

รายชื่อรายนาม

เจ้าหน้าที่ 2 ชั้น

จำนวนโดย

กฤษฎา รัชชกุล ๖๗.๖.

on constant line vibration of 90°

$$f_c' = 150 \text{ ksc}$$

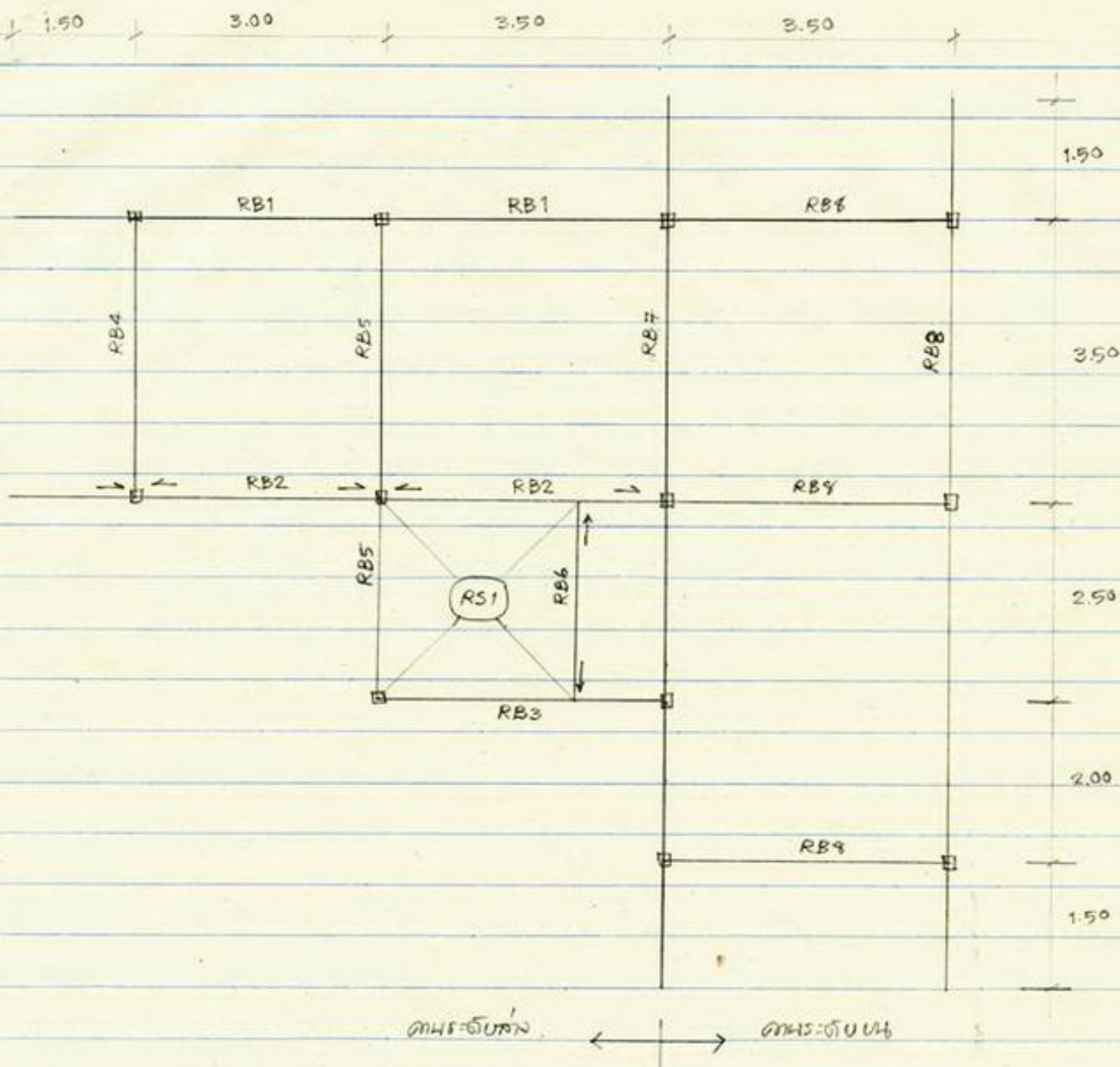
$$f_c = 65 \text{ ksc}$$

$$f_s = 1200 \text{ ksc}$$

$$n = 11$$

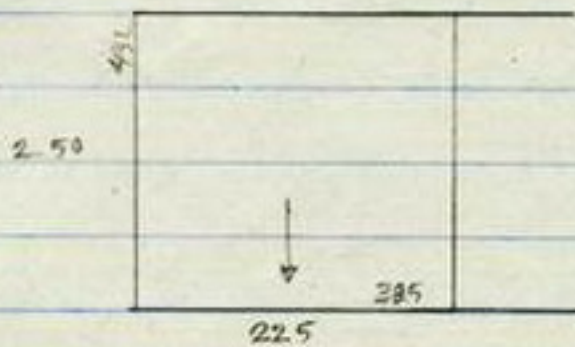
$$LL = 200 \text{ ksm.}$$

$$\text{allowable shear} = 0.29 \sqrt{f_c'}$$



ตั้งทางเดิน

หน้า RS1



Transfer load Div A = 492 Kg/m

Transfer load Div B = 385 Kg/m

$$\text{หน้า RS1} = 0.09$$

$$\text{หน้า RS1} = 192 \text{ Kg/m}^2$$

$$\text{LL} = 300 \text{ Kg/m}^2$$

$$\therefore \text{Total load} = 492 \text{ Kg/m}^2$$

Slab case 1

$$C_A^+ D = 0.04 \quad C_B^+ D = 0.033$$

$$C_A^+ L = 0.04 \quad C_B^+ L = 0.033$$

$$W_A = 0.55 \quad W_B = 0.45$$

$$M^+ A = 139 \quad M^+ B = 141$$

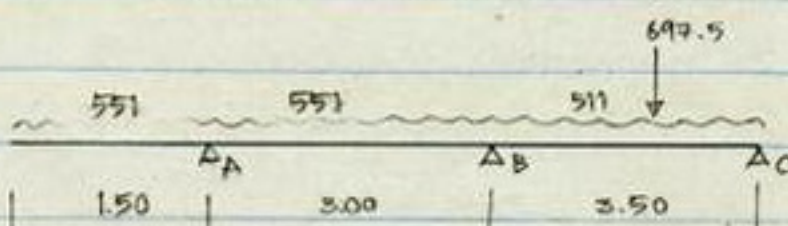
$$\therefore A_s + A = 2.2 \quad A_s + B = 2.24$$

$$\therefore \text{use } \phi 9 \text{ mm @ } 0.20 \# \quad \text{HP: Slab Thickness} = 8 \text{ cm}$$

Shear & Bond OK.

หน้า RB2

Section RB2 0.15 x 0.35



หน้า RB2 Moment Distribution

$$M_A = -574.89$$

$$R_A = 1524.77$$

$$M_B = -779.56$$

$$R_B = 2260.81$$

$$M_C = 0$$

$$R_C = 1119.91$$

$$M^+ \text{ at } 2.2 = 989.2 \text{ Kg-m}$$

$$\text{หน้า RB2 } M = 989.2 \text{ Kg-m HP: } V = \text{Kg}$$

$$\text{หน้า RB2 } M = 150(1.25 + 1.75/2)$$

$$= 425 \text{ Kg/m}$$

$$\text{หน้า RB2 Slab} = 385 \text{ Kg/m}$$

$$\text{HP load} = 697.5$$

$$\text{หน้า RB2} = 126 \text{ Kg/m}$$

$$\text{หน้า RB2 } M = 989.2 \text{ Kg-m HP: } V = 1366 \text{ Kg}$$

หน้า RB2

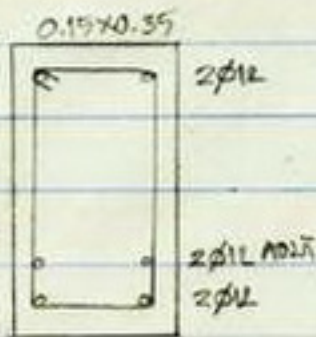
$$A_s = 3.14 \text{ cm}^2$$

$$\text{Shear Stress} = 3.04 \text{ KSC}$$

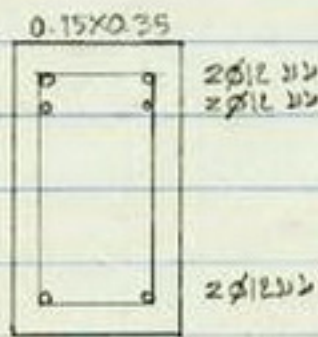
$$\therefore \text{use } 4 \phi 12 \text{ mm}$$

