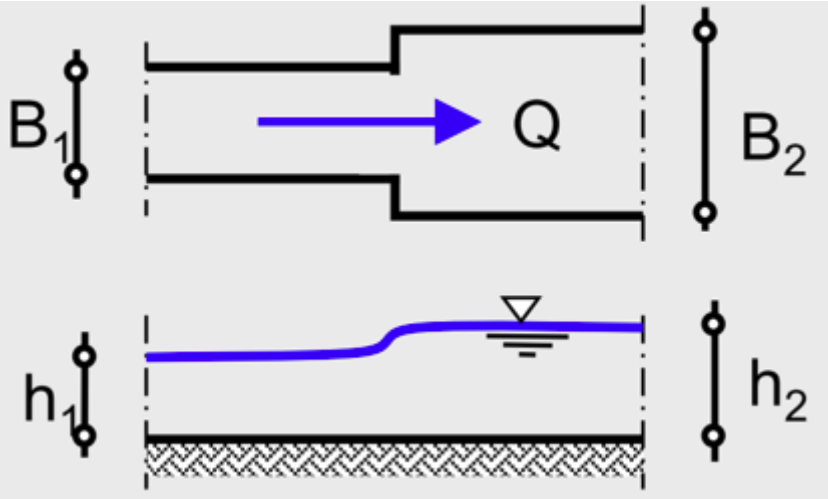
# FLUME 3 – SINGLE LOSS BECAUSE OF EXTENSION

## DESCRIPTION

This example illustrates a single loss occurring when the cross section of a flume abruptly changes.

Given:

- Q = 0.5 m³/s
- $h_2$ = 0.6 m
- $I_s$ = 0.2 %
- Kst = 75
- H = 1 m
- $B_1$ = 0.6 m
- $B_2$ = 1.2 m
- L = 0 m. Leave the length of the flume or flumes empty in this case. This will deactivate the calculation of friction losses.

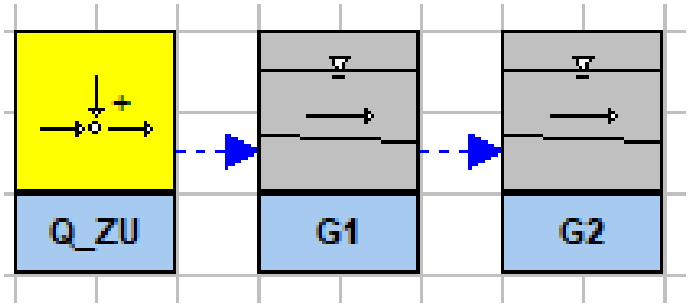



## TASK

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 two open channel elements for the flume itself.

