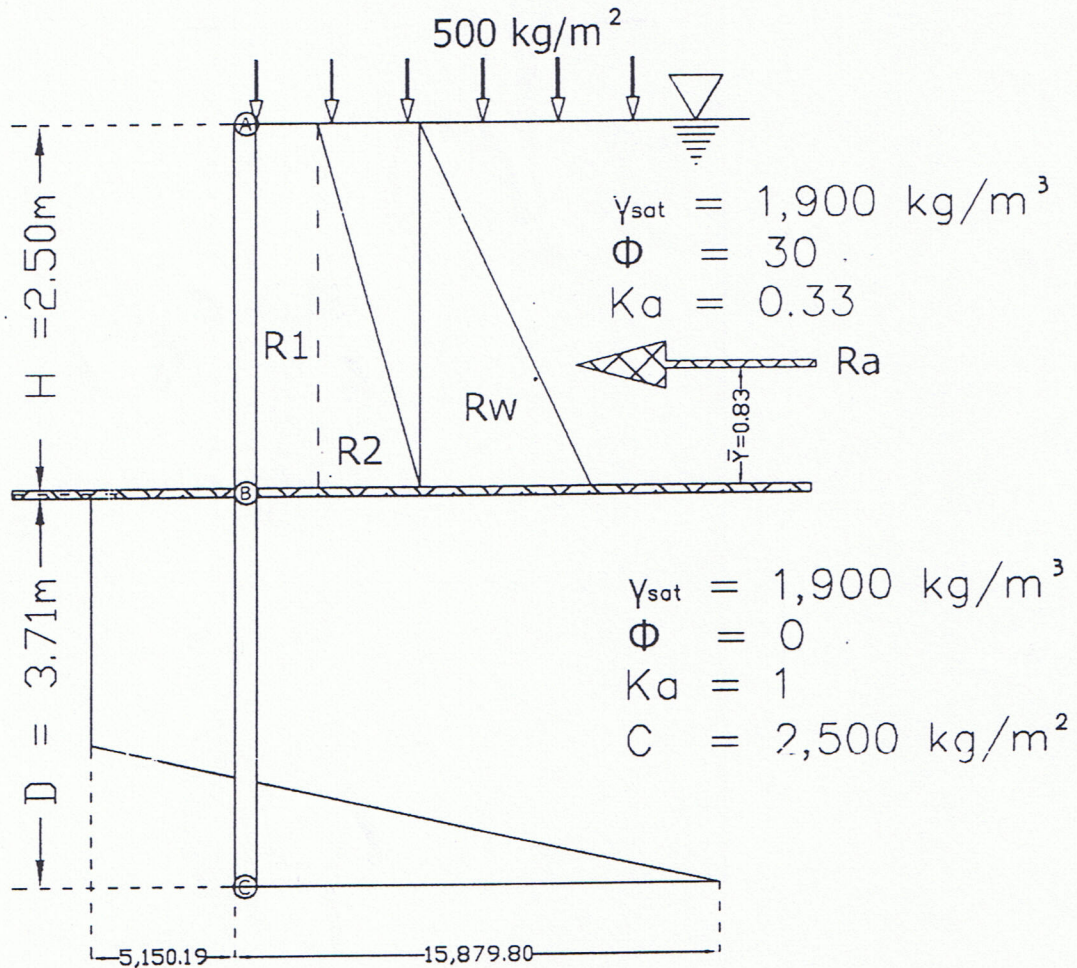


รายการคำนวณกำแพงกันดิน



$$\begin{aligned}
 P_1 &= K_a \cdot W \\
 &= 0.333 \cdot 500 \\
 &= 166.50 \quad \text{kg/m}^2
 \end{aligned}$$

$$\begin{aligned}
 R_1 &= P_1 \cdot H \cdot 2 \quad (1.50 \text{ meters/pile}) \\
 &= 166.50 \cdot 2.5 \cdot 1.5 \\
 &= 624.37 \quad \text{kg}
 \end{aligned}$$

$$\begin{aligned}
 P_2 &= K_a \cdot \gamma' \cdot H \\
 &= 0.333 \cdot 900 \cdot 2.5 \\
 &= 749.25 \quad \text{kg/m}^2
 \end{aligned}$$

$$\begin{aligned}
 R_2 &= \frac{1}{2} \cdot P_2 \cdot H \cdot 1.5 \quad (1.50 \text{ meters/pile}) \\
 &= \frac{1}{2} \cdot 749.25 \cdot 2.5 \cdot 1.5 \\
 &= 1,404.84 \quad \text{kg}
 \end{aligned}$$

