Indian Institute of Technology Kanpur
National Programme on Technology Enhanced Learning (NPTEL)
Course Title
Engineering Graphics

Lecture – 20
Perspective Views - 2

by
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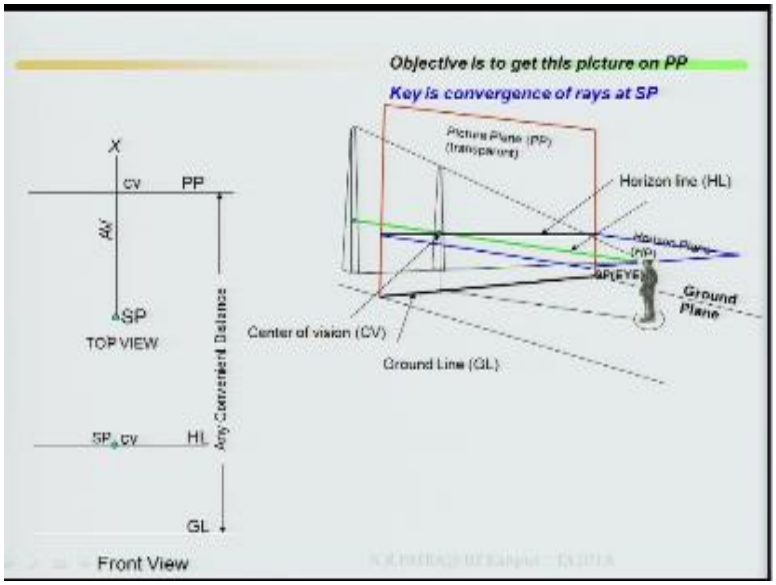

Last class we have covered basics in perspective views. So there will be a picture plane, then there is a center of vision, station point, station point generally in the top view, then center of vision, then horizontal line and ground line, horizon line and ground line.

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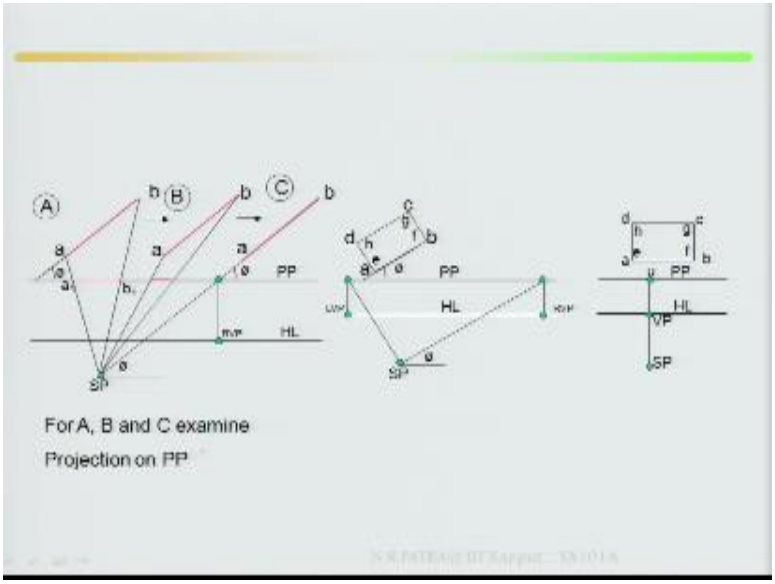

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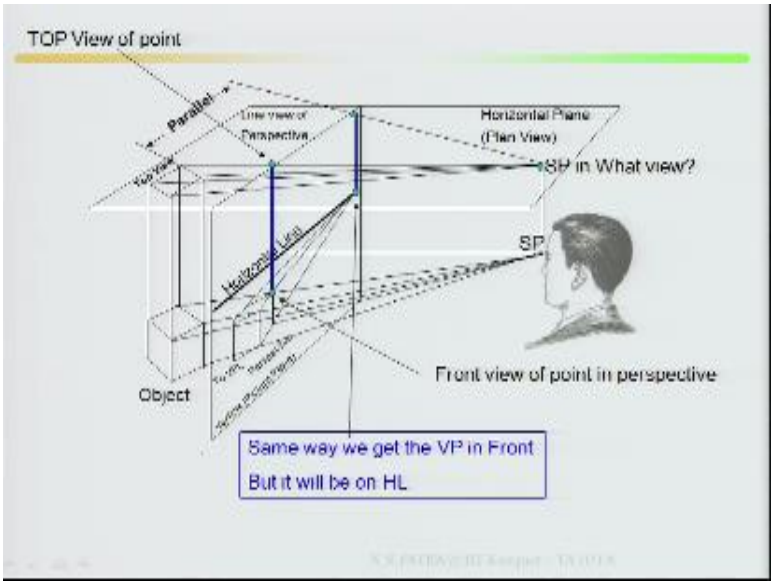

It comes from this 3D picture if you look at here, this is your station point and this is your vertical plane where you can project it back as a front view, and this is your top plane or horizontal plane where your top view can be drawn.

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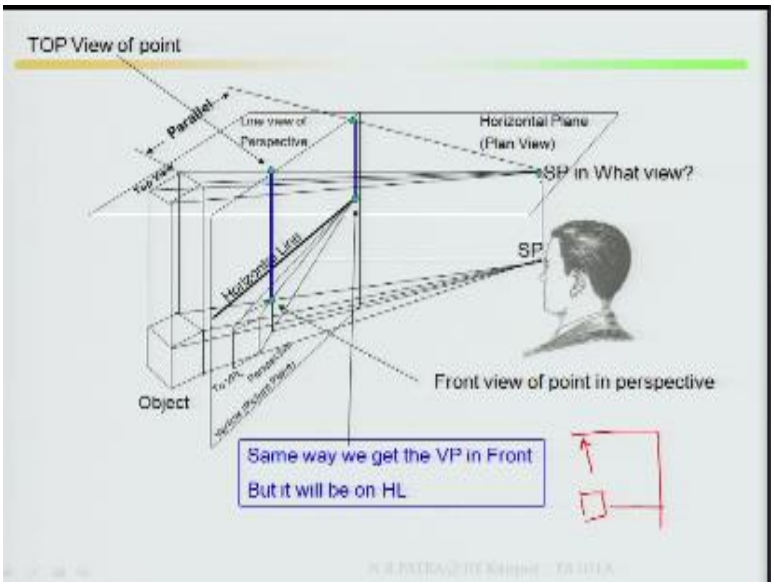

If I take it as I explain later earlier part as I explain it, object is somewhere else here. In third angle projections you are looking your top view here then you are looking your front view here. So horizon line, horizontal line is here, so in that way your station point it has been also projected back to your horizontal plane.

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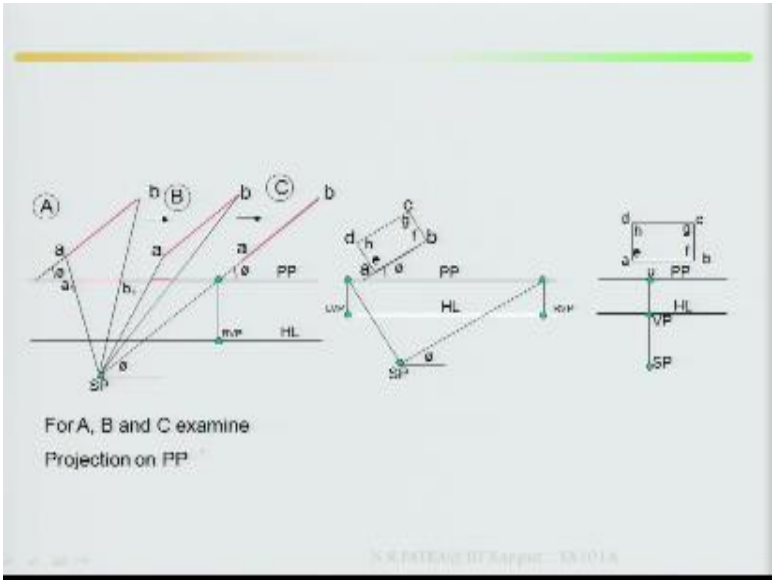

