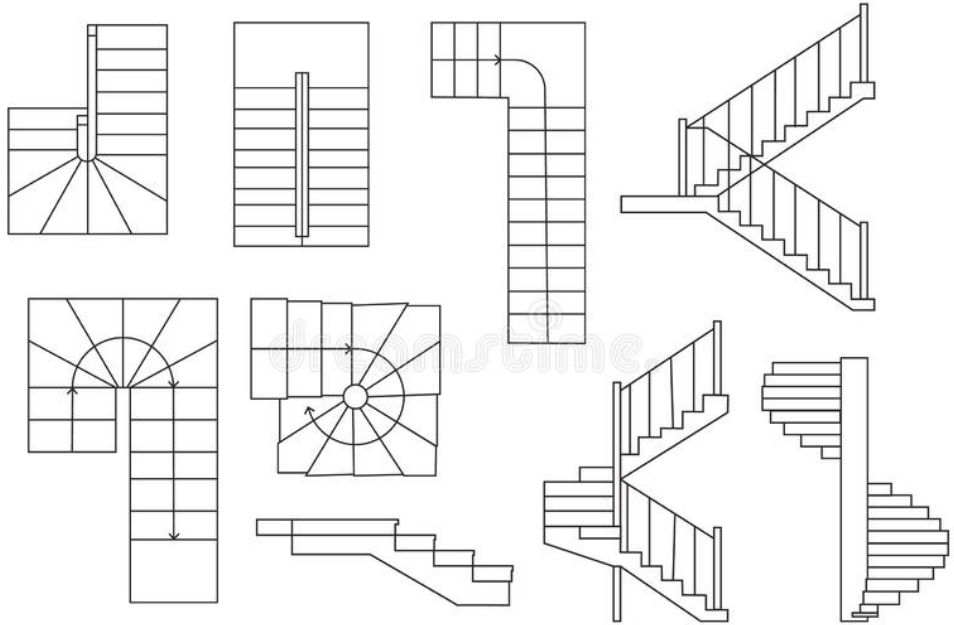
Section Detail



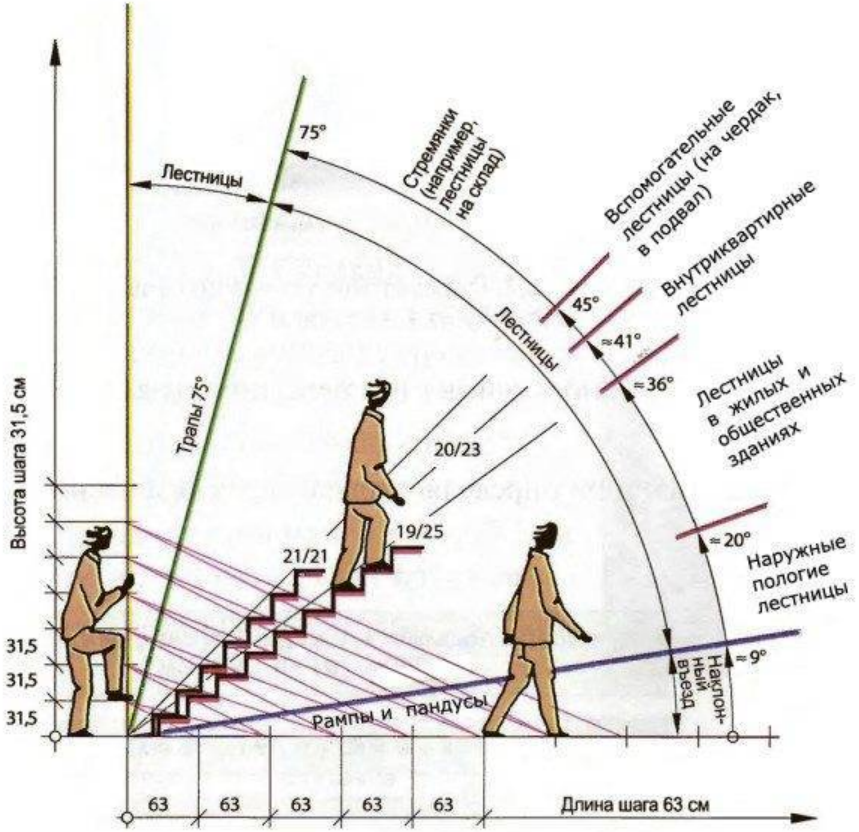
Plan Detail

Stairs



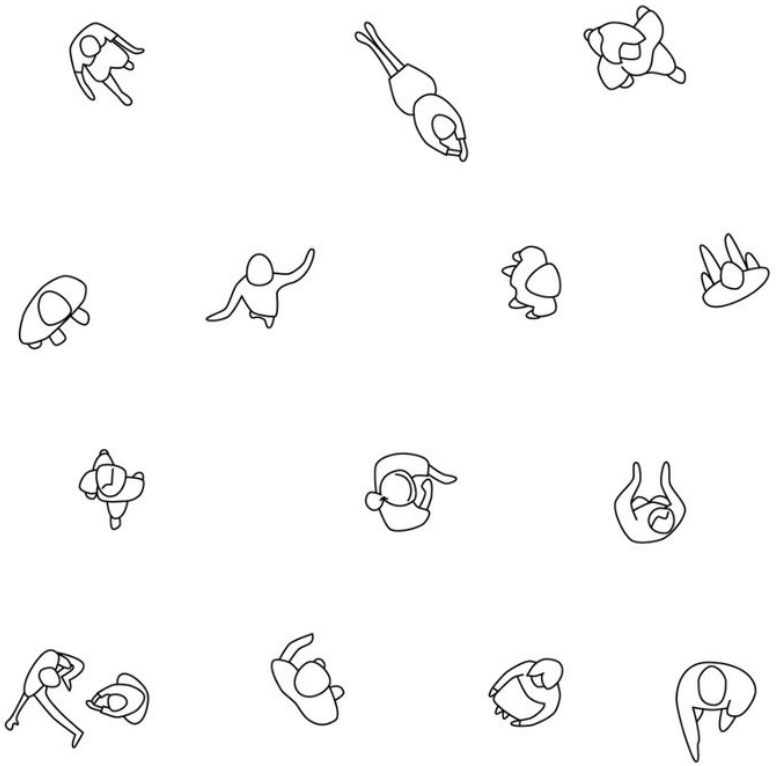


- There are many different layouts of stairs.
- Put arrows to show flow direction
- Width is greater in public buildings as people need to be able to pass by each other comfortably

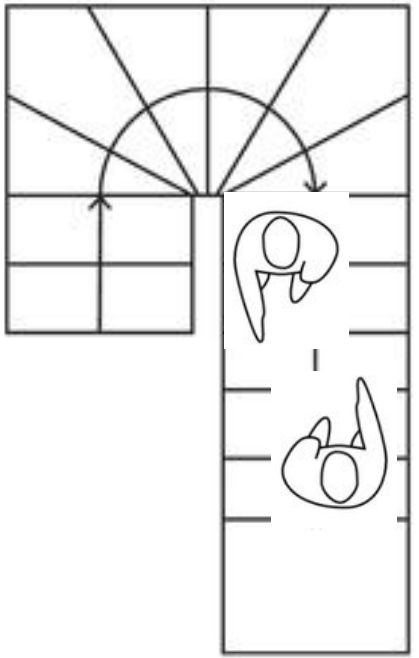


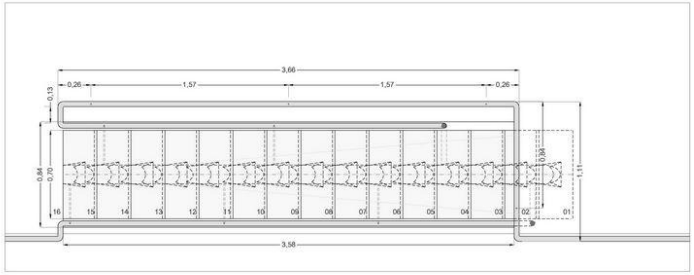
How steep are your stairs (code limits this!)

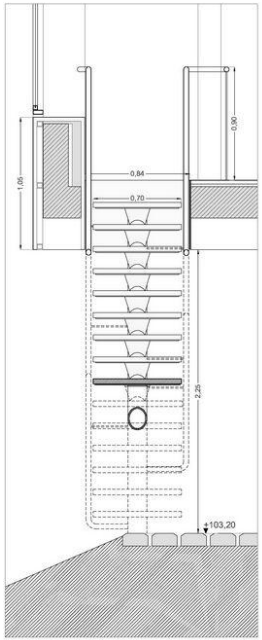
The “nosing” or 25mm projection makes them safer to climb

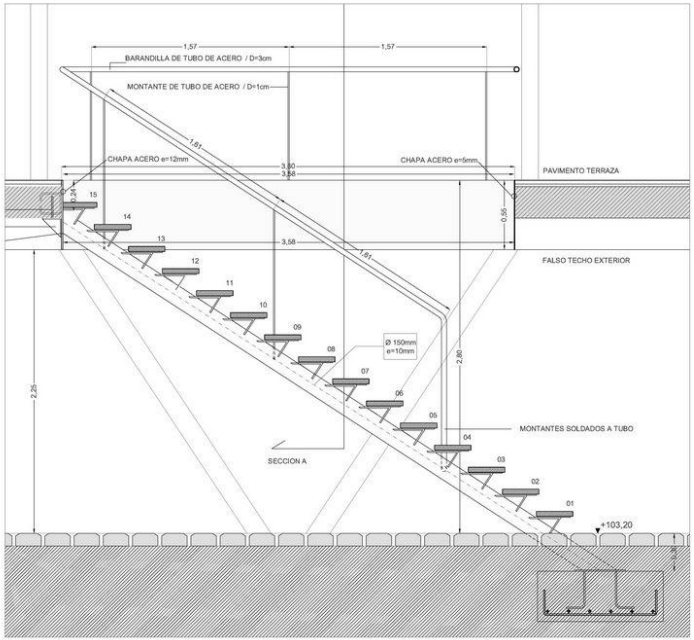


Stair widths in public buildings need to allow passing

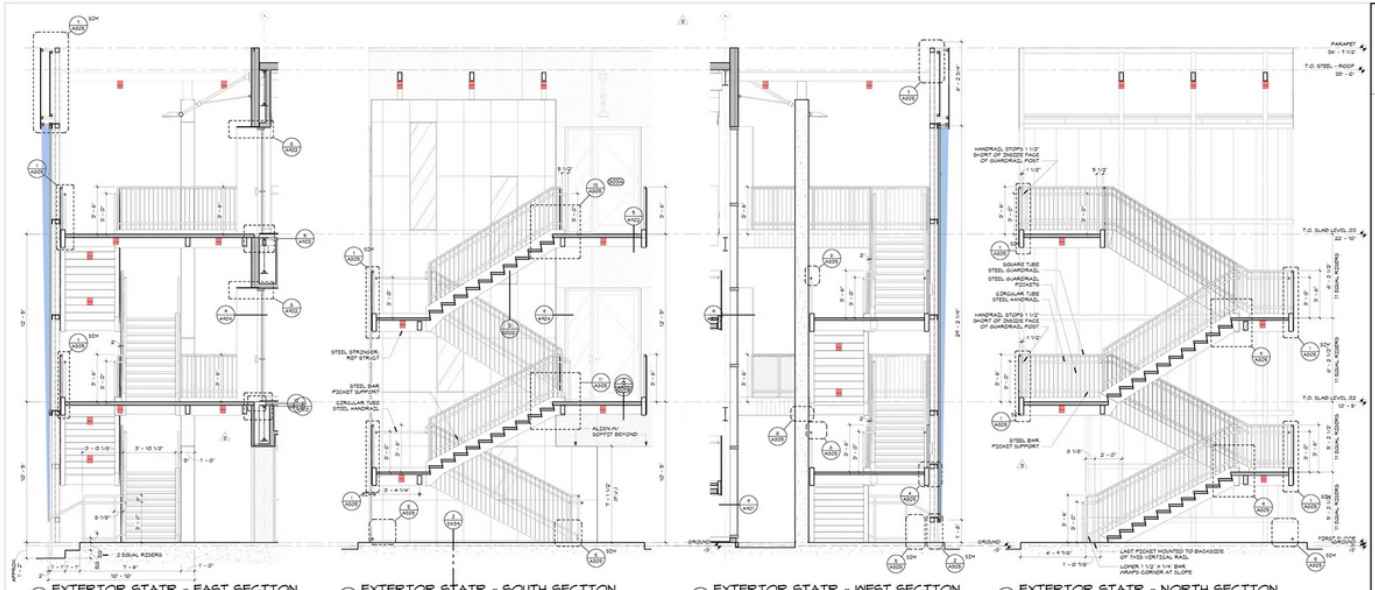








- Stairs have a lot more going on than just the simple plan view
- Railings must be of a height by code and in Canada be **non climbable**
  - Horizontal rails illegal
  - Vertical bars, tempered glass, fine mesh allowed
  - Must pass 4” ball test
- Guard rails at landings are higher to prevent falls



8 EXTERIOR STAIR - EAST SECTION
SCALE: 3/8" = 1'-0"

7 EXTERIOR STAIR - SOUTH SECTION
SCALE: 3/8" = 1'-0"

6 EXTERIOR STAIR - WEST SECTION
SCALE: 3/8" = 1'-0"

5 EXTERIOR STAIR - NORTH SECTION
SCALE: 3/8" = 1'-0"

4 EXTERIOR STAIR - ROOF
SCALE: 3/8" = 1'-0"

3 EXTERIOR STAIR - THIRD FLOOR
SCALE: 3/8" = 1'-0"

*GUARDRAIL AND HANDRAIL NOT SHOWN FOR CLARITY. REF A505 AND A506 FOR DETAILS

2 EXTERIOR STAIR - SECOND FLOOR
SCALE: 3/8" = 1'-0"

*GUARDRAIL AND HANDRAIL NOT SHOWN FOR CLARITY. REF A505 AND A506 FOR DETAILS

1 EXTERIOR STAIR - FIRST FLOOR
SCALE: 3/8" = 1'-0"

*GUARDRAIL AND HANDRAIL NOT SHOWN FOR CLARITY. REF A505 AND A506 FOR DETAILS

Malone Maxwell Borson ARCHITECTS
WWW.MMBARCHITECTS.COM
214-969-5440
718 NORTH BUCKNER BLVD.
SUITE 400
DALLAS, TEXAS 75218

OAK GROVE

GENERAL NOTES:

SET ISSUE DATES

DATE	ISSUE
12.14.18	FOR CONSTRUCTION

REVISIONS

NO.	DATE	DESCRIPTION
1	04.19.2019	REVISION 01

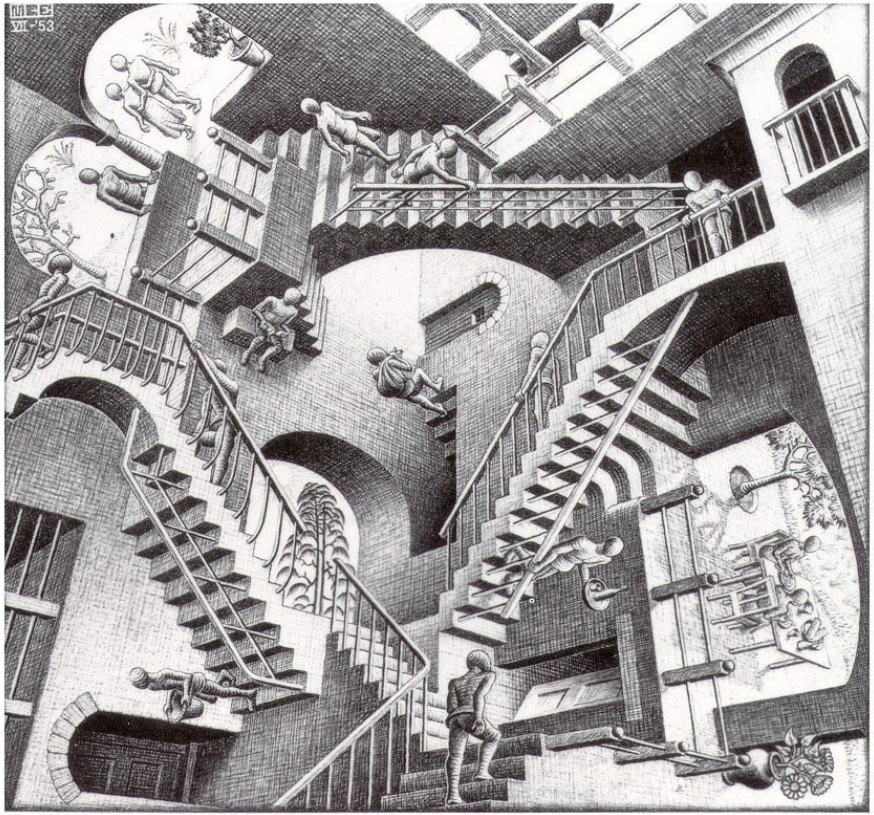
EXTERIOR STAIR

SHEET NO.

A804

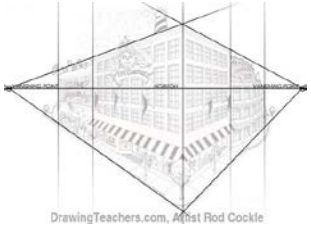
PROJECT NO. 16032
DATE 05/14/2019

3D drawings

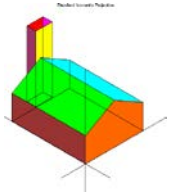


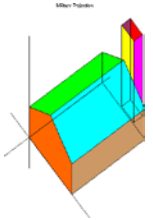
3D Drawing Types

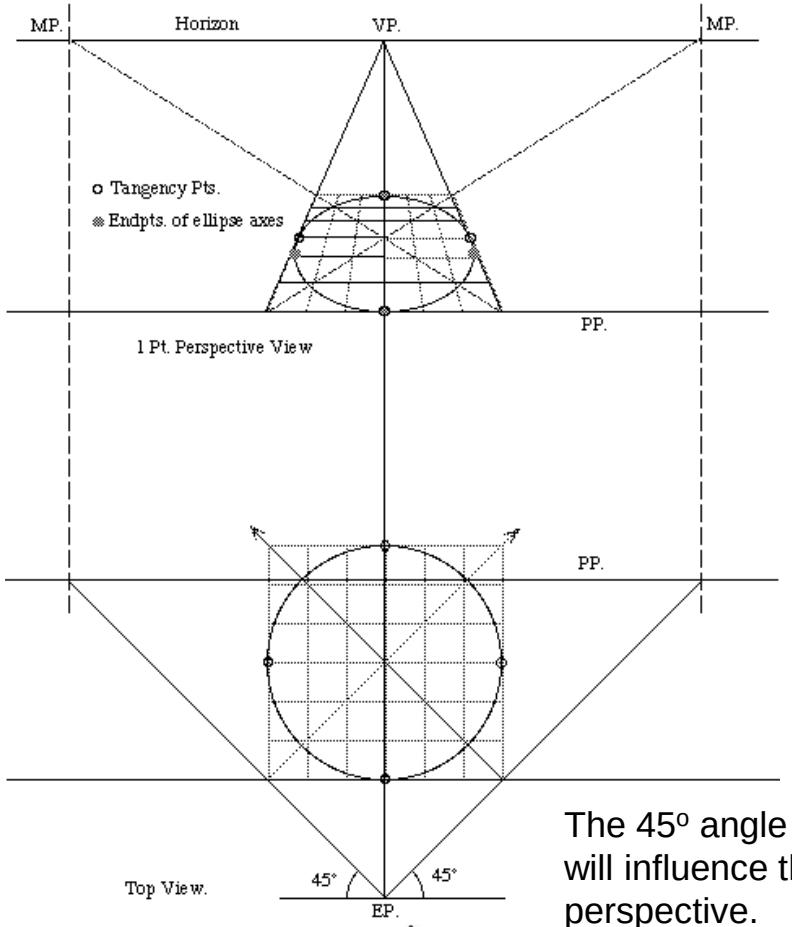
- One point perspective
  - Typically taken at eye level (quasi realistic)
- Two point perspective
  - Can vary from eye level to aerial type overviews
  - Most realistic view



- Projections
  - Isometric
    - The plan is squashed to a diamond shape
    - Dimensions only accurate on the perimeter (will explain)
  - Axonometric
    - The plan is kept square with real dimensions







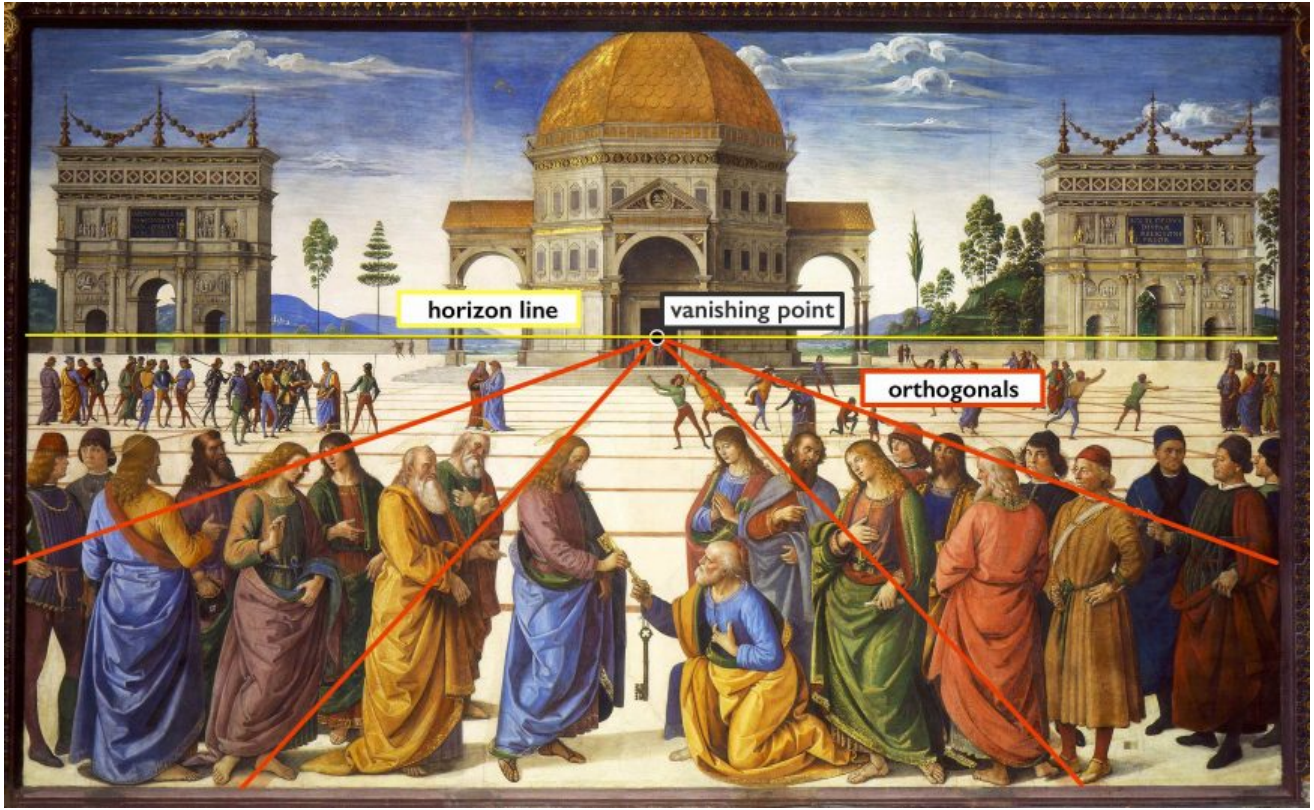
VP is the Vanishing Point
All of the lines on the PP extend to this point. Normally it is set at eye level.

