Reinforcement Estimation of slab

Beam Column Slab culvert Retaining Wall

#3 exact Dia জানতে হবে # 3/8" ø

4 4/8" ø

#10

1.27

upto nine 9/8" — And মিলবে

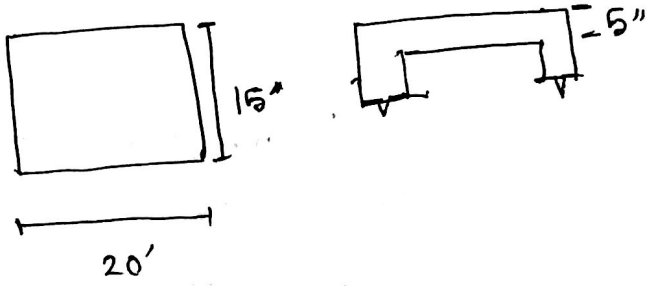
বাকী গুলো + মন গনে রাখতে হবে

2 types Reinforcement — Straight Bar (Hook is provided)

Deformed " (খাজকাটা ")

⌊ — for extra safety

i) % basis of concrete



→ Column ২ ৪-10% Reinforcement is provided

Volume = 20×15×5/12

* Reinforcement × 1/100

1% for slab

Method (2) By thumb Rule

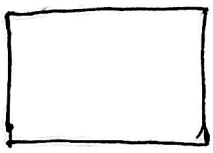
Assignment
Page 88 (1, 2, 3)

10-12 Kg/m²/floor
h = 9m (3 storied build assume)

Required Reinforcement for slab = (10×3) = 30Kg/m²

- কিছু And Practically Related unit এ express
- For example cement bag এ
  Reinforcement volume এ

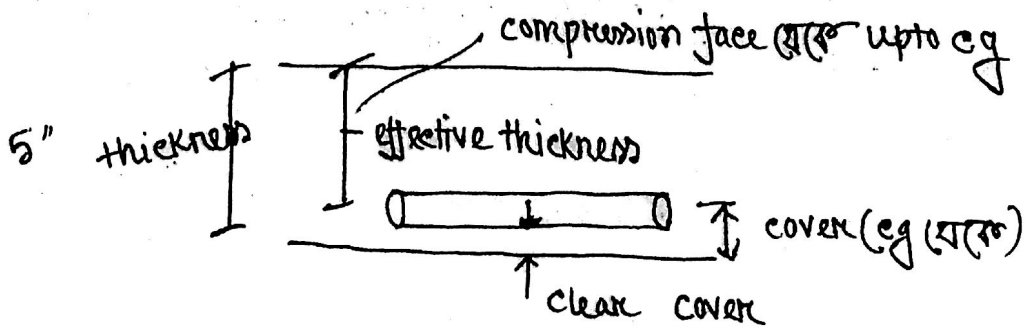
Cover and clear cover



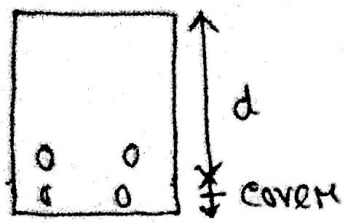
Red দেয়াহয় Tension দিকে

Provision of safety ① fire/moisture/consuming or rusting atmosphere

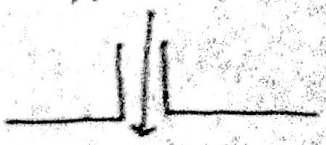
25ᵉ — Beam/Column - min 1.5"
1" — Slab — .75" / 3/4"
— structure in contact with soil 3"