$$\text{HP: } \phi 6200 \text{ @ } 0.20 \text{ V.}$$

മുൻ RB1 ന്റെ



RB1



RB1 ന്റെ മുകളിലെ കമ്പ് ബേസ്

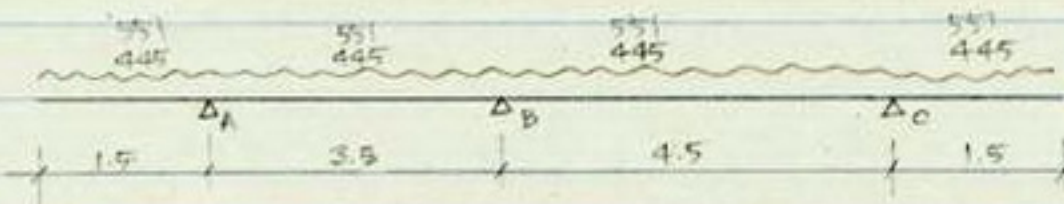
RB1 കോൺക്രീറ്റിനുള്ള RB2

RB3, RB4, RB6, കോൺക്രീറ്റിനുള്ള RB1

RB8

ഡെൽറ്റ = 124

ഡെൽറ്റ = 425



$$M_A = -619.88$$

$$R_A = 1717.21 (826.5, 890.72)$$

$$M_B = -877.26$$

$$R_B = 2361.23 (1037.74, 1323.45)$$

$$M_C = -900.95$$

$$R_C = 1823.55 (1156.05, 667.5)$$

$$\text{Mat } 2.5 \text{ from B} = \frac{712.14}{536.8 \text{ kg-m}}$$

$$\text{in } M = 712.14$$

$$V = 1323.45$$

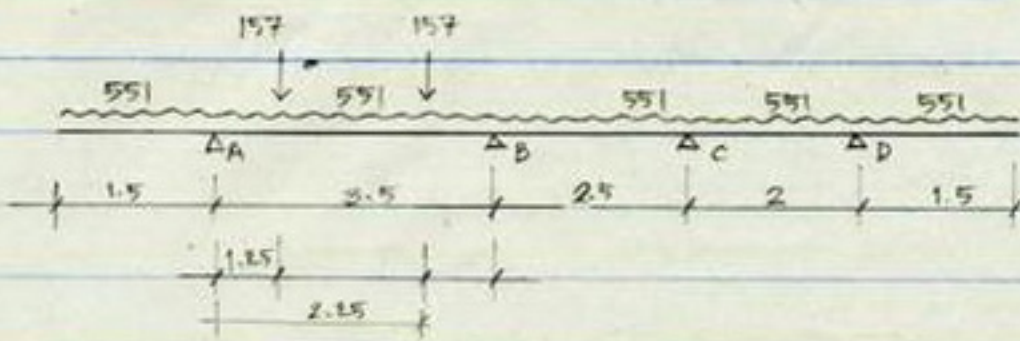
മോശപ്പെട്ട കോൺക്രീറ്റ്

$$f_s = 2.26$$

$$\text{Shear Stress Occur} = 2.94$$

∴ കോൺക്രീറ്റ് RB1

RB7



$$UDL = 126 \text{ Kg/m}$$

$$UDL = 425 \text{ Kg/m}$$

$$pt. load = 157 \text{ Kg}$$

Minimum Moment Distribution

$$M_A = -619.88 \quad R_A = 1956.7 \quad (826.5, 1130.6)$$

$$M_B = -588.95 \quad R_B = 2012.33 \quad (1112.3, 900.03)$$

$$M_C = -60.36 \quad R_C = 748.71 \quad (477.47, 271.25)$$

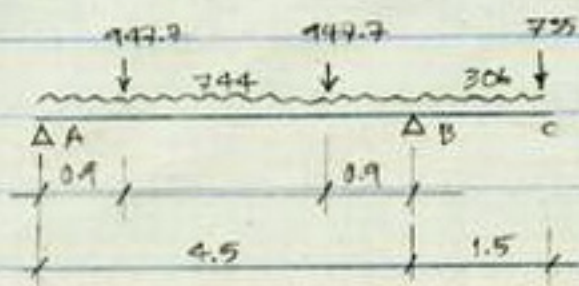
$$M_D = -619.88 \quad R_D = 1657.26 \quad (930.75, 826.51)$$

$$M = -619.88 \quad V = 1112.3 \quad \text{Minimum}$$

$$A_s = 1.97 \text{ cm}^2$$

$$\text{Shear Stress} = 2.47 \text{ KSC}$$

continuous RB



จาก การสำรวจได้

$$M_A = 0 \qquad R_A = 2300.2 \text{ (} 2300.2, 0 \text{)}$$

$$MB = -1446.75 \quad RB = 4137.2 (2943.2, 1194)$$

M at 1.8 from A = 2082.16

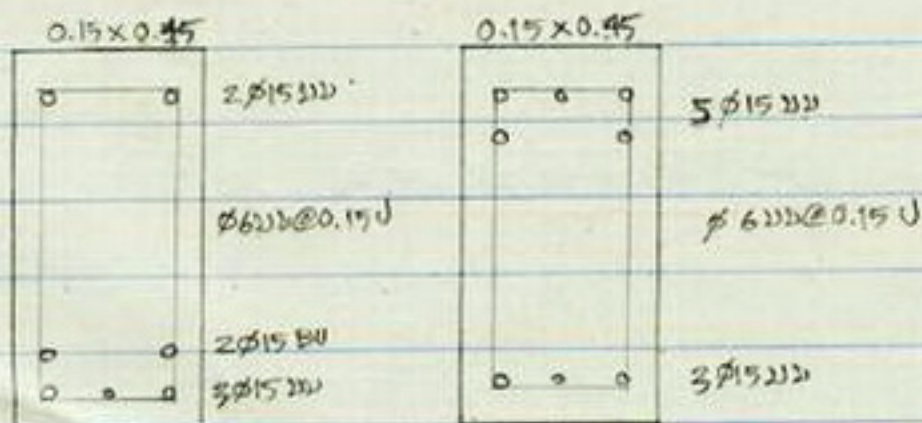
$$m_{[O]} = 2082.16 \text{ kg-m} \quad m = V = 2943.2 \text{ kg}$$

มาตี๋นาม นก แฉกคดตนาโต้

$$AS = 6.6$$

$$As' = 3.28$$

6mm web spacing = 14.89 cm



ป๋อญั๊ญ cantil' beam

КНИЖКА 0.15 x 0.35

104 mm = 126 Kg/m

$$m(\text{milk}) = 360 \text{ kg/m}$$

பகுதி 1472 AB

$$L_{40726} = 126$$

$$W_{\text{air}} = 250 \times 1.75 = 438 \text{ kg/m}$$

$$\text{wt of H}_2\text{O} = 180 \text{ kg/m}$$

Pt load = 947.7 kg

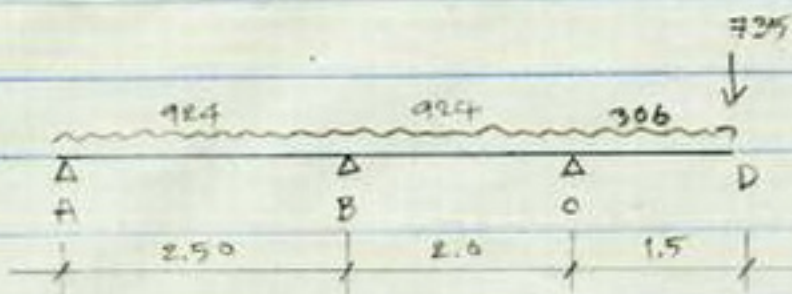
44/100 BC

$$\text{Latent heat} = 126 \text{ kg/m}$$

$$W_{\text{air}} = 180 \text{ kg/m}$$

Pt. load = 735 kg

B13



Continuous Beam Moment Distribution

$$M_A = 0$$

$$R_A = 1041.05$$

$$M_B = -284$$

$$R_B = 1612.01(1268,343)$$

$$M_C = -1446$$

$$R_C = 2698.94(1505,1194)$$

$$A_s = 4.59$$

$$A_s' = 0.6$$

$$\text{Shear Stress} = 3.34$$

$$\text{int mlt} = 126 \text{ kg/m}$$

$$\text{int mlt} = 180 \text{ kg/m}^2$$

int. load AB, BC

$$\text{int mlt} = 126$$

$$\text{int mlt} = 360$$

$$\text{int mlt} = 438 \text{ kg/m}$$

$$\therefore \text{Total load} = 924 \text{ kg/m}$$

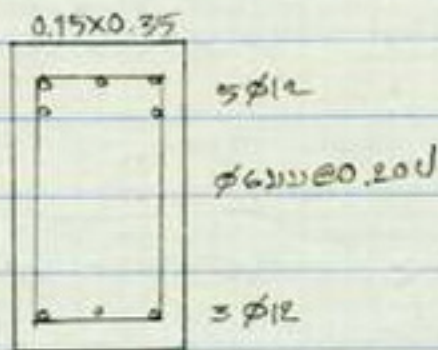
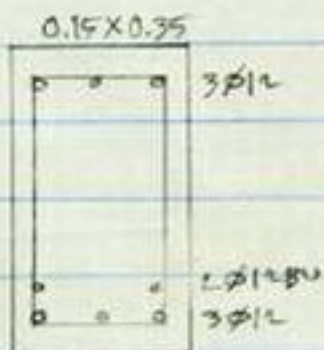
int. load CD

$$\text{int mlt} = 126 \text{ kg/m}$$

$$\text{int mlt} = 180 \text{ kg/m}$$

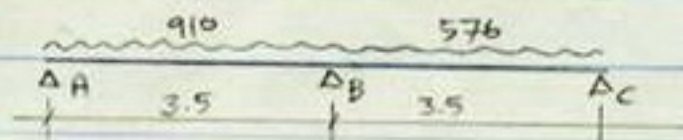
$$\text{Total load} = 306 \text{ kg/m}$$

$$\text{Pt. load} = 735 \text{ Kg}$$



Design continuous beam

B9



တပ်ကုန်ရန်

$$M_A = 0$$

$$R_A = 1267.44$$

$$M_B = -1137.72$$

$$R_B = 3250.63 (1917.6, 1333.1)$$

$$M_C = 0$$

$$R_C = 682.94$$

တပ်ကုန်

$$AS = 3.59$$

$$\phi 620 \text{ Web Spring} = 60.01$$

တပ်ကုန်ရန် အား A-B

$$\text{width} \quad 126 \quad \text{kg/m}$$

$$\text{width slab} \quad 784 \quad \text{kg/m}$$

$$\text{Total load} = 910 \quad \text{kg/m}$$

တပ်ကုန်ရန် B-C

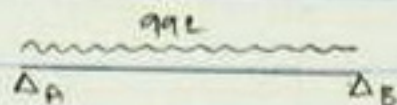
$$\text{width} \quad 126$$

$$\text{width} \quad 450$$

$$\text{Total load} = 576 \quad \text{kg/m}$$

တပ်ကုန်ရန် B7

B7, B6



$$\text{Mid mid span} = 1519$$

$$R_A = 1736$$

$$R_B = 1736$$

တပ်ကုန်ရန် Torsion Moment, U ကုန်ရန်

$$\text{of } AS = 4.82$$

$$AS' = 0.43$$

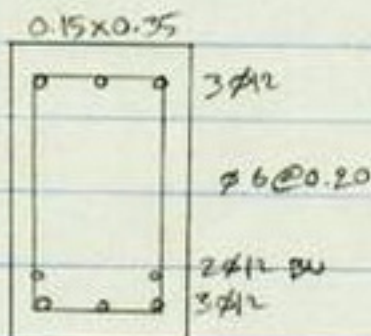
$$\text{required } \phi 620 \text{ Web Spring} = 129 \text{ cm}$$

$$\text{width} \quad 126$$

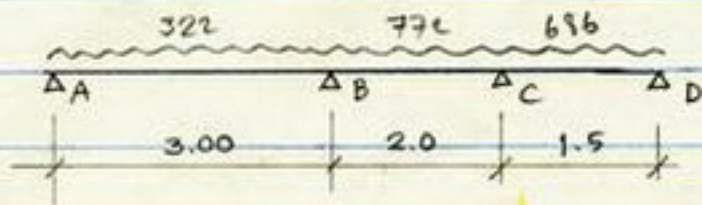
$$\text{width slab} = 686$$

$$\text{width} = 180$$

$$\therefore \text{Total load} = 992$$



B8



moment and reaction

$$\begin{aligned} M_A &= 0 & R_A &= 373.02 \\ M_B &= -329.95 & R_B &= 1425.46 (598., 832.5) \\ M_C &= -208.96 & R_C &= 1365.34 (711.51, 653.83) \\ M_D &= 0 & R_D &= 375.14 \end{aligned}$$

$$A_s = 1.02$$

Shear OK.

