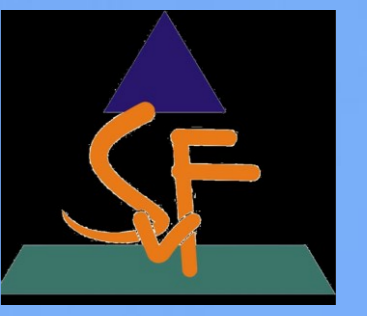


# SPORTING AND RECREATIONAL FUNCTIONS OF WATER STREAMS



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## Abstract

Because of the multiple benefits to riverfront communities, whitewater courses have been popping up in cities all around the world. Courses bring a major positive impact on a community's quality of life by creation new family-oriented recreation opportunities for people who enjoy the outdoors activities. Whitewater courses attract river for more people, have a positive impact on environmental and recreational purposes, provide an exciting controlled learning environment for kids and adults and increase the economy. In paper basic principles of whitewater courses designing as well as selected whitewater courses in the world and in the Slovakia with the outlooks are presented.

## Whitewater courses design

Water stream regulation project is based on purpose of usage the stream and the final water stream effectiveness. For designing riverbed optimization project these facts has to be determined:

- Basic morphologic characteristics of water stream
- Basic hydrological data of assessed water stream

## Designing parameters for white water courses

The whitewater course design parameters take into account the requirements on the whitewater course - the character of the course (race or training), the character of the water sports performed on the course (slalom, rafting, freestyle), the sportsmen abilities (professional, recreational) as well as the safety regulations. Recommendations for white water courses design parameters:

- Course length - minimal length for official and Olympic water slalom races is 300 meters
- Cross section - simple shapes should be used (trapezoid or U-shaped)
- Cross section width - needs to be designed from 10 to 12 meters but not less as 7 meters which is double the size of slalom kayak
- Water depth - no less than 0.4 meters must be provided for safe swimming. Average depth of 0.75 - 0.9 meters is optimal for Eskimo roll and to cut edges under the water. For Freestyle kayak, depth of 1.5 meters must be allowed.
- Velocity - for beginners velocity from 1.4 to 1.7 m.s<sup>-1</sup> is recommended. For Professionals 2 m.s<sup>-1</sup> is the average. Rapids with higher velocity are allowed.
- Roughness - roughness of the surface should be minimal for safety and rapid boat wearing off. Material of construction is preferably concrete with smooth surface finish.

Parameter	Magnitude
length l (m)	250
width b (m)	7
depth y (m)	1.2
discharge Q (m <sup>3</sup> .s <sup>-1</sup> )	14
gradient H (m)	5

## Water course obstacle characterisation

### Stationary obstacles



### Movable obstacles



## Principals of water supplying of white water course

### Gravity system

- when source of supply is at sufficient height.
- it is the most reliable and economical distribution system

### Pumping system

- water is distributed from lower to higher areas using pump stations placed in white water course