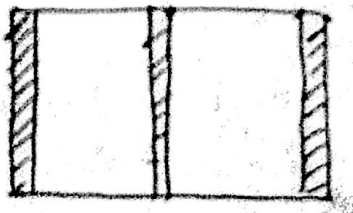


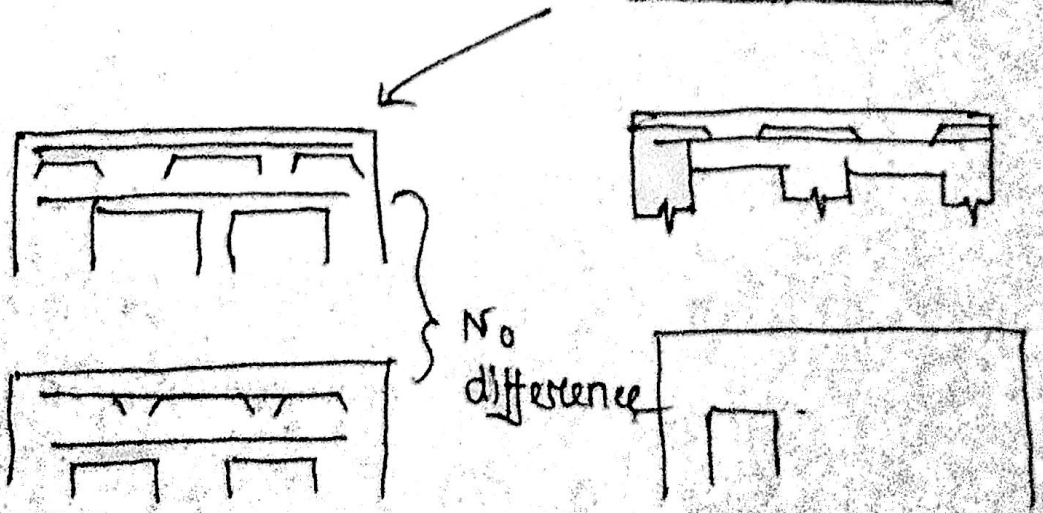
Effective depth 4" (cz no info given slab ~~25~~ 3/4" cover 1")



Rod - cranked Bar (top Bottom)
- ~~extra bar~~ (")
Straight Bar
Extra top - top
→ at support place







Consideration ① symmetric কীনা

② long Direction short Direction

যে side এ length বেশী

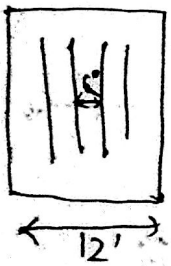
For this level

↓

Rod গুলো বড় হবে ছোট হবে

#4
#5
hook
st - Nox length
crank
Extra top

long direction
short Direction



- সব Rod এর Volume

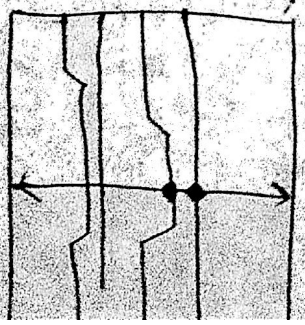
length Area - width

কয়টি Rod লাগবে

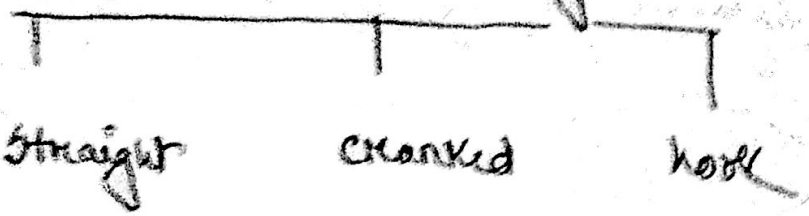
$\frac{12'}{6''} + 1 =$

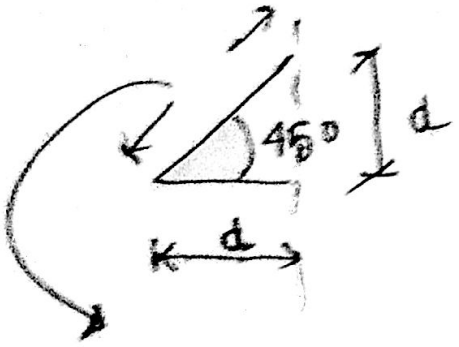
Group এর হিসাব

- long Direction এ Rod হিসেব করতে short Direction length



① #4 @ 6" c/c alternately cranked





long direction length
(length − 4")

