

# Forge Viewer Sectioning

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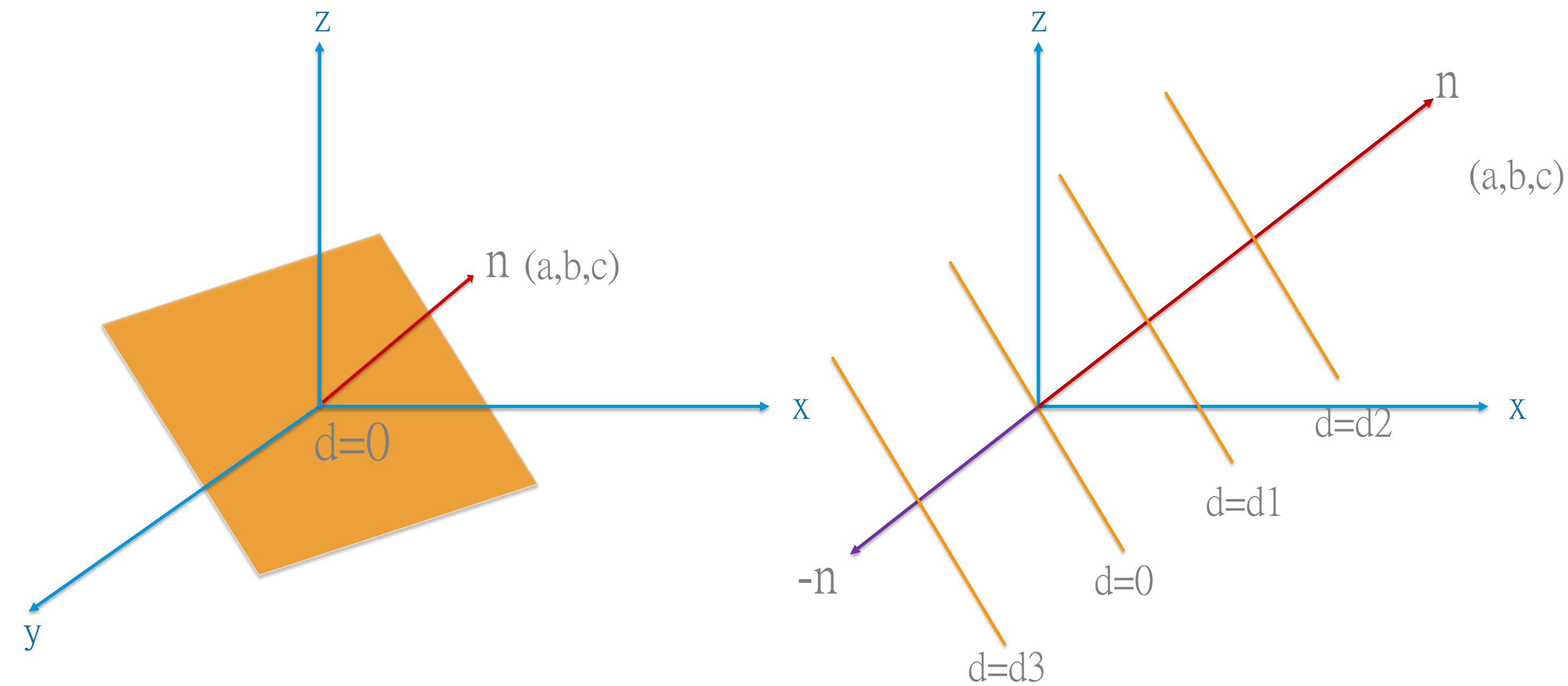
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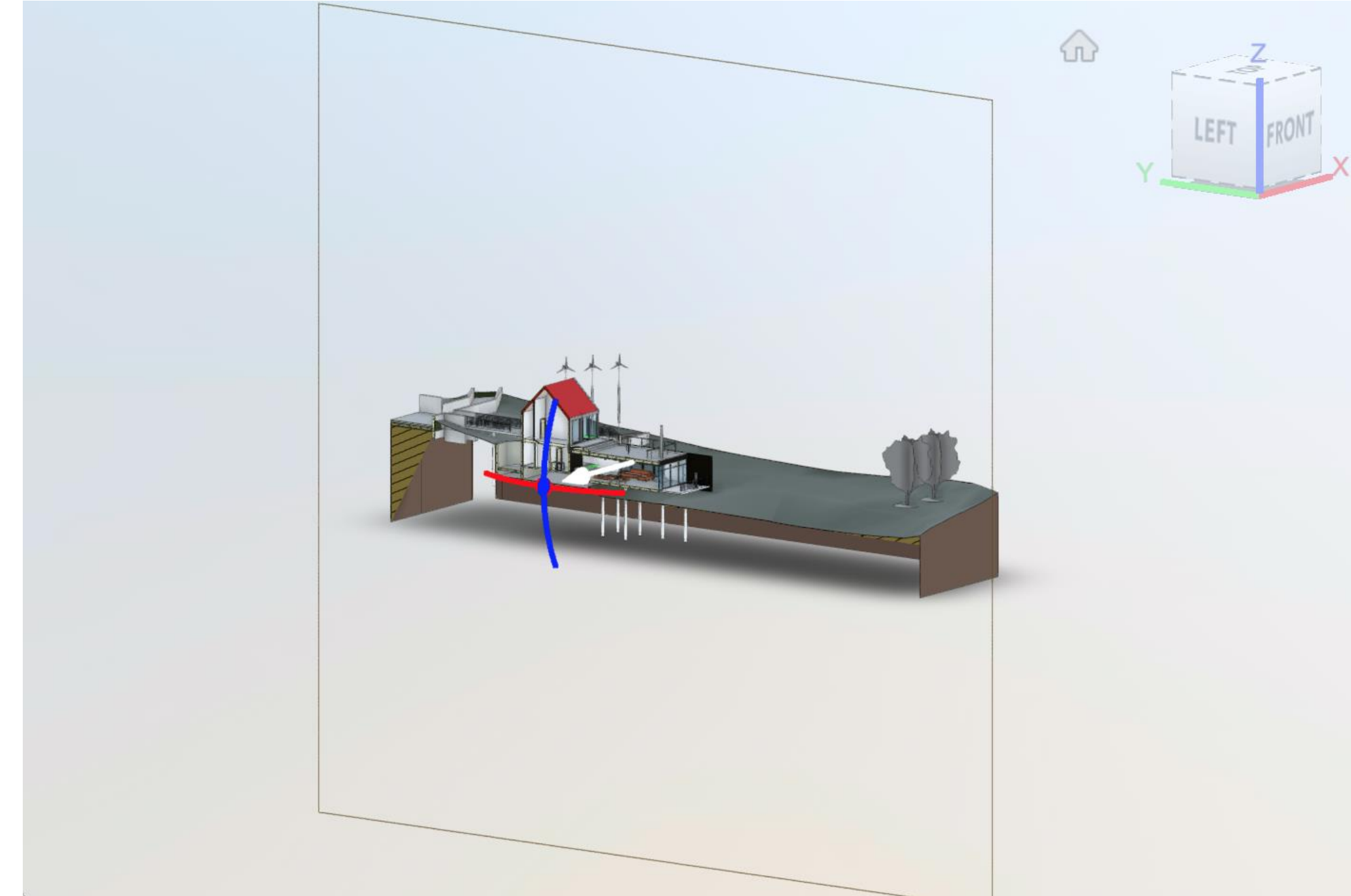
# Viewer sectioning

- Overview:
  - Take advantage of `Viewer3D#setCutPlanes( planes: THREE.Vector4[] )`
  - Equation of the section plan  $ax + by + cz + d = 0$



Isometric view

Front view (Y direction )



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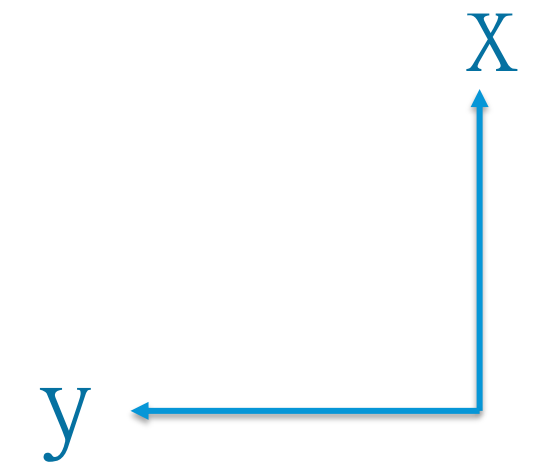
How to control section planes with Viewer APIs?

Is it possible to create section planes regarding to the elevation?

