

drawing

STYLES



PAPER SIZE

SCALE

DRAWING

PROJECT

DRAWN BY

DATE

A3

Coffee Table

Cam Mills

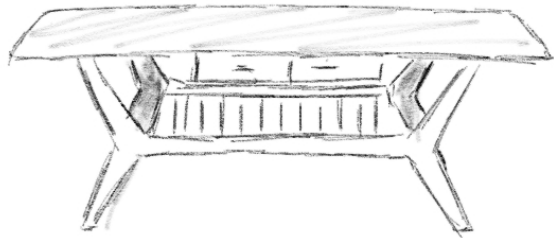
August, 2014

A picture tells
a thousand words.

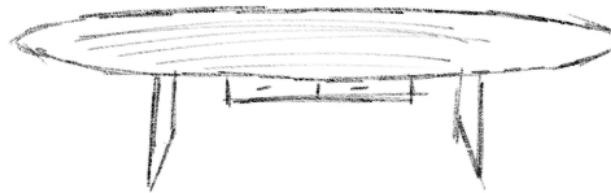
Will your drawings have an
interesting and accurate
story to tell?

Freehand Sketching

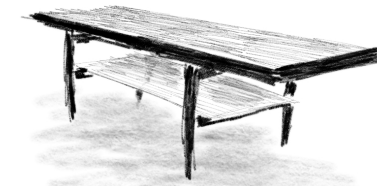
Quick rough capture and working of influential and researched items. Elements are freely identified and refined on paper, or tablet. A record of these workings is useful for ongoing evaluation and development. Below are some drawings prepared in the research of this project and my comments.



Interesting design. Ample storage, joinery construction maybe too complex. Design too retro for my taste? Dislike visible drawers and their side-by-side bulk which clashed with classic design.



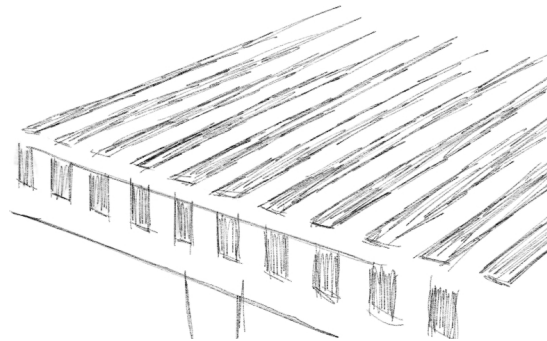
Curved surface is appealing. Same issues with bulky visible drawers. Appears structurally inadequate for my family needs.



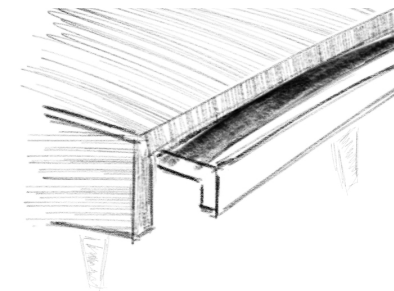
Great design, maybe too light with complex joinery. How to incorporate drawers?



Very appealing design with joinery modified to remain simple enough for production constraints. Drawes still need a location, ends? Can the bulk of 2 coplanar surfaces be minimised... ideas?



Modify this style of production joinery to build a slatted under-tray.

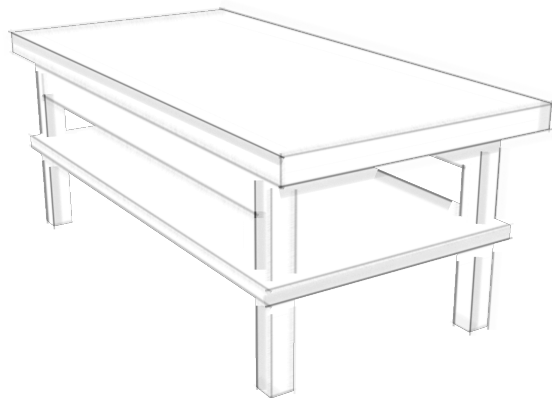


Build drawers at table ends and conceal faces. Perfect!

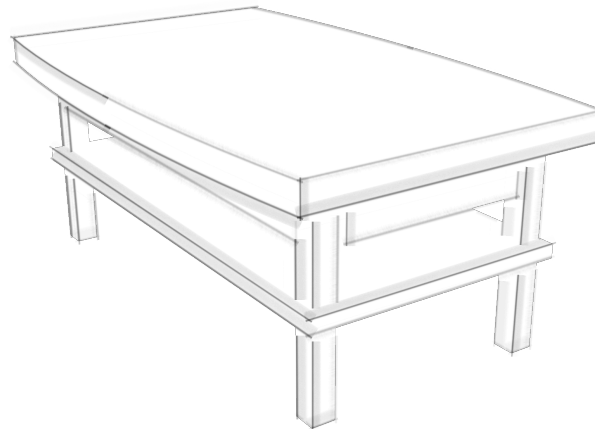
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Design Development

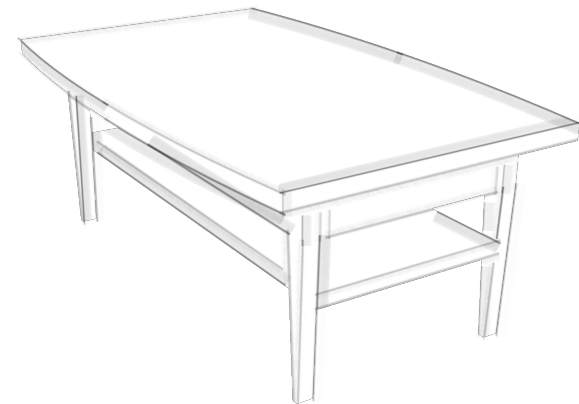
Quick rough capture and working of influential and researched items. Elements are freely identified and refined on paper, or tablet. A record of these workings is useful for ongoing evaluation and development. Below are some drawings prepared in the research of this project and my comments.



Overall size, scale & function is OK yet requires drawers and some softening curves & refinement.



Experimentation with tabletop shape found a curve which looks appealing. Drawers work when locating at either end of table, rather than sides. Table design still looks stocky, legs and under tray needs refinement to reduce bulkiness, but retain overall strength.



Angling legs inward from about $\frac{1}{4}$ height works well although width appears unbalanced. Reduced table-top thickness combines with tray down-size reduces bulk but does little to reduce the final structural strength of the table.