$$\begin{aligned}
 P_w &= \gamma_w \cdot H \\
 &= 1,000 \cdot 2.5
 \end{aligned}$$

$$\begin{aligned}
 &= 2,500 \quad \text{kg/m}^2 \\
 R_w &= \frac{1}{2} * P_w * H * 1.5 \quad (1.50 \text{ meters/pile}) \\
 &= \frac{1}{2} * 2,500 * 2.5 * 1.5 \\
 &= 4,687.50 \quad \text{kg}
 \end{aligned}$$

$$\begin{aligned}
 \bar{P}_a &= (P_1 + P_2 + P_w) * 1.50 \quad (1.50 \text{ meters/pile}) \\
 &= 3,415.75 * 1.5 \\
 &= 5,123.62 \quad \text{kg/m}
 \end{aligned}$$

$$\begin{aligned}
 4C_a - \bar{P}_a &= [(4 * 2500) - 5,123.62] * 3b && \text{3 เท่าของพท.หน้าสัมผัสเพิ่ม} \\
 &= 4,876.38 * (3 * 0.35) \\
 &= 5,150.19 \quad \text{kg/m}
 \end{aligned}$$

$$\begin{aligned}
 4C_a + \bar{P}_a &= [(4 * 2500) + 5,123.62] * 3b && \text{3 เท่าของพท.หน้าสัมผัสเพิ่ม} \\
 &= 15,123.62 * (3 * 0.35) \\
 &= 15,879.80 \quad \text{kg/m}
 \end{aligned}$$

$$\begin{aligned}
 R &= R_1 + R_2 + R_w \\
 &= 624.37 + 1,404.84 + 4,687.50 \\
 &= 6,716.71 \quad \text{kg}
 \end{aligned}$$

$$\begin{aligned}
 \sum M_B &= 0 \\
 R\bar{Y} &= \left((R_1 * \frac{H}{2}) + (R_2 * \frac{H}{3}) + (R_w * \frac{H}{3}) \right) \\
 &= \left(624.37 * \frac{2.5}{2} \right) + \left(1,404.84 * \frac{2.5}{3} \right) + \left(4,687.5 * \frac{2.5}{3} \right) \\
 &= 5,597.27 \\
 6,716.71 \bar{Y} &= 5,597.27 \\
 \bar{Y} &= 0.83 \quad \text{m}
 \end{aligned}$$

$$(4C_a - \bar{P}_a)D^2 - (2R)D - \frac{R(12C\bar{Y} + R)}{2C + \bar{P}_a} = 0$$

$$5,150.19D^2 - 13,433.42D - 20,976.71 = 0$$

$$D = 3.71 \quad \text{m}$$

By Practical increase 30%

$$D = 3.71 * 1.3$$

$$= 4.83 \quad \text{m}$$

$$L = 4.83 + 2.5$$

$$= 7.33 \quad \text{m}$$

$$\text{Used Pile Length} = 8.00 \quad \text{m}$$

$$\begin{aligned} M_{\max} &= R \times [H/3 + R/Pa] - [(4C - Pa)(R/Pa)^2/2] \\ &= 6,716.71 \times [2.5/3 + 6,716.71/5,123.62] - [5,150.19 \times (6,716.71/5,123.62)^2/2] \\ &= 6,716.71 \times 2.14 - 4,422.25 \\ &= 9,951.50 \quad \text{kg-m} \end{aligned}$$

$$V_{\max} = 6,716.71 \quad \text{kg}$$

$$\begin{aligned} S &= M/Fc \\ &= 9,951.51 \times 100 / 350 \\ &= 2,843 \quad \text{cm}^3 \end{aligned}$$

Used เสาค้ำ คอ. รูปตัว I 0.35x0.35x8.0 m (4 - DB 20 mm x 2.50 m) , S = 6,761.40 cm³