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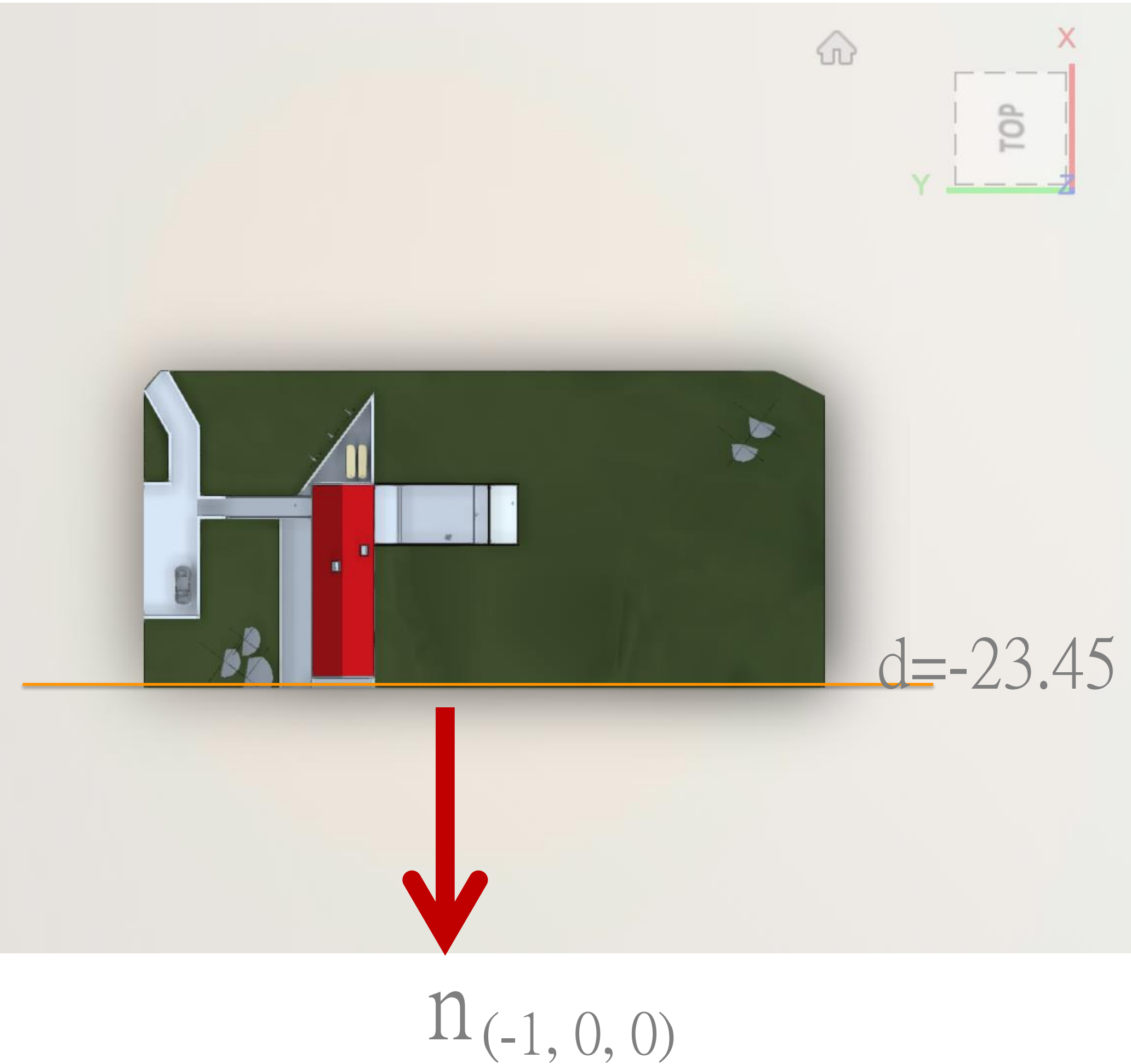
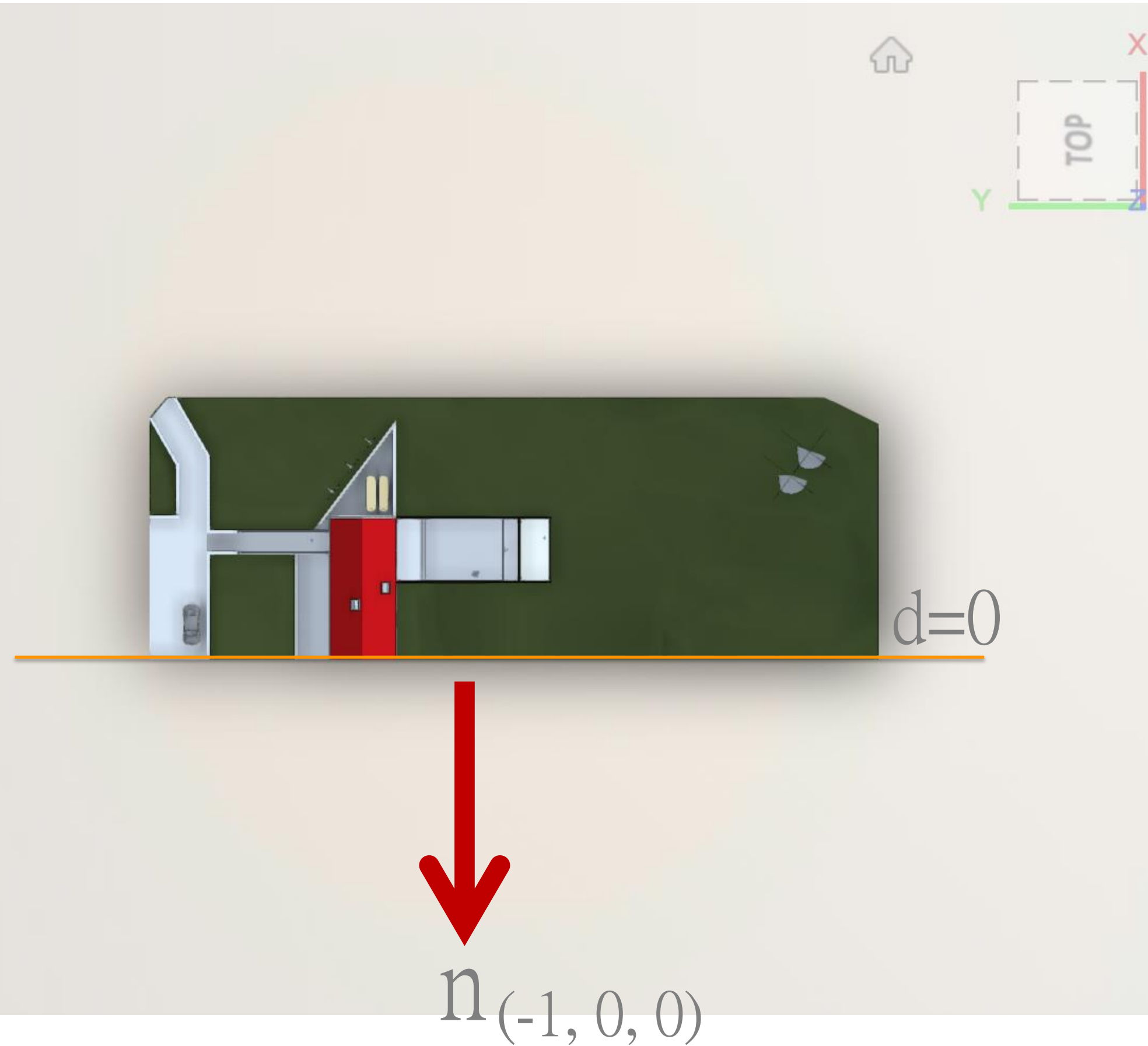
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# Viewer sectioning

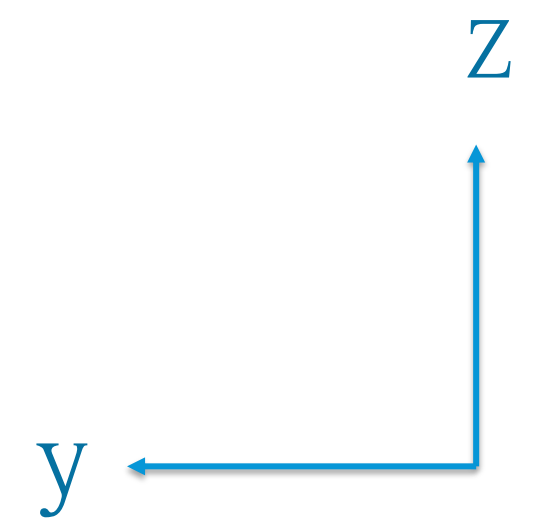


```
viewer.setCutPlanes([ new THREE.Vector4( -1, 0, 0, 0 ) ])
```

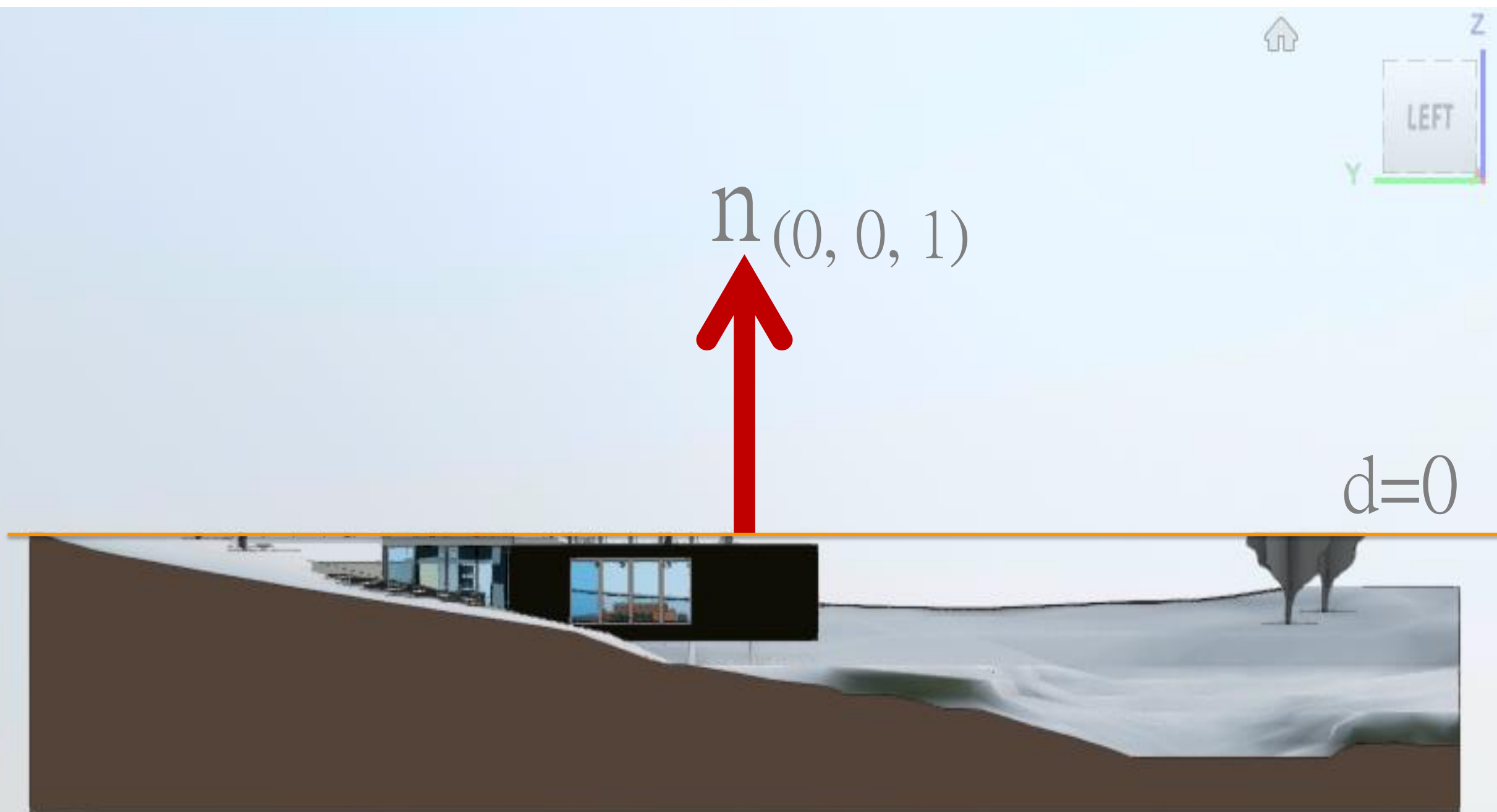
```
viewer.setCutPlanes([ new THREE.Vector4( -1, 0, 0, -23.45 ) ])
```