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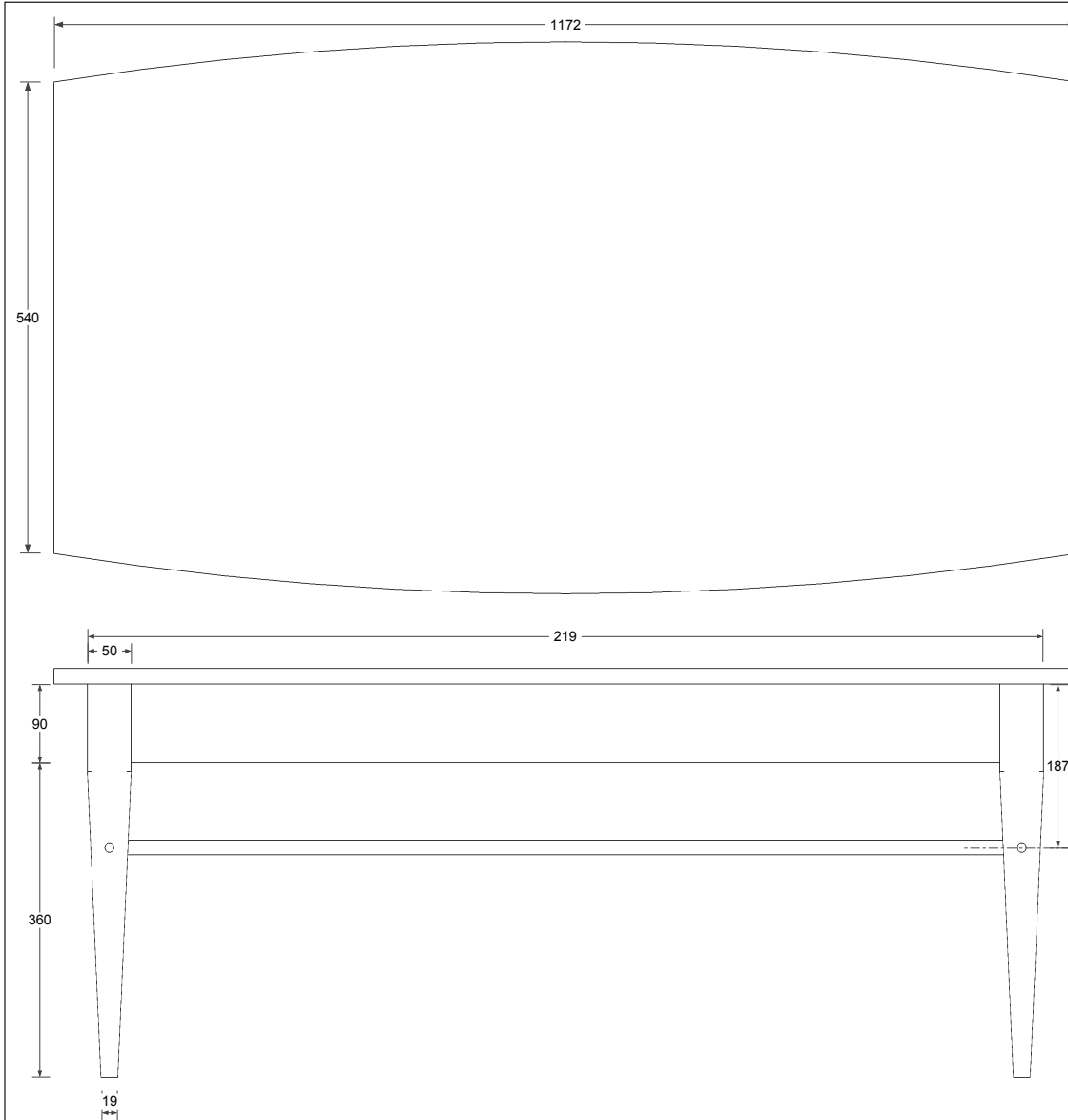
DATE

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Coffee Table

Cam Mills

August, 2014

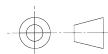
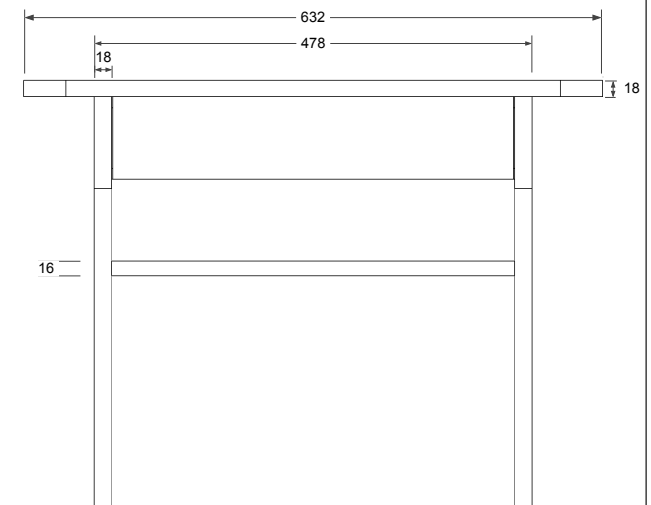


ORTHOGONAL DRAWING

Orthogonal (also orthographic and working) drawings provide the viewer with all the information to convert a 2D object into 3D by projecting the plan, front and end views. This type of drawing is common to production, technical and engineering applications.

Standards Australia recommend 3rd Angle projection to lay out orthogonal drawings (SAA HB1-1986). The symbol in the title block below indicates 3rd angle projection and this tells the reader how the drawing is laid down.

Orthogonal drawings can include hidden line geometry, section cuts and cutaway views.



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1:5

1

Coffee Table

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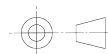
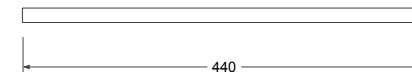
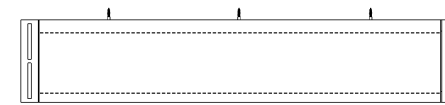
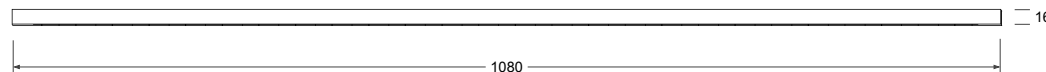
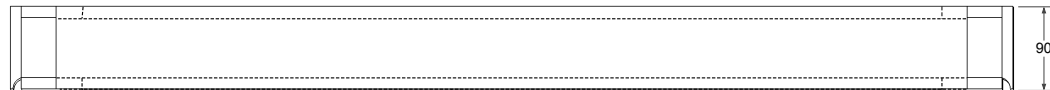
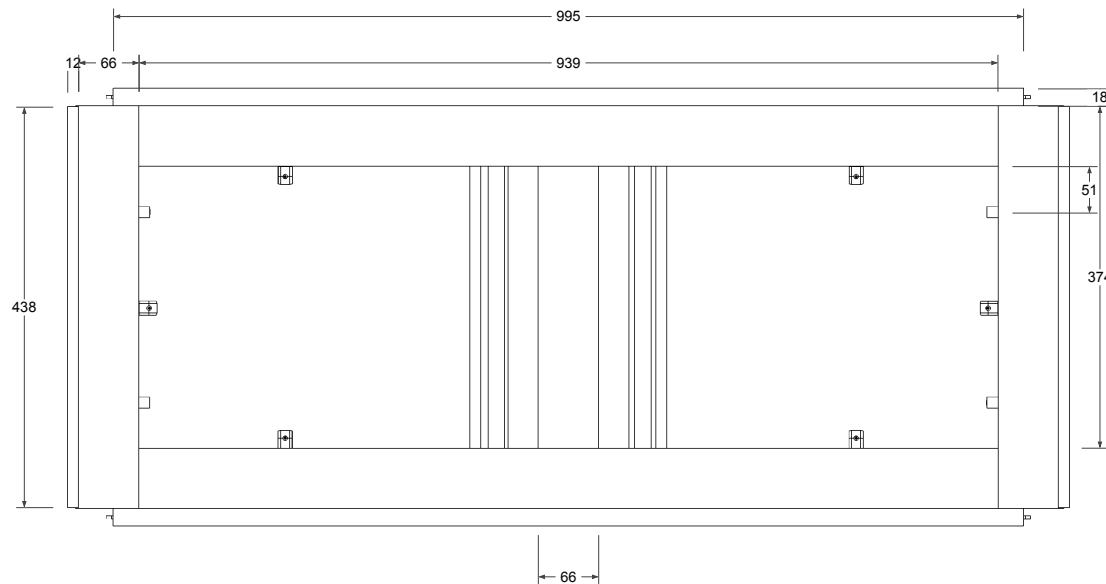
ORTHOGONAL DRAWING (Cont.)

As material is removed from the view other components are revealed. Simple objects may present these hidden components as dashed lines whilst more complex objects are more clearly understood across multiple sectioned drawings.

Here some components have been presented with hidden lines. Can you identify these in the exploded drawing?

TIP

When preparing orthogonal drawings in Sketchup be sure to change camera view to parallel projection.