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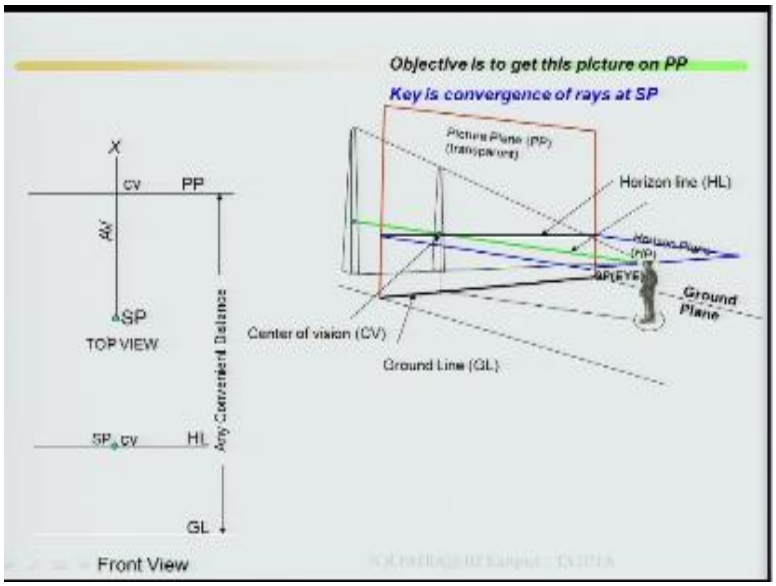

That means if you look back here, it is the same thing you are simulating in 2D.

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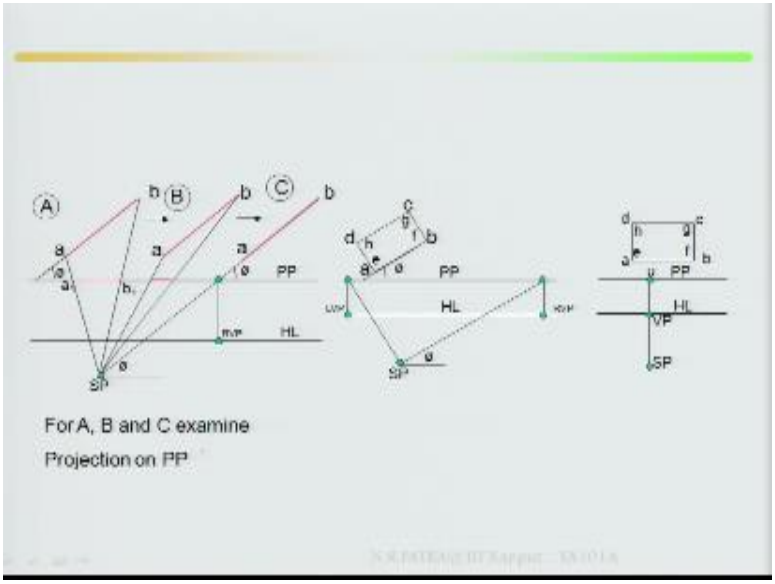

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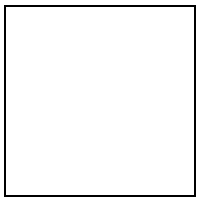

Here if I rotate it back, if I rotate it, it will be come down like this so here it is your top view, top view then here it is your front, then this station point has been projected back. So this is your object, by third angle projections this is your top view, horizontal line it merge with your center line, then station point is coming projected back in the top view.

Then here it is a front view, so if I rotate it back this to this plane so front view is coming here or sometimes it may possible that front view maybe backside of station point or front of the station point. It all depends upon how it has been projected back, what is the distance.

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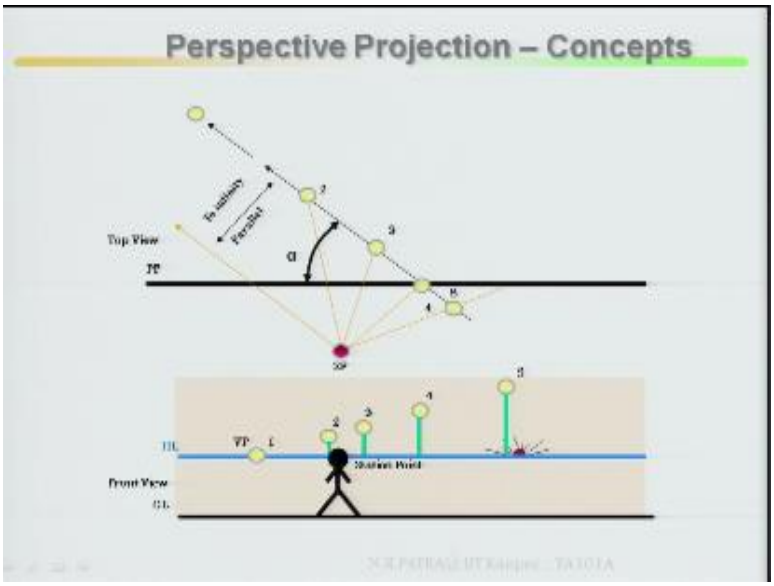

So we have covered a example, how it looks, how you are going to start picture plane, horizon line, front view, ground line, and your station point, object is here. Then considering point 4 you have to find it out station point. Then with respect to your object, how your object is going from here to here in this line, then you have to find it out your vanishing point BP 1, because this object is here, here, here, here, here so it is parallel in this line, from station point draw a parallel line to your objet line where it intercept your picture plane then draw back where it intercept your horizontal line this is your vanishing point 1, vanishing point 1.

Then from vanishing point 1 to point 4 you join, then along this line your object will come back project it back. Now if you look at how your object looks like 5 at this position object it looks like, then 4 then diminishing 3, again it becomes certain, then 2 again it is small, and at point 1 it converge. At infinity distance at point 1 it converge, that is your vanishing point.

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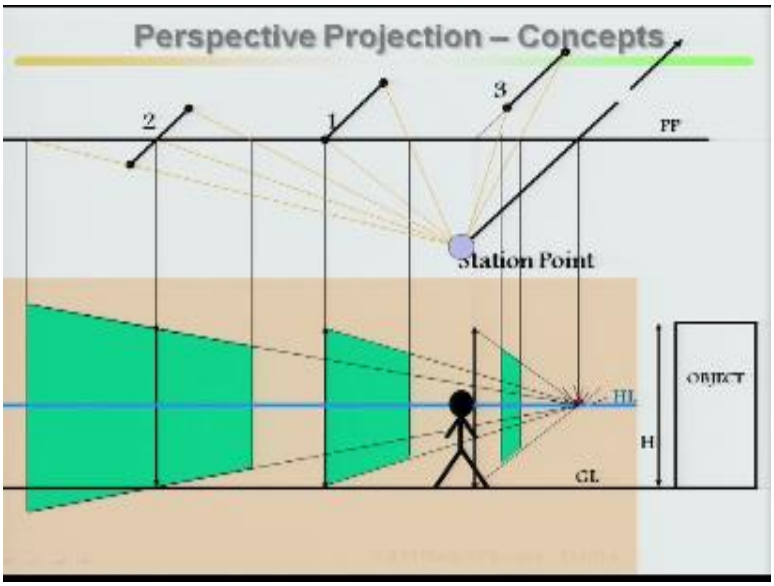

Let us start the perspective projections concepts once again, ground line, horizon line, this is your object, this is your object. Then your station point, then is your picture plane with respect to parallel you draw it, this is your point 1 object it is going through in this line, from station point draw a line parallel to your object line. Then draw from this intercept you draw find it out your vanishing point, then you draw your – how is your object is looks like, then second object at point 2, 2.

Basically this is an example, how it is from station point, how it is varying from 1, 2, 3, 4, 5. So now you come to the 2 how is your object looks like? Now come to the 3, how your object looks like on the picture plane. Now this is your concept as I am going further and further from the station point it will be diminish at one point.