load and reaction

for A-B

$$\text{load} = 126 \text{ kg/m}$$

$$\text{load on slab} = 392 \times 0.5 = 196 \text{ kg/m}$$

$$\therefore \text{Total load} = 322 \text{ kg/m}$$

for BC

$$\text{load} = 126$$

$$\text{load on slab} = 196 \text{ kg/m}$$

$$\text{load on beam} = 450 \text{ kg/m}$$

for CD

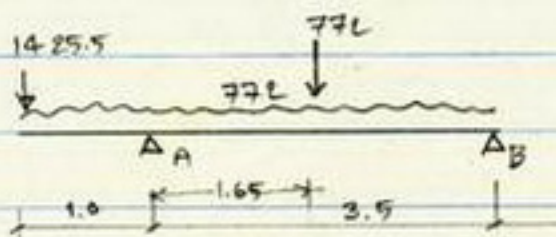
$$\text{load} = 126$$

$$\text{load on slab} = 110$$

$$\text{load on beam} = 450$$

continuous beam B7

B5



$$M_A = -1811.9 \quad R_A = 4474.13 (-2197.5, 2276.63)$$

$$M_B = 0 \quad R_B = 1197.34$$

in the Moment is: Shear is not in the continuous beam

$$A_s = 5.74 \text{ cm}^2$$

$$A_s' = 1.91 \text{ cm}^2$$

$$\phi 6 \text{ mm web spacing} = 29.11 \text{ cm}$$

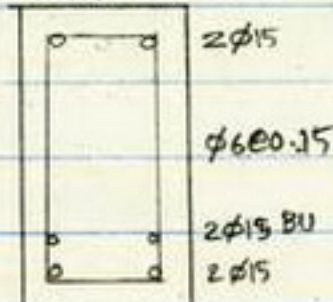
$$\text{Pt. load} = 1425.5$$

$$\text{load} = 126$$

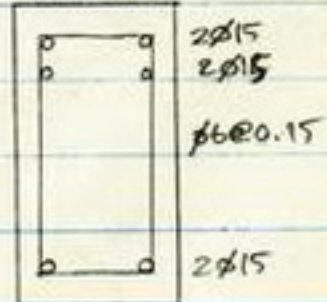
$$\text{load on beam} = 450$$

$$\text{load on slab} = 196 + 0$$

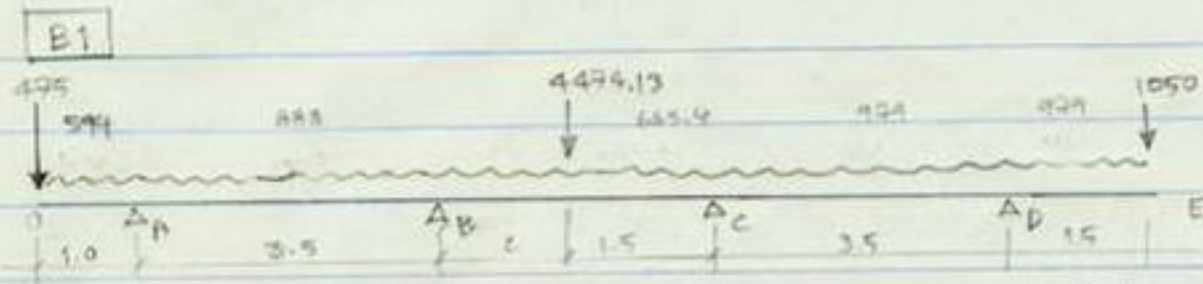
$$0.15 \times 0.35$$



$$0.15 \times 0.35$$



continuous beam



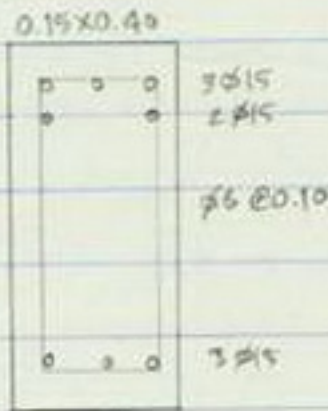
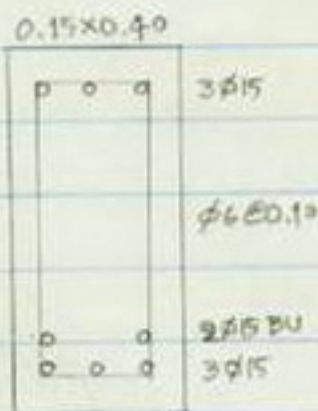
$M_A = -772$ $R_A = 2282.6$ (1069, 1213.6)
 $M_B = -1963.4$ $R_B = 5075.5$ (1894.4, 3181.1)
 $M_C = -1609.12$ $R_C = 5021.8$ (3414.9, 1426.9)
 $M_D = -2676.4$ $R_D = 4538.11$ (2019.6, 2518.51)

Mat 2.0 from B = +3071.98

$A_s = 8.35$

$A_s' = 4.23$

Clear web spacing = 13.36



continuous beam

UDL 0-A

144 Kg/m

450 Kg/m

425 Kg

UDL AB

144 Kg/m

450 Kg/m

294 Kg

UDL BC

144 Kg/m

0

519.4 Kg/m

4474.13 Kg

UDL CD

144 Kg/m

450 Kg/m

385 Kg/m

UDL DE

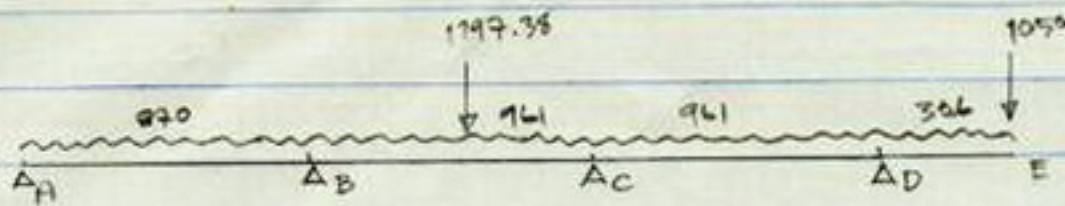
144 Kg/m

450 Kg/m

385 Kg/m

1050 Kg

B2



moment distribution

$M_A = 0$	$R_A = 1089.84$
$M_B = -1914.32$	$R_B = 4292.36 (-1955.16, 2377.2)$
$M_C = -1016.34$	$R_C = 3647.46 (2223.7, 1423.4)$
$M_D = -1919.25$	$R_D = 3448.72 (1979.32, 1509.4)$

moment A-B

UDL	126
point load	450
point load (slab)	294

moment B-C

UDL	126
point load	450
point load	385
Pt. load	1197.38

moment distribution

$$A_s = 6.09 \text{ cm}^2$$

$$A_s' = 2.46$$

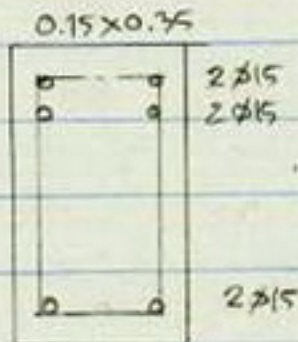
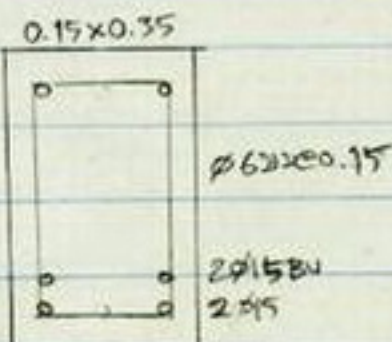
$$6 \text{ mm web spacing} = 26.79$$

moment CD

UDL	126
point load	450
point load	385

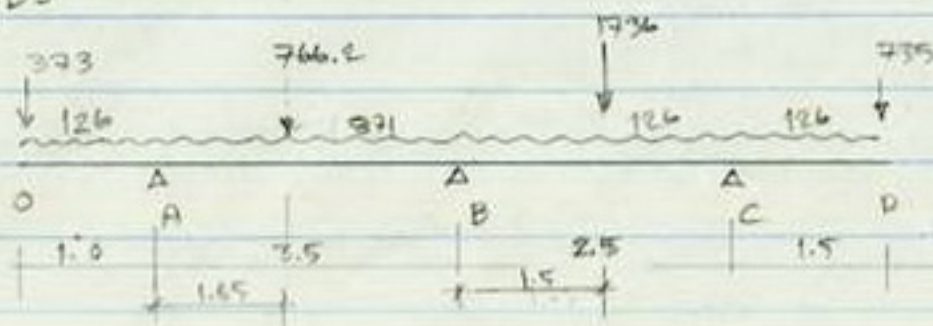
moment D-E

UDL	126
point load	180
Pt. load	1050



minimum cant. len

B3



$$M_A = -436 \quad R_A = 2234.6 \quad (499 \quad 1739.6)$$

$$M_B = -1099 \quad R_B = 3016.2 \quad (2075.1 \quad 941.1)$$

$$M_C = -876 \quad R_C = 2033.9 \quad (1109.9 \quad 924.0)$$

Max 1.65 from A = 1232.5 kg-m

$$AS = 3.91$$

Shear OK

continuation on B7

UDL 126

UDL 126

UDL 126

UDL 126

UDL 126

UDL 126

UDL 126

UDL 126

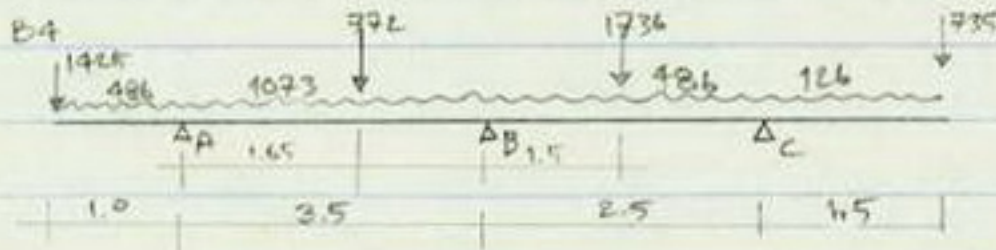
UDL 126

UDL 126

UDL 126

UDL 126

UDL 126



$$M_A = -1668$$

$$R_A = 4374.17 \quad (1911, \quad 2465.17)$$

$$M_B = -1040$$

$$R_B = 3429.63 \quad (2062.33, \quad 1367.3)$$

$$M_C = -976$$

$$R_C = 2507.71 \quad (1583.7, \quad 924)$$

$$AS = 5.29$$

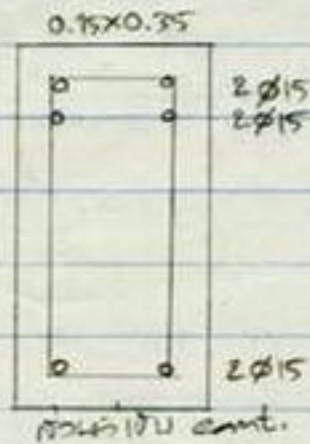
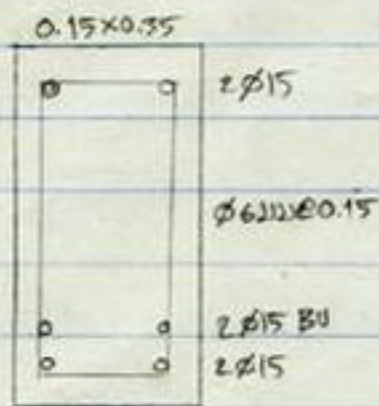
$$AS' = 1.17$$

