

CALCULATION SHEET

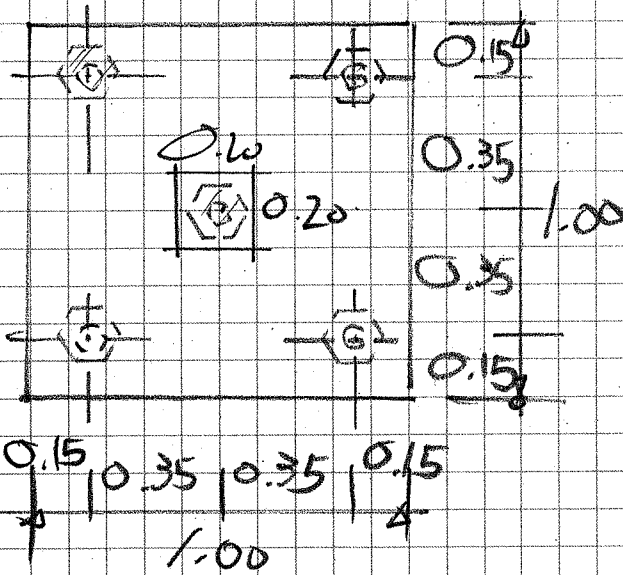
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F-1 = Max load on footing = 9,000 kg.

USE = 5 Pile ϕ 0.15 x 6.00 m

load/pile = 1800 kg.

USE: Pile Cap = 1.00 x 1.00 x 0.20 dp.



$$M = 2 \times 1800 \times (0.35 - 0.10) = 900 \text{ kg.m}$$

$$A_s = 3.93 \text{ cm}^2$$

$$S_o = 12.2 \text{ cm}$$

} 5BB12 #

$$l_f = 2.46 \text{ KSC}$$

$$l_p = 4.28 \text{ KSC}$$

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C-1 Max load on Column = 8500 kg

USE Secty 0.20x0.20

$$P_C = 14705 \text{ kg}$$

$$1-1 A_g = 4.0 \text{ ont} - \frac{11-DB12}{\omega / 20 \times 0.20 \text{ tied}}$$

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S-1 : USE $t = 0.10 \text{ m}$

$$\begin{aligned}
 DL &= 240 \text{ kg/m}^2 \\
 FL &= 230 \text{ " } \\
 LL &= 150 \text{ " } \\
 &= \underline{620} \text{ " }
 \end{aligned}$$

$$M = 2.16 / 2.50 = 0.85$$

$$M^{\ominus} = 0.068 \times 620 \times 2.16^2 = 186 \text{ kg.m/m}$$

$$A_{st} = 2.16 \text{ cm}^2/\text{m} = \underline{289 @ 0.20}$$

$$M^{\oplus} = 0.051 \times 620 \times 2.16^2 = 140 \text{ kg.m/m}$$

$$A_{sl} = 1.62 \text{ cm}^2/\text{m} = \underline{289 @ 0.20}$$

S-2 : USE $t = 0.10 \text{ m}$

$$DL = 240 + 50 = 290 \text{ kg/m}^2$$

$$LL = 150 \text{ kg/m}^2$$

$$= \underline{440} \text{ "}$$

$$M = 0.5 \times 440 \times 1.0^2 = 220 \text{ kg.m/m}$$

$$A_{sl} = 2.55 \text{ cm}^2/\text{m} = \underline{286 @ 0.10}$$

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B-1 : 0.15 x 0.50

$\Delta G = 180 \text{ kg/m}$

$SL = 890 \text{ ''}$

$CL = 432 \text{ ''}$

1502 ''

$M = \frac{1}{8} \times 1502 \times 2.89^2 = 1563 \text{ kg.m}$

$A_g = 2.21 \text{ cm}^2 - 26012$

$V = 2170 \text{ kg}$

$V_c = 2685 \text{ ''} - \text{U.PB6E0.20}$

B-2 : 0.15 x 0.50

$\Delta G = 180 \text{ kg/m}$

$SL = 890 \text{ ''}$

$CL = 432 \text{ ''}$

1502 ''

