PONDASI MESIN DIGITAL PRINTING

I DATA - DATA

♣ Mutu Beton	(fc')	:	24.90	Mpa
♣ Mutu Baja	(fy)	:	390	Mpa
♣ Berat Mesin		:	12800	kg

Koefisien jika beban berjalan jika mesin menyala

$\Psi = (1 + k1 \; k2 \; v)$

dimana :

- Ψ : Koefisien kejut yang nilainya tidak boleh diabil kurang dari 1.15
- v : Kecepatan angkat maksimum dalam m/det dan nilainya tidak perlu diambil lebih dari 1.00 m/det
- k1 : Koeefisien yang bergantung pada kekauan struktur, pada umumnya diambil 0.6
- k2 : Koeefisien yang bergantung pada sifat - sifat mesin angkat dari keran angkatnya
  - mesin listrik biasa = 1.0
  - mesin asinkron = 1.3

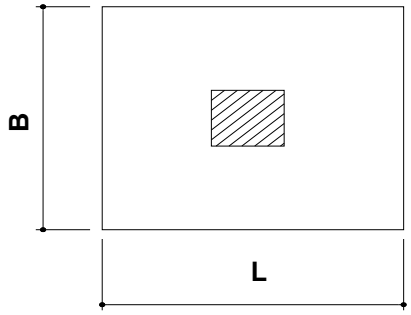
$\Psi = (1 + 0.6 \; 1.3 \; 1.00)$

$= 1.78$

II PEMBANAN

- Berat Mesin	=	12800	x	1.78	=	22784	kg
- Instalasi (10%)	=				=	2278.4	kg
					=	**25062.4**	**kg**

III PERHITUNGAN



Perhitungan daya dukung ijin dengan kedalaman 1 m

$q_{ult} = 5 + 0.34 \; qc$

$= 5 + 0.34 \; 9$

$= 8.06$ kg/cm2

$$q_{ijin} = \frac{qult}{FS}$$

$$= \frac{8.06}{3}$$

$= 2.687$ kg/cm2

Diketahui :

P1 = 25062.40 kg M1 = 2304.00 kgm $\bar{\sigma}$ = 2.687 kg/cm^2
= 26866.7 kg/m^2

Dicoba **B = 1.2 m h = 0.50 m**
L = 2.2 m

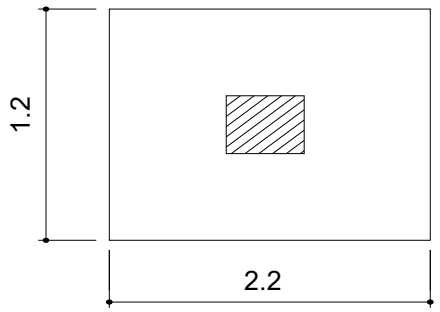
$$\sigma = \frac{P}{A} \pm \frac{M}{0.167\ B\ L^2} < \bar{\sigma}$$

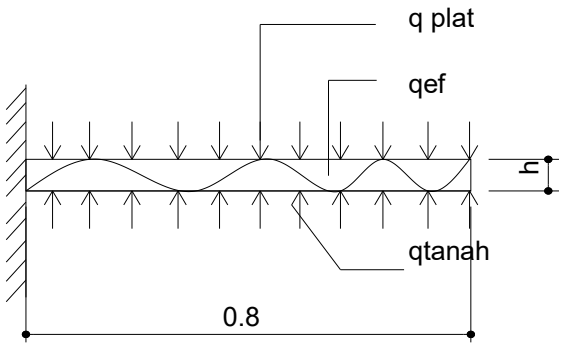
$$= \frac{25062.40}{2.64} \pm \frac{2304.00}{0.167\ 1.20\ 2.20^2} < 26867 \text{ kg/m}^2$$

