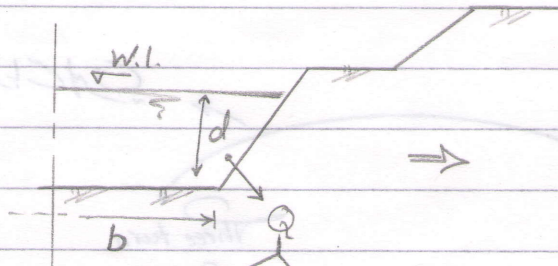


Design of Irrigation Works (1)



Basic eqn 1.

Design equation

$$Q = AV$$

$$V = \frac{1}{n} R^{2/3} S^{1/2} \text{ (Manning)}$$

Solve

Graphical

Analytical

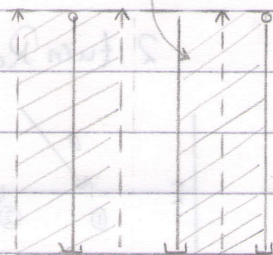
W.D Canal Drain

A.S. (Area Served)

D.F.
(Drainage Factor)

F.W.D

Field water Duty



* Side Slopes

* Manning Coef.

* water Slope

Design Section (b & d)

Modified section (b_m & d_m)

$$\text{area designed} \leftarrow A_d = A_m$$

Final section

* Checks

velocity

Navigation

* Additional eqn.

Canal

Drain

* Water Duty 2. Canal W.D. = F.W.D. * (1 + f)

f = 10%

(private)

15%

(Distributary)

20%

(Branch Canal)

25%

(Main Canal)

30%

(Diversion Canal)

($\frac{1}{2}$)

* Drainage Factor: D.F. = k * W.D.

k = 50% (lower Egypt)

40% (Middle)

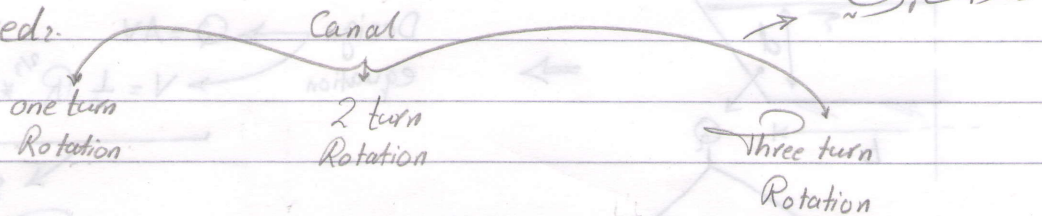
50% (upper Egypt)

$$D.F. = 25 - \frac{A.S. (\text{fed})}{25000} \rightarrow \text{empirical eqn.}$$

*Max $25 \text{ m}^3/\text{fed}/\text{day}$ ($AS < 10000 \text{ fed}$)

*Min $12 \text{ m}^3/\text{fed}/\text{day}$ ($AS > 30000 \text{ fed}$)

*Area Served:



- For Drains: No turn درزی بابت کشی آب در نی است

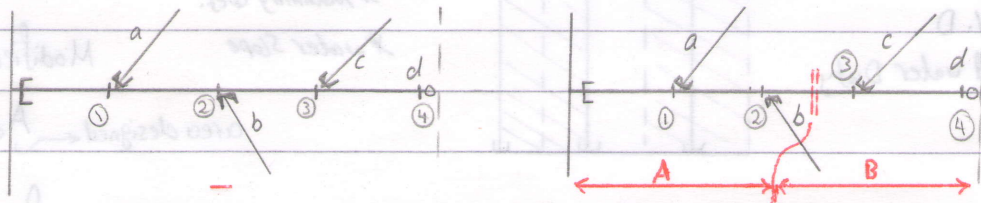
total AS = X

$$\Rightarrow \frac{A}{B} \approx \frac{X}{2}$$

2 turn Rotation

One turn Rotation

درزی بابت کشی آب در نی است

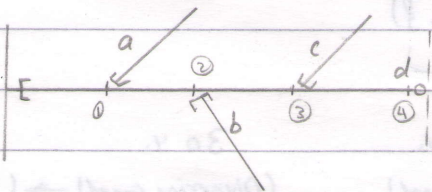


	Sec	Kilo	AS		AS taken in design	Sec	Kilo	AS		A.S. + α		AS taken in design
			A	B				A	B	A + α B	B + α A	
upstream	1		a+b+c+d			1		a+b	c+d			
downstream	2		b+c+d			2		b	c+d			
	3		c+d			3		0	c+d			
	4					4		0	0			

Total AS = X

$$\Rightarrow \frac{A}{B} \approx \frac{X}{3}$$

3 turn Rotation



Sec	Kilo	AS			AS + α			AS taken in design
		A	B	C	A + α	B + α	C + α	

AS taken in design

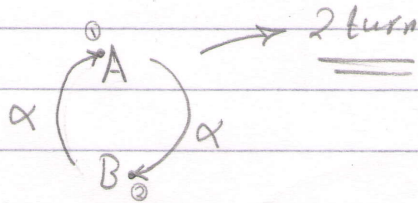
$\alpha \equiv$ Compensation (التعويض) \rightarrow النسبة التي ما فزت له بتأخر في وقت تنفيذها في

لوقت بناء لنسبة لتأخير.

20 ~ 30 %

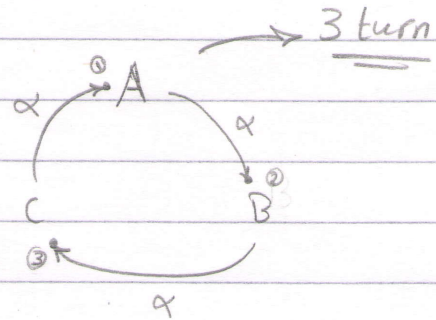
في الآلة مثال هي جزء معين (A or B) يعتبر الجزء الثاني من مصدر

given



① $A + \alpha \cdot B$

② $B + \alpha \cdot A$



① $A + \alpha C$

② $B + \alpha A$

③ $C + \alpha B$

في 2 turn انما في كأي قسم لثلاثة نصيب بشكل واحد ونفس الثاني وعبره تطلب وهكذا