Technical Arts 101
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Lab – 05

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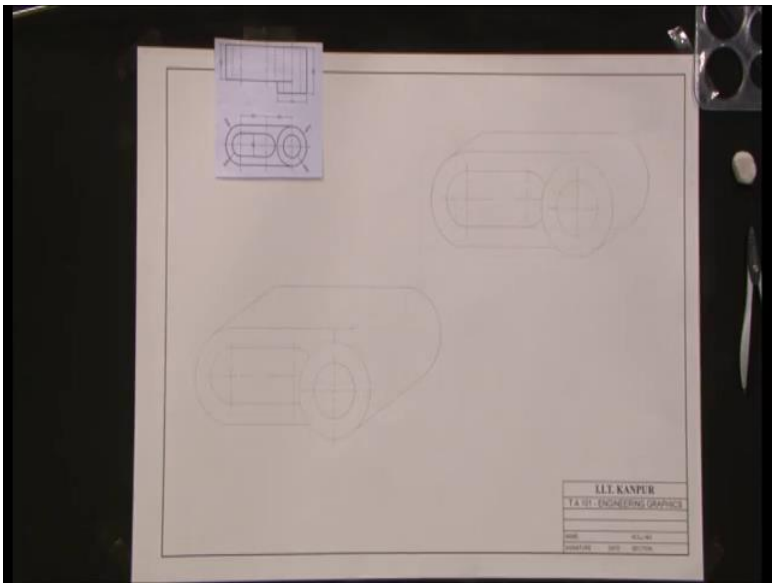

This is an example on oblique projections. So, we are going to be making an oblique projection of this solid, the front view and the top view which is given over here. So, in oblique projections we try to ensure that we show the true features on the plane of the sheet. And along the depth direction which could be either 30 degrees or 45 degrees or 60 degrees from the horizontal. We try to show this solid as if it is a 3 dimension solid. So, in a sense oblique projection is a nice marriage between orthographic and isometric projections. So, I will draw 2 kinds the cavalier projection, and cabinet projection. In one of these; this depth is the same, and in the second one this depth is produced to half giving an impression of 4 shortly.

So, if look at this object carefully they are not many features, of course; this is circular feature here, circular feature here semicircle joined by 2 straight lines. And then this is semicircular feature here, and these features are to be represented or depicted on 3 planes. So, I will try to draw the cavalier projection of the solid first. Once again I will start with the bounding box; the center to center distance is 120, and this distance is about 35 and this distance is also about 35. So, 70 plus 100 and 20 would be close to 200

precisely 190. I want to make sure if I draw both of these on one scale, then I have enough space in my sheet.

Let me double check this is 120 and 70, 190 before I start; let me align my drafter with the horizontal margin of the sheet make sure that it is align properly. Once I align this properly I tacking this to, and I am ready to draw once again I will start with the bounding boxes. So, what I will do is I will sketch these 3 planes at different depths. So, at depth 0, this is about 190, I am using a 2 h and this is about 70. So, I will mark this here, close to the margin should be as closed. But I am not really sure if I will have enough space looks like I will through the, to draw the second oblique projection.

Never the less coming back to the first one; this is 90, this should be 70, and this should be 90 again. So, I will draw plane here, measure this again; this 70, and this is semi close this point. And then I will use my friend the 30 60 s a square and to show the depth I will use the 30 degree angle. So, for this one I am going be using the through depth of 80. So, I will use a longer line segment, so these are just construction lines. And let me rotate this measure 80 just about there and then draw vertical. Let me also draw these depth directions from these 2 vertices. Since; I have evolved in measure 80 from here, may be I will just come back.

And then draw this horizontal, and perhaps draw this horizontal at the stand at dim lines. You probably may not be able to see most of them, but one will construct the solid hopefully most of the lines will be clear to you and then let me have this vertical. Let me see if I have this thing right, just about 80, and make this is a little less than 80, I want to be as possible so that I do not make mistakes. So, gave for me to use the eraser at this time and hopefully even though I hope that I will not need it later. Once know always a good idea to have a piece of cloth with you just to make sure your sheet is clean, to get a better view maybe use the important part of the horizontal scale. Now, this looks part alright, and then; maybe I will join these 2 vertices quite a while ago, I said that my mini drafter is not accurate and I am just managing maybe I am doing a little better than managing anyhow.

So, I have got this plane here, and I have got this plane here about this plane maybe I will sketch that. I would imagine this is about 20 from here because this 60 and this is 80, so this about 20 from here. So, maybe I will mark that and once I have made this mark I am

going to be using the verticals and the horizontals to identify that plane looks little better just want to double check this a little deviation but that is ok. And then I have got this plane alright, hopefully pretty much. So, I have got 3 planes; it be a good idea for me to start drawing this from the back side or from the front side.