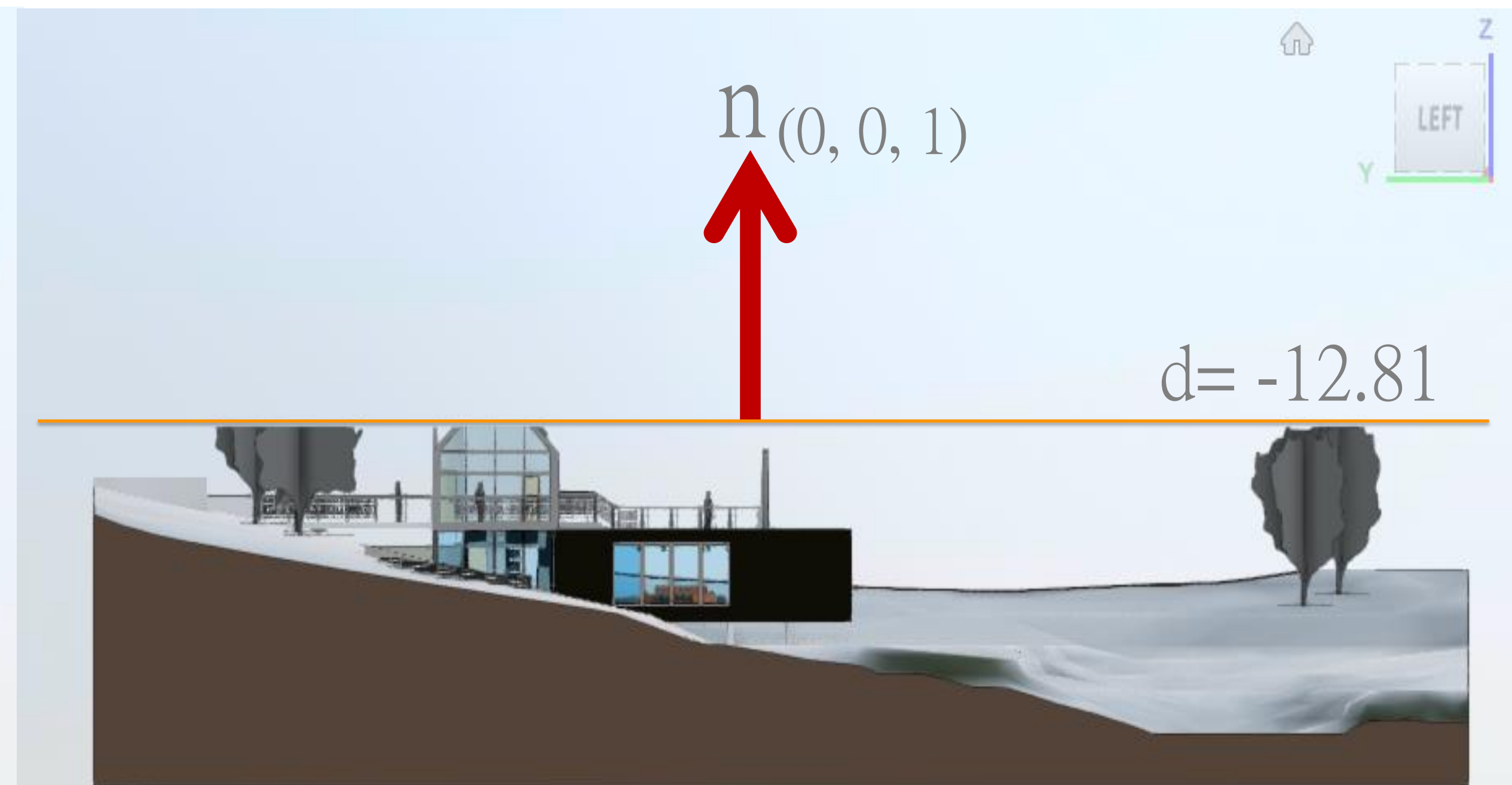
# Viewer sectioning



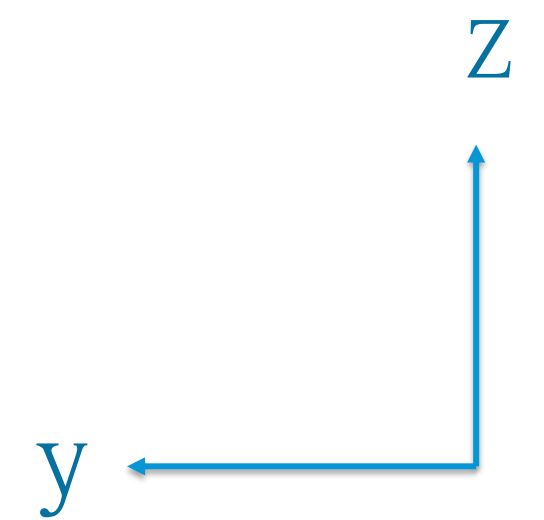
```
viewer.setCutPlanes([ new THREE.Vector4( 0, 0, 1, 0) ])
```



```
viewer.setCutPlanes([ new THREE.Vector4( 0, 0, 1, -12.81) ])
```

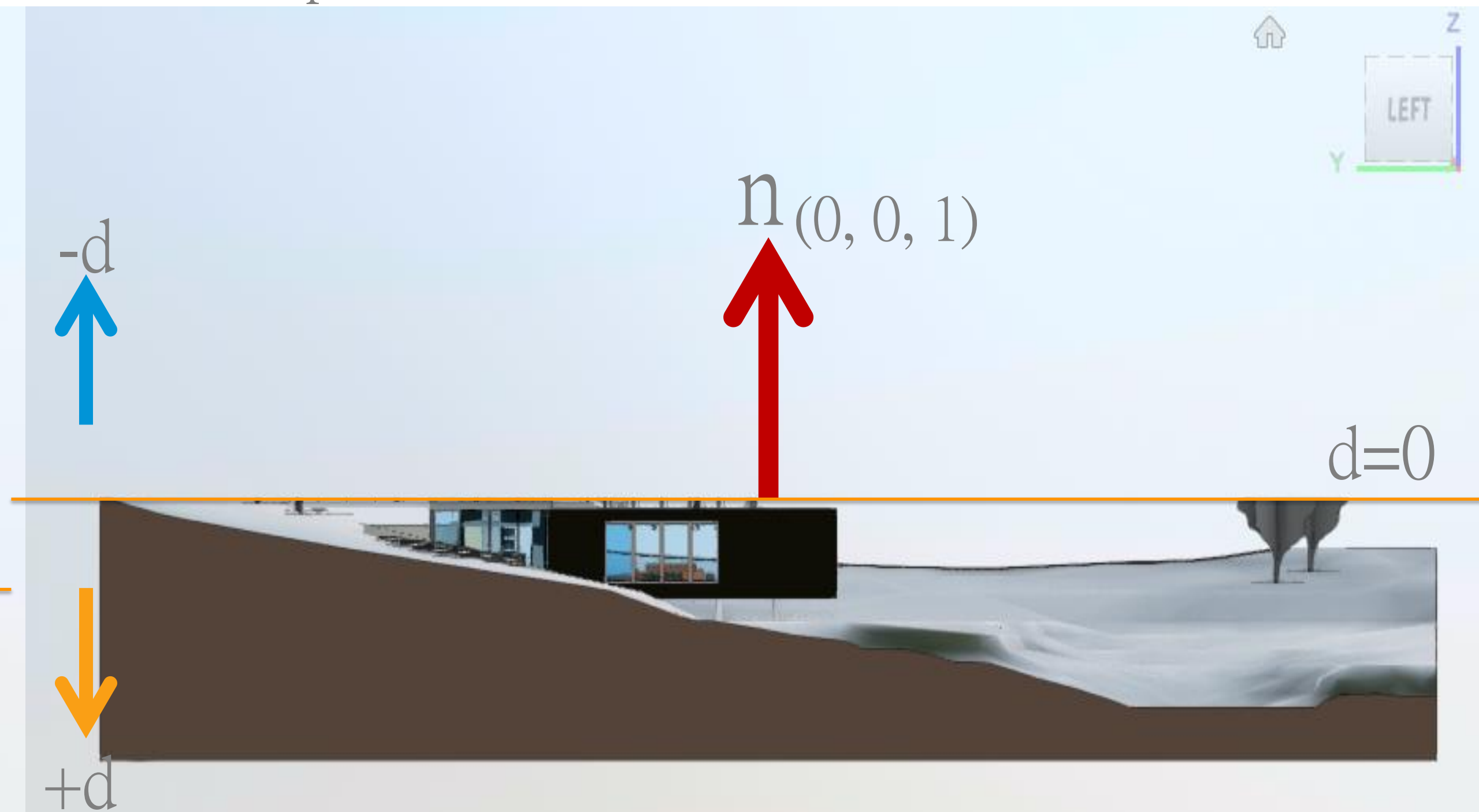
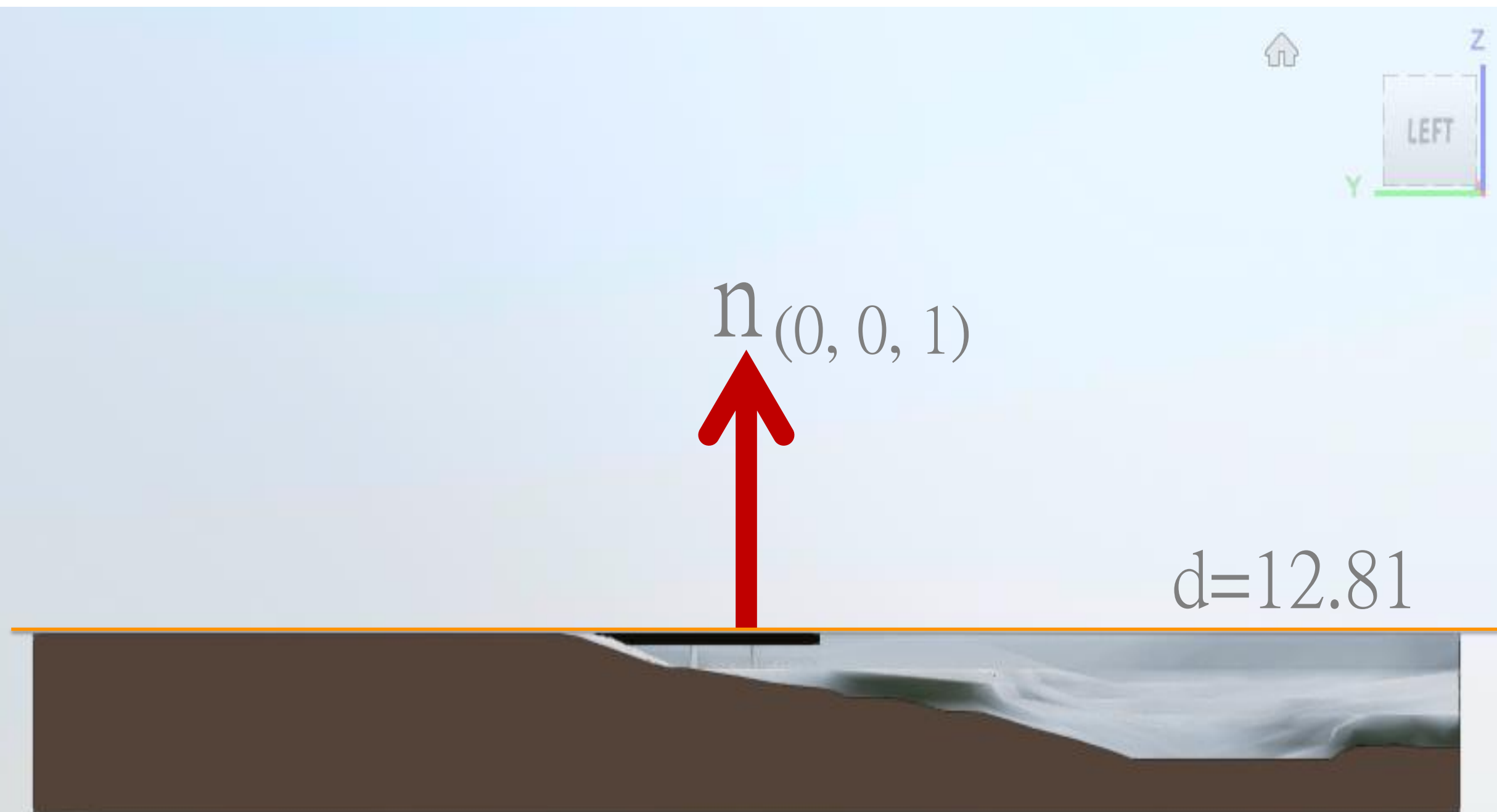


