AUTOCAD STAIRCASE PRACTISE

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Plan

After making the elevation of a plan and top view, now we can make the elevation of a staircase. For making a staircase, we can first start on that sheet the plan, which we was made earlier, or if I want to make in a new sheet then we need to set dimension and page (Basic settings). First, we need to on some settings like DYNAMIC INPUT, ORTHOMODE, OBEJCT SNAP TRACKING, and OBEJCT SNAP. Make sure that all setting in the object snap are on. Then set the units. In addition, set the insertion scale to FEET and INCHES. Set the length type into engineering.

Some basic dimensions need to be remember.

Floor height = 10 feet (in this room, 7 feet up to chajja, chajja = 6 inch, rest = 2 feet 6 inch)

Wall thickness = 9 inches (Here used 6 inch)

Design of Staircase

Riser = 6 inch

Tread = 10 inch

Width of Stair = 3 feet

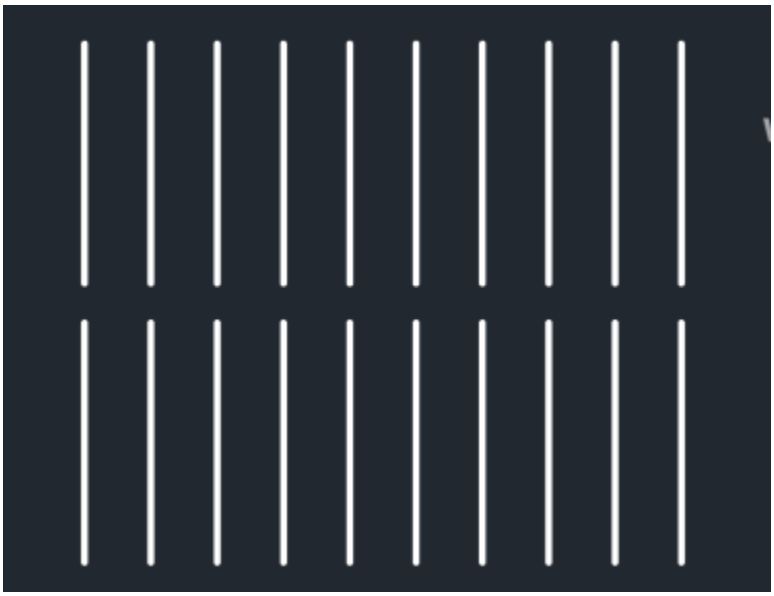
Width of Landing = 3 Feet

Waist lab = 6 inch

Railings = 3 feet

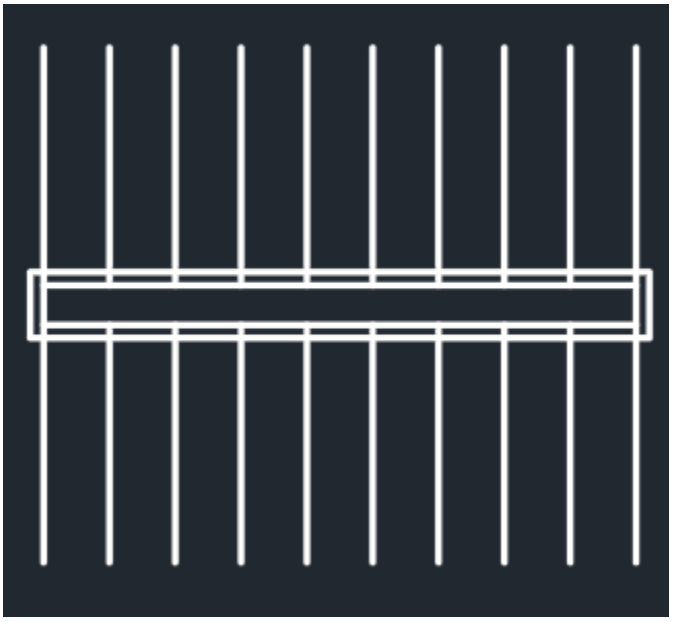
First taking L for line, then make a line of 3', then press esc. You can change the thickness of the line for better understanding. You can make the thickness to 0.30 and you can enable the lineweight. Now make an offset to the tread distance (minimum, you can make 12 inch or 13 inch also). Width of stair needs to be minimum of 3 feet. You can take more than 3 feet as per IS standard. We will make an offset of 10 inch in this case. Then we need to take offset line 10 times for showing 10 steps. The final picture look like this

Then select that 10 line, and copy in the above (height will be 3 feet and 6 inches).

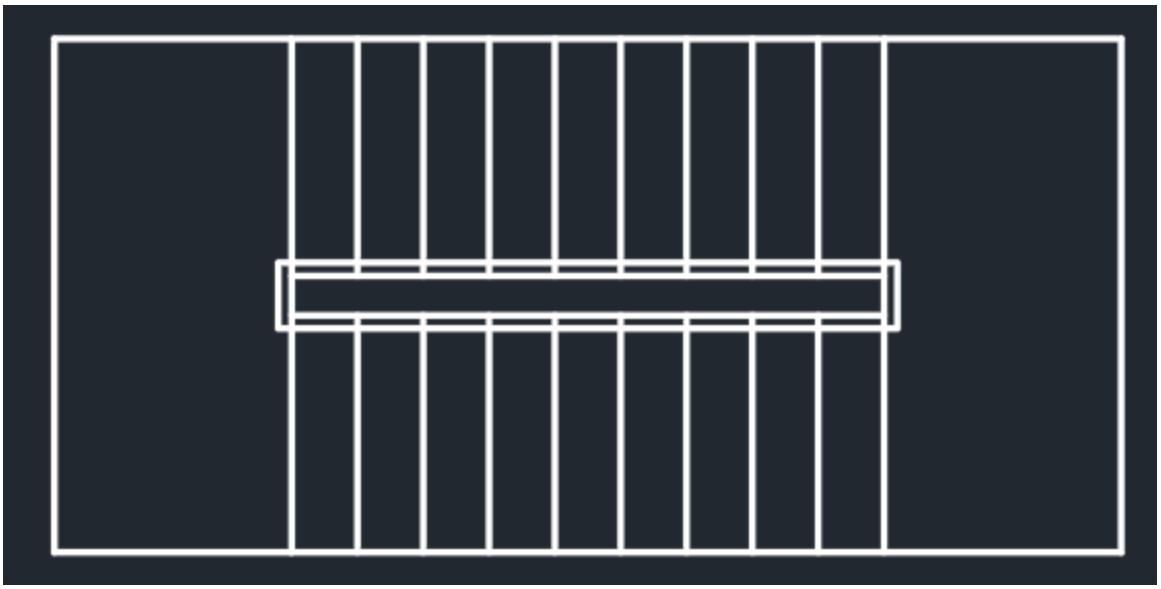


This distance will help to provide a gap in 6 inches and the total steps are 20 in this case. Need to remember that the **steps depend on the floor height. Here floor height was 10 feet, riser was 6 inches so the total number of steps will be 20.** Now take rec for rectangle and make a rectangle in the gap of two stair lines like this.

For showing railings, we can make 2 inch (you can make 1 or 1.5 inch also) offset of the rectangle in outer section. Like this



Now we will draw the landings. For that, we need to take line command, then adding first line top to last line, then use the distance 3 feet in horizontal, then in the vertically lower side, take 6 feet 6 inches, then close the line by adding the lower parts of the stairs then take again 3 feet and then add the rest like this.

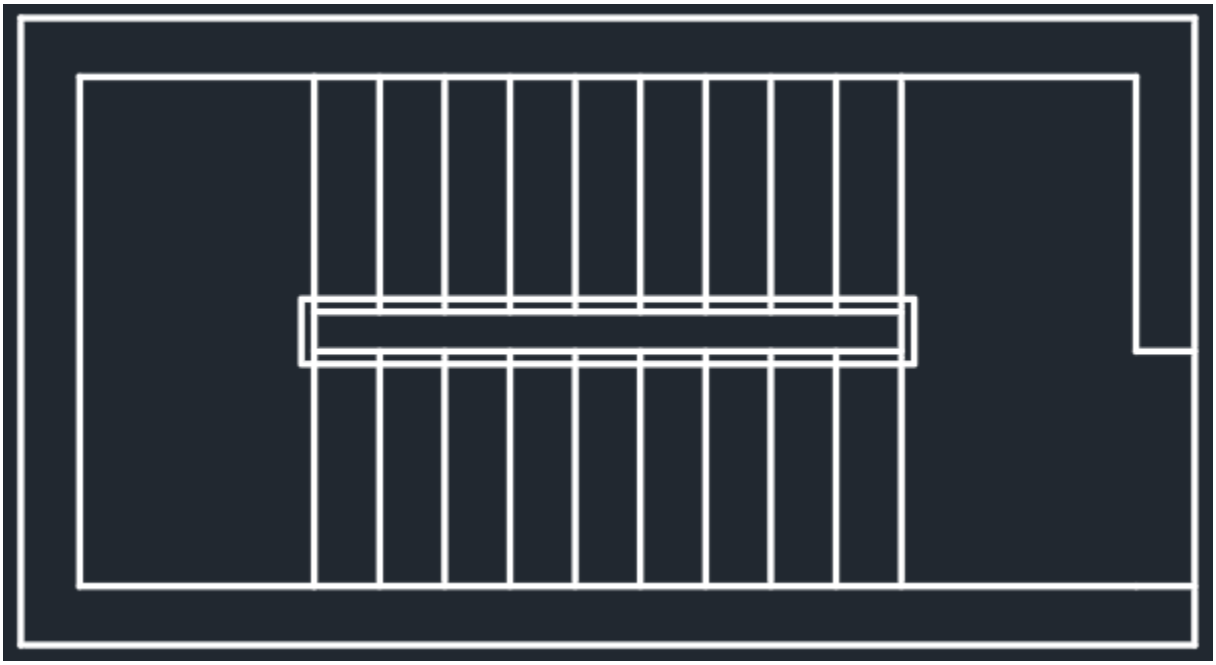


As per IS standard, the width of the stairs and the length of the lending (minimum) not below that. You can use more distance into lending but not lower than that.

Now take offset of 9 inches for outer walls. Then take offsets. Like this

Now use F then enter to use fillet, then radious of the fillet need to be 0, then click the lines to extend. 0 will help to make corner like this

Now we can show a door. For that, taking a line, in the lower right side, then taking offset of 3 feet, then TR double enter to trim the inner line like this.



If we need to fit a door, CTRL +3 then go to architecture, select imperial doors if need to take in feet inches, or you can choose Metric door for taking in MM. Selecting imperial door and placing

in the side first. Then open the door in 90 degree and rotate according to plan, then move to the specified location. After placement, adjust the size like this.