Concrete Wall

Depth 2.50 m

$$\begin{aligned} Pa &= (0.33 \times 900 \times 2.50) + (0.33 \times 500) + (1,000 \times 2.50) \\ &= 3,407.50 \quad \text{kg/m}^2 \end{aligned}$$

$$W = 3,407.50 \quad \text{kg/m}$$

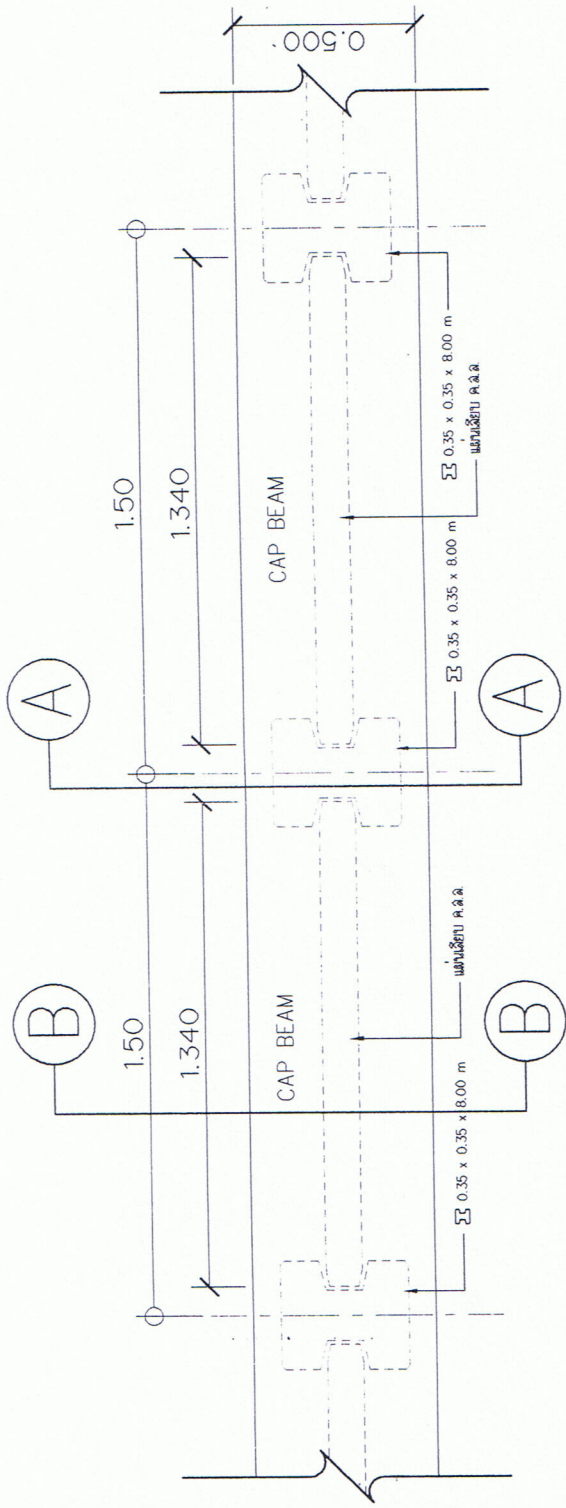
$$\begin{aligned} M_{\max} &= \frac{1}{8} w L^2 \\ &= \frac{1}{8} \times 3,407.50 \times 1.34^2 \\ &= 764.81 \quad \text{kg-m} \end{aligned}$$

$$\begin{aligned} As &= \frac{764.81 \times 100}{1,200 \times 0.863 \times 9.5} \\ &= 7.77 \quad \text{cm}^2 \end{aligned}$$

Used RB 9 mm @0.075

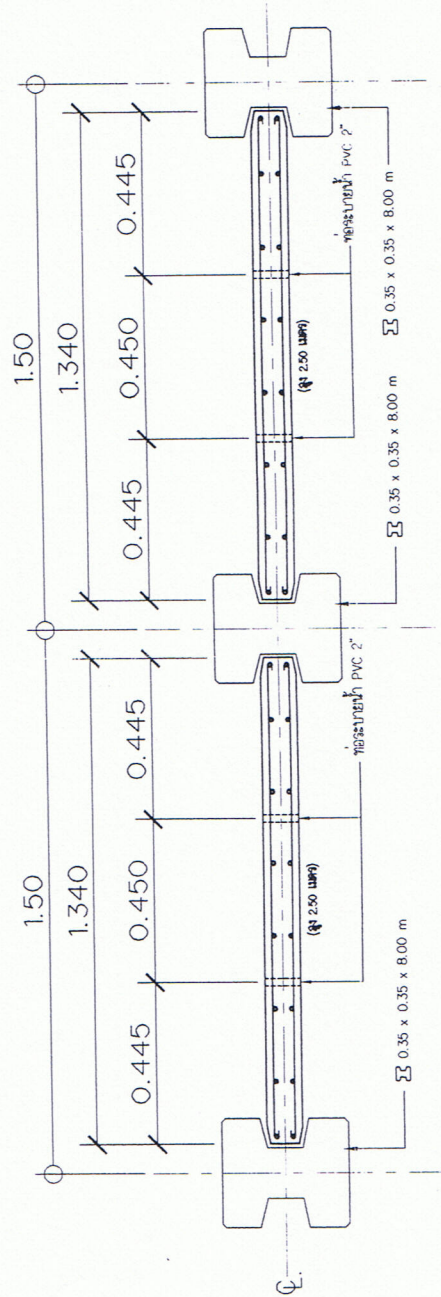
$$\begin{aligned} Ast &= 0.0025bd \\ &= 0.0025 \times 100 \times 10 \\ &= 2.5 \quad \text{cm}^2 \end{aligned}$$

