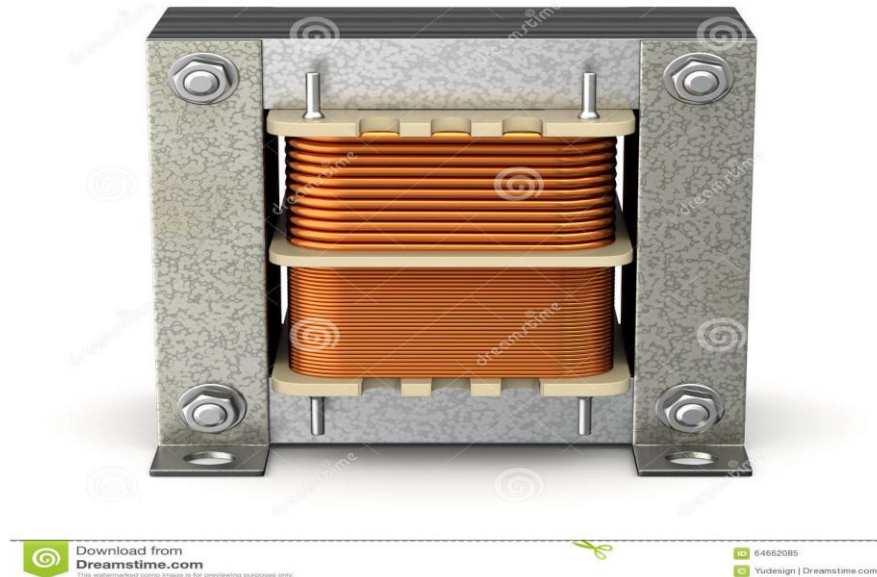


Course – Computer Aided Electrical Drawing
Code- 21EE741

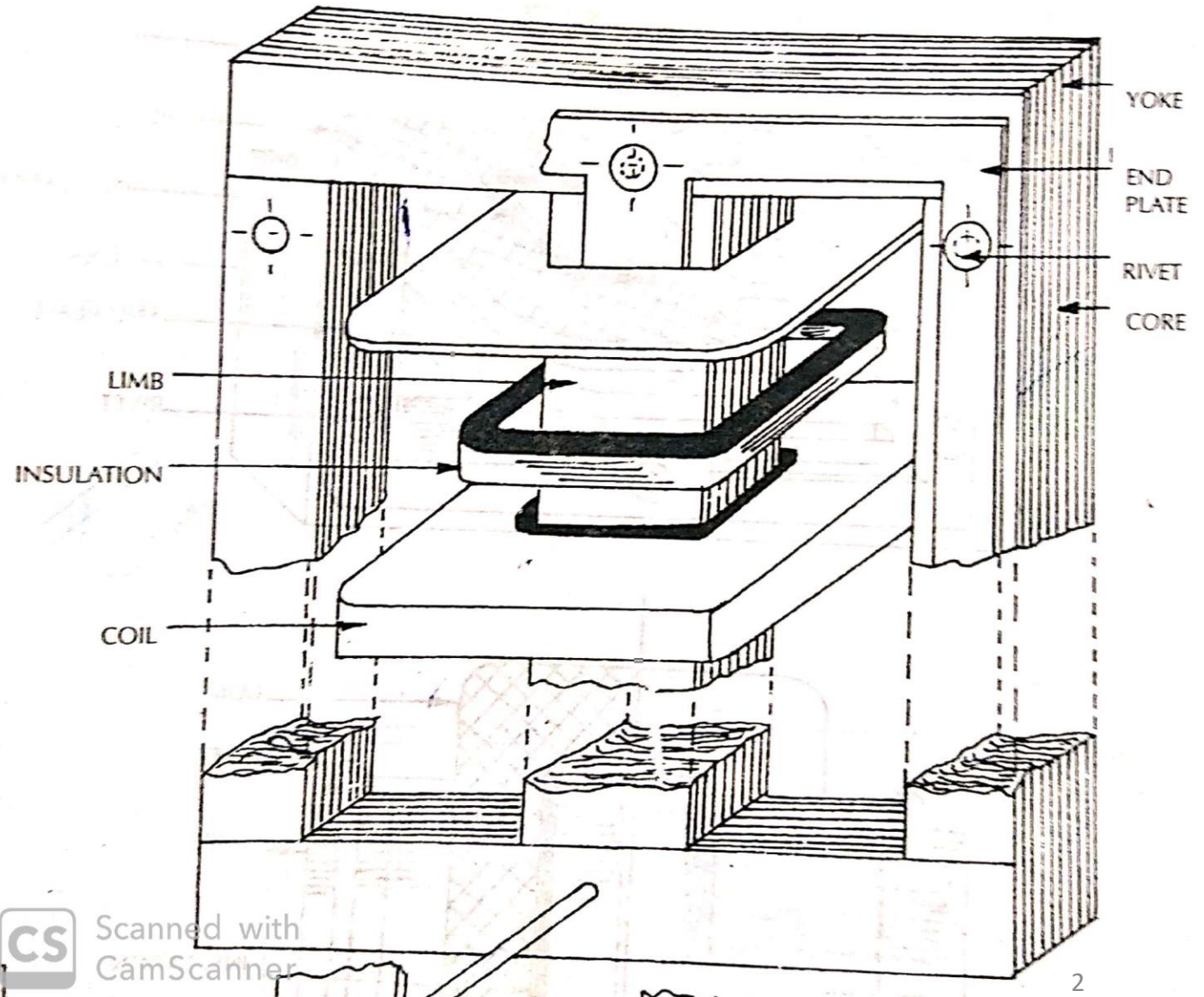
Module-3: Transformer Assembly- Shell Type