= 9493.33 + 2380.2 = **11873.50 kg/m^2 < 26867 kg/m^2 (OK !!!)**

= 9493.33 - 2380.2 = **7113.17 kg/m^2 < 26867 kg/m^2 (OK !!!)**

PERHITUNGAN TULANGAN PLAT





qplat = 0.5 2400 = 1200 kg/m^2

q_{ef} = q tanah - q plat
= 11873.5 - 1200
= 13073.5 kg/m^2

Mu = 0.5 q_{ef} t^2
= 0.5 13073.5 0.80^2
= 4183.52 kgm = 41835195.6 Nmm

$$m = \frac{fy}{(\ 0.85\ x\ fc'\ )} = \frac{390}{(\ 0.85\ x\ 24.90\ )} = 18.427$$

$$\rho\ \text{balance} = \frac{0.85\ x\ \beta_1\ x\ fc'}{fy} \times \frac{600}{600 + fy}$$

$$= \frac{0.85\ x\ 0.85\ x\ 24.90}{390} \times \frac{600}{600 + 390}$$

= 0.0280

ρ mak = 0.75 x ρ balance
= 0.75 x 0.0280 = 0.0210

$$\rho\ \text{min} = \frac{1.4}{fy} = \frac{1.4}{390.00} = 0.00359$$

d = h plat - selimut - (tul. pokok / 2)
= 500 - 40 - (16 / 2)
= 452 mm

$$Rn = \frac{Mu}{\emptyset \times b \times d^2} = \frac{41835195.59}{0.8 \times 1000 \times 452^2} = \mathbf{0.2560}$$

$$\rho \text{ perlu} = \frac{1}{m} \times \left(1 - \sqrt{1 - \frac{2 \times Rn \times m}{fy}} \right)$$

$$= \frac{1}{18.43} \times \left(1 - \sqrt{1 - \frac{2 \times 0.2560 \times 18.43}{390}} \right)$$

= 0.00066 < ρ min (= 0.00359)

ρ pakai = 0.00359

As = ρ perlu x b x d

= 0.0036 x 1000 x 452 **= 1623 mm^2**

Diberi Tulangan Tarik = **D 16 - 100 mm (As = 2011 mm^2)**

As' = 0.4 x As

= 0.4 x 1623 **= 649 mm^2**

Diberi Tulangan Tekan = **D 16 - 200 mm (As = 1006 mm^2)**

Tulangan Dipasang Rangkap

PONDASI MESIN DIGITAL PRINTING 2

I DATA - DATA

- ♣ Mutu Beton (fc') : 24.90 Mpa
- ♣ Mutu Baja (fy) : 390 Mpa
- ♣ Berat Mesin : 10000 kg

Koefisien jika beban berjalan jika mesin menyala

$\Psi = (1 + k1 \; k2 \; v)$

dimana :

- Ψ : Koefisien kejut yang nilainya tidak boleh diabil kurang dari 1.15
- v : Kecepatan angkat maksimum dalam m/det dan nilainya tidak perlu diambil lebih dari 1.00 m/det
- k1 : Koeefisien yang bergantung pada kekauan struktur, pada umumnya diambil 0.6
- k2 : Koeefisien yang bergantung pada sifat - sifat mesin angkat dari keran angkatnya
  - mesin listrik biasa = 1.0
  - mesin asinkron = 1.3

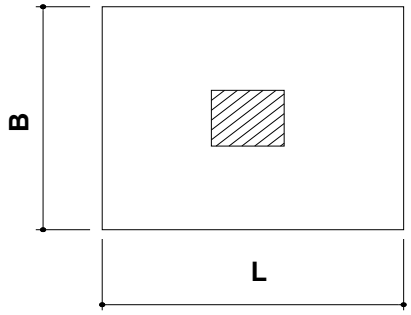
$\Psi = (1 + 0.6 \; 1.3 \; 1.00)$

$= 1.78$

II PEMBANAN

- Berat Mesin	=	10000	x	1.78	=	17800	kg
- Instalasi (15%)	=				=	2670	kg
					=	**20470**	**kg**

III PERHITUNGAN



Diketahui :

P1 = 20470.00 kg M1 = 7812.50 kgm $\bar{\sigma}$ = 2.687 kg/cm^2 = 26866.7 kg/m^2

Dicoba **B = 2.5 m** **h = 0.50 m**

L = 5.5 m

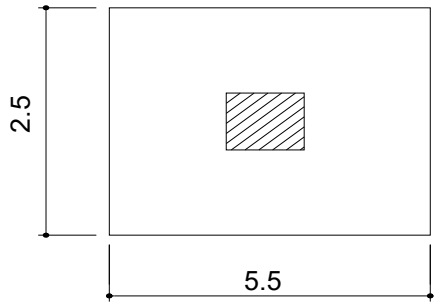
$$\sigma = \frac{P}{A} \pm \frac{M}{0.167 \; B \; L^2} < \bar{\sigma}$$