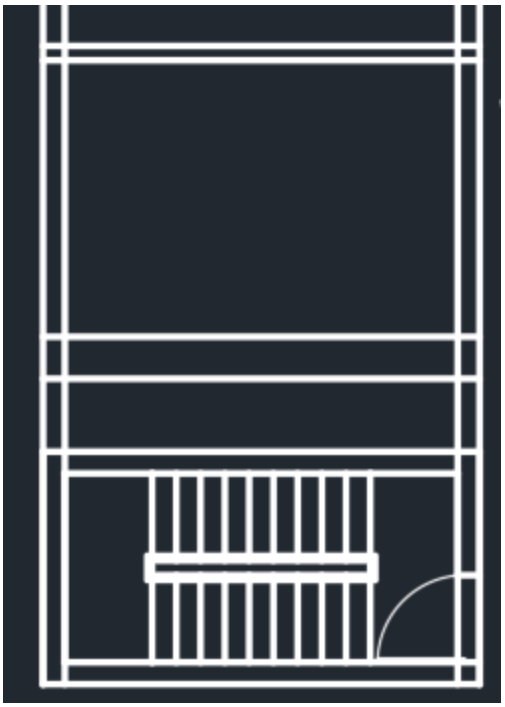
Sectional Elevation

After making planning of the stairs, now we can make its elevation. It is the most complicated part of a building planning that is why it comes with many complications. We can start making sectional plan of staircase by making projections. For that, we can use the RAY command. Now make the sectional walls of the stairs. We can use XL enter then V enter to make vertical constructional line which is easier from the RAY command.

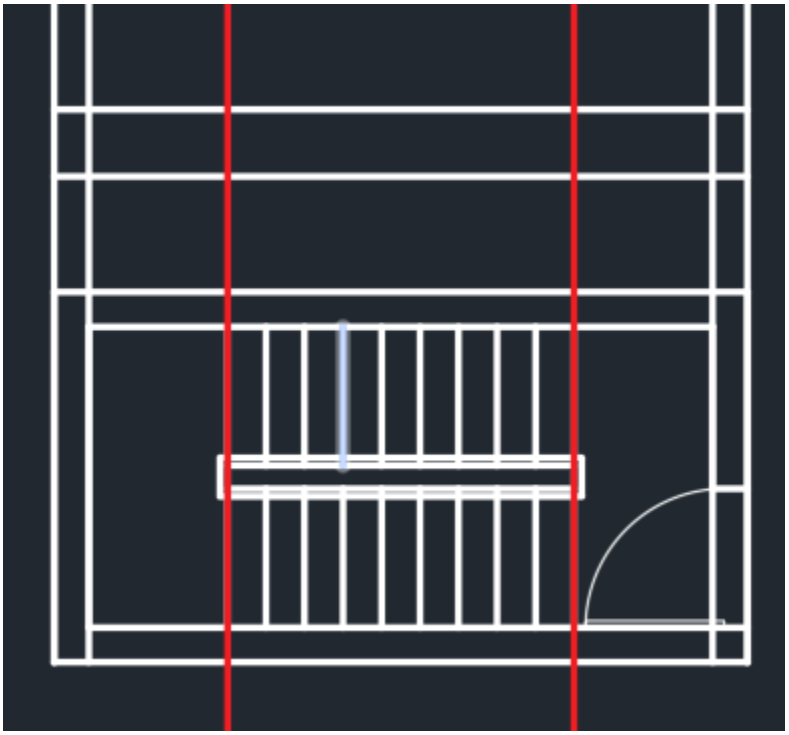
After doing vertical lines, we need a horizontal line so make a horizontal line like this

Now we need to take the plinth height. For that, we need to take an offset of 2 to3 feet. Here we are taking the plinth height is 2.5 feet. It will look like this

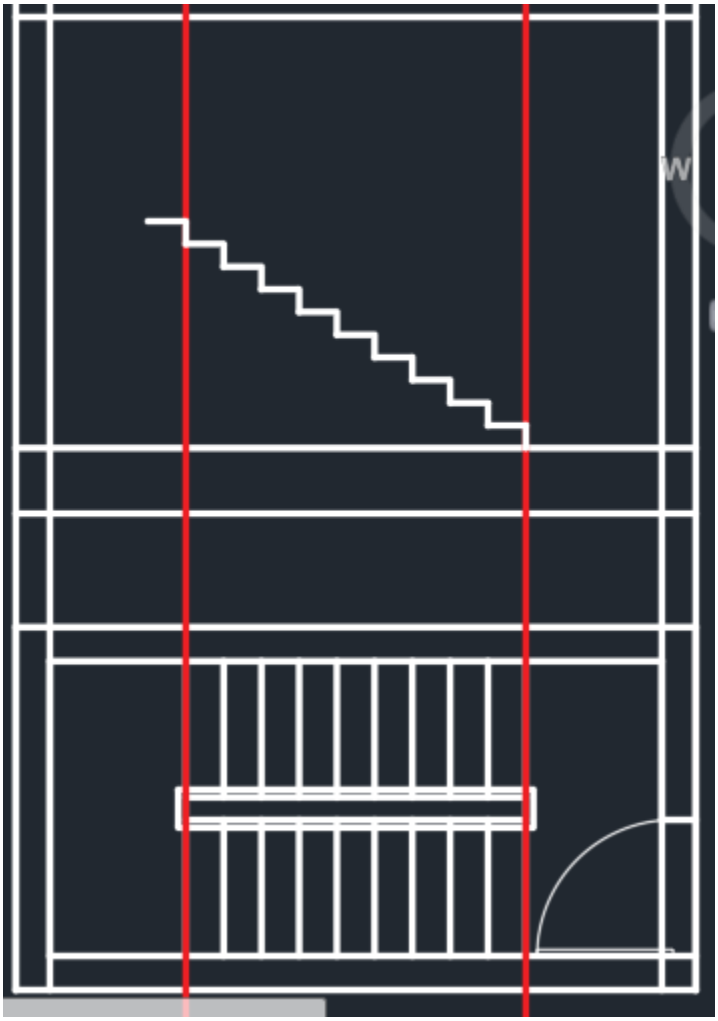
Now we can take the height of the floor. For that, we need to take 10 feet offset from the floor height. We can also show the thickness of the slab, for that we can take 6 inches thickness.



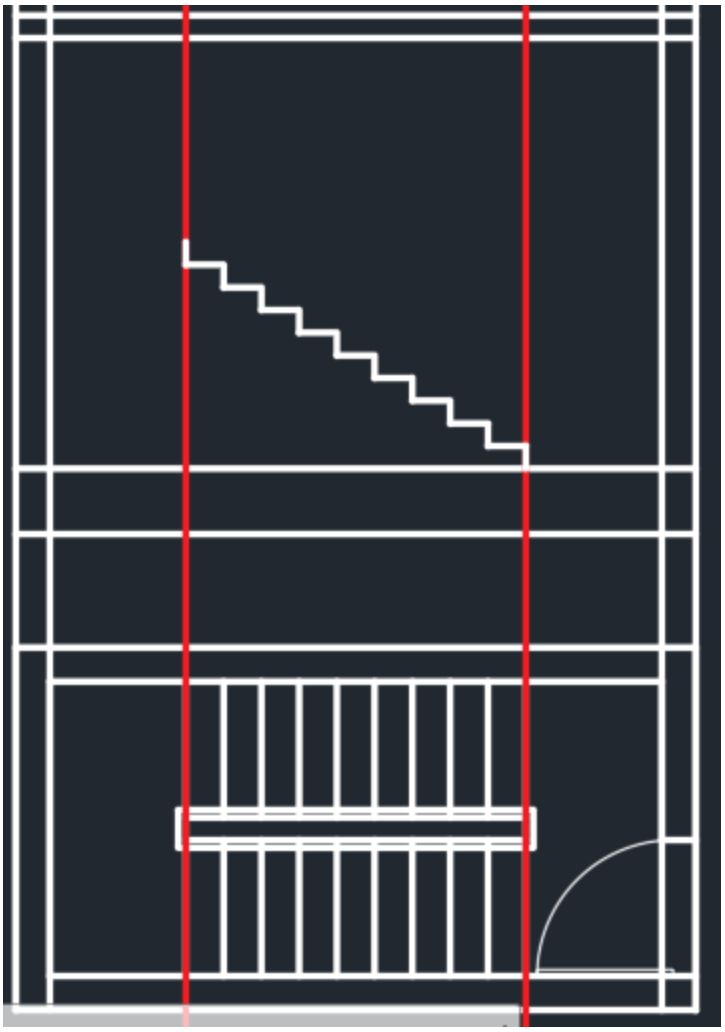
In this picture, total height is 10 feet and the thickness of the slab, which is shown from the upper horizontal line, is 6 inches, which comes for landing. Now we need to take more constructional line. For that, we can use XL enter, then V enter. You can use other color for avoiding confusion. Then we need to take two lending points like this.



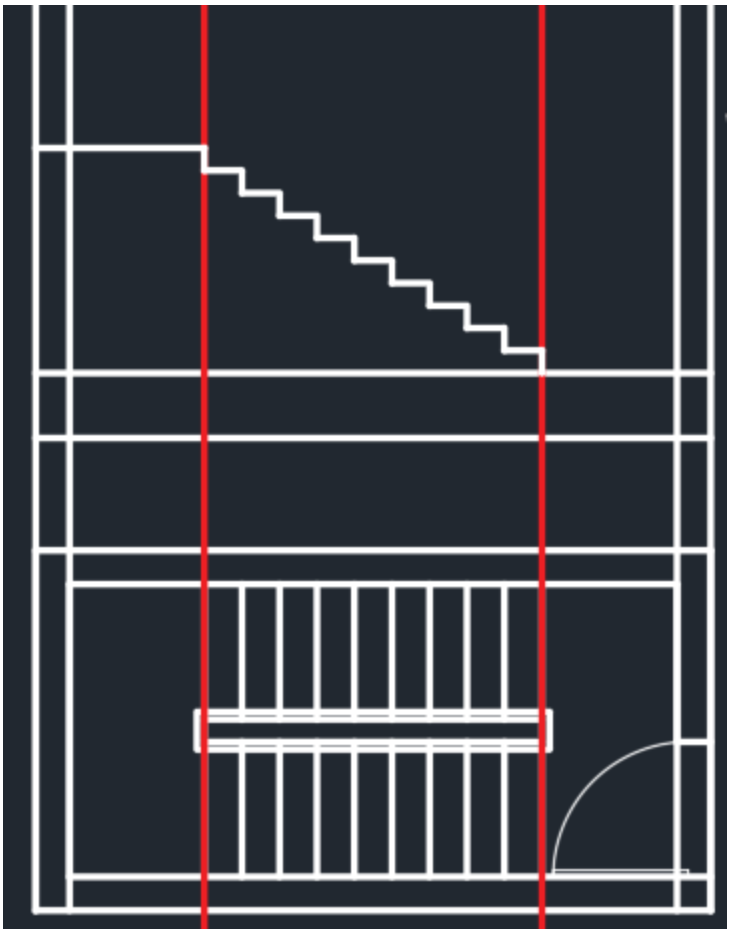
The two places in each side from the red line is for landing. In addition, the mid portion will be for steps. For making steps, we can change the color for the steps. We can use here POLYLINE by using PLINE command. You can also use line command as well. To make stairs, we first take PLINE, then starting from the landing line on the door side, then take vertically 6 inches line which is also called riser, then 10 inches horizontal line for treed. Then copy these two lines, and paste into number of steps drawn in the plan. You can off the ortho setting for better placement. You need to make 10 steps this way like this.



