

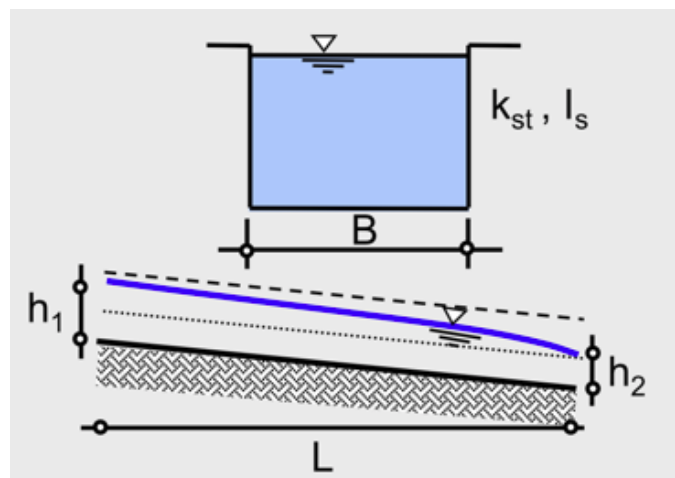
FLUME 2 – FRICTION, INCREASING WATER LEVEL

DESCRIPTION

A single flume element with a rising water level

Given:

- $Q = 0.5 \text{ m}^3/\text{s}$
- $h_2 = 0.6 \text{ m}$
- $I_s = 0.2 \%$ ($\Delta z = 0.2 \text{ m}$)
- $K_{st} = 75$
- $B = 1.0 \text{ m}$
- $L = 100.0 \text{ m}$

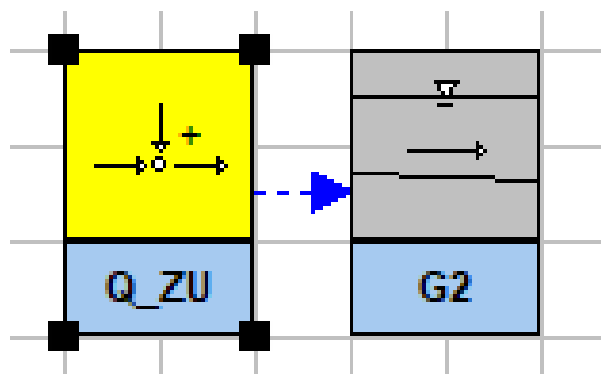


TASK

Determine the flow depth h_1 at the flume inlet.

SYSTEM ABSTRACTION IN HYBEKA

The system is very simple. To represent it, we only need a flow changer to represent the inflow into the flume and an open channel element for the flume itself.



DATA INPUT

General settings:

waterlevel at end of system [mas]

The water level at the system outlet is given by the user. Note that it must be given in the unit masl.

Flow changer Qzu:

HYBEKA for windows input of data
 HYBEKA Ergebnisse Plot

data in detail | system | geometry | hydraulic losses | count elements

system/flow path

description of element	element	inlet	outlet	division	Qin/Qout
Zufluss	Q_ZU		G2		500,00

insert division-line elements of *.ERK file create *.TAU file no plotting

geometry

longitudinal section			losses		cross section			upstream	cross section			downstream
zo	zu	L	k	c	T	hs	h	B	T	hs	h	B
100,2			75		T		1	1				

adjust invert level

hydraulic losses

losses			coefficient		dimensions			comments	
hve	Zeta1	Zeta2	μ	n(c)	T	h,D	Bu	Bo	

number dist.
n a

zeta-table

Q_ZU

G2

order
 flow path
 element

*.PKL
 check

A B D G M P Q R S T U V W Z find continue close

Notice: the value for zo is arbitrary. It was chosen in a manner that the lower end of the flume element would be at 100.

Flume element G2:

HYBEKA for windows input of data

HYBEKA Ergebnisse Plot

data in detail | system | geometry | hydraulic losses | count elements

system/flow path

description of element	element	inlet	outlet	division	Qin/Qout
Gerinne 2	G2	Q_ZU	ENDE		

insert division-line elements of *.ERK file create *.TAU file no plotting

geometry

longitudinal section			losses		cross section			upstream	cross section			downstream
zo	zu	L	k	c	T	hs	h	B	T	hs	h	B
100,2	100	100			T		1	1				

adjust invert level

hydraulic losses

losses			coefficient		dimensions			comments	
hve	Zeta1	Zeta2	μ	n(c)	T	h,D	Bu	Bo	

number dist.
n a

zeta-table

Q_ZU
G2

order
 flow path
 element

*.PKL
check

A B D G M P Q R S T U V W Z find continue close

RESULTS:

i	element	Q	discharge [m³/s]	length [m]	invert [masl]	board level [m]	water level		wetted cross-section [m²]	velocity [m³/s]	energy level [masl]	shear stress [N/m²]	Pr o/g	losses [m]				comment
							[m]	[masl]						frict.	single (1)	single (2)	transit.	
1	Q_ZU	1	0,500	0,000	100,200	1,000	0,476	100,676	0,48	1,05	100,733	3,07	o				0,000	
1	G2	1	0,500		100,200	1,000	0,476	100,676	0,48	1,05	100,733	3,07	o	0,097	0,000			
2	G2	1		100,000	100,000	1,000	0,600	100,600	0,60	0,83	100,635	1,87	o				0,000	

The water level at h₁ is 0.476 m.