

رسم اولی مدنی

هامه ل Mid term

أمشله متبوعه على
كبارى "Arch Bridge"

السادسة
(6)
2008



اولا :- كبرى فته واحد (one vent)

(1,2)

(3,4)

(5,6)

Example (1) •

Ex(2) → term (2005) •

Ex(3) → Mid term (2005) •

ثانيا :- كبرى فتهين (two vents)

(7,8)

(9,10)

(11,12)

(13,14)

Example (4) •

Ex (5) → term (2001) •

Ex (6) → term (2003) •

Ex (7) → Mid term (2003) •

ثالثا :- كبرى ثلاث فحات (Three vents)

(15,16)

Example (8) •

رابعاً :- فكره تخير مطاه (Abutments)

(17 → 19)

Example (9) •

خامساً :- مسأله الواجب



Ex(1)

* Draw to scale 1:100 an arch bridge of one vent to cross the Canal shown in The figure for The given data:-

(a) Road way over bridge = 4.00m

(b) Thickness of Parapets = 0.50m

(c) 90° segmental arch:

* span = 4.50m

* springing level = 10.00

* Thickness = 0.64



(d) Abutment (P.C)

* Thickness at springing level = 0.90

* Thickness of foundation = 0.70

(E) Wing wall

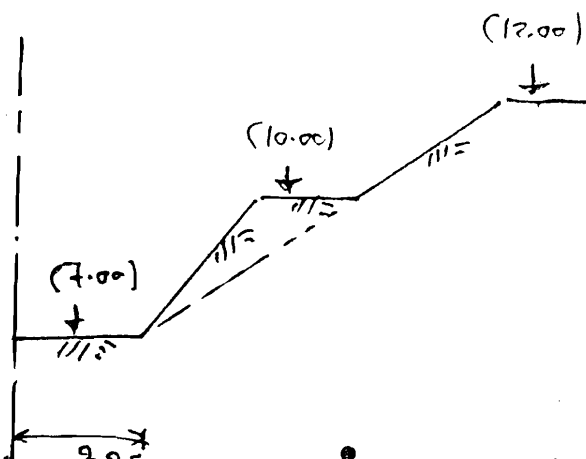
* U.S wing wall is sloping

* D.S wing wall is box (t=0.70)

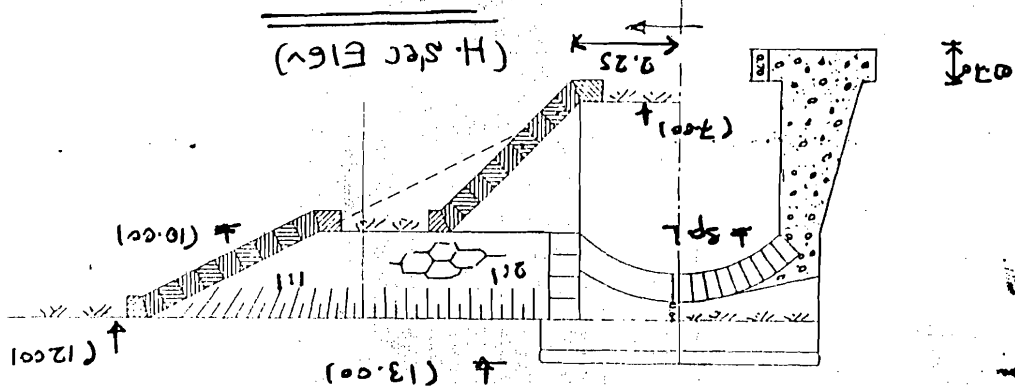
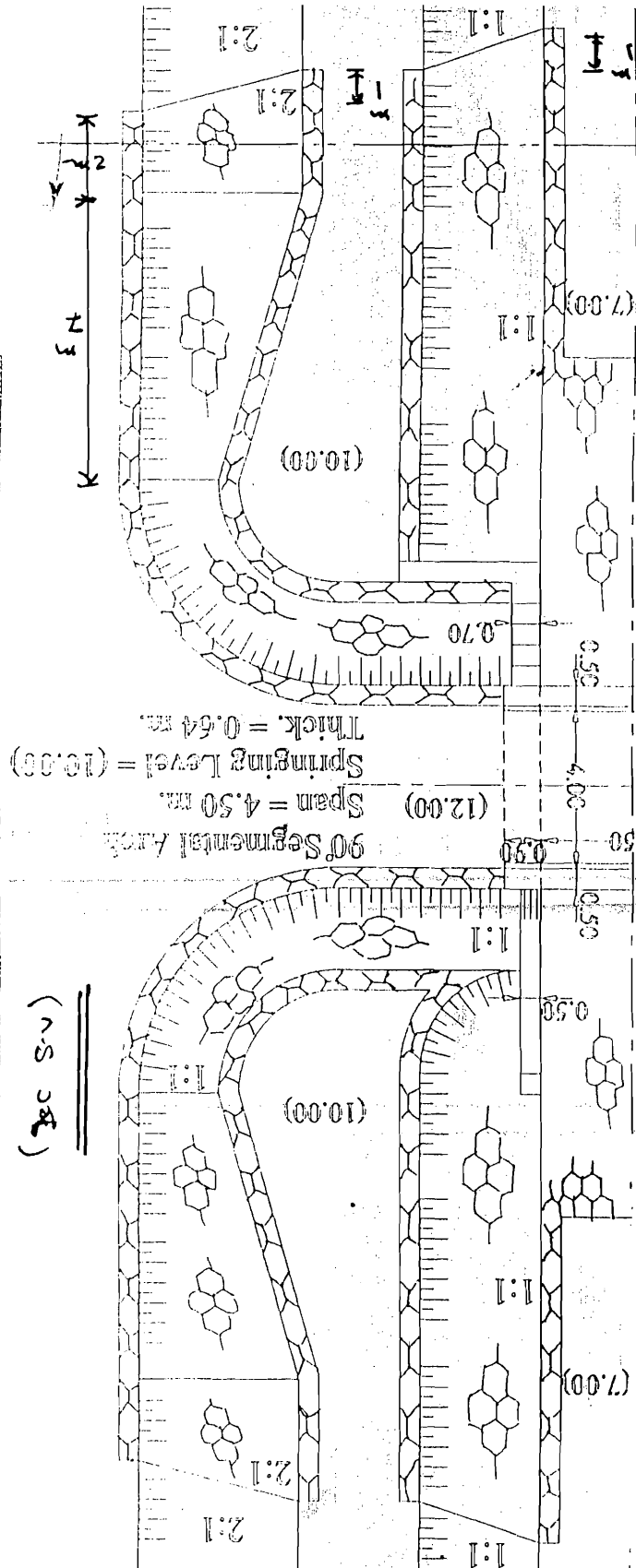
(*) It is required to draw

(i) plan (H.E.R)

(ii) H-Sec ELEV



$$\frac{5 \pm 8.0}{4} = 12$$



(*) Draw to scale 1:100 an arch bridge of one vent to cross the Canal shown in figure for the given Data:-