1.42d

.42d

Ex Extra length .42d
provide করবো

d = slab এর effective depth

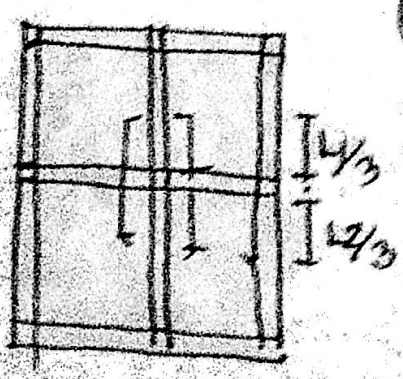
dr = Rod dia

#extra Top

2 type ② legend

③ legd

length এর 1/3 Clear span



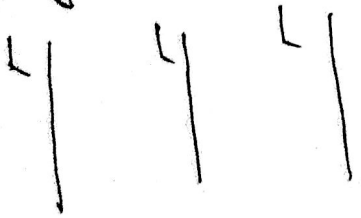
দুপাশে support এ e তাহলে supp-span
Clear , " Face থেকে " - Face

8" পরের extension

$\frac{22'}{3} \times 2 + 10''$ পরের distance

$\frac{22'}{3} + 10'' + (1'9'' - 2')$

→ How many extra top ??



$(33-1) = 32$

2টি Extra top $(33-1) \times 2 =$

3 $(\quad) \times 3$

Hook 33 straigh bars ~~extra~~ hook 66

Hook length

$\#4 = 9 \times \frac{4''}{8}$

20mm = 9 × 20mm

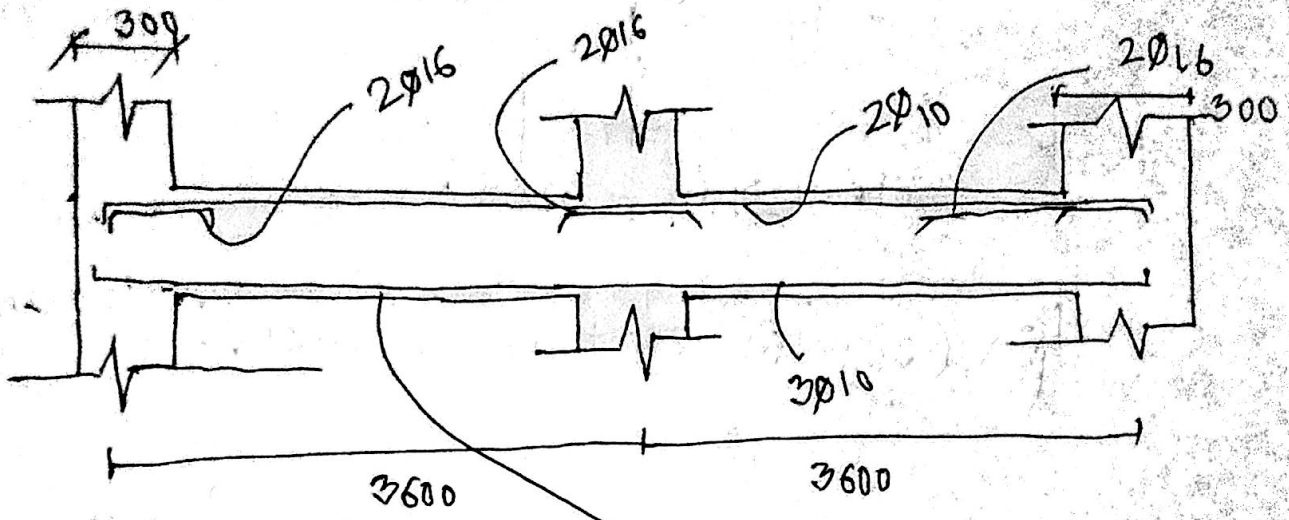
490 pcf 16/ft3

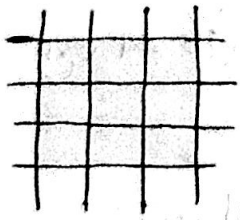