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Coffee Table

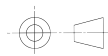
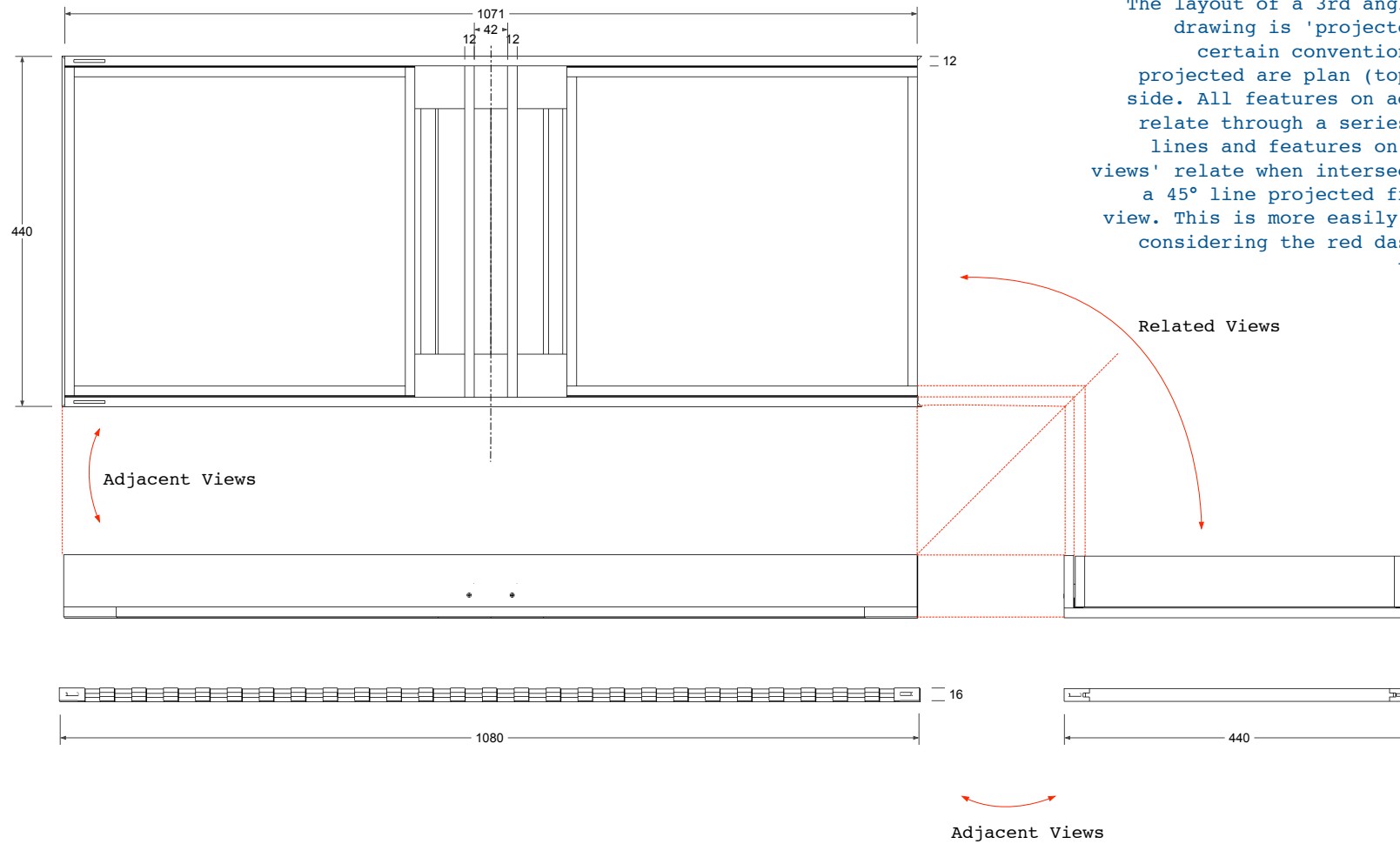
Cam Mills

August, 2014



ORTHOGONAL DRAWING (Cont.)

The layout of a 3rd angle orthogonal drawing is 'projected' following certain conventions. The views projected are plan (top), front and side. All features on adjacent faces relate through a series of parallel lines and features on the 'related views' relate when intersecting through a 45° line projected from the front view. This is more easily explained by considering the red dashed lines on this drawing.



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1:5

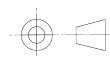
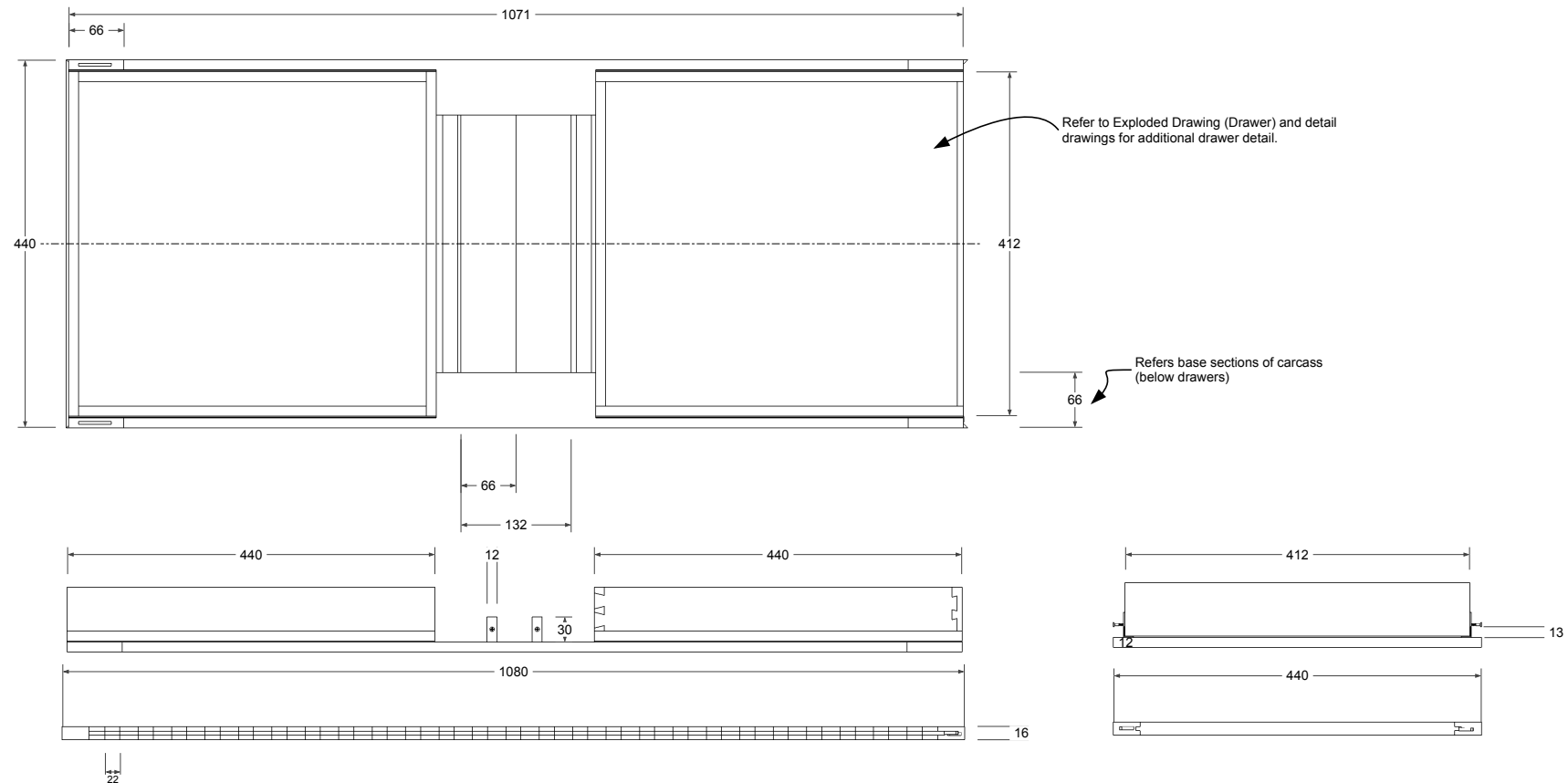
3