(a) Road way width over bridge = 4.00m

(b) Thickness of parapet = 0.50m

(c) 90° segmental Arch of:-

1- span = 5.00m

2- springing Level = (6.00)

3- Thickness = 0.64

(d) Abutment (P-C)

1- Thickness at springing level = 0.90m

2- Thickness of foundation = 0.80m

(E) wing wall

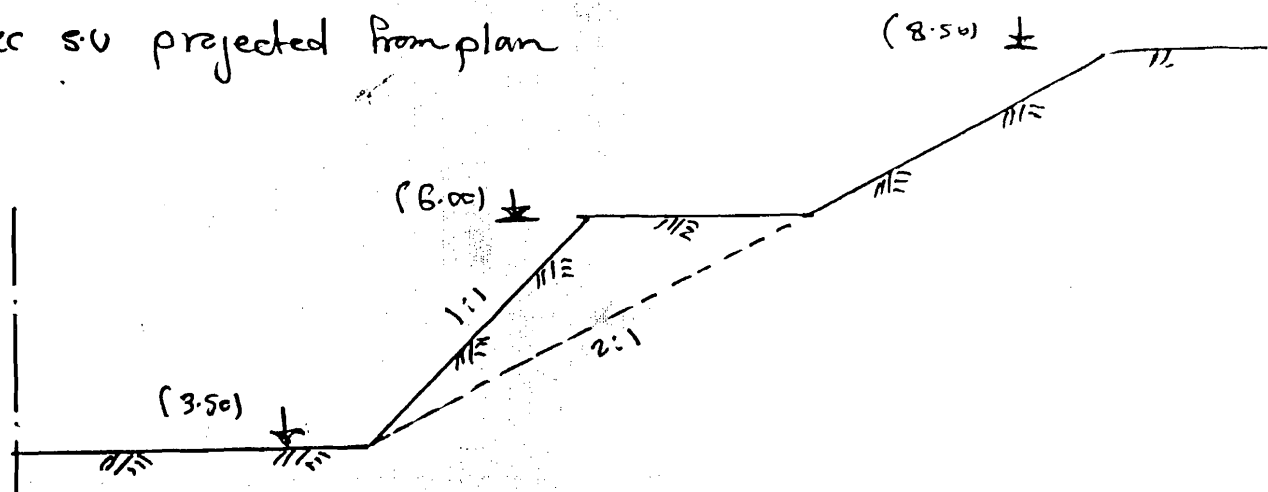
U.S and D.S wing walls are box type ($t = 0.65m$)

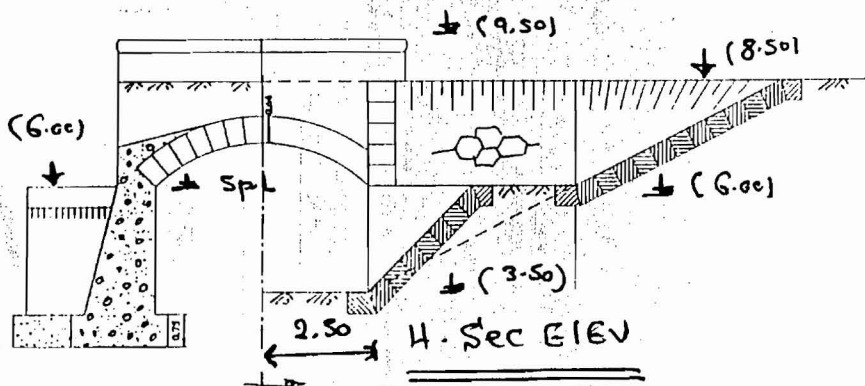
(*) It is required to draw to scale 1:100

(i) plan

(ii) Half sec ELEV

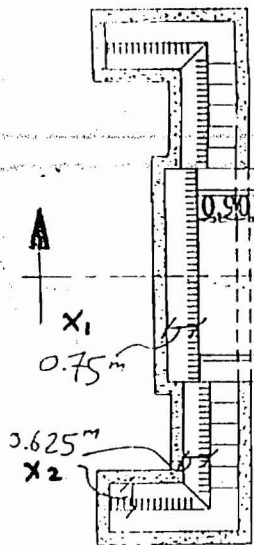
(iii) sec su projected from plan





(9.50)
(8.50)
(6.00)
(3.50)

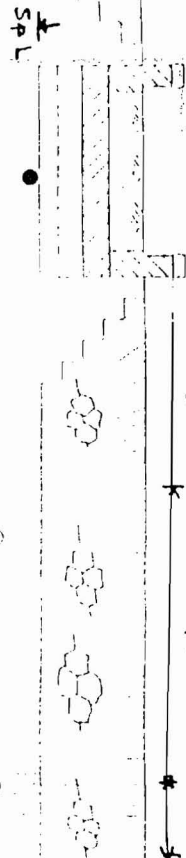
$$X_1 = \frac{6.00 - 3.00}{4} = 0.750$$



$$X_2 = \frac{6.00 - 3.50}{4} = 0.625$$

90° Segmental Arch
Span = 5.00 m.
Springing Level = (6.00)
Thick. = 0.64 m.

(Sec S.V.)



Midterm Exam

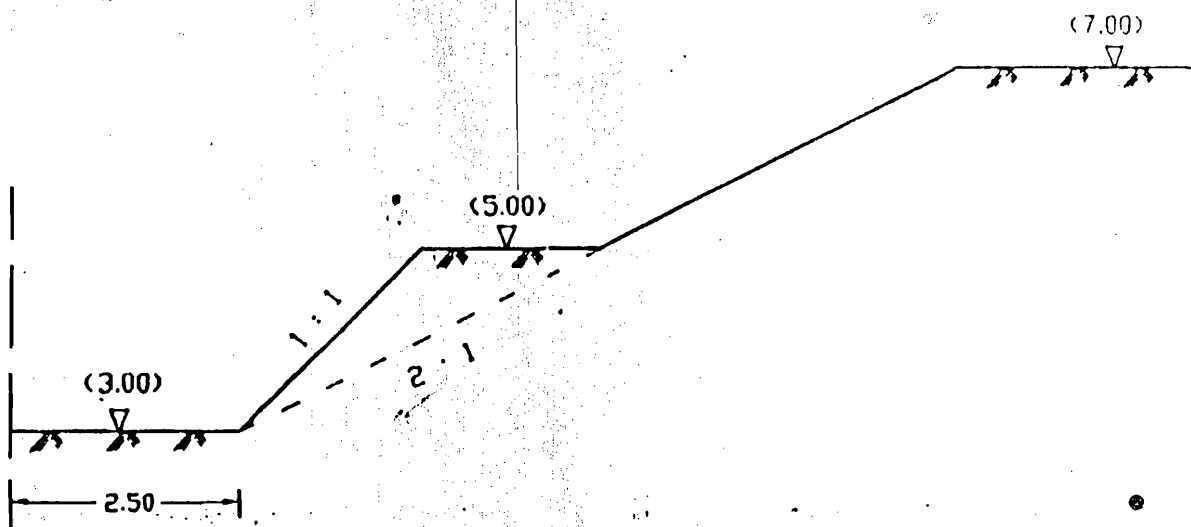
It is required to draw a **Masonry Arch Bridge** of one vent to cross the canal section shown in figure according to the following data :-