- Reinforcement unit weight

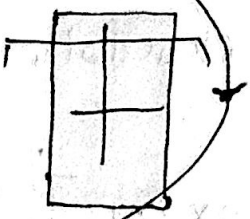
1 ton = 5500 tk

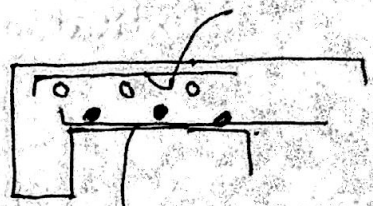
short direct Rod
নিচে থাকবে

Reinforcement Estimation of Beam :-

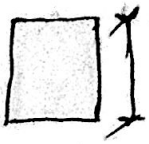








long direction
Section
ez Rod নীচে
long Direction
কাটা পড়েছে



Beam (300 × 450)

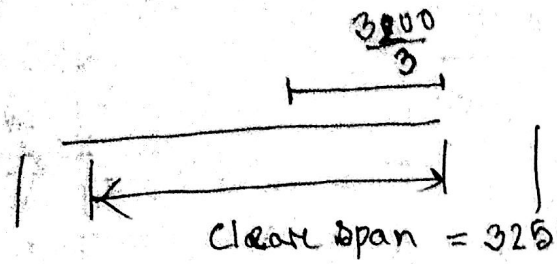
6" into the support

* symmetric xtion
* half calculation enough

top < 5t / Extra top

bottom < 5t

} 5X (3600 - 150 - 200 + 200 + 6" + 9X16) } 2
× π/4 × 16²



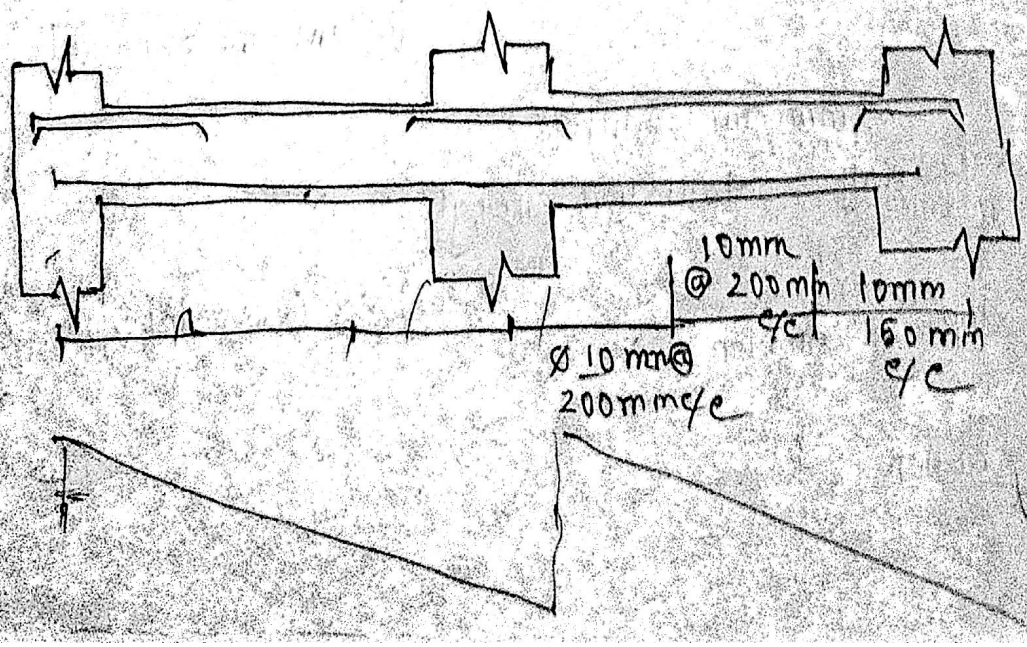
$\{5 \times (3600 - 150 - 200 + 200 + 6'' + 9\times16)\} \times 2 \times \frac{\pi}{4} \times 16^2$