Coffee Table

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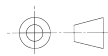
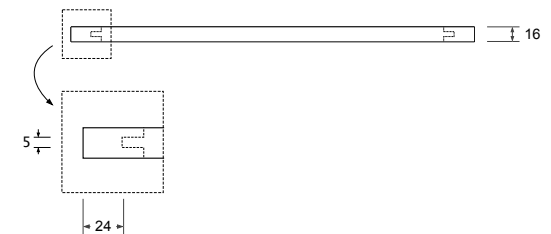
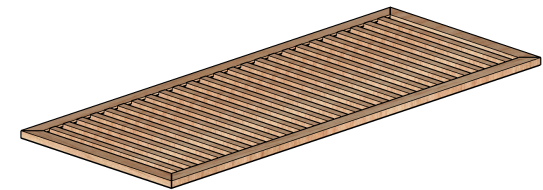
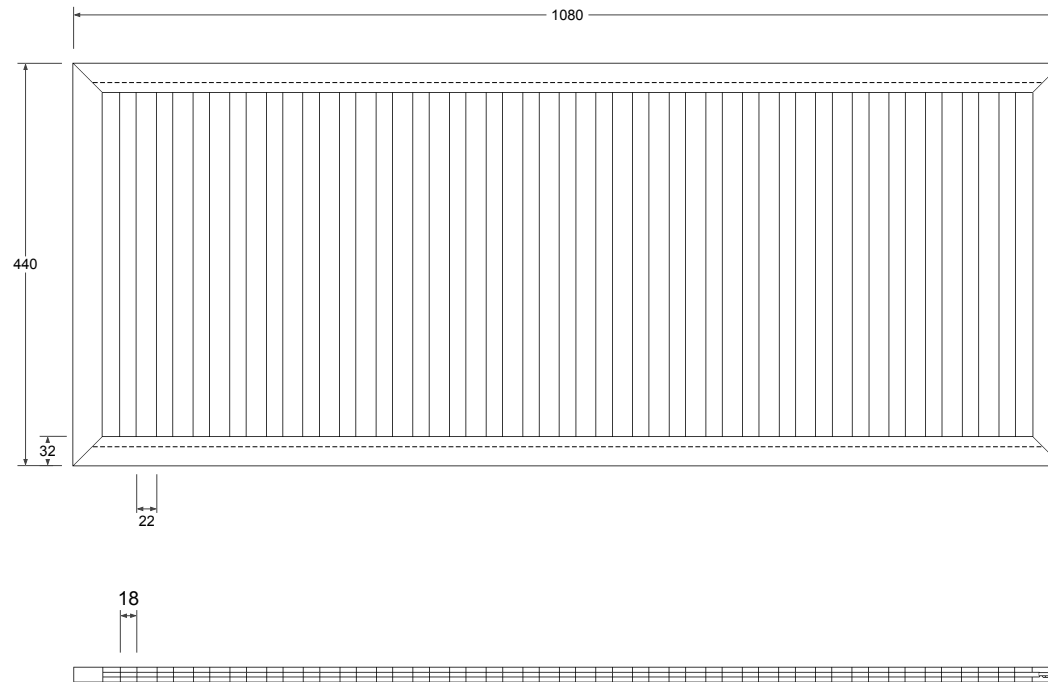
ORTHOGONAL DRAWING (Cont.)



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A3	1:5	4	Coffee Table	Cam Mills	August, 2014

ORTHOGONAL DRAWING (Cont.)

It is helpful to include an isometric, or perspective view of the object being projected when presenting orthogonal drawings.



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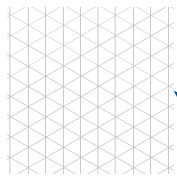
1:5

5

Coffee Table

Cam Mills

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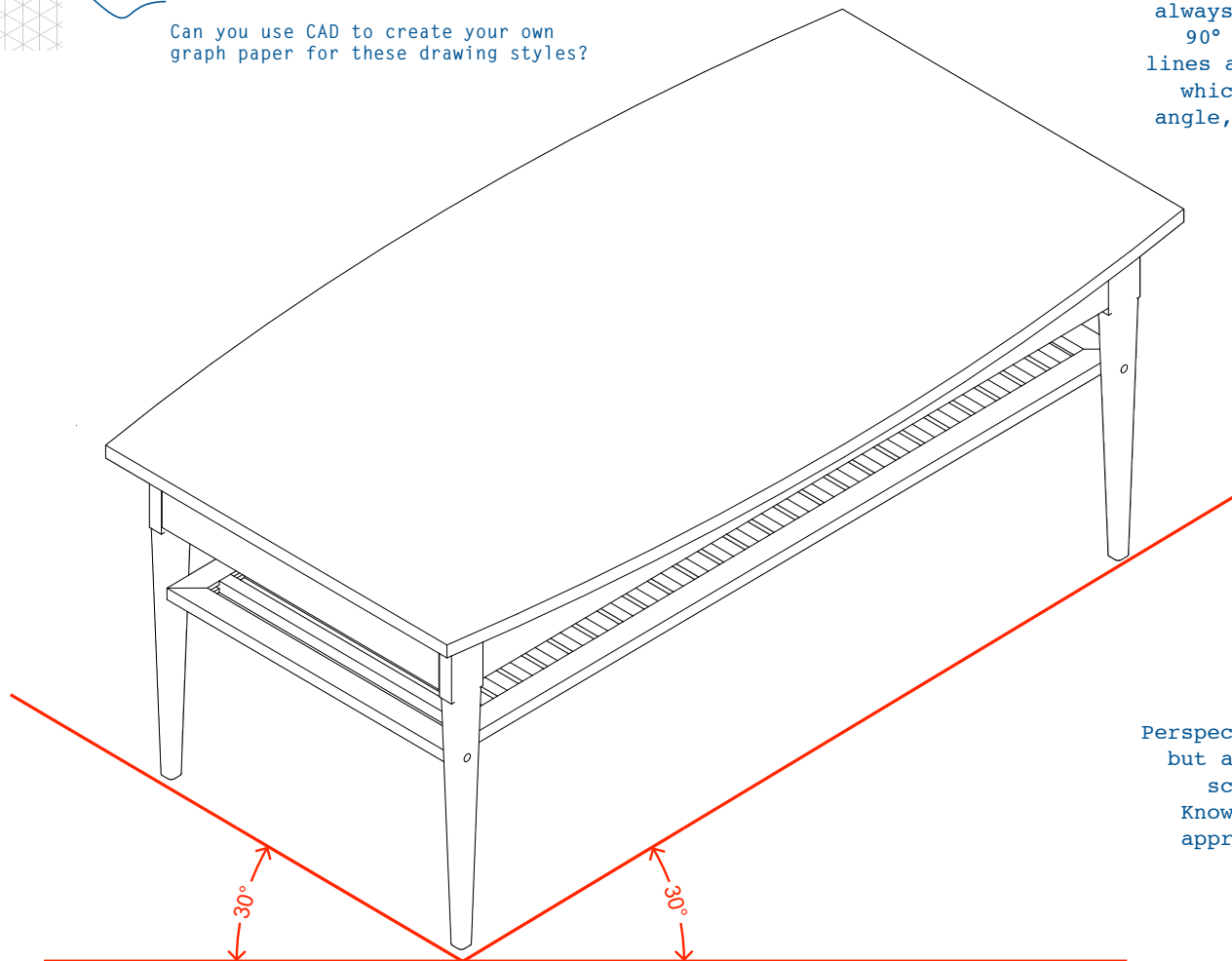


Isometric sketching & hand-drawing is aided by grid paper placed beneath the drawing. Other paraline drawing such as oblique and planometric is also aided by this technique.

Can you use CAD to create your own graph paper for these drawing styles?

ISOMETRIC PROJECTION

A style of pictorial drawing, the isometric verticals (heights) are always parallel to each other, and at 90° to the baseline. The horizontal lines are shown at 30° to the baseline which makes the object appear at an angle, showing a large section of the the topside (or underside).



TIP

An isometric view is not a perspective view. Perspective views look more realistic but are complex to hand draw to true scale, where an isometric is not. Knowing this helps you to determine appropriate uses of drawing styles.

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A3	1:5	6	Coffee Table	Cam Mills	August, 2014

RENDERED DRAWING

Rendering of a technical drawing is the process of presenting the 2D image to appear lifelike and often in 3D.

The rendered image may not be very useful for assembly or production drawings but it is critical for the designer and client to visualise the design.

A rendering usually involves creative input and therefore the designer can flavour the output as she wishes. Hyper-realistic hand or software drawn surfaces suggesting light, tone & texture are often used, and so too are sketchy, stylistic impressions that allow the viewer to add their own interpretations to the object.

This drawing uses;

- lines to define edges
- shadows to emphasise form
- photorealistic patterns to suggest colour, tone & texture
- A perspective view which adds reality.



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RENDERED DRAWING (Cont.)

Various angles and objects states can add value to a rendered image.