So, remember just in case of isometric views running to; show the lines in dark which are visible, and I need to show the lines in light, prefight impressions which are not visible. So, this feature rather these 2 circles will be on this plane, this feature here will be on the second plane, and this feature will be again on the second plane. So, perhaps what I can do is I can draw this feature on this plane, because I know that will be visible, and I will draw these 2 semicircles on the plane behind, because I know that they will visible as well, alright.

So, having set that so let me marks the center lines. So, remember this entire length is this length, so this mental note to myself. So, let me go 35 left from here, mark this, let me go 35 right from here, mark this here. Were, rather there is no point going 35 right from here, because these features are on the plane behind this. So, let me mark the center lines over here, and this is about 70. So, I will go 35 up, so before I start drawing these 2 circles always in my side yet to locate the center well. You have to locate the center anyways here. And the center would be on the back plane.

So, let me mark this center line, and let me mark 35 on the back plane, and mark the horizontal of the center line, rather the horizontal center line, alright. Have been done that; I use my compass, and I will first draw the outer semicircle making sure that I touch both the horizontal edges looks like and perhaps this edge also. Maybe I need to adjust my center and there goes my semicircle uniform pressure rather that this would be a full circle. So, let me rather go ahead and complete this, so a mental note to myself, and the others watching this video that this is a cavalier projection.

Now, the inner circle is of diameter 40, I do not have that on my stencils, so maybe I will have to draw that using my compass. So, I just mark 20 pretty much here, and draw the circle a few times. So, that I get the graphite uniformly impressed on the sheet, these 2 circles done. Let me take care of the outer semicircle, and the inner semicircle. First the inner, because the various is something that I know 20, and the outer one which is 35 I

need to adjust my compass little I think I have got it. They would be minor errors but I will tent to ignore them, so got this part right.

Now, this distance is 60, measure 60 from here, and draw a center rather vertical center line. Maybe I will have a horizontal center line as well a part of it. So, I have got the center for this arc. Now, this arc is on this plane, and a part of this arc will be hidden behind the circular feature. So, I will have to be a little careful, and I have to draw only a part of it. So, I take my compass we adjust the radius to 20 get the center, and I will draw only that part of the arc which is going to be visible, and I let go the other arc. So, I will start from here; I will be careful about this part right possibly, little distance and perhaps from here up to this part again keeping little distance. So, I do some touching and once I do that I am ready to draw the horizontal lines. Just want to make sure that; I hit the 2 points looks like I do. And here, I hit the 2 points here as well looks like probably I do, little better of touching, so I have this feature all set, ok.

Now, I have to work this part out for that I need to project the center back or maybe measure the corresponding center from the vertical and the horizontal. So, this is a 35, 35 maybe better I would do that use my 2 h 35, and this time I just be using a dim line and perhaps this way my horizontal line would be. And if I use a 30, 60 set square, and if I try to project the center line over there I should be able to confirm that it lies on the line which it does. Now, what I will do is; I will use half 35 this radius, and using this center to I have this center right, not sure perhaps going be this center here. There would be a little gap on the left anyhow, so I will draw away them arc.

You know just to get this 30 degree line, once I have that I use my set square, and my drafter assembly go very close to this and think about drawing this tangent plane. I am having a hard time seeing the features from here, but if I hope that I have gotten this right maybe a little up probably would have like this way. Little touch and then I would know that this part of the arc is visible. I will get back to this center and darken this part of the arc, alright. Now, what I would do is; I would extend this line up till possibly this position.

Now, for that I need to get this part projected over there .I use my 30 60 set square, change pencils go up there, you know just gently project this point. So, I can extend this line up till this point and of course, this feature is tangent to this. So, I know what to do, I

go on to make sure I do not draw double line, and that is a little difficult at times. Draw solid line and right at this position, and make a little free hand arc just to give the viewers impression that; this is tangent. And I finally; make this line alright. So, looks like I have gotten this part right. Now, what I need to do is; I need to get this part right, and I know that this would be a circular feature here. So, I take my drafter here; get the vertical line at 35 marks that maybe with a little thicker line. So, that is visible get 35 from the horizontal mark this get the intersection between these 2, well they do not need to be that dark, just this point is good enough. And the radius on my compass is set or maybe it is not looks like I need to shrink that little bit seems, alright.

