

Notes by-

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Prob: Design canal for $Q = 15$, $f = 1$, $S = 1/2$

Lacey's Mtd:-

LACEY'S MTD

① $f = 1.76 \sqrt{m} \approx d_{50} \text{ mm}$

② $V = \left(\frac{Q f^2}{140} \right)^{1/6}$

$= 0.689 \text{ m/s}$

③ $A = \frac{Q}{V} = \frac{15}{0.689}$

$= 21.77 \text{ m}^2$

④ $P = 4.75 \sqrt{Q}$

$= 4.75 \sqrt{15}$

$= 18.4 \text{ m}$

⑤ $A = BD + zD^2$ & $P = B + D\sqrt{z^2 + 1}$

$= 21.77$

$21.77 = 18.4 \times D$

$\therefore 21.77 = BD + zD^2$

$\Rightarrow 21.77 = BD + 0.5D^2$

& $18.4 = B + D\sqrt{z^2 + 1}$

$\Rightarrow 18.4 = B + D\sqrt{1.225}$

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solving,

$B = 1.26 \text{ m}$

& $D = 17 \text{ m}$

⑥ $R = A/P = \frac{21.77}{18.4} = 1.183 \text{ m}$

⑦ verify $R = \frac{5}{2} \frac{V^2}{f} = \frac{5}{2} \times \frac{0.689^2}{1} = 1.186$

⑧ slope $= \frac{f^{3/2}}{3340Q^{1/6}} = \frac{1}{3340 \times 15^{1/6}} = \frac{1}{5245} = 1.9065 \times 10^{-4}$

Canal Design, Kennedy's mtd

~~Ex 4~~ Find out a channel for $Q = 10$ cumec, $N = 0.0225$,
 $m = 1$, channel has bed slope of 0.3 m/km.

Use 1st mtd :- (Q, N, m, S)

① Assume trial value of 'D'. $D = 1$ m - Always.

② $V = 0.55 \text{ m} \times D^{0.64}$
 $= 0.55 \text{ m/s.}$

③ $A = \frac{Q}{V} = \frac{10}{0.55} = 18.18 \text{ m}^2$

④ Assume $z = 0.5$,
 $A = BD + 0.5 D^2$

$\therefore 18.18 = BD + 0.5 D^2 \Rightarrow \boxed{B = 17.68 \text{ m}}$

⑤ $P = \frac{17.68}{B} + \sqrt{0.5^2 + 1} \times B$

$\therefore \boxed{P = 18.79 \text{ m}}$

⑥ $R = A/P = 0.967 \text{ m}$

⑦ Calculate actual mean vel. : from kutter's eqⁿ.

$$\therefore V = \frac{23 + \frac{1}{N} + \frac{0.00155}{S}}{1 + \left(\frac{23 + \frac{0.00155}{S}}{3} \right) \cdot \frac{N}{\sqrt{R}}} \times \sqrt{RS}$$

$$= 23 + \frac{1}{0.0225} + \frac{0.00155}{.3 \times 10^{-4}}$$

~~$V = 0.238 \text{ m/s.}$~~

$\boxed{V = 0.752 \text{ m/s}} \neq 0.55 \text{ m/s.}$

\therefore Go for second trial

\therefore STOP

2h given, 4h - ? by S curve mtd.

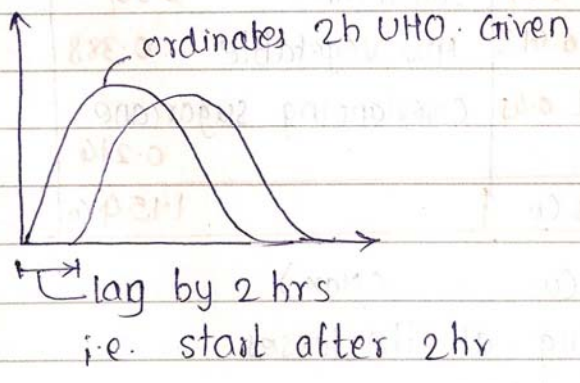
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Time (h)	2h UHO (cm ³ /s)	②	DRH = 2h UHO + ② 2cm, 4h	4h UH DRH ÷ 2	Ahrs.		(SA-SB) × 2 / 4
					SA	SB	
0	0	0	0	0	0	0	0
2	25	0	25	12.5	25	0	12.5
4	100	25	125	62.5	125	0	125 62.5
6	160	100	260	130	285	25	130
8	190	160	350	175	475	125	175
10	170	190	360	180	645	285	180
12	110	170	280	140	755	475	140
14	70	110	180	90	825	645	90
16	30	70	100	50	855	755	50
18	20	30	50	25	875	825	25
20	6	20	26	13	881	855	13
22	0	6	6	3	881	875	3
24	-	0	0	0	881	881	0

solution by 's' curve

2hr shift

- * Method of superposition :
- * 'S' curve mtd:



881
881