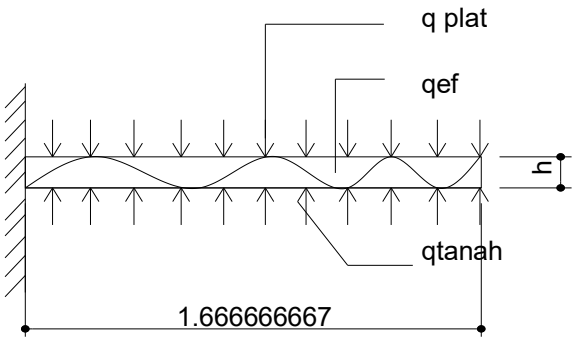
$$= \frac{20470.00}{13.75} \pm \frac{7812.50}{0.167 \quad 2.50 \quad 5.50^2} < 26867 \text{ kg/m}^2$$

$= 1488.73 + 619.83 =$ **2108.56 kg/m^2 < 26867 kg/m^2 (OK !!!)**

$= 1488.73 - 619.83 =$ **868.89 kg/m^2 < 26867 kg/m^2 (OK !!!)**

PERHITUNGAN TULANGAN PLAT





qplat = 0.5 2400 = 1200 kg/m^2

q_{ef} = q tanah - q plat
= 2108.6 - 1200
= 3308.6 kg/m^2

Mu = 0.5 q_{ef} t ^{2}
= 0.5 3308.6 1.67 ^{2}
= 4595.22 kgm = 45952249.8 Nmm

$$m = \frac{fy}{(\ 0.85 \times fc'\ )} = \frac{390}{(\ 0.85 \times 24.90\ )} = 18.427$$

$$\rho\ balance = \frac{0.85 \times \beta_1 \times fc'}{fy} \times \frac{600}{600 + fy}$$

$$\frac{0.85 \times 0.85 \times 24.90}{390} \times \frac{600}{600 + 390}$$

= 0.0280

ρ mak = 0.75 x ρ balance
= 0.75 x 0.0280 = 0.0210

$$\rho\ min = \frac{1.4}{fy} = \frac{1.4}{390.00} = 0.00359$$

d = h plat - selimut - (tul. pokok / 2)
= 500 - 40 - (16 / 2)
= 452 mm

$$Rn = \frac{Mu}{\emptyset \times b \times d^2}$$

$$\frac{45952249.77}{0.8 \times 1000 \times 452^2} = \mathbf{0.2812}$$

$$\rho\ perlu = \frac{1}{m} \times \left(1 - \sqrt{1 - \frac{2 \times Rn \times m}{fy}} \right)$$

$$= \frac{1}{18.43} \times \left(1 - \sqrt{1 - \frac{2 \times 0.2812 \times 18.43}{390}} \right)$$

= 0.00073 < ρ min (= 0.00359)

ρ pakai = 0.00359

As = ρ perlu x b x d

= 0.0036 x 1000 x 452 **= 1623 mm^2**

Diberi Tulangan Tarik = **D 16 - 100 mm (As = 2011 mm^2)**

As' = 0.4 x As

= 0.4 x 1623 **= 649 mm^2**

Diberi Tulangan Tekan = **D 16 - 200 mm (As = 1006 mm^2)**

Tulangan Dipasang Rangkap

PONDASI BOILER

I DATA - DATA

- ♣ Mutu Beton (fc') : 24.90 Mpa
- ♣ Mutu Baja (fy) : 390 Mpa
- ♣ Berat Mesin Boiler : 5000 kg

Koefisien jika beban berjalan jika mesin menyala

$\Psi = (1 + k1\ k2\ v)$

dimana :

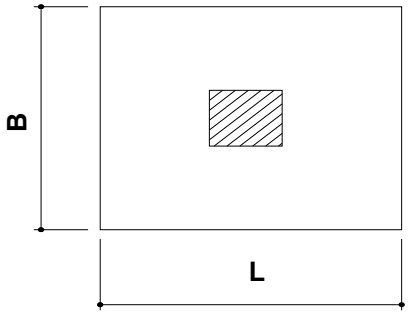
- Ψ : Koefisien kejut yang nilainya tidak boleh diabil kurang dari 1.15
- v : Kecepatan angkat maksimum dalam m/det dan nilainya tidak perlu diambil lebih dari 1.00 m/det
- k1 : Koeefisien yang bergantung pada kekauan struktur, pada umumnya diambil 0.6
- k2 : Koeefisien yang bergantung pada sifat - sifat mesin angkat dari keran angkatnya
  - mesin listrik biasa = 1.0
  - mesin asinkron = 1.3