And then all the I will draw this part using a light pencil and then; search for I do not need to search for tangent over here. But I need to search for one over here. So, this part is a little thicker, then I imagine it to be rather this part is little darker, then I imagine this to be. So, I will erase this part, wipe this off first work on this horizontal line, which I know will be solid rather dark. Just want to make sure I do not double line this looks like am I right. There and using my 30 60 set square, I draw a little oops I should be using a different pencil little line here. So, I know that my curve is going to get truncated, at this juncture. So, from here to here maybe I can darken the circle, I have that and then perhaps I can go ahead and darken this line, and a little touch. So, this is my cavalier projection of the solid.

Now, let me on the side make cabinet projection; maybe I can use this part, and let you figure the difference between these 2. So, what I will do is; I will make some preparations, and I will ask my friend asutosh here to stop the camera. The preparations pretty much have the same as this just that this depth, and this depth rather this depth. They will be halved rather scale to half. So, this would be 40, and this would be 30 well. But perhaps on second thought; let me go ahead and make all these constructions all over again front of you. What I would do is I would mute myself so that you can just focus on the construction, and not listen to the blabbering that I have been doing over, you know many minutes.

So, I will use this part of the sheet; perhaps one statement from my side; these depth dimensions they will be halved. So, instead of 80 I would need to take this as 40, and this is 30. One more thing this plane would be at 10 behind this plane. So, like in this case; I will have to draw this third plane as well. First these 2 circles on this plane the front

plane. So, full circle if you rounds, and a smaller circle of diameter 20, again if you rounds of this. Now, this feature is on the second plane, I need to identify the center for that. First the outer circle, rather first the inner circle, inner semicircle rather I might as well extend the center line to somewhere here.

This distance is 60 and then it is same radius I draw this arc, and notice that only a part of this feature will be visible. The rest is going to be hidden behind this; I just want to make sure that; I do not over shoot. If I do, I probably have to take help of my friend standing just rather sitting just there, looks like I do. Well, not to worry, because the next thing that I am going to do is make a larger arc of the same radius as this one looks like am I right, there a little touch up.

So, next is this semicircle with that center need you reduce or shrink my compass little bit. And there I go and of course; these lines you going to get extended up till this here. Let me project this tangent line along the 30 degree direction, so that I get this corresponding point in the cabinet view, possibly here. So, this my first horizontal line switch in pencil, just going to make sure that; I do not draw double. Let me erase this part just little bit, I can always touch it up later. No, I am working here well; this horizontal line will also be there. So, would this be and of course; so would this all I need to do is identify these features on the back plane. And use the horizontal lines and then; I think I should be done going back to the back plane identifying the centers, identifying the vertical using by dim lines, identifying the horizontal.

So, this is first center right there, and this would be my second one. On this particular line right and perhaps let me use my set square; I have to be on the back plane pretty much over here, I will get adjusted. So, this is about 35 yeah, so looks like this is a center taking my compass, my radius is all set I think. First center here, well little to the left perhaps maybe a little more to the left, all I need is just this part of the arc again something 10. And from here maybe this is where my center was maybe a little up perhaps over here, and looks like I am ok.

And this part of the arc, so the first tangent here using my solid line, and the second tangent here, little bending. Let me redraw the rest of the arc maybe up till this point and I can do the touch up later. And this arc a little darker I realize have there is a better in act to receive here. But, so the final touches in this drawing; this line was dark already.

So, maybe a little touch up here, and this line was little dark already, may I make it little more darker rather little more dark. And little touch up here and finally; the horizontal line I hope I do not make it a double line, there I am little touch up.

So, this sheet now is ready; let me stripe this object off get the drafter out of the way. And so this is the cavalier projection, cavalier oblique projection, this is the cabinet oblique projection. The height remains the same, I will have to get back the height remains18, the height is 4 shortened conventionally to half of 80 it is 40. Just observe the differences in the 2 views; you know one nice thing is that this is I said before a nice marriage between orthographic projections and isometric projections.

So, if you want to show the circular features pretty much in true scale; you would want to choose a plane which is parallel to your sheet. Here, parallel to your sheet and for the depth dimension you might want to choose this angle as 30 or 45 depending on your convenience. And get the 3 dimensional impressions to this solid. So, well if I ask you which one is looking more 3 dimensional? I mean it is up to you to observe and then tell yourself. For me possibly this, because this has a little four shortened feature, but this also alright, I mean just imagine that if you have this depth to be 160. Then, this would rather be a cabinet projection for this depth to be 160, and this depth to be 120, I believe alright. So, observe the differences; while I leave you for today, and come back with perspective projections later in the next lab.