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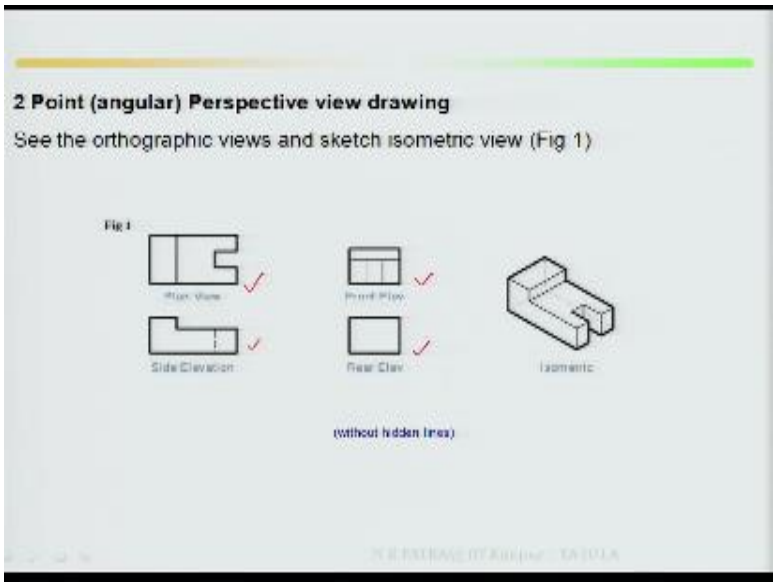

Point 2 angular perspective view drawing, see the orthographic view and sketch isometric view in figure 1. This is your figure 1, plan view, plan view and side elevation, this is your front view and rear elevations and from there you draw without hidden lines isometric view.

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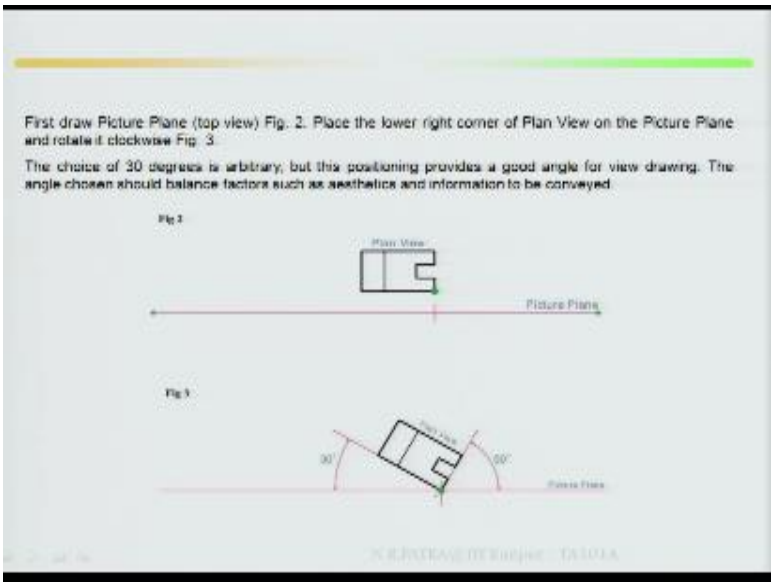

Then first draw picture plane top view, first draw picture plane top view, this is your picture plane, place the lower right corner of plane view on the picture plane, rotate it clockwise figure 3. Picture plane, picture plane, rotate it clockwise in figure 3, the choice of 30˚ is arbitrary, but this positioning provides a good angle for view drawing. What happen, this is a simple plan view, then this has been made as a isometric view with respect to.

Choice is 30˚ you can take it 30 or 60˚, but this position of the 30˚ provide a good angle to view the drawing. The angle chosen should balance factors such as aesthetic and information to be conveyed.

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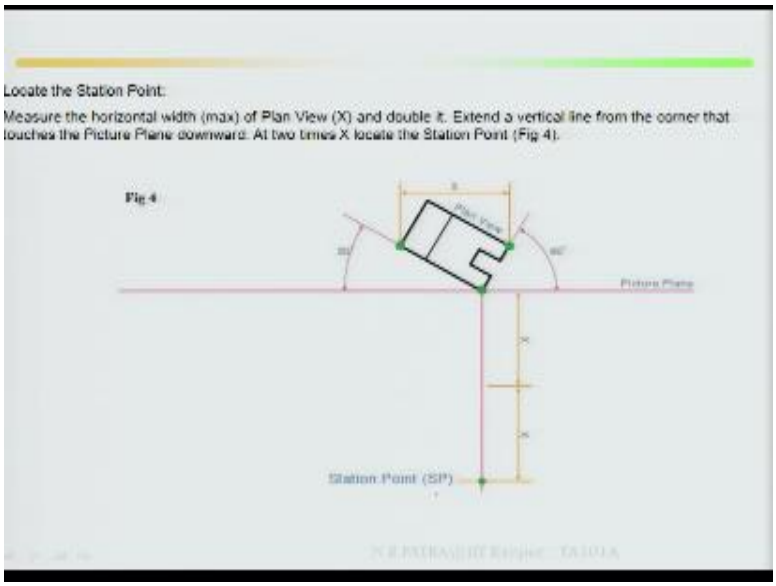

Then locate this station point, once you put your picture plane.

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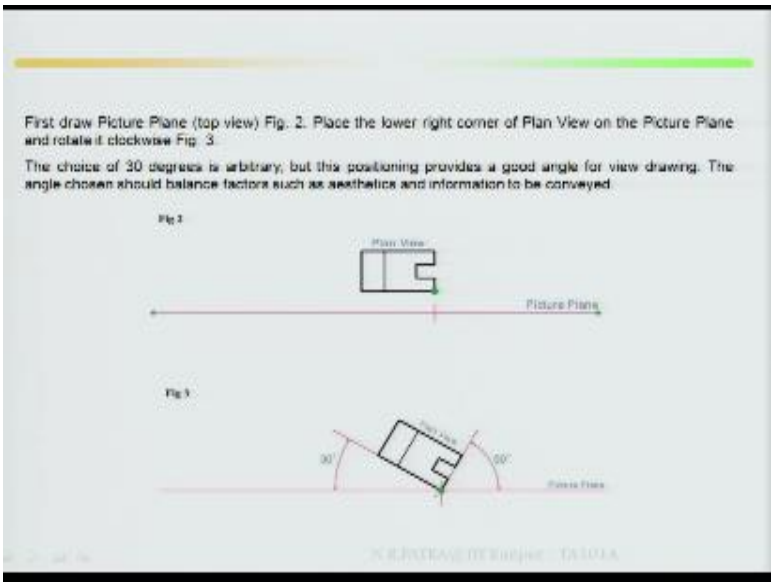

If you understand well or not.

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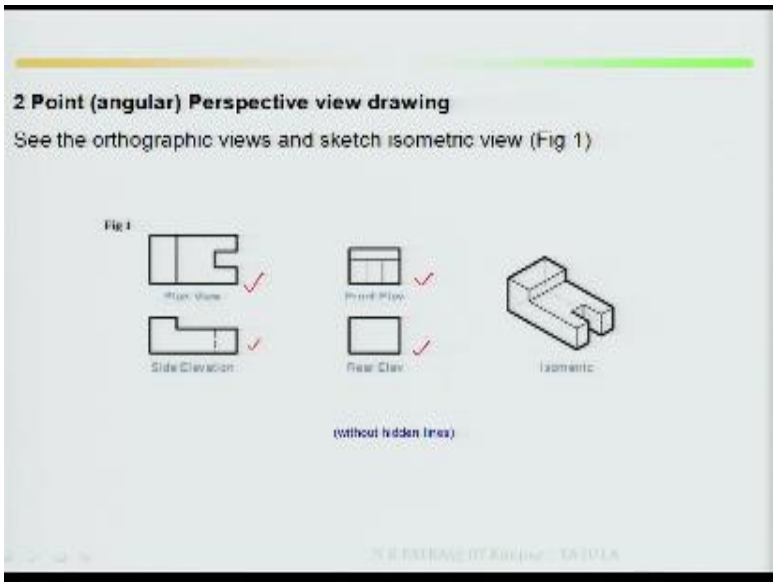

Let me go back to this is your front view, this is your front side elevation, plan view that means your top view, side elevation this is your front view.

