

# PROJECT SHEET

## SEVILLE, SPAIN

### PORT OF SEVILLE MARITIME ACCESS IMPROVEMENT CAMPAIGN STAGE 1: LOCK

#### INTRODUCTION

Seville is located 80 km land inwards and it is Spain's only commercial river port. Access is along the Rio Guadalquivir. The current dimensions and depth of the port impose limitations on the breadth and draughts of the vessels that use it, putting the future of the port at risk. So the Port Authority developed a New Maritime Approach that provides for the deepening and widening of the approaches to the port. Studies have shown that the optimal nominal water depth based on economic, technical and sustainability criteria is 8.5 meters.

The first phase of the plan includes the construction of a new lock to the south of the present one that will be 40 m wide, 450 m long and 11 m deep. During the second phase, the Rio Guadalquivir will be deepened to 8.50 meters to the estuary at Chipiona. This next stage comprises approximately 8,000,000 m<sup>3</sup> and it is expected to be tendered during the second half of 2010. Because the dredging in the second phase will also pass by the Doñana National Park, it will be preceded by an extensive Environmental Impact Assessment (EIA).

#### PROJECT SPECIFICATION

The complete dredging project, amounting to approximately € 15 million, started with maintenance dredging in the entrance channel and the removal of the top layer of the construction pit for the future lock down to a depth

#### FEATURES

Client	Autoridad Portuaria de Sevilla
Location	Seville, Spain
Period	2006 - 2010
Main Contractor	Esclusa Sevilla UTE
Dredging Contractor	Sociedad Española de Dragados S.A., a Royal Boskalis Westminster company



- A Location map
- B Phase 1
- C Phase 1
- D Phase 2

of about 5.50 m. A trench with a depth of 15.5 m was then dredged for the foundations of the dike round the construction pit. After the completion of the lock, the new entrance channels will be dredged to a depth of 9.10 m downstream and 7.70 m upstream. The dredged material was pumped to fill areas (recintos) around the construction area, sometimes over distances of more than 2000 m. The work was done by Boskalis' 3,400 kW diesel-electric CSD Para I, a dredger with a maximum working depth of 17.50 m. The ship


**B**

**C**

**D**

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is equipped with a special cooling system to cope with tropical temperatures, which is ideal for the hot summers in Seville, where temperatures can reach 45°C. Before this dredging work started, the ship was also adapted to comply with the client's requirements relating to noise reduction.

Operational measures were taken to minimize the problems for shipping caused by the dredger's anchors and wires. This is because the port will still be fully operational during the work. There were limitations: the grain size of some of the dredged material was very fine, there was only a limited amount of space for the fill areas, and the dredging work had to be closely coordinated with the civil works. There were other strict boundary conditions relating to the project such as the prevention of turbidity, the protection of riverbank vegetation and limited operations during the nesting season. All these problems were tackled successfully while maintaining returns.

### HIGHLIGHTS

One of the client's requirements was that the consortium doing the work had to include an experienced and innovative dredging contractor. Over the years, Royal Boskalis, acting through the Sociedad Española de Dragados S.A. and its predecessors, has completed numerous projects in Spain on time, according to specifications and within budget. So that means it has built up an excellent reputation. During the tender procedure,

that historical performance helped to maneuver the consortium of which we are a contributor, Esclusa Sevilla UTE, into a good position. Boskalis was able to comply in full with the strict turbidity requirements by constructing several fill areas. These fill areas were fitted out with special water boxes, the height of which could be adjusted, so that the excess water that was discharged back into the river was virtually clean. In addition, the discharge line from the cutter suction dredger was linked up to other lines using branches with valves, making it possible to switch to other fill areas when the levels behind the fill dikes got too high. The monitoring by the client showed that turbidity remained within the prescribed limits at all times.

The extensive experience that Royal Boskalis has acquired in the coordination of dredging with civil works was essential in Seville. The factors mentioned here – the limited space, the shipping, the limitations on the deployment of equipment and the delays on the civil side of the project – made it very difficult for the dredging contractor to plan the work.

By doing another project in the interim and carrying out major maintenance work, we managed to follow the schedule of the main contractor to his satisfaction, while maintaining a certain efficiency.

### PORT OF SEVILLE MARITIME IMPROVEMENT PROJECT SUMMARY

Dredging works:

- 2006 campaign: 875,000 m<sup>3</sup>
- 2009 campaign: 2,600,000 m<sup>3</sup>

Equipment deployed:

- 3,400 kW CSD Para I and auxiliary equipment
- Multicat
- Survey vessel
- 2 equipment teams for dry earthmoving



**E** Phase 1  
**F** Phase 2