Prepared by
Maria Sushma S
Asst Professor
EEE

Cut away section of transformers

1. Sectional Plan
2. Sectional Elevation

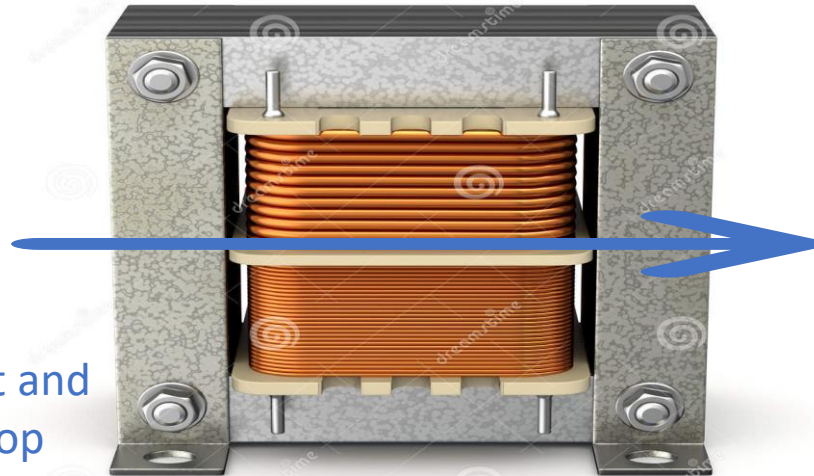


Top view-Sectional Plan

View it from top



Horizontal cut and
view it from top



View it from top



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Top view-Sectional Plan

Details of dimension we can get

Width of transformer or core depth

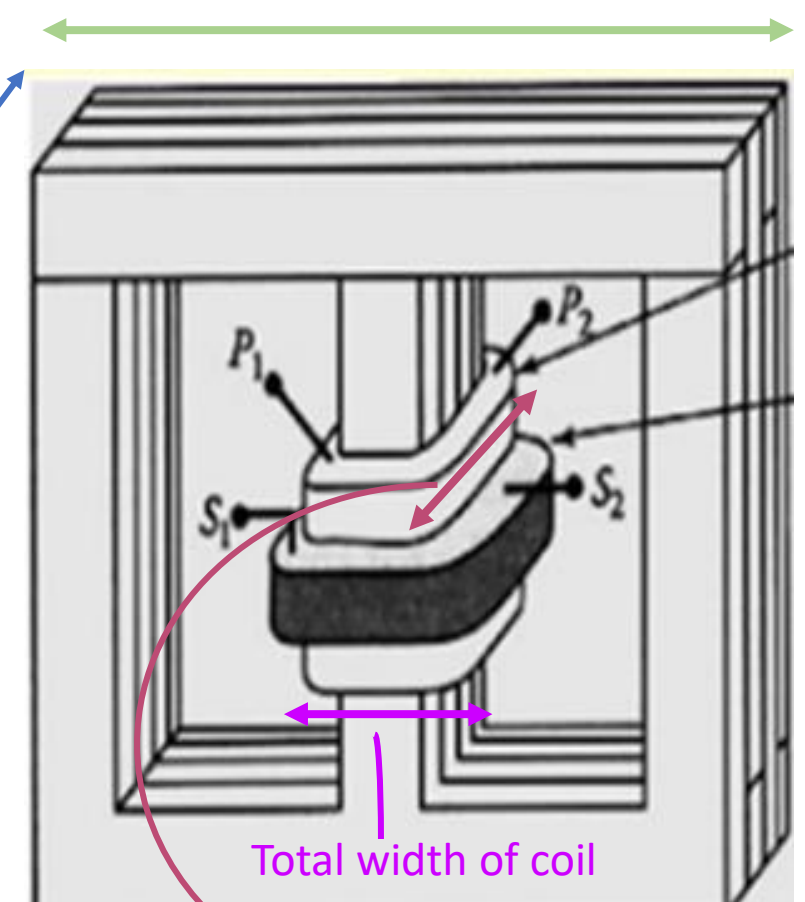
Length of transformer

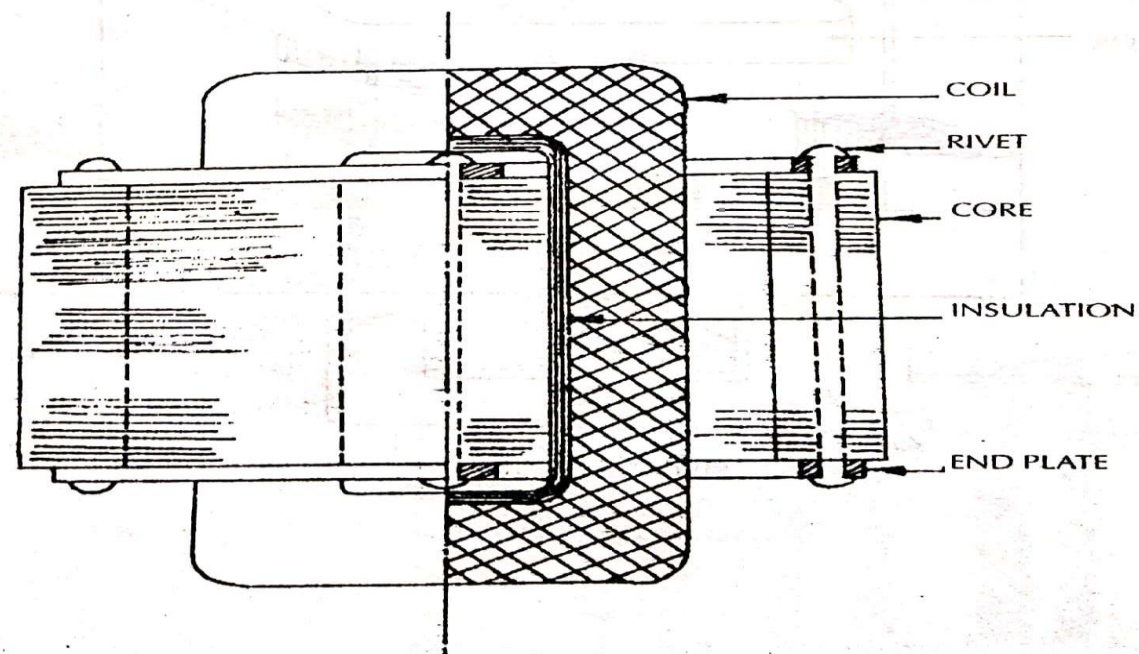
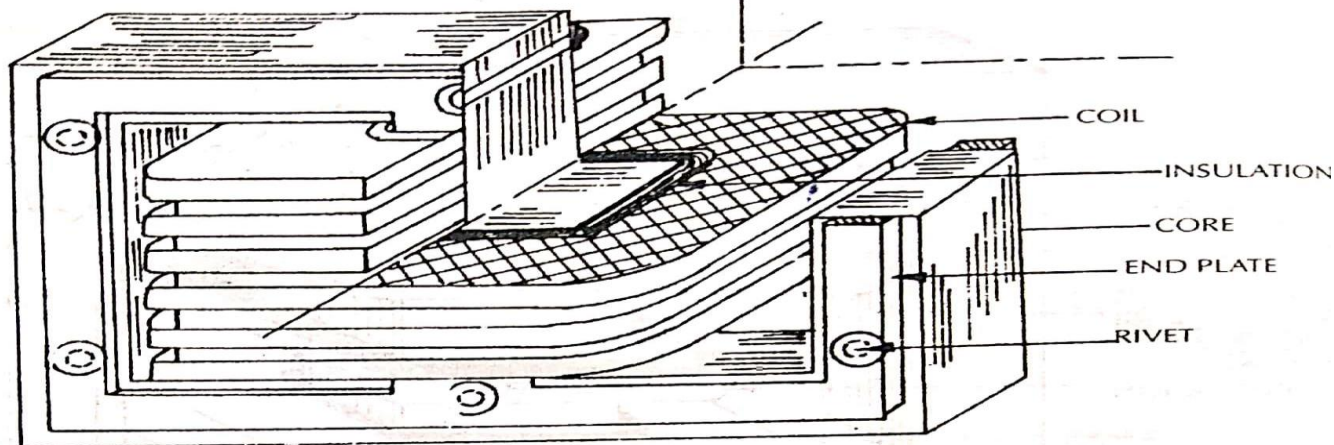
Width of transformer or core depth