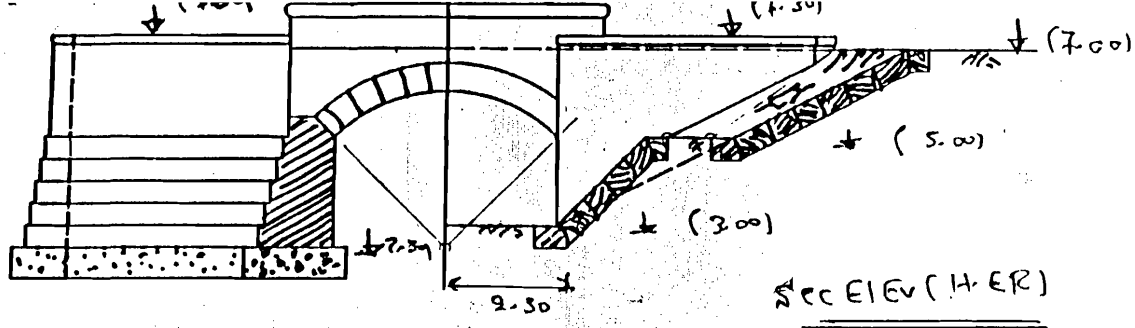
- Road way width over bridge = 5.00 ms.
- Arch : 90° segmental arch, span = 5.00ms, springing level = (5.00) and thickness = 0.64m.
- Masonry abutment : thickness at springing level = 0.90 m and foundation thickness = 0.70 m.
- Wing walls of masonry splayed type with thickness = 0.64m, $\alpha = 45^\circ$ and foundation thickness = 0.70 m.

Draw to scale 1 : 100

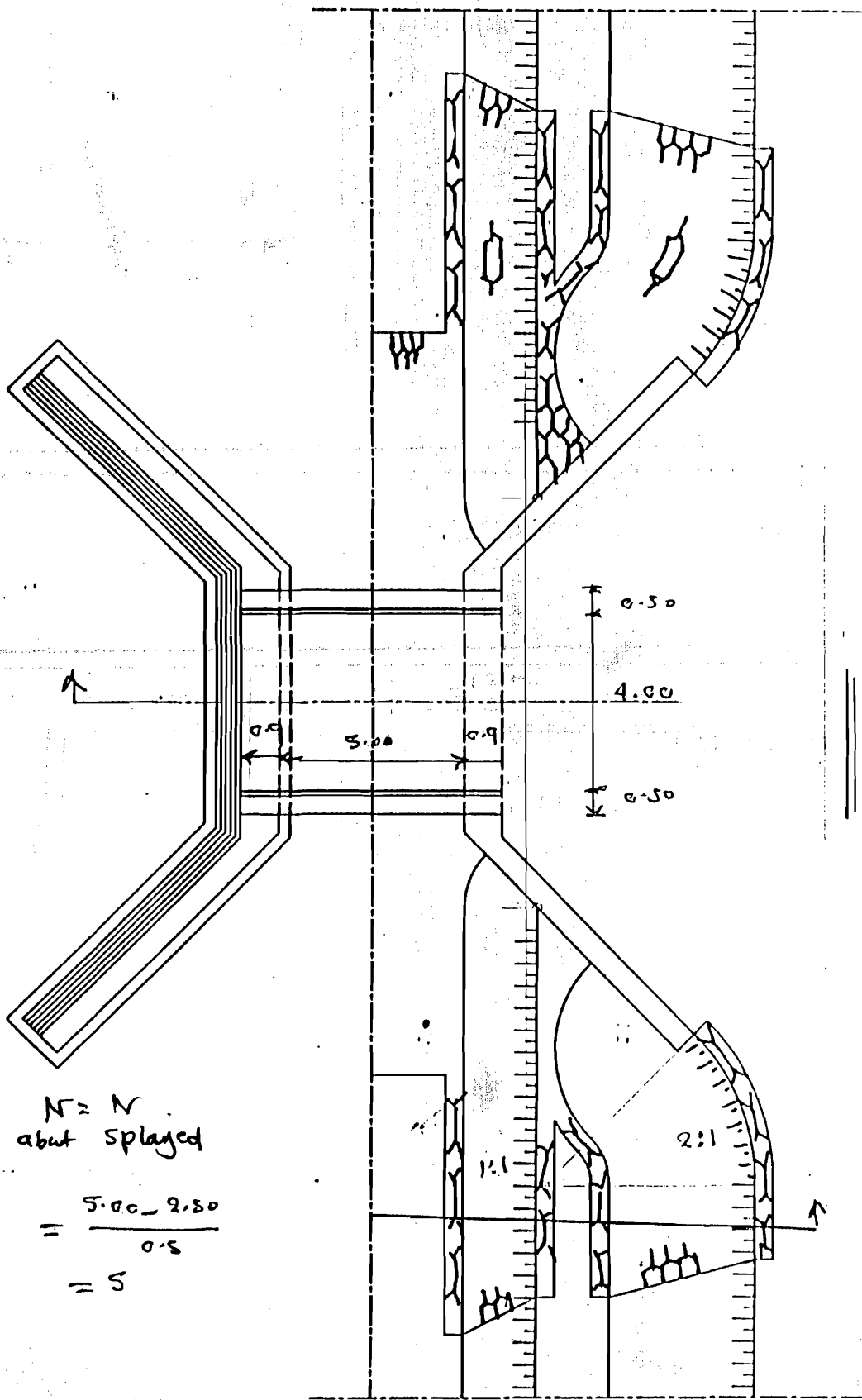
i) Full Plan (H.E.R.)

ii) Half Sec. Elevation (H.E.R.)

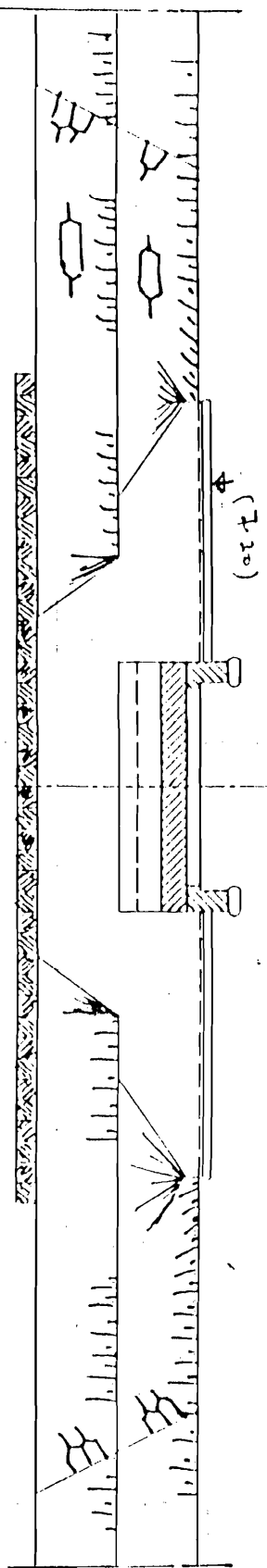




(7.00)
(5.00)
(3.00)