Extra top → $(2) \times \{1084 + 6'' + 9\times16 \times 2\} \times 2$

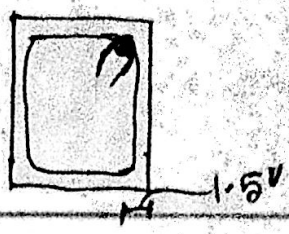
Clear distance — দুটি rod এর জন্য

$\{2 \times [1084\times2 + 400 + 9\times2\times16]\} * 2 \times \frac{\pi}{4} \times 16^2$ — মাঝের

$= * 2 \times (2\times1084 + 400 + 9\times16\times2) \times \frac{\pi}{4} \times 2 \times 16^2$



Shear force



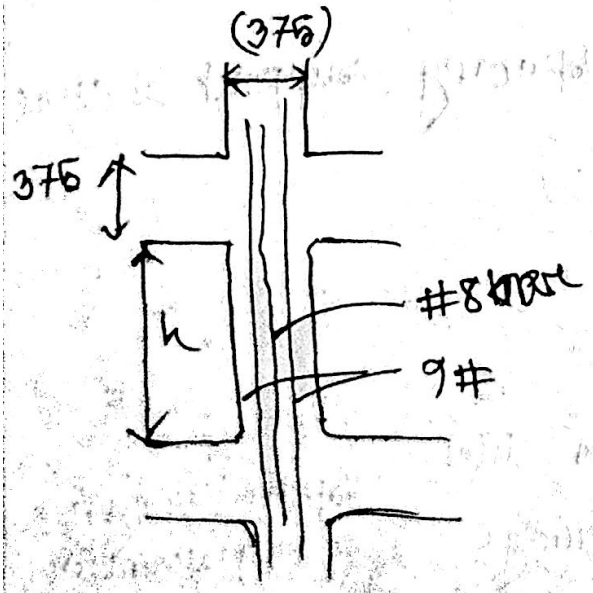
$\left(\frac{1100}{150}+1\right)$ No of stirrups $\times \{(300-15\times2)\times2 + (450-15\times2)\times2\}$

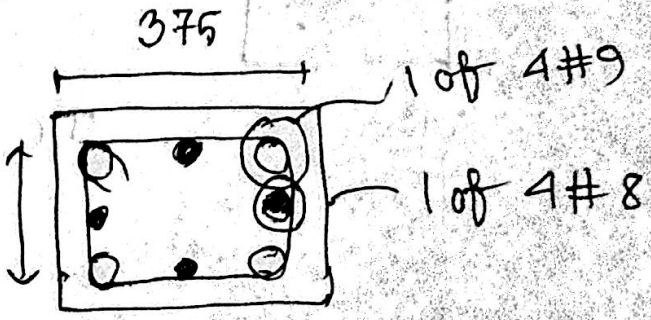
(6 db or 75mm)

6×10mm or 75mm = 75mm

Mid span ও length same

$\left(\frac{1100}{200}\times2\right)$





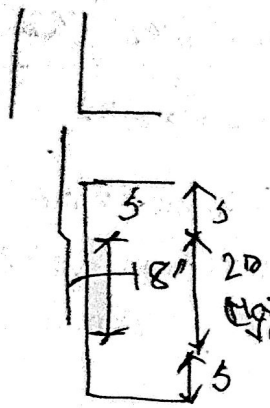
2 types Question

(I) ১ Floor ও কতটা — [length - clear span]