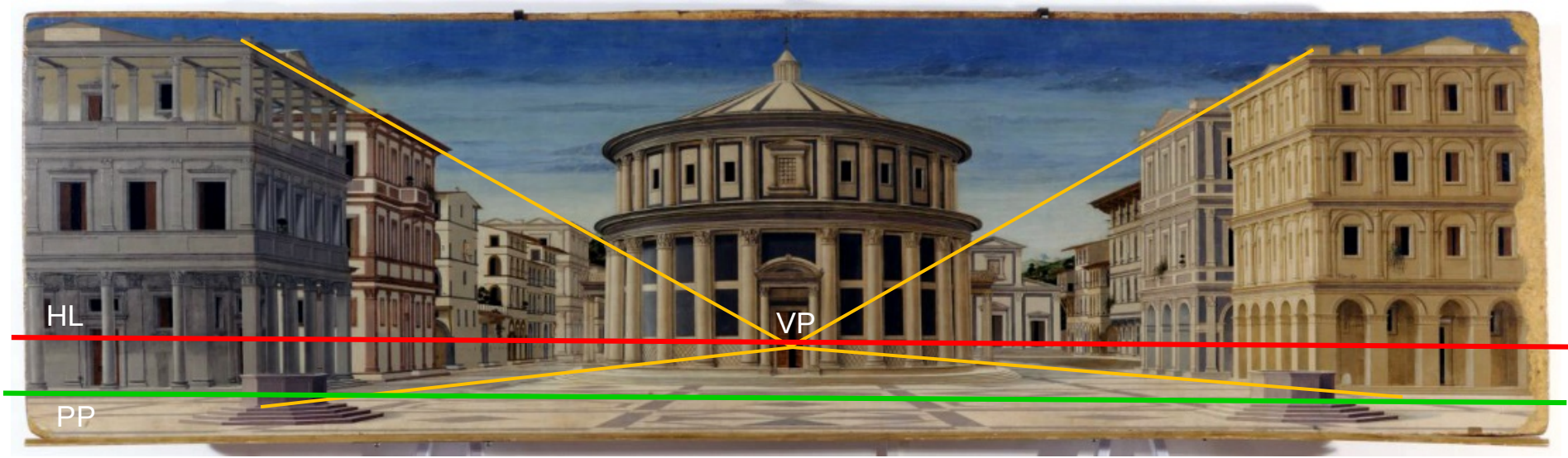
PP is the Picture Plane
Everything on this line is to scale

The plan is drawn to scale and you project its dimensions up the page to the PP

The 45º angle is somewhat arbitrary and will influence the overall “look” of the perspective.

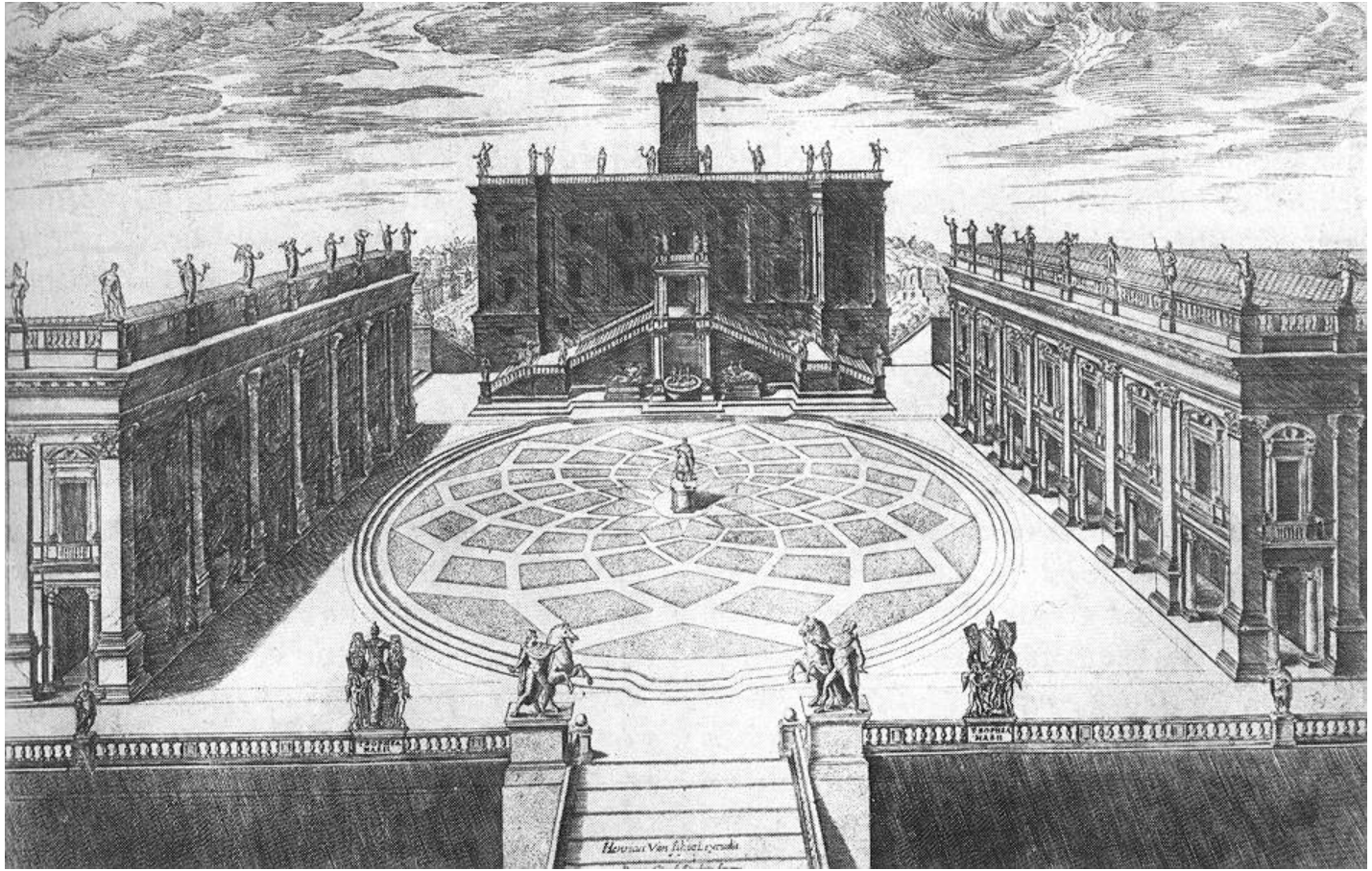
One point perspective gives a quasi real view to the scene



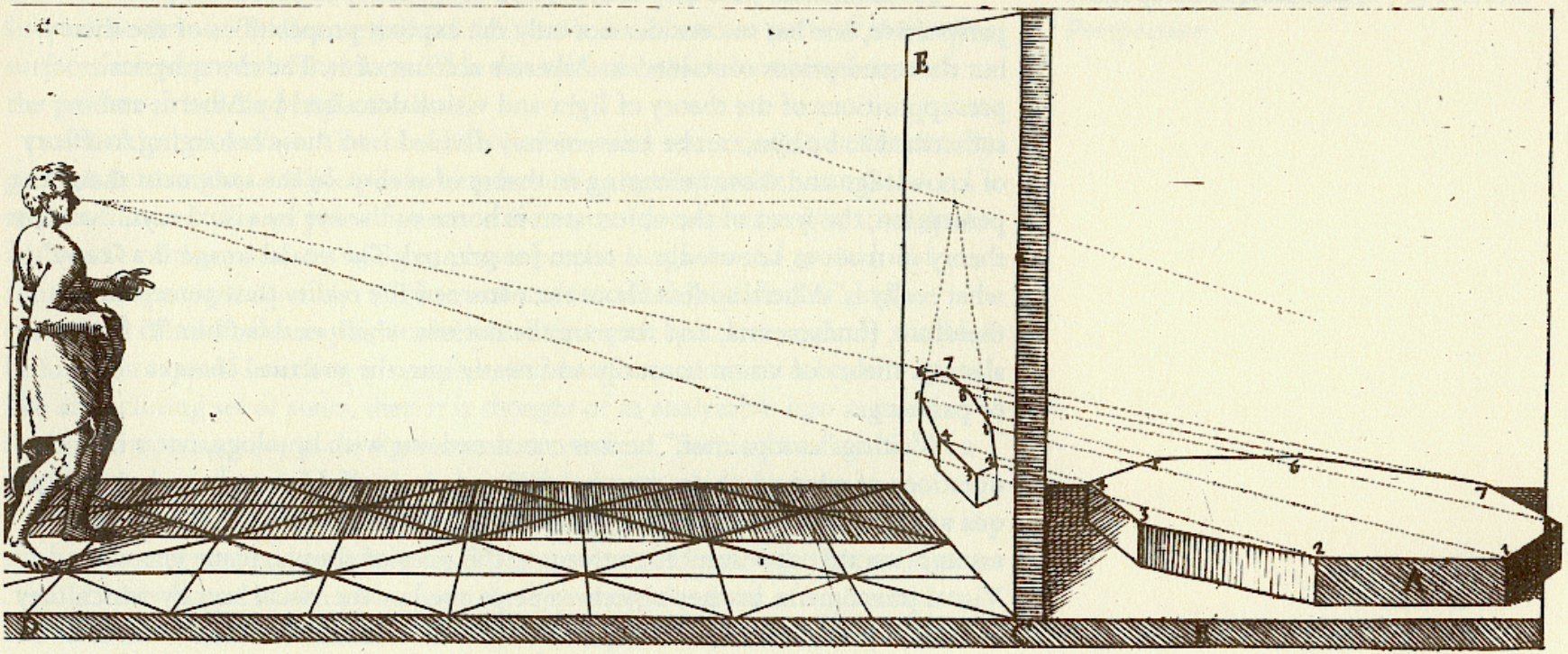


Guessing that they made the PP at the base of the building to make it easier to measure and construct.

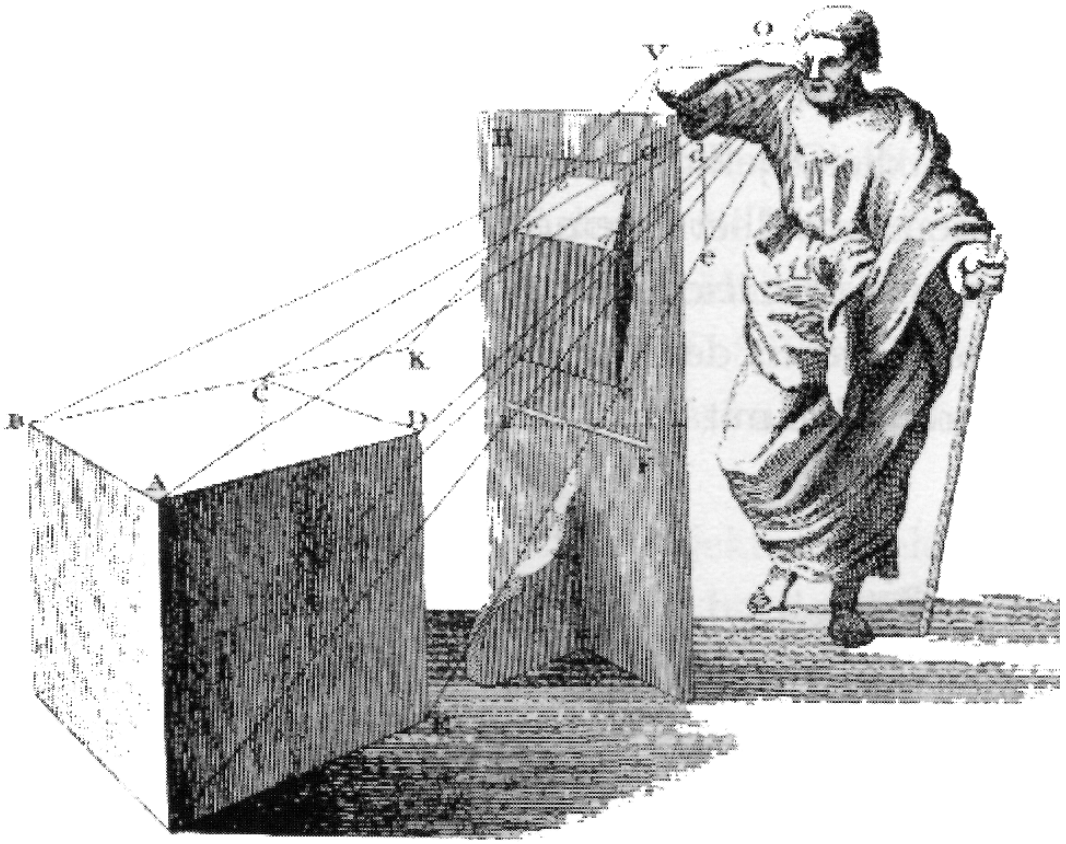
Renaissance painting of the Ideal City

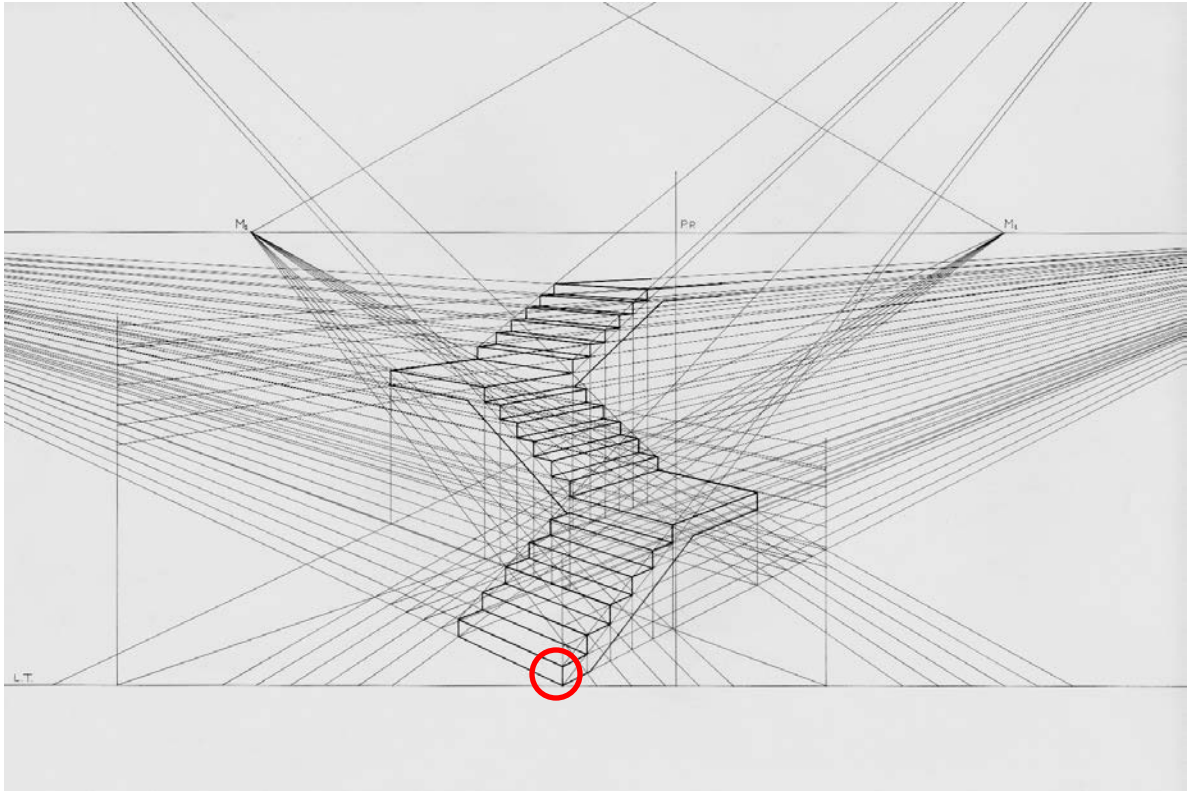


This engraving of the Capitoline Hill in Rome, designed by Michelangelo shows a bird’s eye view



3. *Seeing by means of visual rays. From Vignola,* La due regole della prospettiva practica, *1611.*


V
O
H
C
K
B
A
D
E
F
G



Two point perspective of a staircase. The only TRUE dimension is the one small vertical line that touches the picture plane at the bottom.

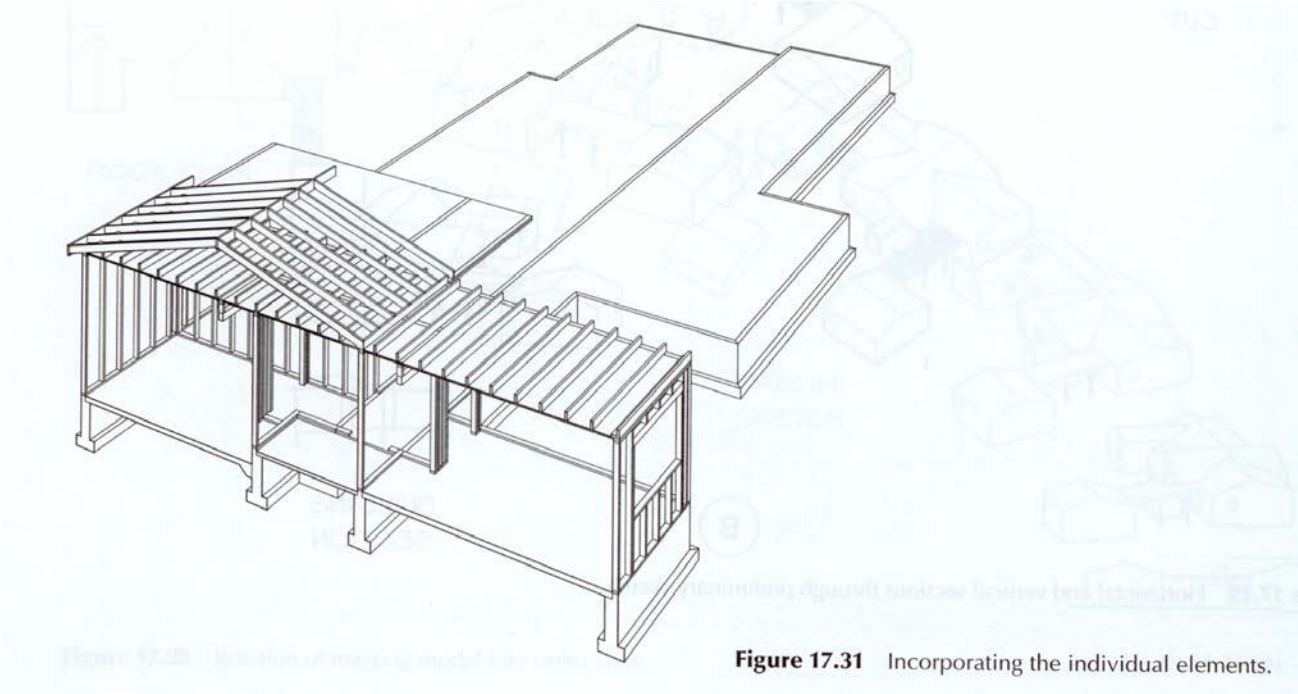
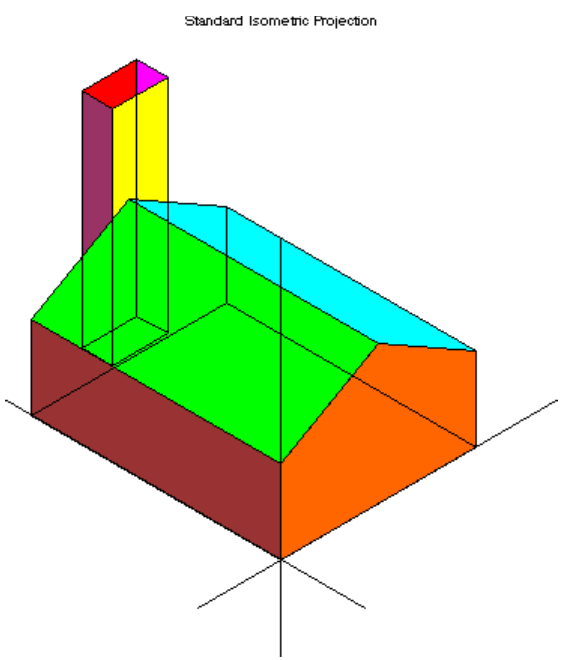
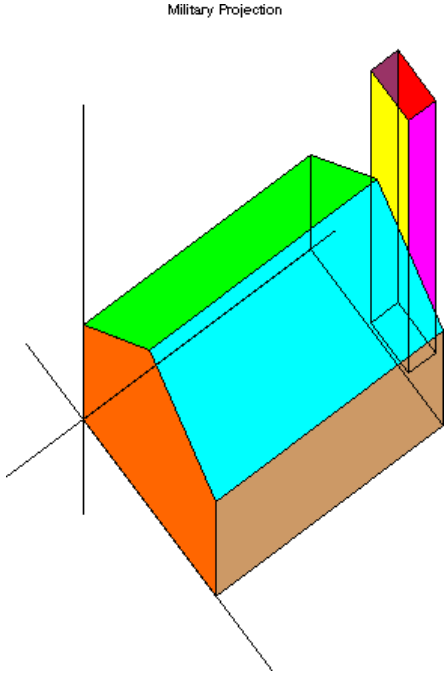


Figure 17.31 Incorporating the individual elements.

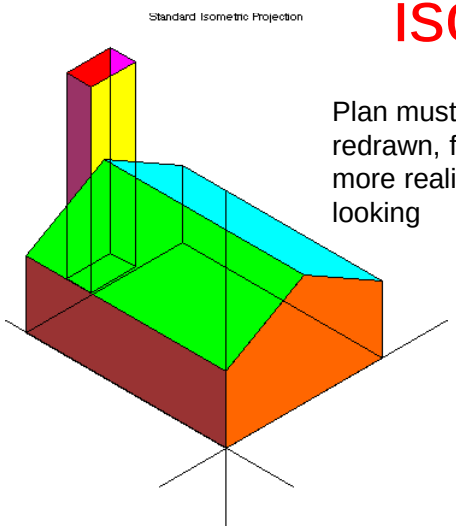
Cutaway sectional perspective – 3D drawing

isometric versus axonometric



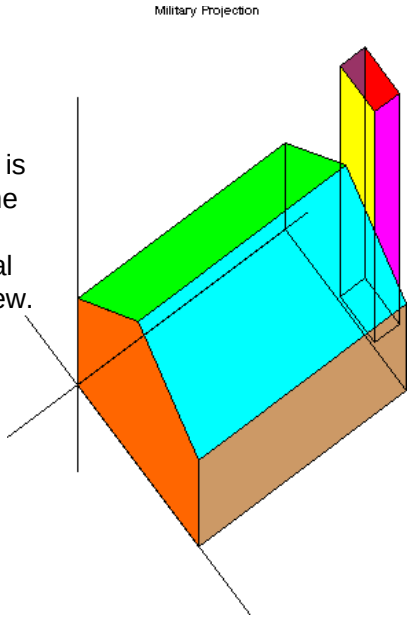


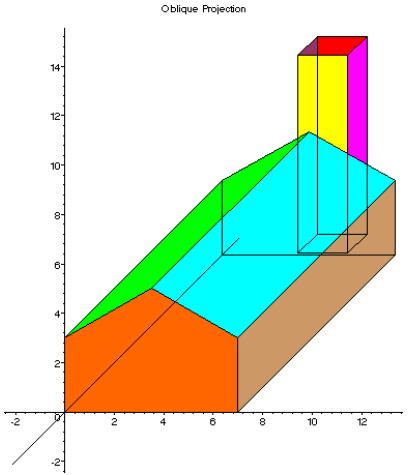
iso versus axo



Plan must be redrawn, final view more realistic looking

Floor plan is used as the base.
More aerial looking view.