$P_L = (1502 \times 2.5) / 2 = 1886 \text{ kg}$

$M = 2925 \text{ kg.m}$

$A_g = 0.90 \text{ cm}^2 : 20012$

$A_{st} = 4.31 \text{ cm}^2 : \underline{45012}$

$V = 3110 \text{ kg}$

$V' = 426 \text{ ''} - \text{U.PB6E0.20}$

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B-3 : 0.20 x 0.50

$DG = 240 \text{ kg/m}$

$SL = 890 \text{ ''}$

130

$P_f = [1502 \times 2.5] = 3,755 \text{ kg.}$

$M = 9611 \text{ kg.m}$

$A_g = 9.95 \text{ cm}^2 - 50\% \text{ lb}$

$A_s = 14.52 \text{ cm}^2 - \underline{80\% \text{ lb.}}$

$V = 5025 \text{ kg}$

$V' = 1447 \text{ ''} - \underline{U. RB \times 0.20.}$

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คำนวณ

คาน้ำหนักหลังคา Monitor : Slope = 30°

95 มม. 25x25x1.60 มม @ 0.32 ม.

$$S_w = \left[\begin{matrix} S_x = S_y = 1.02 \text{ dm}^3 \\ \uparrow 1.2 \text{ kg/m} \end{matrix} \right]$$

$$Roof = 65 \times 0.32 = 20.8 \text{ kg/m}$$

$$L = 50 \times 0.32 = 16.0 \text{ kg/m}$$

$$\text{Wind Pressure} = \frac{381}{5} \text{ kg/m}^2$$

$$\begin{aligned} \text{WL คาน้ำหนักหลังคา} &= 50 \times 0.32 \times \sin 30^\circ \\ &= 8.3 \text{ kg/m} \end{aligned}$$

$$a_y = 38 \cos 30^\circ + 8.3 = 41.3 \text{ kg/m}$$

$$a_x = 38 \sin 30^\circ = 19.0 \text{ "}$$

$$M_x = \frac{1}{8} \times 41.3 \times 1.0^2 = 5.20 \text{ kg.m}$$

$$M_y = \frac{1}{8} \times 19 \times 1.0^2 = 2.31 \text{ "}$$

$$\begin{aligned} f_b &= \frac{5.20 \times 100}{7.02} + \frac{2.31 \times 100}{(1.02/2)} \\ &= 963 \text{ ksc} < f_b = 1440 \text{ ksc } \underline{\text{OK}} \end{aligned}$$

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Πρόβλεψη.

$$S_N = 4.50 \text{ kg/m}$$

$$W = 413 / 0.32 = 130 \text{ kg/m}$$

$$w_f = \underline{\underline{35}} \text{ kg/m}$$

$$M = \frac{1}{8} \times 135 \times 2.0^2 = 68 \text{ kg.m}$$

$$S_{req} = \frac{68 \times 100}{1,440} = 4.73 \text{ cm}^3$$

USE: C-100x50x20x2.30 mm @ 1.00 m

$$A = 5.172 \text{ cm}^2; Z_x = 16.1 \text{ cm}^3; I_x = 80.7 \text{ cm}^4$$

$$\Delta = \frac{5 \times [135 \times 2.0] \times 2.0^3}{384 \times 2 \times 10^6 \times 80.7}$$

$$= 0.18 \text{ cm} < \frac{L}{240} = 0.83 \text{ cm} \quad \underline{\underline{OK}}$$

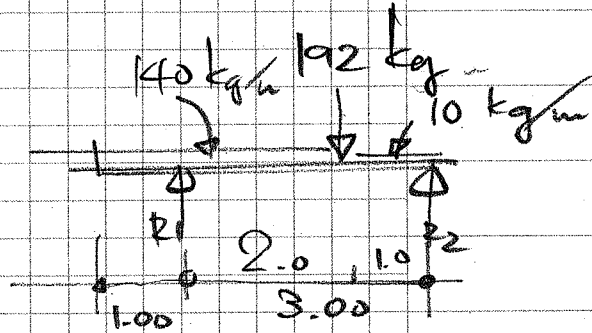
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$\sigma = 192 \text{ kg}$