# Viewer sectioning



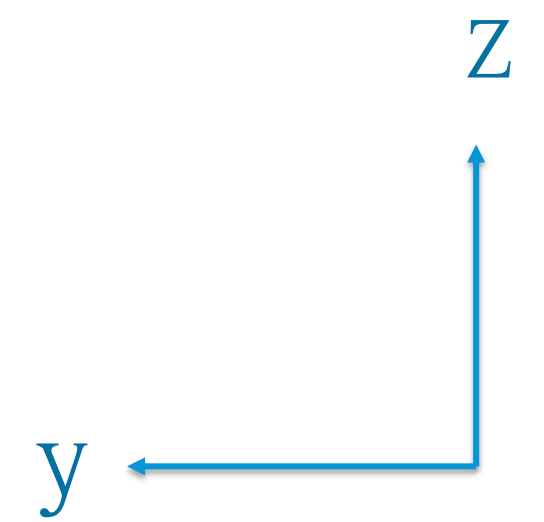
```
viewer.setCutPlanes([ new THREE.Vector4( 0, 0, 1, 12.81) ])
```

The relation of the d value and the section plane when plan normal is in positive direction:

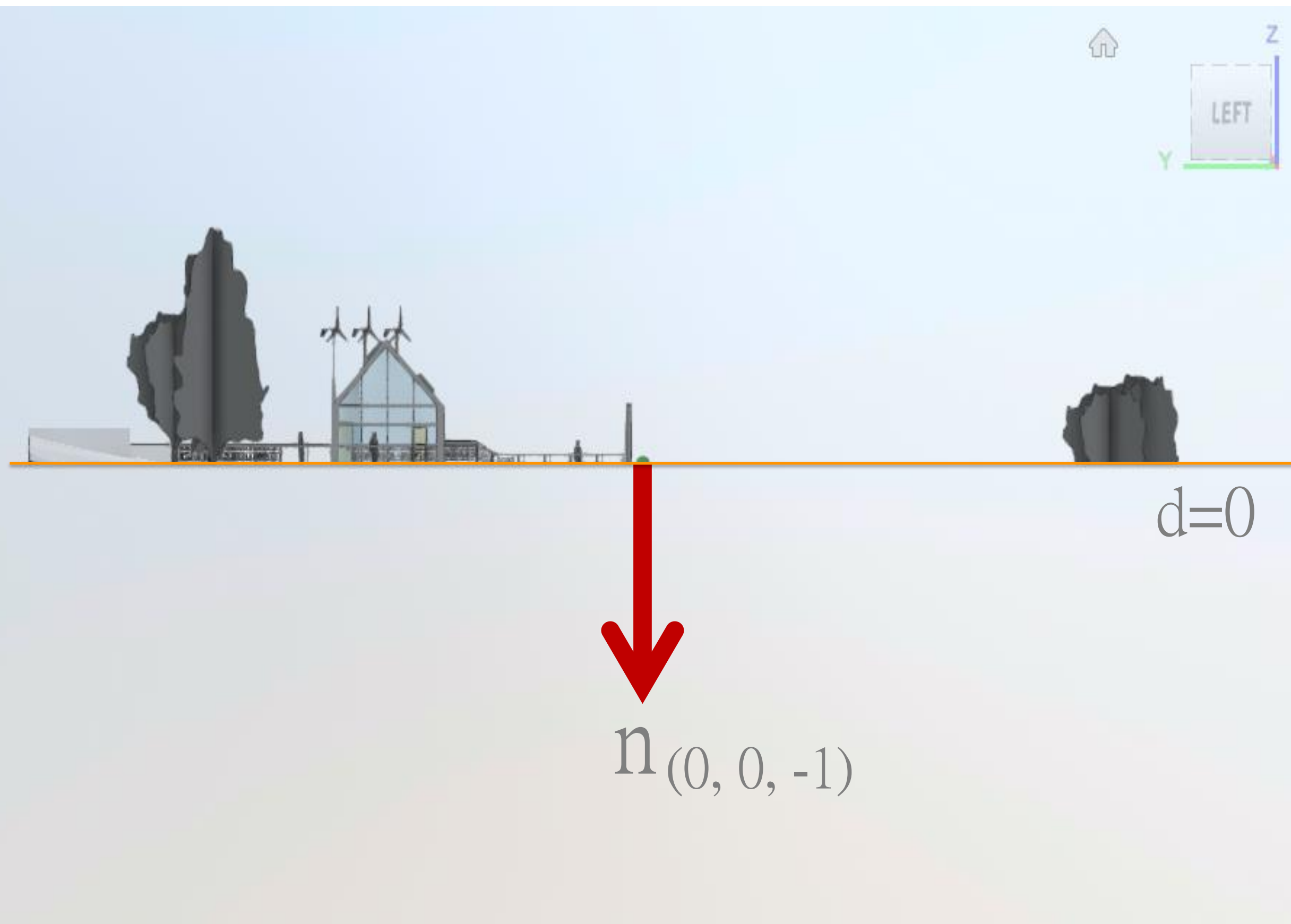




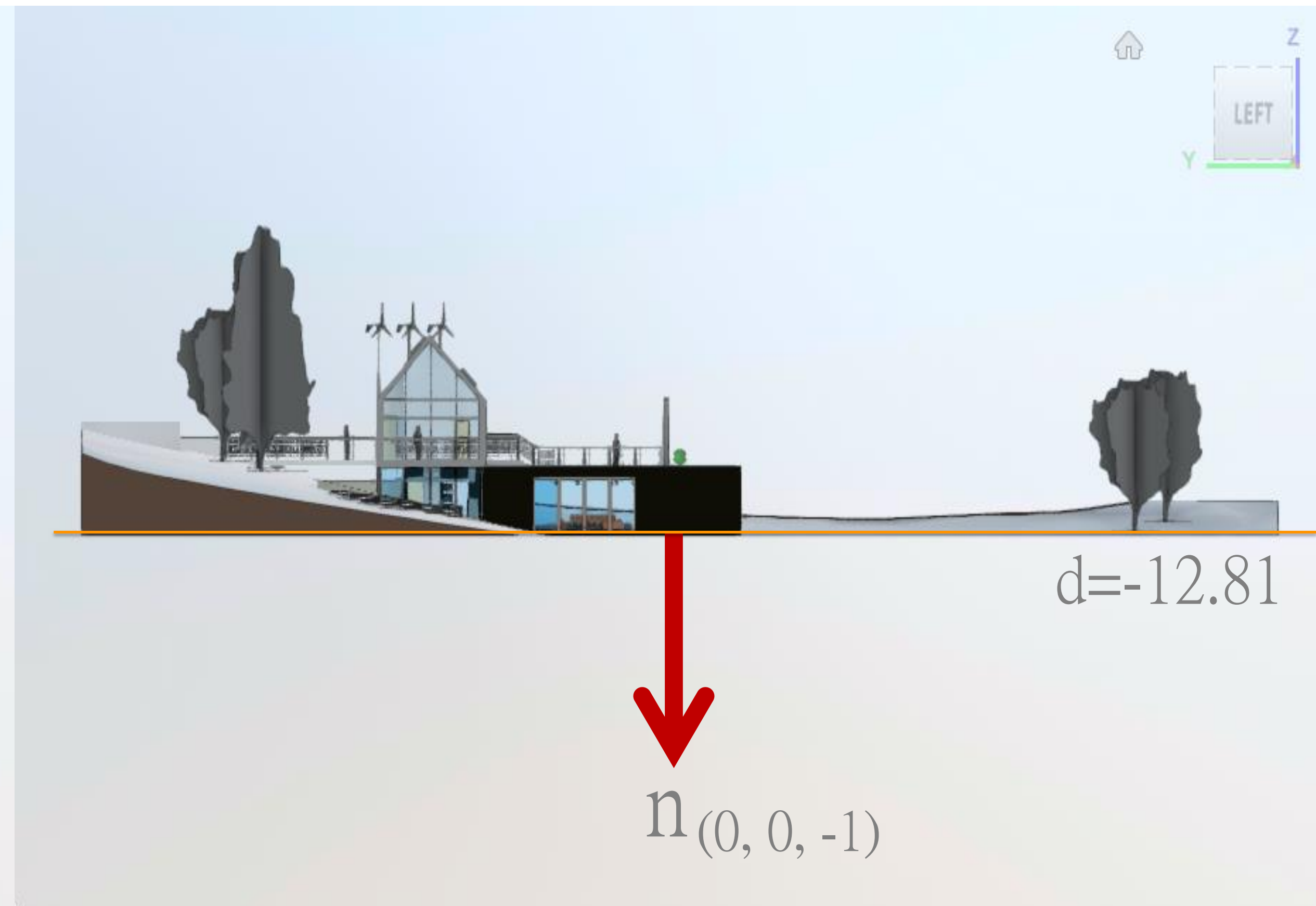
# Viewer sectioning



```
viewer.setCutPlanes([ new THREE.Vector4( 0, 0, -1, 0) ])
```