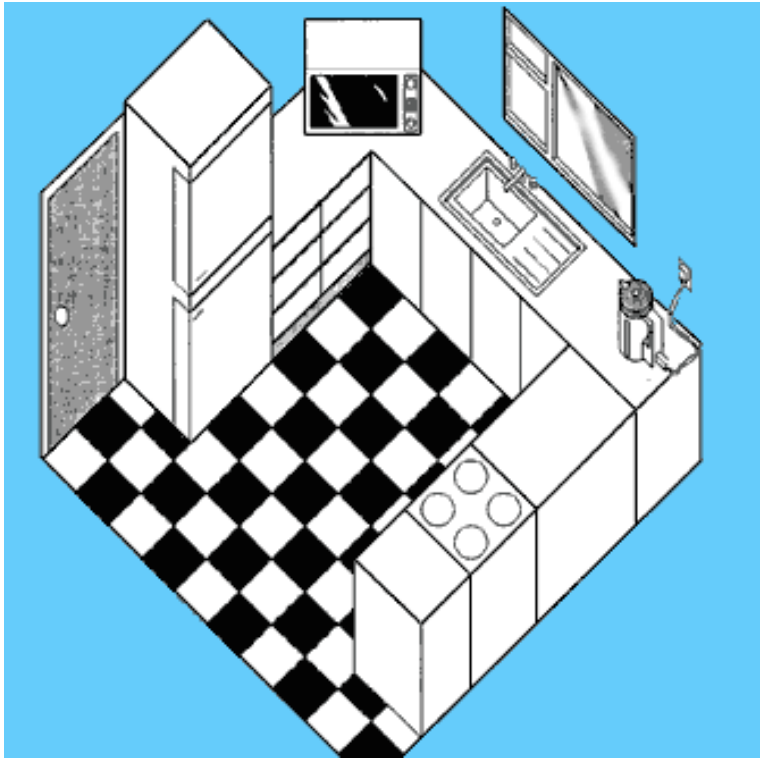




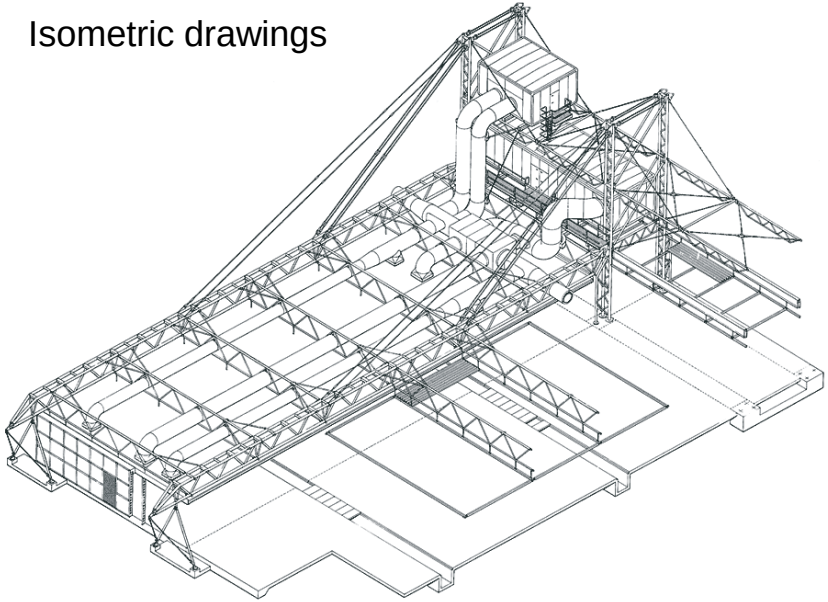
Front elevation is used as the base.

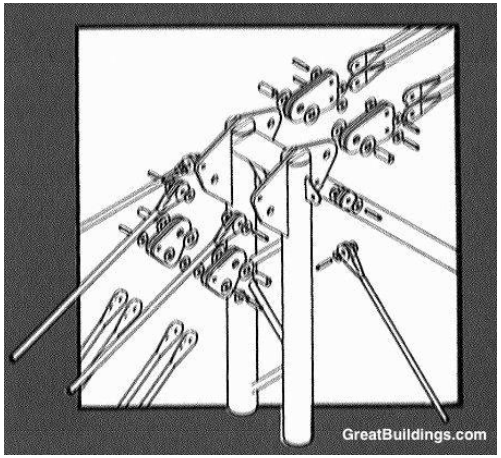
Vertical dimensions are all actual.

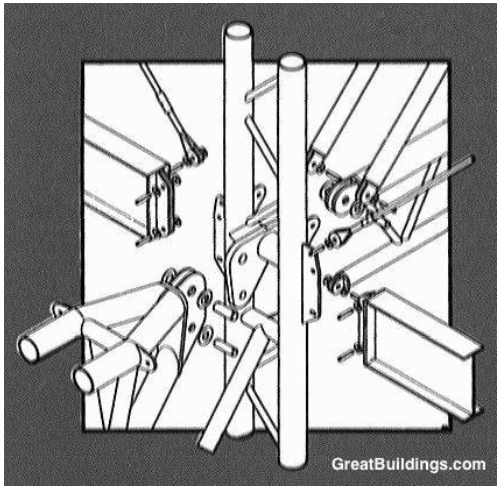
Axonometric drawing



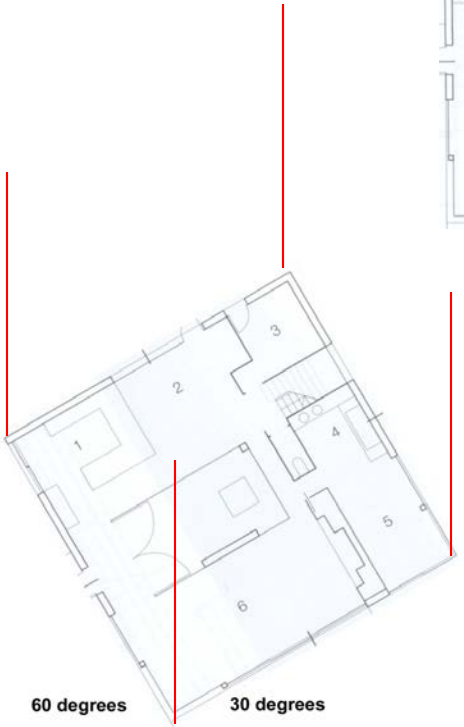
Isometric drawings





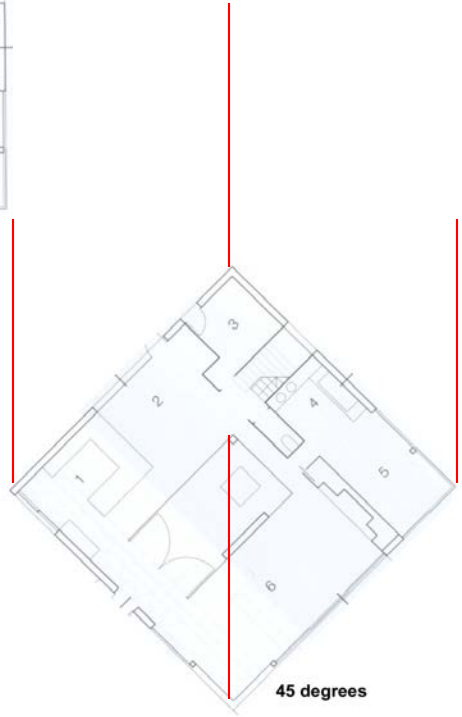


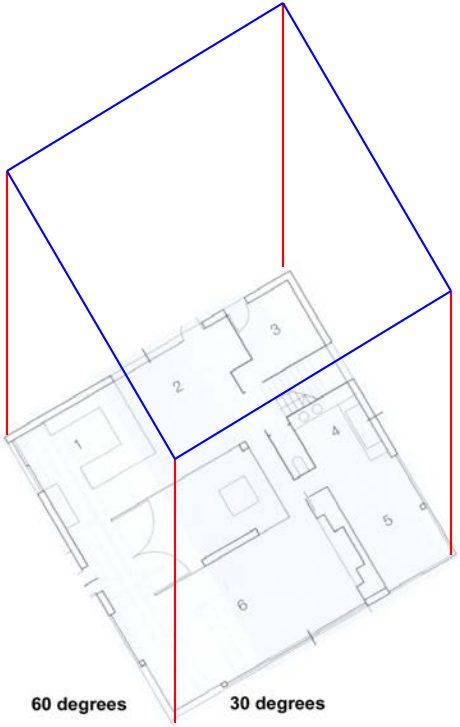
Richard Rogers
Inmos Microprocessor Factory, 1982



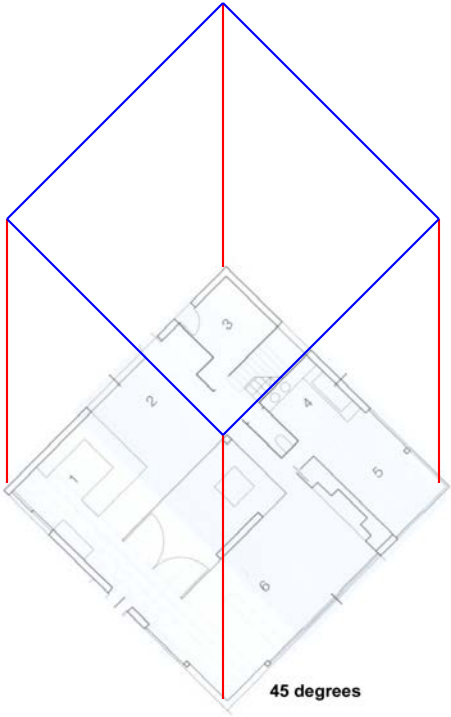
Take your plan and decide if it is best to rotate 30 or 60 degrees.

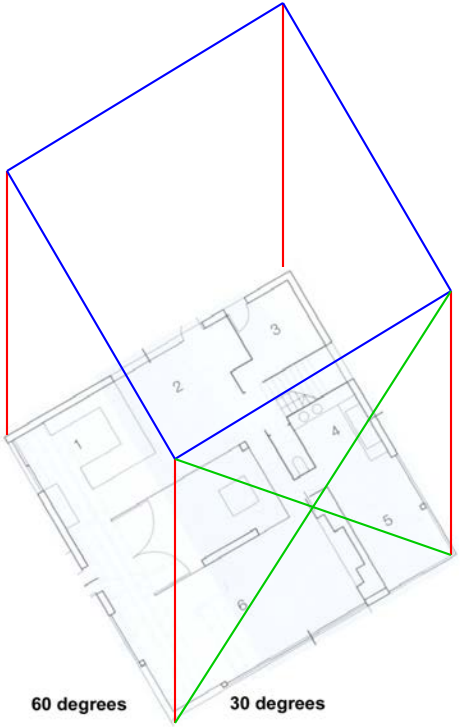
Add your vertical lines that are true measurements ..





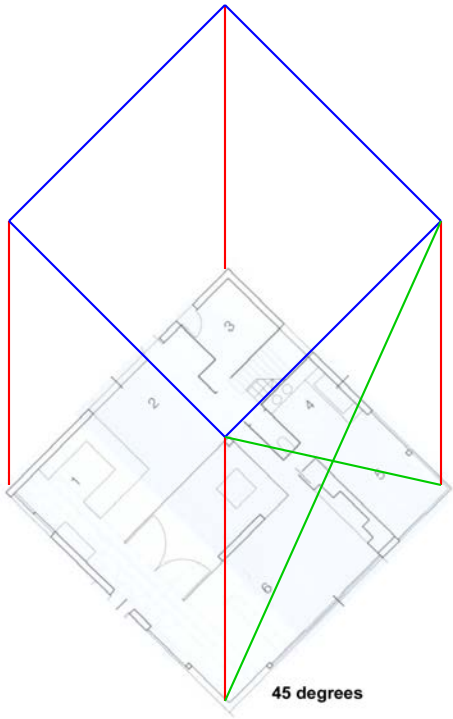
Add horizontal lines. They are also “to scale”.

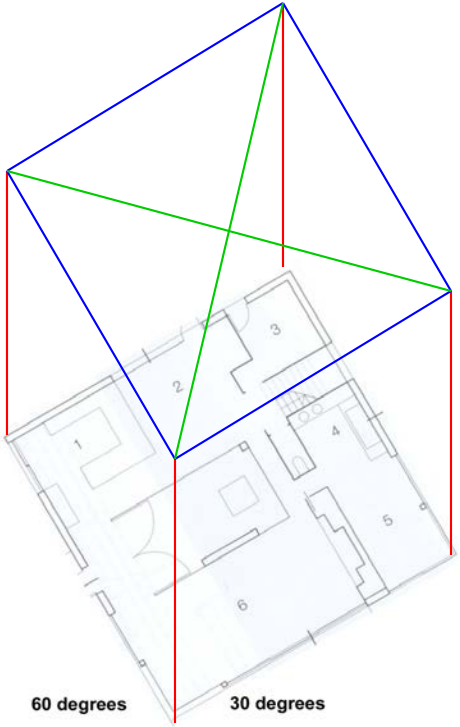




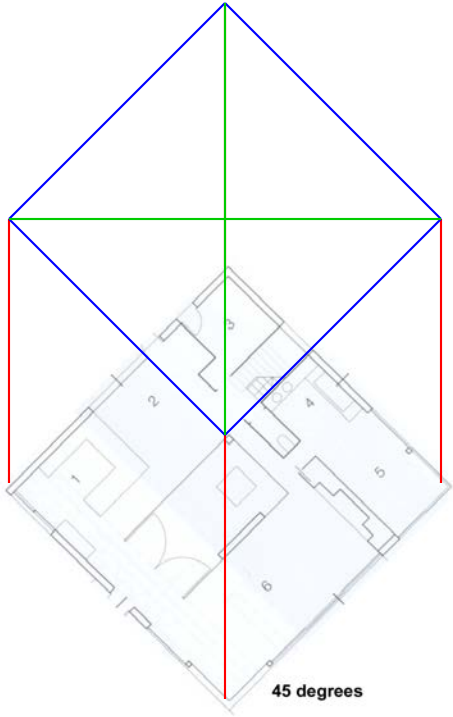
Add horizontal lines. They are also “to scale”.

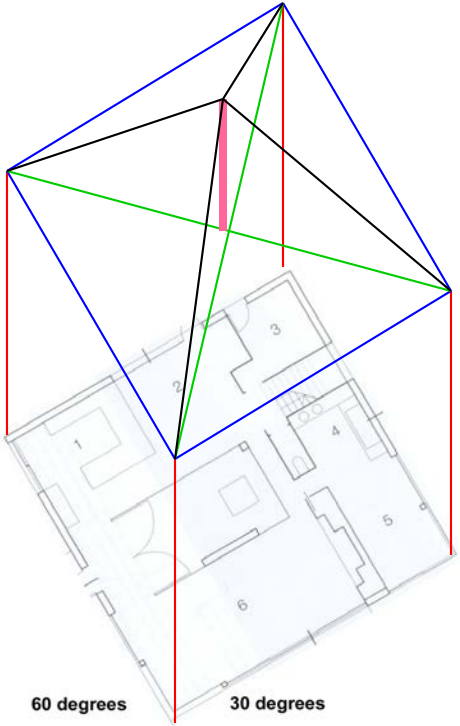
Diagonal lines on the planes of the walls are NOT to scale but can be used to find the middle, etc.





To make a pitched roof, draw the diagonals across your roof plane.

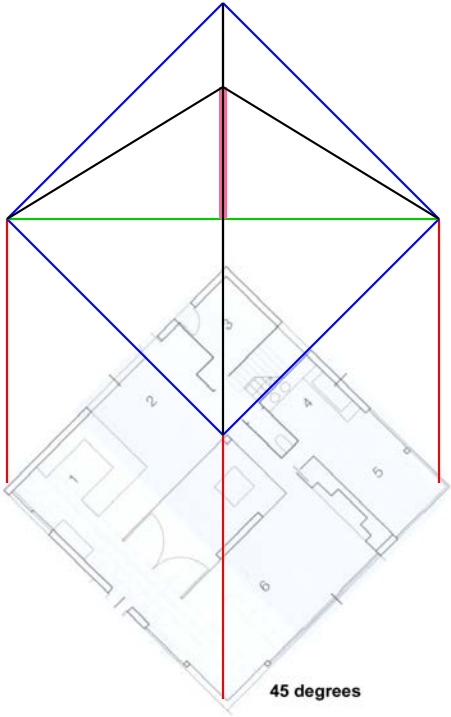




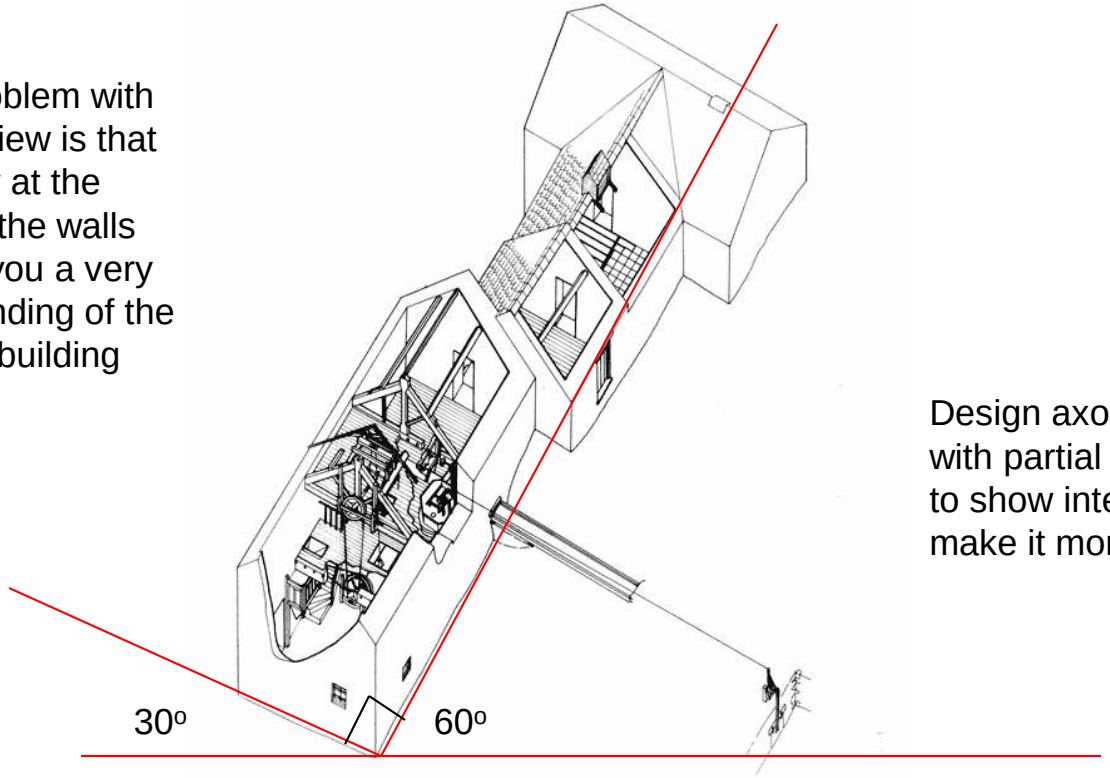
Draw in the vertical dimension to the top of the roof. This is a true dimension.

Then finish with the ridges.

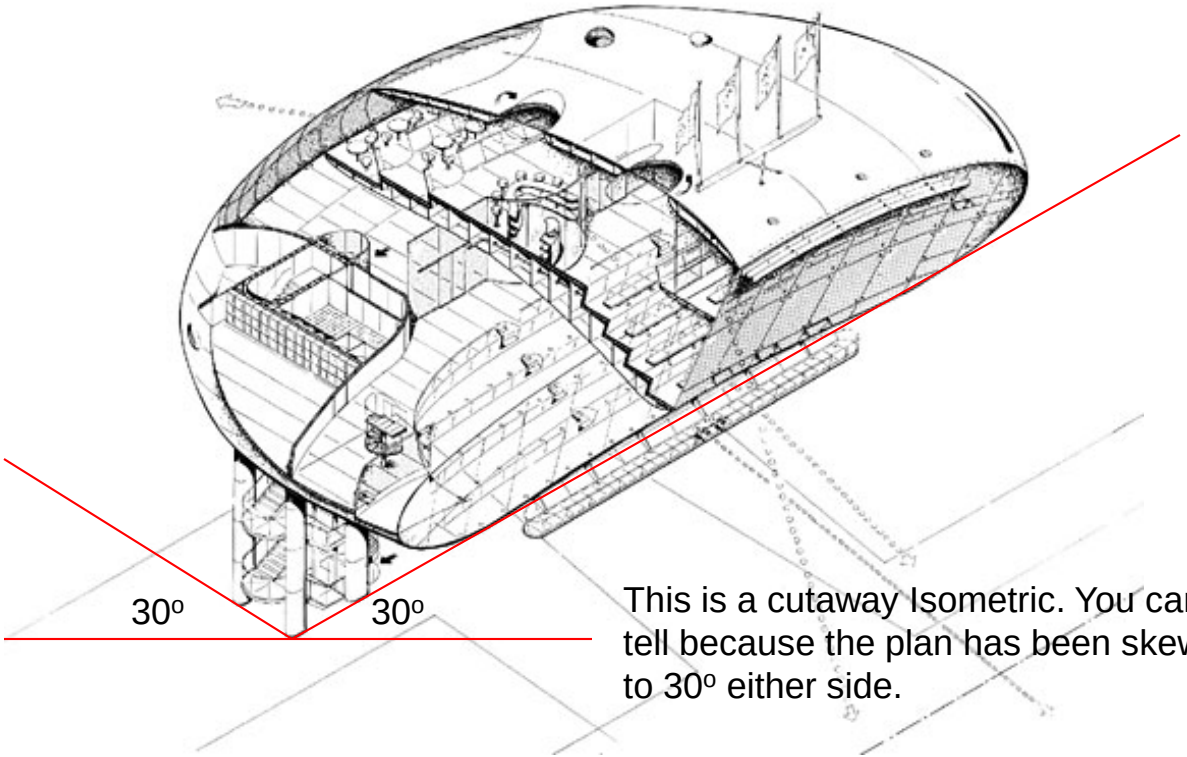
There are issues with the 45 degree image with overlap.