6222 Wst Spacing = 22.9 cm

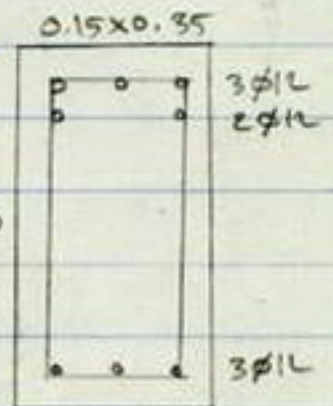
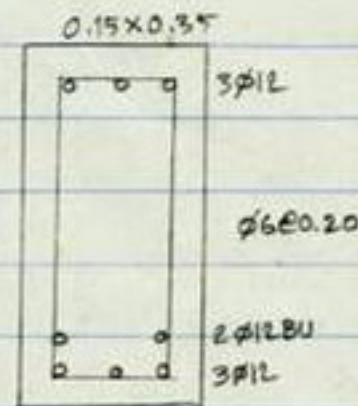
continuation on B7

UDL 126

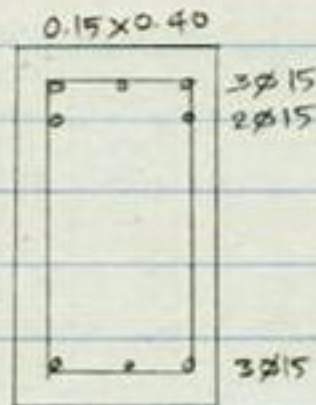
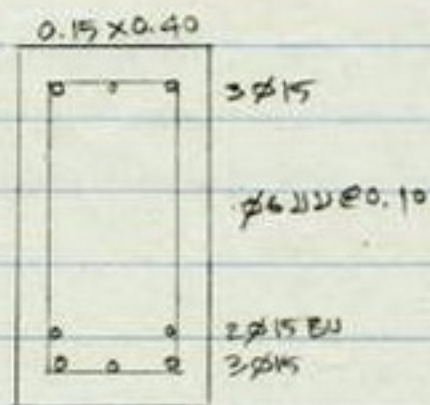
UDL 126



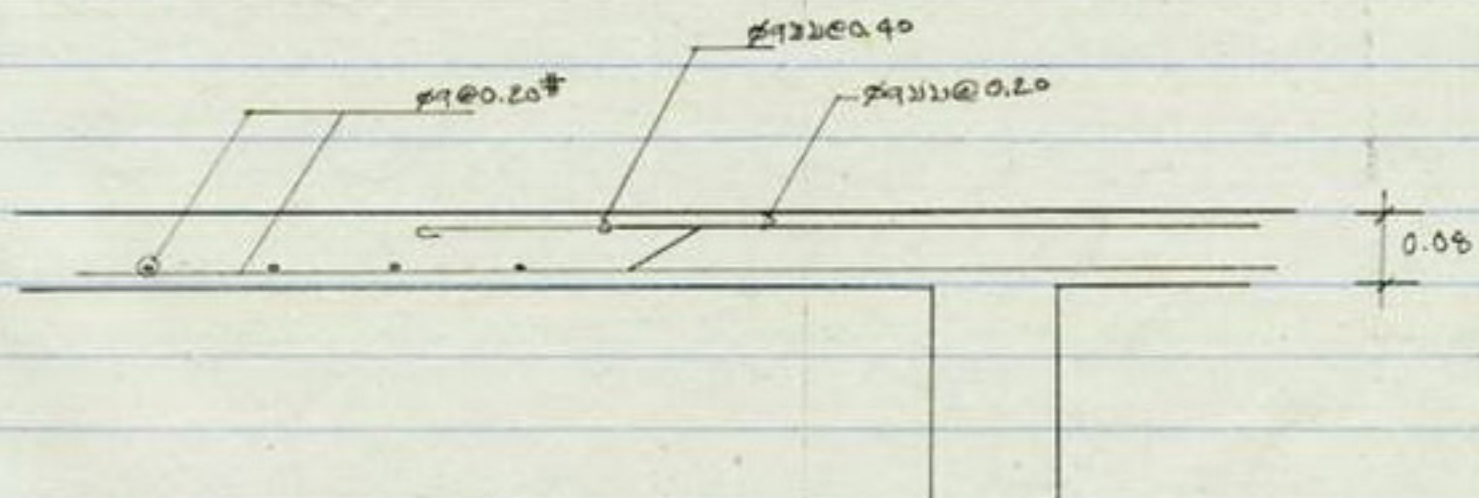
B5, B2



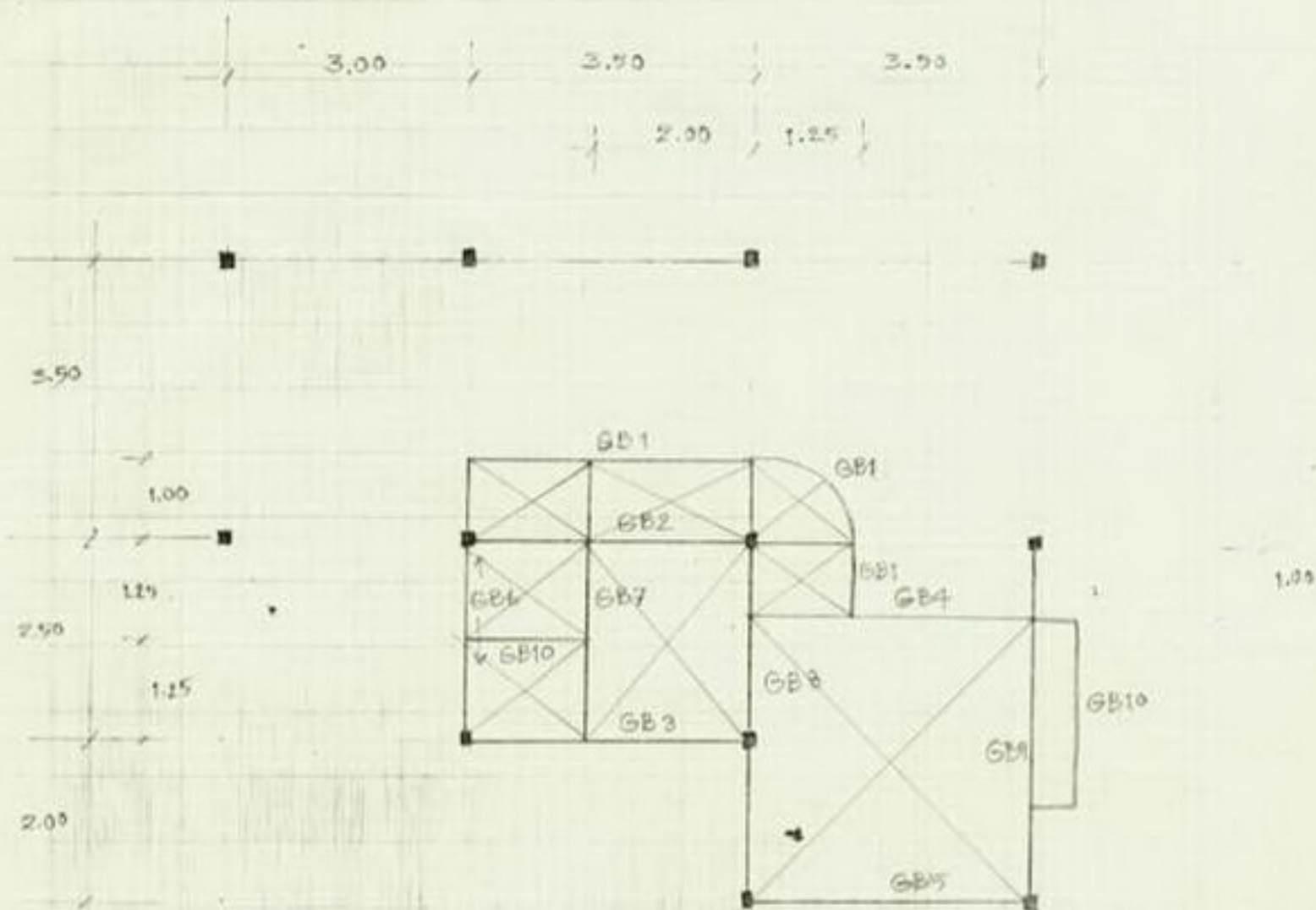
B13, B6, B7, B8, B9, B3, B4



B1, B1L

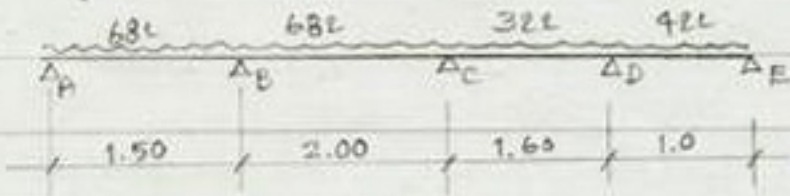
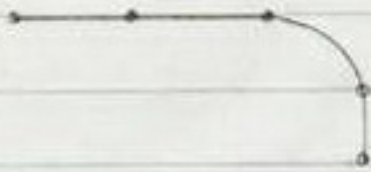


SLAB 5



GROUND FLOOR AT + 1.10

GB1



moments and reactions

$M_A = 0$	$R_A = 358.1$
$M_B = -230$	$R_B = 1380.1$
$M_C = -163$	$R_C = 188.1$
$M_D = -33$	$R_D = 420.2$
$M_E = 0$	$R_E = 177.7$

moments and reactions

A-B $M_A = B_C$

width 126

width slab 196

width main = 360

C-D (main)