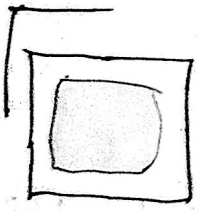
(II) Full Building ও কতটা Rod লাগবে

Floor

Splice Lap length



- প্রতিটি section এ Lap length দিতে হবে না
- সোজা বসাতে হবে
- longitudinal section
- কিছু না থাকলে 1 feet



(375 - 3") × 4 + 75 × 2

Tie spacing support এ close হয়।

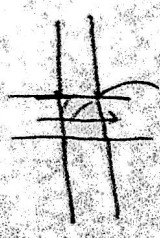
19/05/16

Form Work · Box culvert - আমাদের দেশে

Diff culvert and Bridge

- Water Navigation possible হয় না

Span - Design Parameter



Estimation of culvert:- Box culvert বললে further inspection possible হবে না,

Page-14 Retaining wall - মাটি আটকিয়ে রাখে

abutment - vertical Force (Retaining wall এ সামনে/পাশে থাকে না) পাবে,

↓

হলো Pressure Retaining structure

associate wall wingwall

Retaining , not associated .

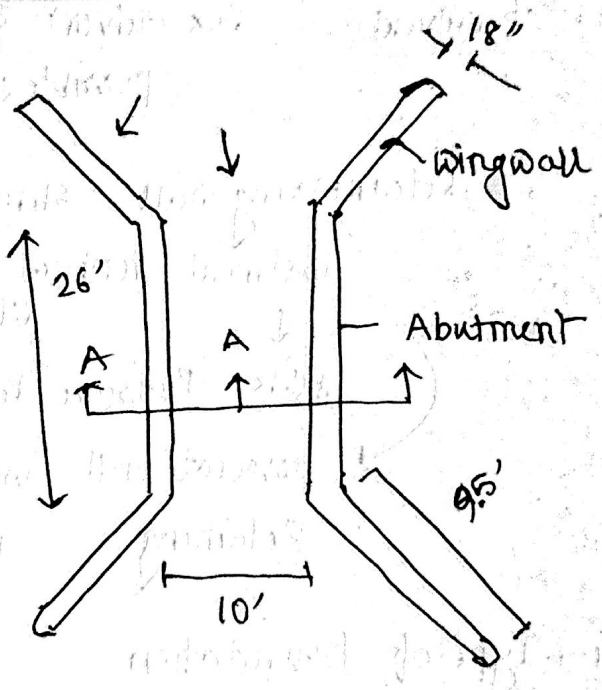
Pear- Type of Bourndation

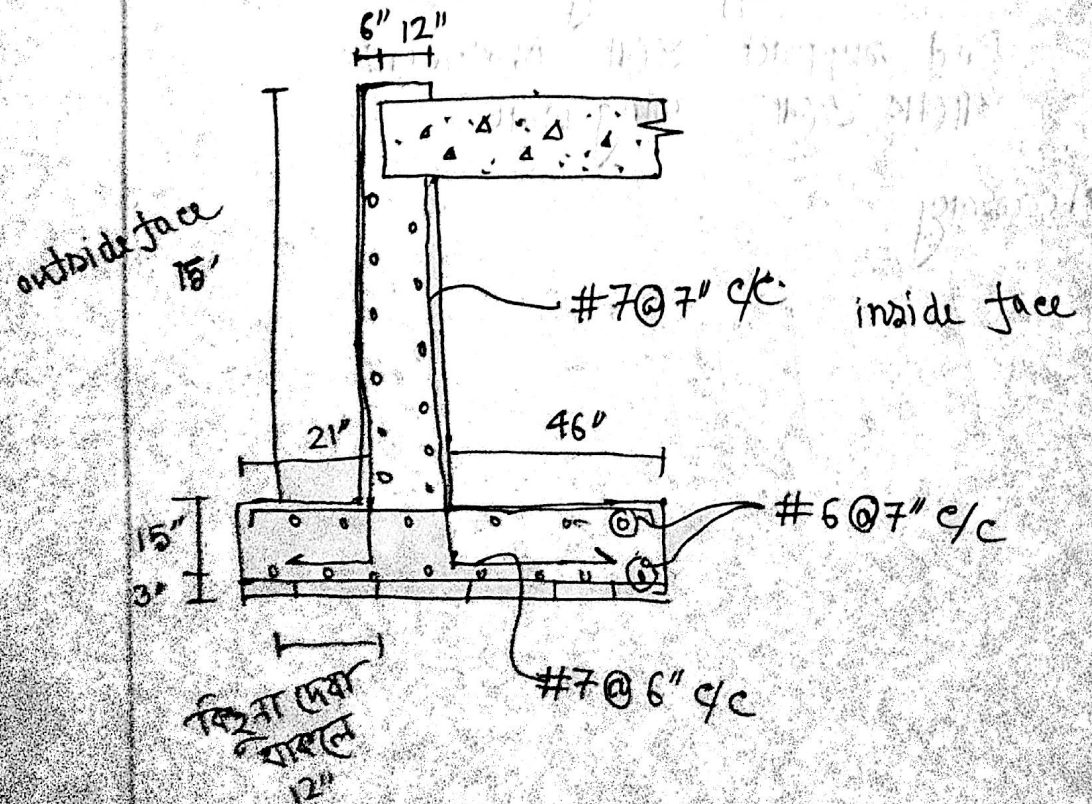
↳ Bridge এর support system গুলো

End support গুলো Abatiment