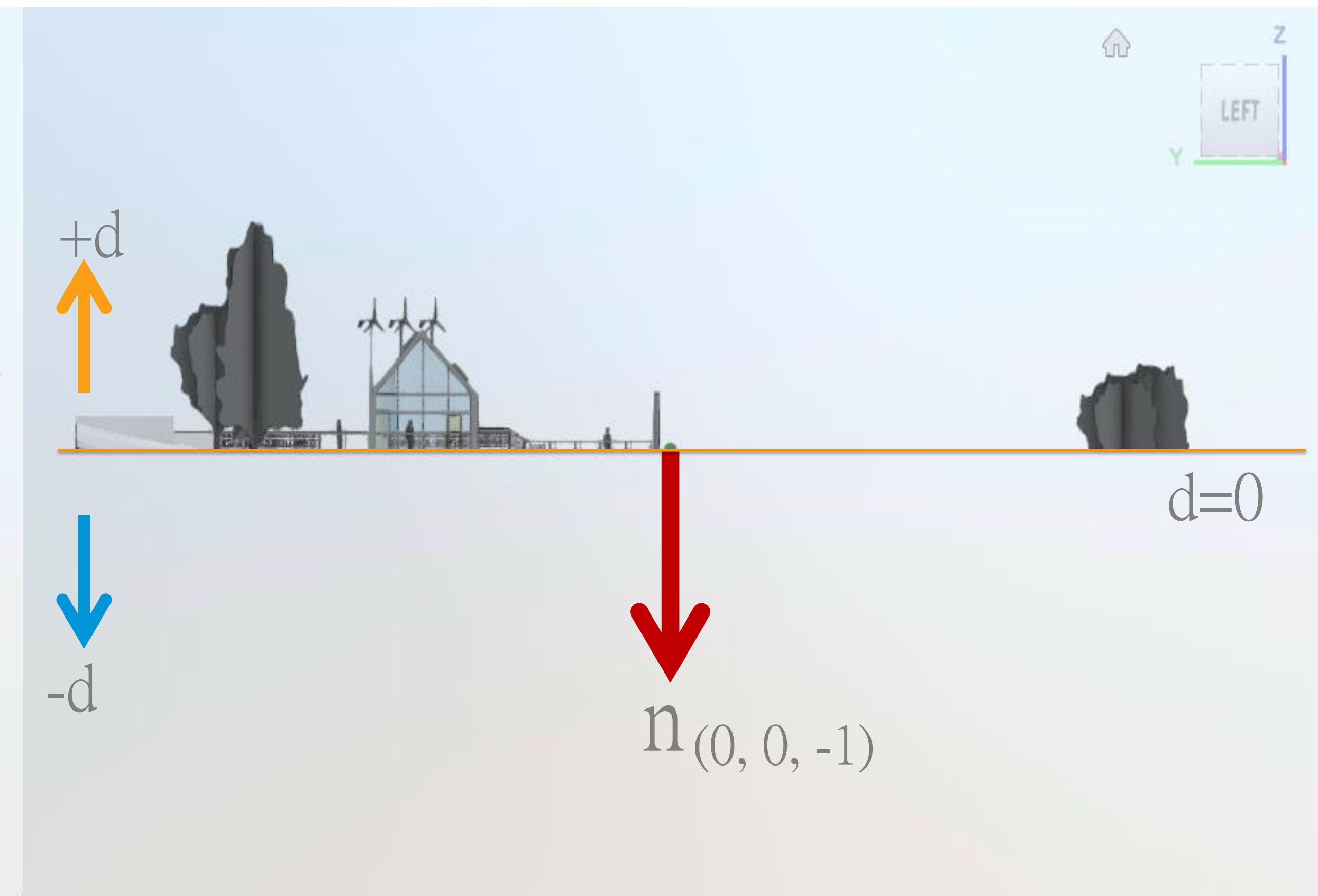
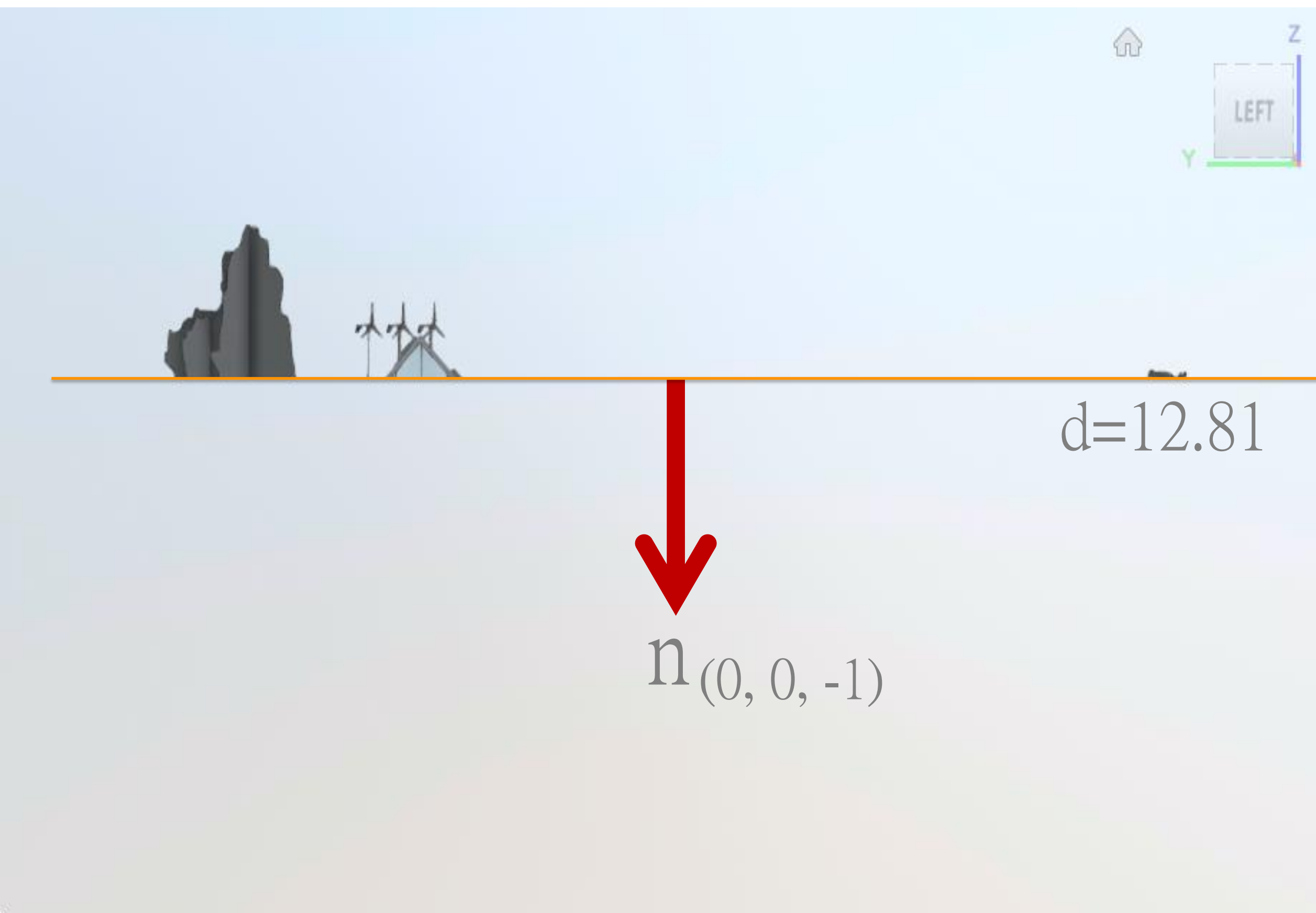
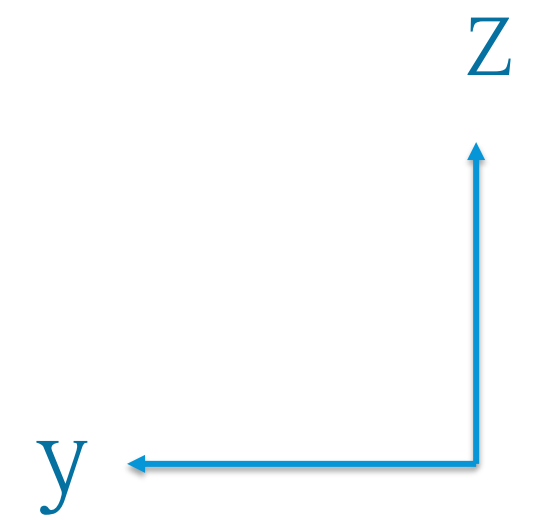
```
viewer.setCutPlanes([ new THREE.Vector4( 0, 0, -1, -12.81) ])
```