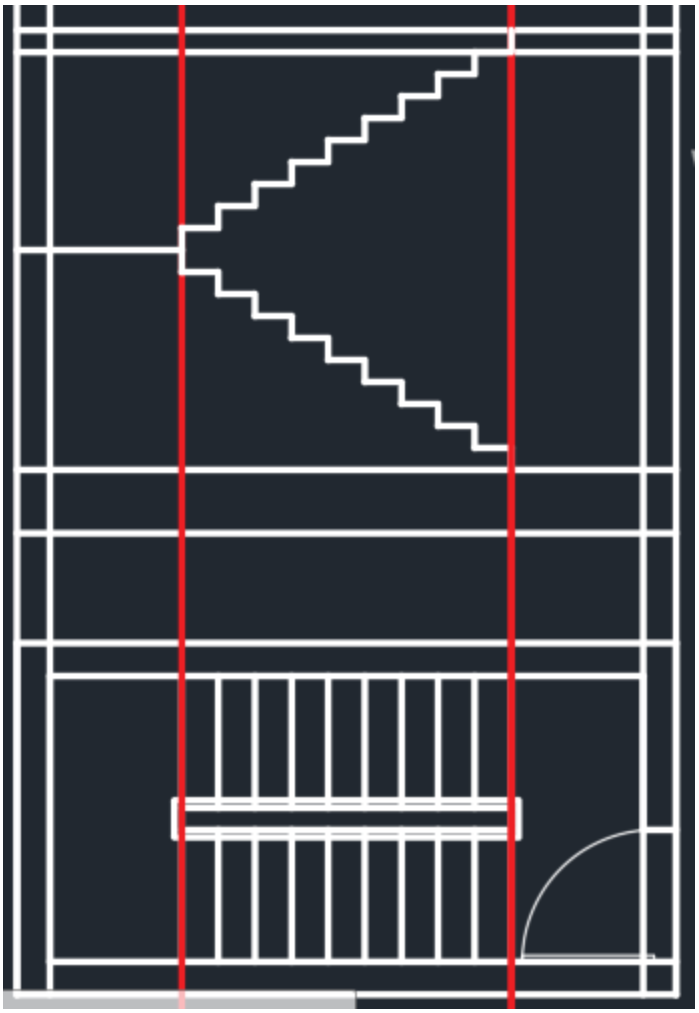
The last portion, which is extended from the red line, can be trimmed.



Now we can make the landing point. For that, we can extend the line which is seen below



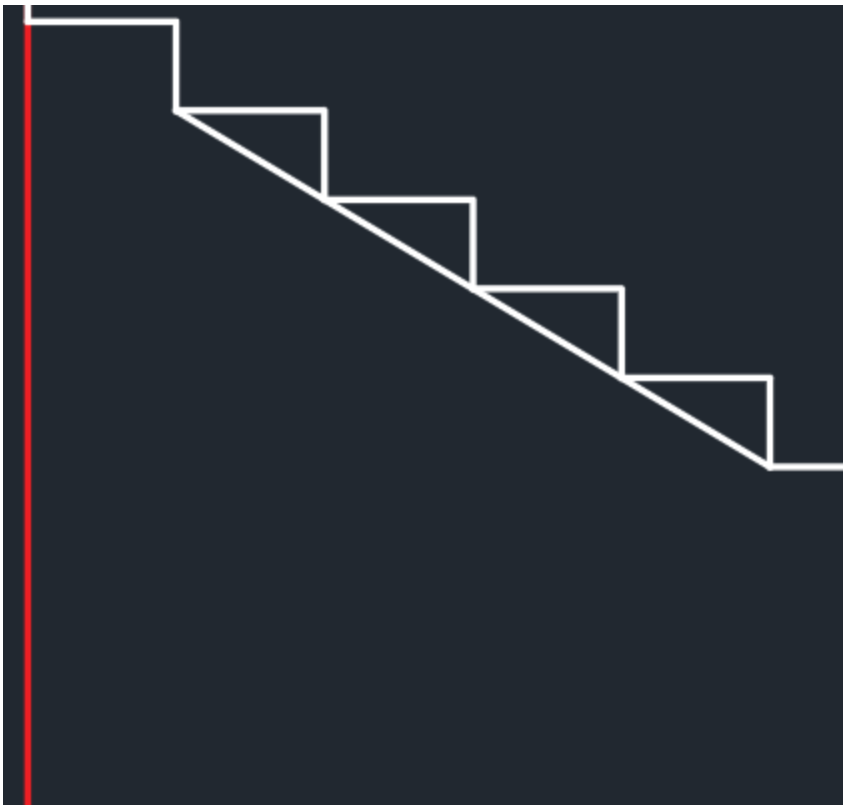
This portion is for lending and this portion need to be provided with beam. Now this entire thing can me mirrored. For that, we need to make select the stairs, then press MI for mirror, then select the mirror line, which will be the middle line (lending line that made in the vertically middle position). After mirroring, the drawing will look like this.



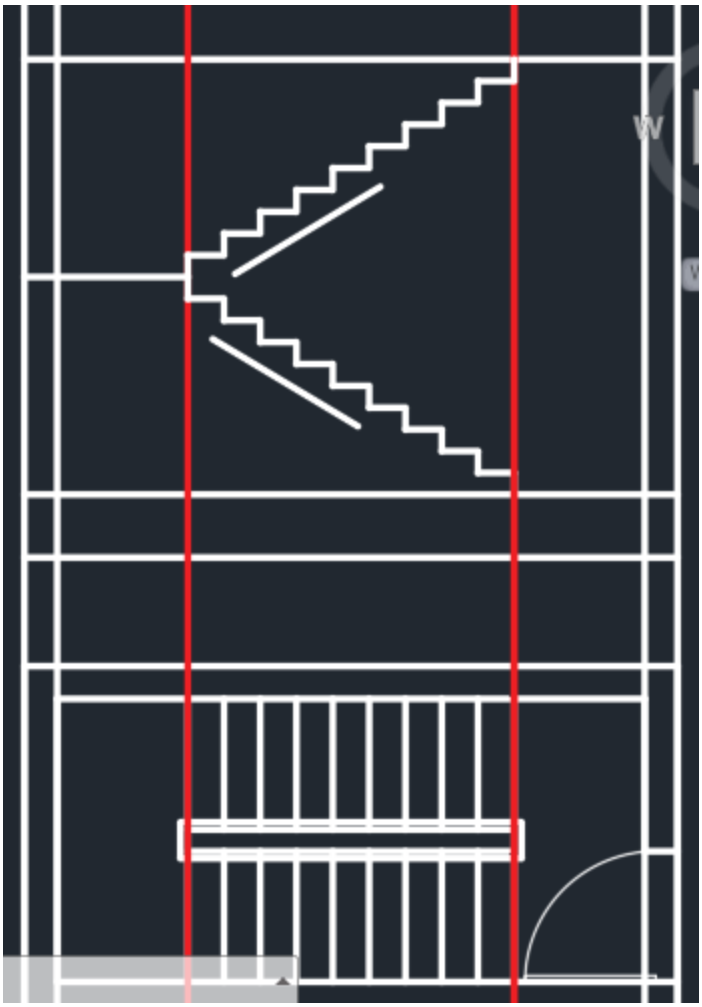
Sometimes, we need to make the 18 or 16 steps for the same height, that time, we need to make higher riser, maximum we can use 8-inch riser. More of riser high than 8 inch, it will be hard for someone to climb. Generally, 6-7 inch is comfortable.

Waist Slab

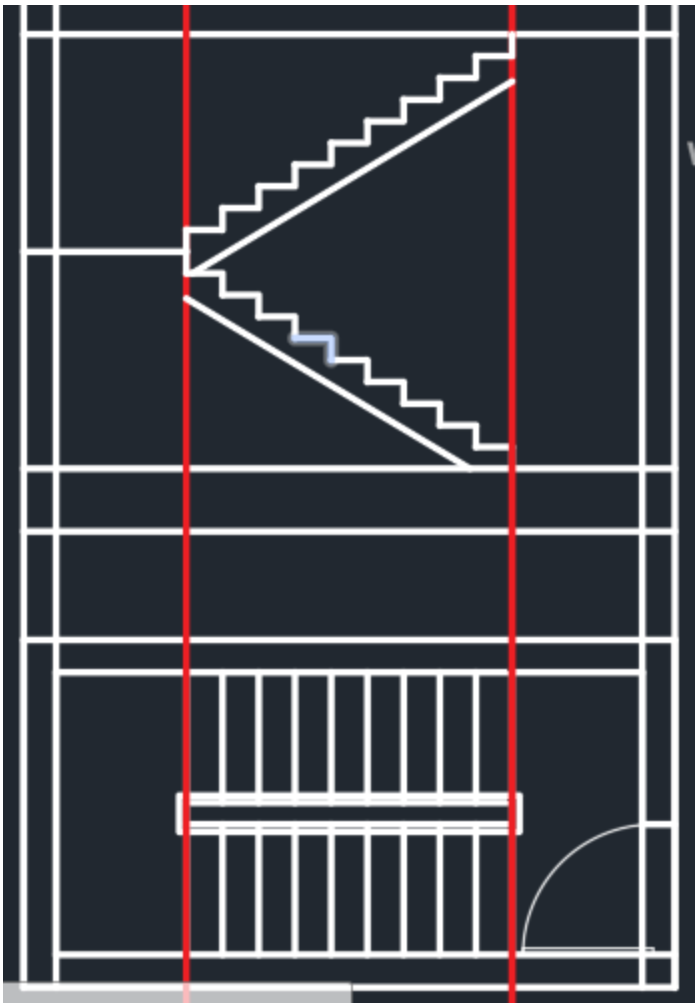
Waist slab is called the slab, which is given below the staircase. For making a waist slab, first, make a line, which is connecting on the bases of the stairs like this.