(Sec 5v)



$$N = N_{abut} \text{ splayed}$$

$$= \frac{5.00 - 2.50}{0.5}$$

$$= 5$$

Ex (4)

* Draw to scale 1:100 an arch of 2 vents to cross the Canal shown in figure for the given data

(a) road way over bridge = 4.00m

(b) Thickness of parapet = 0.50m

(c) 90° segmental arch

1- span = 4.50m

2- springing level = 10.25

3- Thickness = 0.64 m

(d) Abutment

1- Thickness of abut at springing level = 1.03

2- Thickness of foundation = 0.90

(E) pier

1- Thickness (D) = 1.20

2- Thickness of foundation = 0.70m

(F) wing wall

* u.s wing wall is sloping type with horizontal part

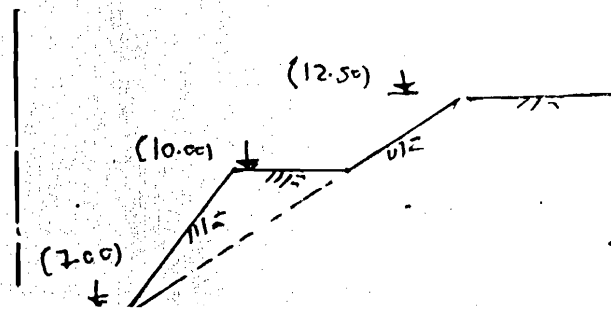
* D.s wing wall is box type (t = 0.69m)

(*) It is required to draw

(i) plan (H.E.R)

(ii) H.s'ec ELEV

(iii) sec S-V



* ما هو

الارتفاع

في حالة

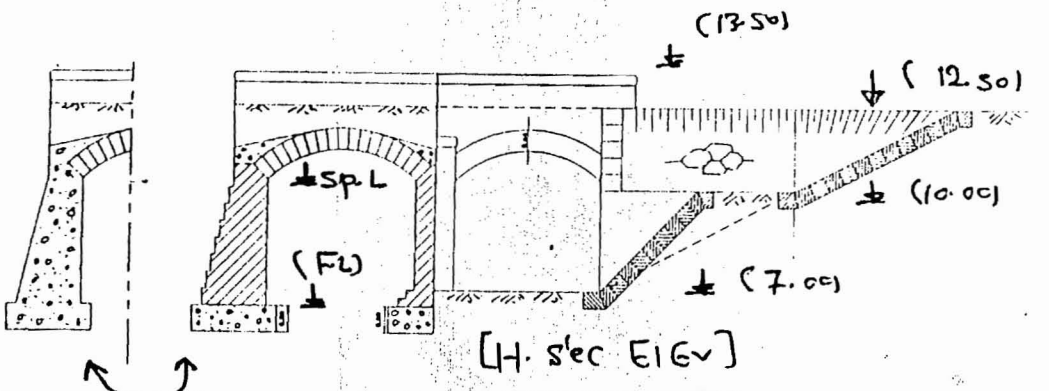
استخدام

من نوع

1:1

$$N_1 = \frac{10.00 - 7.00}{0.50} = 6 > N_2 = \frac{12.50 - 10.00}{0.50} = 5 > N_3 = \frac{10.00 - 7.00}{0.50} = 6$$

abut box sloping 0.5 = 0.0

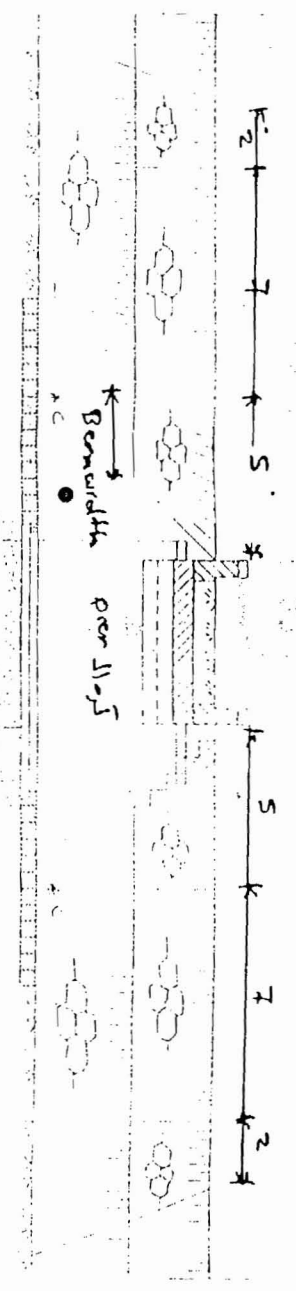
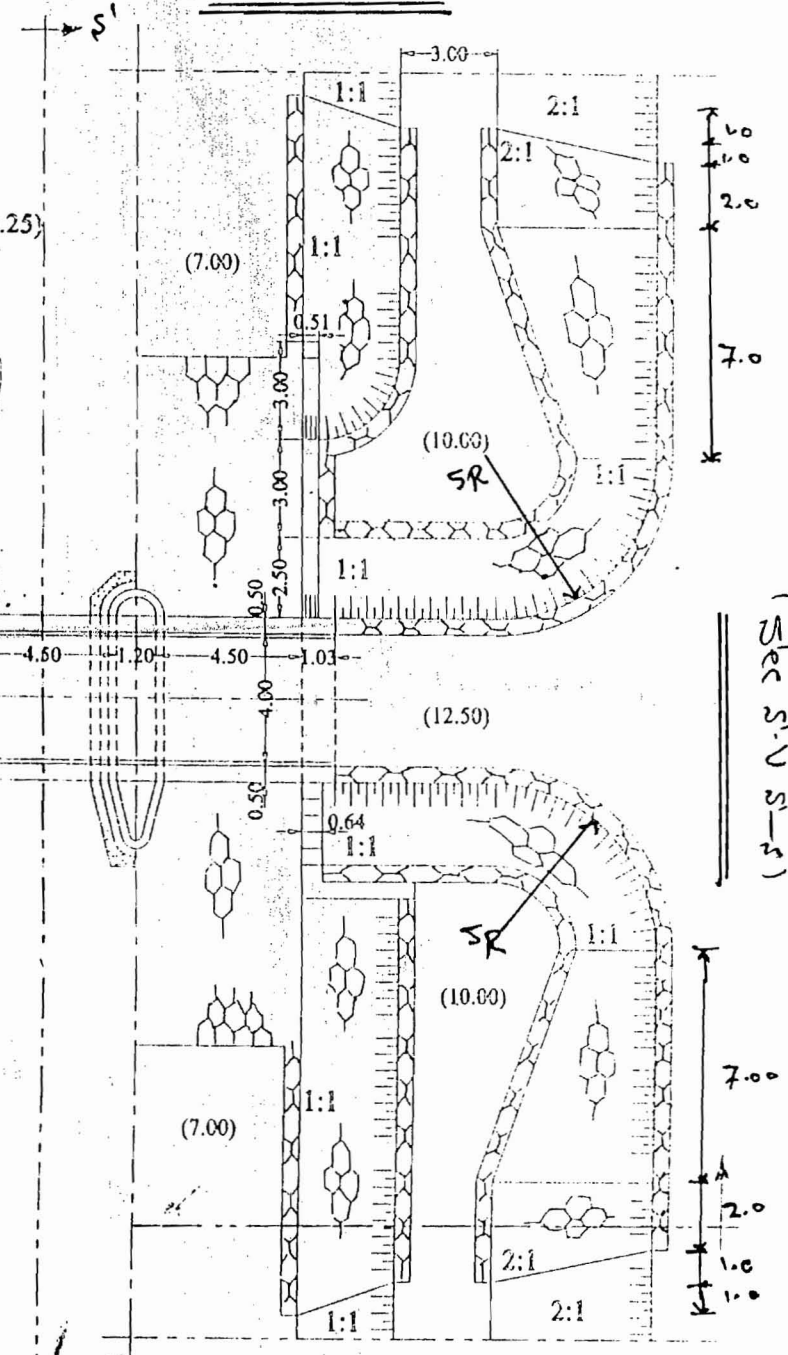
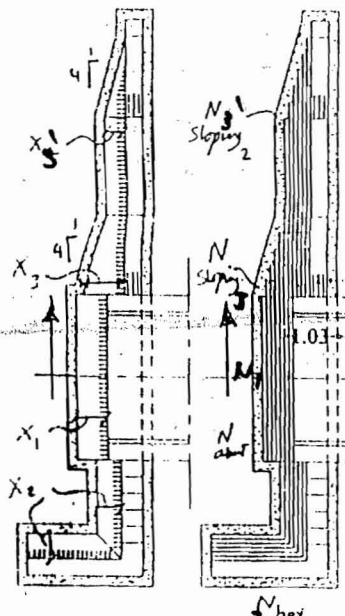