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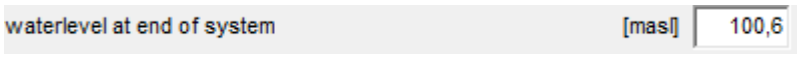
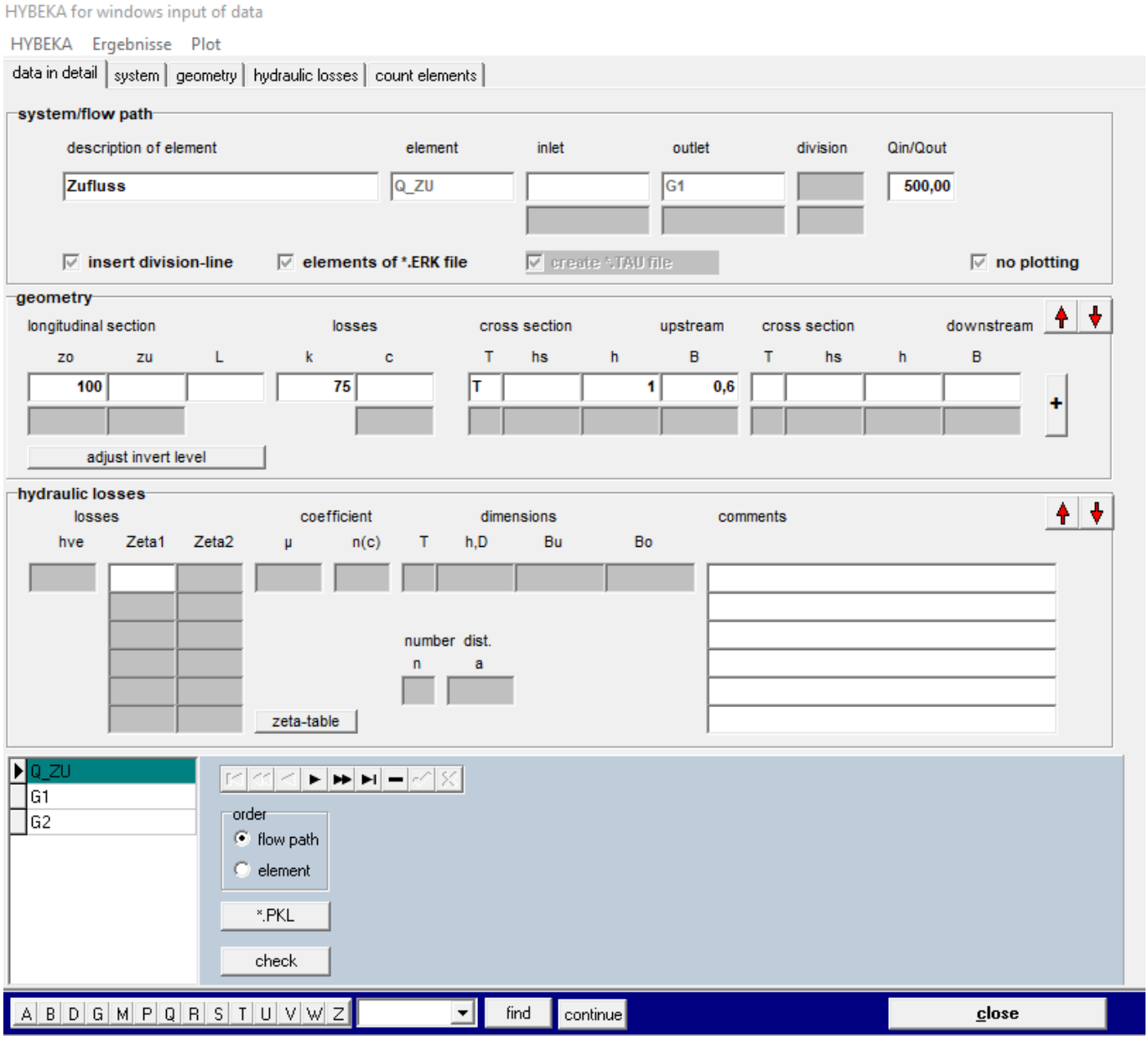
# DATA INPUT