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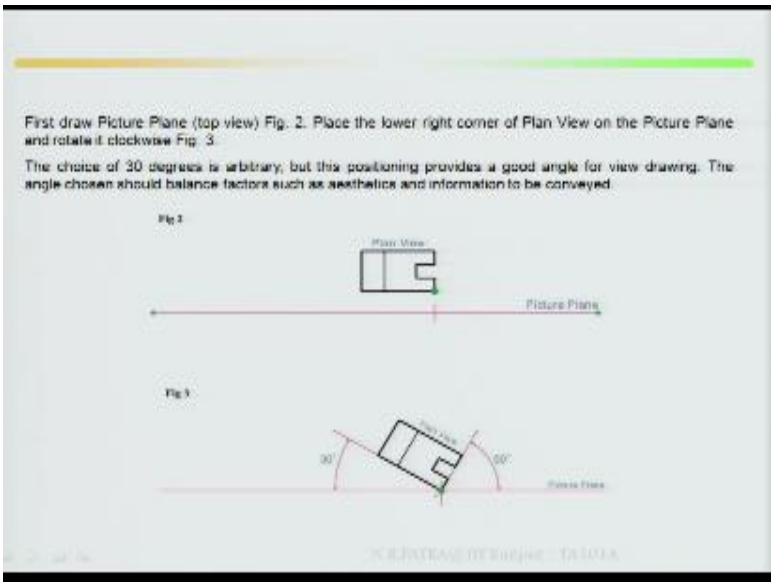

Taking into considerations the object looks like this plan view.

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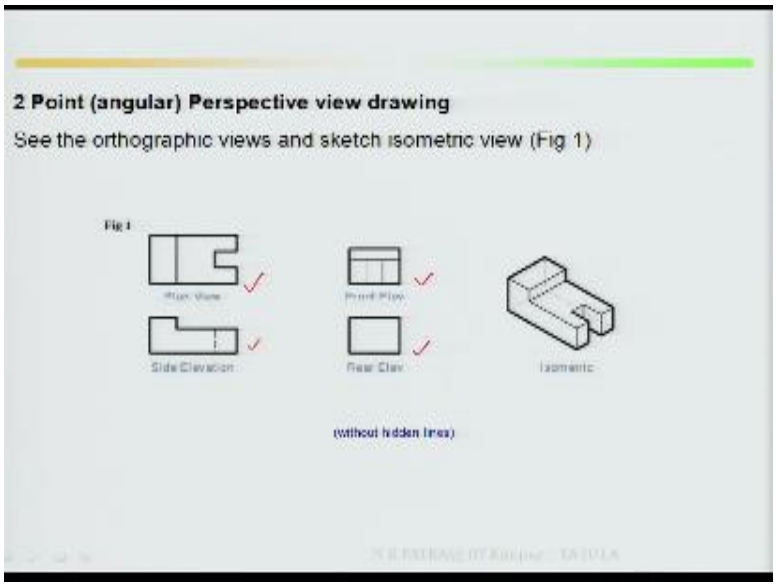

Now this plan view you have to rotate it with the 30˚ so that you can see clear picture in all directions.

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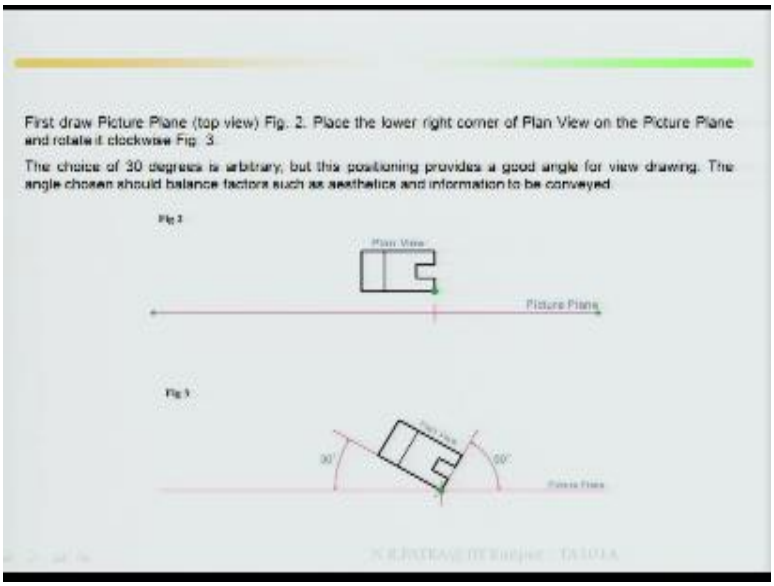

So what happen in the picture plane you put the plan view, then rotate it into 30˚ clockwise. So that you can see both the sides, you can visualize it, so that object will be clear.

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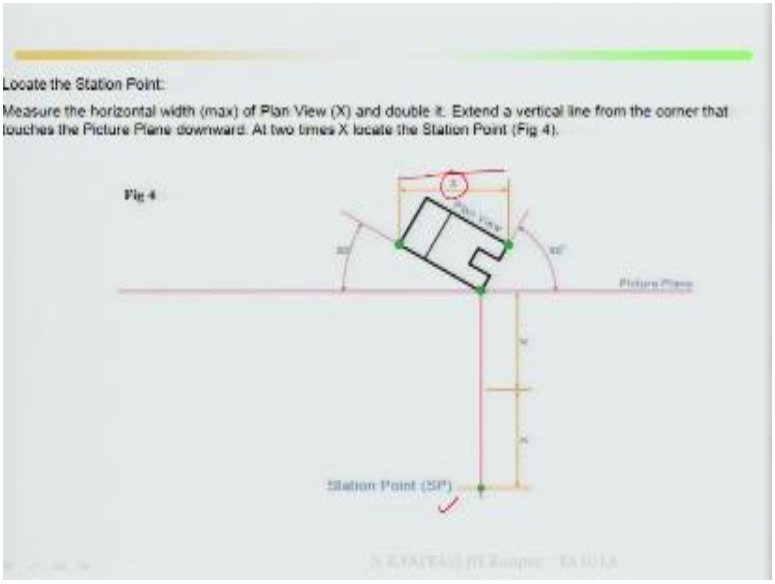

Then locate this station point, once you have a picture plane then make the plan view with your 30˚ and 60˚ or maybe 60˚, 60˚, measure the horizontal width maximum of plan view. This is your horizontal width x, double it that means 2x, extend a vertical line from the corner that touches the picture plane downward. Here one of the corner in plan view touches your picture plane that means your station point will be 2x from this, if the coordinate is not given, if the coordinate is not given.

This distance is your x, so from here once it touches the point where your plan view touches your picture plane it will be 2x. So add two times x, locate your station point, this is a step by step. First step you make it in isometric view so that you can see it all around the object and how it looks like. Then second point is your locate your station point.

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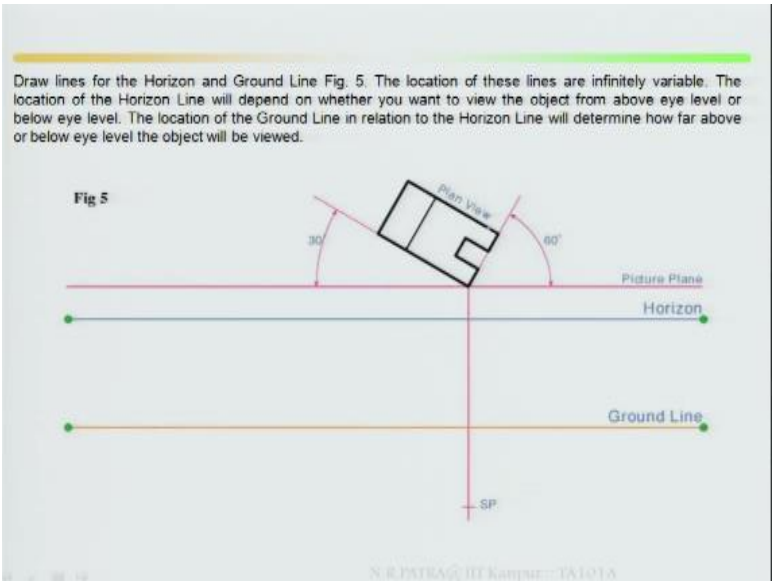

Then third point darw lines for the horizon and ground line in figure 5, draw line for horizon and ground line, the location of these lines are infinitely variable, the location of horizon line will depend on whether you want to view the object from above the eye level or below the eye level. Horizon line particluary you are looking at above the eye level or below the eye level, the location of ground line in realtion to horizon line will determine how far above or below eye level a object will be viewed.