$$SW = 10 \text{ kg/m.}$$

$$111 = \frac{130}{140}$$



$R_L = 135 + 57 = 192 \text{ kg.}$

$R_1 = 416 \text{ kg}$

$M^\ominus = 90 \text{ kg.m}$

$R_2 = 207 \text{ kg.}$

$M^\oplus = 202 \text{ kg.m}$

$Z_{req} = \frac{202 \times 100}{1440} = 14.0 \text{ cm}^3$

USE: 20-100X50X20X2.50 mm

σ: 192 kg

$P_{max} = 6 \times 207 = 1242 \text{ kg.}$

USE: 20-100X50X20X2.50 mm

$(A = 0.34 \text{ cm}^2, \delta = 1.92 \text{ cm})$

$\frac{K\sigma}{\delta} = \frac{200}{1.92} = 105 ; F_a = 846 \text{ kg}$

$F_a = 874.7 \text{ kg} < P_{max} \text{ OK}$

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RB-1 ; 0.15 x 0.40

$$\begin{array}{r}
 \text{DL} = 144 \text{ kg/m} \\
 \text{Roof} = 230 \text{ " } \\
 \hline
 374 \text{ " }
 \end{array}$$

$$M = \frac{1 \times 374 \times 2.50^2}{8} = 293 \text{ kg.m}$$

$$A_{st} = 0.80 \text{ cm}^2 - \underline{2.0812}$$

$$V = 468 \text{ kg}$$

$$V_c = 2100 \text{ " } - \underline{J. RB 600.20}$$

RB-2 : 0.15 x 0.40

$$\text{DL} = 144 \text{ kg/m}$$

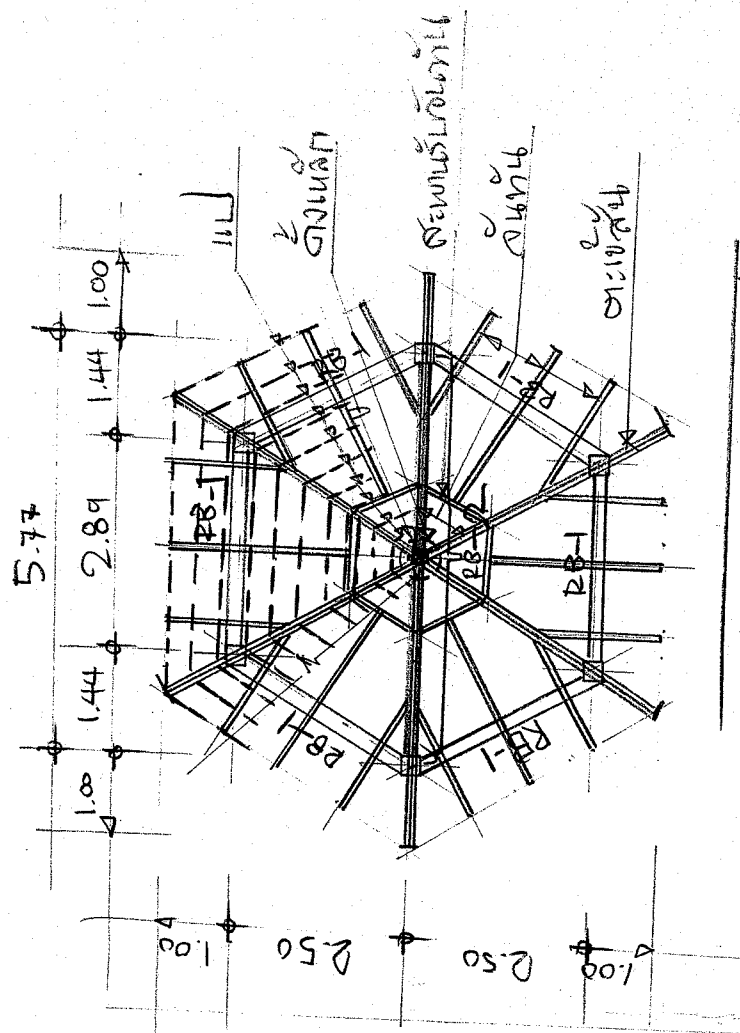
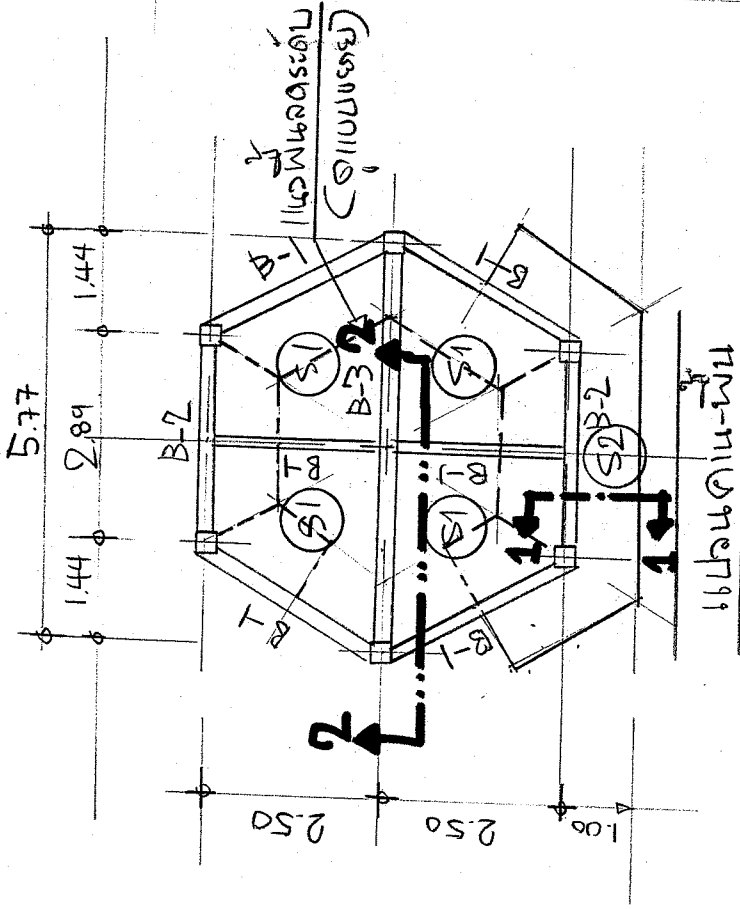
$$\text{DL} = 1245 \text{ kg.}$$