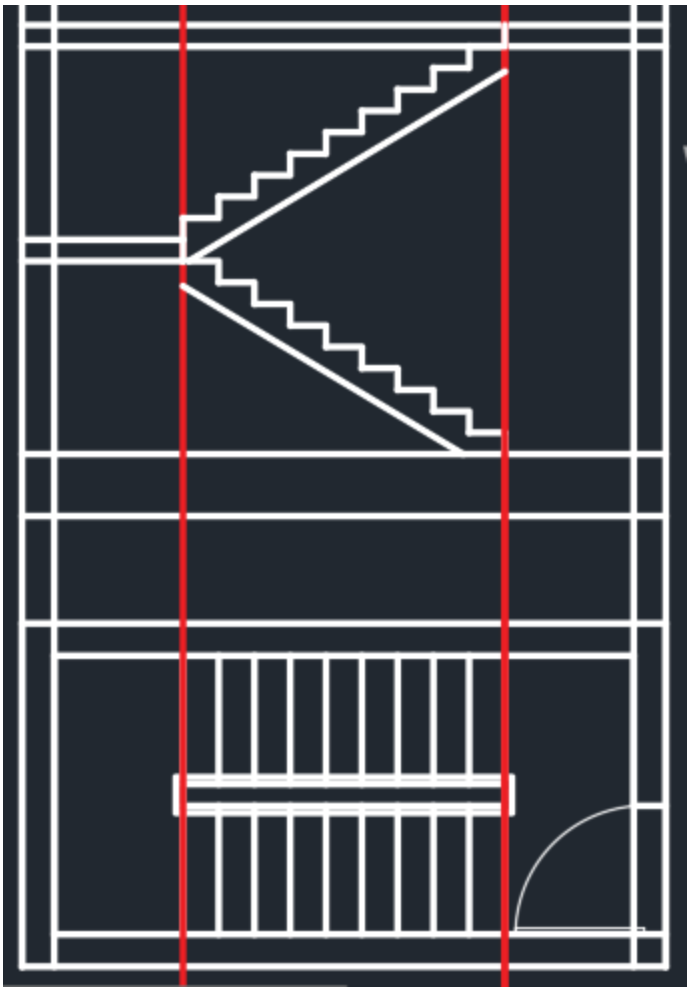
After this, make an offset of 6 inch. You can make 5-inch slab, but 6-inch slab will be better. After making the offset of the line (which is called waist slab), the upper line need to be deleted. The picture will look like this.



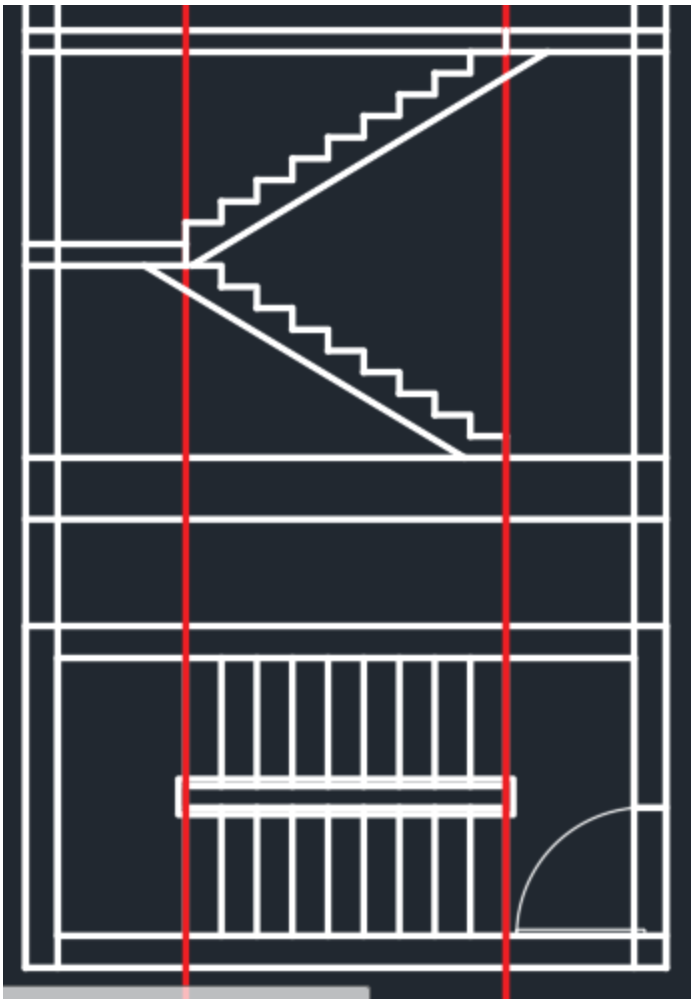
After making the waist slab, we need to extend this portion or lines. For that, type EX then press double enter, then extend the lines.



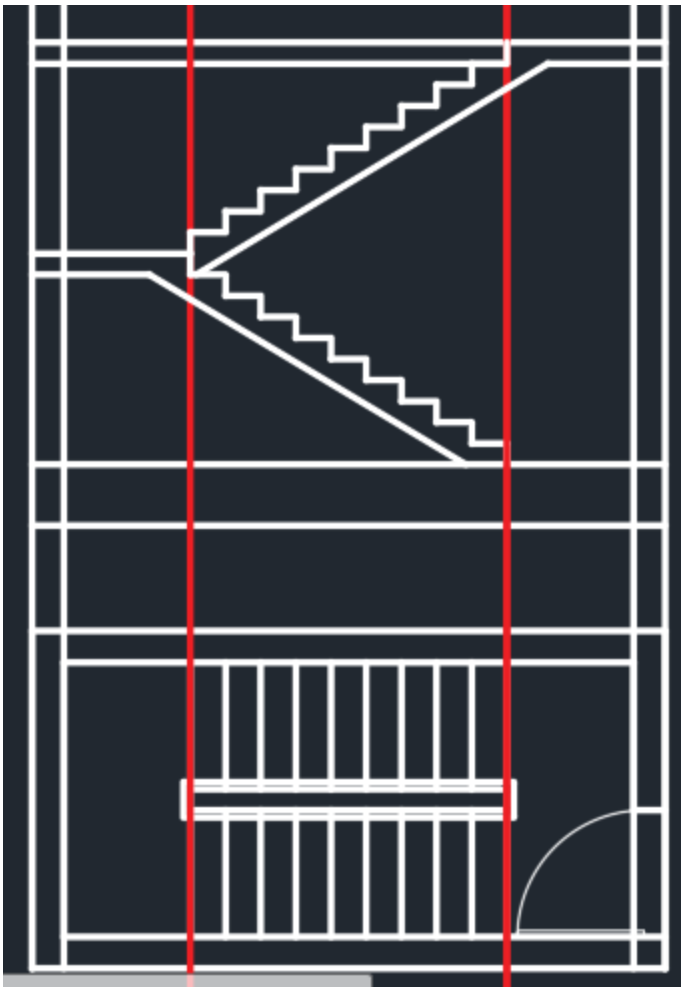
After making these lines, we need to make thickness for the landing. For that, we can use offset of 6 inches.



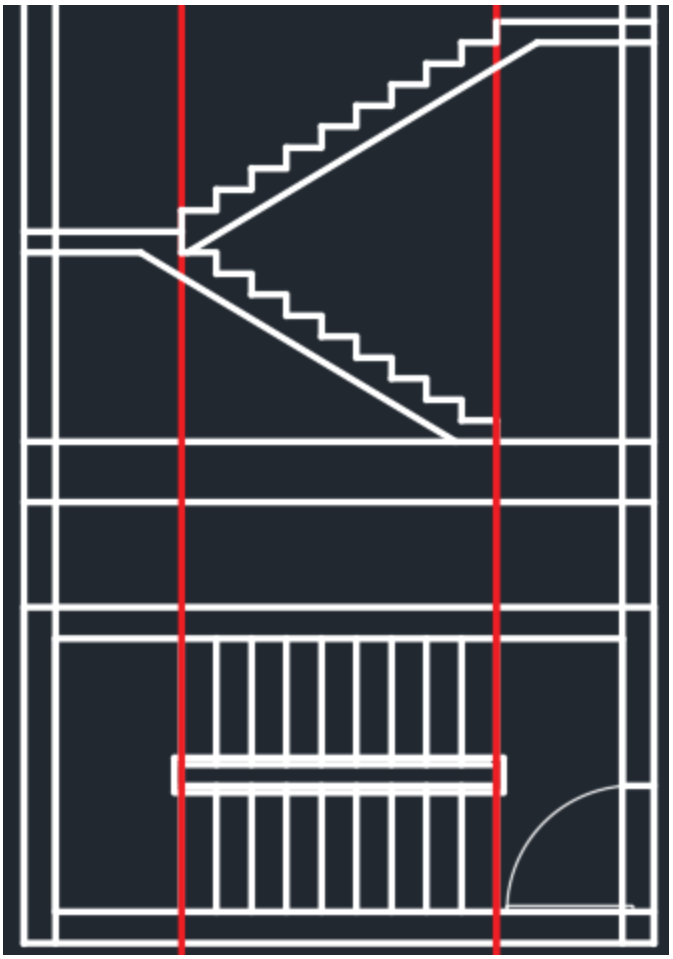
Now the waist slab needs to be go up to the lending height. For that, we can extend the line.



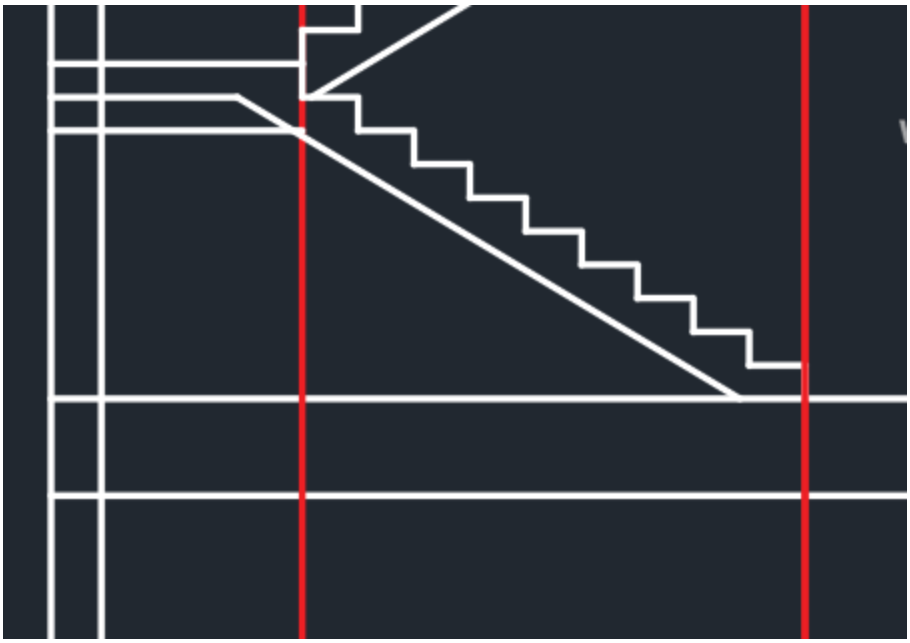
Now we need to trim the extra portion, for that we need to go to the extend command, then pressing shift, then the lines can be trimmed, like this.