- The biggest problem with the axo or iso view is that you look mostly at the ROOF and not the walls
- They can give you a very quick understanding of the massing of the building

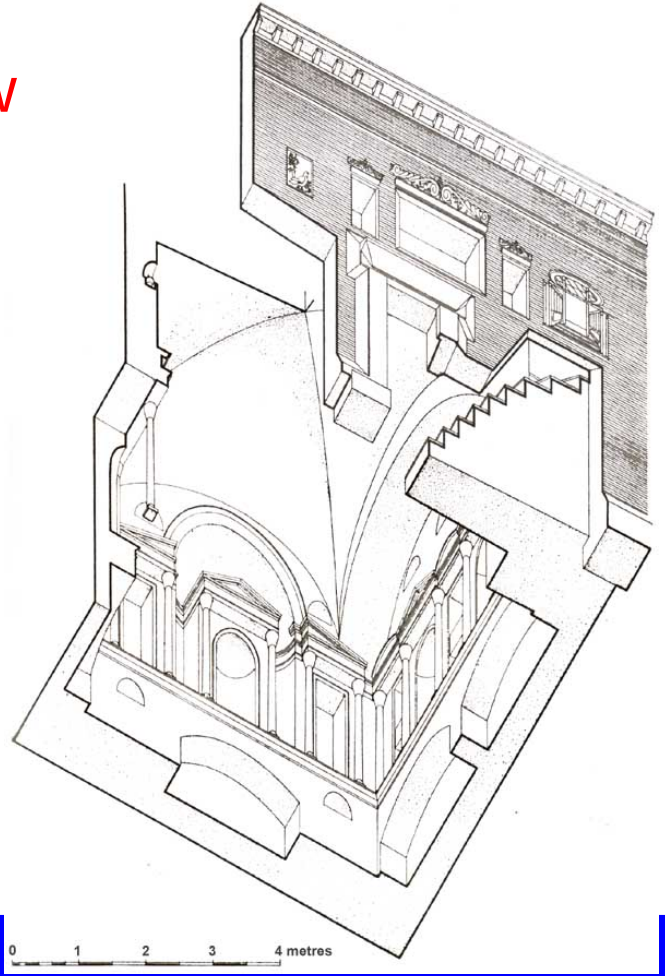


Design axonometric with partial cutaway to show interior to make it more useful

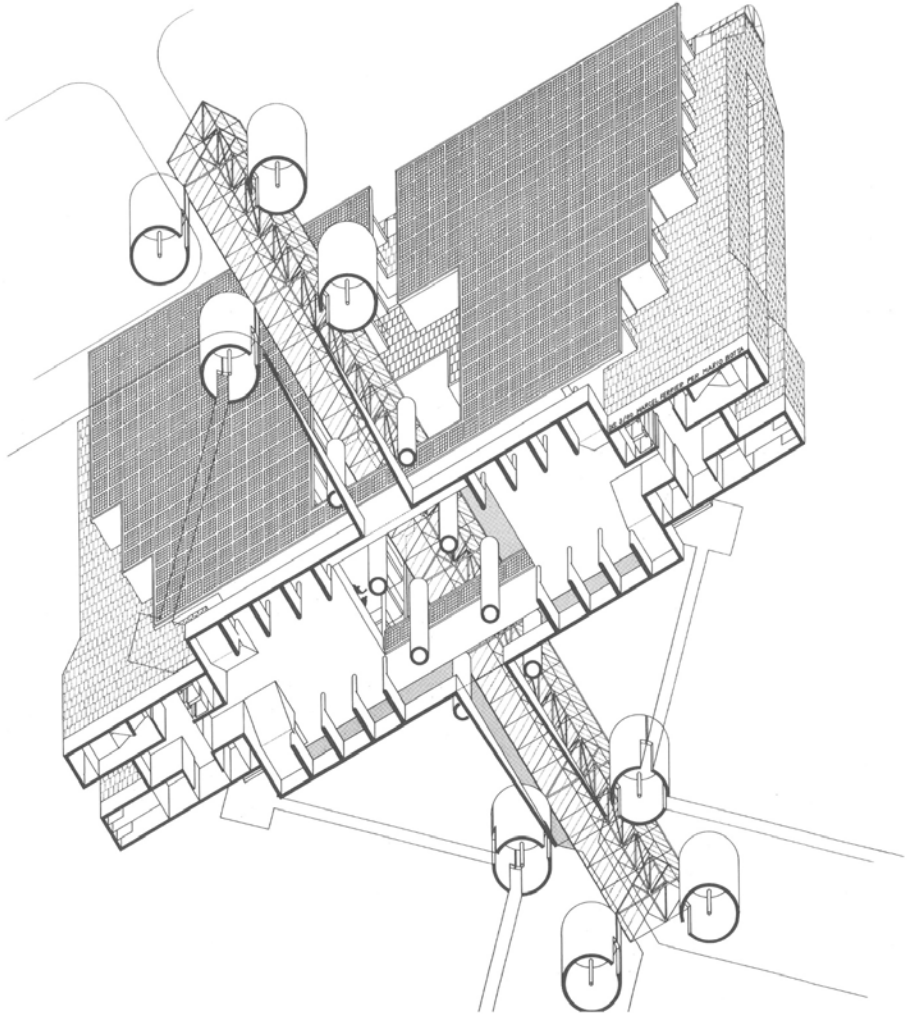


This is a cutaway Isometric. You can tell because the plan has been skewed to 30º either side.

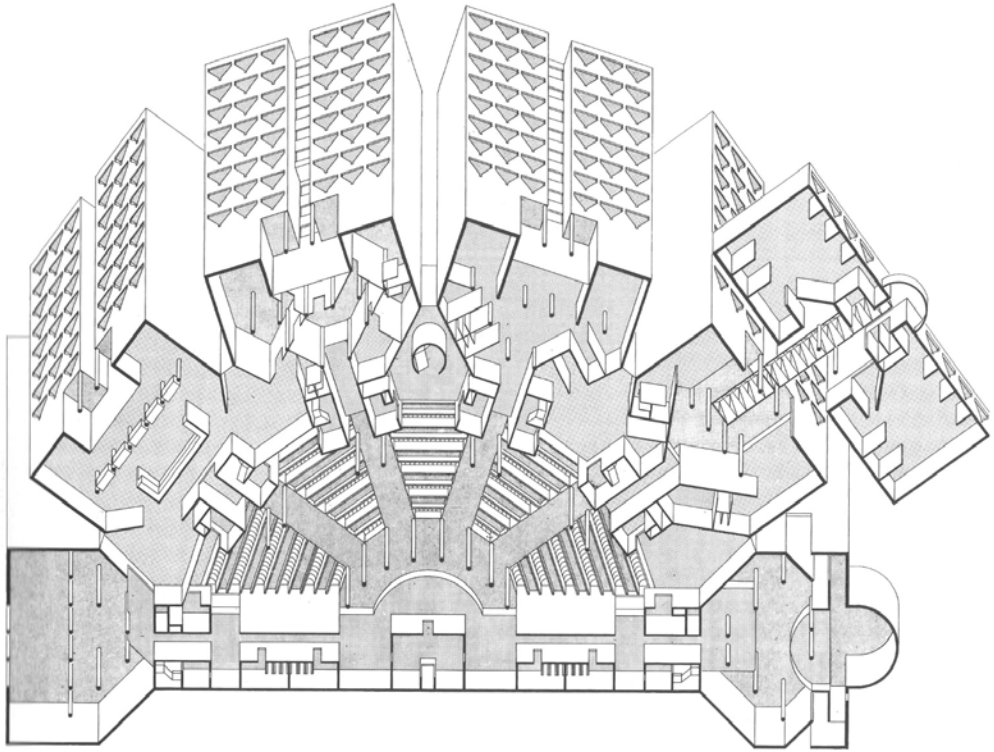
Worm’s Eye View



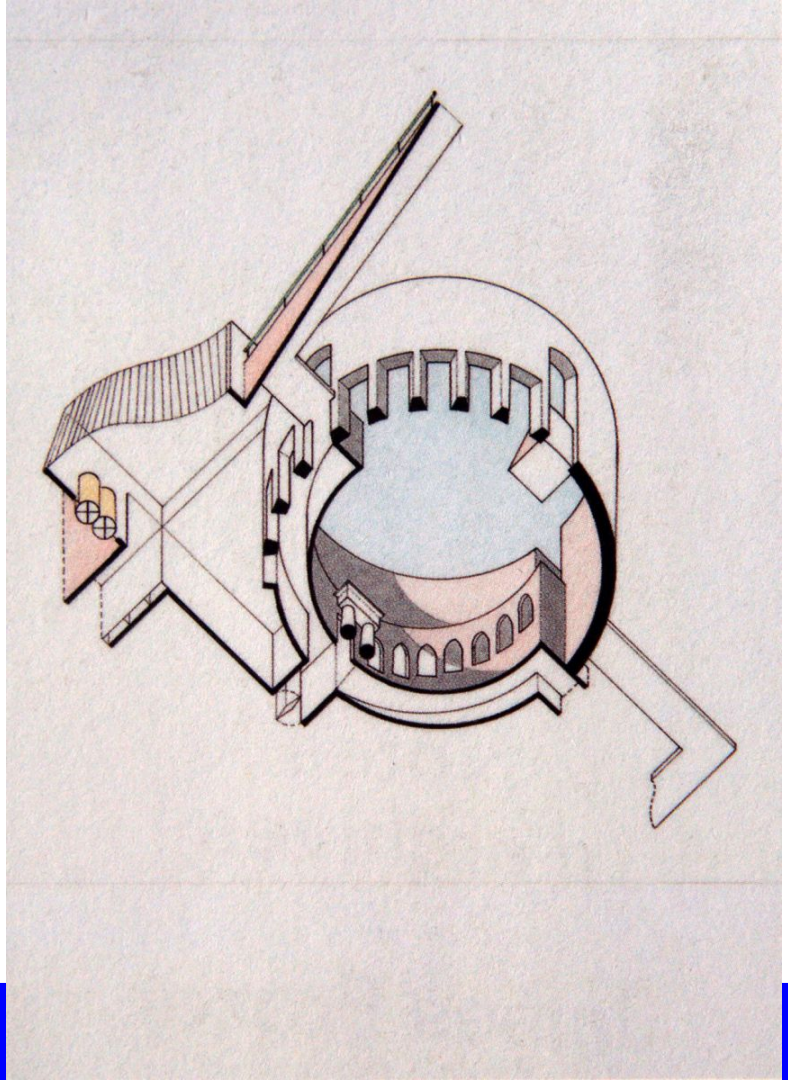
The elusive worm’s eye axonometric drawing that looks at the ceiling.



Worm’s eye view axonometric

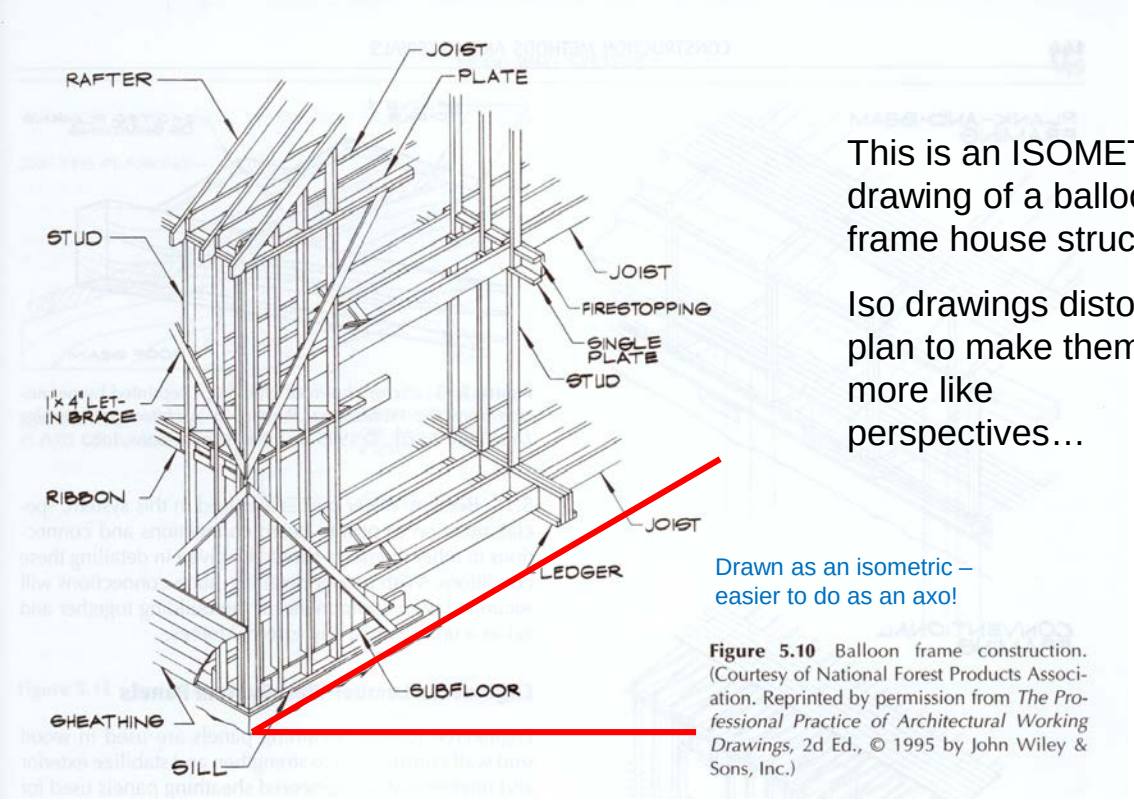


Worm’s eye view axonometric



Worm’s eye view axonometric is often used when you want to show off the ceiling or interior of a larger space.

3-D construction drawings

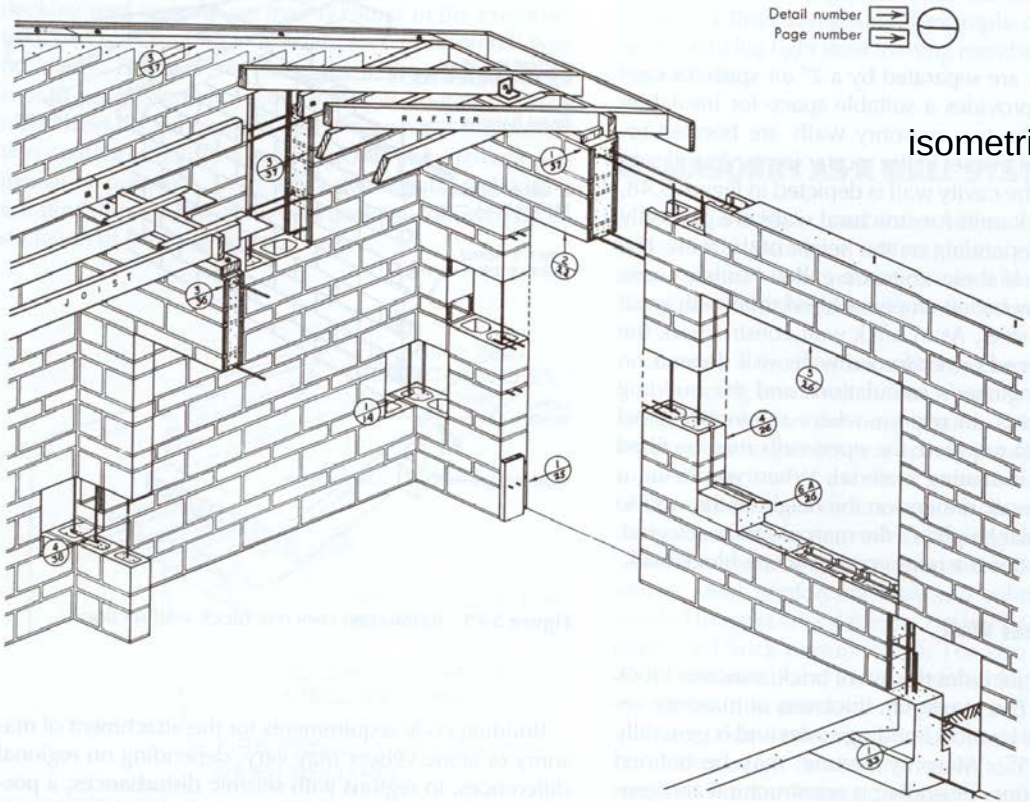


This is an ISOMETRIC drawing of a balloon frame house structure.

Iso drawings distort the plan to make them look more like perspectives…

Drawn as an isometric – easier to do as an axo!

Figure 5.10 Balloon frame construction. (Courtesy of National Forest Products Association. Reprinted by permission from *The Professional Practice of Architectural Working Drawings*, 2d Ed., © 1995 by John Wiley & Sons, Inc.)



isometric

Figure 5.51 Typical concrete block residential construction. (Reprinted by permission from *Professional Practice of Architectural Detailing*, 3d Ed., © 1999 by John Wiley & Sons, Inc.)

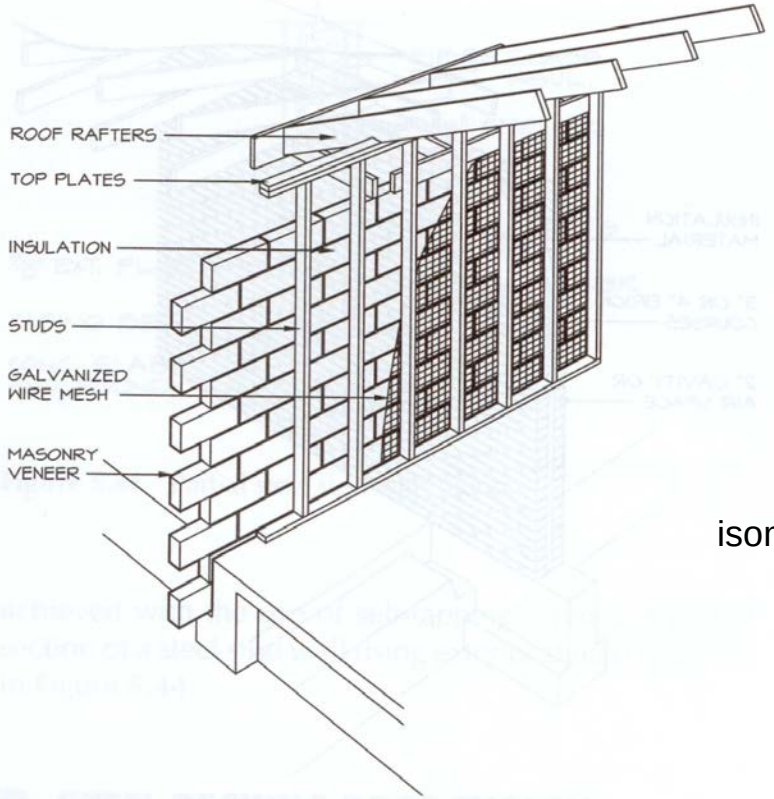


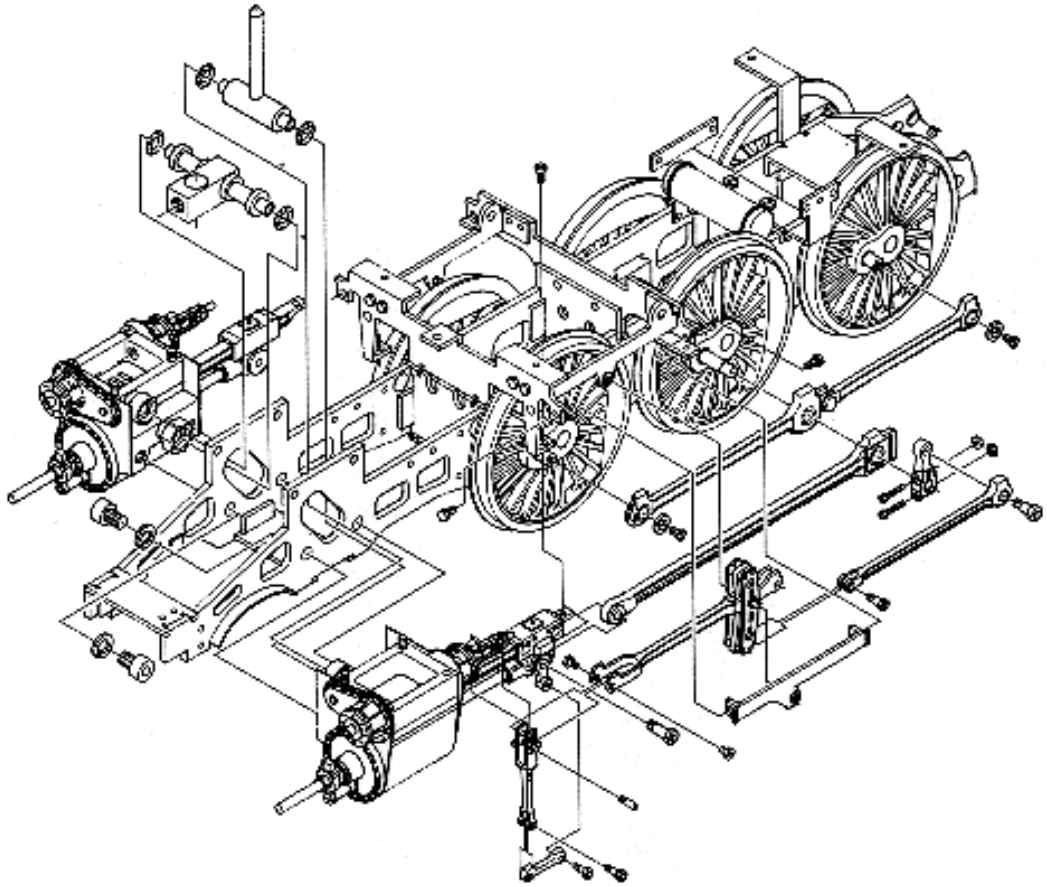
Figure 5.50 Wall section/masonry veneer.