Length of transformer or core length

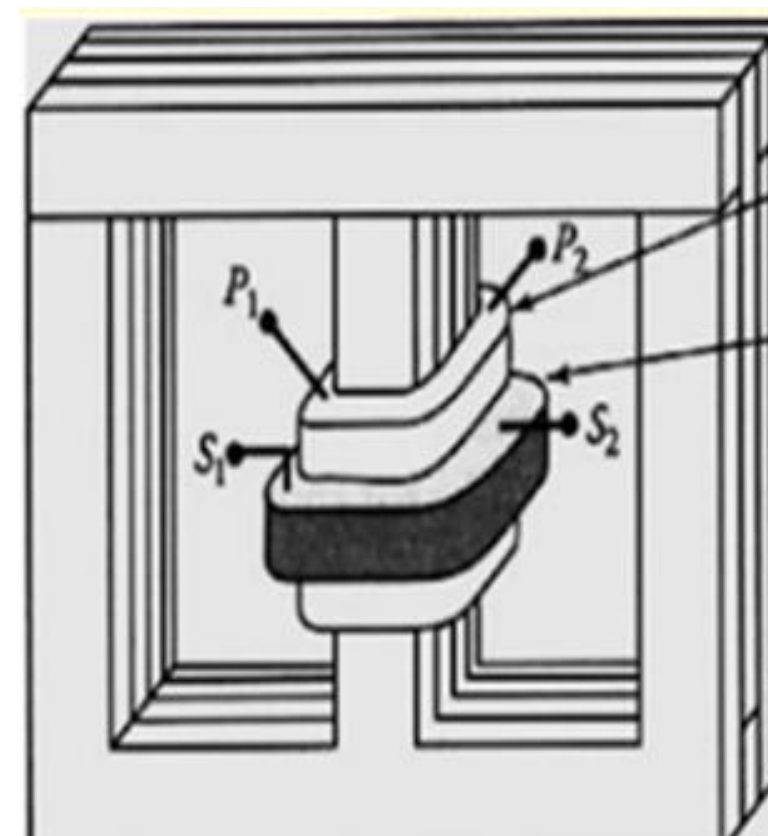
Total coil width

Height of coil

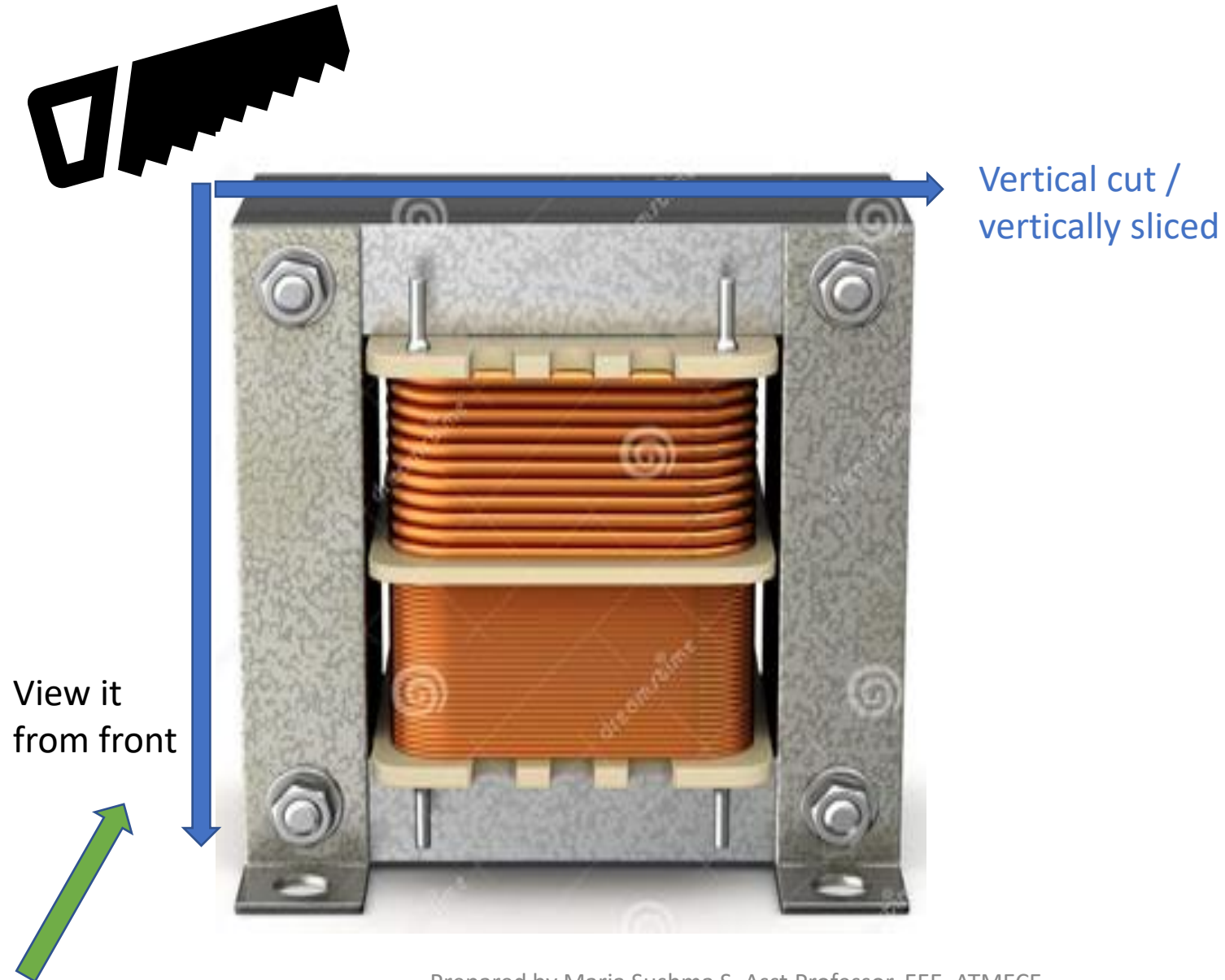




Plan Top view

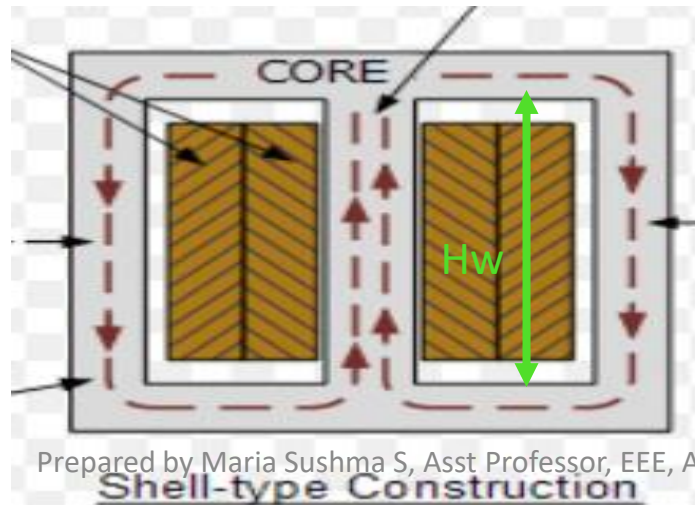


Front elevation

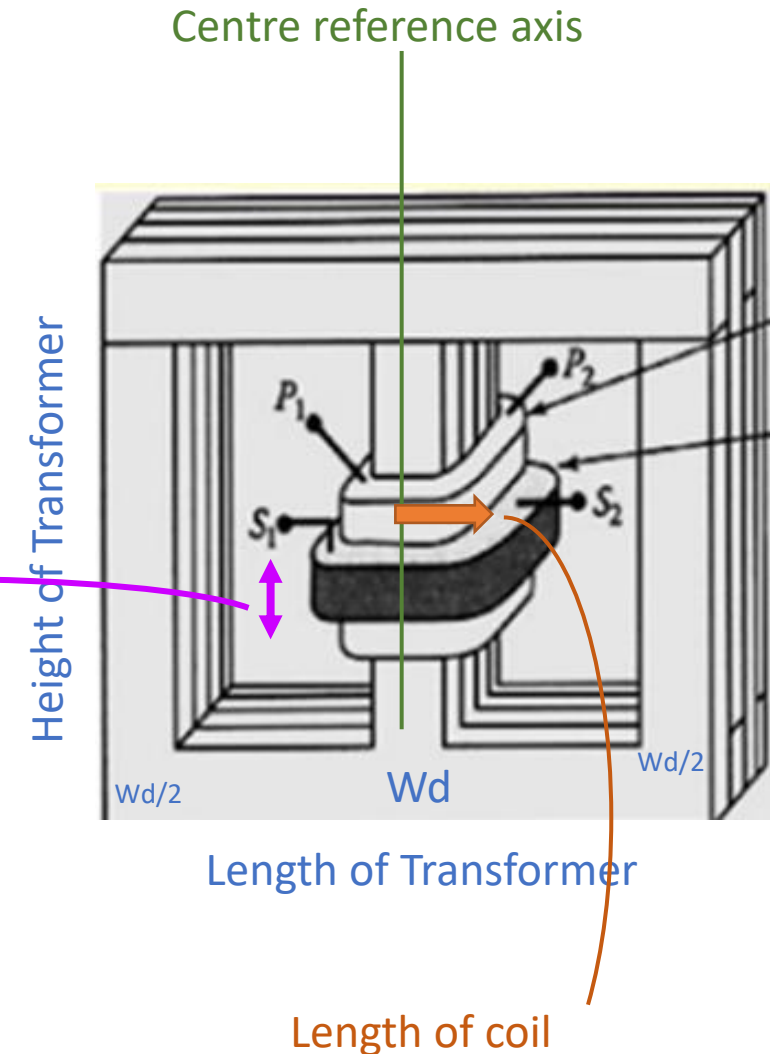


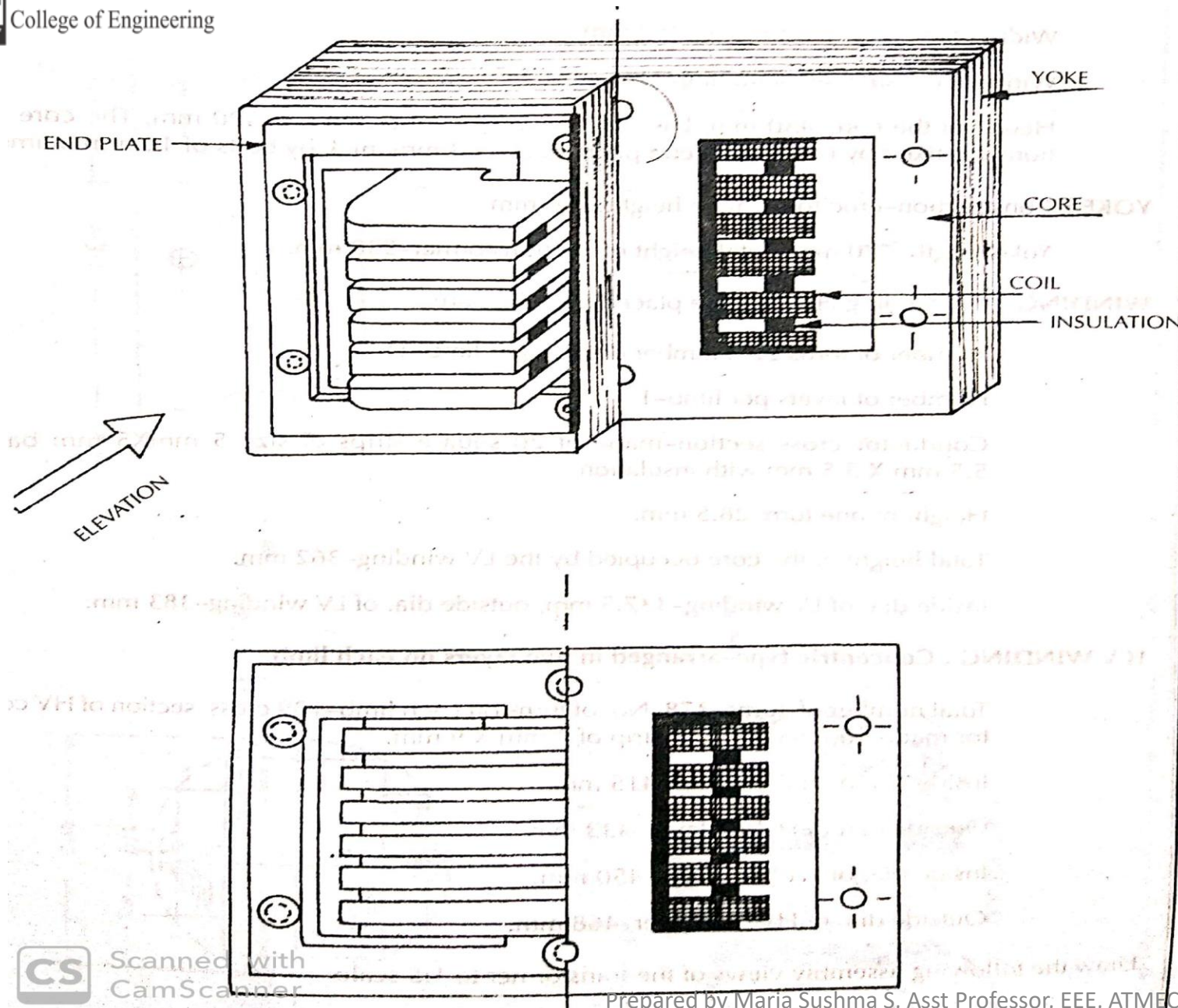
Sectional elevation: Dimension details obtained:

- Height of transformer
- Length of transformer
- W_d - width of central limb
- Length of coil
- Thickness of coil or height of one turn
- Height of window- H_w



Prepared by Maria Sushma S, Asst Professor, EEE, ATMECE





Sectional
Elevation- front
view

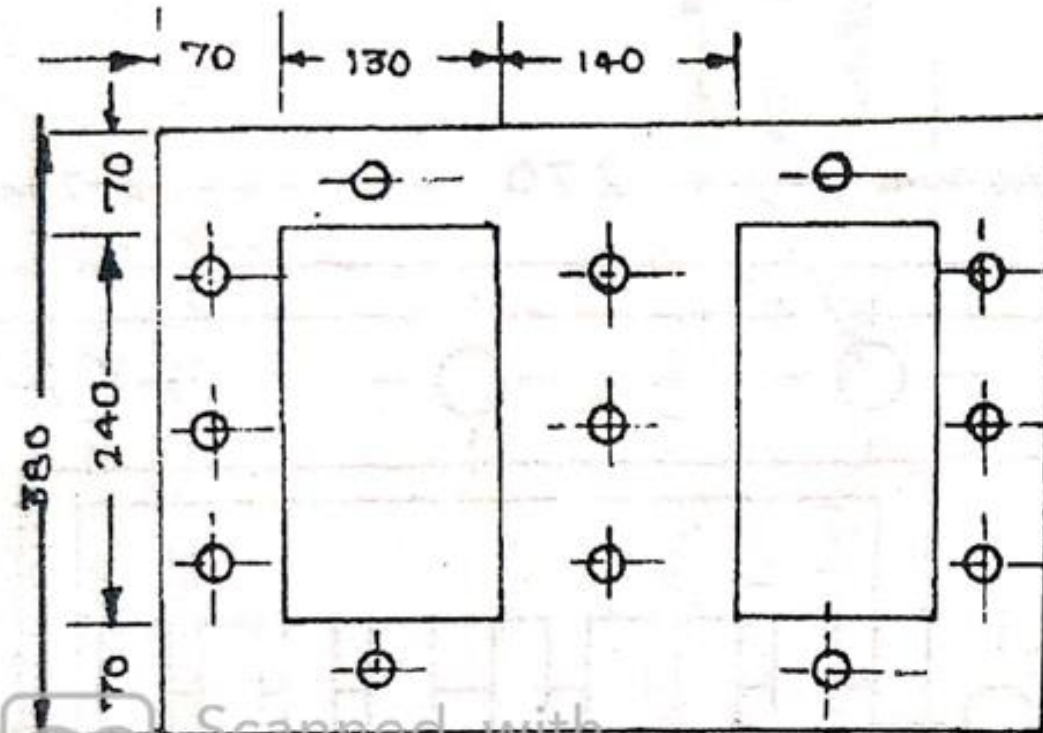
PROBLEM 3:

Draw the sectional elevation of single phase shell type transformer for the given below dimensions:

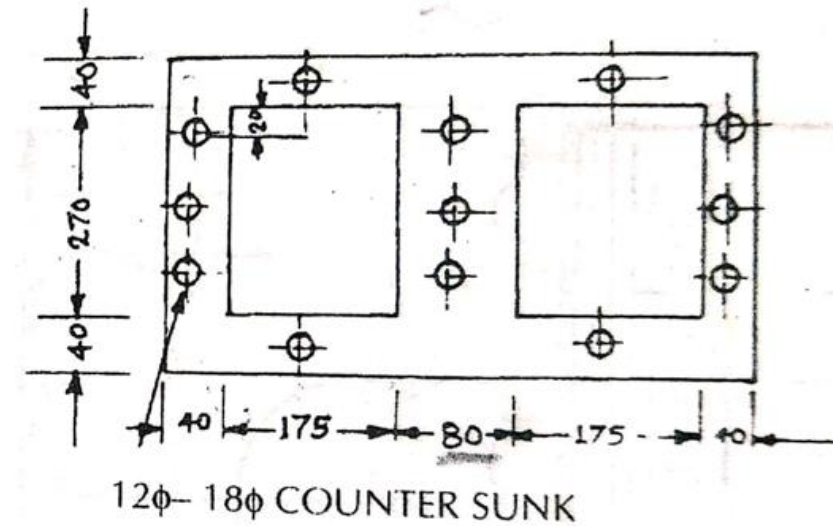
Core width	=14cm
Core depth	=37cm
Core height	=38cm
Core length	=54cm
Window size	= 13*24cm
LV coil	= 4
HT coil	= 4
No. of turns in LV per coil	=10
No. of turns in HT per coil	=40
Cross section of the HT conductor	=28sq mm
Average height of one turn	=1.8cm
Coil to be arranged over medium reactance	