$\Psi = (1 + 0.6\ 1.3\ 1.00)$
$= 1.78$

II PEMBANAN

- Berat pompa	=	5000	x	1.78	=	8900	kg
- Instalasi (15%)	=				=	1335	kg
					=	**10235**	**kg**

III PERHITUNGAN



Diketahui :

P1 = 10235.00 kg M1 = 6400.00 kgm $\bar{\sigma}$ = 2.68667 kg/cm^2
= 26866.7 kg/m^2

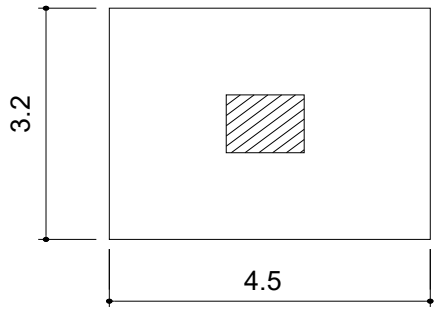
Dicoba **B = 3.2 m h = 0.50 m**
L = 4.5 m

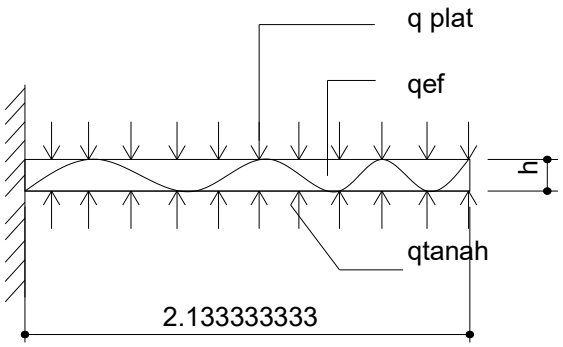
$$\sigma = \frac{P}{A} \pm \frac{M}{0.167\ B\ L^2} < \bar{\sigma}$$

$$= \frac{10235.00}{14.4} \pm \frac{6400.00}{0.167\ 3.20\ 4.50^2} < 26867\ kg/m^2$$

= 710.76 + 592.59 = **1303.36** **kg/m^2** **<** **26867** **kg/m^2** **(OK !!!)**
= 710.76 - 592.59 = **118.17** **kg/m^2** **<** **26867** **kg/m^2** **(OK !!!)**

PERHITUNGAN TULANGAN PLAT





qplat = 0.5 2400 = 1200 kg/m^2

q_{ef} = q tanah - q plat
= 1303.4 - 1200
= 2503.36 kg/m^2

Mu = 0.5 q_{ef} t ^{2}
= 0.5 2503.36 2.13 ^{2}
= 5696.53 kgm = 56965267.5 Nmm

$$m = \frac{fy}{(\ 0.85 \times fc'\ )} = \frac{390}{(\ 0.85 \times 24.90\ )} = 18.427$$

$$\rho\ balance = \frac{0.85 \times \beta_1 \times fc'}{fy} \times \frac{600}{600 + fy}$$

$$\frac{0.85 \times 0.85 \times 24.90}{390} \times \frac{600}{600 + 390}$$

= 0.0280

ρ mak = 0.75 x ρ balance
= 0.75 x 0.0280 = 0.0210

$$\rho\ min = \frac{1.4}{fy} = \frac{1.4}{390.00} = 0.00359$$

d = h plat - selimut - (tul. pokok / 2)
= 500 - 40 - (16 / 2)
= 452 mm

$$Rn = \frac{Mu}{\emptyset \times b \times d^2}$$

$$\frac{56965267.49}{0.8 \times 1000 \times 452^2} = \mathbf{0.3485}$$

$$\rho \text{ perlu} = \frac{1}{m} \times \left(1 - \sqrt{1 - \frac{2 \times Rn \times m}{fy}} \right)$$

$$= \frac{1}{18.43} \times \left(1 - \sqrt{1 - \frac{2 \times 0.3485 \times 18.43}{390}} \right)$$

= 0.00090 < ρ min (= 0.00359)