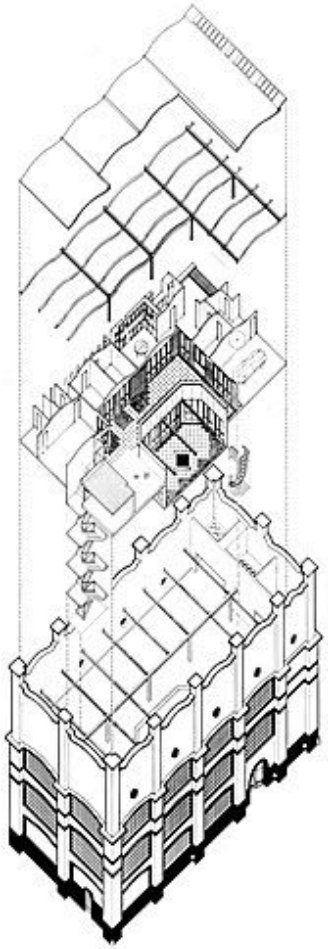
isometric

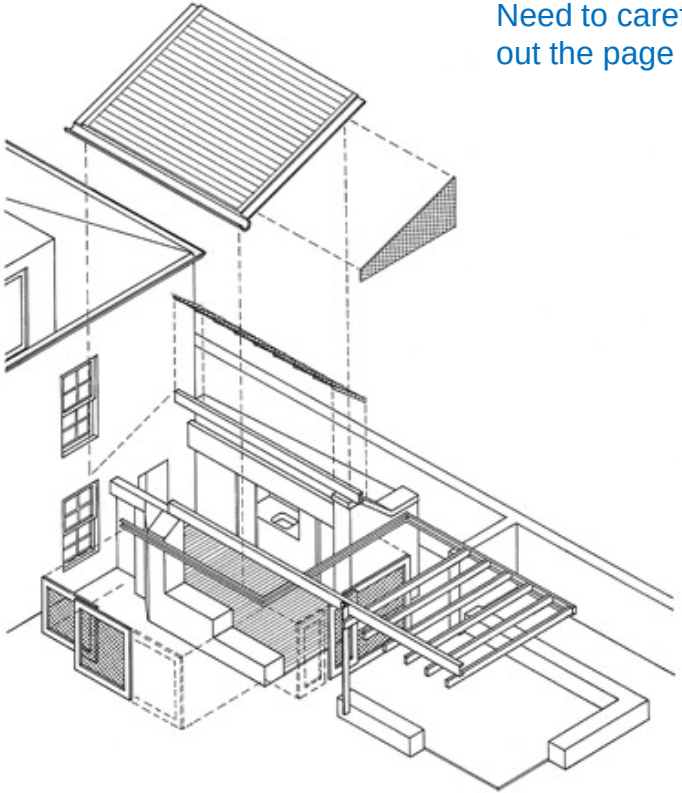
And now for even more fun!

exploded views

exploded views
exploded views
exploded views

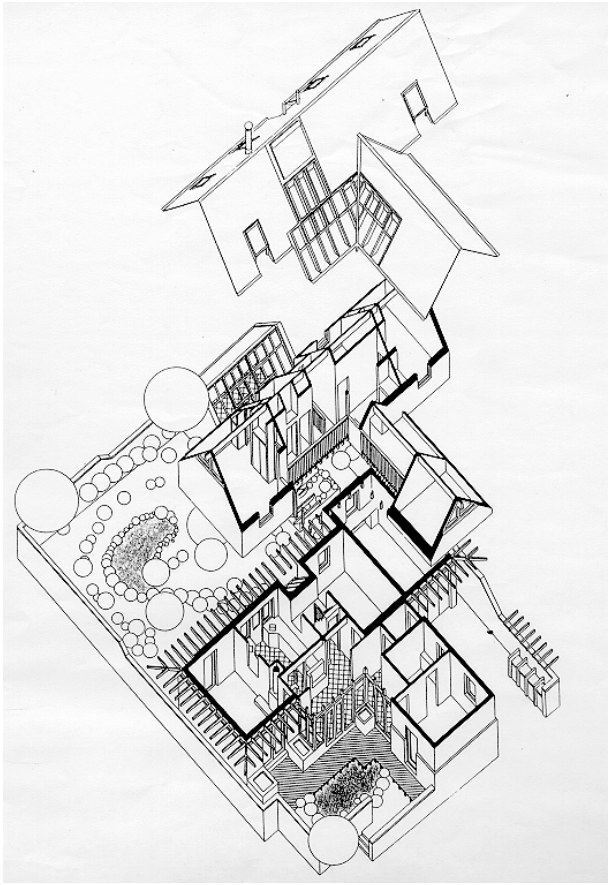


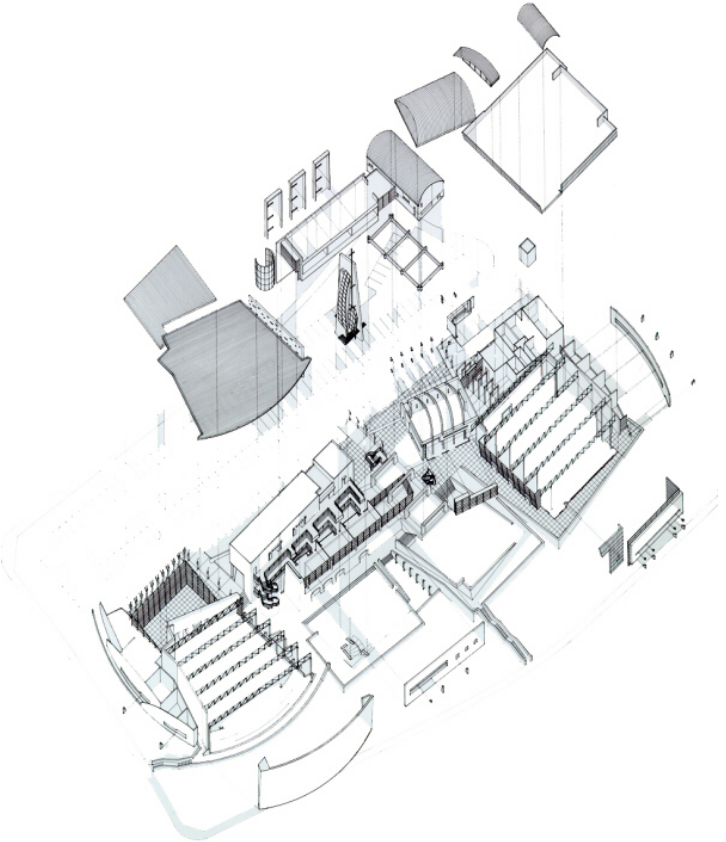


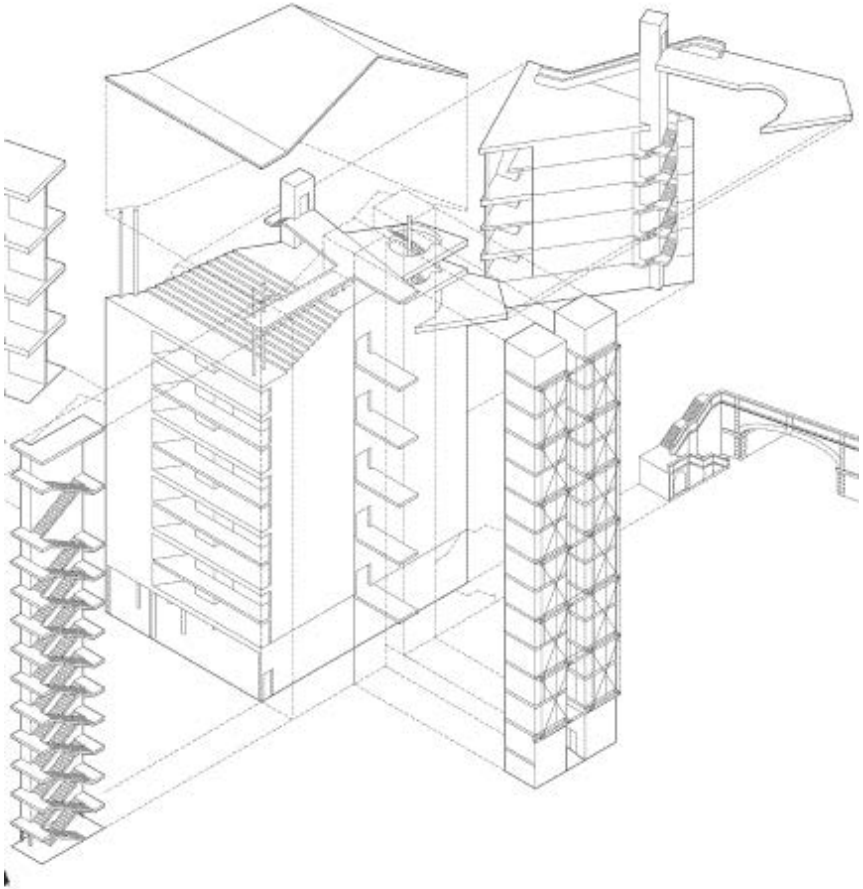


Need to carefully plan out the page so they fit

Dotted lines connect the pieces







How to put a plan together:

Terri’s old fashioned tried and true yellow trace method!

File Edit View History Bookmarks Tools Help

https://www.amazon.ca/Borden-Riley-Sun-Glo-Thumbnail-Sketch/dp/B003XKGPFI

Getting Started | (1) Facebook | Home / Twitter | Discord | IPlateau | Google Maps | Terri Meyer Boake | Sc... | Home | Quest - Stude... | Home | University of ... | Home | Architecture | ... | Homepage - Universit... | ARCH 172 Fall 2020 - S... | Mail - Terri Boake - Ou...

amazon.ca

Office Products

Hello, Sign in
Account & Lists

Returns
& Orders

Try
Prime

0
Cart

Hello
Select your address

Best Sellers | Gift Ideas | New Releases | Deals Store | Electronics | Customer Service | Home | Books | Coupons | Computers | Gift Cards | Sell | Registry

Shop the Home Holiday Guide

Office & School Supplies | Best Sellers | Printers & Ink | Office Electronics | Pens & Writing | School Supplies | Office Organization | Deals | Subscribe & Save

Home & Kitchen › Arts, Crafts & Sewing

Click to open expanded view

Borden & Riley #35C Sun-Glo Thumbnail Sketch Paper, 8 lb, 12 Inches x 20 Yards Per Roll, Canary Yellow, 1 Roll Each (35CR122000)

Brand: Borden & Riley

4.5 out of 5 stars 5 ratings

Price: CDN$ 17.37 + CDN$ 5.36 Shipping. An Import Fees Deposit may apply at checkout. prime

New (2) from CDN$ 17.37 + CDN$ 5.36 Shipping

- 8 lb. paper
- Transparent with 4 sheet overlays
- Ideal for engineers and architects
- Designed to be used with pens, pencils or markers
- Fortified to withstand considerable handling

CDN$ 17.37
+ CDN$ 5.36 Shipping. An Import Fees Deposit may apply at checkout.
prime

Arrives: **Dec 11 - 28**

Only 10 left in stock.

Quantity: 1

Add to Cart

Buy Now

Secure transaction

Sold by Noteworthy Goods and Fulfilled by Amazon from outside Canada. Customs & Duties may apply. Importers of commercial goods should review the shipping & delivery policy.

Add gift options

Select delivery location

Add to Wish List

Frequently bought together

Total price: CDN$150.80

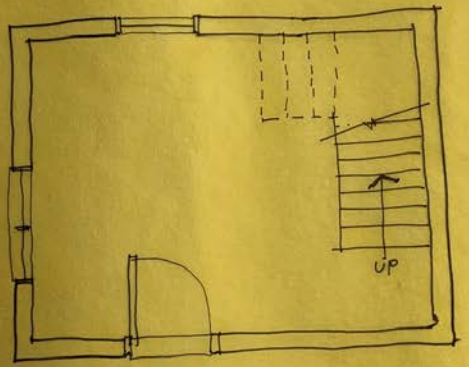
Add all three to Cart

These items are shipped from and sold by different sellers. Show details

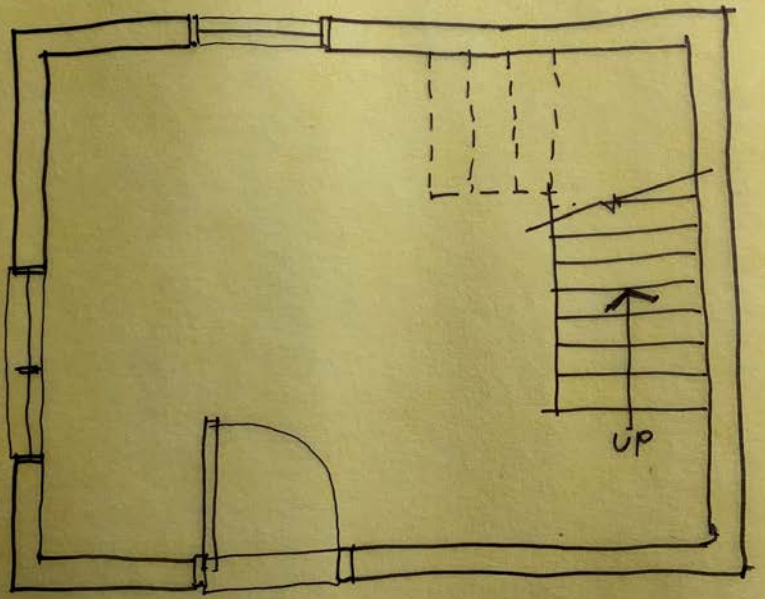
Search for anything

ENG
US

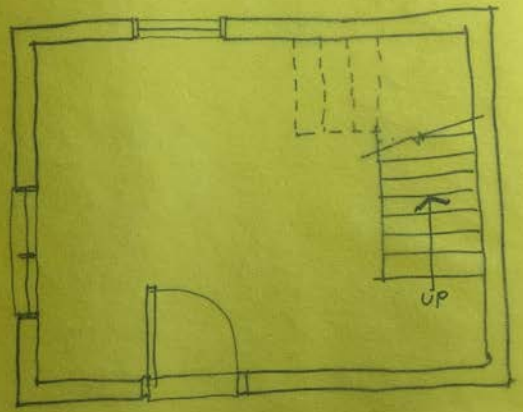
5:13 PM
2020-12-01



Ground floor plan….

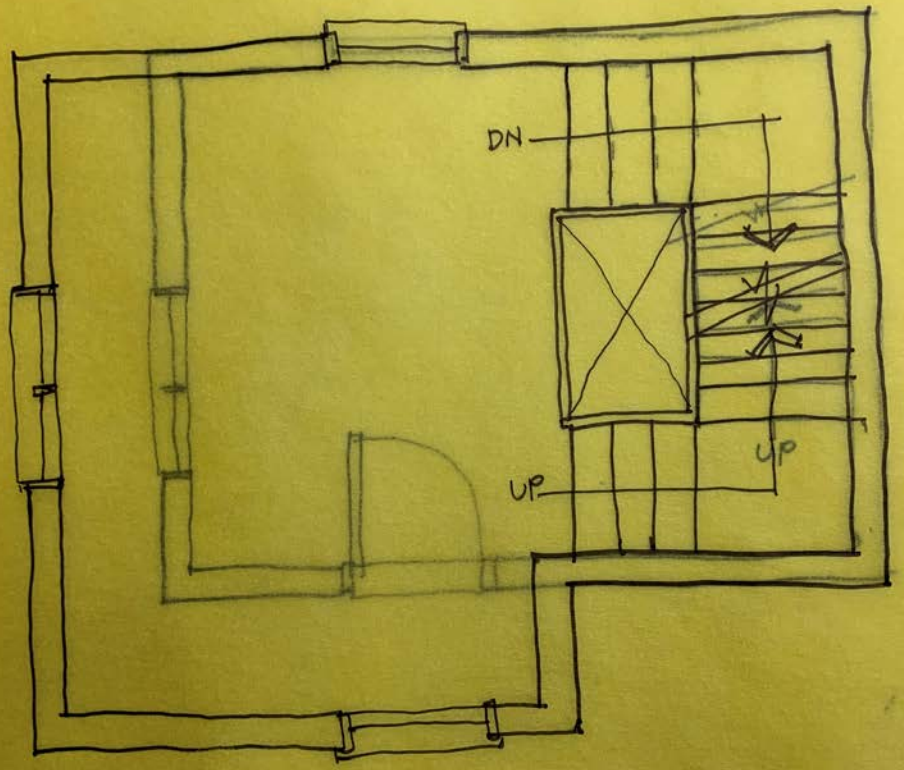


Ground floor plan

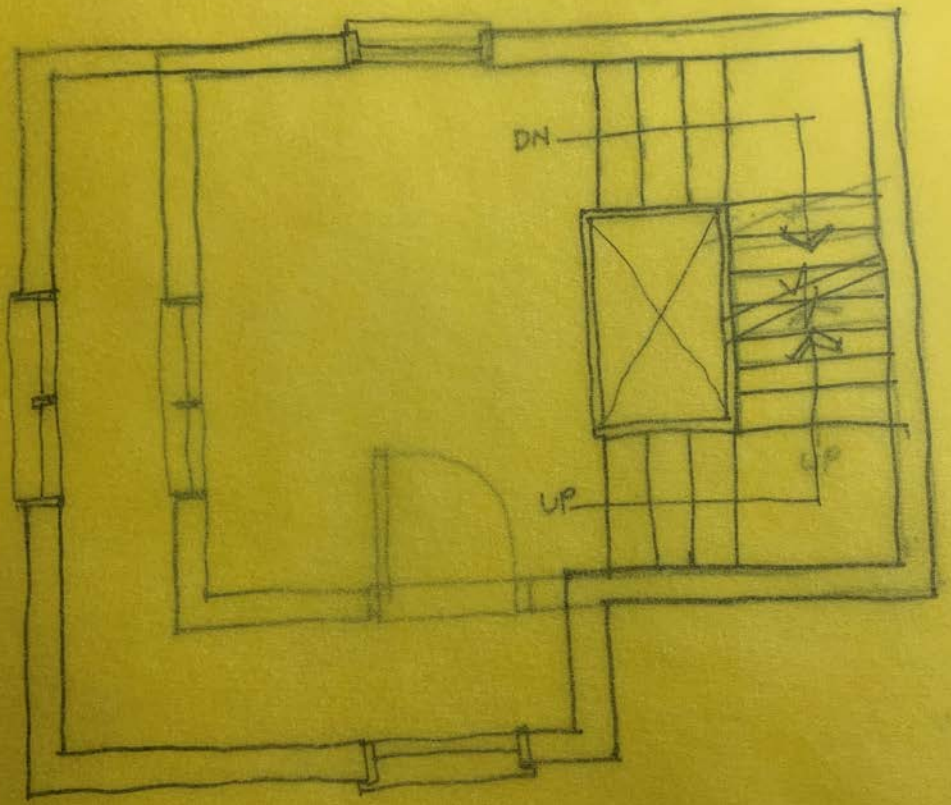


Overlay another sheet of trace

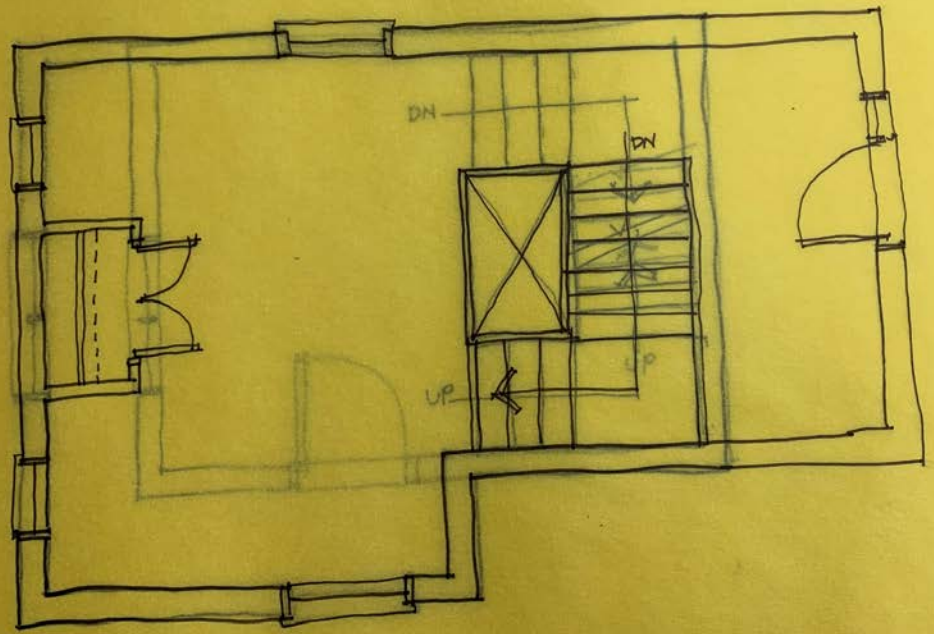
Draw the second floor plan ON TOP of the ground…
Line everything up!



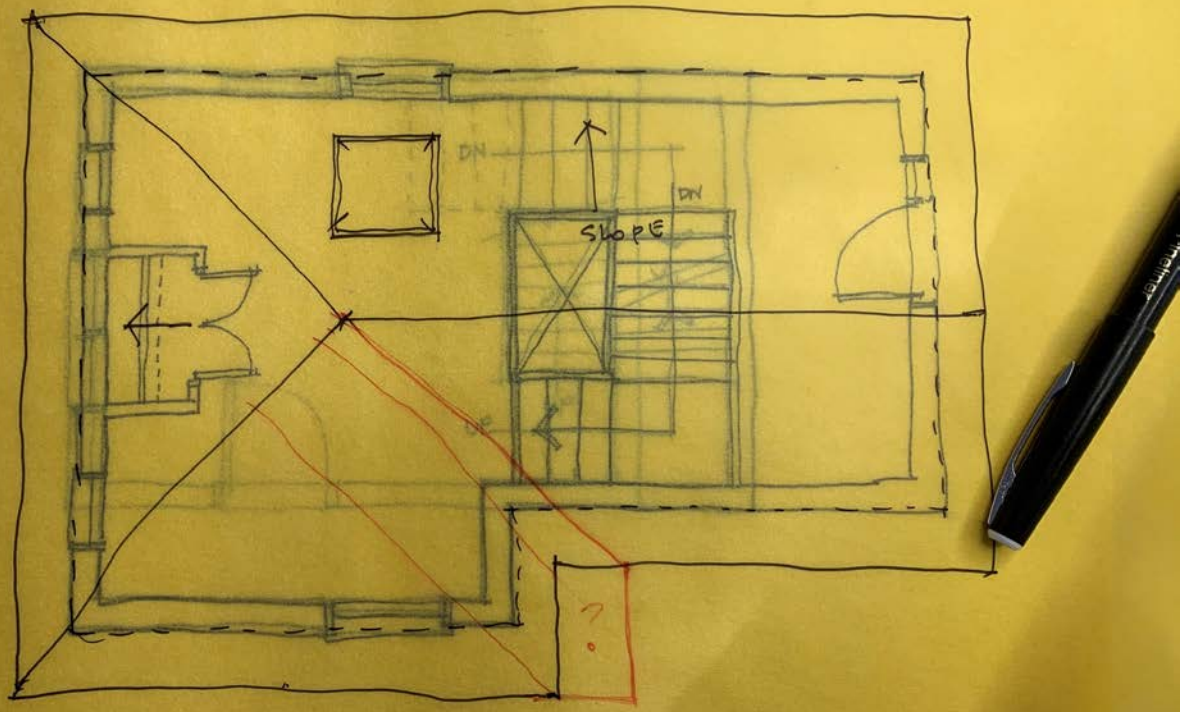
Stretch over another layer of trace….

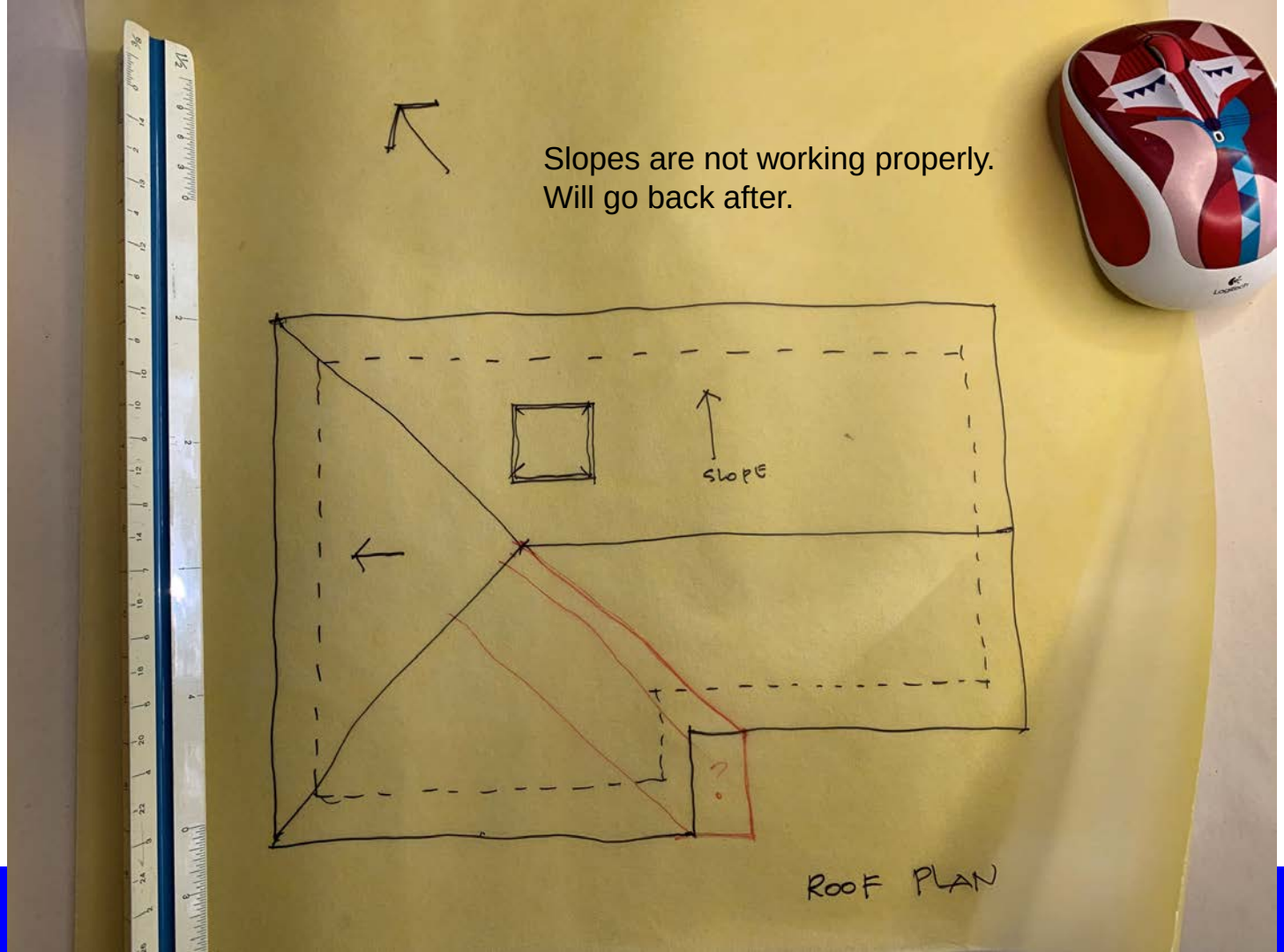


Draw the third floor plan…
Everything lines up!