Fixing end cover

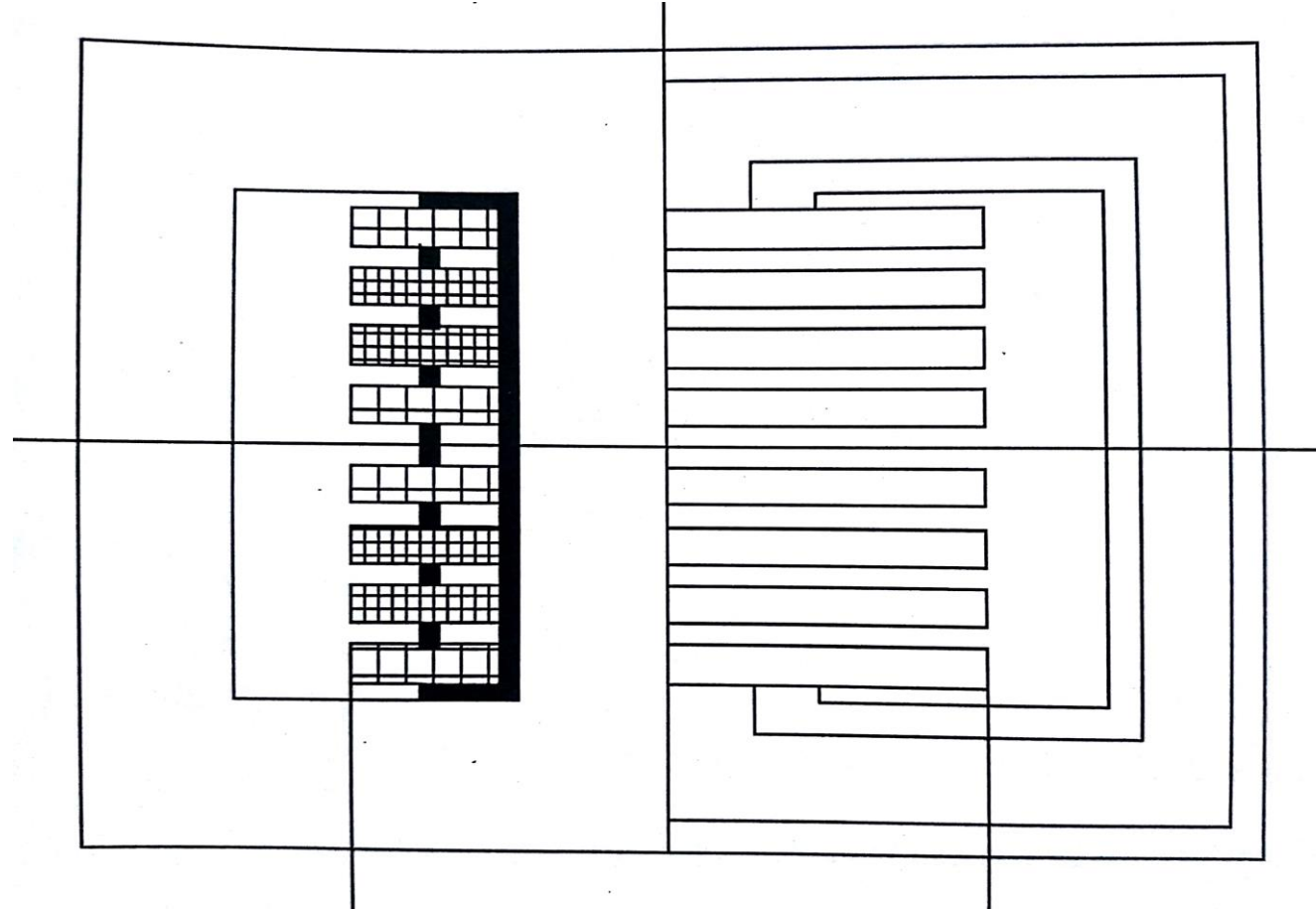
ELEVATION



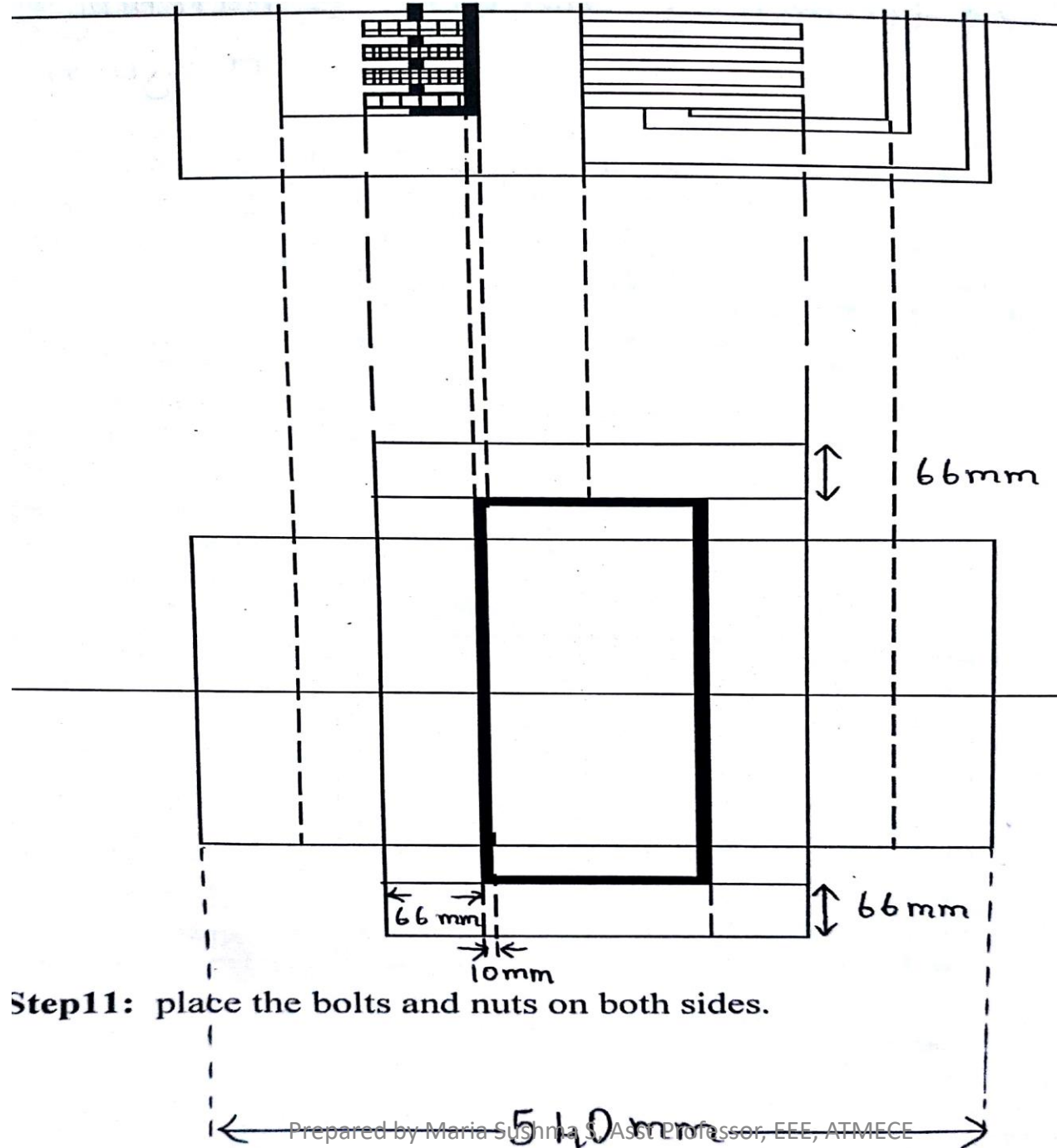
END PLATE 2-OFF 30 THICK

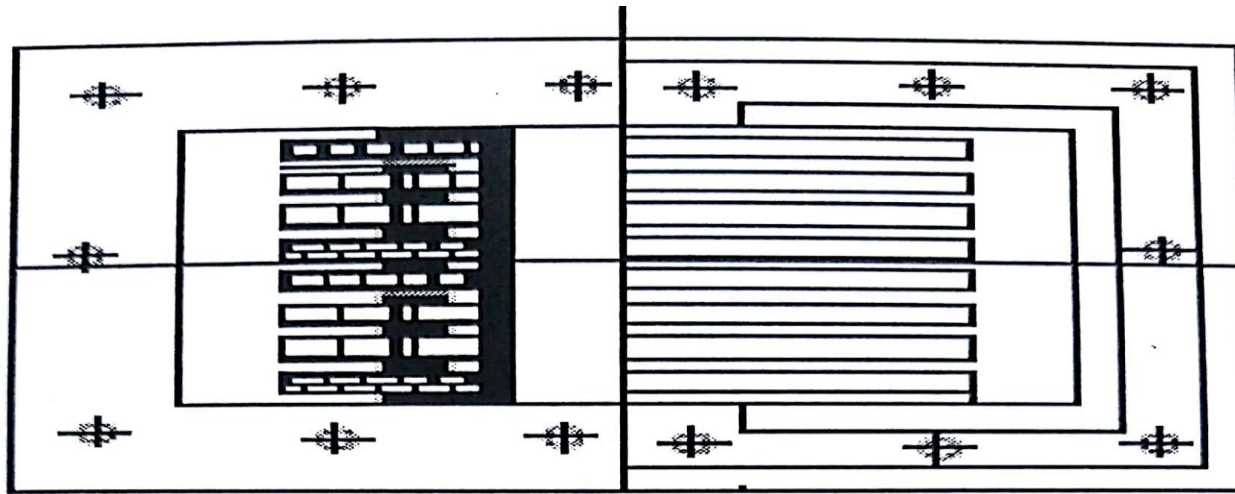


Sectional elevation

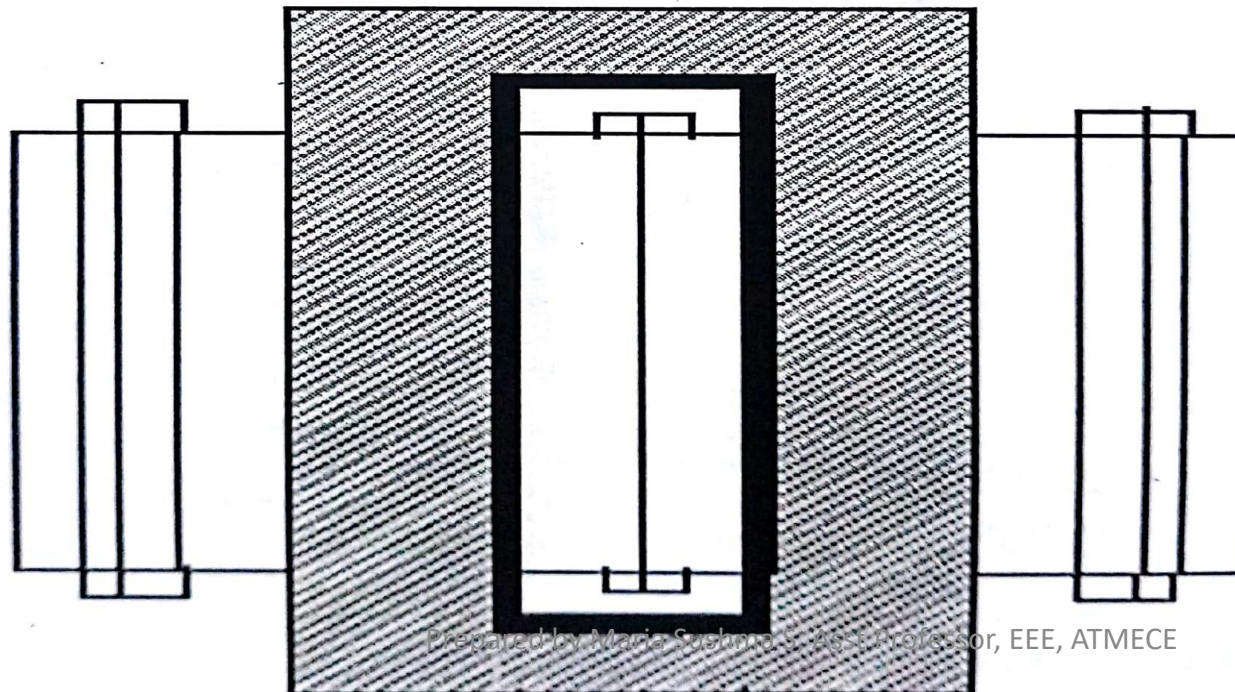


Sectional Plan





SECTIONAL ELEVATION FRONT VIEW



SECTIONAL PLAN- TOP VIEW

Problem-2(VTU QP) on Shell type Transformer

Core: width of central limb = 14 cm = **140mm**

Overall height of core = $H = 38 \text{ cm} = \mathbf{380 \text{ mm}}$

Overall width of core = $W = 54 \text{ cm} = \mathbf{540 \text{ mm}}$

Overall depth of core = $D = 37 \text{ cm} = \mathbf{370 \text{ mm}}$

Window dimension = $13 \times 24 \text{ cm} = \mathbf{130 \times 240 \text{ mm}}$

Windings: 4 HV coils, 4 LV coils

Rectangular coil dimension :

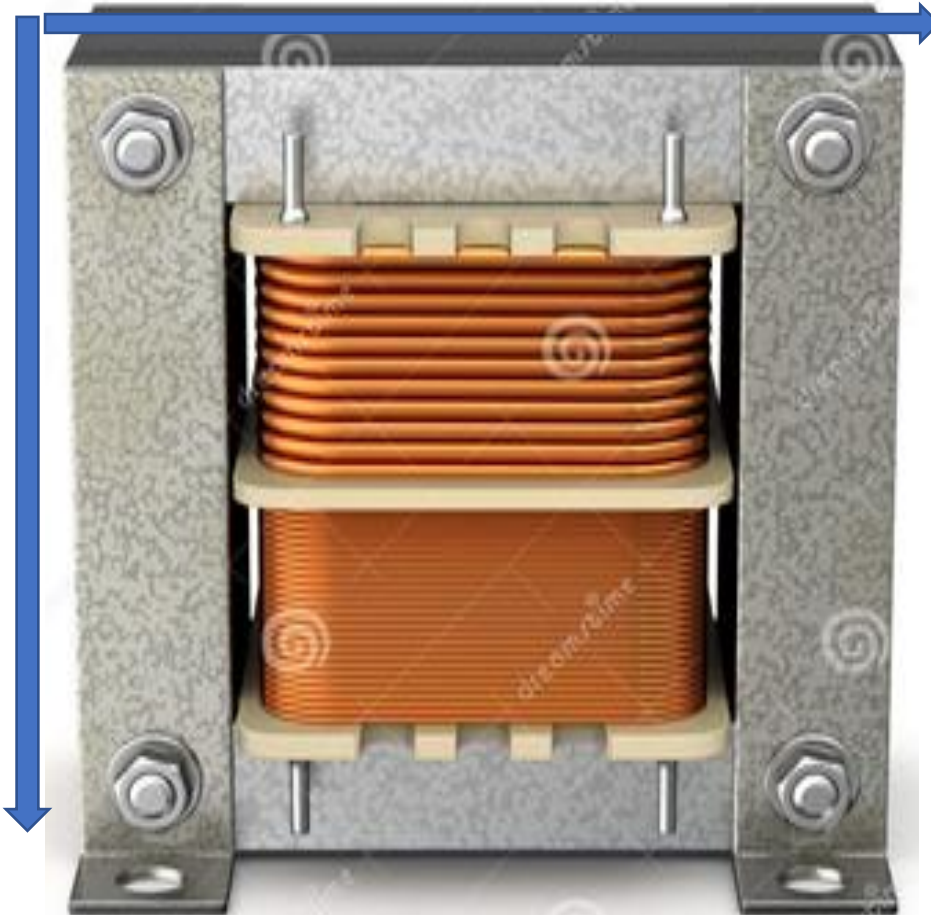
Inside = $15 \text{ cm} \times 41 \text{ cm} = \mathbf{150 \text{ mm} \times 410 \text{ mm}}$

Outside = $35 \text{ cm} \times 61 \text{ cm} = \mathbf{350 \text{ mm} \times 610 \text{ mm}}$

Insulation support between coils = $1 \text{ cm} = \mathbf{10 \text{ mm}}$

Solution steps

Front elevation



Vertical cut /
vertically sliced

View it
from front

Elevation details

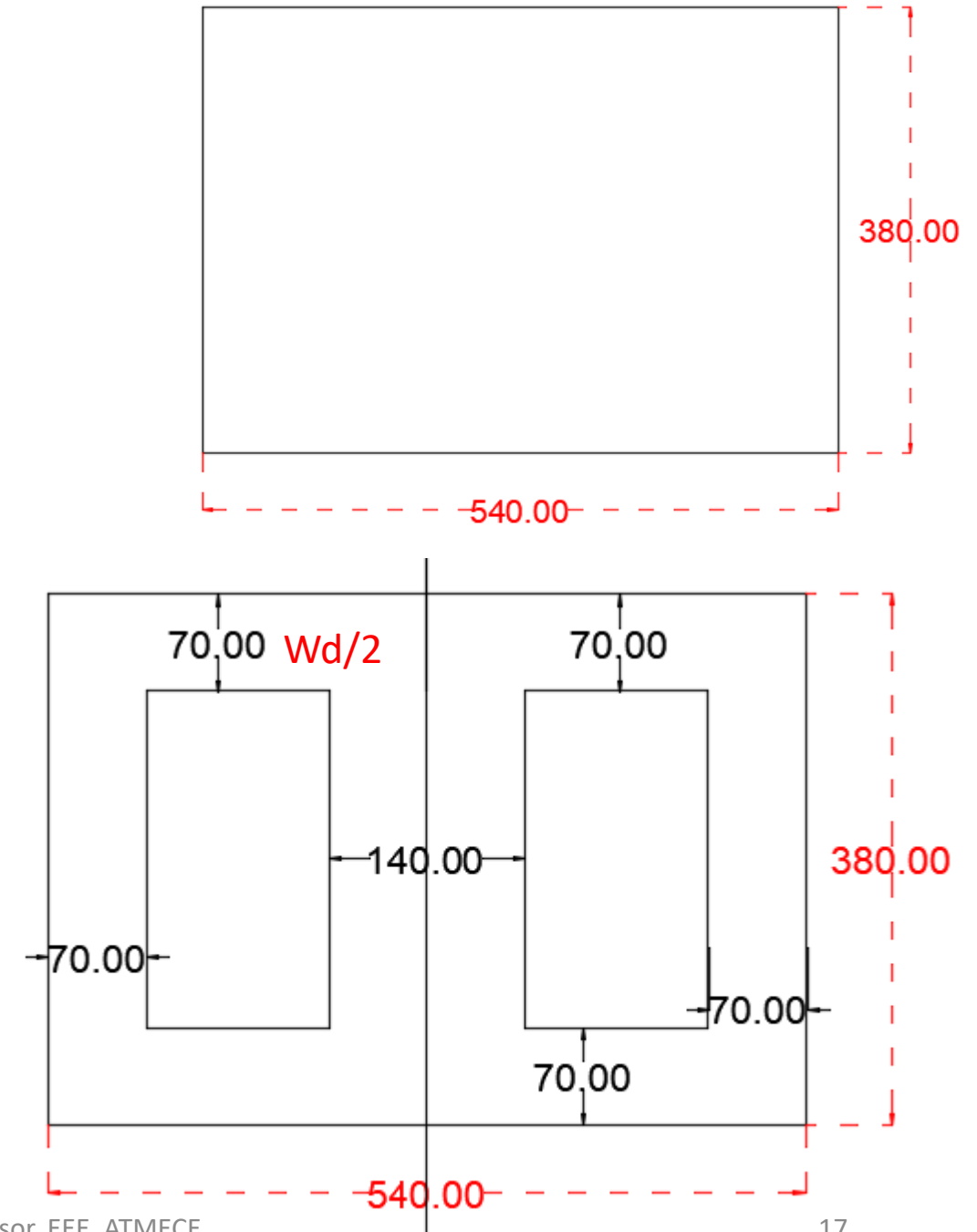
Step-1 :