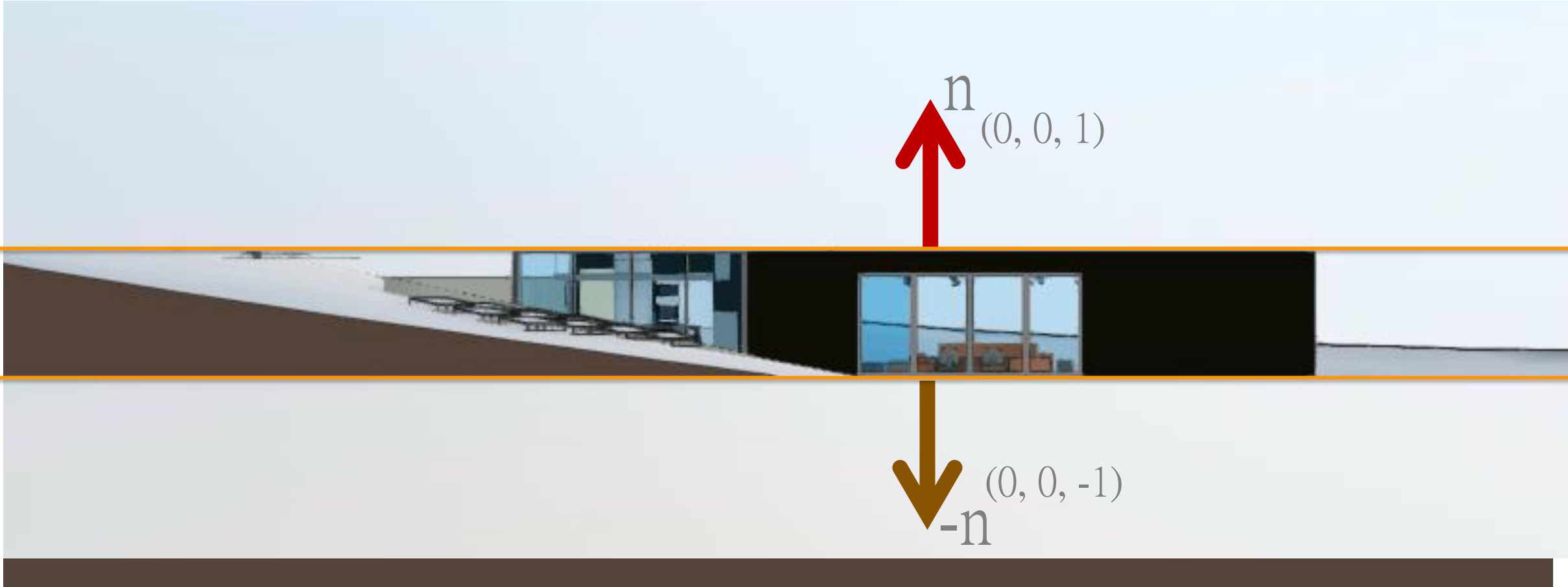
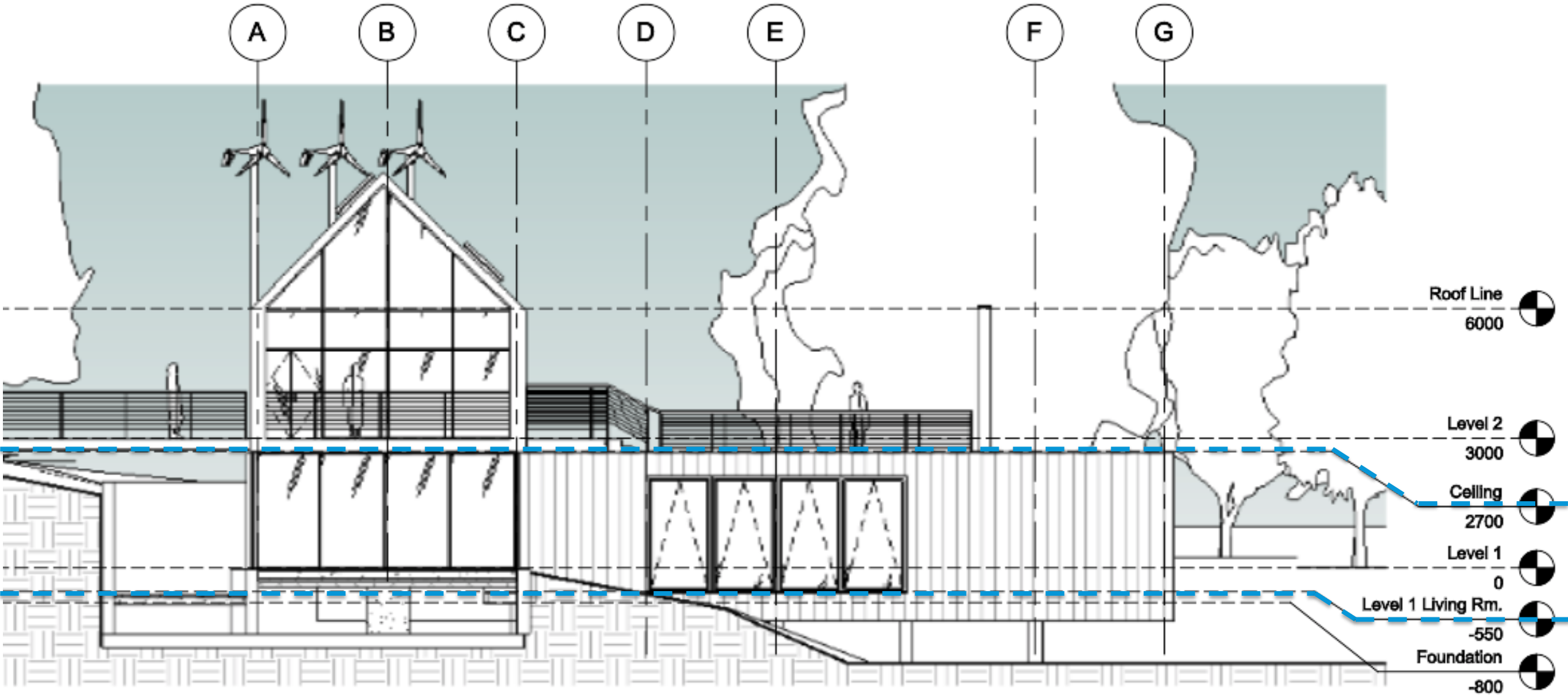
# Viewer sectioning

```
viewer.setCutPlanes([ new THREE.Vector4( 0, 0, -1, 12.81) ])
```

The relation of the d value and the section plane when plan normal is in negative direction:



# Do sectioning with Revit's elevations



Ceiling,  $d= 1.575$

Level 1 Living Rm.,  $d= -12.237$

Determine normal direction of the section plane (elevation is in Z)

Obtain z value of the Revit elevation

Convert length units (From SI to Imperial)

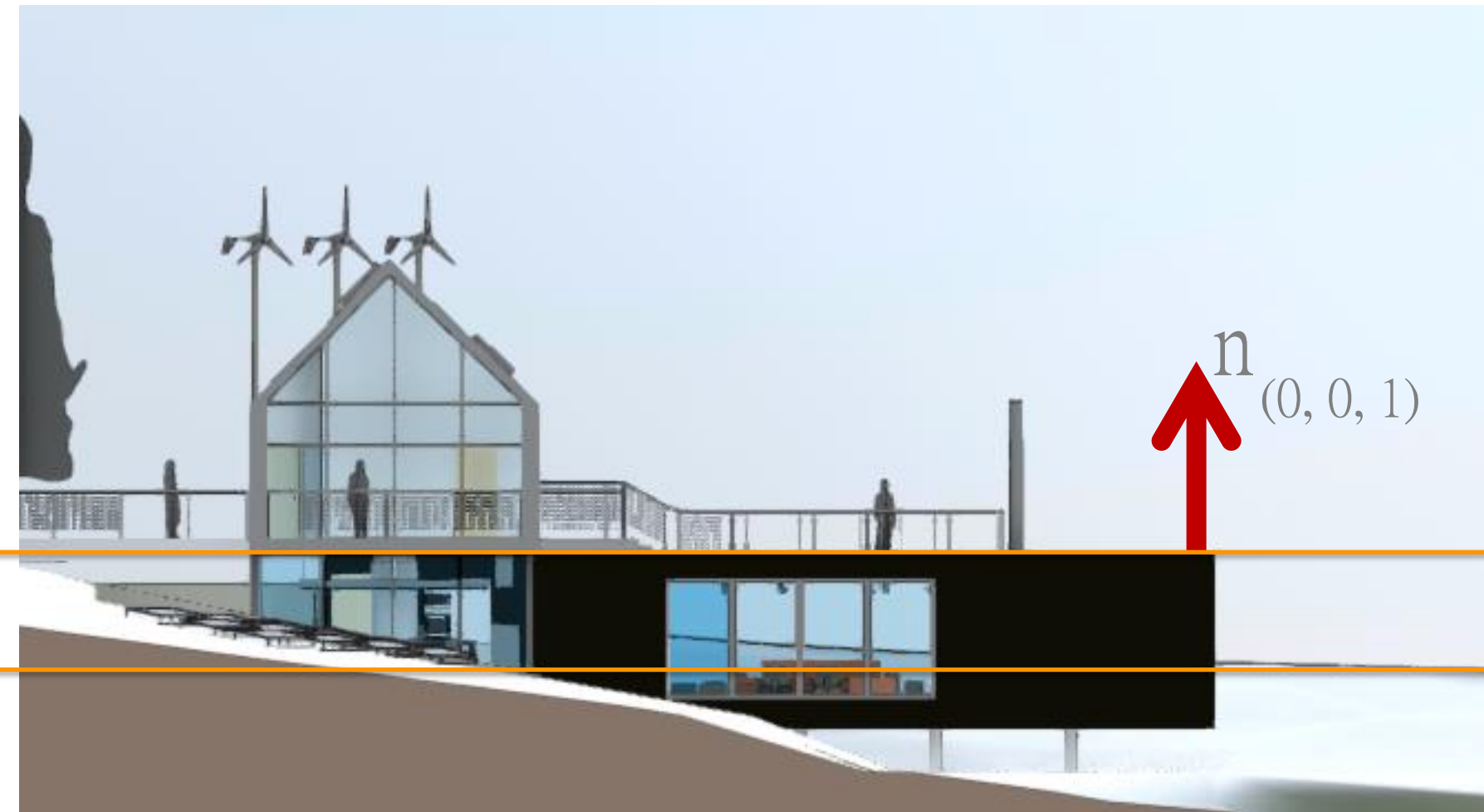
Convert coordinate system (From Revit to Viewer)