$$N_3' = \frac{10.00 - 7.00}{0.50} = 5$$

sloping

لافتة الجدران
Masonry & P.C

90° Segmental Arch
Span = 4.50 m.
Springing Level = (10.25)
Thick. = 0.64 m.



$$X_1 = \frac{10.25 - 7.00}{4} = 0.94$$

abut

$$X_2 = \frac{10 - 7}{4} = 0.75$$

box

$$X_3 = \frac{12.5 - 7.0}{4} = 1.25$$

top

$$X_3' = \frac{10.00 - 7.00}{4} = 0.625$$

sloping

(7.00)
(10.00)
(12.50)

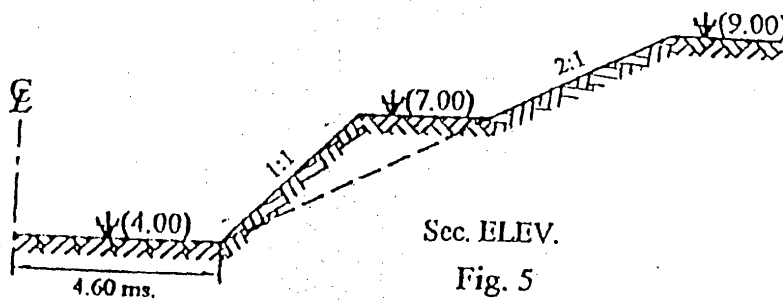
It is required to draw an ARCH BRIDGE of two vents to cross the canal shown in Fig. (5), according to the following data:

- Roadway width over bridge = 4.50 ms.
- The arch is 90° segmental, span = 4.00 ms., its thickness = 0.64 m., and springing level is (7.00).
- The abutments are masonry retaining walls with thickness at the springing level = 1.29 ms. and their plain concrete foundations thick. = 0.90 m.
- Pier thickness is 1.20 ms. and its plain concrete foundation thick. = 0.70 m.
- Up stream and down stream wing walls of the splayed type at 60° and their thick. at road level = 0.64 m.

Draw the bridge to scale 1:100 showing the following views:

- FULL PLAN HALF EARTH REMOVED.
- HALF SECTION ELEVATION HALF EARTH REMOVED.

الفق < projected from plan
اسقاط (plan)
• Sec S.V (A-A)
• Sec S.V (B-B)



(42)

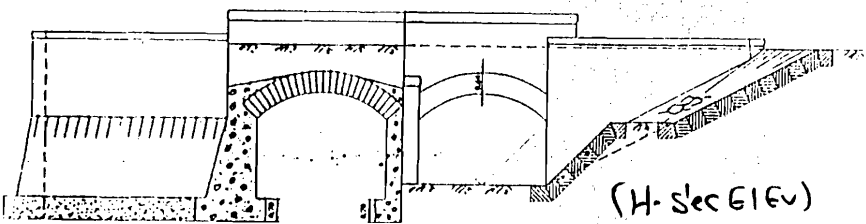
(Masonry) السور (splayed) الجدران (x)

تقریباً نقد مستقیم

(Mid term)