**General settings:**

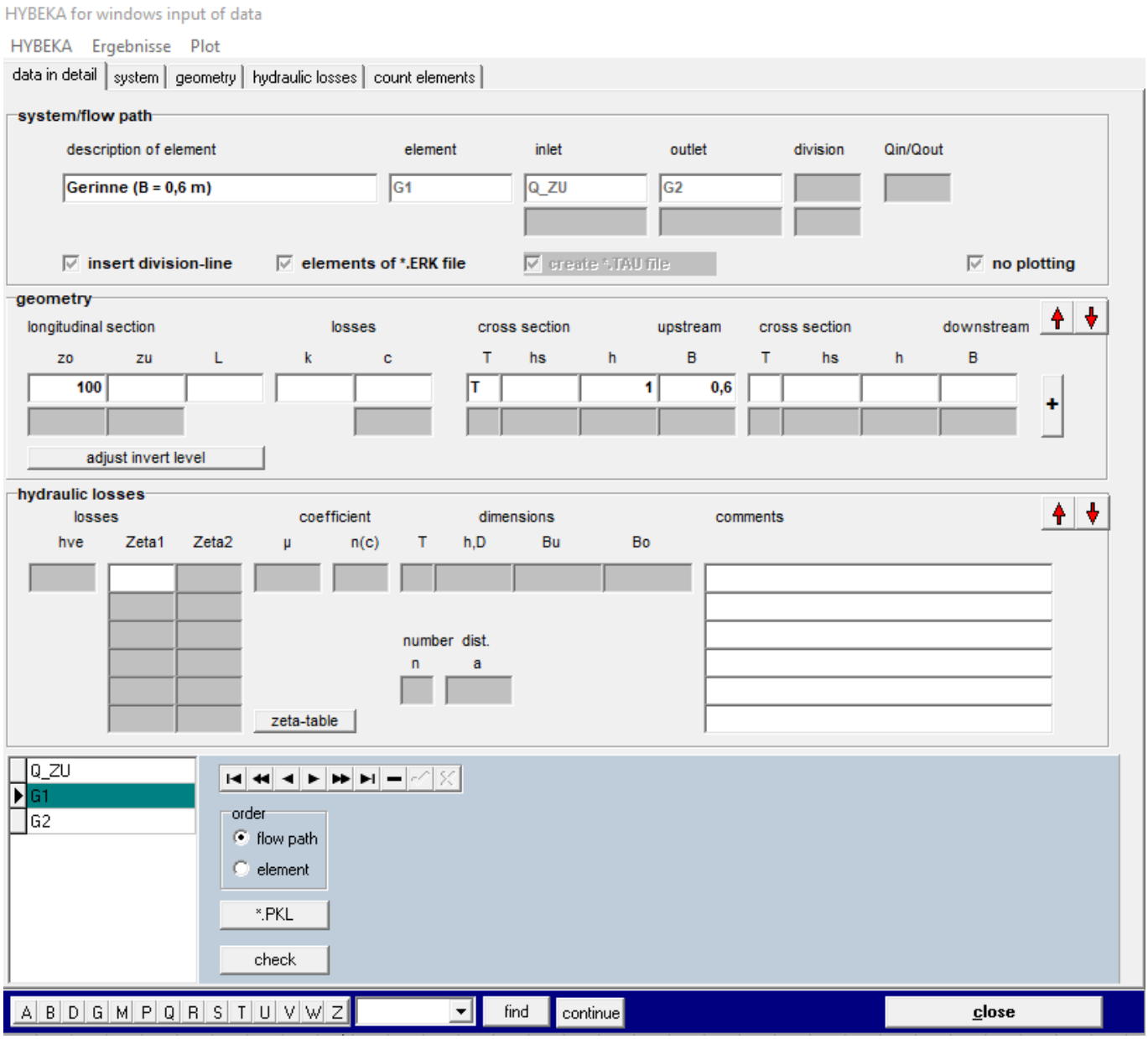



The water level at the system outlet is given by the user. Note that it must be given in the unit masl.