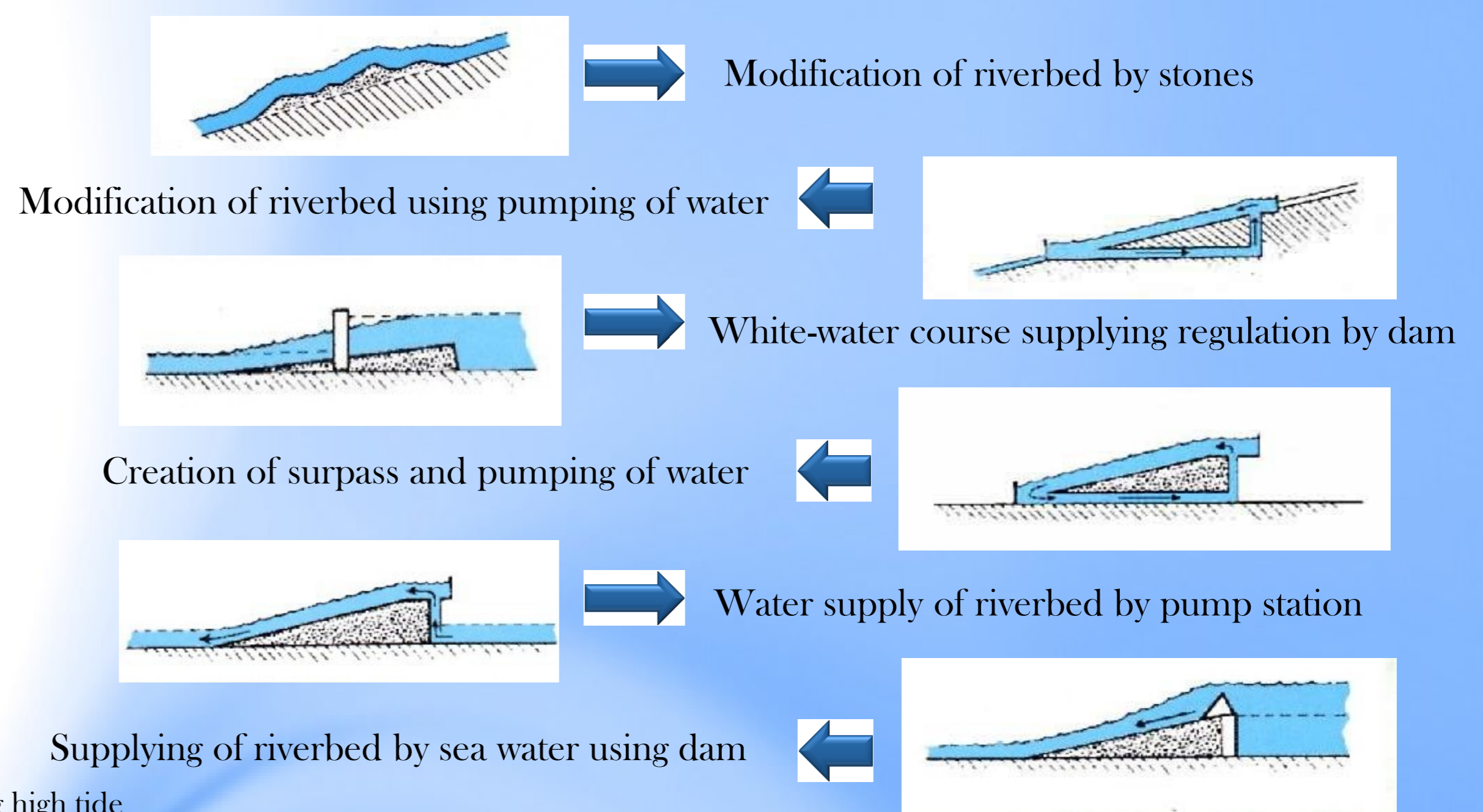
### Combined Gravity and Pumping system

- sometimes a situation of low discharge is insufficient for creating suitable stream
- in these events pumping stations should be added to the design for additional reservoir filling above the race course

### Tidal system

- is based on maintaining water during high tide using movable dam in the area where water will be released in the event of low tide right into the water course.

## Requirements for white-water course designs



## Conclusion

The whitewater course designing parameters have to accept the requirements on the structure; especially if planned course have race or training character, then consideration of character of the water sports performed on the course (slalom, rafting, freestyle), safety regulation as well as level of sportsmen abilities. Thanks to our sportsmen success (Jana Dukátová - double world champion, European champion, triple world cup winner, etc., Michal Martikán - double olympic winner Atlanta 1996 and Beijing 2008, etc., Elena Kaliská - double olympic winner Athens 2004 and Beijing 2008, etc. or Pavol and Peter Hochschornerovci - triple olympic winner, once bronze, five time world champions, six time gold in European championships and others), there is a huge development in water sport channels construction. Target groups of interest could not only be professional sportsmen but also amateur water sport enthusiasts. Children could easily be attracted to this sport which could provide solid youth base for pro sport career. Even recreational advantages of such channels will also attract tourists ranging from local to wide area of residence.