width main 126

Kg/m

width slab 196

Kg/m

D-E

width main 126

Kg/m

width slab 196

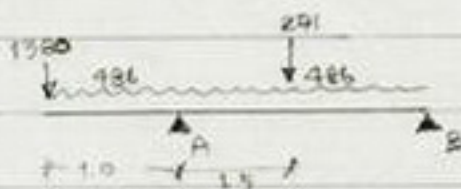
Kg/m

width main 100

Kg/m

dimensions of main GB 4

GB7



$M_A = -1623$	$R_A = 3231.1 (1966, 1365.1)$
$M_B = 0$	$R_B = 120.9$

dimensions of main $A_3 = 5.15 \text{ cm}^2$

$A_5' = 0.96$

width web spacing = 71 mm

moments and reactions

width 0-A

pt. load = 1380.1

Kg

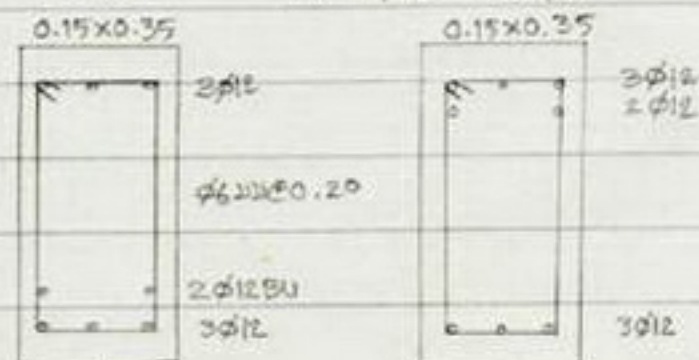
width main = 126

width main = 360

width 0-A

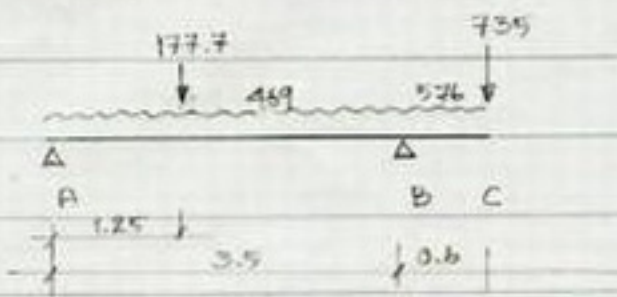
width main = 126

width main = 360



GB7

GB4



$$M_A = 0$$

$$R_A = 779.36$$

$$M_B = -544 \text{ Kg-m}$$

$$R_B = 2120.44 (1039.94, 1080.61)$$

msms=ดัดคานา q_{UDL} A-B

ขนาด คาน 126

ขนาด พื้น 343 kg

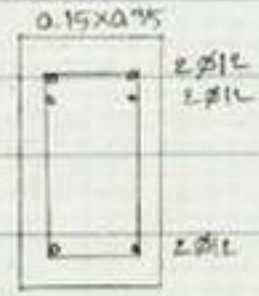
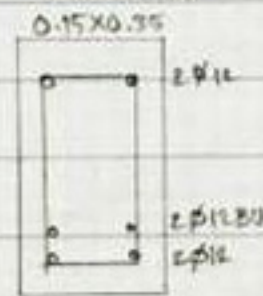
 q_{UDL} BC

ขนาด คาน 126

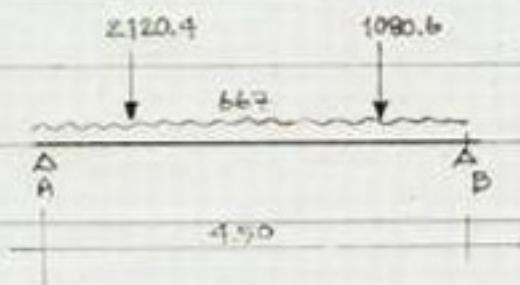
ขนาด ดัดคาน 450

Pt. load

735



GB9



$$M \text{ at } 1.9 \text{ from A} = 3286$$

$$R_A = 3395.86$$

$$R_B = 2806.64$$

$$A_s = 7.81 \quad 8.93$$

$$A_s' = 2.22 \quad 5.04$$

$$\phi 6 \text{ web spacing} = 20.98$$

Section 0.15x0.40

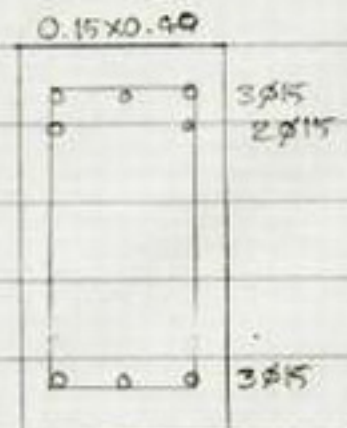
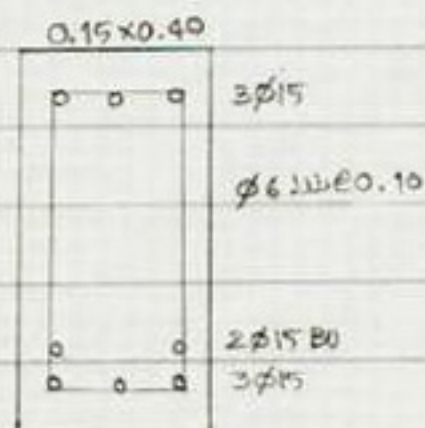
msms=ดัดคานา

Pt. load = 1080.6

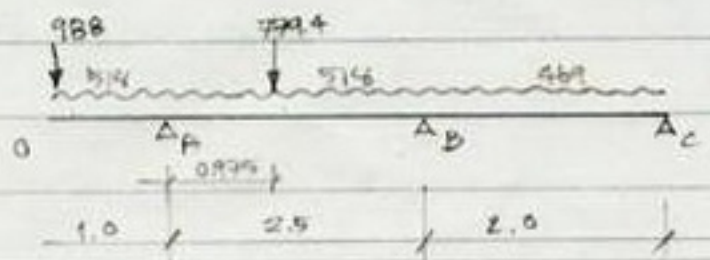
ขนาด คาน = 144

ขนาด ดัดคาน = 180

ขนาด พื้น Slab 343



GB8



$$M_A = -1247$$

$$R_A = 3063.1 (1506, 1557.1)$$

$$M_B = -161.64$$

$$R_B = 1067.1 (517.32, 549.78)$$

$$M_C = 0$$

$$R_C = 388.2 ()$$

ขนาดหน้าตัด

$$A_s = 3.95 \text{ cm}^2$$

Shear ok

คอนกรีตเสริมเหล็ก GB4

ขนาดหน้าตัด

จุด 0-A

$$P.L. = 988 \text{ kg}$$

$$UDL = 126 \text{ kg/m}$$

$$UDL \text{ slab} = 392 \text{ kg/m}$$

จุด A-B

$$P.L. = 779.4 \text{ kg}$$

$$UDL = 126 \text{ kg/m}$$

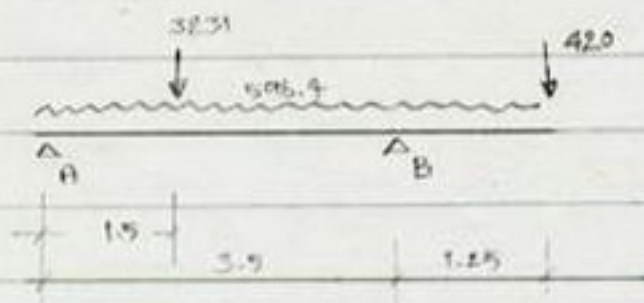
$$UDL \text{ slab} = 392 \text{ kg/m}$$

จุด B-C

$$UDL = 126 \text{ kg/m}$$

$$UDL \text{ slab} = 393 \text{ kg/m}$$

GB2



$$M_A = 0$$

$$R_A = 2606.8 ()$$

$$M_B = 990.9$$

$$R_B = 3877 (2711.5, 1165.5)$$

$$M \text{ at } 1.5 = 3239.4$$

คอนกรีตเสริมเหล็ก GB 9

ขนาดหน้าตัดเหล็กเสริม

GB6 စာနိူပုယိၣ်ဝဲ GB 7

GB 10 , GB 5 စာနိူပုယိၣ်ဝဲ GB4

GB 3 စာနိူပုယိၣ်ဝဲ GB 7

GB11, GB13, GB14, GB15, GB17, GB16

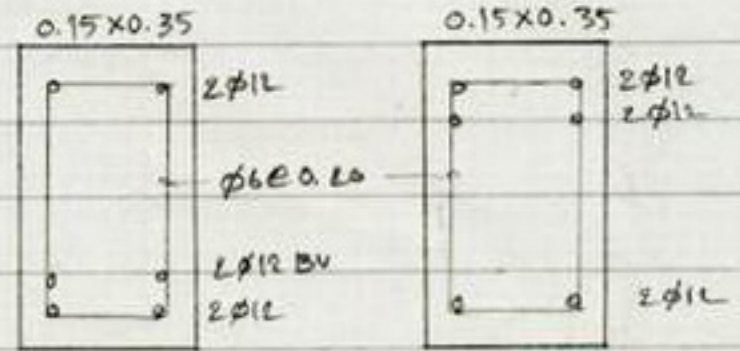
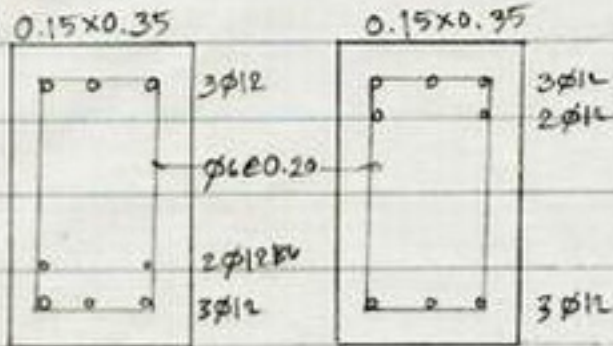
GB12, GB18, GB19

0001100 14204 GB7

0001100 14204 GB4

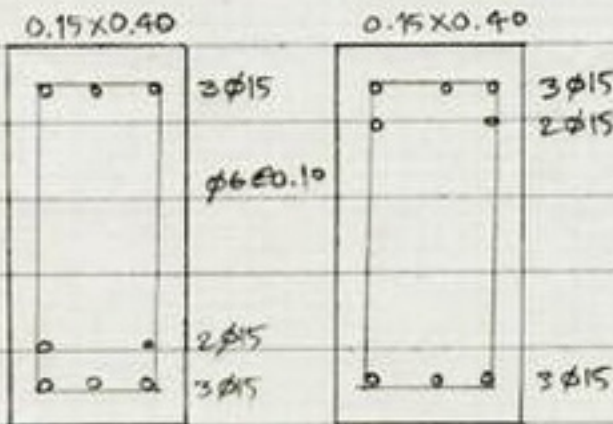
(GB-2)

(GB-1)



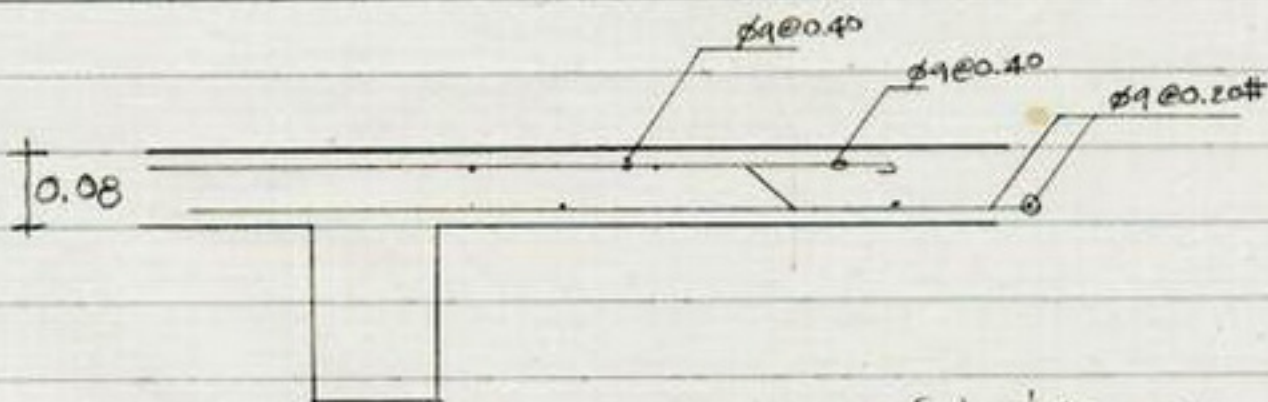
GB7, GB6, GB3
GB11, GB13, GB14, GB15, GB16, GB17

