



# The management of sediments near infrastructures on mobile beds

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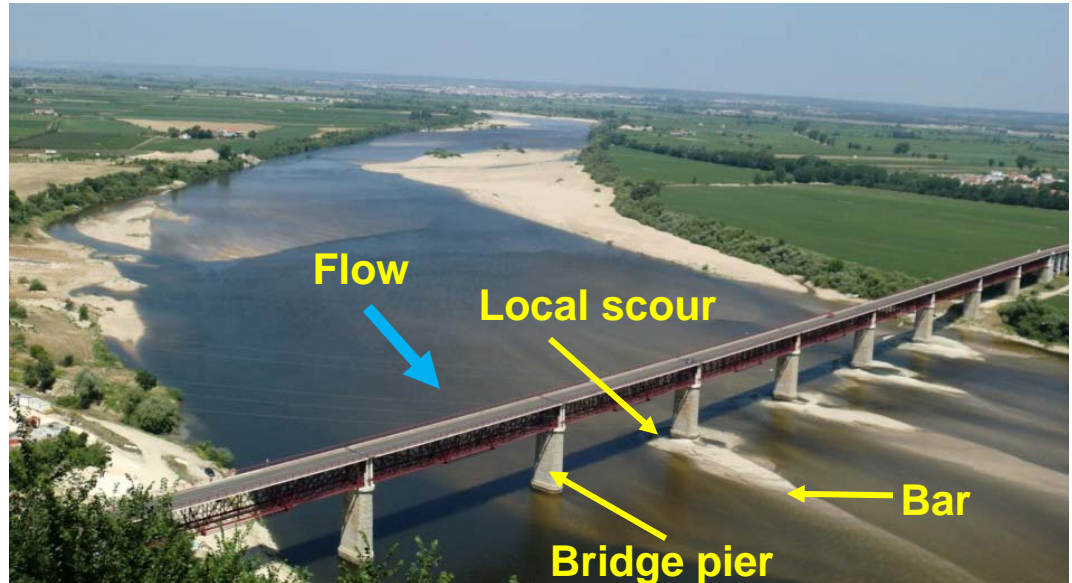
# The management of sediments near infrastructures on mobile beds

Introduction

Methods

Results

Discussion



River Tagus, Santarém



## The management of sediments near infrastructures on mobile beds

# Introduction

Management of sediments around infrastructures is focused on their safety and also on navigation safety, among other water uses

Infrastructures such as bridges are simultaneously influenced by and influence flow, sediment transport and river or estuarine bed morphology



Bassano da Grappa, Italy

## Introduction (2)

Present study emphasizes the main situations related with infrastructures founded on mobile beds, in rivers and estuaries, such as predictions of the bed morphology, erosion, sedimentation and time variations of the bed





## Methods

The impact of infrastructures on the sediment transport in rivers can be characterized by experiments of local scour around complex piers, being carried out in the framework of a experimental research



## Methods (2)

A large set of experiments on local scour around complex piers was run, during 3 years, considering different pier geometries and hydraulic flow ratios

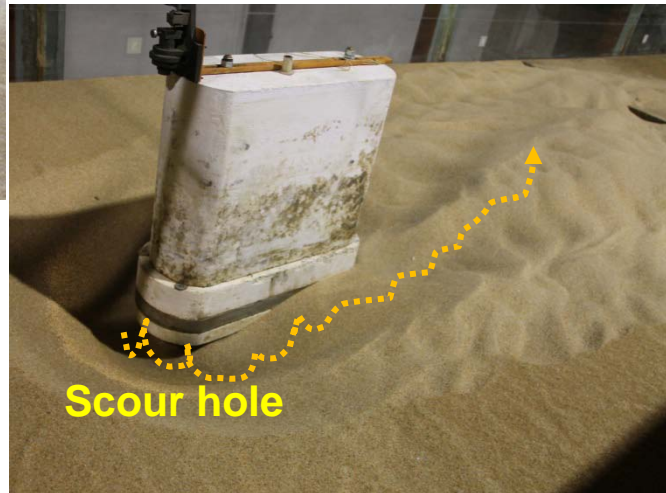
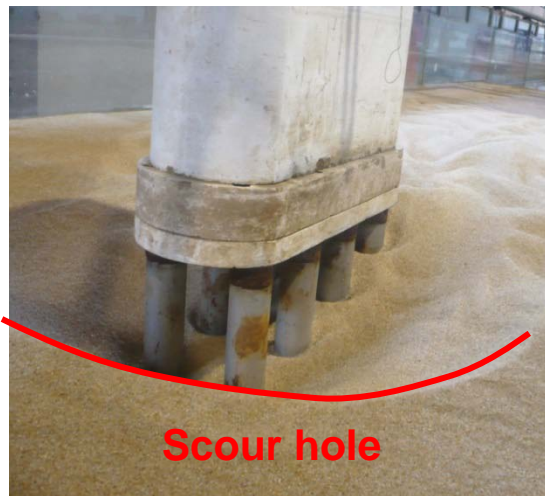
Experimental tests were done in:

- LNEC tilting flume
- UBI flume
- FEUP flume



# Results

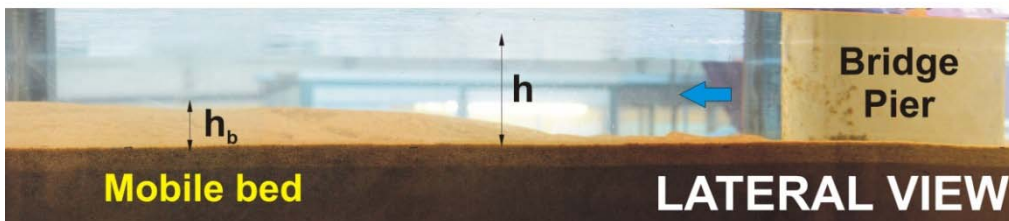
Profiting tests for local scour around bridge piers, results also include the downstream bed morphology





## Results (2)

Both transported and deposited materials downstream the piers produce large shallow bars that can be hazardous to navigation or other activities





## Results (3)

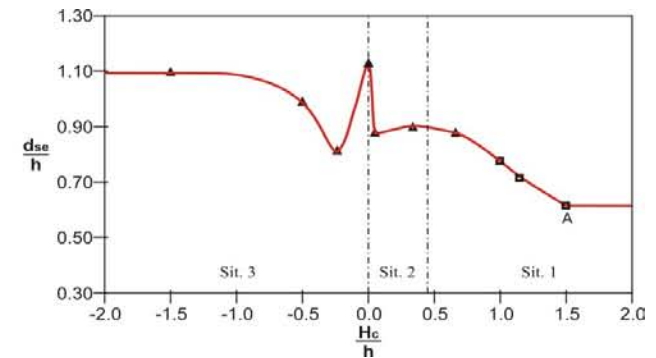
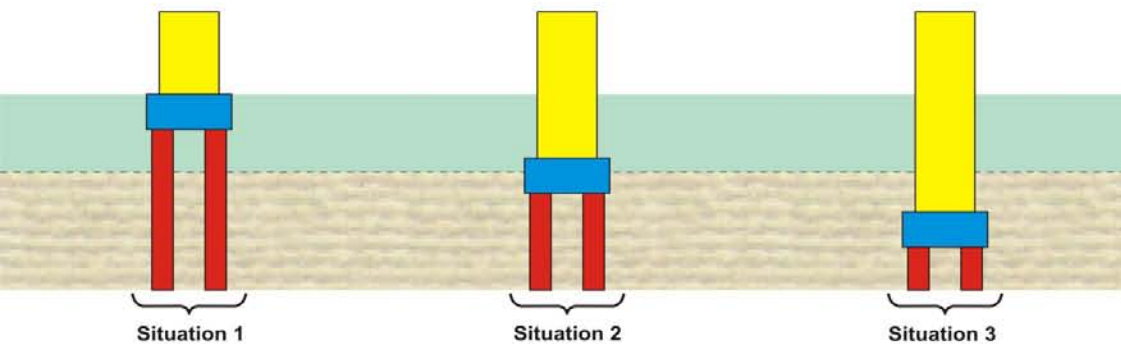
The large shallow bars can be reduced implementing scour protection works on the bridge piers bases



Abutment test  
Convectional scour protection  
UBI flume (Portugal)

# Discussion

- Experiments to obtain a new maximum scour prediction method for complex piers
- Results for safety purposes in bridge design
- Movable bed changes near infrastructure



# The management of sediments near infrastructures on mobile beds

## Discussion (2)





## Discussion (3)

### According to Apitz (2012):

- It is necessary to carry out a sustainable sediment management to maintain the navigational channels
- Sediments are managed to achieve socioeconomic goals (e.g. navigational dredging, flood defense, many others)
- The term “***sustainable sediment management***” is increasingly applied to aspects of, for ex., dredged material management

# The management of sediments near infrastructures on mobile beds

## Discussion (4)



# The management of sediments near infrastructures on mobile beds



Vasco da Gama bridge  
Tagus estuary

## Local sediment management for a global and integrated sediment management

End



co-funded

**Research project** PTDC/ECM/101353/2008  
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