Used RB 9 mm @0.20



แป้นยึดใบ คุ.ส.ล.

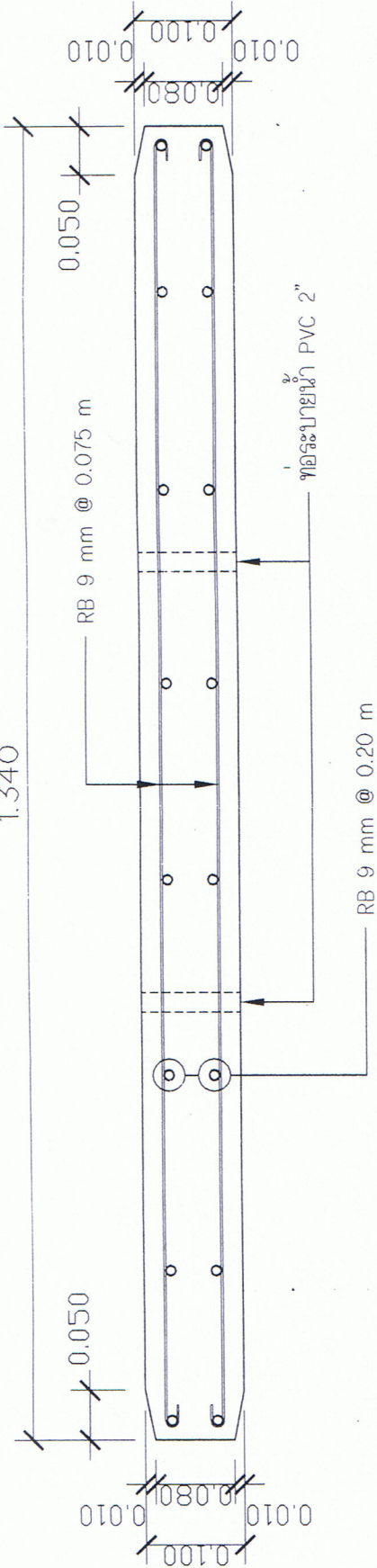
มาตราส่วน 1 : 15



ท่อระบายน้ำ คุ.ส.ล.