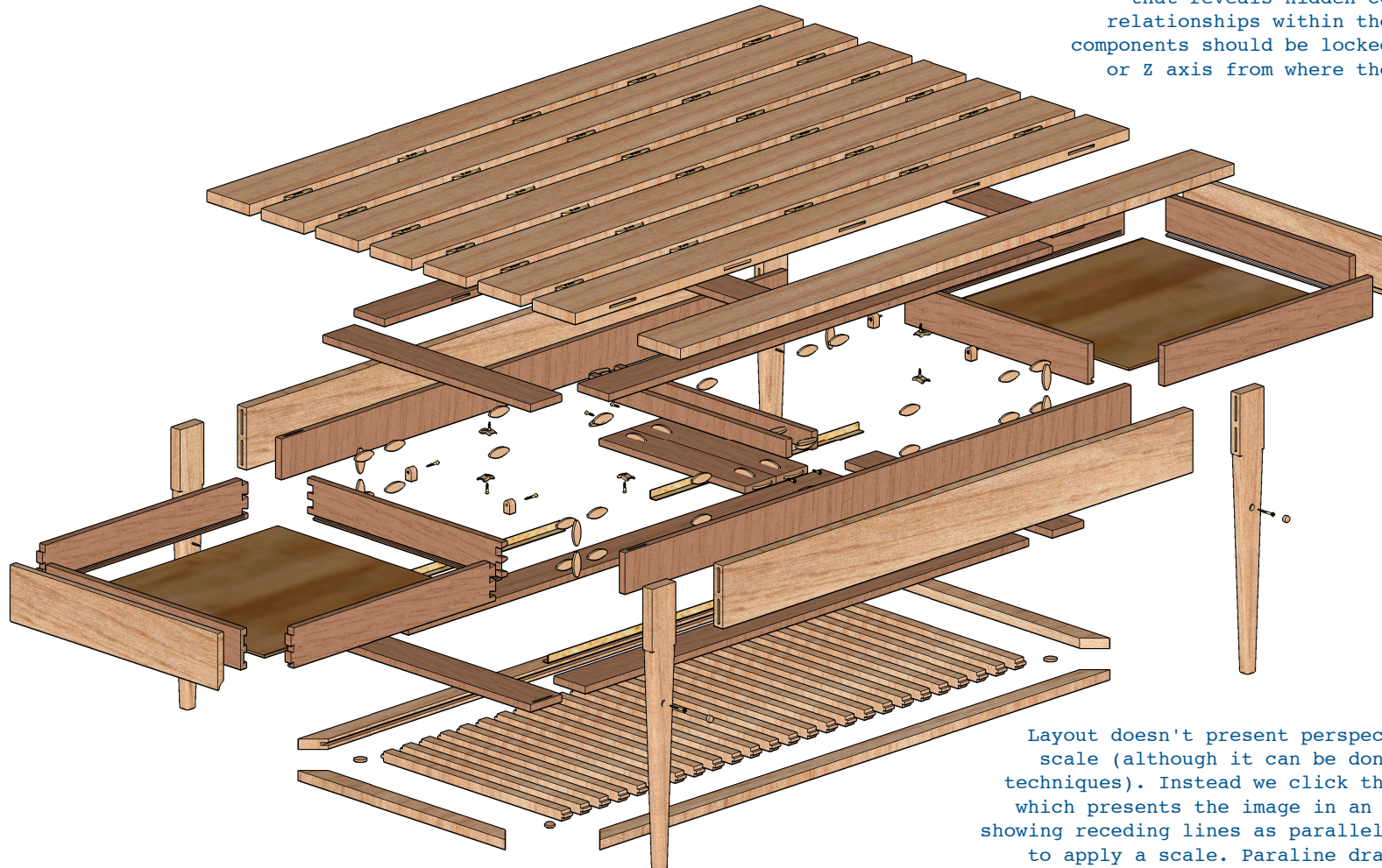
Again, the rendering is a creative approach so some liberty should be allowed in presenting the object with interest. Here the magazines suggest scale and the open drawer suggests a place to find the remote!



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A3	NTS	8	Coffee Table	Cam Mills	August, 2014

EXPLODED DRAWING

Exploded drawings are useful as a 3D pictorial representation of a design, that reveals hidden components and relationships within the design. All components should be locked to the X, Y or Z axis from where they originate.



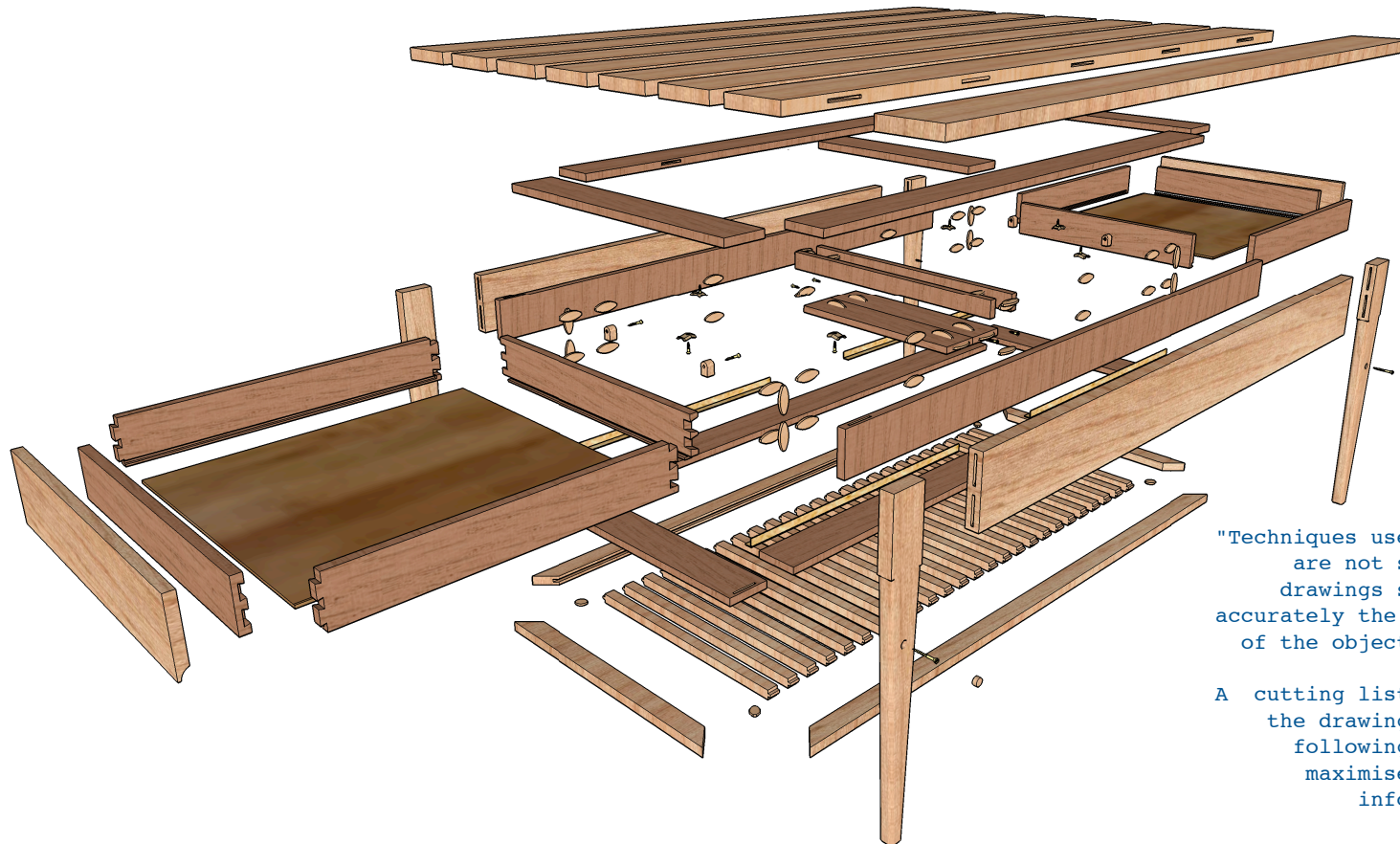
TIP

Layout doesn't present perspective views to scale (although it can be done using other techniques). Instead we click the "ortho" tab which presents the image in an paraline view showing receding lines as parallel, allowing us to apply a scale. Paraline drawings include oblique, isometric and planometric views.