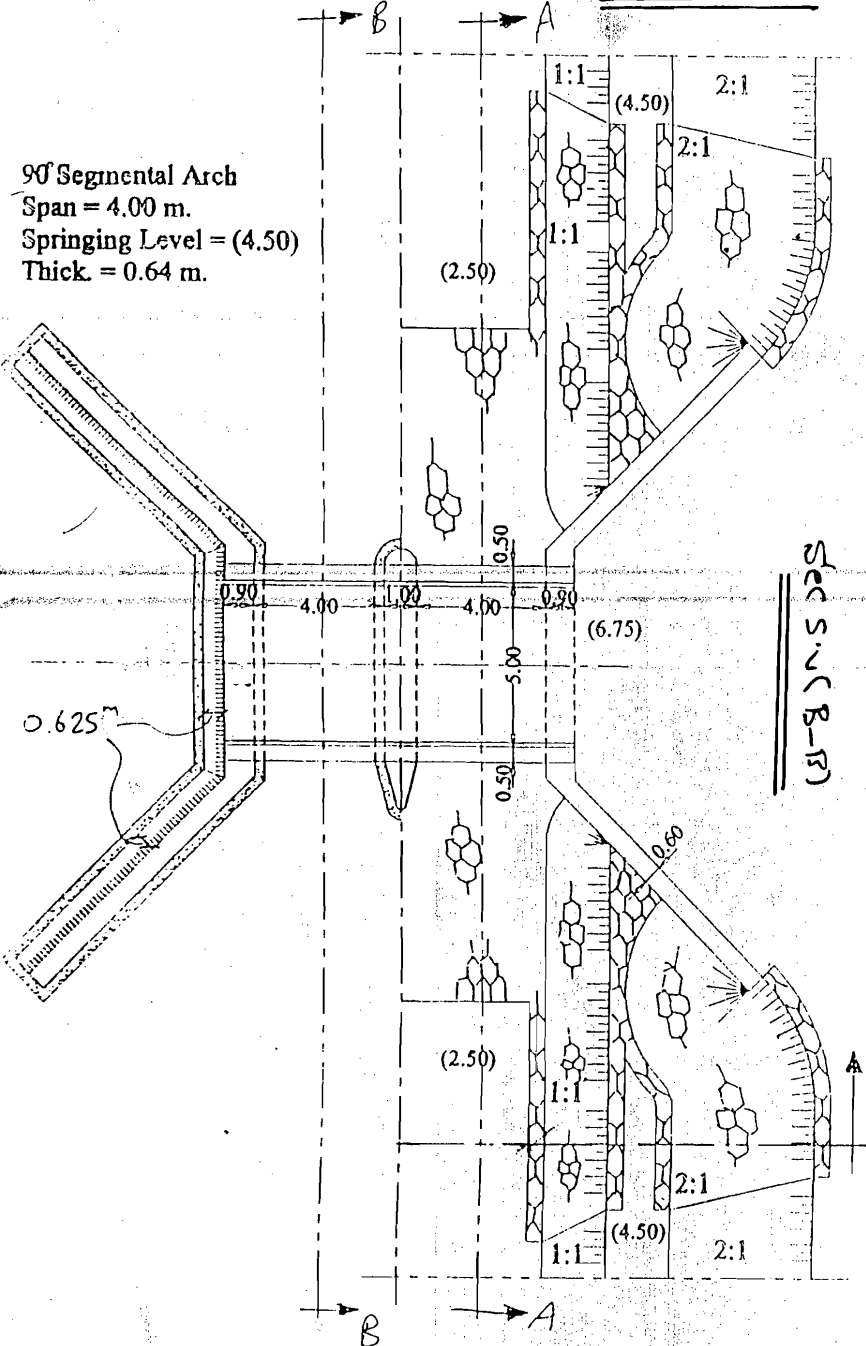
معاضلات
الحائط

حل (2003) Term



(H. Sec 61 Ev)

90° Segmental Arch
Span = 4.00 m.
Springing Level = (4.50)
Thick. = 0.64 m.



Sec 5 (B-13)

Sec 5 (A-1)

Plan (H.E.R)

X =
abut

$$X = \frac{4.50 - 9.50 + 0.5}{4} = 0.625$$

$$X_1 = X_{splayed} = 0.625$$

(*) Draw to scale 1:100 an arch bridge of 3 vents to cross the Canal shown in The Figure according to The Following Data:-

(a) Road over bridge including parapet = 6.00m

(b) Thickness of The parapet = 0.50m

(c) Masonry abutment

- Thickness at springing level = 1.03 m

- Thickness of foundation = 1.0 m

(d) 90° segmental arch of

- Span = 4.00m

- Springing level = (6.00)

- Thickness = 0.51

(e) Wing walls

- U.S wing wall is box type ($t = 0.64$)

- D.S wing wall is sloping ($t = 0.51$)

(f) pier

- Thickness (D) = 1.00m

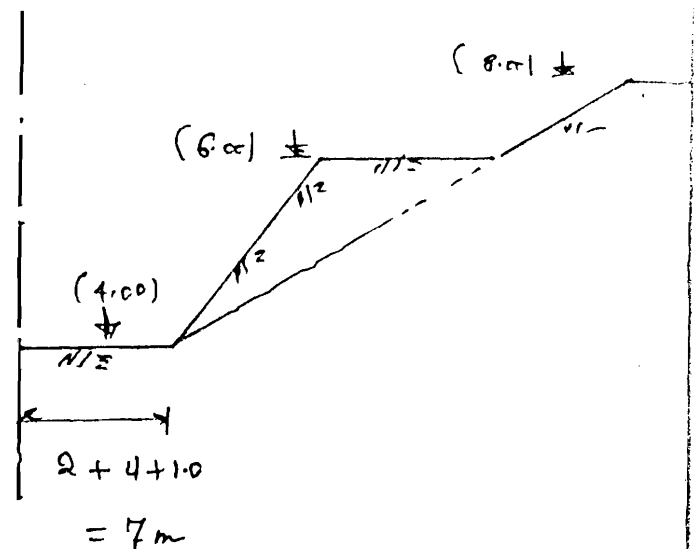
- Thickness of foundation = 1.00m

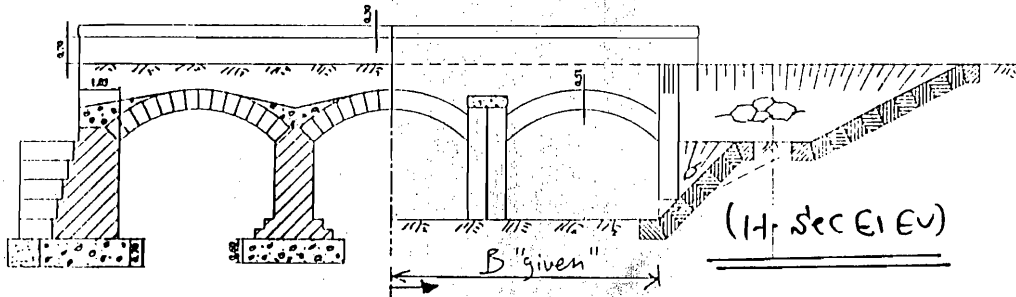
(*) It is required to draw

(i) plan (H.E.R)