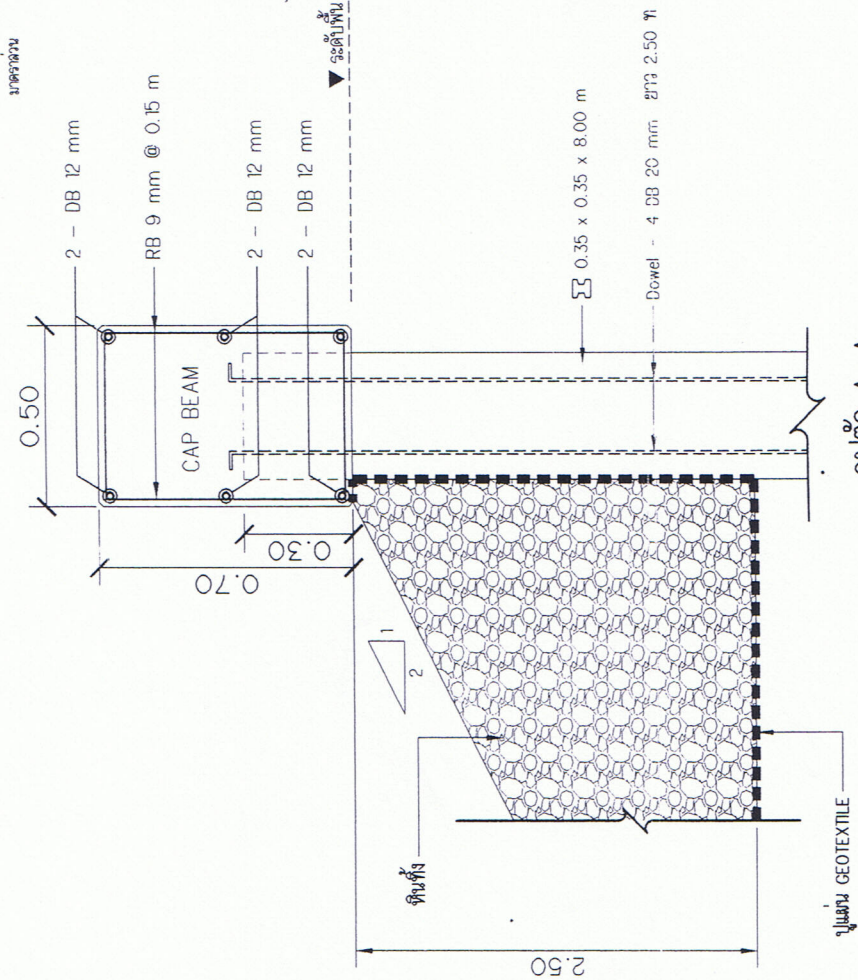
มาตราส่วน 1 : 15

1.340



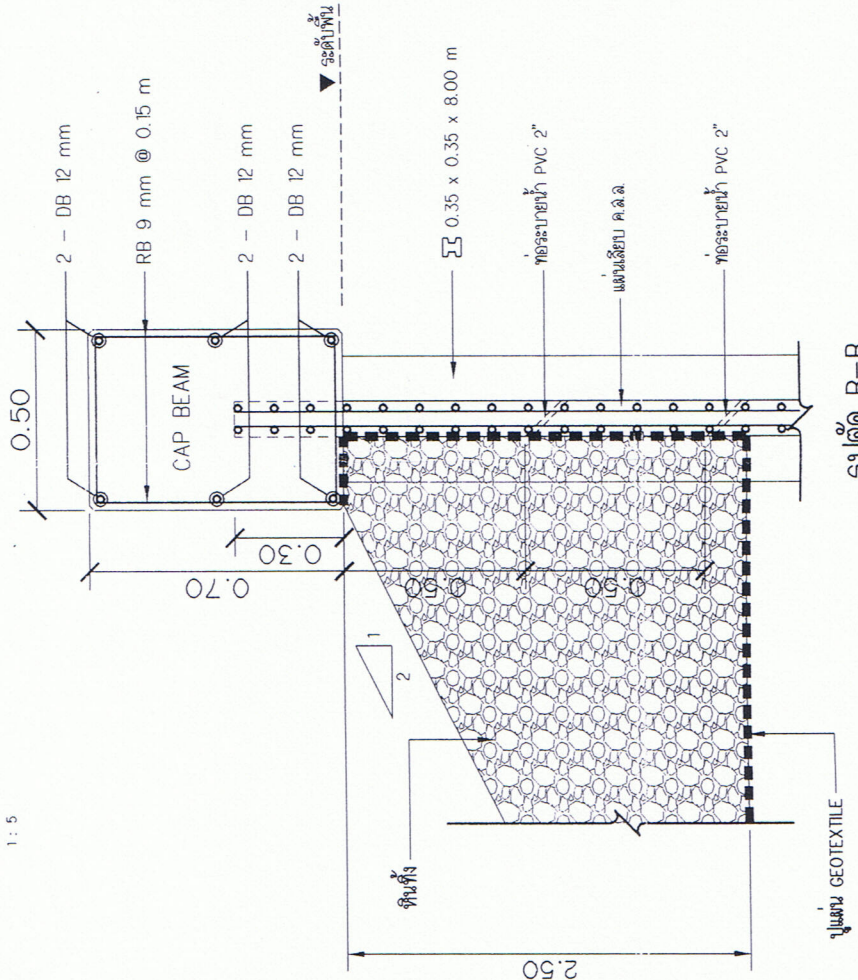
แบบขยายแผนลึบ ค.ล.ล.

ขนาดจริง 1 : 5



รูปตัด A-A

ขนาดจริง 1 : 5



รูปตัด B-B

ขนาดจริง 1 : 5