- Core height = 380mm
- Core width = 540mm

Step-2:

Width of central limb = $W_d = 140\text{mm}$

$W_d/2 = 70\text{mm}$



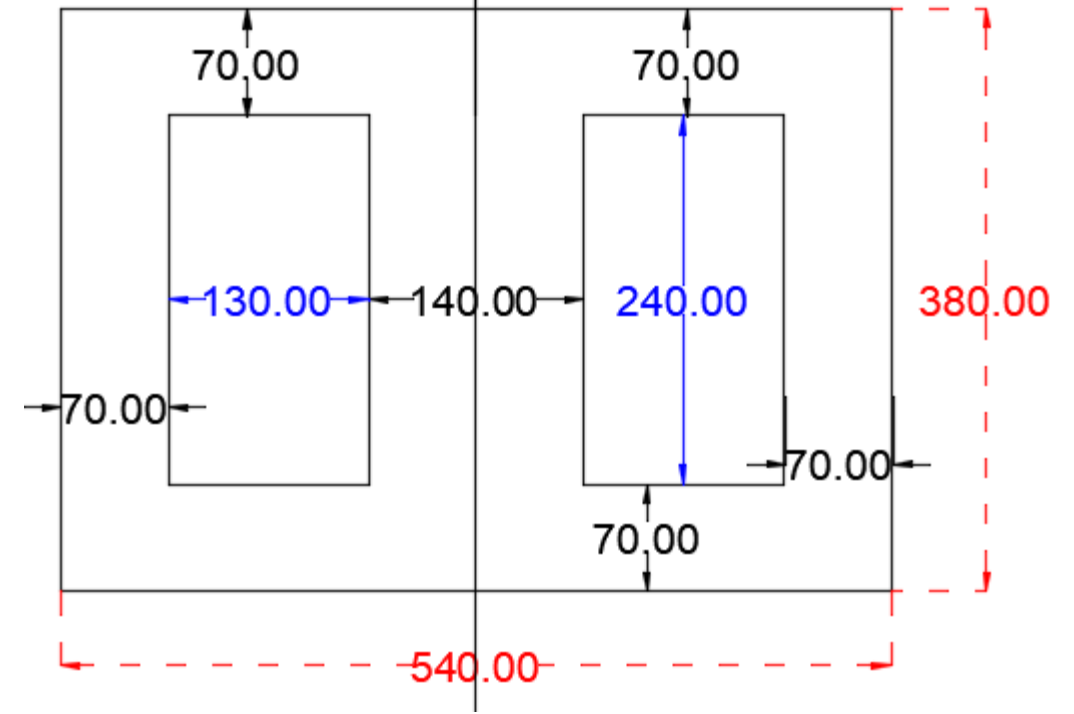
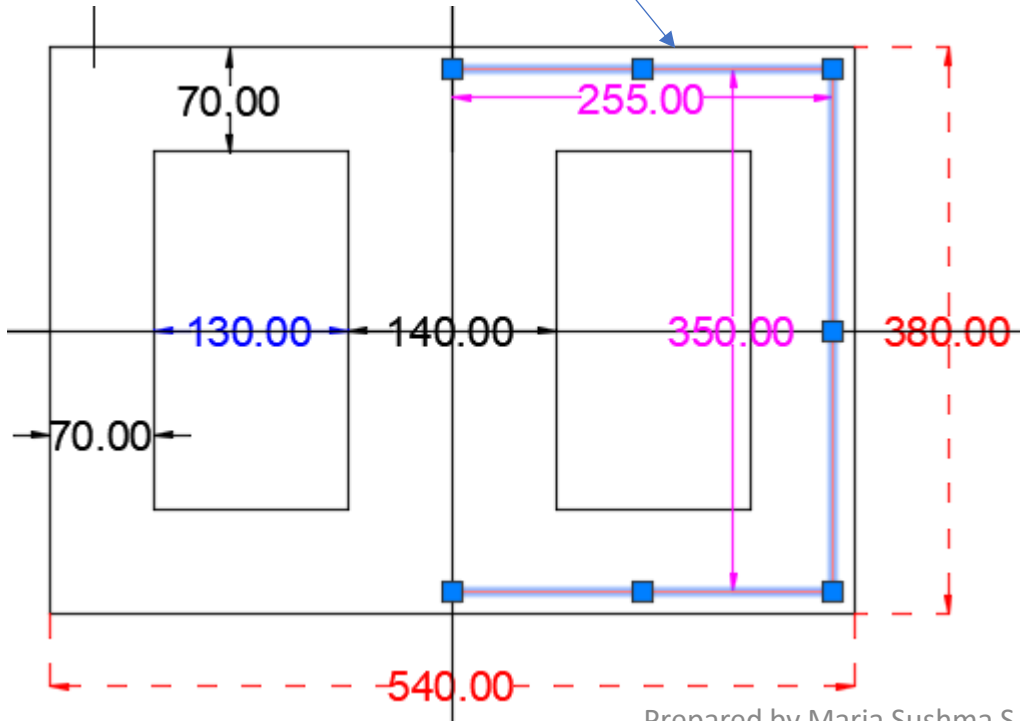
Step-3:

Window- 130*240

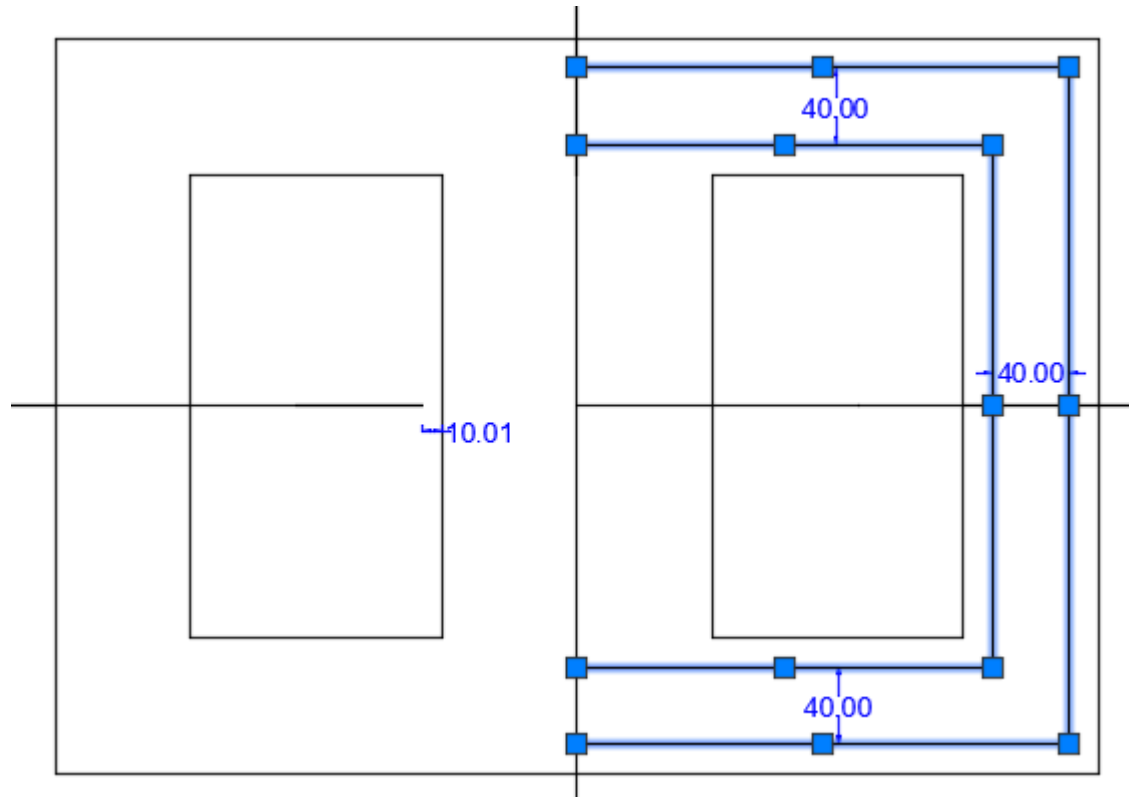
Step-4: End shield details- to be assumed