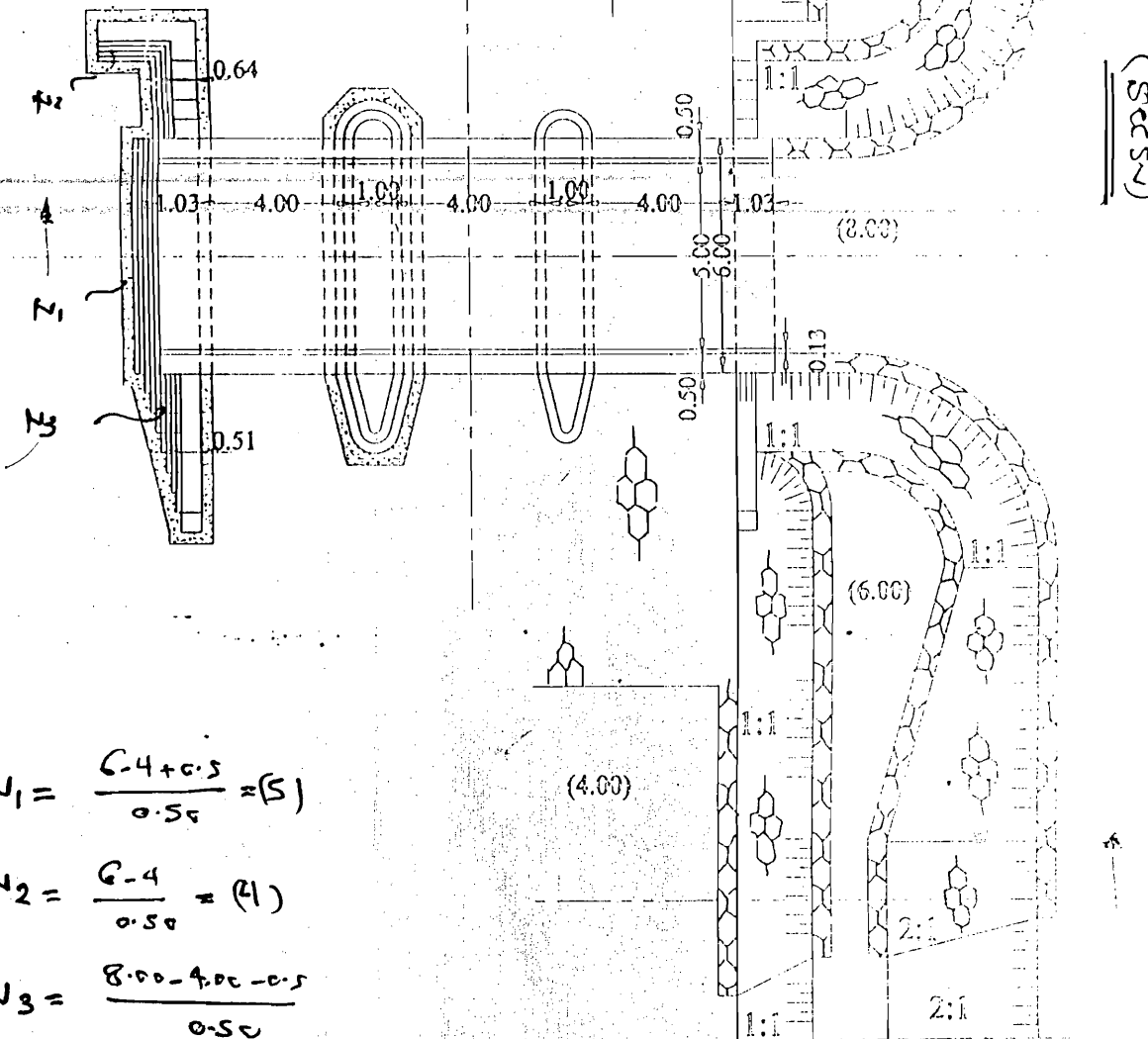
(ii) H.Sec ELEV

(iii) sec S.V projected from plan





90° Segmental Arch
Span = 4.00 m.
Springing Level = (6.00)
Thick. = 0.51 m.



$$N_1 = \frac{6.4 + 0.5}{0.50} = (5)$$

$$N_2 = \frac{6.4}{0.50} = (4)$$

$$N_3 = \frac{8.00 - 4.00 - 0.5}{0.50}$$

= (7)

Plan (H.E.P.)

Ex (9)

(*) مثال على تغير وضع (abut) "رأب" 117

* It is required to Draw an Arch bridge of two vents to cross

The Canal shown in The figure according to the following:-

a) Road way width over bridge = 500 m

b) • 90° Segmental Arch • span = 4.00 m

• Thickness = 0.64 m • springing Level = (4.50)

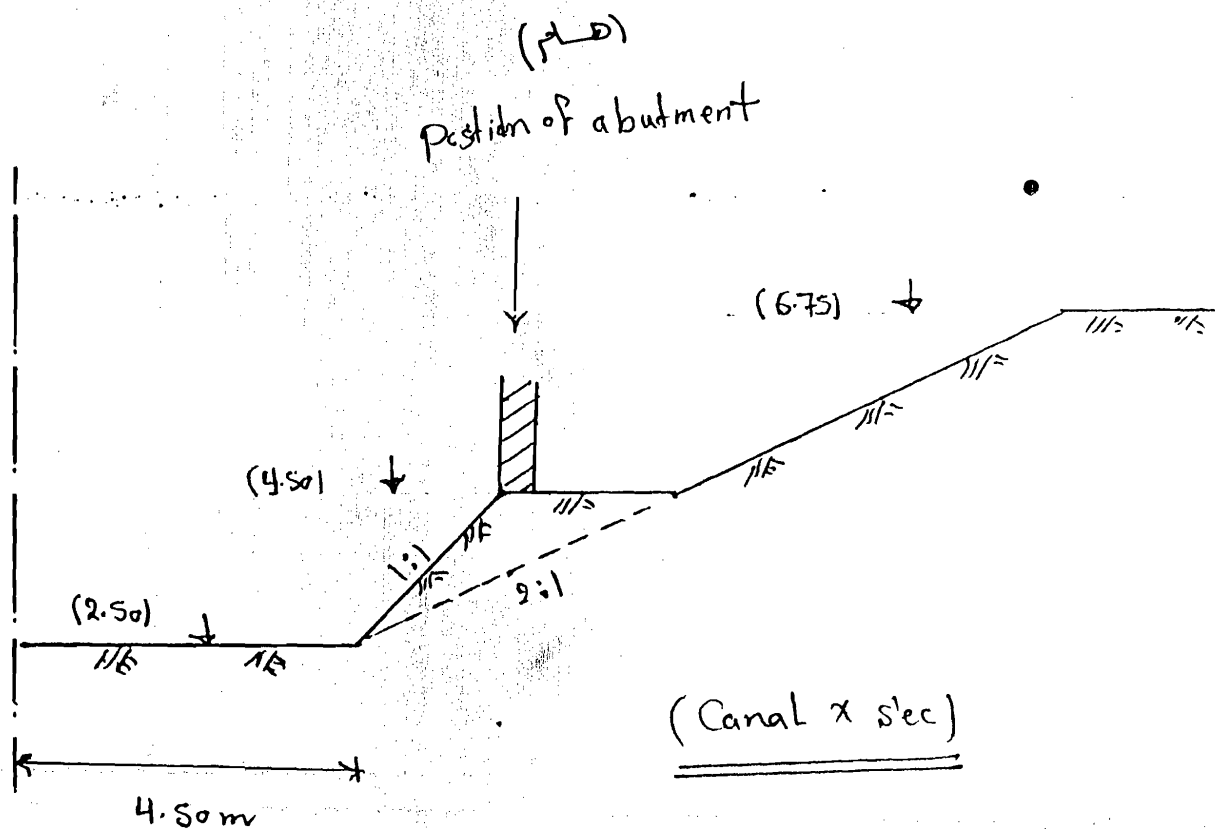
c) Thickness of plain Concrete pier = 1.0 m

d) Thickness of plain Concrete wing walls of splayed
type 45° at road Level 60 cm

e) Thickness of plain Concrete abutment at
springing Level = 0.90 m

f) Thickness of plain Concrete foundation = 0.70 m

* Draw to Scale 1:100 (i) Full plan (H. E. R)