$$M = 2395 \text{ kg.m}$$

$$A' = 2.10 \text{ cm}^2 - \underline{2.0816}$$

$$A_{st} = 5.89 \text{ cm}^2 - \underline{4.0816}$$

$$V = 1035 \text{ kg} - \underline{J. RB 600.15}$$

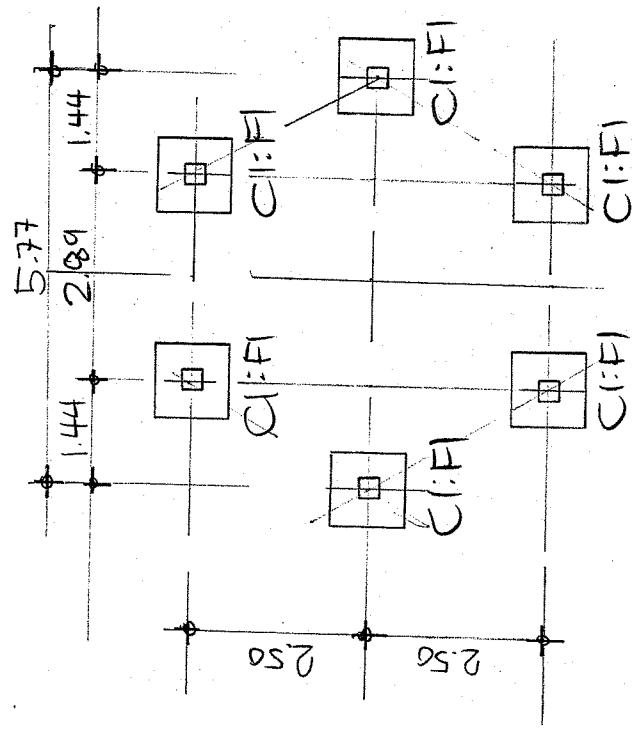


ใช้เหล็กรูปพรรณ

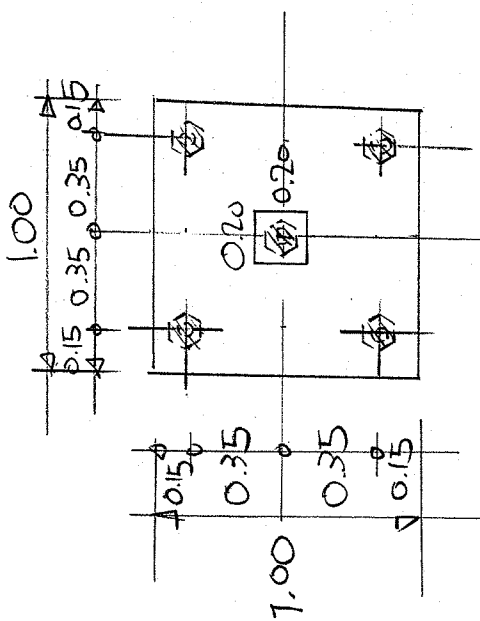
ใช้เหล็ก :-

เหล็ก : $\square 25 \times 25 \times 1.6$ มม. @ 0.32 ม.
 รั้ง : $\square 100 \times 50 \times 20 \times 2.30$ มม.
 ฝาผนังรับน้ำหนัก :-

เสาเหล็ก : $2 \square 100 \times 50 \times 20 \times 2.30$ มม.
 (ใช้) รางเหล็ก : $2 \square 100 \times 50 \times 20 \times 2.30$ มม.