GB4, GB1, GB8, GB10, GB5
GB12, GB18, GB19, RB7, RB5

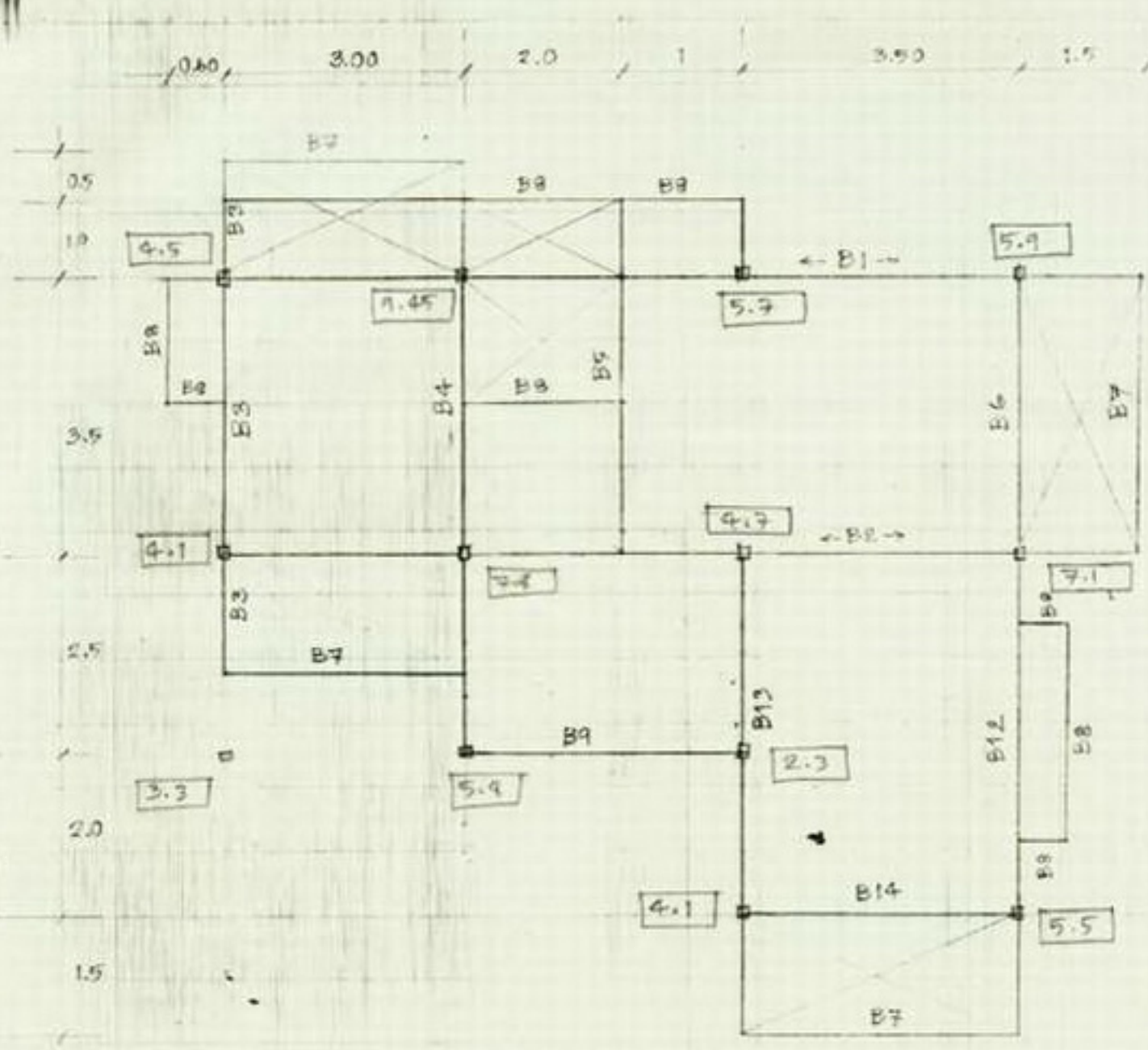


GB9, GB2

(GB-2)

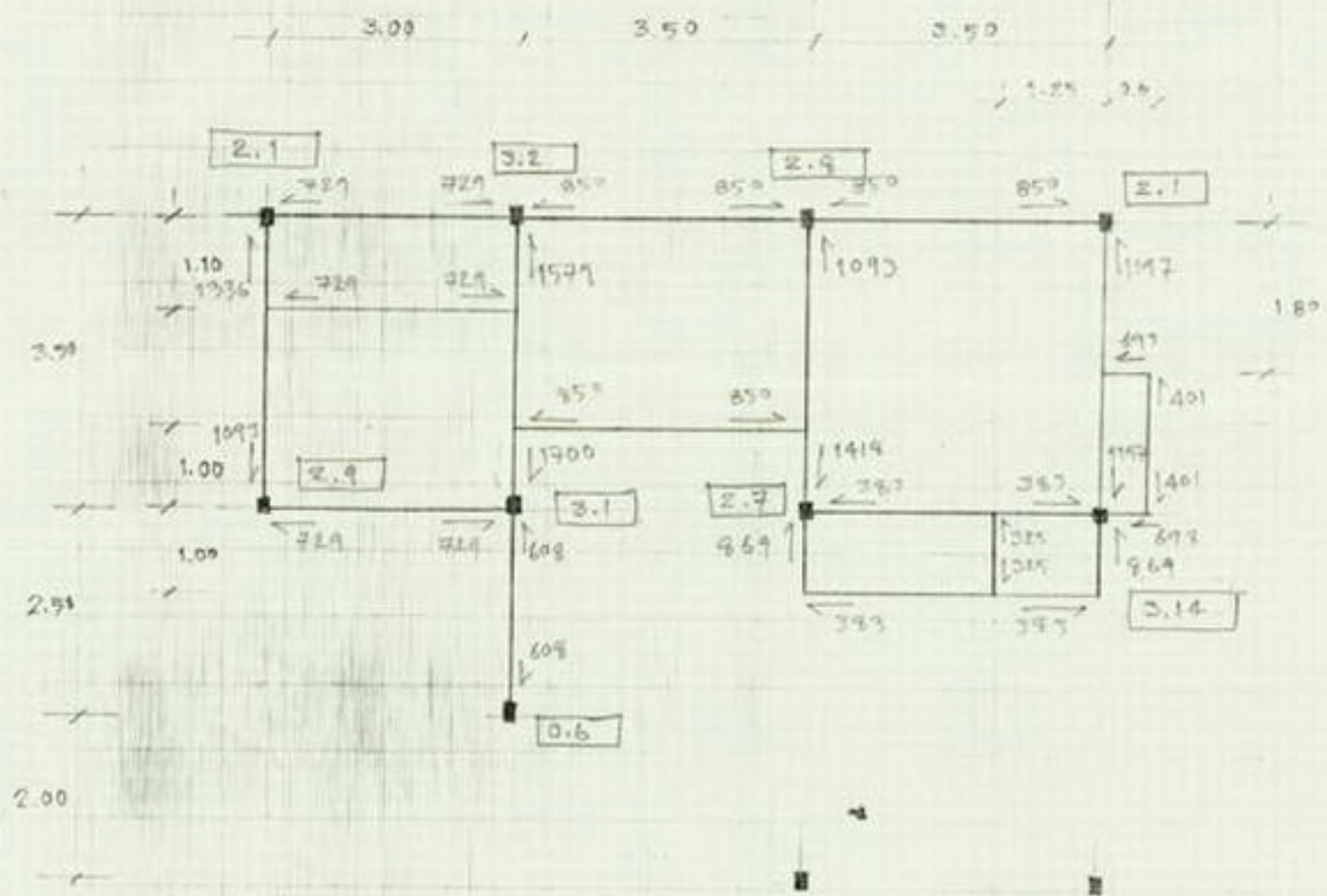


SLAB SECTION OVER ON BEAM



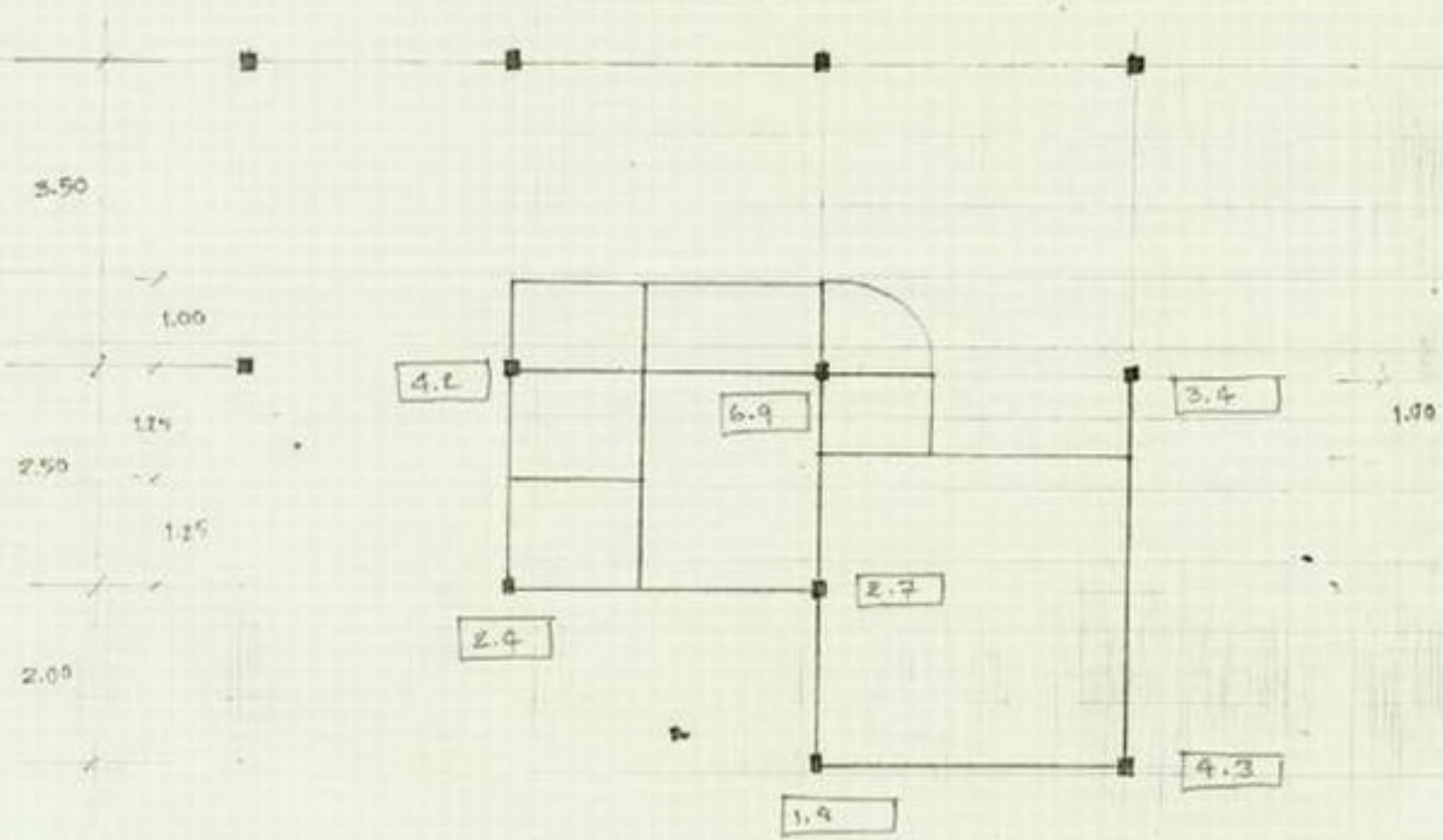
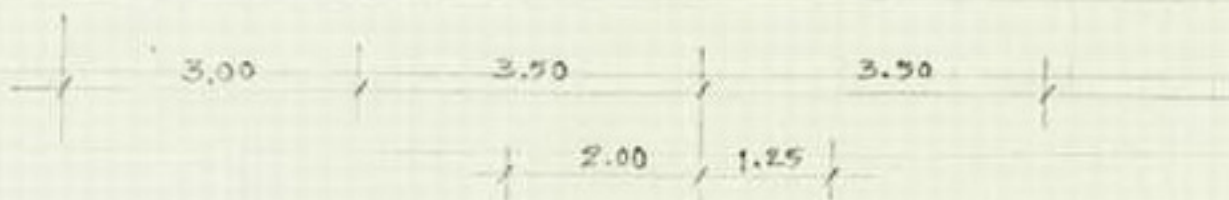
ภาพแปลนชั้นบน