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A3	1:6	9	Coffee Table	Cam Mills	August, 2014

EXPLODED DRAWING (cont.)


Using a perspective view the designer is able to present the object in a view that appears natural and most informative to human vision.



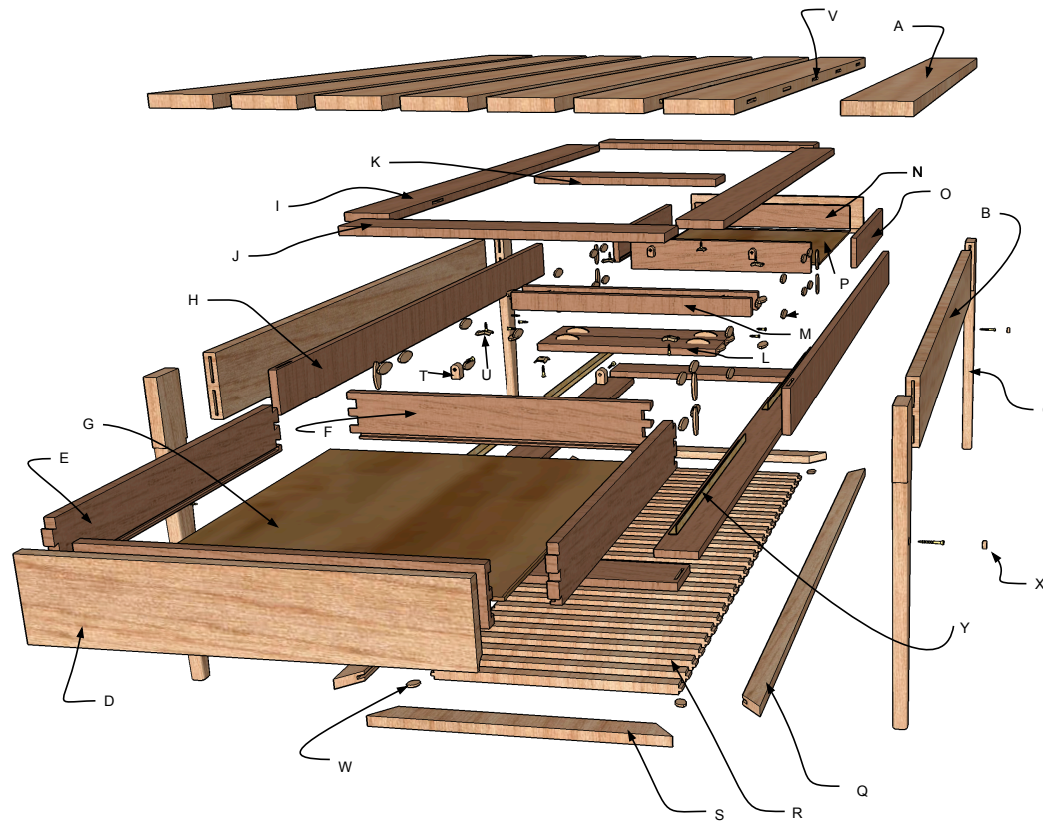
"Techniques used in pictorial drawings are not satisfactory for working drawings since they cannot convey accurately the constructional features of the object" (www.hsc.csu.edu.au).

A cutting list is an integral part of the drawing presentation. Note the following drawing is laid out to maximise space & present clear information for production.

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EXPLODED DRAWING with CUTTING LIST



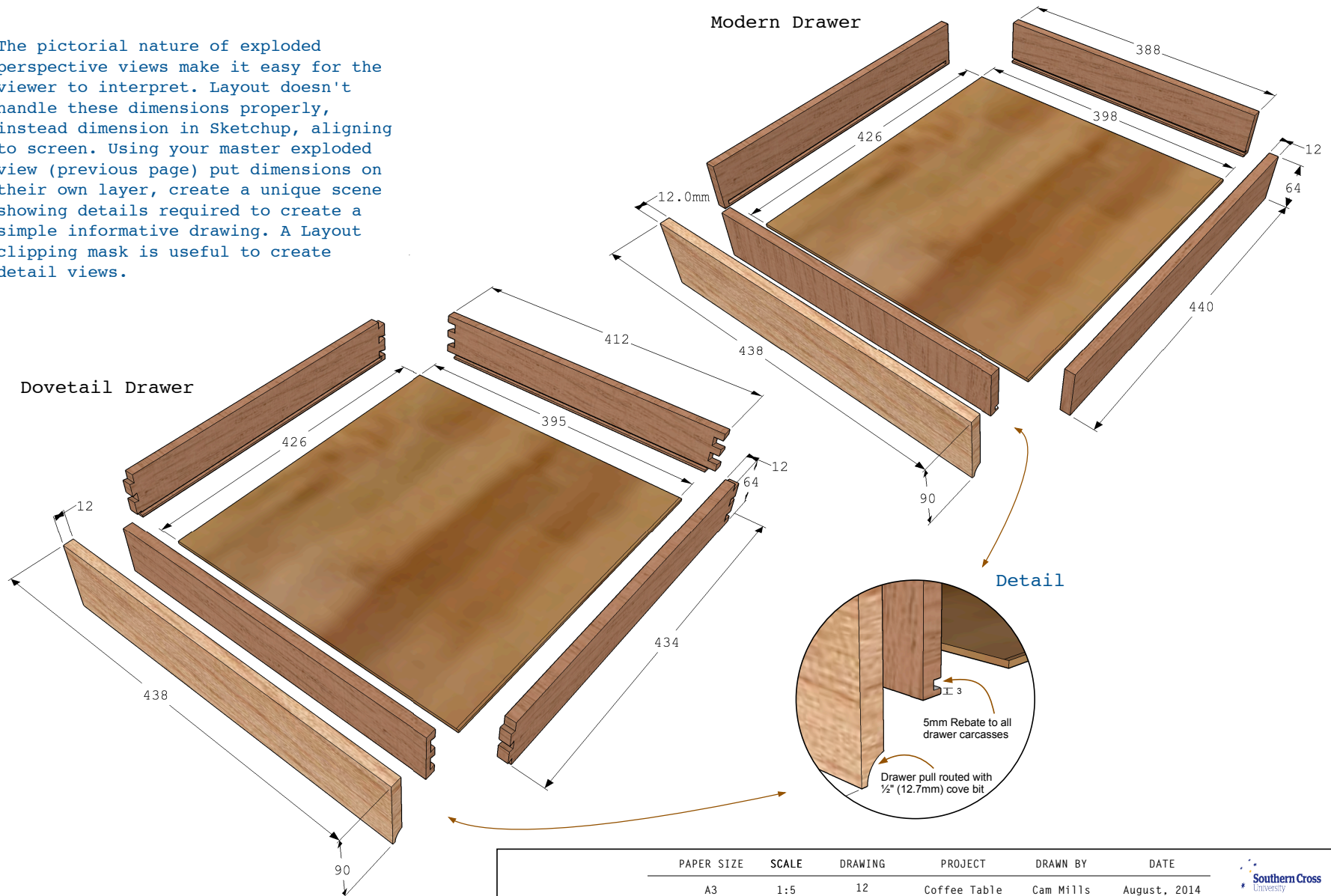
Description	WxTxL	Qty	Material
A Tabletop boards	90x18x1172	8	French Oak
B Aprons	90x18x995	2	French Oak
C Legs	50x19x450	4	French Oak
D Drawer Face	90x12x438	2	French Oak
E Dovetail Side	64x12x434	2	Meranti
F Dovetail Ends	64x12x412	2	Meranti
G Drawer Base	426x4x398	1	ply
H Carcase Sides	66x12x1071	2	Meranti
I Carcase Longs	66x12x939	4	Meranti
J Carcase Shorts	66x12x440	4	Meranti
K Carcase Midrail	66x12x308	1	Meranti
L Carcase Midbase	66x12x308	2	Meranti
M Carcase secret	30x12x416	2	Meranti
N mod' drw' end	66x12x388	2	Meranti
O mod' drw' side	66x12x440	2	Meranti
P Drawer Base	426x4x398	1	ply
Q Tray Long	32x16x1080	2	French Oak
R Tray Slat	16x18x386	25	French Oak
S Tray Short	32x16x440	2	French Oak
T Drawer Stop	12x12x40	4	Hardwd offcut
U Table Tie		10	
V #20 Biscuit		100	(allowance)
W Special Biscuit	15x4x20	4	Hardwd offcut
X Wood Plug	R5x5	4	French Oak
Y Brass Bar	440x12x1	4	Brass
Z spare			

* French oak recycled
from renovated
(imported) floor boards.