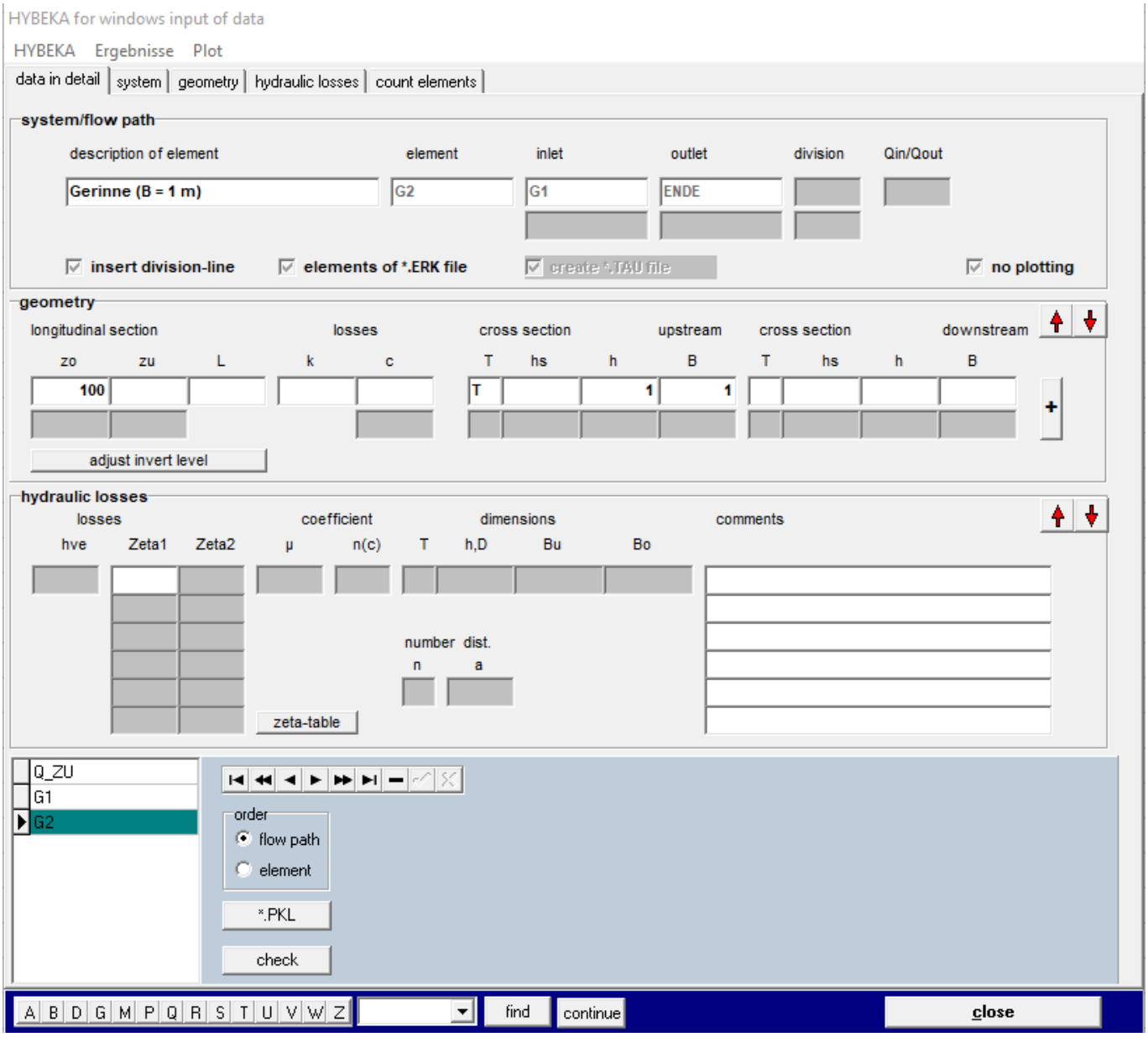
**Flow changer Qzu:**



**Flume element G1:**



**Flume element G2:**




## RESULTS:

| | i | element | O | discharge | length | invert | board level | water level | | wetted cross-sectic | velocity | energy level | shear stress | Pr | losses [m] | | | | comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | [m³/s] | [m] | [masl] | [m] | [m] | [masl] | [m²] | [m²/s] | [masl] | [N/m²] | o/g | frict. | single (1) | single (2) | transit. | |
| ▶ | 1 | Q_ZU | 1 | 0,500 | 0,000 | 100,000 | 1,000 | 0,546 | 100,546 | 0,33 | 1,53 | 100,665 | 7,02 | o | | | | 0,000 | |
| | 1 | G1 | 1 | 0,500 | | 100,000 | 1,000 | 0,546 | 100,546 | 0,33 | 1,53 | 100,665 | 7,02 | o | 0,000 | 0,000 | | | V |
| | 2 | G1 | 1 | | 0,000 | 100,000 | 1,000 | 0,546 | 100,546 | 0,33 | 1,53 | 100,665 | 7,02 | o | | | | 0,029 | V |
| | 1 | G2 | 1 | 0,500 | | 100,000 | 1,000 | 0,600 | 100,600 | 0,60 | 0,83 | 100,635 | 1,87 | o | 0,000 | 0,000 | | | |
| | 2 | G2 | 1 | | 0,000 | 100,000 | 1,000 | 0,600 | 100,600 | 0,60 | 0,83 | 100,635 | 1,87 | o | | | | 0,000 | |

**The water level at $h_1$ is 0.546 m.**

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