So it depends upon your horizon line and ground line, ground line depnds on your horizon line how far above or below eye level the object will be viewed, then you locate your horizon line and ground line, genrally is a ground line will be provided in the problem some times if it is not provided you choose it appropiately.

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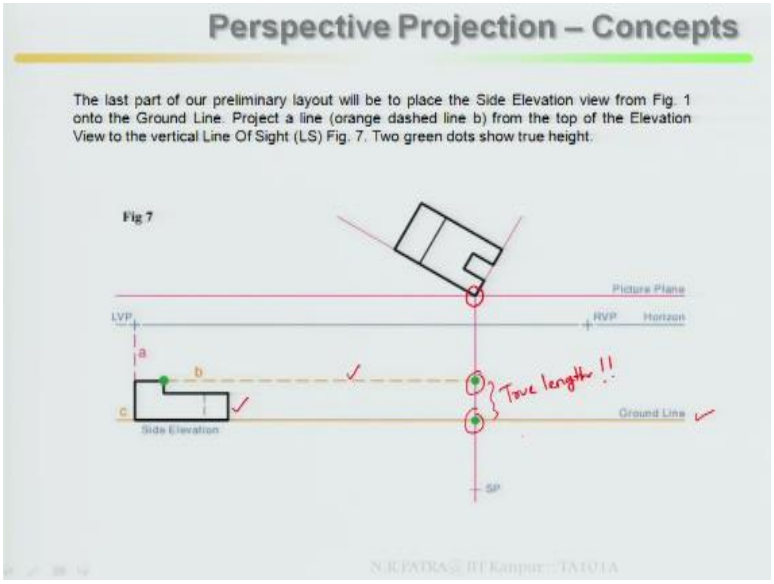

Then once you loacte staion point, picture plane, horzinone line and ground line this is wht you have loacted, then you take your plan view in rotated wise so that you can see isometric view, ismotric view means you can see both sides all the sides, then what is your next step? Draw two lines from the station point, this is your sation point draw two lines from the staion point that are parallel to the bottom edges of plan view, if this is your fiugure 6 that are parallel to the bottom edges of plan view, this is the bottom edge, this is the bottom edge, from here station point draw parallel line, one parallel line with one bottom edge paralell line, with other bottom edge draw another parallel line, next draw vertical lines from point A and B.

Once you draw the parallel line where it intercept here, picture plane, it intercept your picture plane at A and B, from there draw vertical lines, vertical lines intercept your horizontal line. Where the left, right vanishing points? Generally we say vanishing point VP1, VP2, or you can say that left hand side vanishing point or right vanishing point, here it has been marked left vanishing point and here it has been marked right vanishing point will be located. First you have to locate your vanishing point, what do you mean by vanishing point? Vanishing point particularly if your object is here and it is infinity throughout this that means it will converge at

one some point, so vanshing point is it will converge, as I showed ealier from larger figure to smaller, smaller, smaller and at one point it will vanish.

So it will converge at one point, then the last part of power preliminary layout will be place this high elevation, place this side view from fifgure one on to the ground line, if this is my ground line and place the side elevation or side view along the ground line, project a line, orange dust line, this is your orange dust line, from the top of the elevation view to the vertical line of sight. I t has been projected to the vertical line of sight, project it back, two green dots showthe true length, if it is projected back, if it is projected back it is your true length, why?

Any idea why it is true lengh, why it is true length, because this point is touching your picture plane, this pooint is touching your picture plane means this is going isometric, that means there will be a some depth directions or width directions, so this will be your height because this is touching your picture plane that is why this is in your true length, that is the reason this is your true length.

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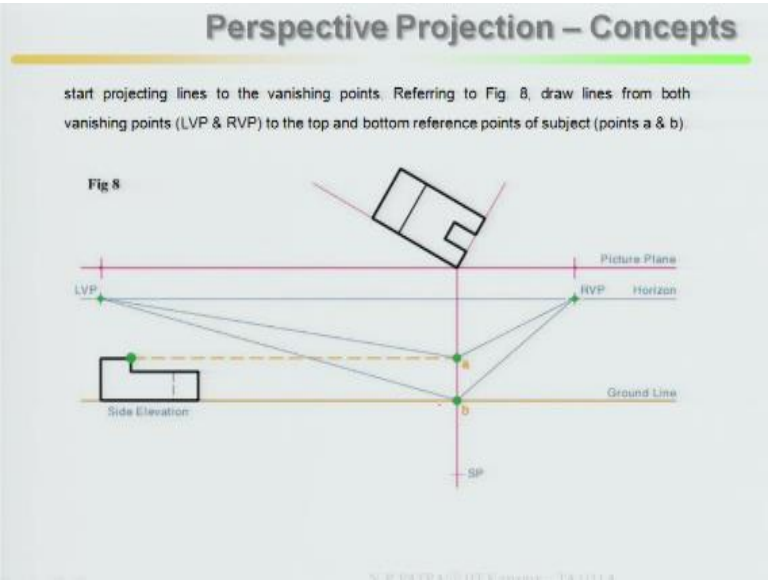

Then next step start projecting lines to the vanishing points, start projecxting lines to the vanishing points referring to figure 8 draw lines from both vanishing point, left side vanishing point or left vanishing point, right vansihing point to the top bottom reference point of the subject. This is your top and bottom reference point of the subject because this is in true length. From here draw a line, join is your right vanshing point, here join your right vansihing point as well as A to left vanishing point, B to left vanishing point, then.

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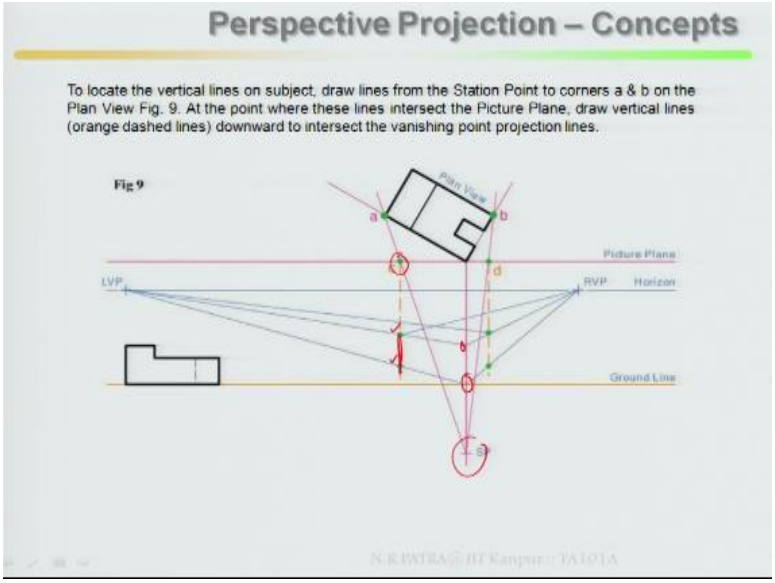

To locate the vertical lines on subject, to loacte the vertical lines on the subject draw lines from this station point to corner A B, this your staion point, draw lines from station point to corner A and B. On the plan view figure 9, on the plan view figure 9, at the point where these lines intersect the picture plane, from here you draw a line to a corner A and B where these lines intersect the picture plane, let us say exmaple from station point to these are the two corners, fisrt one I draw a line joining with point A where the point line intercept is your picture plane.