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A3	NTS	11	Coffee Table	Cam Mills	August, 2014

EXPLODED DRAWING (cont.)

The pictorial nature of exploded perspective views make it easy for the viewer to interpret. Layout doesn't handle these dimensions properly, instead dimension in Sketchup, aligning to screen. Using your master exploded view (previous page) put dimensions on their own layer, create a unique scene showing details required to create a simple informative drawing. A Layout clipping mask is useful to create detail views.



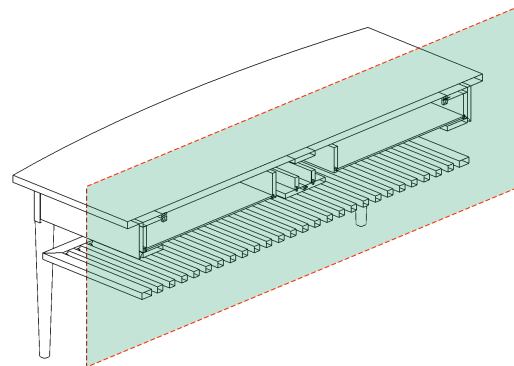
SECTIONED DRAWING

A sectioned drawing allows the viewer to look within a design to see information that is normally obscured.

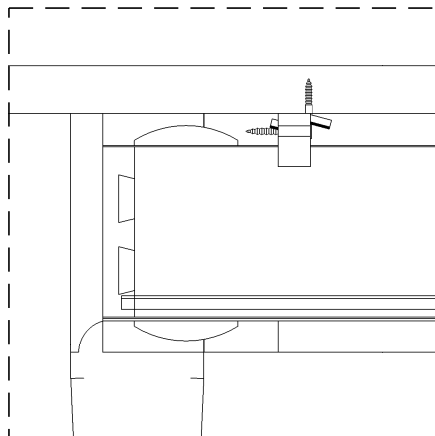
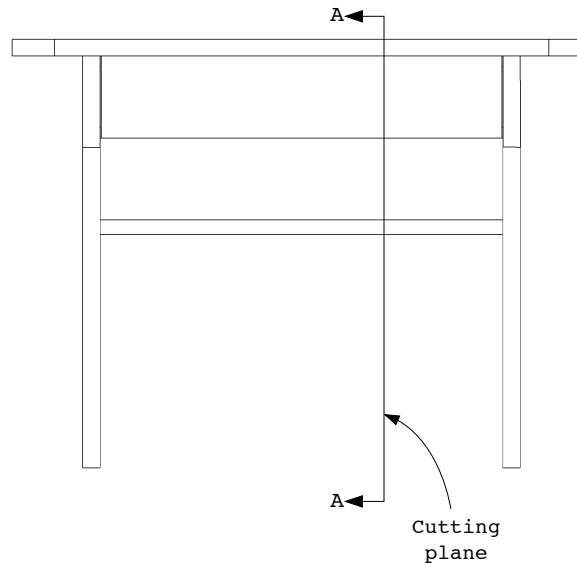
Two pieces of information are required to inform the viewer how to interpret a section view:

- The cutting plane line with arrows pointing the direction of the object that remains,
- The section plane or drawing projected in a range of possible views (iso, elevation etc) with material exposed at the point of the cutting plane line.

The example shows letters AA at each end of the cutting plane line and these match the title "Section AA" so the viewer knows which section to relate when more than one exist.

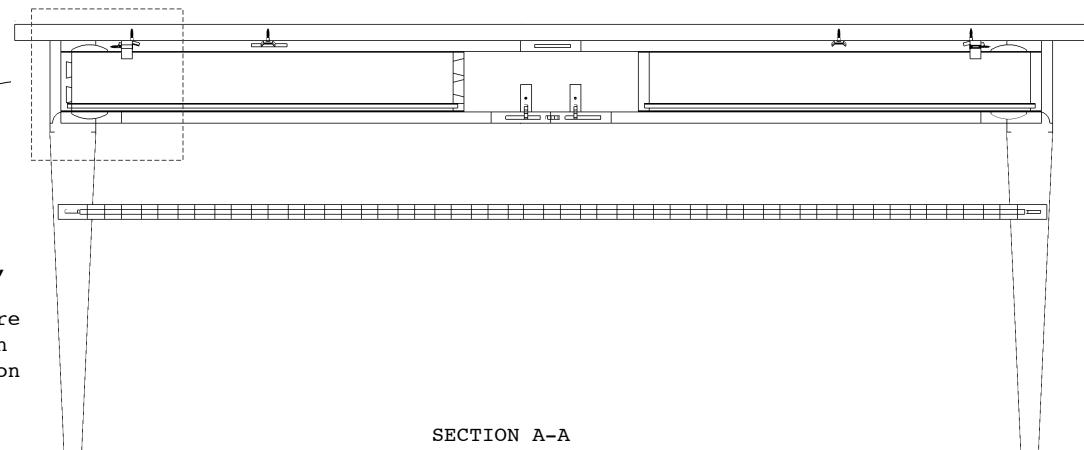


SECTION A-A
Isometric View including imaginary 'cutting-plane' revealing elevation view shown as Section A-A



Detail including dovetail, drawer stop, table ties, biscuits, drawer front and legs are all apparent with the use of section cuts.

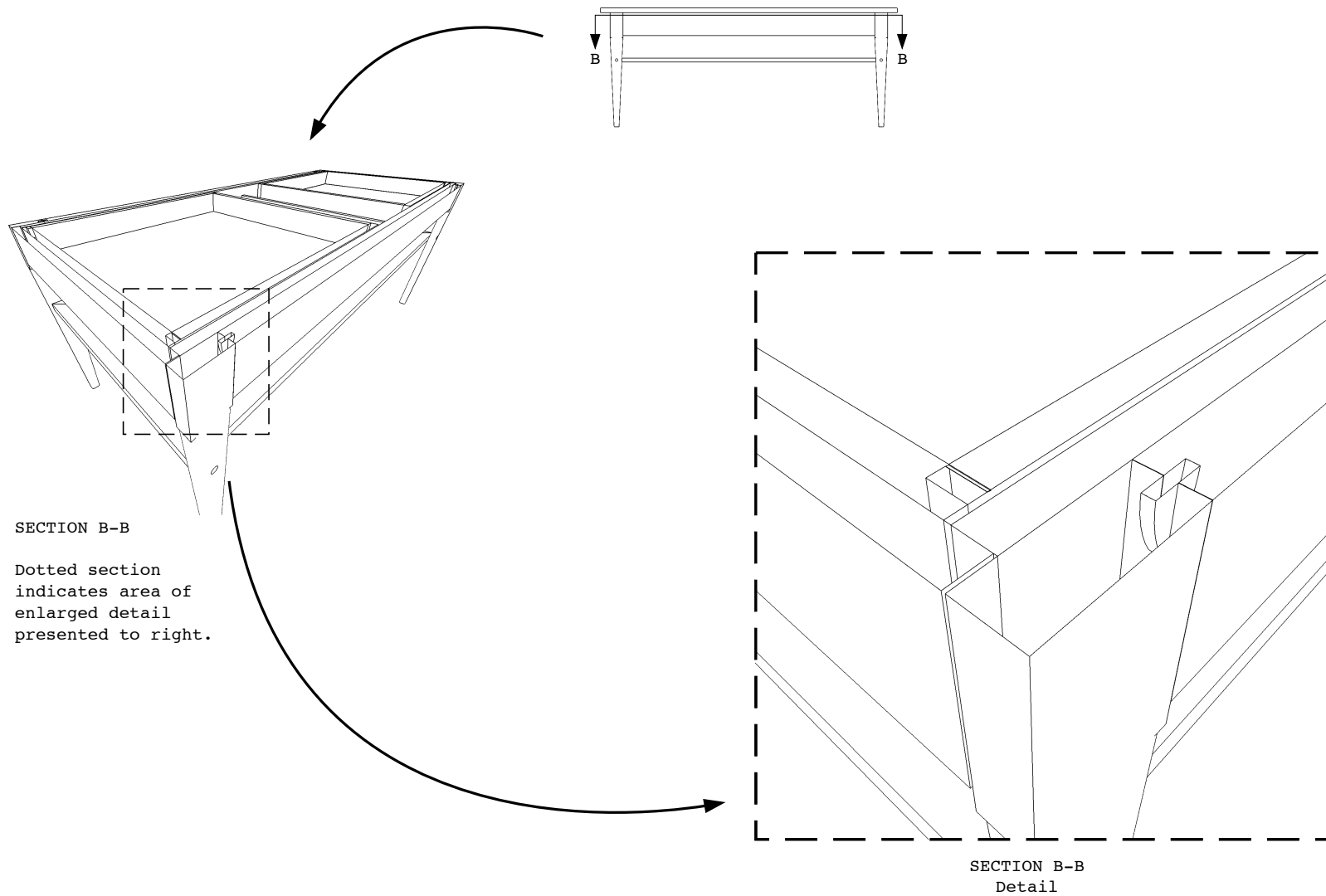
Did you spot the secret compartment?