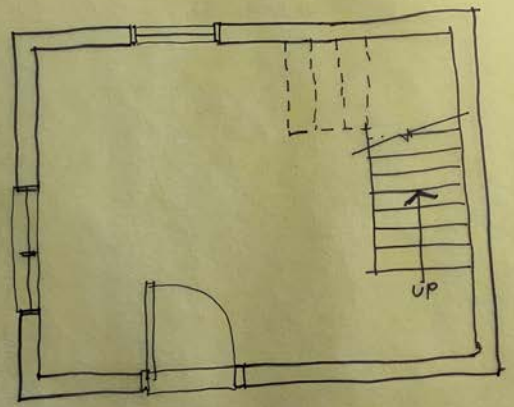


Last layer is the roof plan…
Not working out so well… will figure that out later. Pitched roofs are hard.



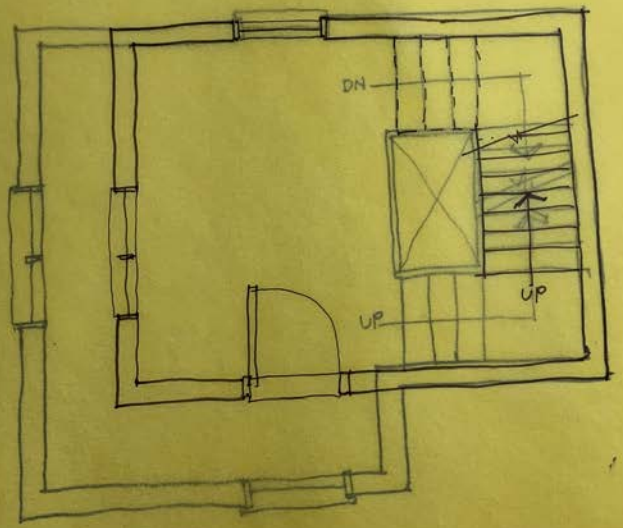

Slopes are not working properly.
Will go back after.
SLOPE
?
ROOF PLAN

Back to the ground floor plan,
With title and NORTH arrow



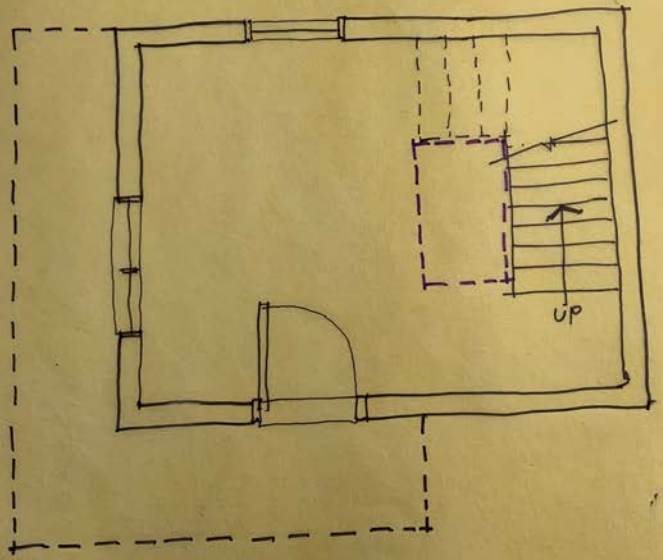
GROUND FLOOR PLAN

Slip the second floor plan under
So that we can trace in the overhangs
It makes with the first

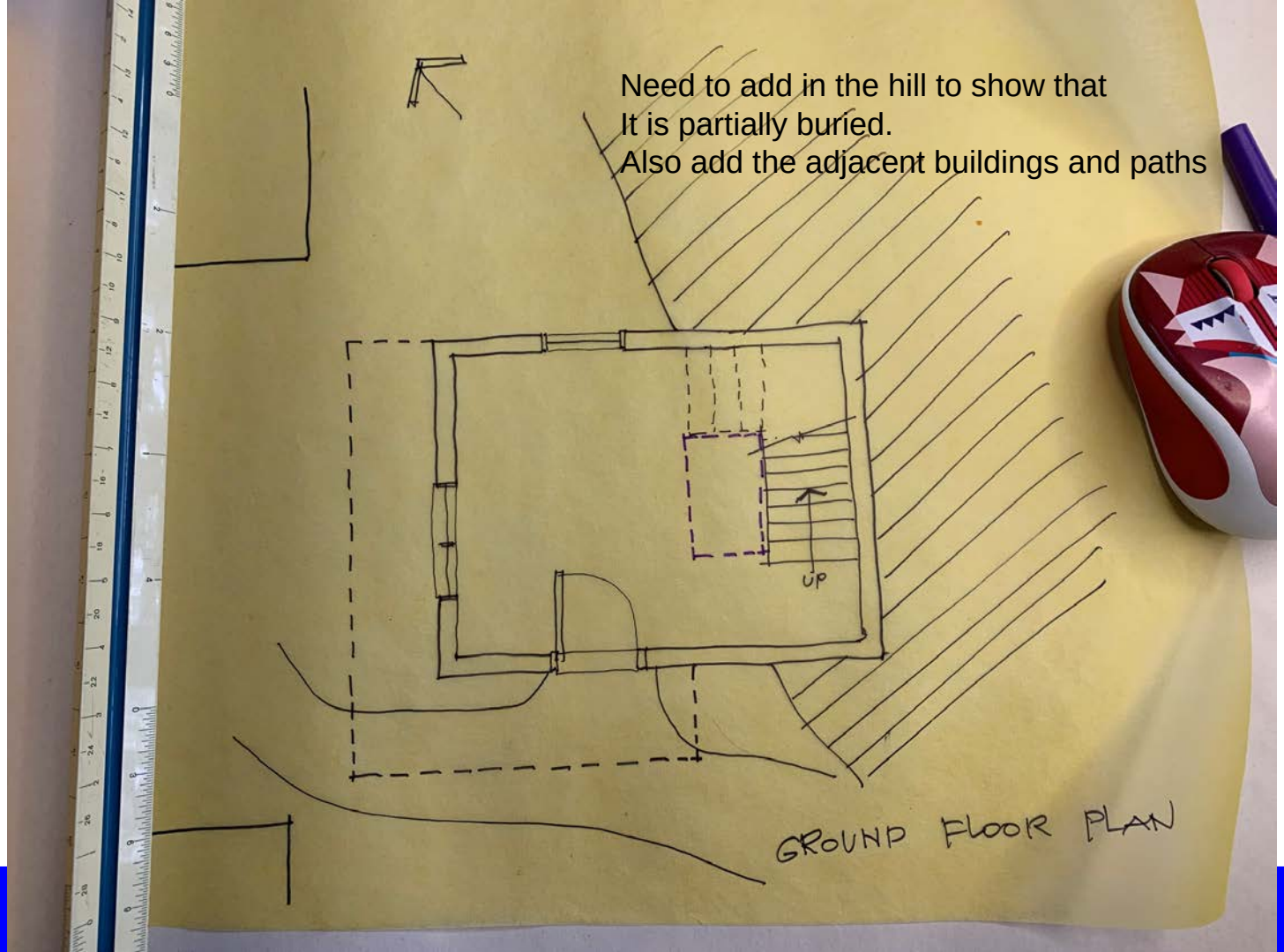


GROUND FLOOR PLAN

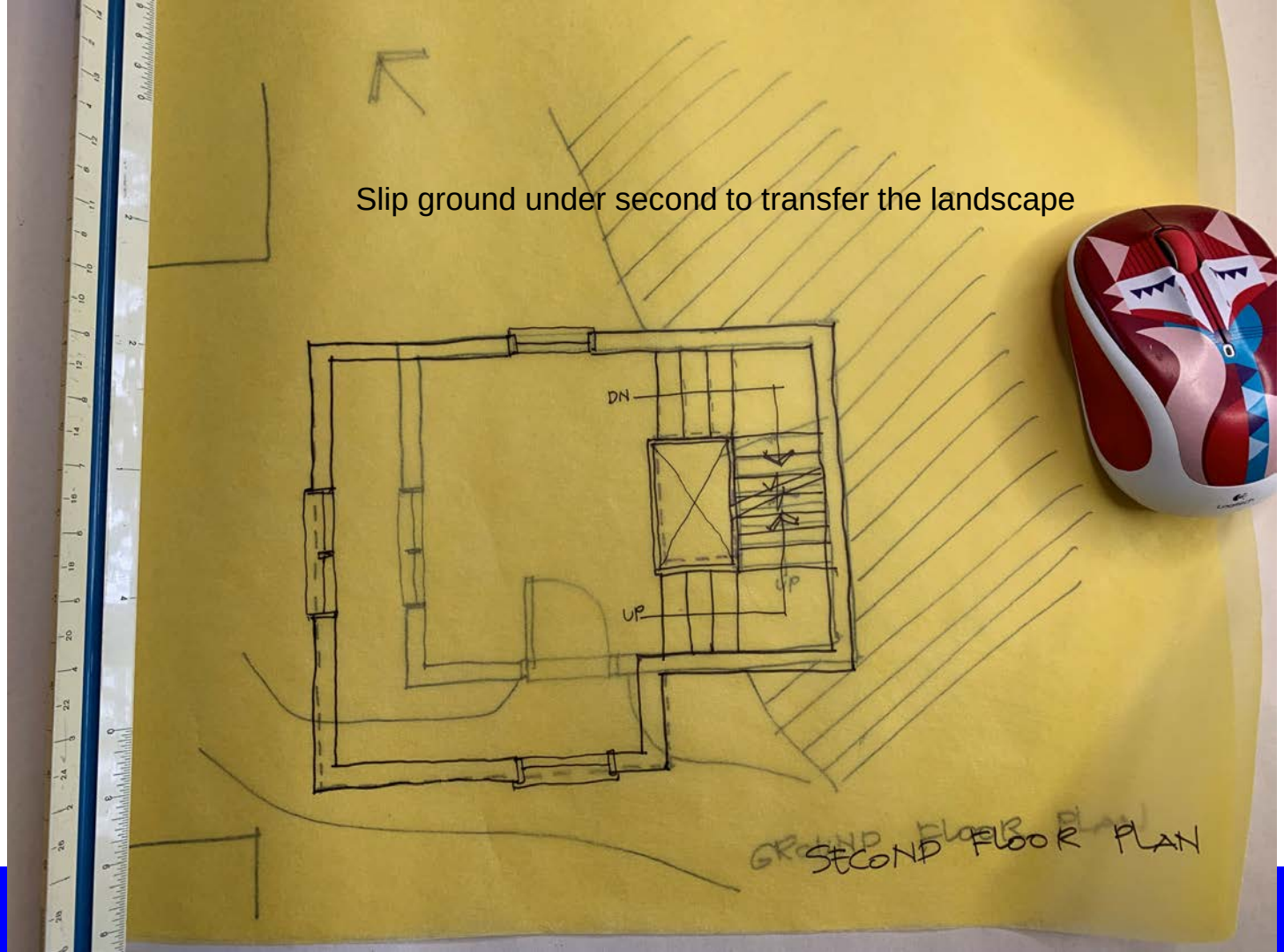
Remove the second floor plan and see the
Dotted lines made to show how it overhangs.

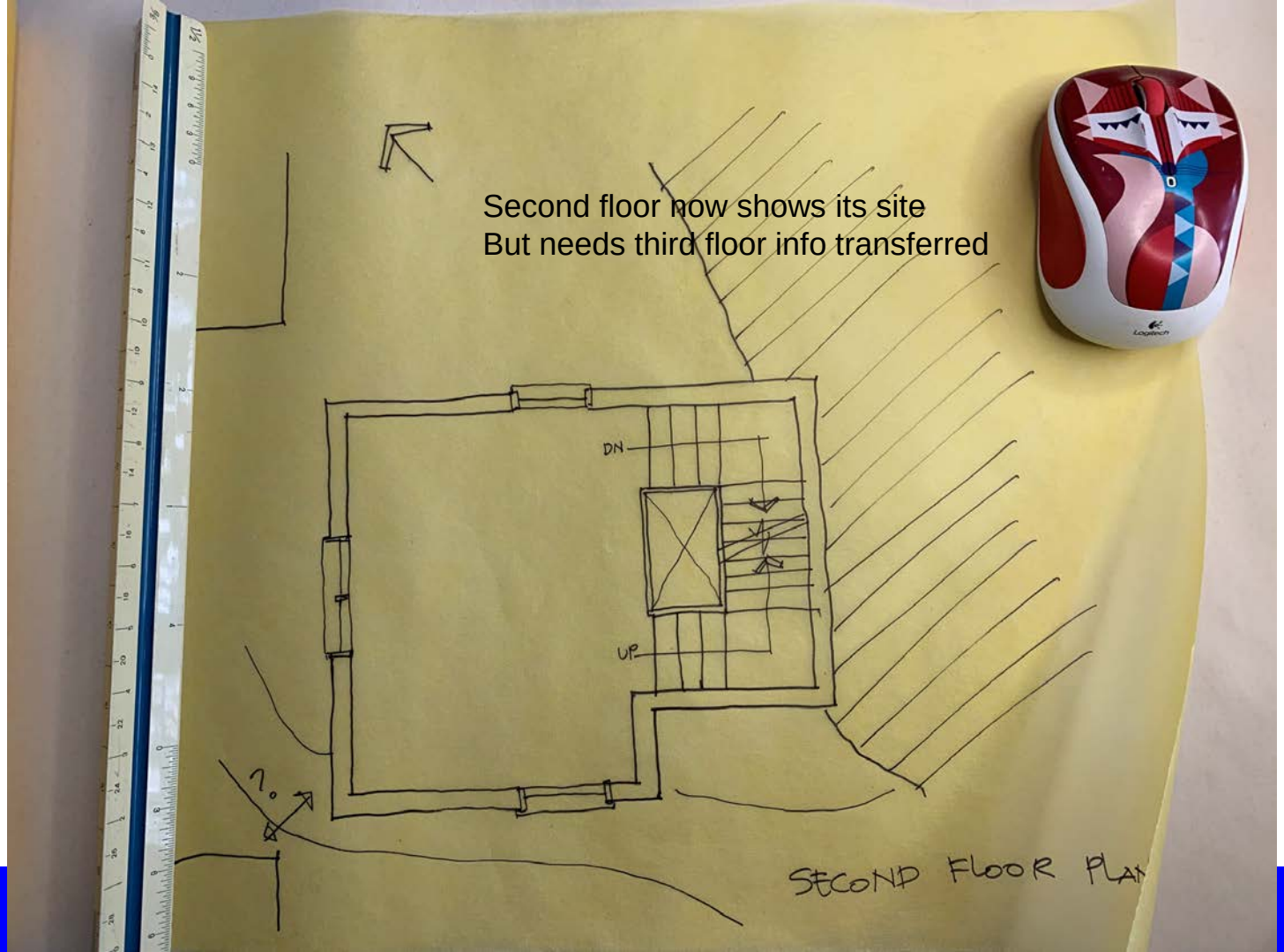


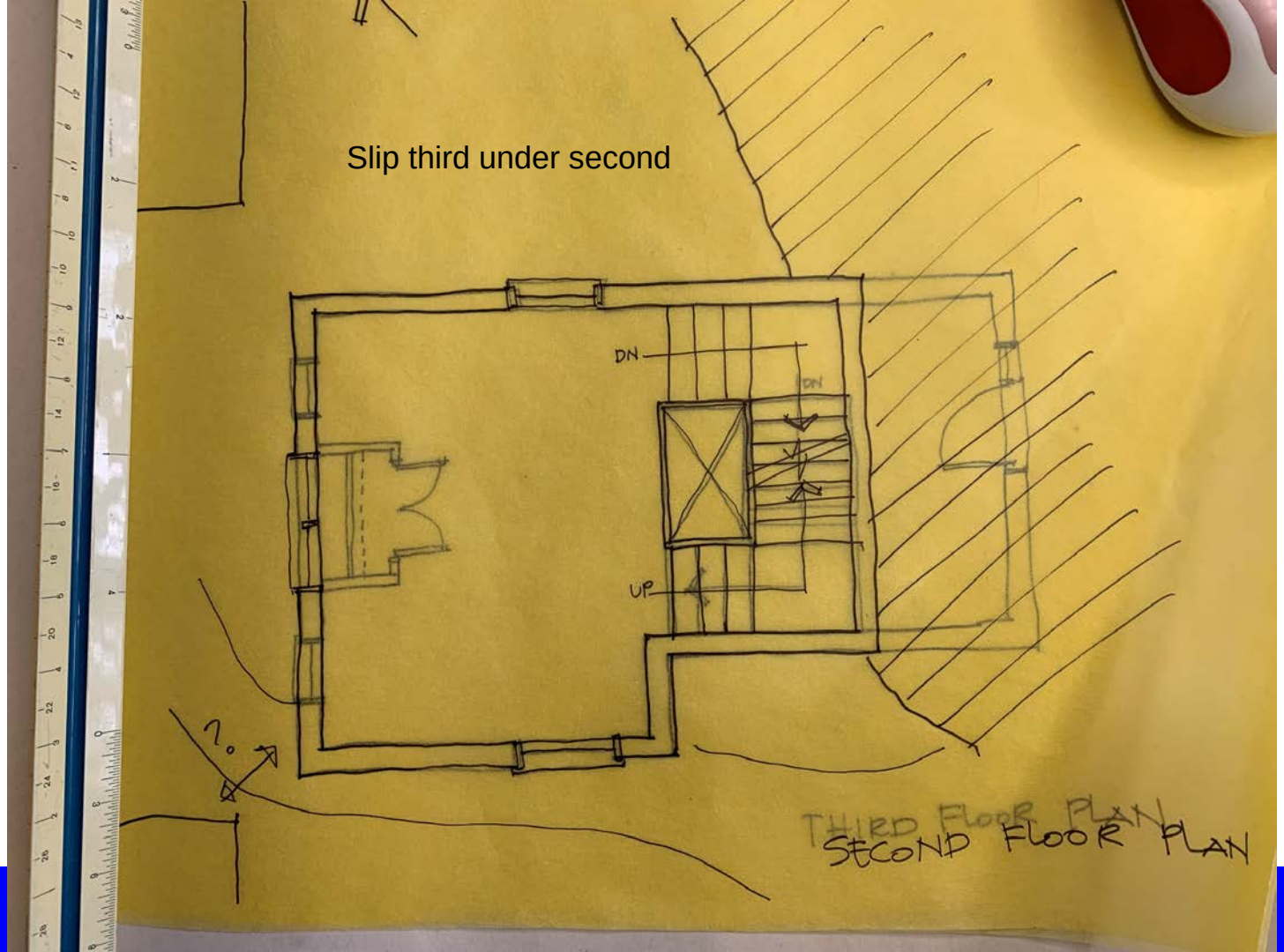
GROUND FLOOR PLAN

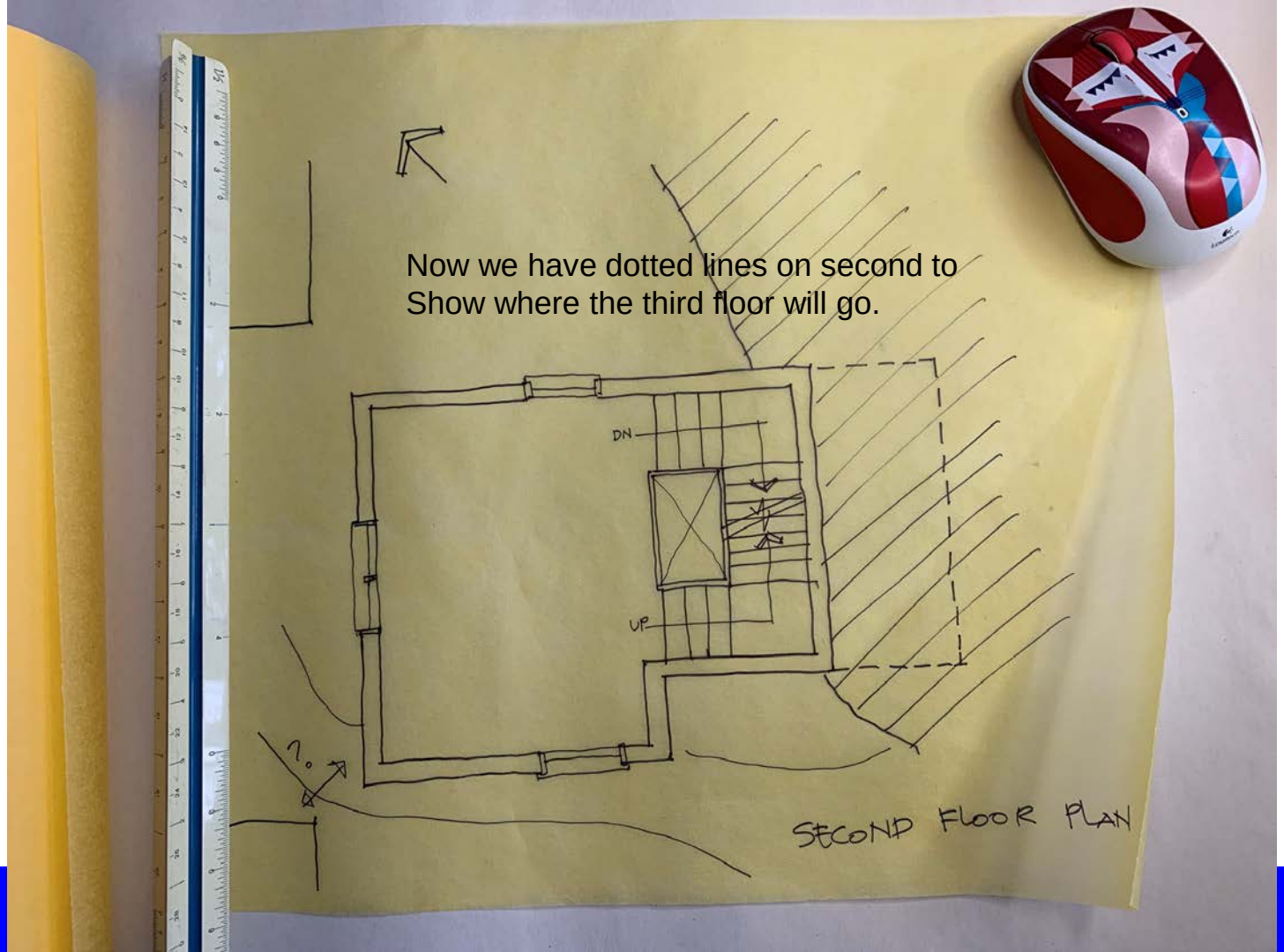

Need to add in the hill to show that
It is partially buried.
Also add the adjacent buildings and paths
UP
GROUND FLOOR PLAN