That is at C, C draw vertical lines, orange dust downward to intersect vanishing point, downward to intersect vanishing point projection lines. From here if I draw downward what happen, from these two points I draw with your right vanishing point, I draw with your left vanishing point,

because I am looking from station point to left vanishing point or left edge I am looking it the point where it is intersecting your picture plane, if I draw the, draw it back, project it back with this two lines, with this two points it intersect with your left vanishing point that you mark. Similarly from this station point to draw a line or look at the edge point B, the line from station point to B where it intercept are point D from where draw dash lines or dotted lines, project it back where it will intercept your right vanishing point lines covering from your true length so you will get two edges.

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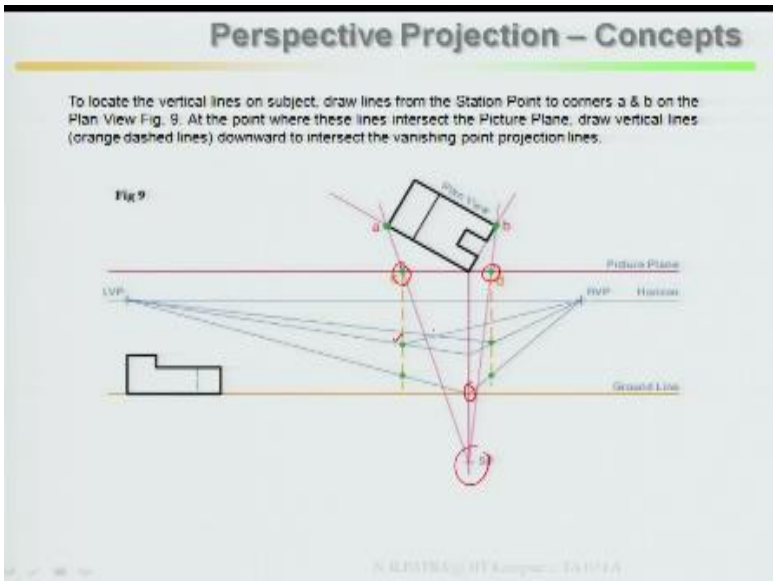

First point means this point is your to locate vertical line from this object particularly each vertical lines you are locating this and this, once you locate this vertical lines what is your next step? Once it has been you will locate these two points and these two points from here at the top again join it back your right vanishing point, here join it back your left vanishing point. This is particularly intersection of left and right vanishing point then you will get the object.

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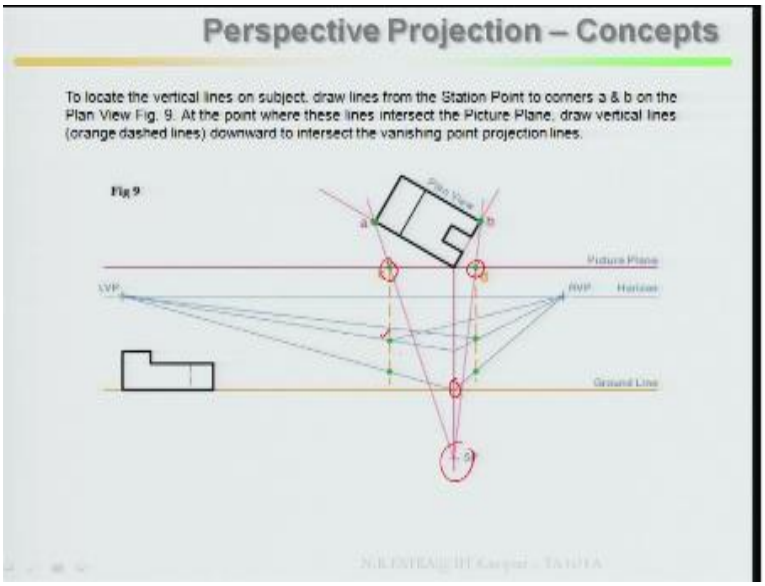

Using the same procedure as shown it in figure 9 find the smaller features on the subject in both plan view and the elevation view, what happen? In previous we identify the edges here, here, here, identify the edges, once you identify the corners edges then using the same principle.

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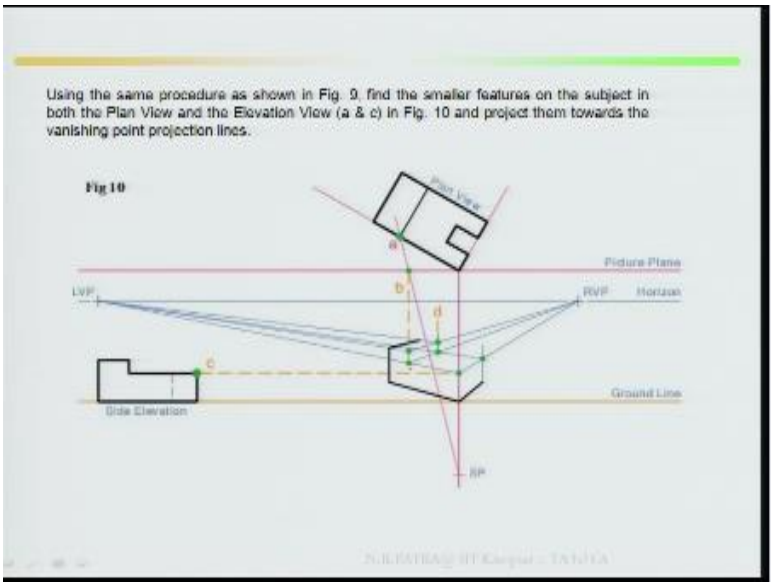

Inside features you identify all the edges, then inside features this, this, this, this, this, same procedure has to be followed. From here station point to look at the inside pictures A draw a line, then where it intercept is your picture plane, then vertical projection you draw it back, then where it got inside edges has to be marked.

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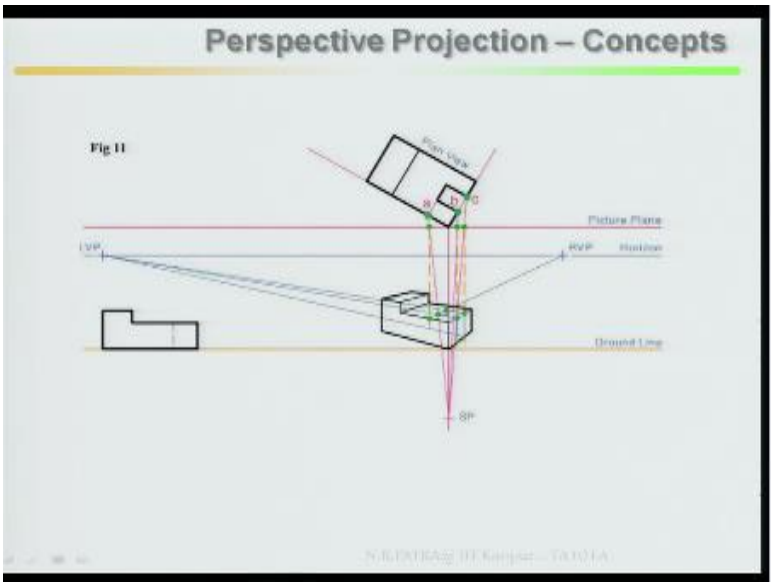

Same principle slowly, slowly intersection points you will get it.