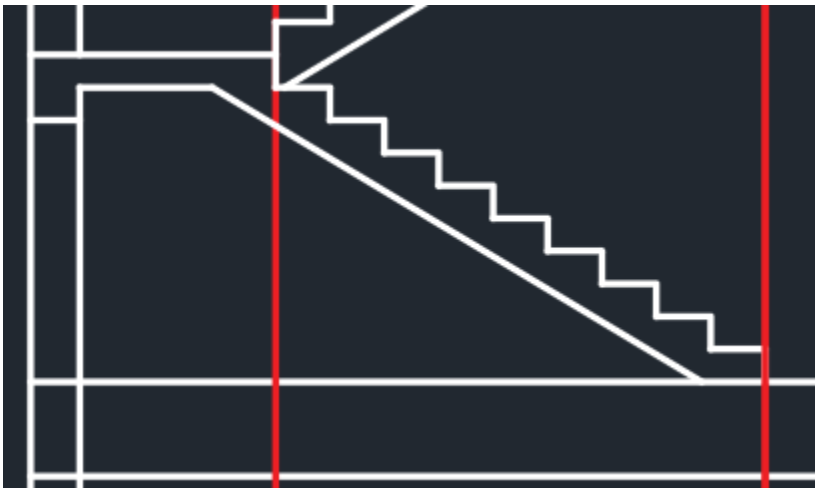
Now the above two lines are not needed, so we can remove those two lines like this.



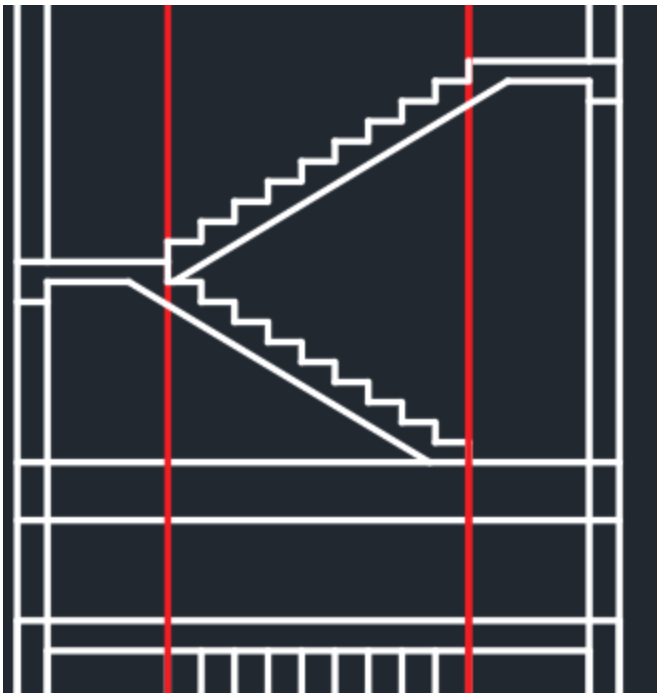
We made the lending, but the issue is that the lending needs to a support. For that, we need to provide a beam. We need to make a beam in the middle of the wall. Also in the lower landing, we can use a beam. However, in the sectional view, the showing of beams are not so necessary. We need to make a wall beam only in this case. Therefore, for making a wall beam, we can take an offset of 12 inch, and the offset we need to make from the upper wall, like this.



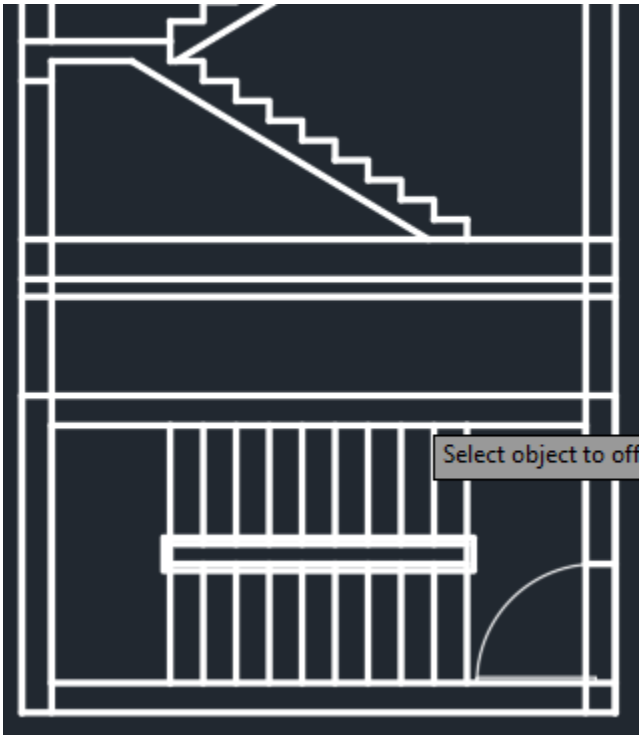
After making this offset, the rest portion needs to be deleted. The final drawing look like this.



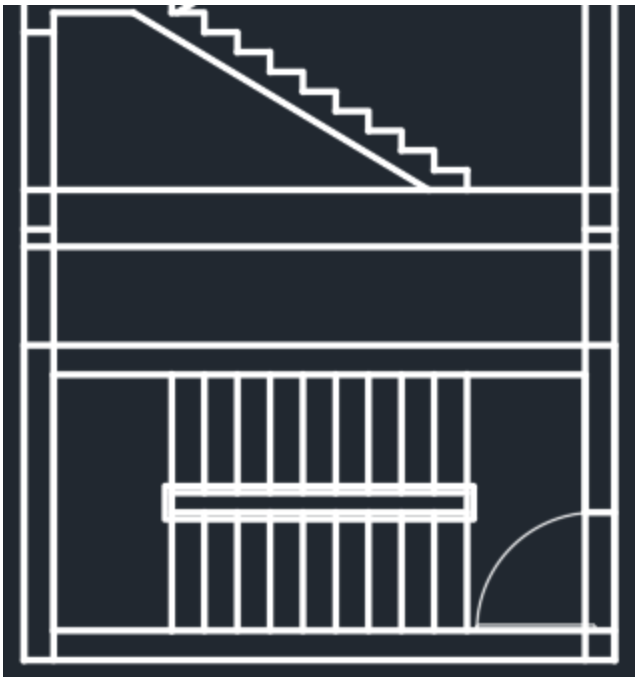
This portion will be filled with concrete up to beam. Same as below needs to do in the upper portion as well.



Now the projection lines (red lines) need deleted, as it not need now. In the lower section need to make a beam where the door stands. Which is also called as plinth beam.

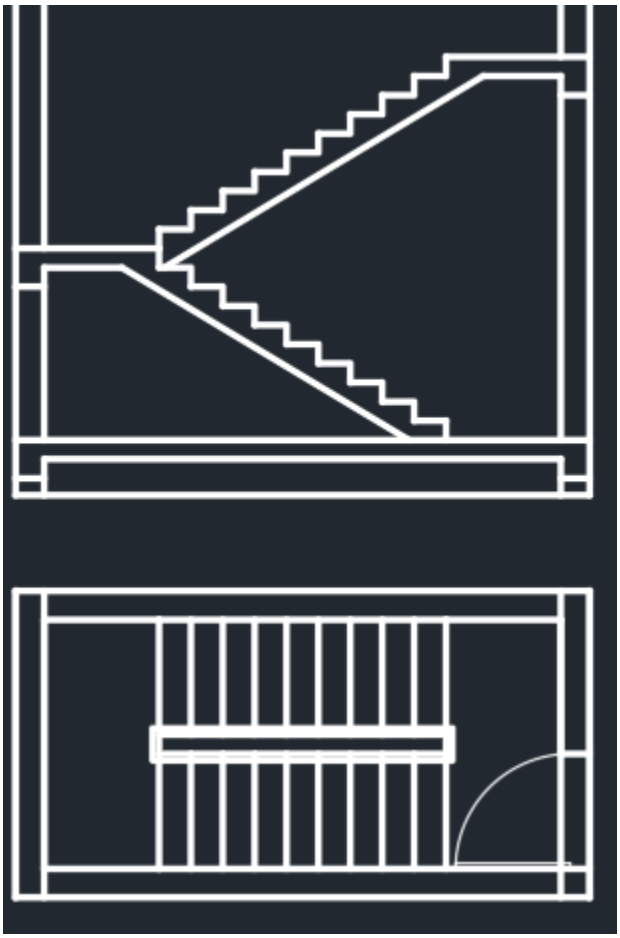


After making the line, trim the mid portion.

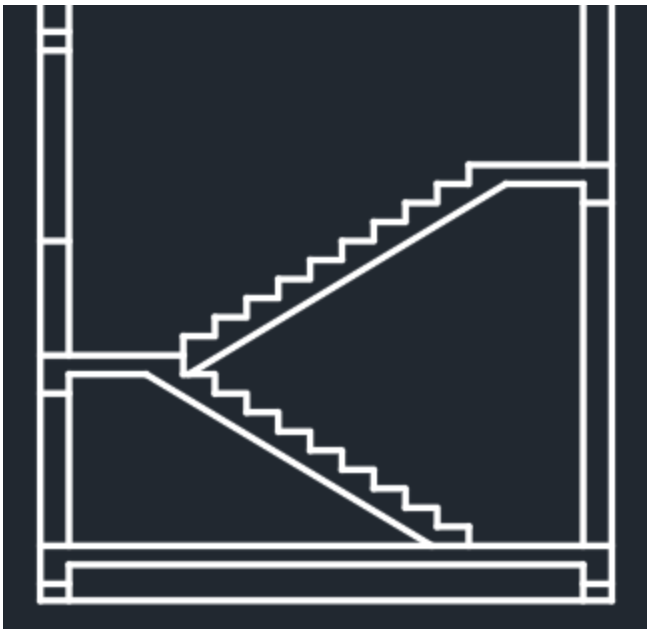


Then we need to make the thickness of the slab, which is 6 inch. In addition, the side portion will be deleted like this.

Now the extra lines can deleted (ray lines, which used for making the elevation).