510mm*350mm

$$510/2 = 255 \text{ mm}$$

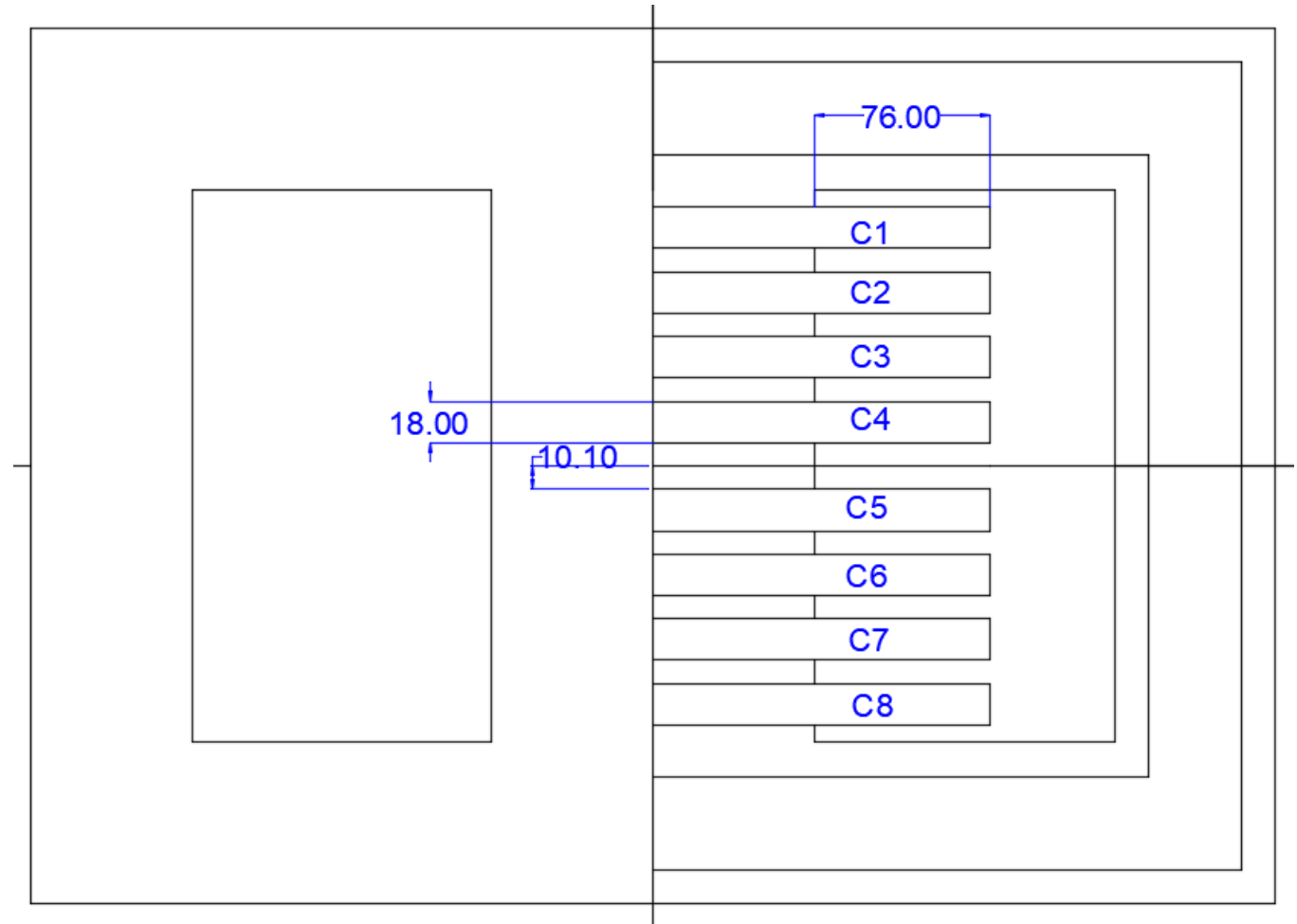


Thickness of end shield = $wd'^2/2 = 40$ (less than $wd/2=70$)

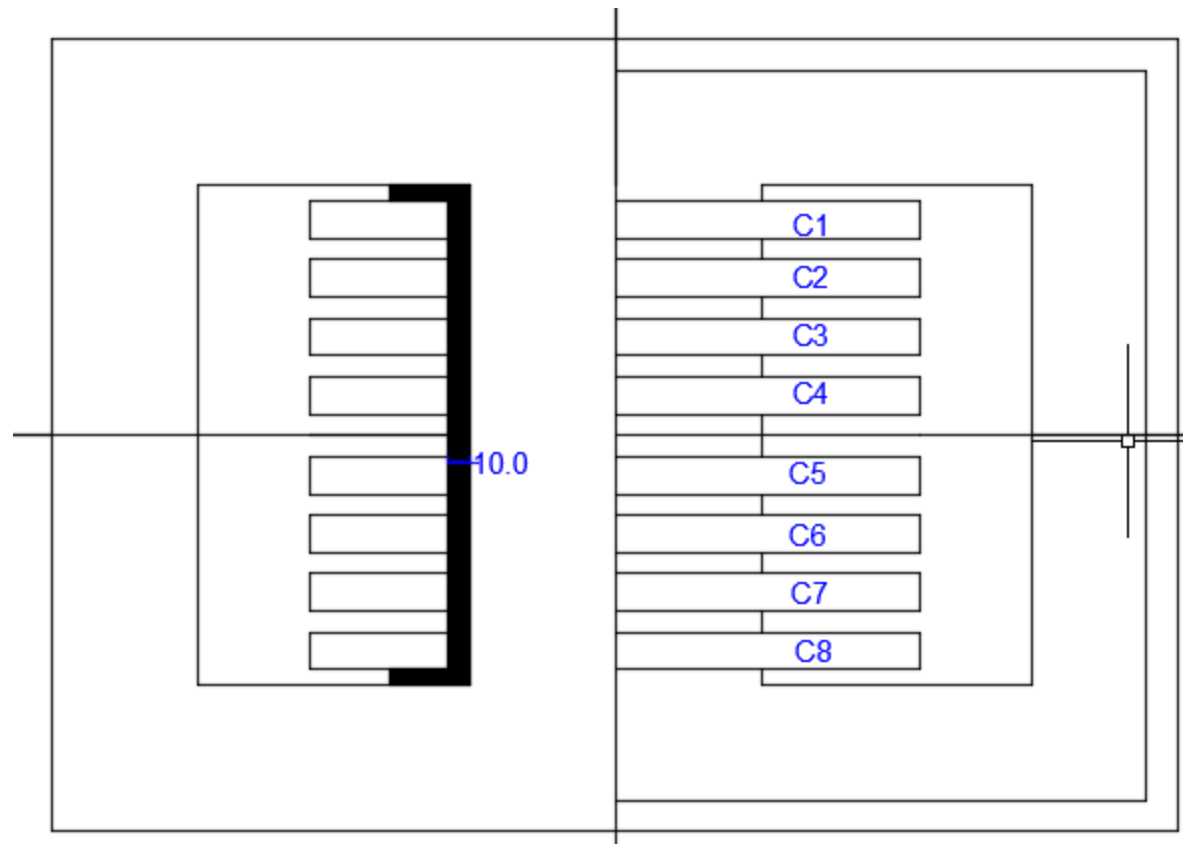


Step-4: Coil details-

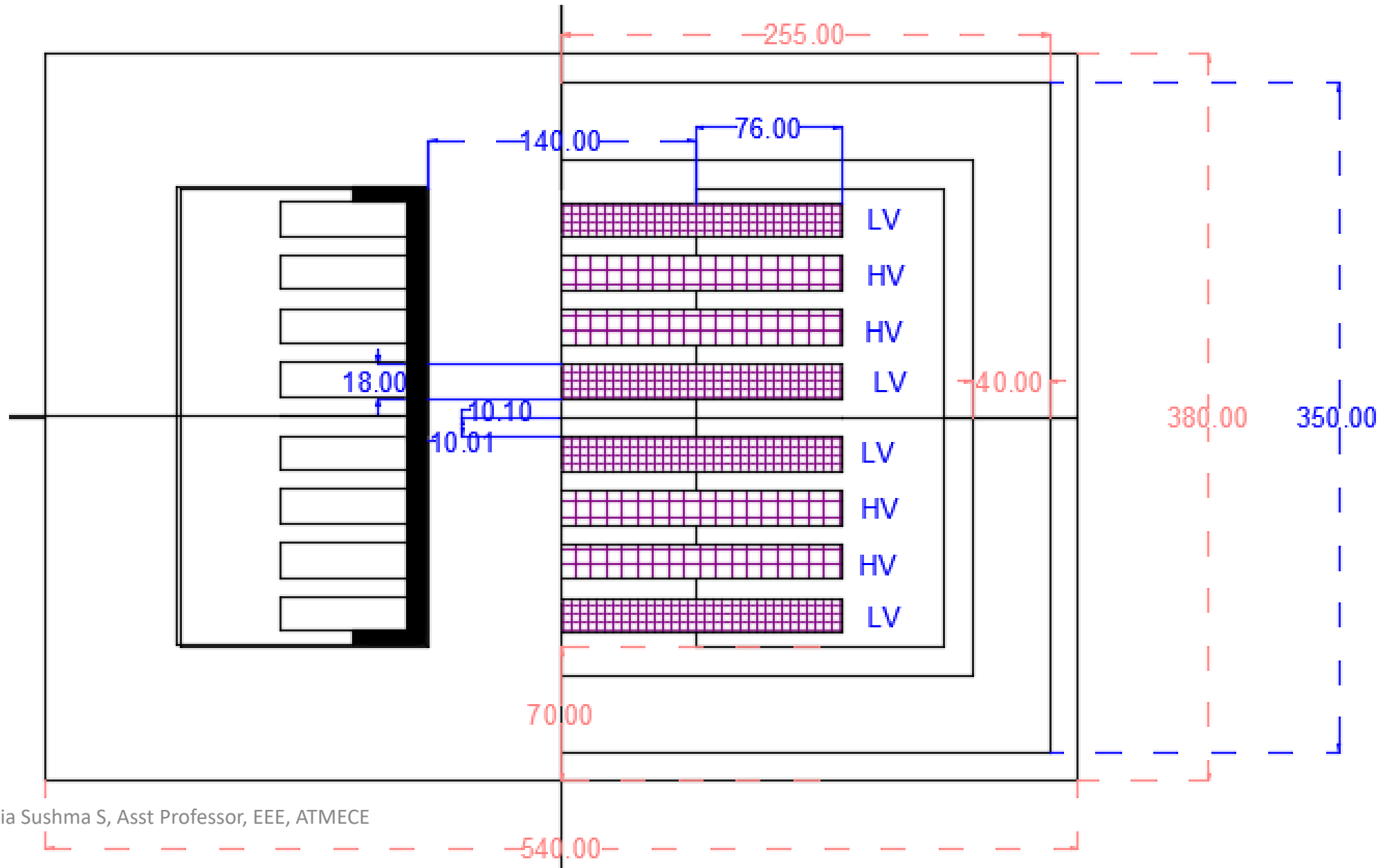
- LV=4, HV=4
- Coil width= 76 mm
- coil height=18mm
- Clearance = 10.1mm