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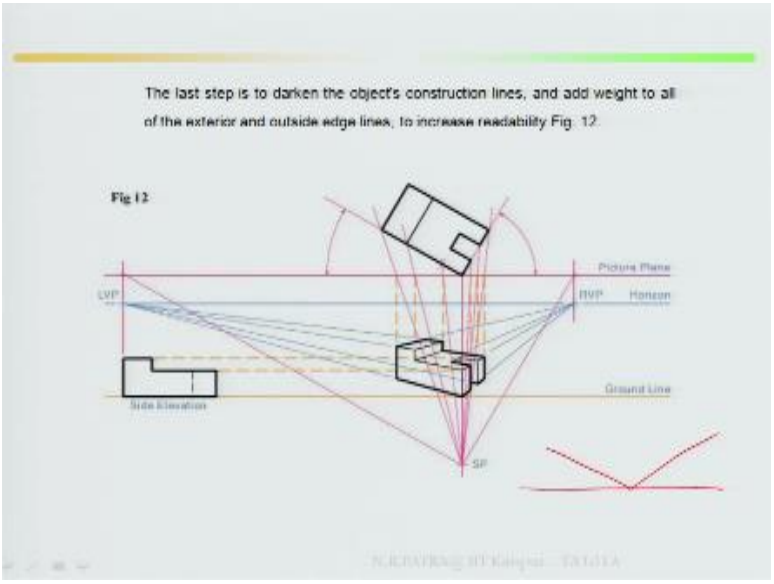

The last step is to darken the object constructional lines and add way to all the exterior and outside edge lines to increase readability, you can read it, if you look at here then same principle mark it with your dark lines. So this is your object in isometric, in isometric what angle you generally do it?

If this is the line then here and here 30 degree. So that it will be 120 degree, 120 degree, and 120 degree. So basically here it has been done with 30 degree. So that what will happen this become a isometric view, you can do it with a isometric view.

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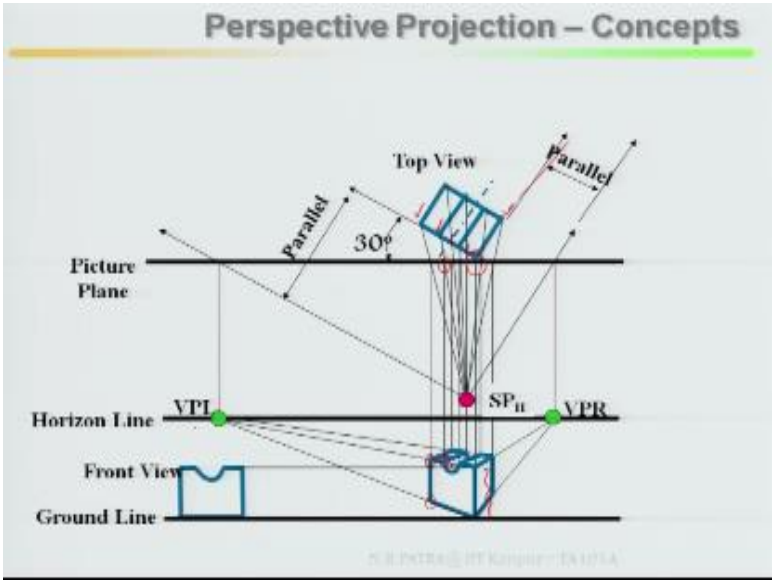

Look at your, first you draw ground line, along the ground line draw the front view this is your front view, then mark your picture plane, then just in animation I am showing with 30 degree put your top view rotate it back with 30 degree, then horizon line you mark it, then take your station point, station point will your maximum width if it is not given then it will be twice of x, then from station point draw parallel to two edges.

Here one is going here, other edge is going here, left hand side edge draw parallel line where it intercept picture plane from there, then from station point to right edge draw parallel lines where this left and right parallel lines intercept your picture plane that you mark, from there you draw the line where it cut your horizon line this is your left vanishing point and this is your right vanishing point VP right, VP left, vanishing point left, vanishing point right, or you can say that VP1, VP2, why?

It is preferable to write left and right, it will say you that this left vanishing point will be features where it is shown in the left side, right vanishing point features in your right hand side, then once it is over next step because this line is joining this point is joining with your picture plane that means this is in true length, that means this is your in true length. Once this is in your true length

then from there join vanishing point left, then from there join vanishing point right, then you get in this face you will get left edge, in this face you will get right edge, right surface right side of the object you will get it right face, then from this station point find it out edges, first one you have to locate the edges, edges has been located and brought if you see it this has been joined with this edge this point is there, then you project it back.

Once you project it back look at, this is coming through because this is your true length passing through here this has to come through within this area, this has to come through within this area. Then go this is your, you join it, similarly this is your extreme edge, then go to your inside edge left hand side inside edge, then from there what is your intercept here? This point from this point draw it back, join it then look at the other edge inside edge this is your point of intersection, then from there join it back and you join right?

Then because there is a if you look at your top view this is a hole, this is a dotted line, this is your center line. So taking into as, taking into as a diameter half of the radius find it out center line, draw the arc, then look at the right edge, right edge has been located from here to here mark it, mark it.

So the right surface will be located in this face, from here to here because it is vanishing here, so you project it back so this point will be there, then from there again you join it back left, this is the outer surface, join it then what will happen join it, then what remaining, you have checked this, this, this, this, now you have checked this now it is remaining. Look at this then project it back, so where it will be there, once you project it back this is going like this.

So from here this point is your right face, so from here again it going towards your left vanishing point, so from here we have joined with your left vanishing points. So once you joined it back from here project it back it will be along this line, so you mark it, join it. Similarly join it, then go for this, edge back it, join it, then go for other edge, back it, join it, then draw it semi circle.

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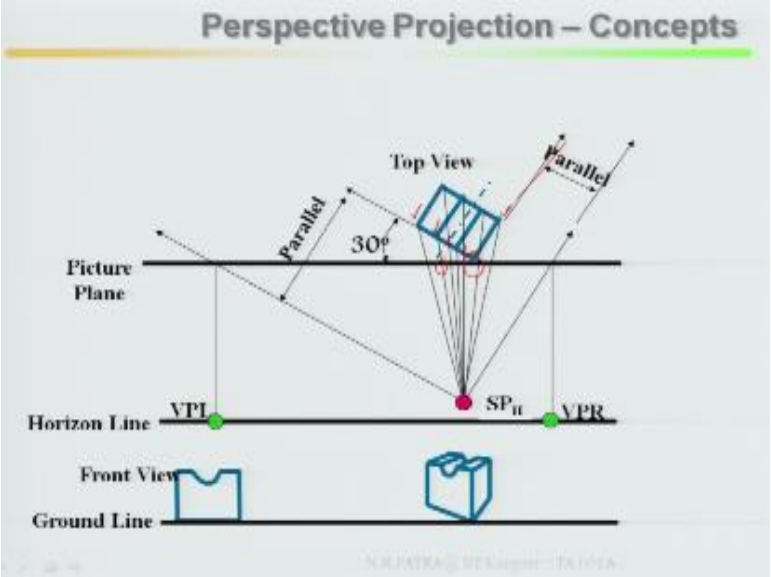

Look at the objet how it looks like, this is your object how it looks like.

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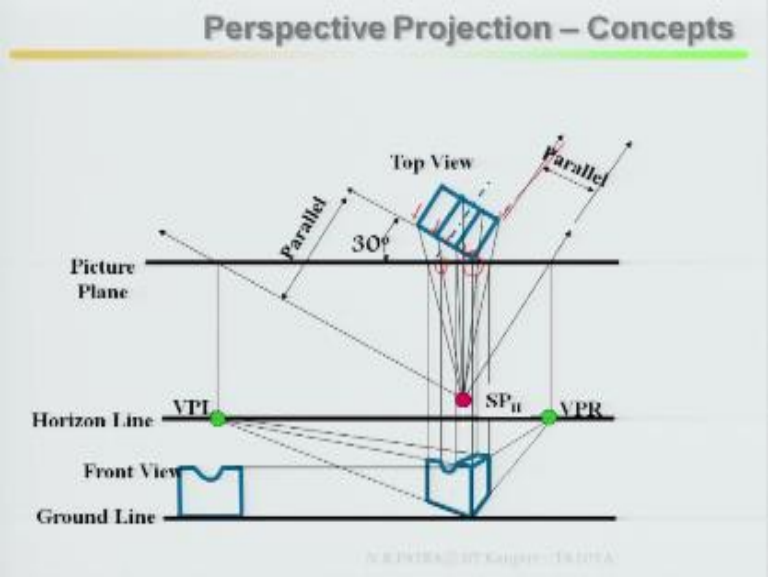

Once again just I am repeating for your, because these are the steps if you understand very well I do not think there will be any problem in drawing particularly your perspective views.