Now we can make a window in the landing portion. For that, we can make 3 feet offset from landing for seal height. You can make more or less high window but here we are making 5 feet high window. Then making lintel beam, making offset of 6 inches. Then trim the extra portions.

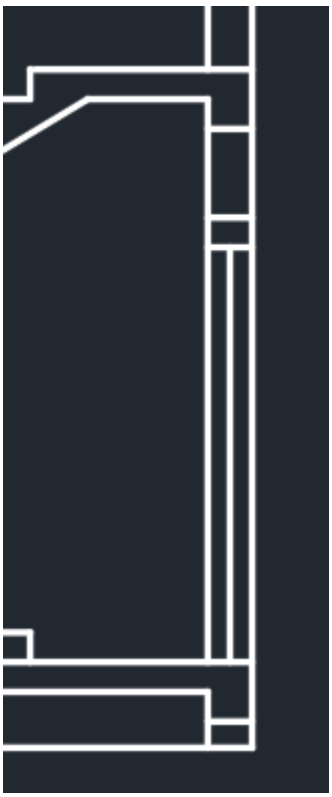


Then we can make a chajja. For that, we can make 1 to 1.5 feet chajja in length (Broad chajja). Then the upper portion will be 4 inch, and then close the line. Then trim the necessary part and the final picture look like this

In addition, you can make this slight bend towards lower side for the rainwater flow also like this.

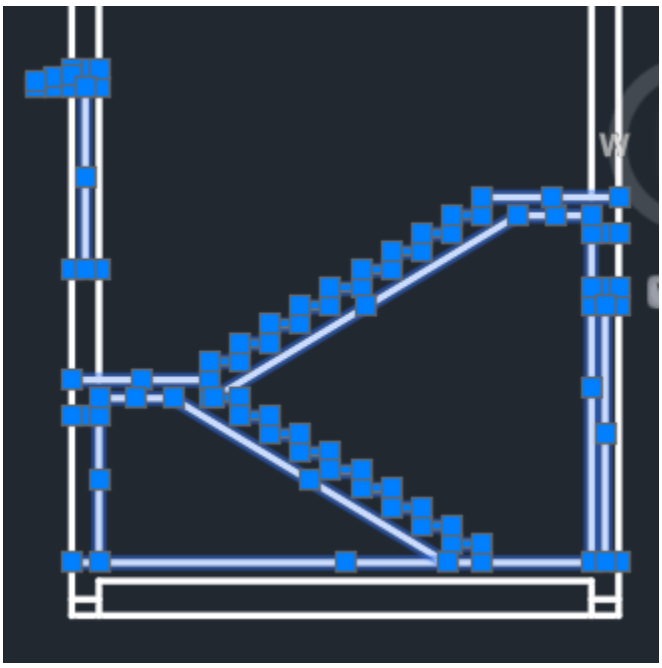
The upper line is showing the lintel beam. For window, you can make a line in the mid portion like this

Now we need to make a door in the door area. For that, taking an offset of 7 feet, then again taking lintel beam, for that taking 6 inch offset. Then delete the extra lines. In addition, make a line in middle portion like done in the window portion. The final picture will look like this.

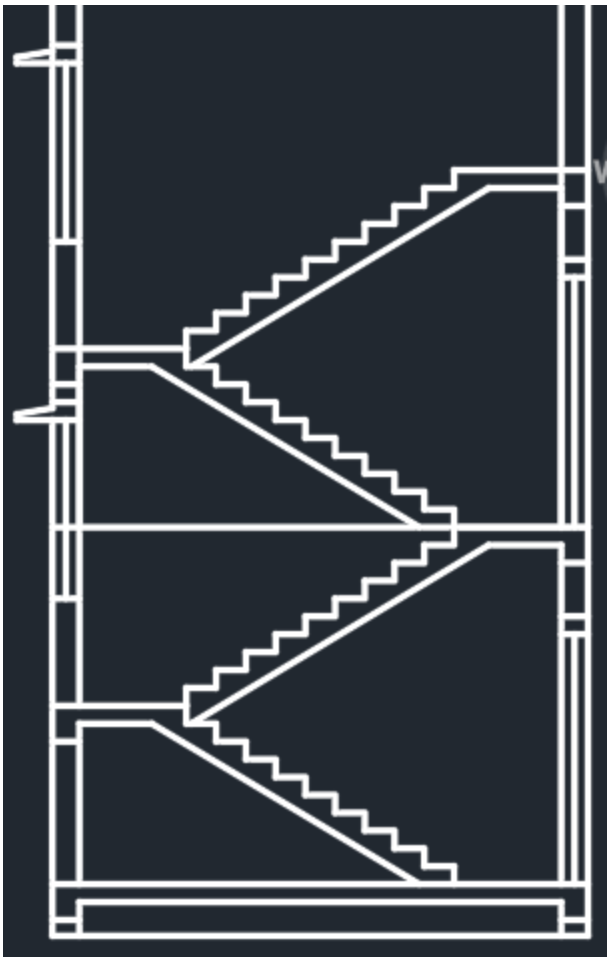


Need to remember the section is taken from the stair is the line which is made below.

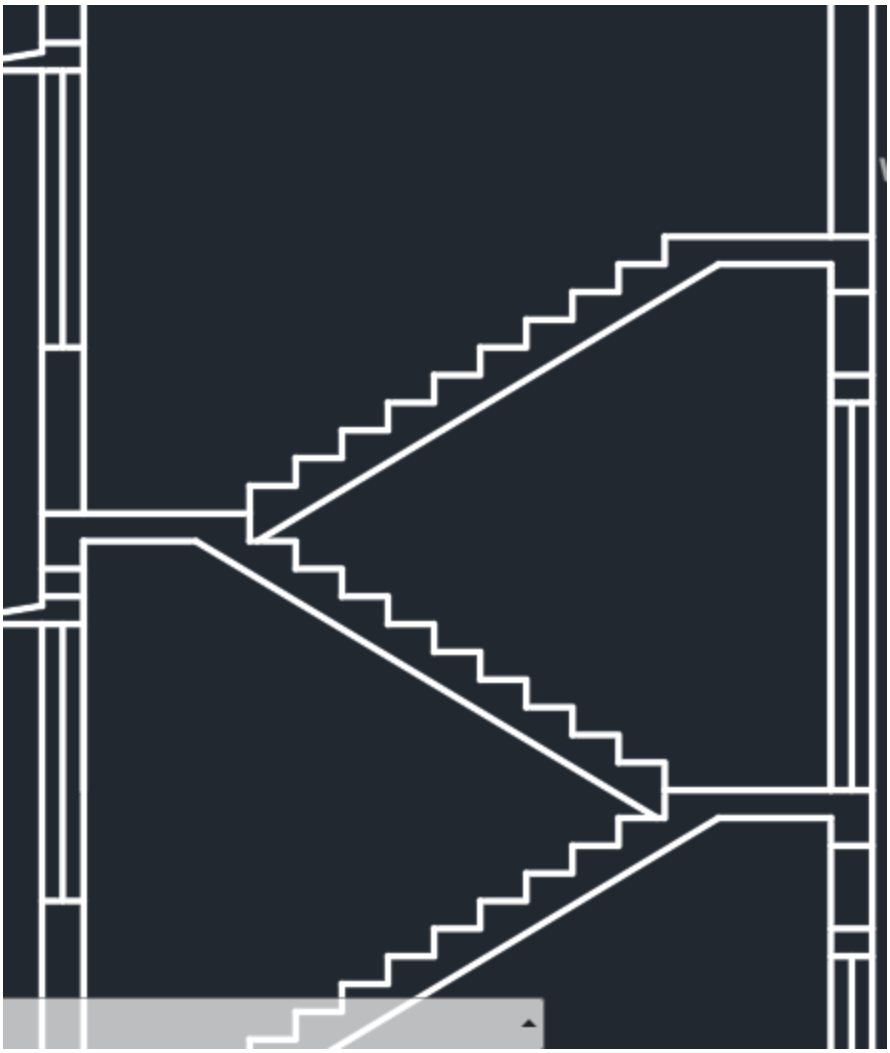
Here we are making double floor so the entire sectional plan of the stair need to copy for second floor. For that, select the part of stair, like this



Then copy and paste the selected portion and the base point will be the lower right point.

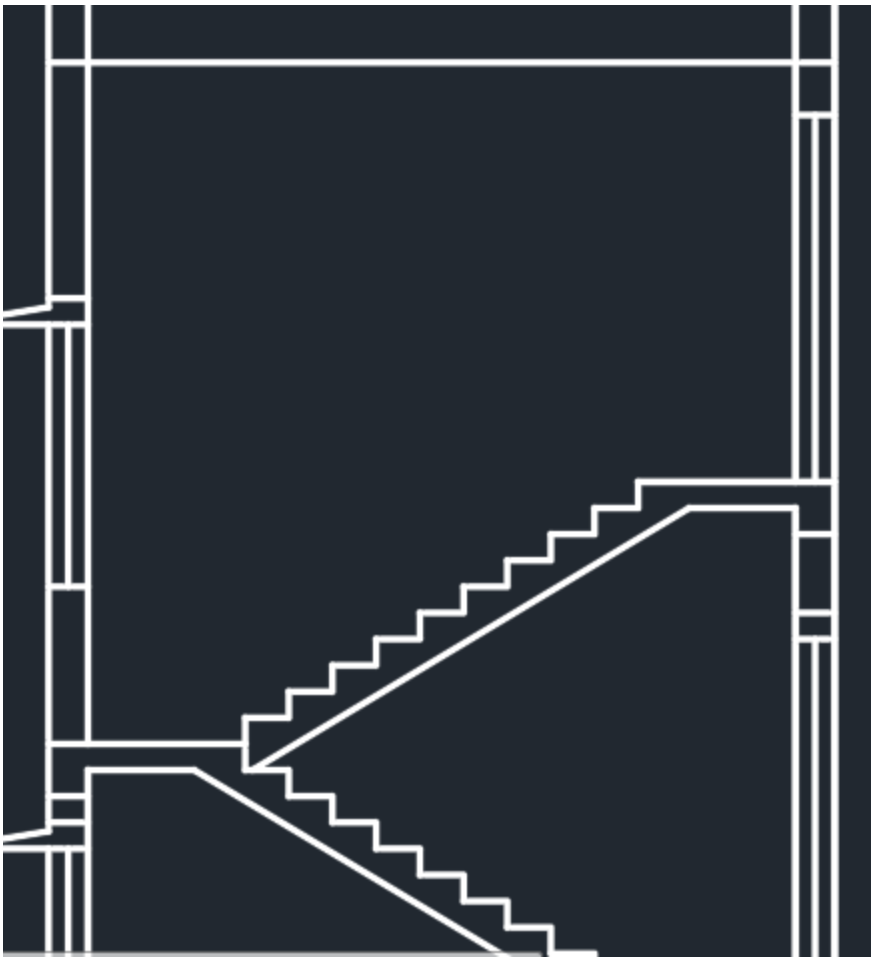


Some extra things are also copied which we need to remove. Like the middle horizontal line which need to be deleted then the waist slab needs to be expand.