Convert coordinate system (From Viewer to Section plane)

Create planes

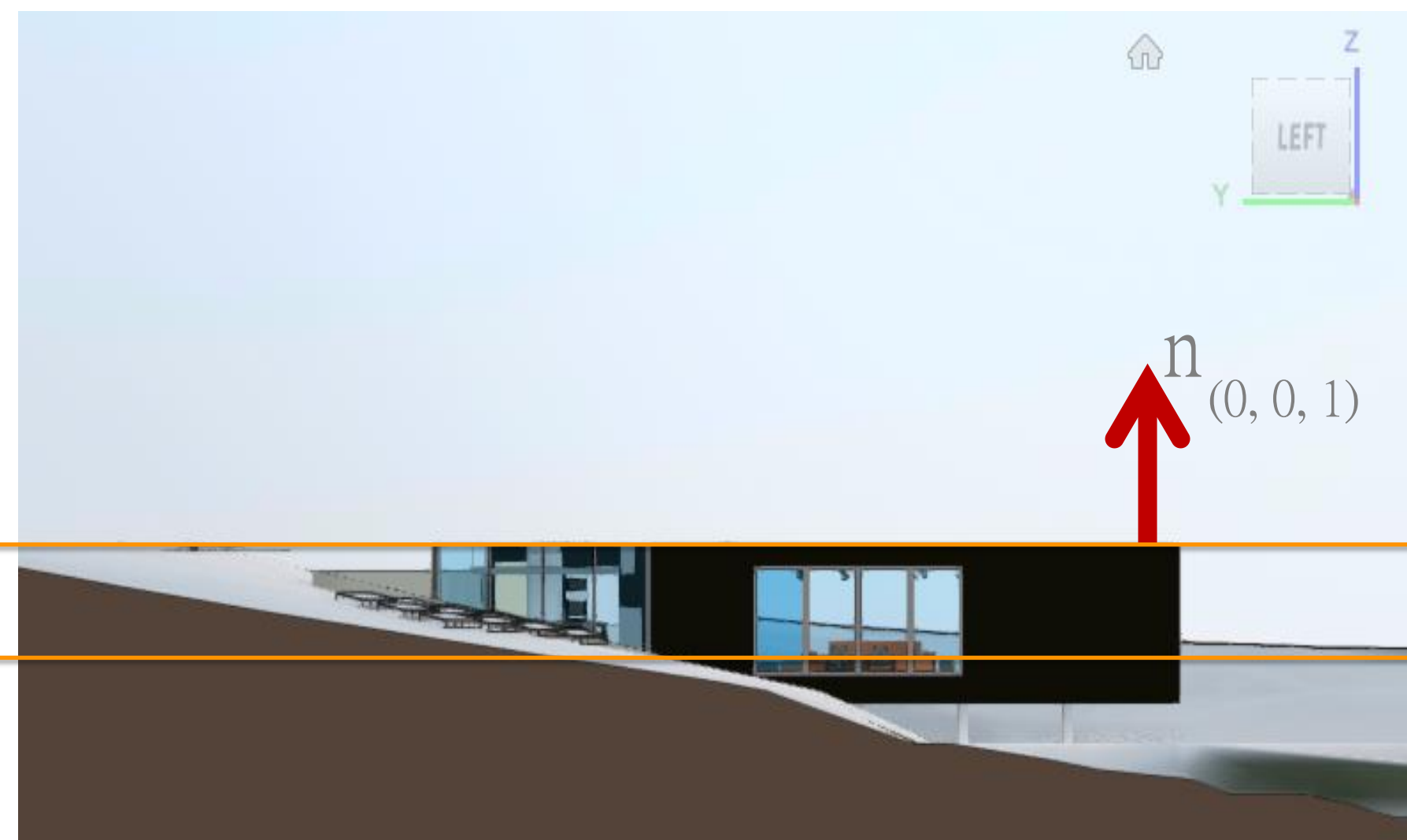


# Do sectioning with Revit's elevations



Celling , EL. 2700 mm

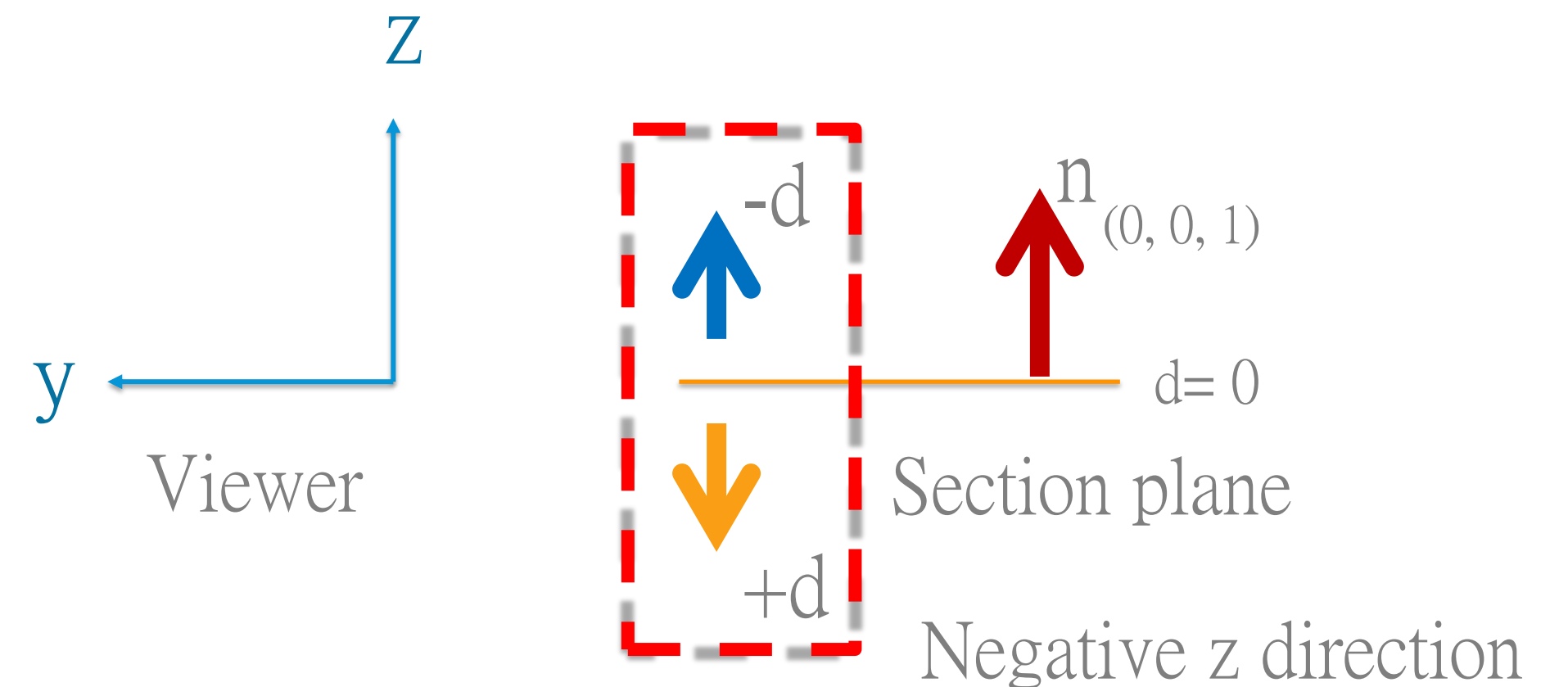
Level1, EL. 0 mm



Celling, d= 1.575

Level1, d= 0

1. Obtain z value of the ceiling level , 2700mm
2. Convert length units (From SI to IM) , 2700mm = 8.85 ft
3. Convert coordinate system (From Revit to Viewer):
  - `GobalOffset = model.getData().globalOffset`
  - $z = 8.85 - \text{GobalOffset.z} = -1.575$  units
4. Convert coordinate system (From Viewer to Section plane):