ρ pakai = 0.00359

As = ρ perlu x b x d

= 0.0036 x 1000 x 452 **= 1623 mm^2**

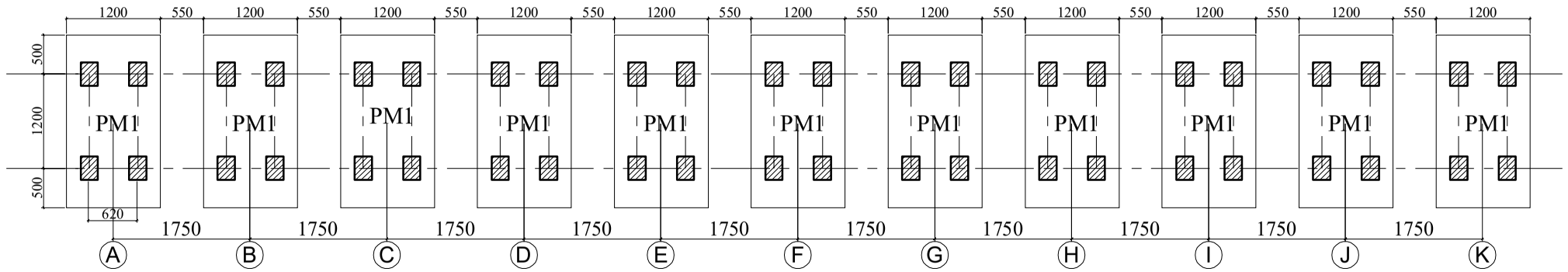
Diberi Tulangan Tarik = **D 16 - 150 mm (As = 1341 mm^2)**

As' = 0.4 x As

= 0.4 x 1623 **= 649 mm^2**

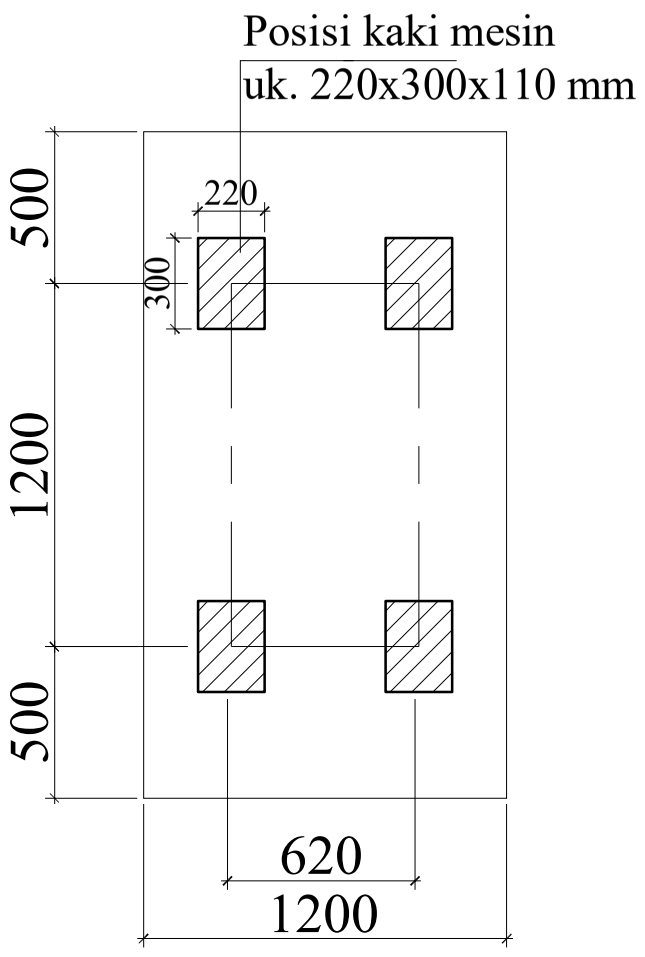
Diberi Tulangan Tekan = **D 16 - 200 mm (As = 1006 mm^2)**