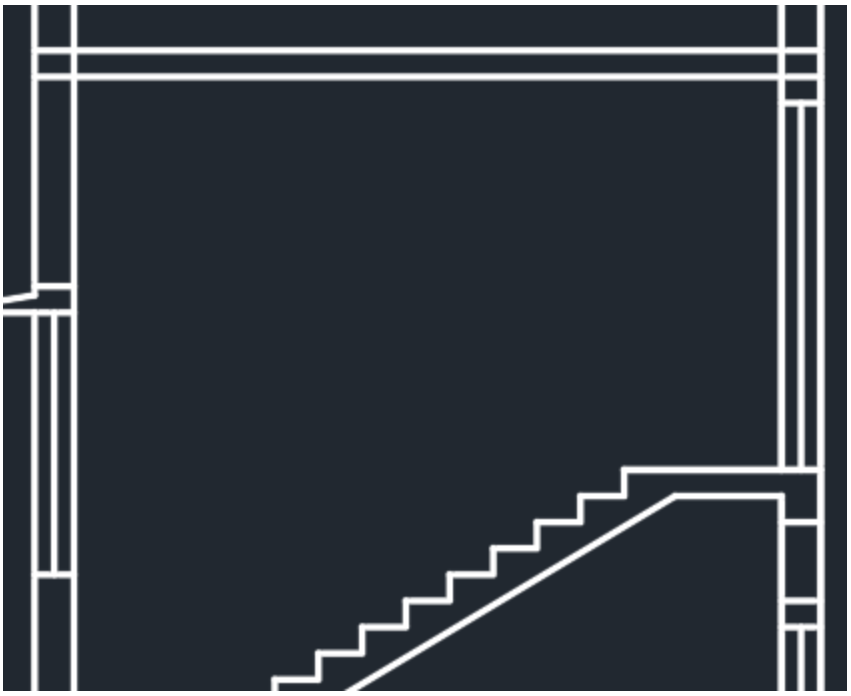


Now, in the first floor, we do not need the door so that the door needs to be deleted. If you are making staircase for a flat then the door need to be placed. Therefore, you can remove or keep the door as per requirement. We need another door for going into Terries for that; we can copy the door and paste it above and the lintel beam there will not needed so we can delete in terries portion.

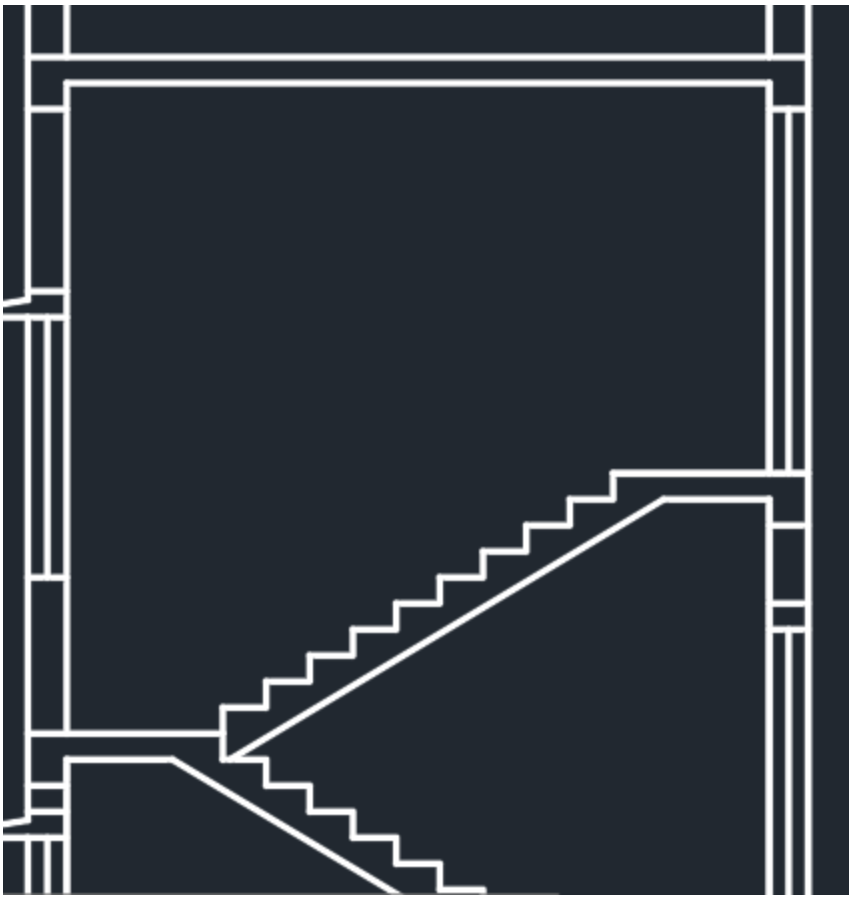
Now we need to give a slab for headroom. For that, we can take offset of 8 feet. Then extend the line like this.



Now we need to show the thickness of headroom slab, which is 6 inch. The offset need to be done in the lower section.



Now we need to make a beam length which is one feet. For that, we can take an offset of one feet from the above line and then make the offset in the lower section. Then the extra portion needs to be trimmed. The final picture will look like this.

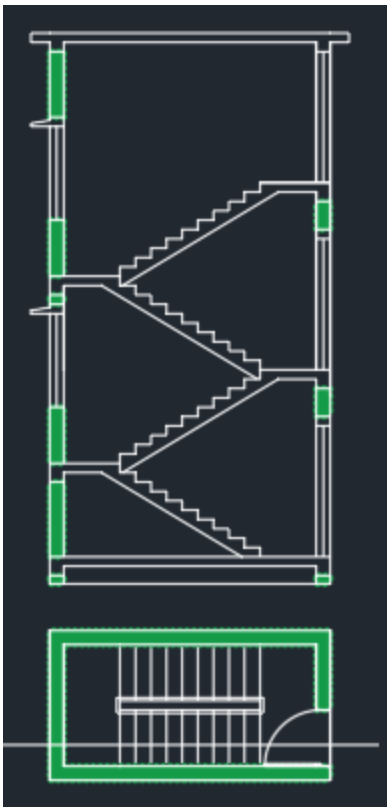


Now the extra lines in the upper side can be trimmed / deleted.

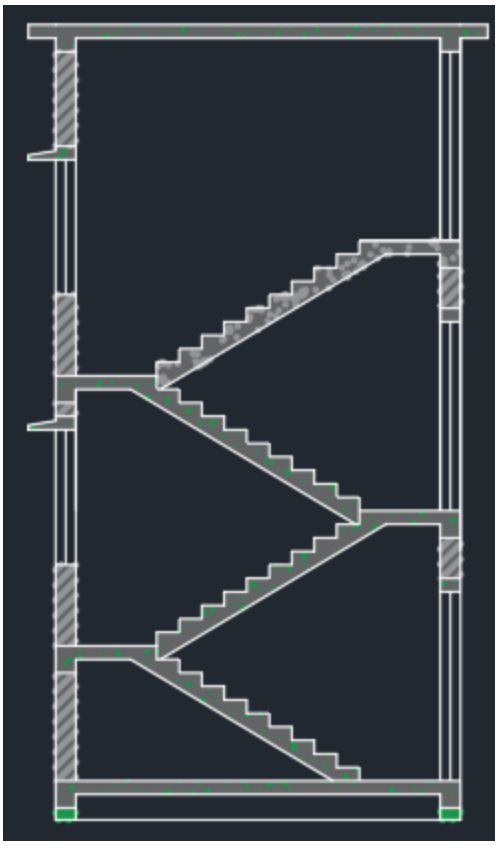
In addition, we can make a chajja in the headroom portion for rainwater. For that, make a horizontal line of one feet, then lower side 6 inch, then close. Then mirror the same portion for the opposite side.

Hatching

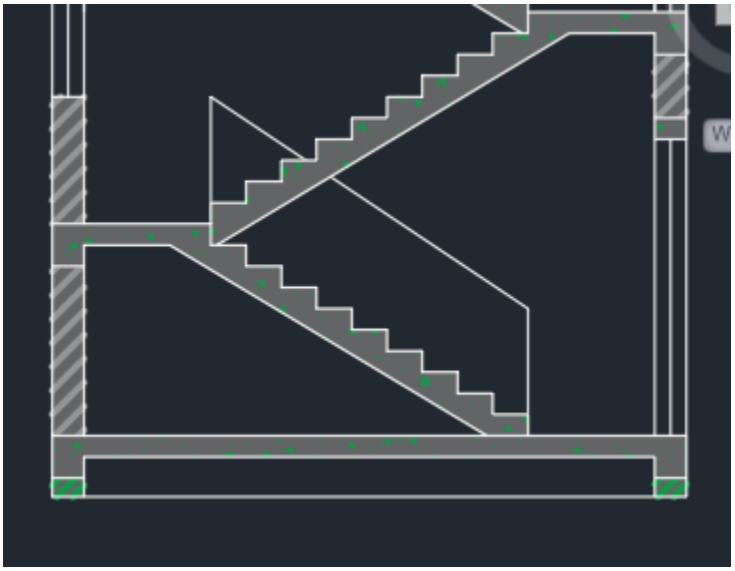
After making all the necessary things, we need to do the hatchings part. After that we can do the annotations part. For hatching the walls, we can select H enter and select the wall hatching which is **ANSI31** first we need to change the linewidth. For that, select the entire stair plan and sectional drawing and make in linewidth 0.20 mm. select the wall layer for better drawing, after doing it will look like this



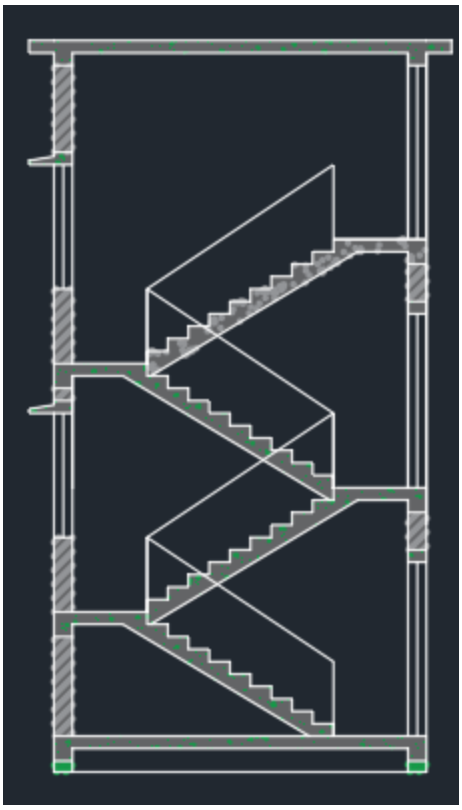
After making wall hatching, we need to make concrete hatching in stairs. For that, press H enter and select **AR-CONC** for concrete hatching. You can change the color of the hatching. Then select the portion (staircase) portion, the chajja, and the lintel beam sections. Change the scale according to visual. After applying, the final view will look like this.