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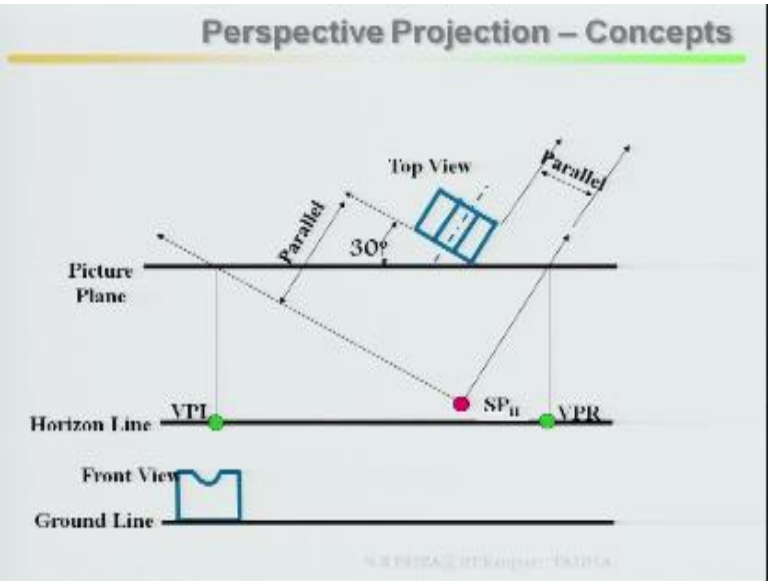

So this is your problem given, first you draw the ground line, then along the ground line either front view or side view you put it here, then draw the picture plane, then take this with your 30° your plan view, put it and join one of the edge is joining or touching your picture plane, then horizon line you draw, then locate your station point, how do you locate your station point? You locate your station point measuring maximum width x, it is your 2x, then from there draw a parallel line with respect to left edge station point, then draw a parallel line with respect to right edge from the station point, both these parallel lines where it intercept picture plane from there draw vertical lines, where it intercept is your horizon line that gives vanishing point left, vanishing point right.

Then edge, one of the edge touches your picture plane, one of the edge touches your picture plane that particular point or line gives your true length.

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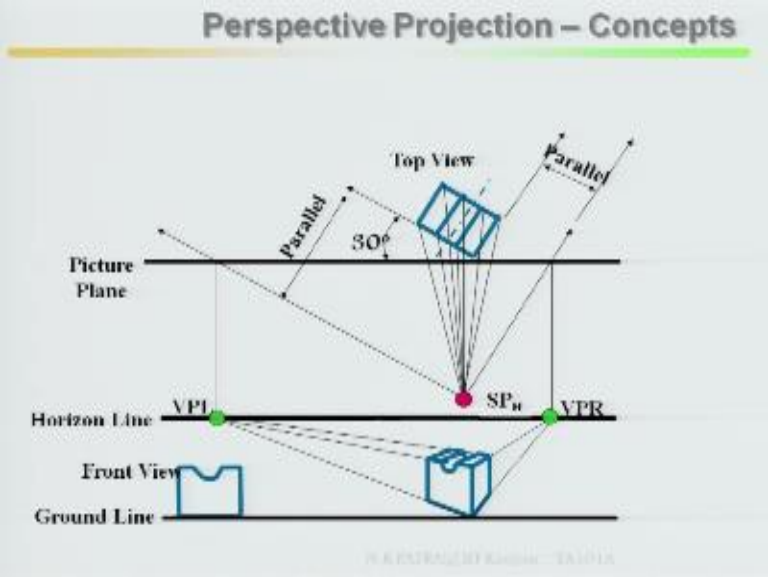

So from this front view, from this touches the picture plane you draw it back, project it back, from the front view extend it so this is your true length, with respect to true length this is your length join is your vanishing point left, vanishing point right, once you join it then it is over, first part is over. So this surface along the surface you will get left side face, along the surface vanishing point you will get right side face, then you start locating left side face point by point.

Now first you go to your outer edge, mark the point, project it back, as I said this gives your left face, so this you mark it, then go to your inner edge of your left face or left edge, then project it back, then draw it, then there is a center line as well as there is a circle here or hole here we do not know. So then inner face you mark it, then draw it, then your semi circle you plot it taking into consideration this is your diameter, this is your diameter tape, identify your center line, draw your arc, then go to your right side face, right side edge, mark it along this, this is your right face.

Then draw it, then mark it, then draw it, then go to there, then draw it, go to right side here right side edge, then you are going towards your left face, left face. Then going towards your left vanishing point, finish it off, inside edges mark it, draw this lines, draw it and remove it and darken.

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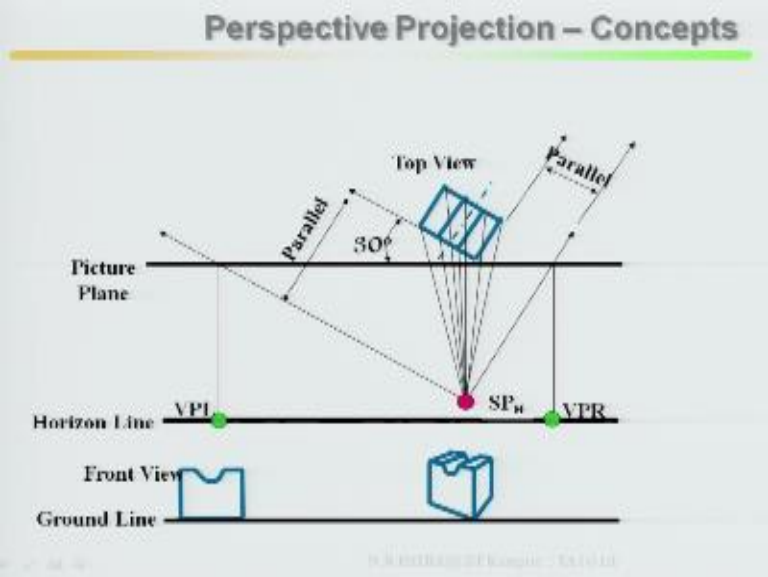

This is your perspective view, what I have explained please go through this and I will start more examples in the next class and we will go for more complicated problem where plan view or the object is not touching in picture plane.

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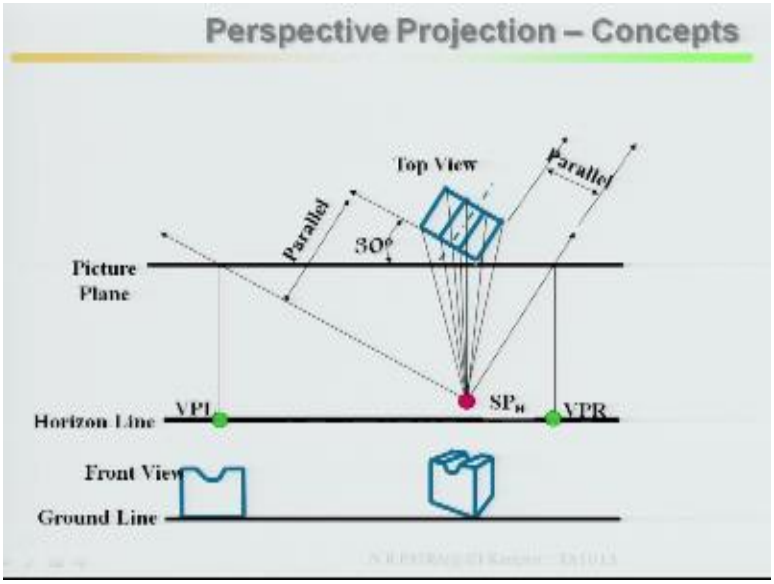

In this case one of the edges object is touching in your picture plane, where it is not necessarily that object is touching your picture plane rather object is some distance away from picture plane, this cases I am going to explain. Thank you.

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