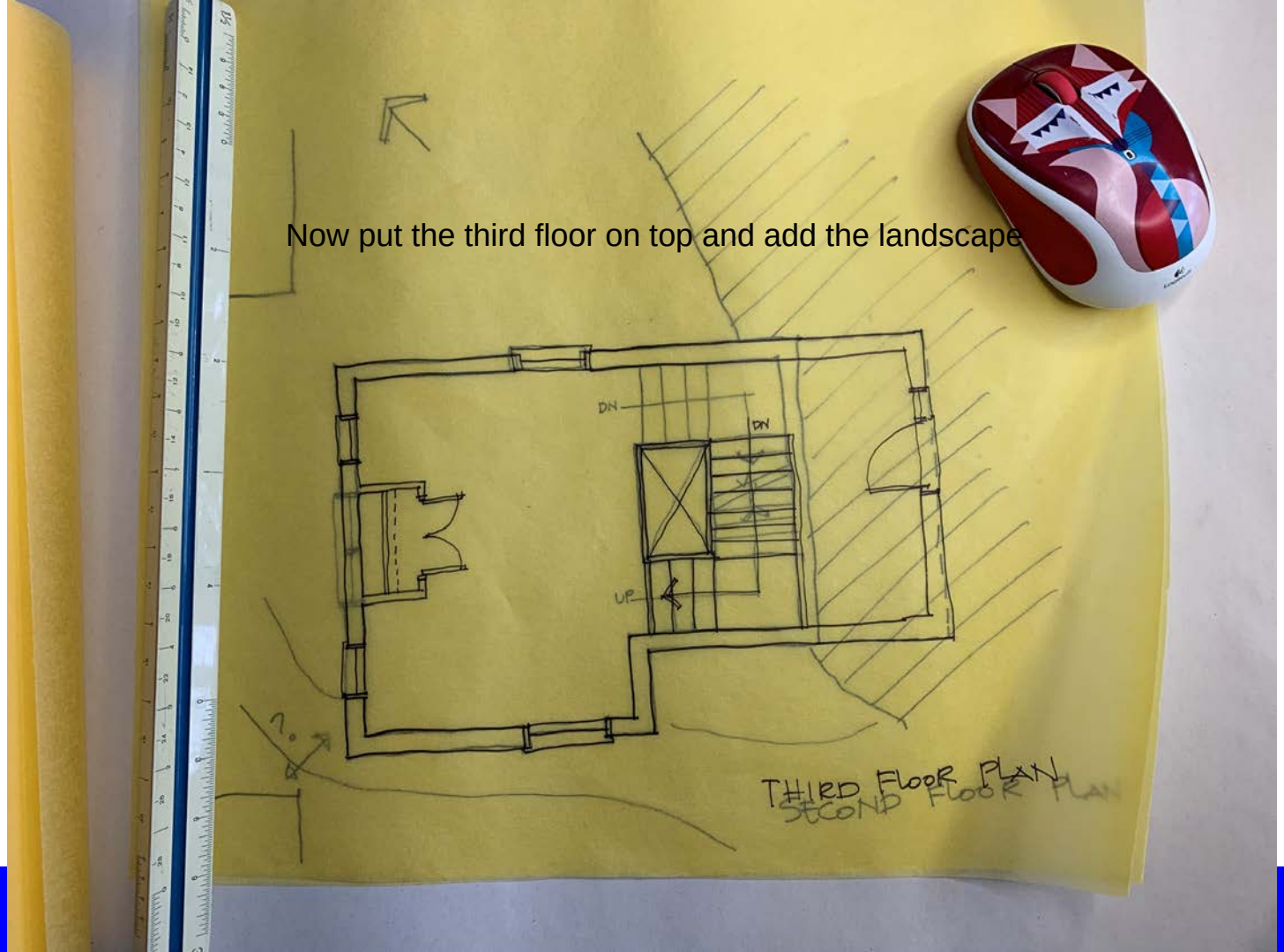
Slip ground under second to transfer the landscape

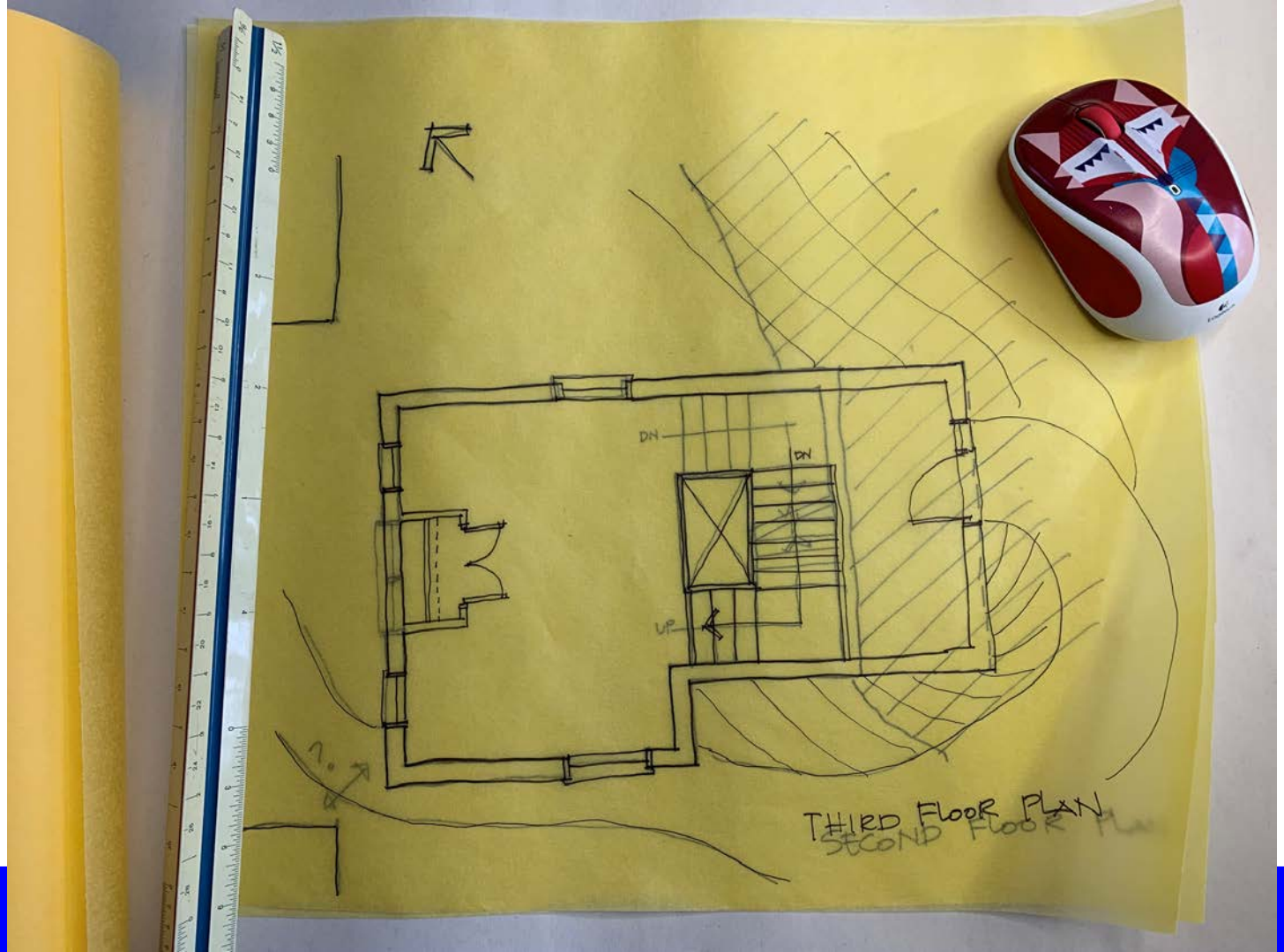


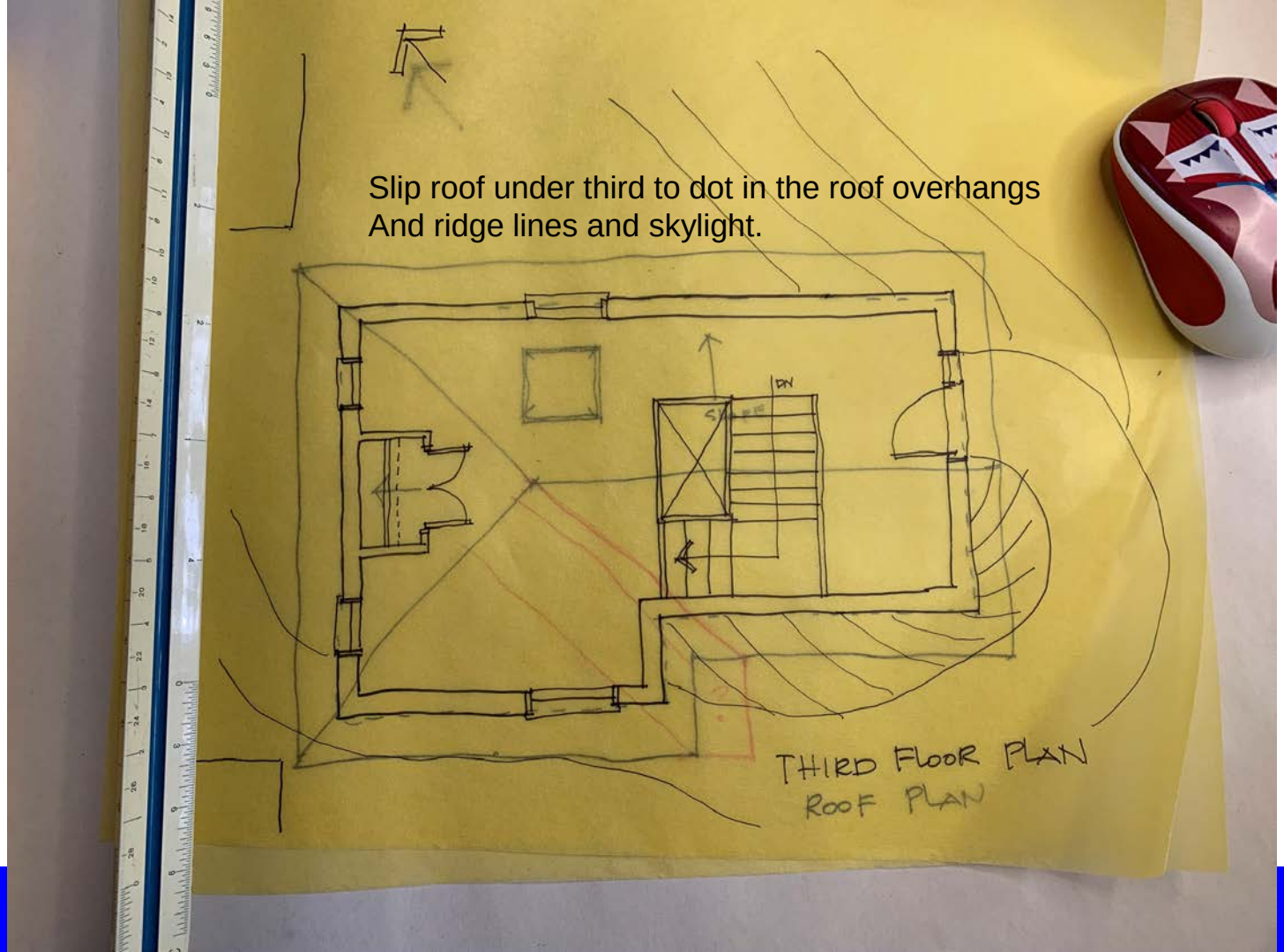

Second floor now shows its site
But needs third floor info transferred
DN
UP
SECOND FLOOR PLAN


Slip third under second
DN
DN
UP
THIRD FLOOR PLAN
SECOND FLOOR PLAN

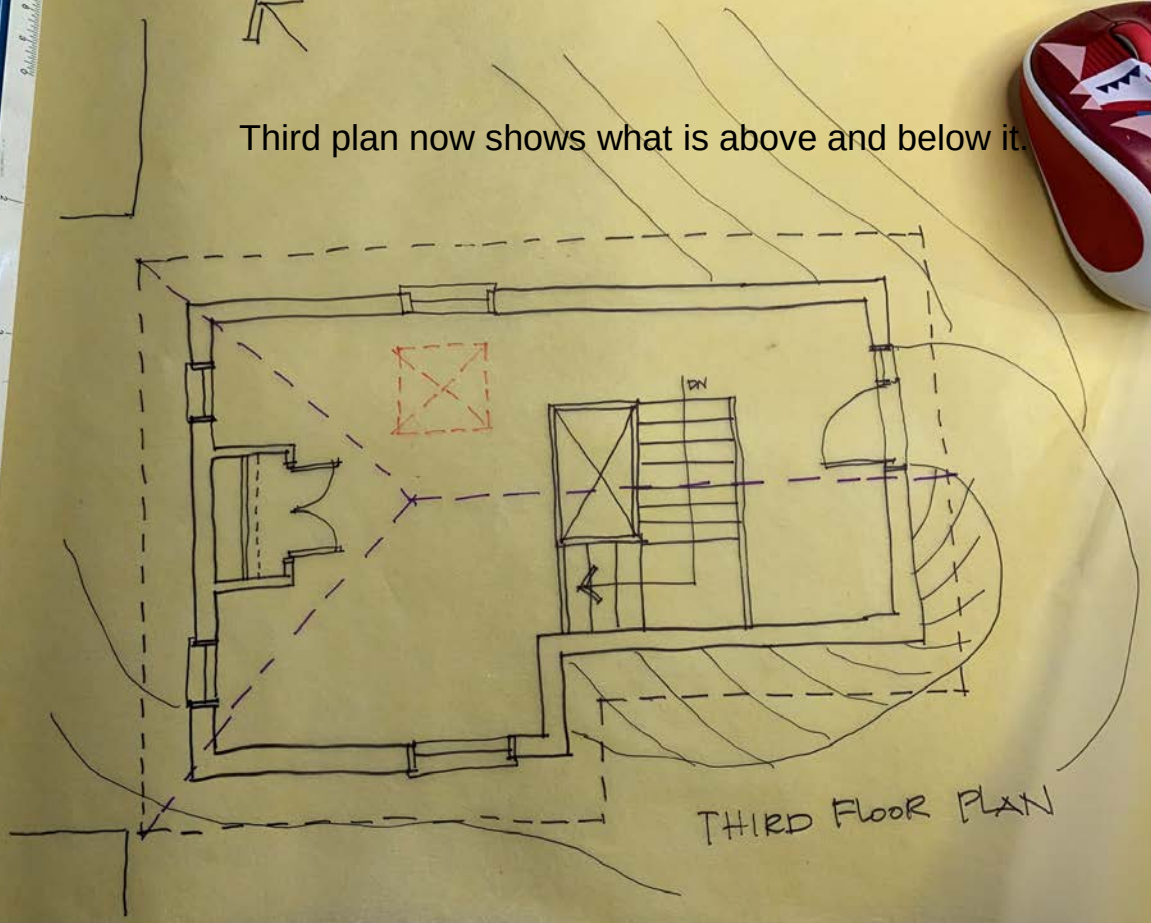

Now we have dotted lines on second to
Show where the third floor will go.
DN
UP
20
SECOND FLOOR PLAN


Now put the third floor on top and add the landscape
DN
DN
UP
THIRD FLOOR PLAN
SECOND FLOOR PLAN

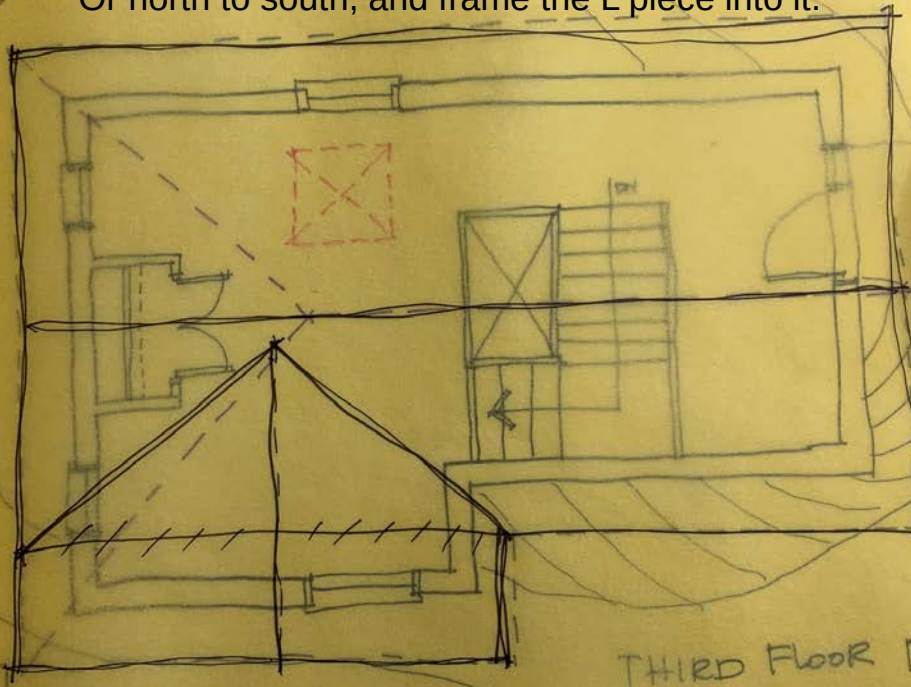

DN
DN
UP
THIRD FLOOR PLAN
SECOND FLOOR PLAN


Slip roof under third to dot in the roof overhangs
And ridge lines and skylight.
DN
THIRD FLOOR PLAN
ROOF PLAN

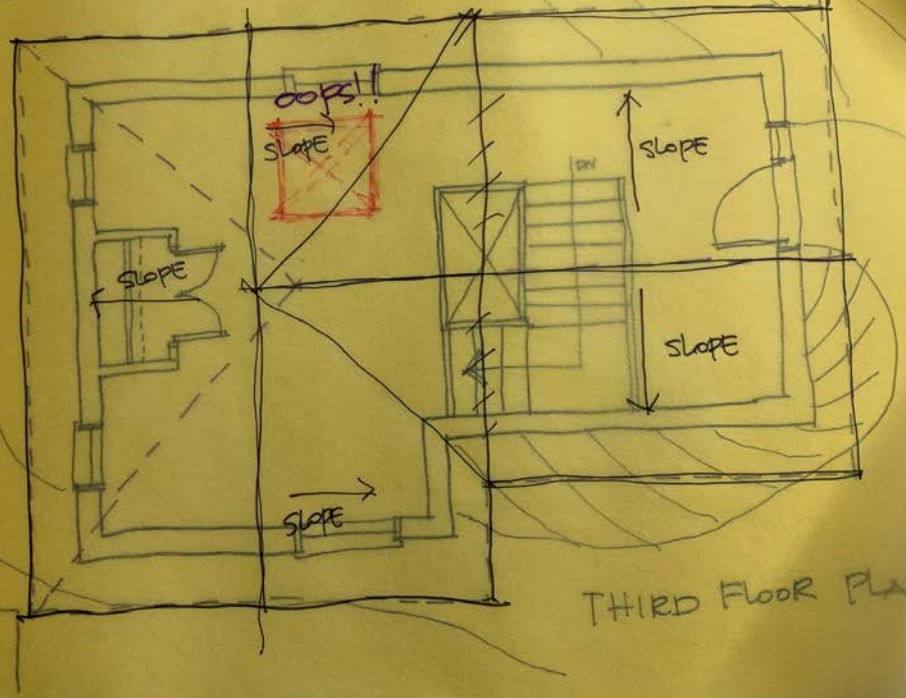
Third plan now shows what is above and below it.



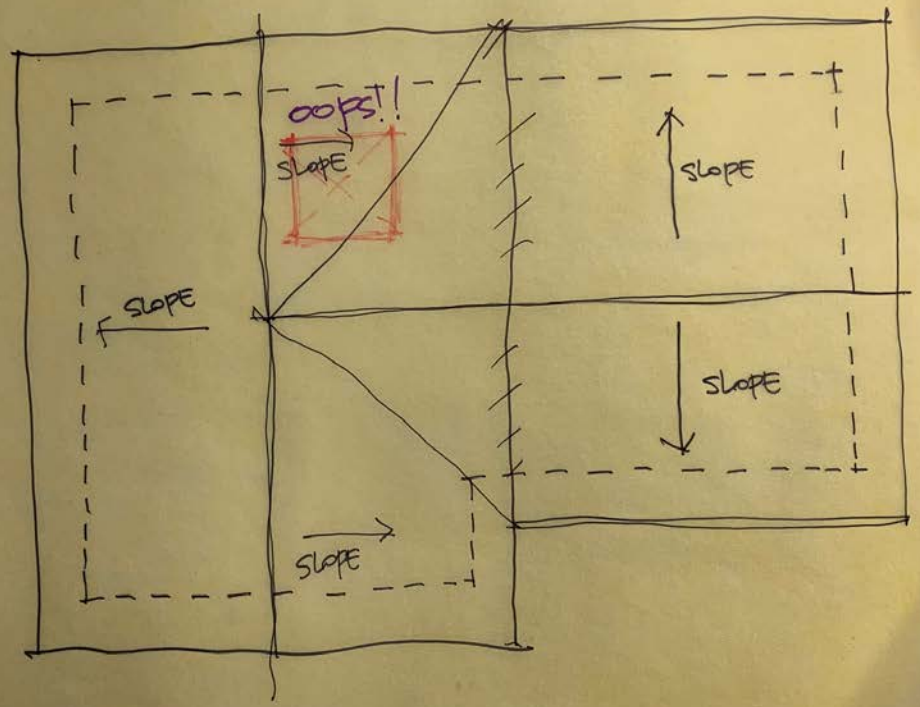
Let’s mess with the roof! Think about how it is constructed.
They will either put a ridge roof continuously east to west,
Or north to south, and frame the L piece into it.