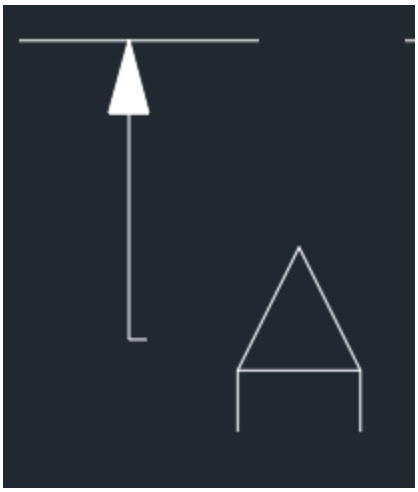
Railing need to be drawn which I forgot earlier, for that, we need to make a line of 3 feet like this



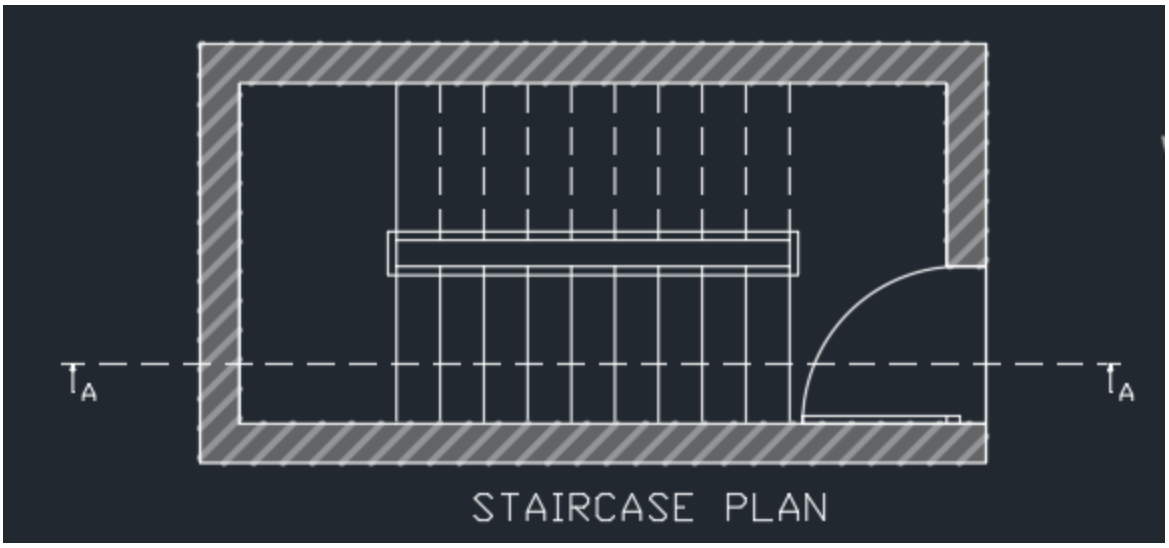
You can make this by polyline or you can make by line then join them by using the command J enter then select those lines you want to join then press enter to join them. This helps in making the rest railings by copy and paste. Final look will be like this.



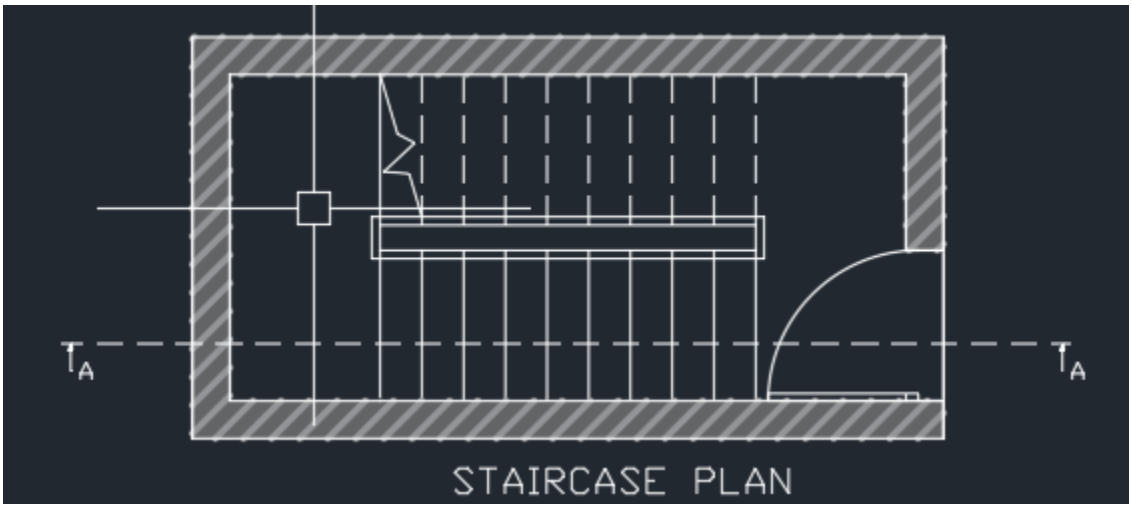
Section line need to be in hidden line that needs to remember and the direction needs to be shown. For that, select the arrow from the ribbon bar, then go to leader, then select arrow head location then go to the lower side, you will see the arrow is shown. Then change the arrow tail by using explode. Like this



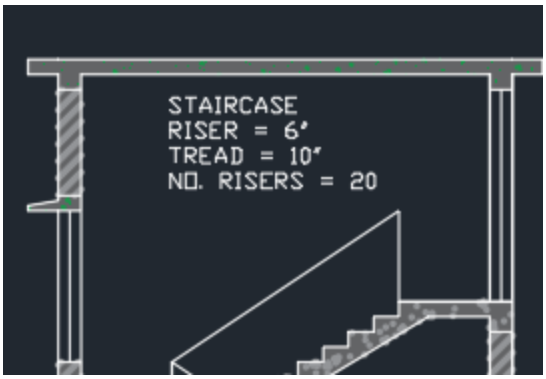
The planning or top view of the stair is called **STAIRCASE PLAN** and the sectional plan of the staircase can be texted as **SECTION PLAN A-A.** the upper portion of the staircase need to be drawn on the hidden line like this.



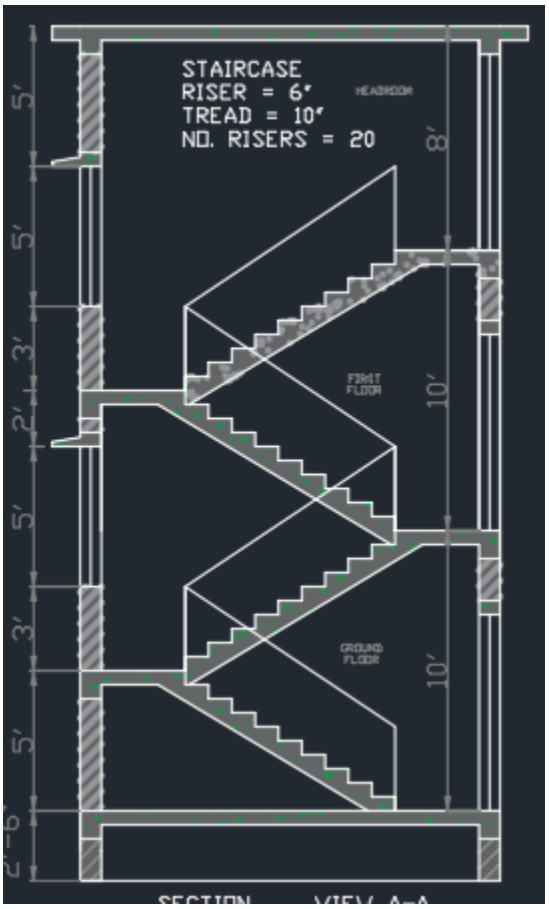
Because the plan, which are drawing it, is also the sectional view but we are seeing from the top. Therefore, the portion, which is blocking on the sectional view, needs to do in hidden line. Now we need to make a break line in staircase. For that, we can make this through Line command like this.



Now we can make some details in the staircase portion. For that, we can do this way.

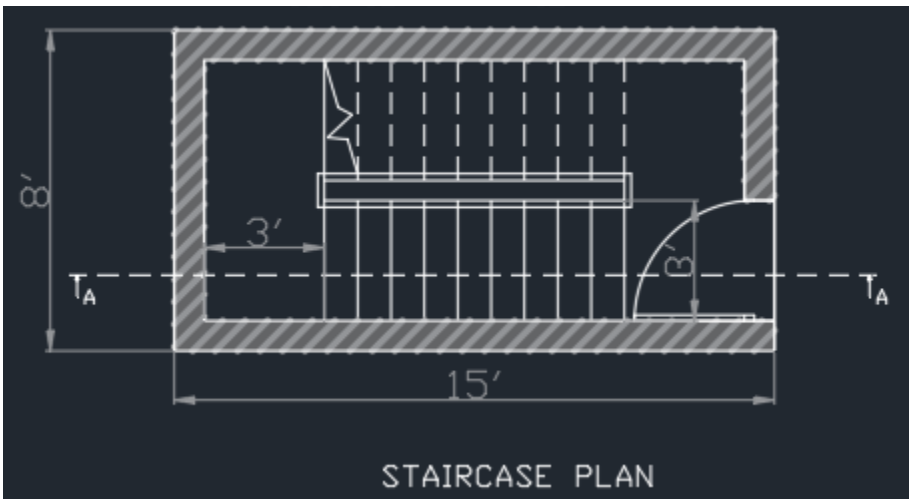


Now we need to make to place the dimensions. For that, we need to set the dimensions first. For that, Press the D enter, then modify, then adjust the text size, change the offset from dimension line (1 inch), then adjust the arrow size, change the arrow type (Architectural tick). You can also change the color of the line as grey. Because when the planning and elevations needs to be printed on a sheet then the dimension lines needs to be shown on light colors which helps the gray color. Change the primary units as engineering and tick on the trailing. Scale factor needs to be one. Text color needs to change in grey.



After providing dimensions, now we need to show the ground level like this

Now we need to make dimensions in the top view plan also.



This drawing is now complete.