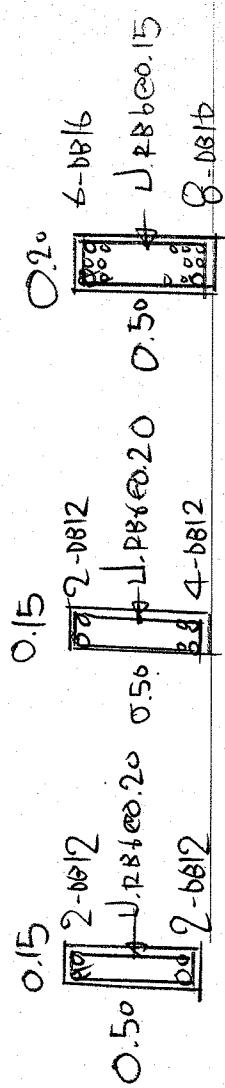
ใช้เหล็กรูปพรรณ



C: F: 11/24

0.20
 0.20 4-DB12
 U.P.B600.20

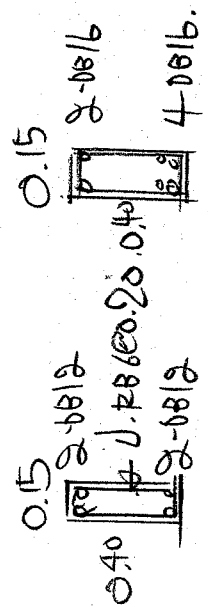
C: F: 11/24



B-1

B-2

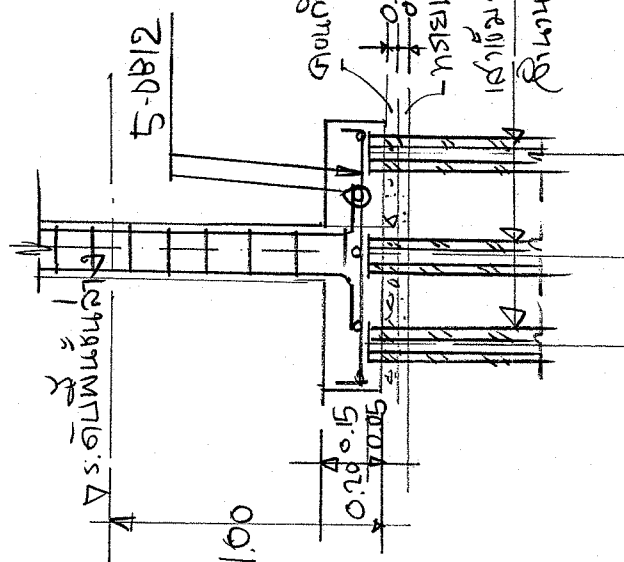
B-3



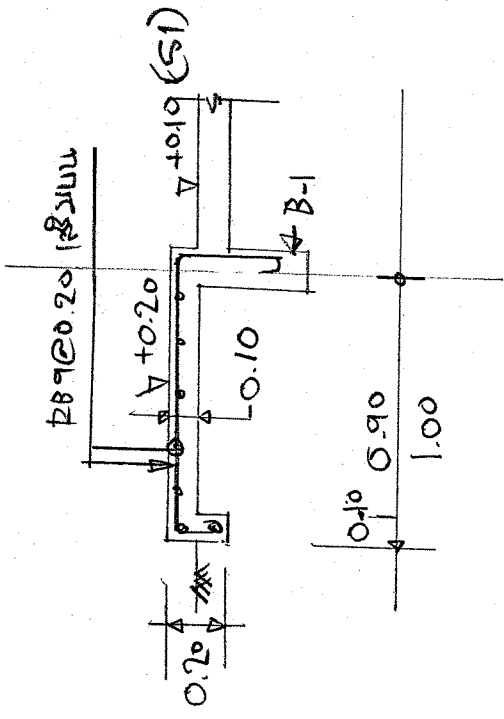
B-1

B-2