Tulangan Dipasang Rangkap



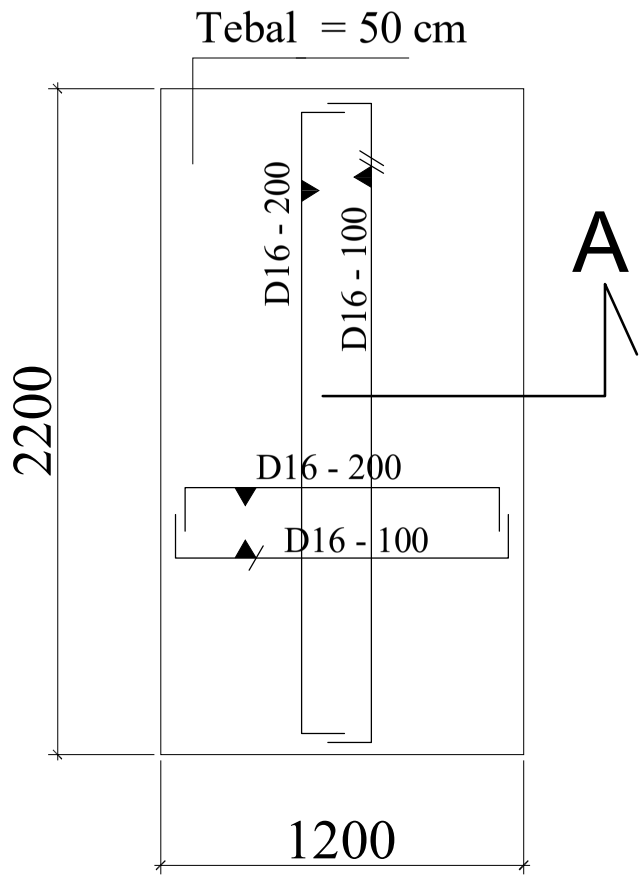
DENAH RENC. POND. MESIN 1 (PM1)

1 : 75



DETAIL POND. TYPE PM1

1 : 25

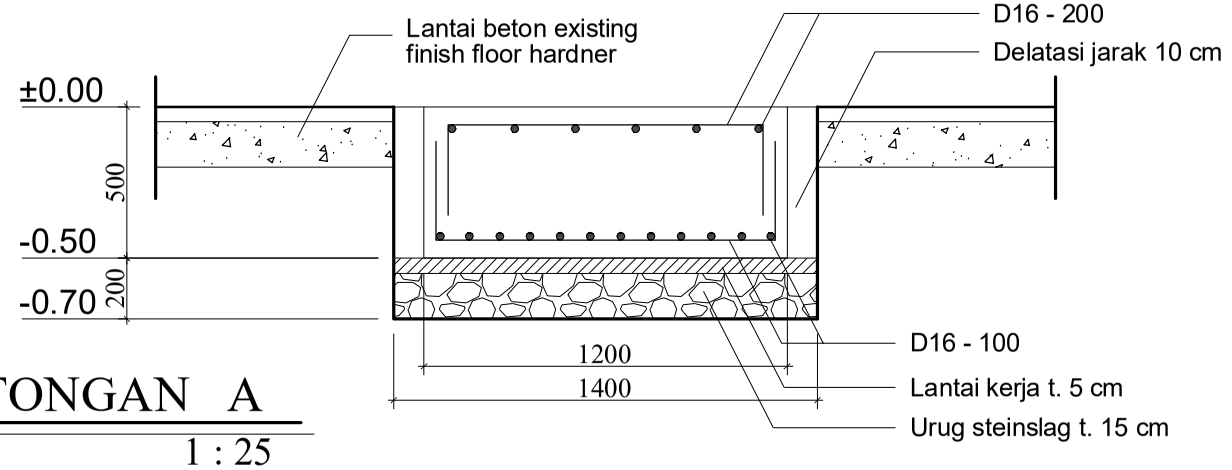


PENUL. POND. TYPE PM1

1 : 25

CATATAN :

- Mutu beton (fc') = K - 300
  Struktur Utama
- Mutu besi ulir (fy) = 390 Mpa
- Mutu besi polos (fy) = 240 Mpa



POTONGAN A

1 : 25

JUDUL GAMBAR

PEMBANGUNAN
PONDASI MESIN

LOKASI BANGUNAN

JL. RAYA KARANG PLOSO
KABUPATEN MALANG

GAMBAR	SKALA
DENAH RENC. PONDASI MESIN 1	1 : 75
DETAIL PONDASI	1 : 25

PERENCANA BANGUNAN	NAMA	TANDA TANGAN
ARSITEKTUR		
STRUKTUR		
MEP		

CATATAN :

NO GAMBAR	STR - 60
TANGGAL	MARET 2023