মাঝের গুলো wing wall

Pg-78 - Necessary





RCC estimation আমাদের পাবে (abutment)

xm 2 inside বা outside face এর Reinforcement Estimation আমাদের পাবে,

→ 26' span দেওয়া আছে

$15'+15''+12''+9d_0\times 2-3\times 2-3''$

Vertical Rod in wall

outside face $=\left(\frac{26\times 12}{6''}+1\right)$

$15'+15''+12''+9d_0\times 2-3''-6''$

inside face $=\left(\frac{26\times 12}{7}+1\right)$

inside outside এর difference নীচের টা $-9''$ $9''$ শুধু বার Dia change হবে

outside face No of Rod $\left(\frac{15'\times 12\ 3'}{6'}+1\right)$

inside wall $\frac{(15'-9''-9''-3'')}{6''}+1$

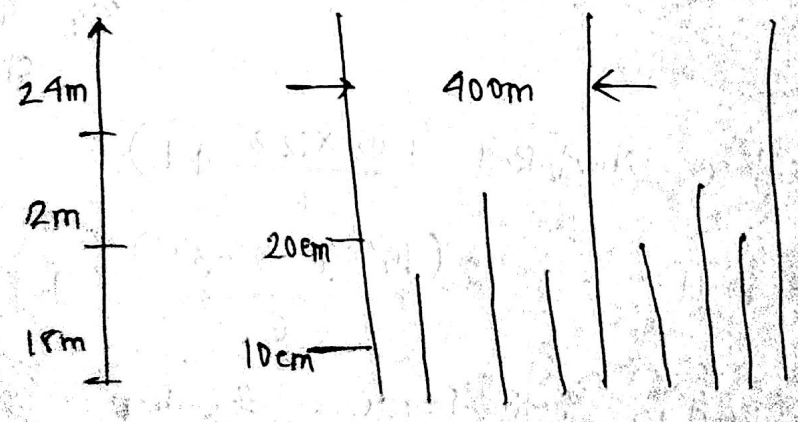
→ base-rod in both layer #7 bar

Rod in face #6 bar $\frac{(15'-9''-3'')}{6'}+1$

$(26'+2$

Estimation of a Retaining wall

hold back masses of earth or other



$\left(\frac{30}{10cm} + 1\right)$

$\left(\frac{30m}{20cm} + 1\right)$

$\left(\frac{30m}{40cm} + 1\right)$