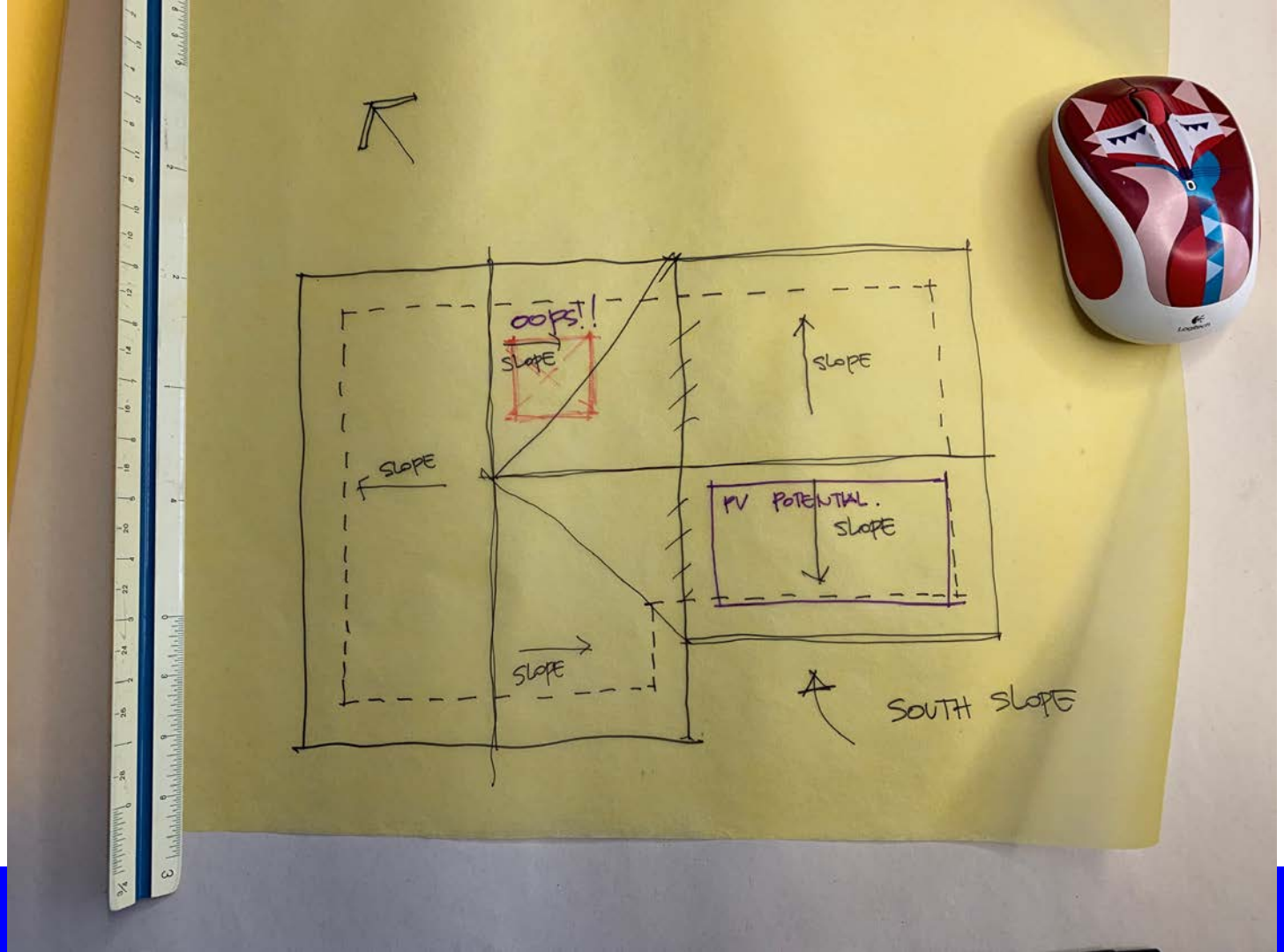


I think I prefer the look of having the north south
Part in place first with the east west portion framing
Into it.

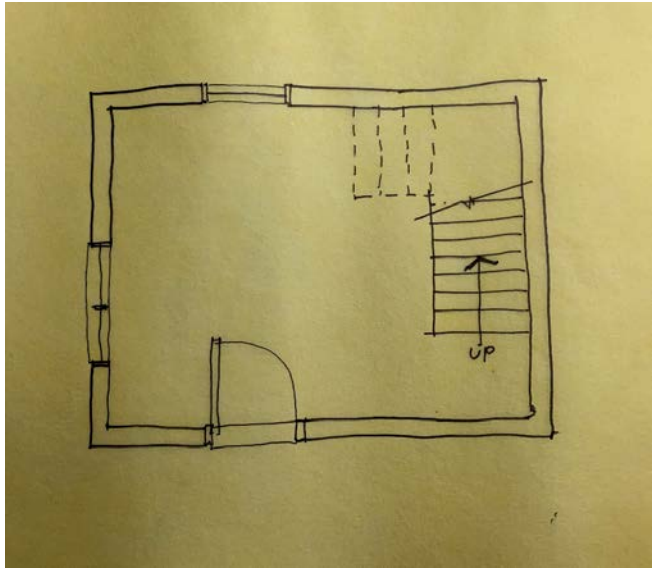


But the skylight I had roughed in is in a bad spot so
Will have to move it.

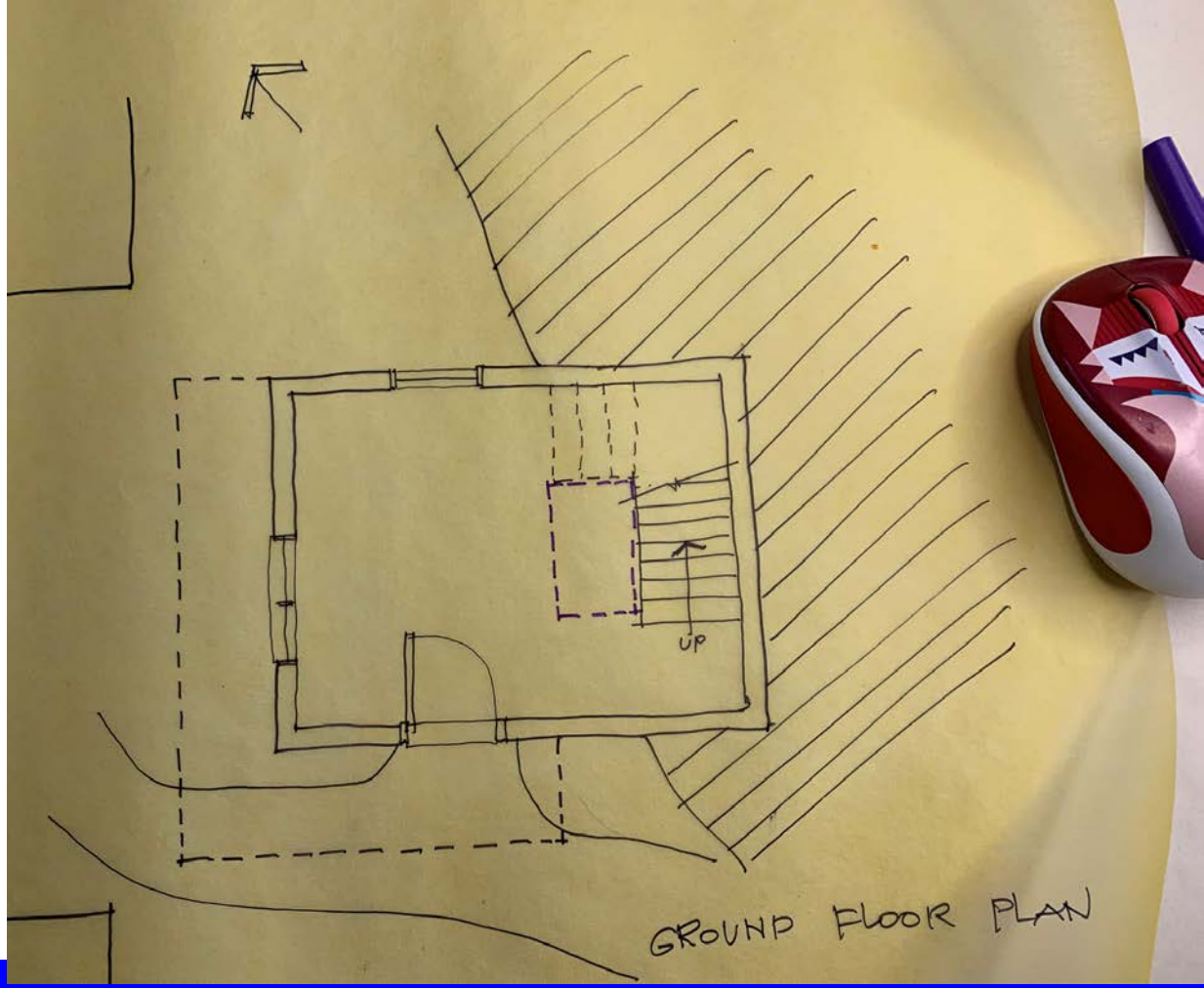



oops!
SLOPE
SLOPE
SLOPE
SLOPE
PV POTENTIAL.
SLOPE
SOUTH SLOPE

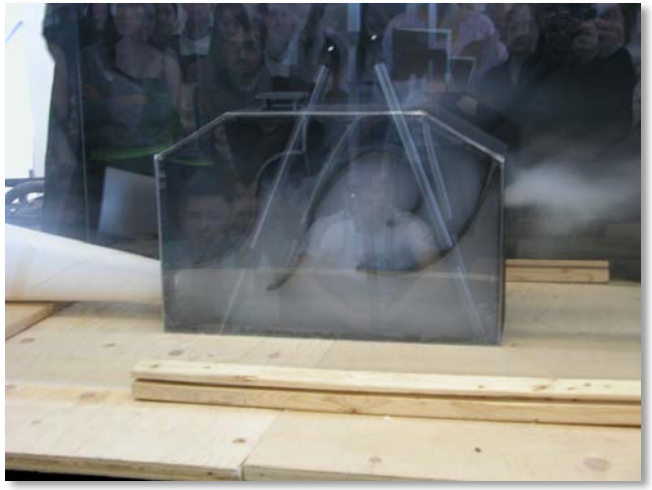
Same essential floor plan.
Reads entirely differently.



Entire drawing set took
me less than an hour.



Rough / test models:



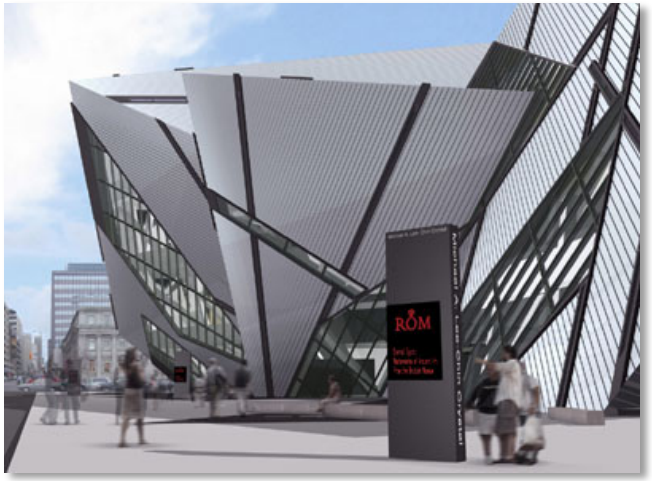
We can make models to understand how a building works for wind and sunlight, or simply to establish “massing”.

Massing Models:

These models are used to see how the general shape of the building works; orientation, sun access, relationships

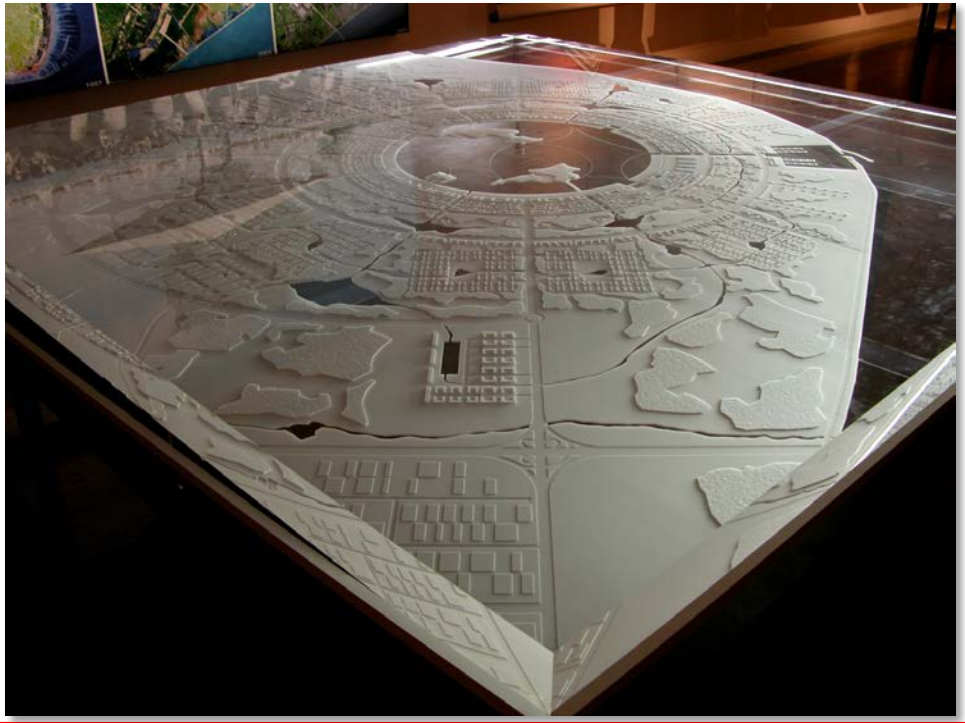
Massing model of the ROM showing its relationship to the original building

Detailed models

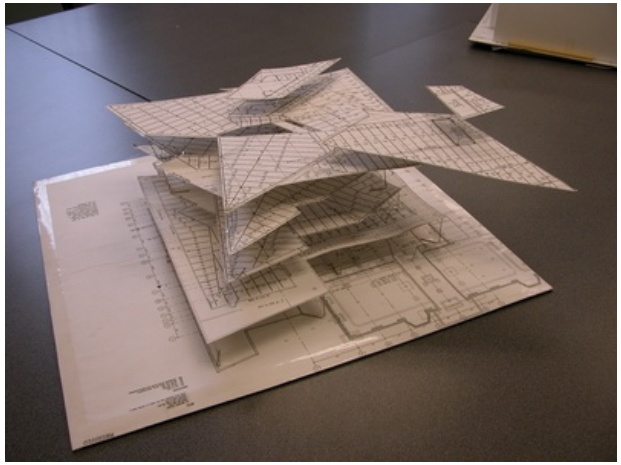


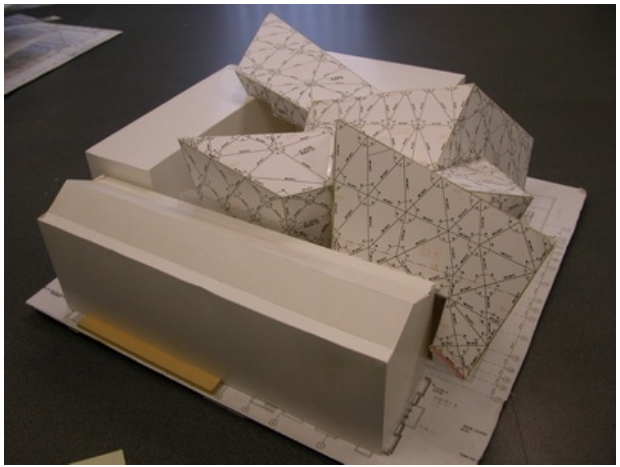
The architect might also supply detailed models that can give the client or user group a better feel for the finished building. These can be physical or computer created.

Urban scale model:



Structural Models:

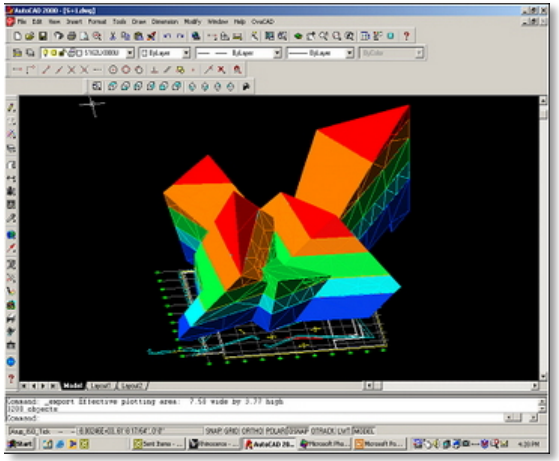


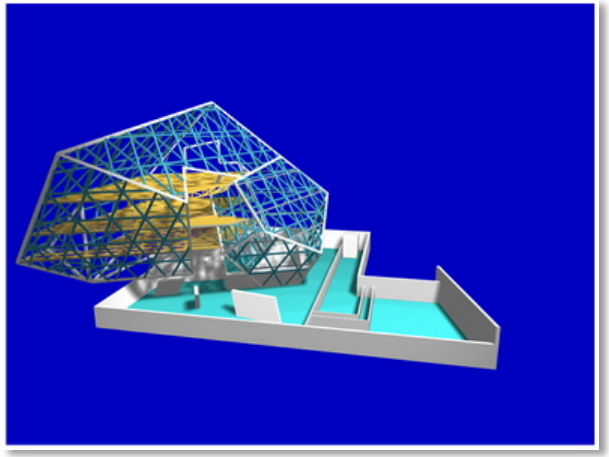


The engineers and fabricators might also make rough models to see how things like the framing are working. The steel diagrid used in the ROM required many different ways to understand its 3-D nature and construction detailing.

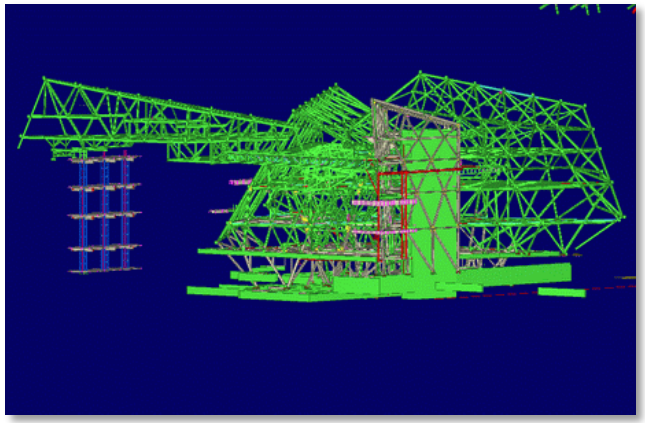
Structural computer models

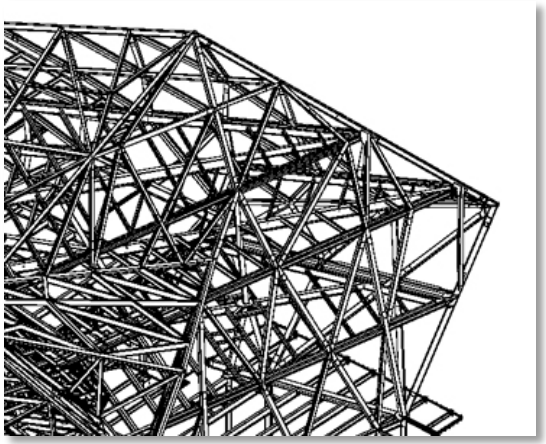
These were done by the structural engineers to look at the relationships of the ROM crystals.



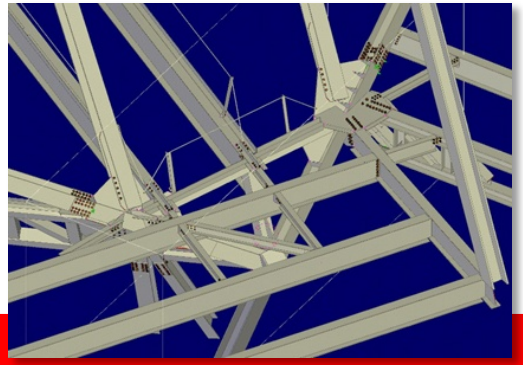


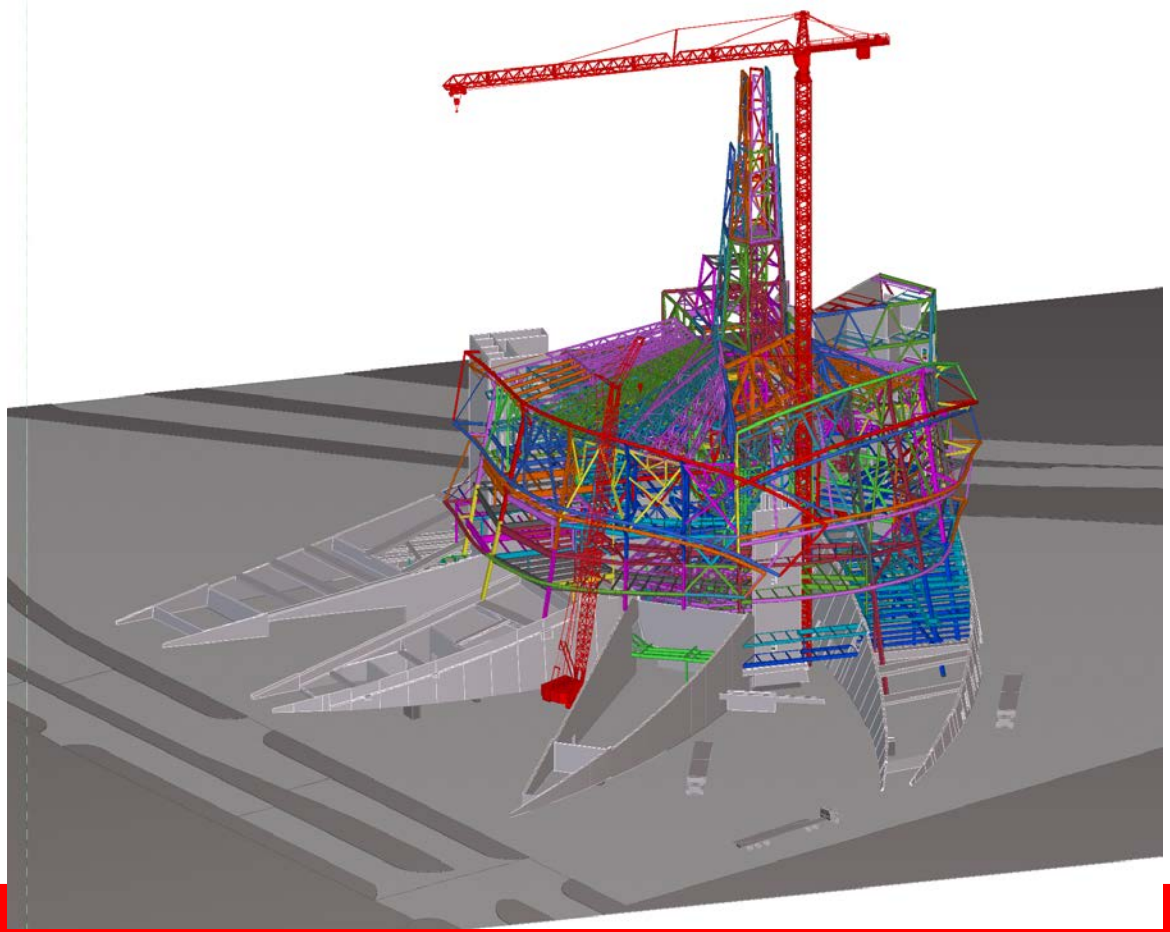
Fabrication modelling:





If the project has a complex structure, the fabricators of various components might also need to be more involved in the design and detailing process.





Size and Complexity Matters

- Not all projects are developed to the same level of detail, nor use all types of communication methods.
- The scale / size / scope of the project will greatly affect what methods are used, as will the cost and the amount of fees paid to the design team.
- The region / location / history and local practices of the project will greatly affect the way work is carried out.