Insulation thickness = 10mm

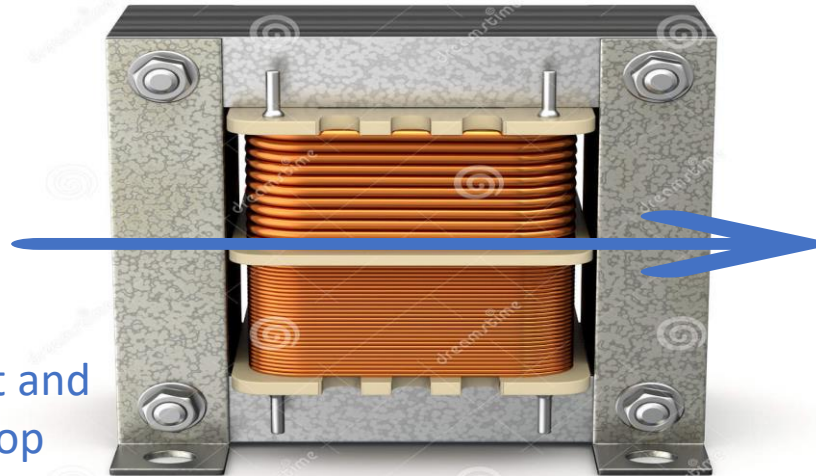


Sectional Elevation



Top view-Sectional Plan

View it from top



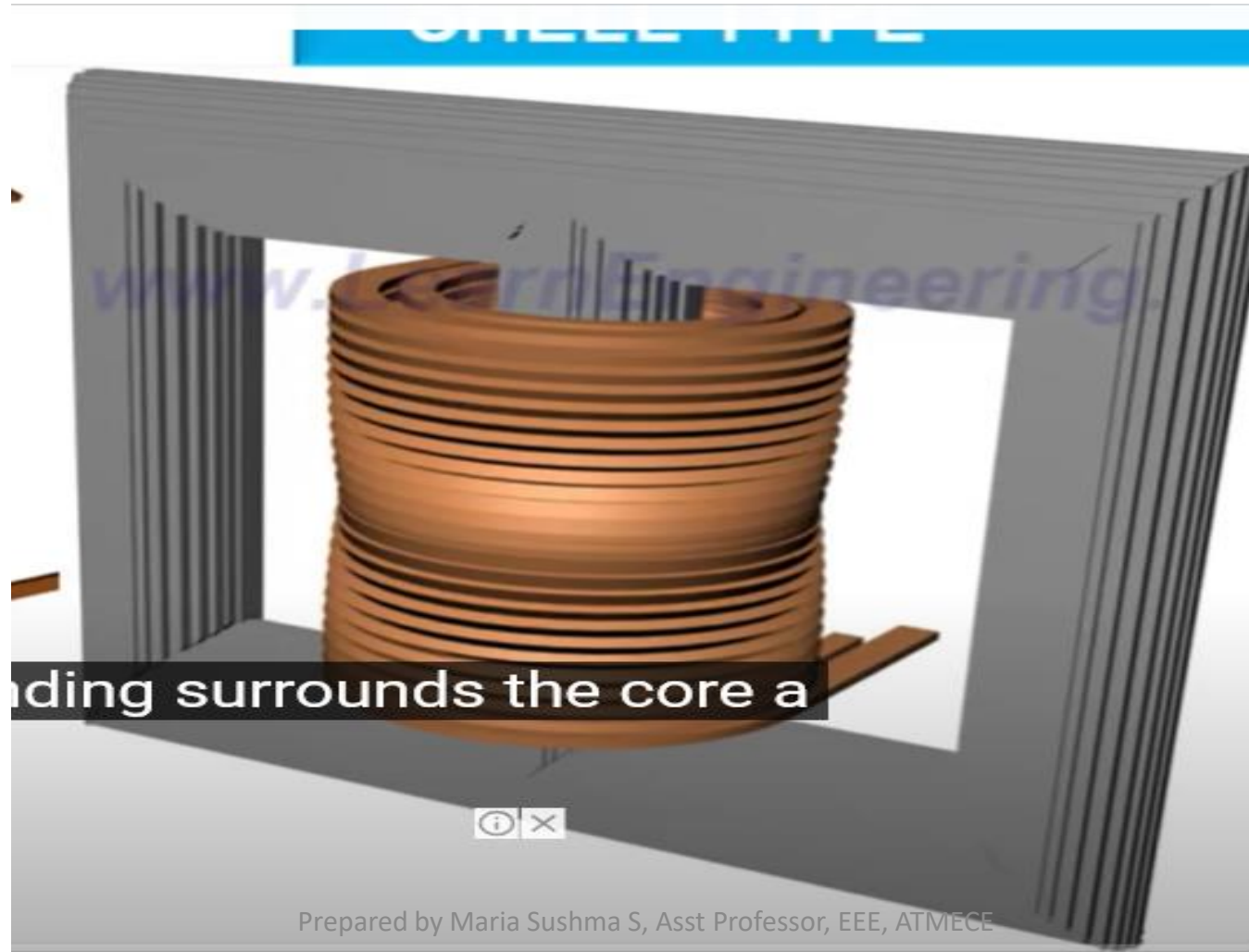
Horizontal cut and
view it from top

View it from top



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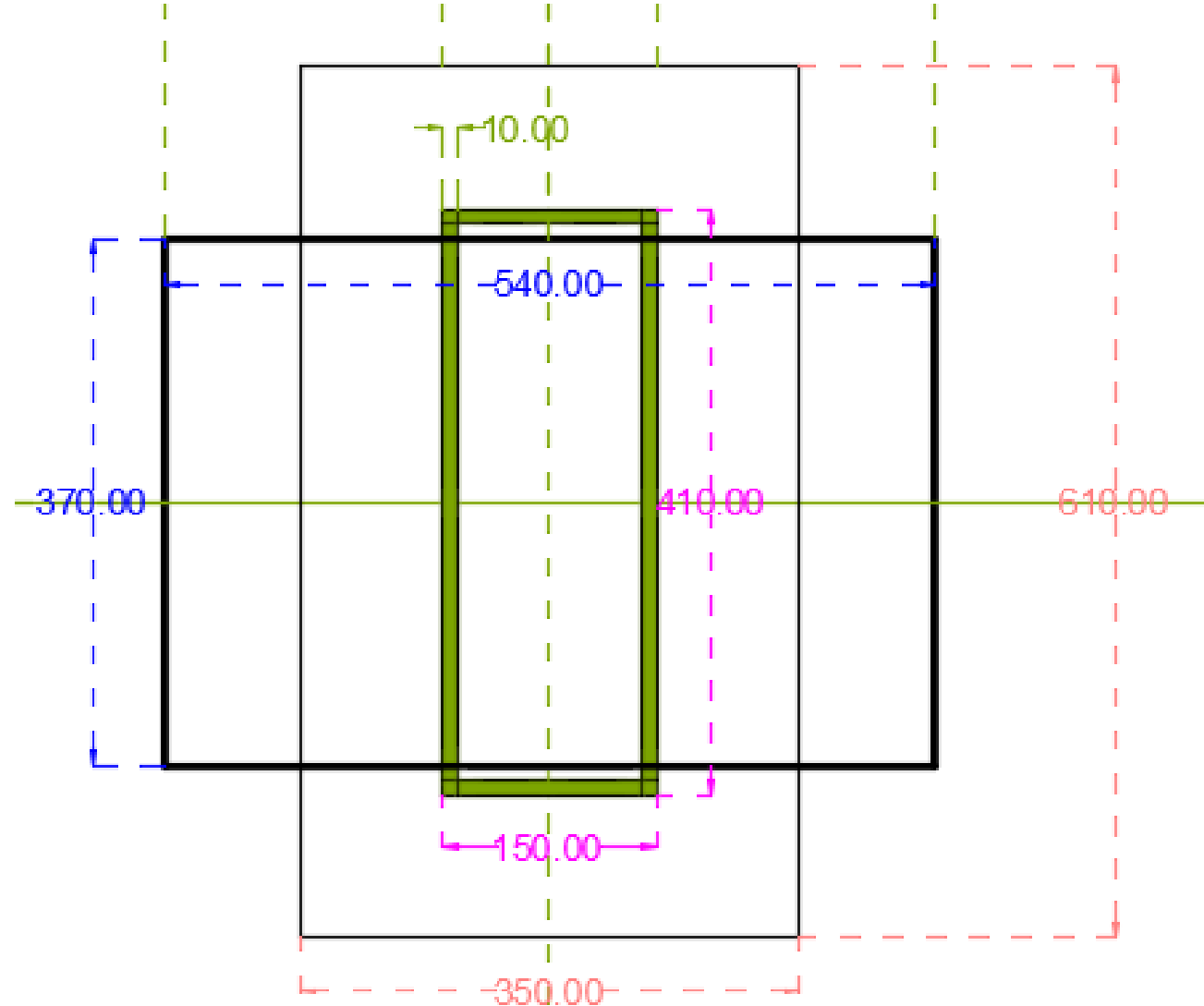


Sectional Plan details

Rectangular coil:

Inside- 15cm*41cm = **150mm*410mm**

Outer- 35 cm*61cm = **350m*610mm**



Complete sectional plan