SECTION A-A
Elevation View - Side

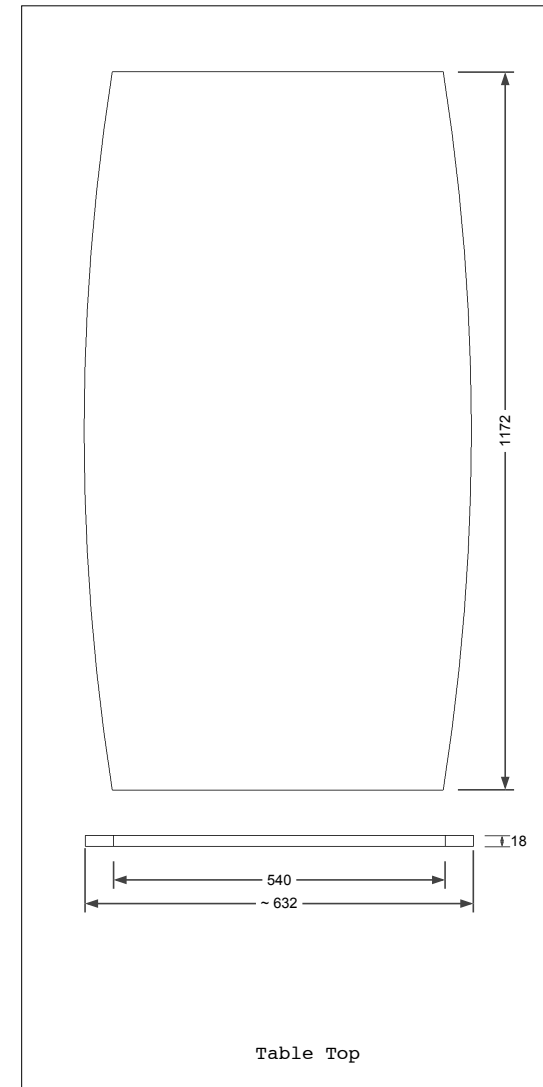
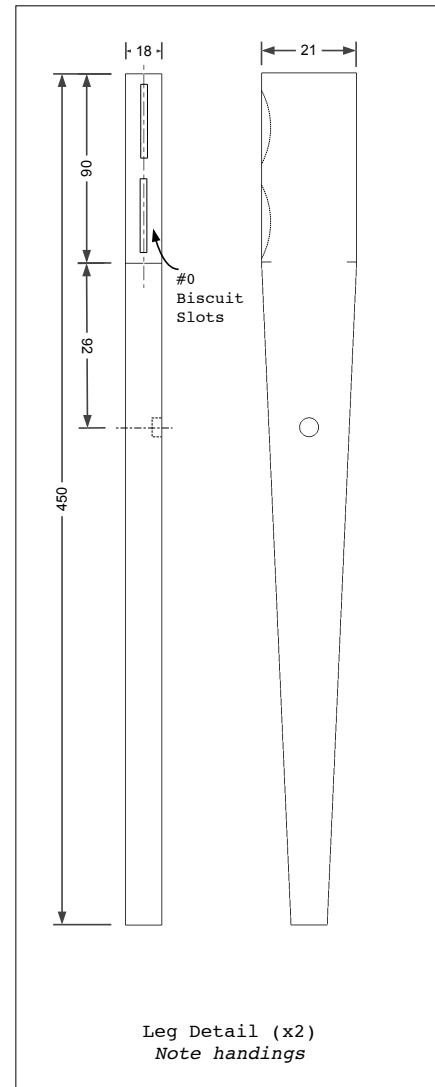
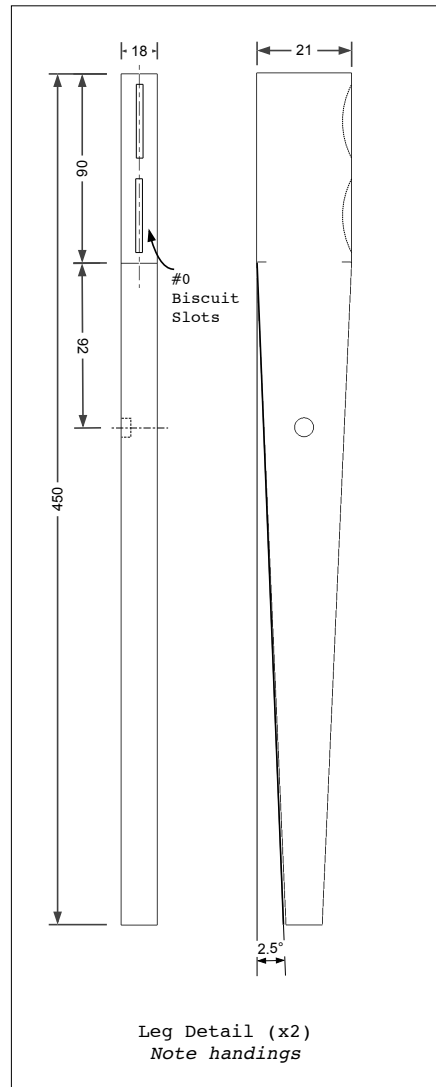
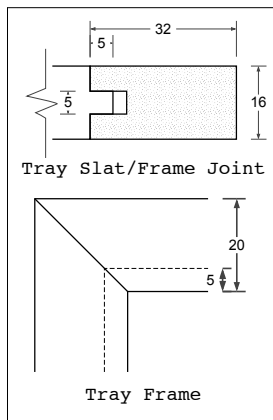
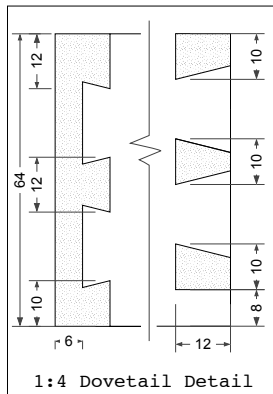
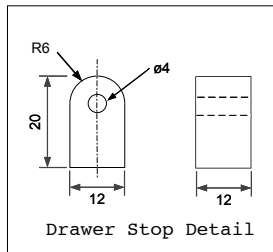
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SECTIONED DRAWING WITH DETAIL



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DETAIL DRAWING



TIP

Dotted lines indicate hidden geometry that is relative to the component in view.

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A3	NTS	15	Coffee Table	Cam Mills	August, 2014

References

http://www.hsc.csu.edu.au/ind_tech/design/2418/types_of_drawings.html

http://www.engineeringessentials.com/ege/ortho/ortho_page7.htm

http://www.engineeringessentials.com/ege/pic/pic_page2.htm

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<http://www.wordle.net/create>

<http://www.formfett.net/tusj-one-handwritten-font/>

3D Warehouse;

“Remote” by Nathan.

“InStyle Magazine Stack” by Graham K.