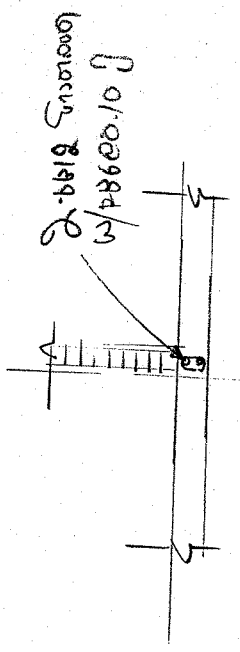
0.05
 0.05
 6" x 6.00 21
 5 0.14/5.14



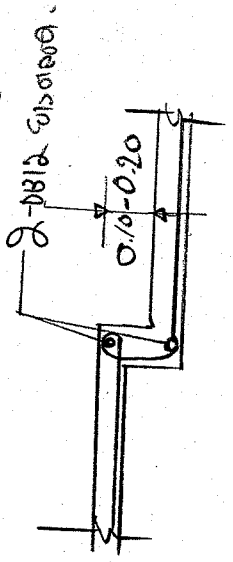
C: F: 11/24



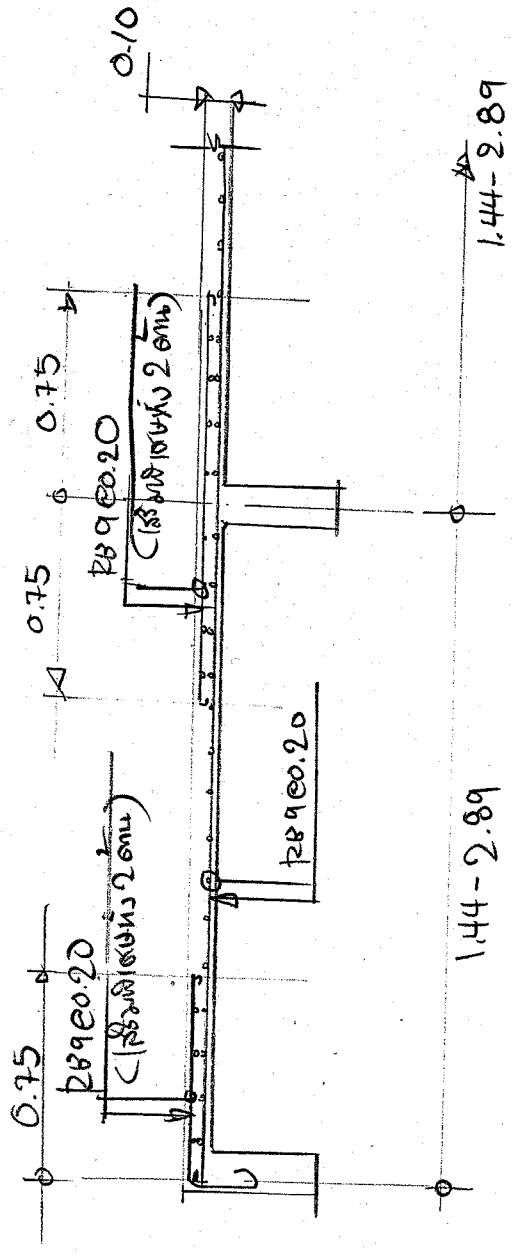
ပုံ 52 : ပုံစံ 1-1



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ပုံစံ ၅၁ : ပုံစံ ၂-၂