ملاحظات

(1) يوجد (P.M) واحد جزئي (earth) والآخر من غير التراب

steps 5 = $1 + \frac{4.50 - 2.50}{0.5}$ = Abut عدد سلالم (2)

steps N_{abut} (5) = played عدد سلالم

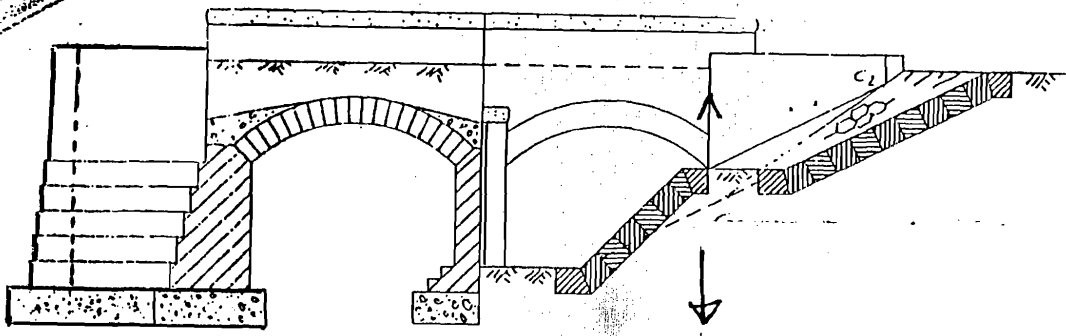
(2) حكايات (Abutment) على ال (berm) لذلك يحدث في

• Plan → played at berm line

• Elev → played From berm to Road

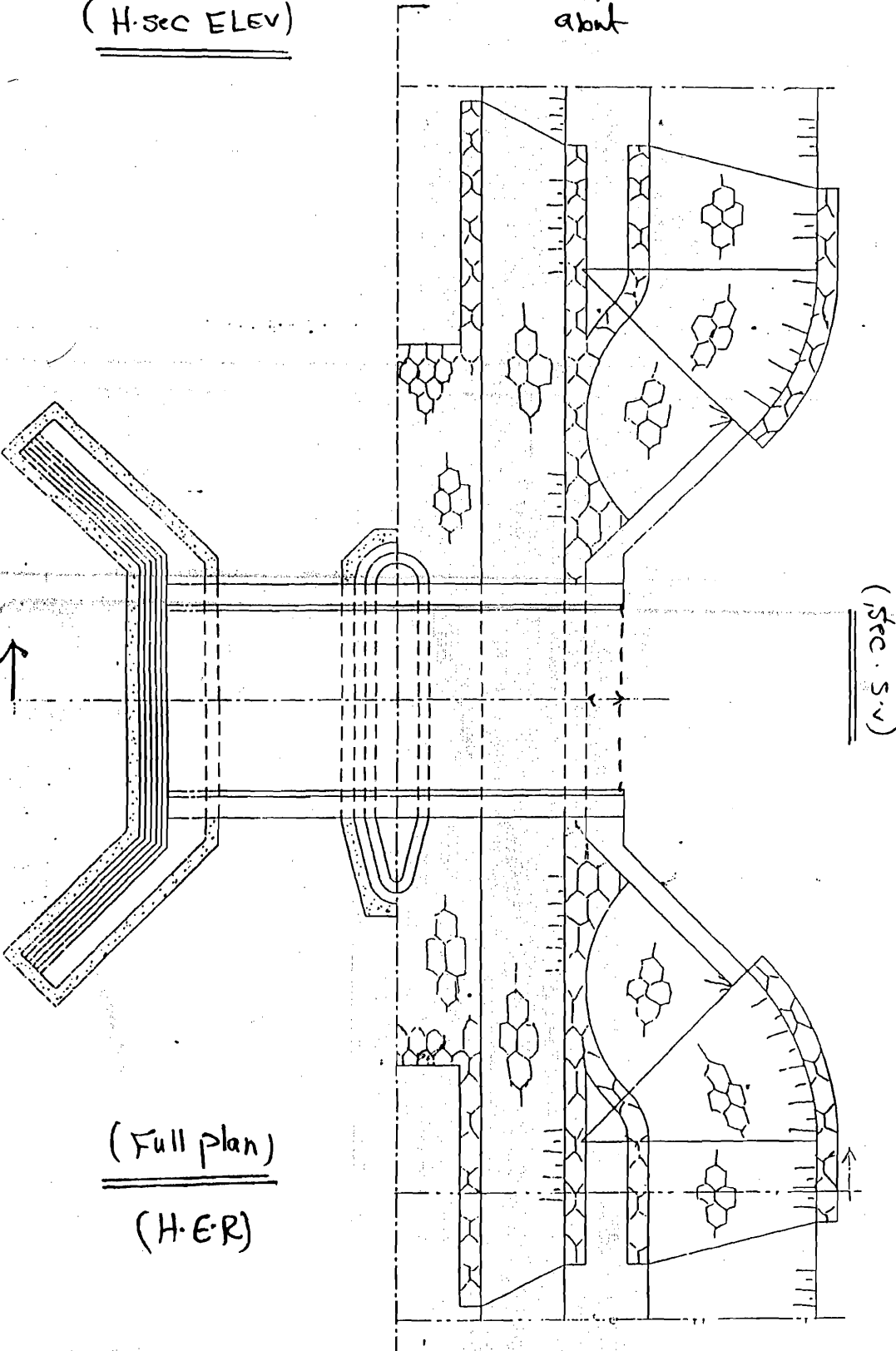
• S.V → played From berm to Road

only.



(H-sec ELEV)

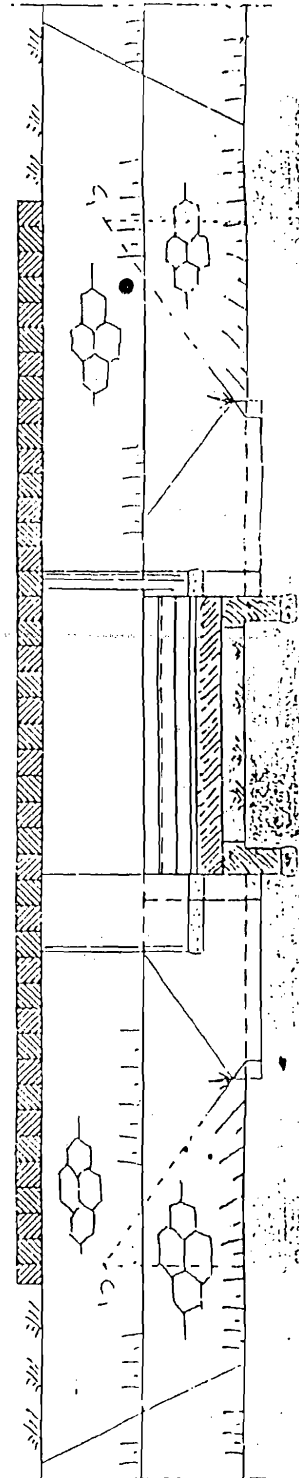
abut
abut



(H-sec S.V.)

(Full plan)

(H.E.R.)



Term (1998)

* It is required to Draw an arch bridge of one vent to cross The canal shown in The Figure according to The following Data:-

a) Road way over bridge = 5.0 ms

b) Arch * 90 Segmental arch * Span = 4.0 ms
 * Thickness = 0.64 ms * Springing level = (1.00)

c) Abutment * Thickness at springing level = 1.03 ms
 * Thickness of Foundation = 0.60 ms

d) Wing wall * u.s (up stream) and D.s (Down stream)
 wing wall are of masonry box type with
 top thickness = 0.64 ms

* It is required to Draw to Scale 1:100 showing The following views

(i) Full plan Half earth removed

(ii) Half section elevation H.E.R

and (iii) side view projected

From plan