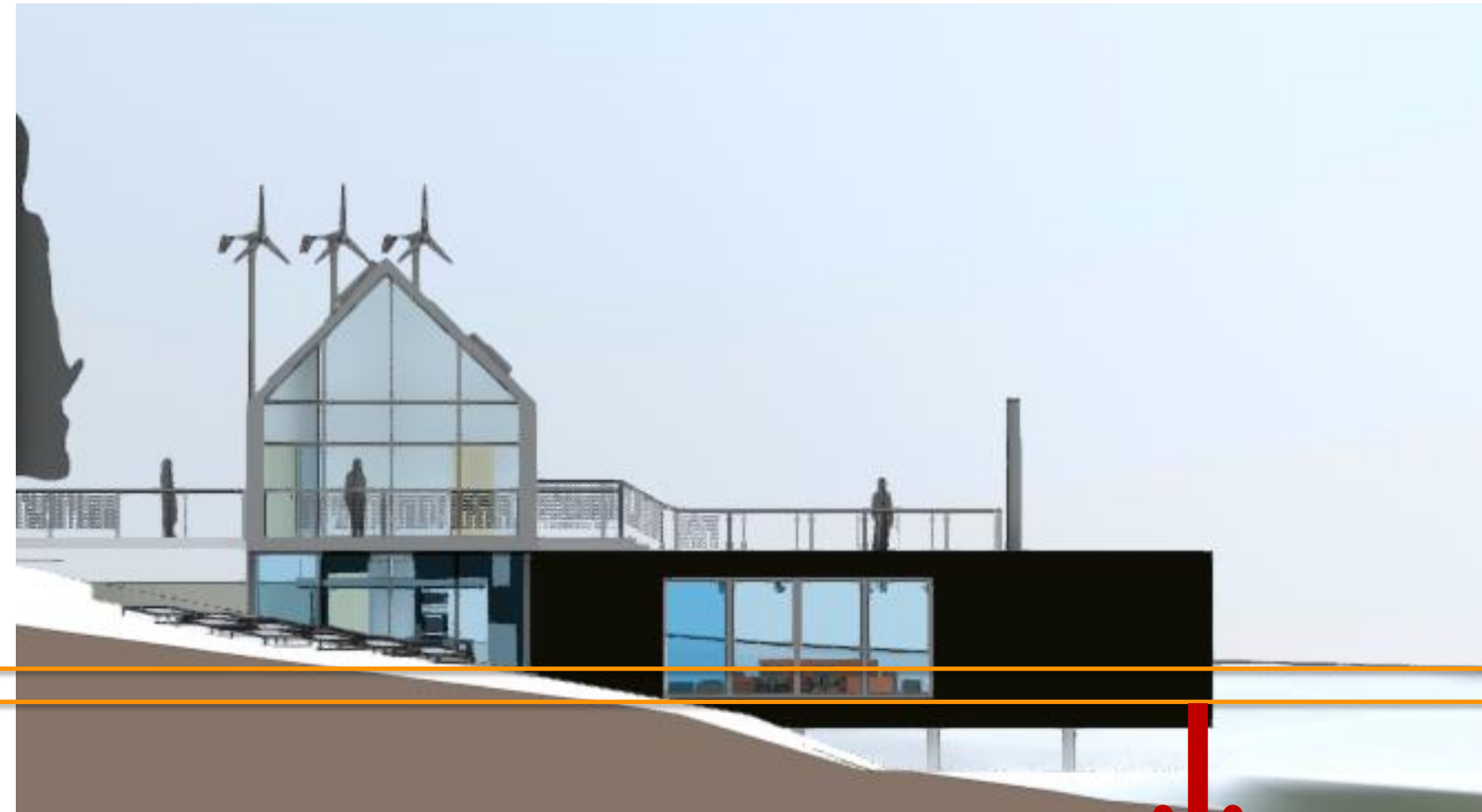


- $d = -1.575 \times -1 = 1.575$

5. Create planes:

- `planeUpper = new THREE.Vector4( 0, 0, 1, 1.575 )`
- `viewer.setCutPlanes( [ planeUpper ] )`

# Do sectioning with Revit's elevations



Level1, EL. 0 mm

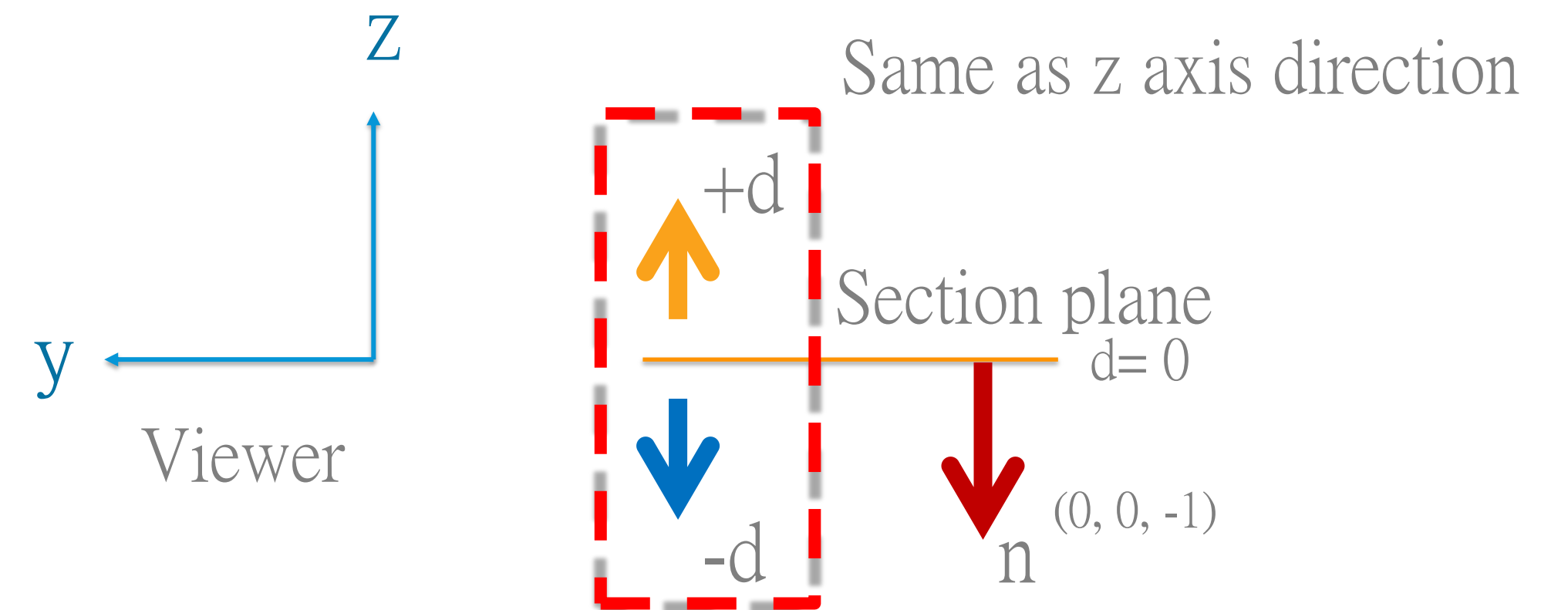
Level 1 Living Rm.,  
EL. -550 mm



Level1, d= 0

Level 1 Living Rm.,  
d= -12.237

1. Obtain z value of the Level 1 Living Rm , -550mm
2. Convert length units (From SI to IM) , -550mm = -1.804 ft
3. Convert coordinate system (From Revit to Viewer):
  - `GobalOffset = model.getData().globalOffset`
  - $z = -1.804 - \text{GobalOffset.z} = -12.237$  units
4. Convert coordinate system (From Viewer to Section plane):

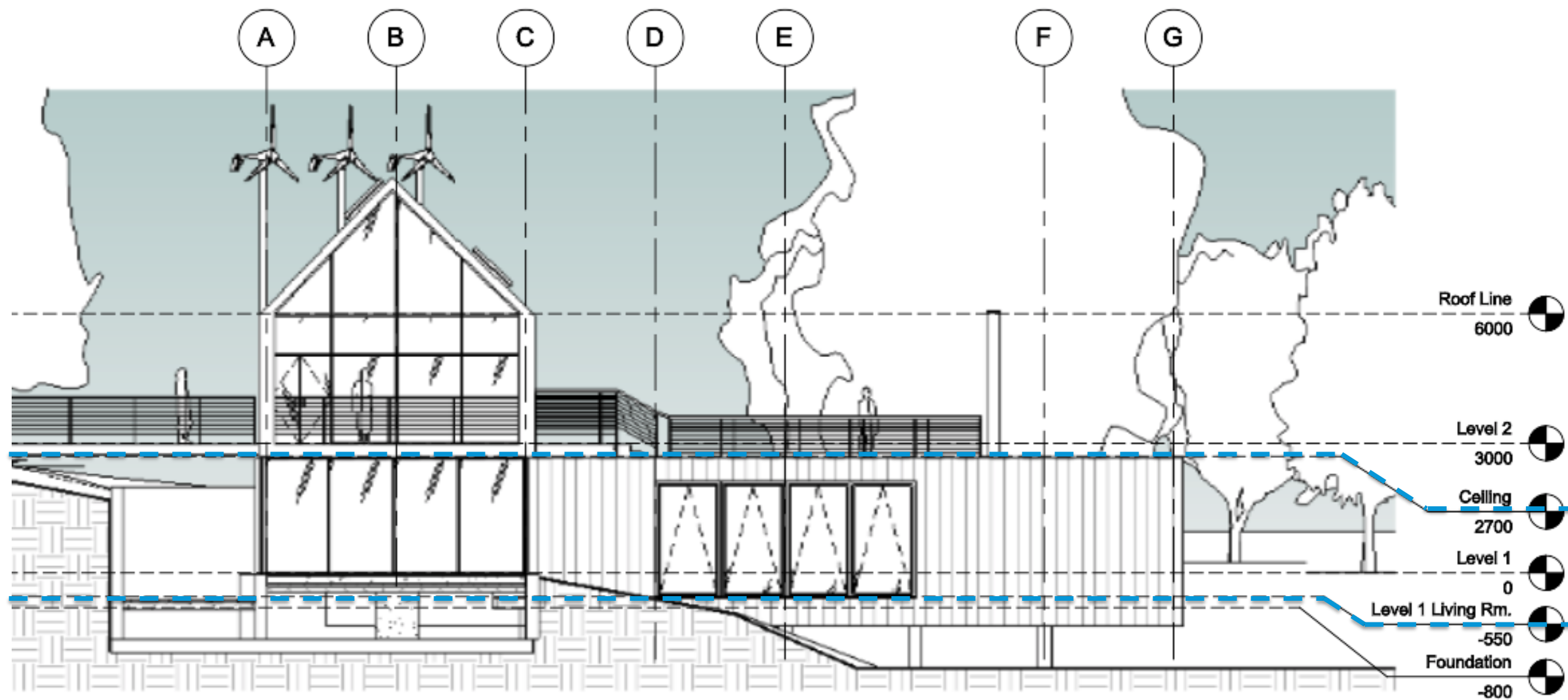


- $d = -12.237$

5. Create planes:

- `planeLower = new THREE.Vector4( 0, 0, -1, -12.237 )`
- `viewer.setCutPlanes( [ planeLower ] )`

# Do sectioning with Revit's elevations



Section planes for elevations:

- `planeUpper = new THREE.Vector4( 0, 0, 1, 1.575 )`
- `planeLower = new THREE.Vector4( 0, 0, -1, -12.237 )`
- `viewer.setCutPlanes( [ planeUpper, planeLower ] )`



Ceiling,  $d = 1.575$

Level 1 Living Rm.,  $d = -12.237$



# Viewer

A web browser based viewer  
with JavaScript API for 3D  
models and 2D drawings.



<https://github.com/yiskang/forged-au-sample>





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