UPPER FLOOR PLAN



มาตรา=ตอหน้าเหล็กคาน + 0.20

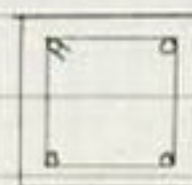
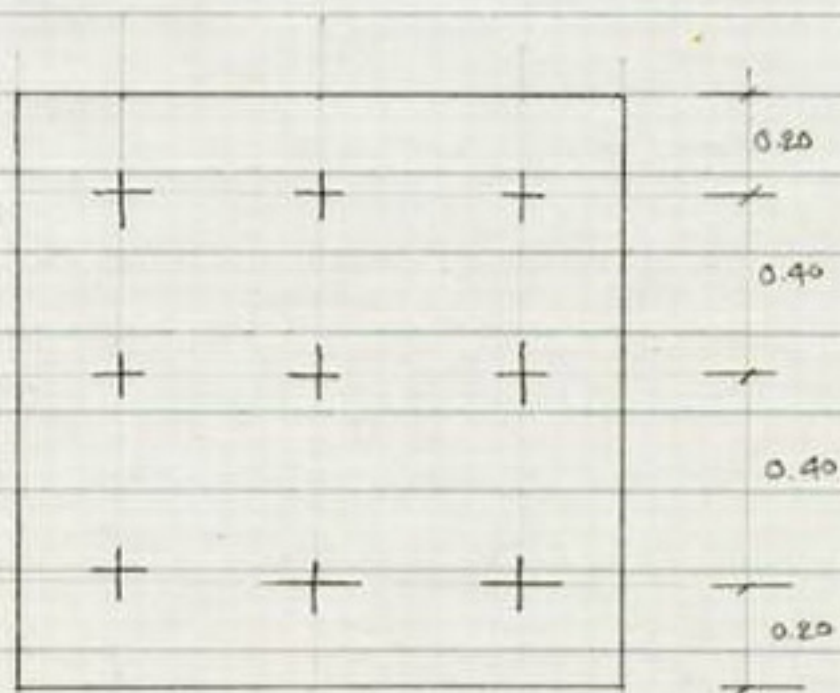
GROUND FLOOR AT + 0.20



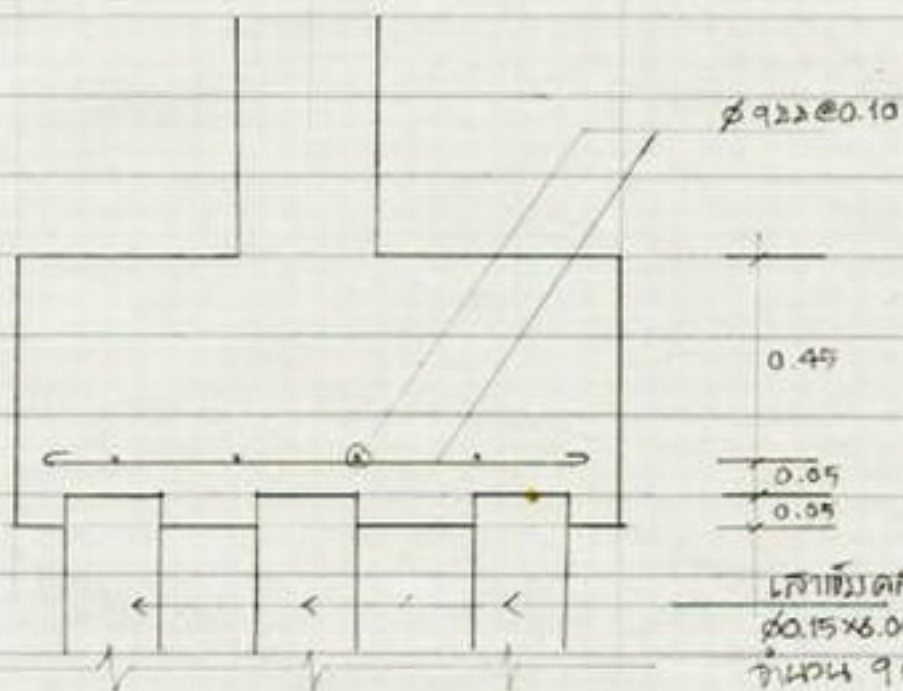
ขนาดของอาคาร พื้นผิวที่ 2 + 1.10

Footing F₁

Column C₁



C₁



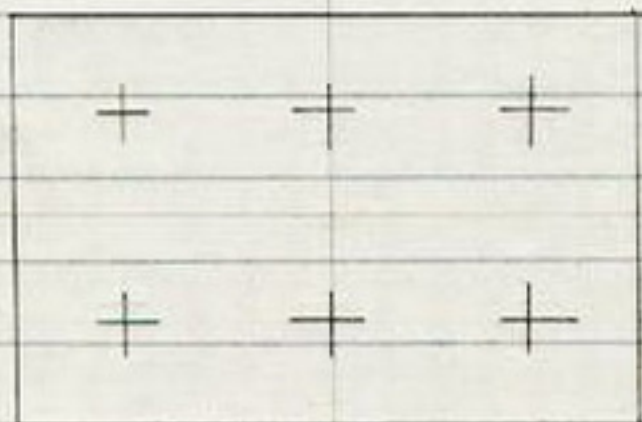
เสาเข็มคอนกรีต
φ 0.15 x 6.00
จำนวน 9 ต้น

F₁

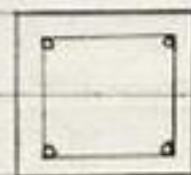
Footing F2

Column C2

0.20 0.40 0.40 0.20

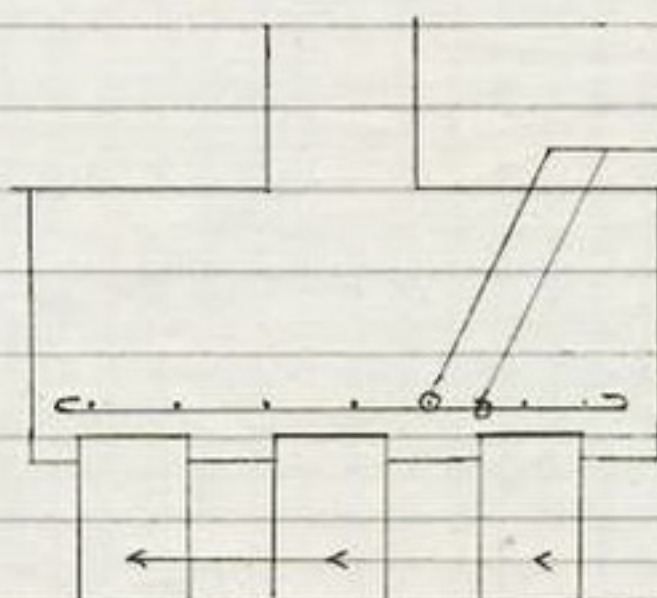


0.20
0.40
0.20



4 ϕ 12
 ϕ 200.20

C2



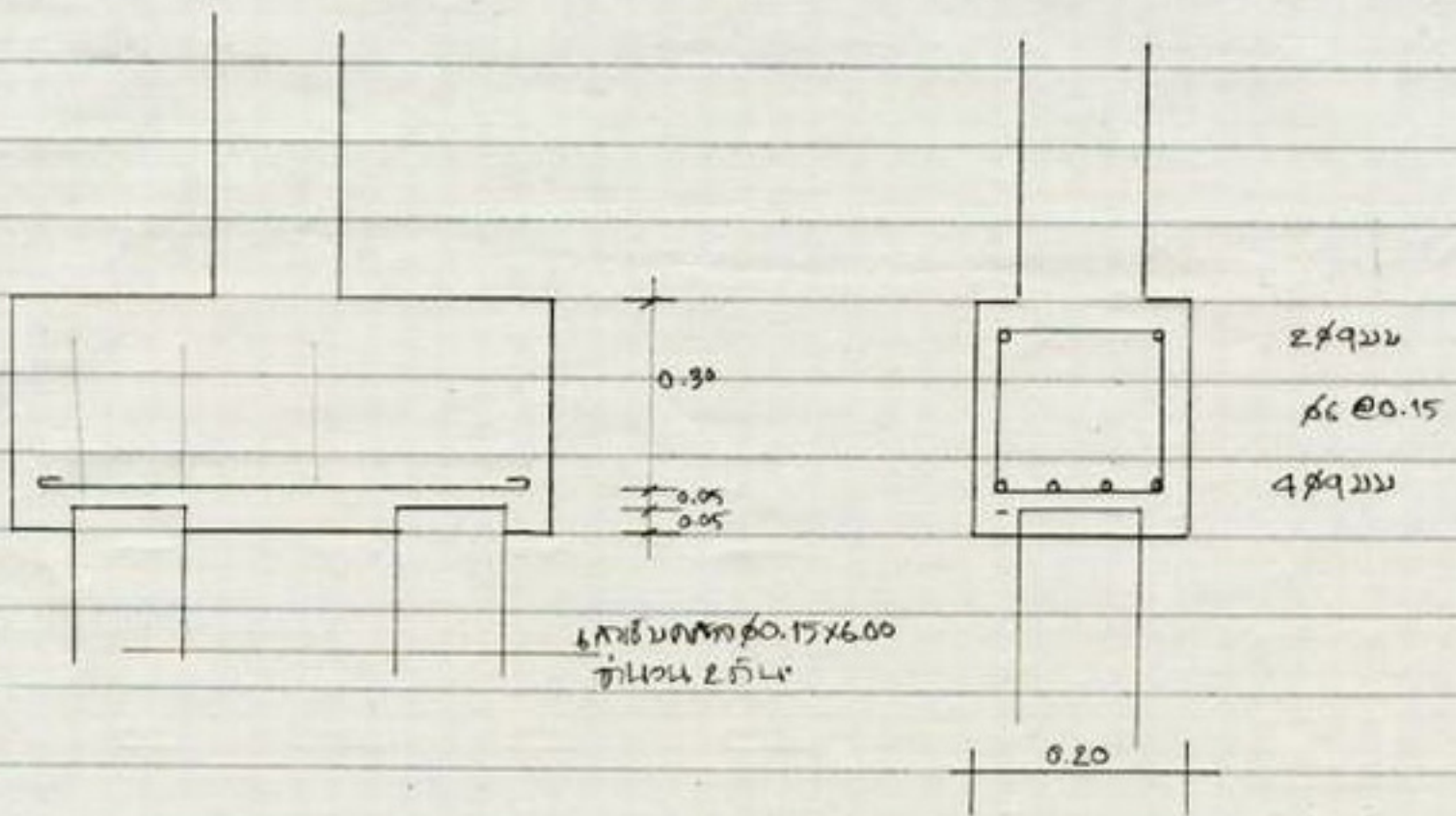
ϕ 4mm @ 0.10#

0.30

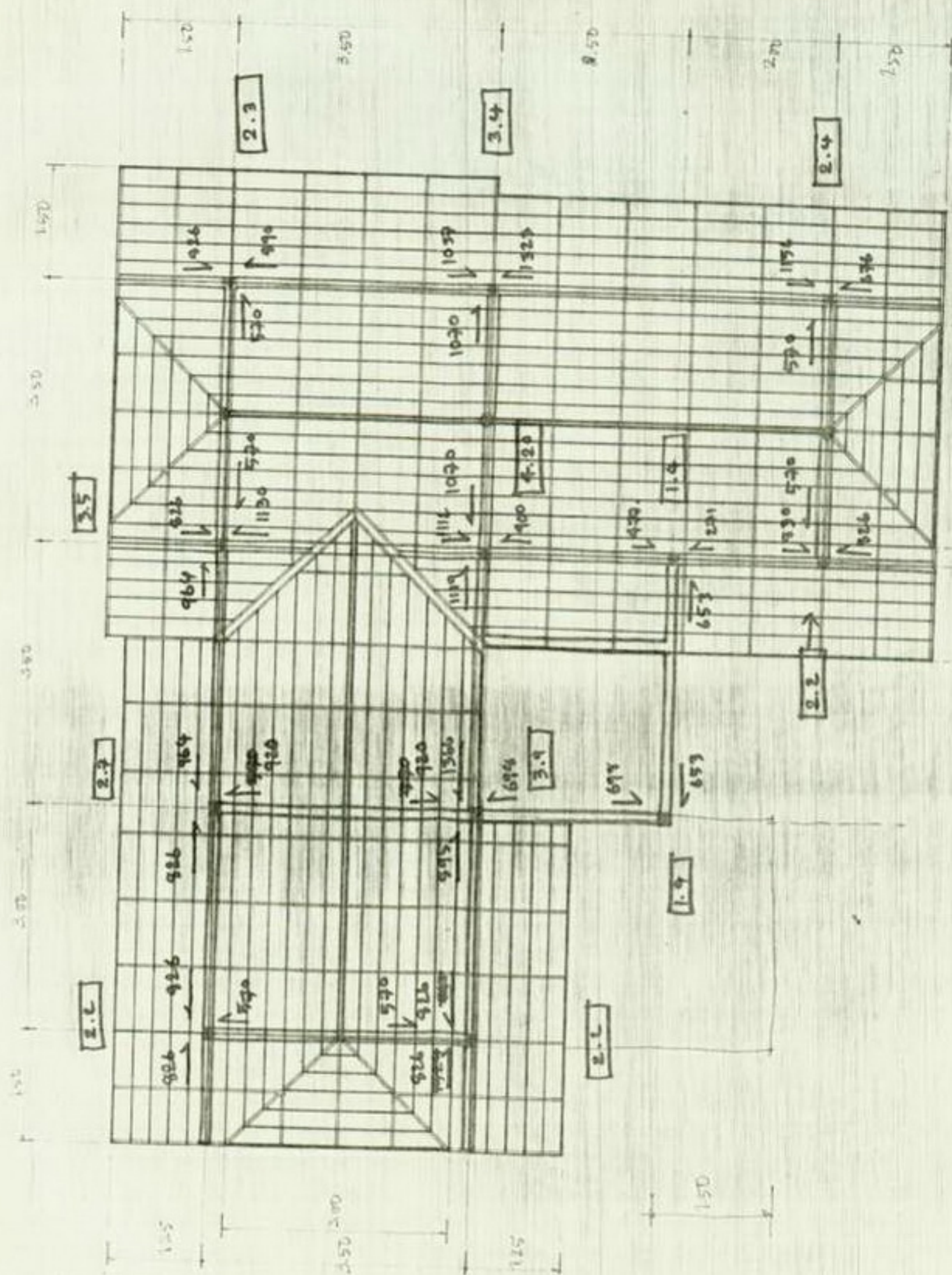
0.20
0.20

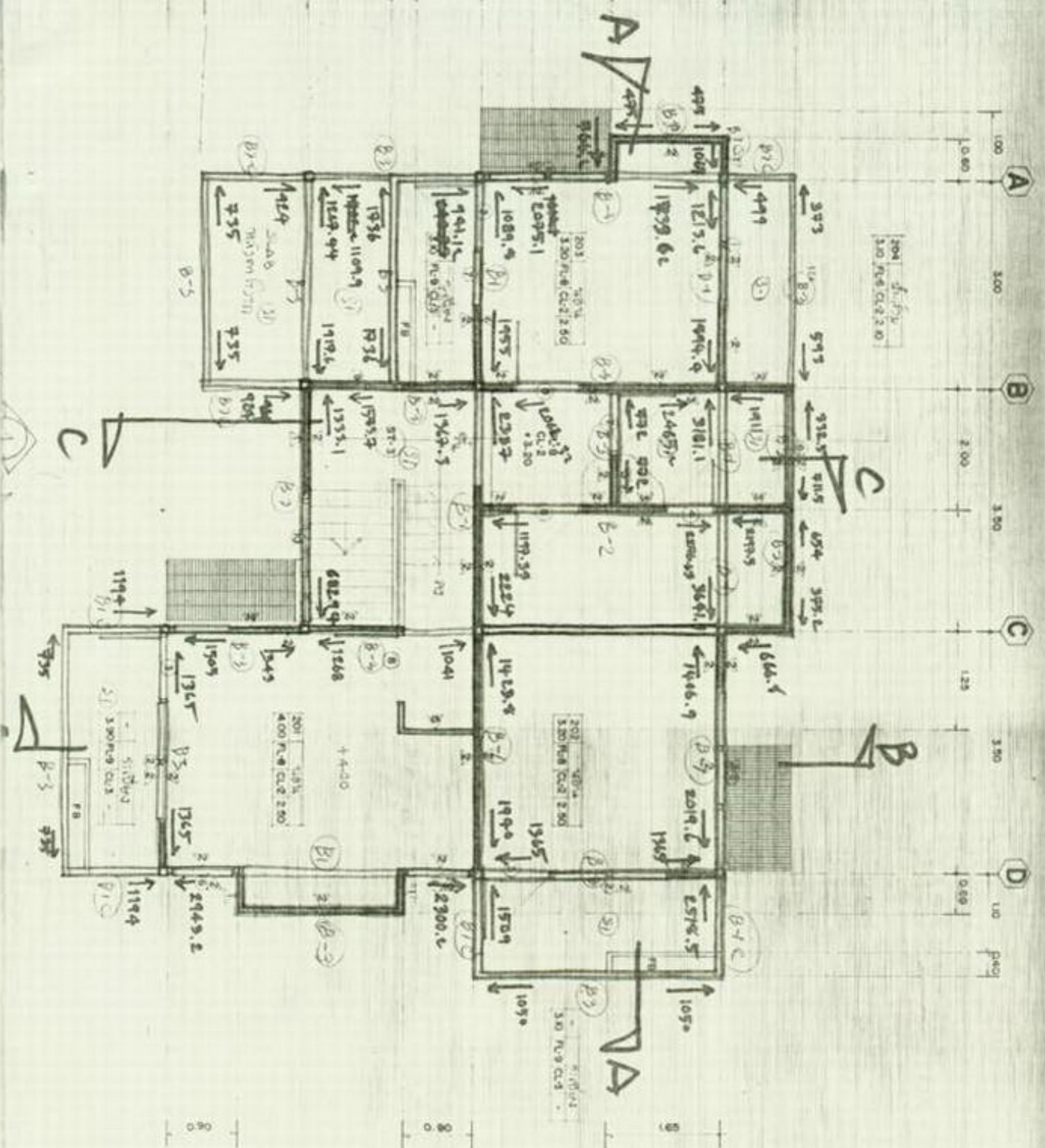
6.5m x 0.15m
 ϕ 0.15 x 6.00 3.0m 4.0m

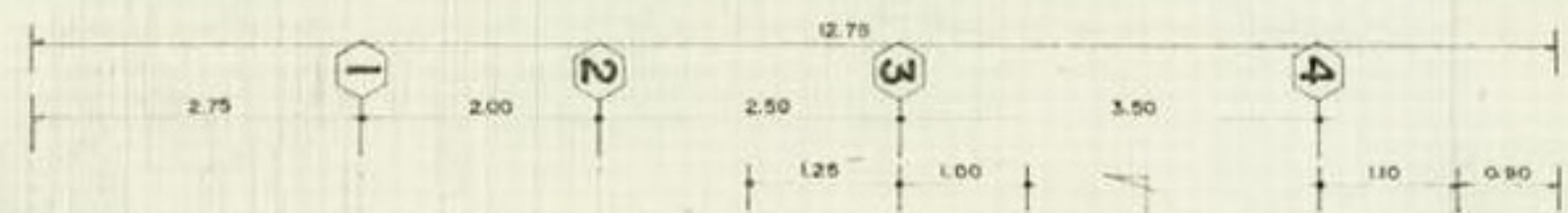
Footing F3



F3







GROUND FLOOR PLAN 1:50