

#### Q11.3 – 996 Words

Edburton Contractors will utilise the expertise of our Specialist Subcontractor J.T.Mackley to fulfil the requirement of the coastal protection works. The following is an example of how J.T.Mackley fulfils this criterion.

# **Shoreham and Adur Tidal Walls**

Client: Environment Agency Contact: James Fuller, Senior Project Manager – James.Fuller@environment-agency.gov.uk Contract Start: June 2016 Contract Completion: February 2019 Value: £31m

# **Description of Contract & Scope**

Mackley was the Principal Contractor under The Construction (Design and Management) Regulations 2015 within our joint venture Team Van Oord (TVO).

The project's aim was to enhance the coastal defences along 7.2km of the tidal River Adur, protecting more than 2400 properties in Shoreham. It exemplifies multiple engineering solutions meeting environmental and engineering challenges inherent when working in a built-up area and in tidal conditions. The design and construction methods were tailored for each of the 10 'Reaches' illustrated in the figure below. Each Reach had its own challenges, including working adjacent to Brighton City Airport; the Worthing to Brighton rail line; Shoreham Fort; plus multiple businesses and homes. Reaches E1-3 and W4-7 were inside a protected wildlife site, the Adur Estuary SSSI. We also had to temporarily divert riverside footpaths and several highways and manage our impacts on pleasure craft.





# **Risk Management and Scheme Challenges**

The locational challenges presented major risks for construction. Some examples included:

- **Tidal working and lack of access**: Due to riverside buildings, the defences in W1, W3, W4 and E1 was only accessible from the foreshore. We used specialist floating plant for E1 and installed the other reaches by programming the works to work a low tide. We also installed temporary trackways across the mudflats.
- Noise & vibration: The E1 pile line ran adjacent to housing, including listed buildings, and there was no landside access. We therefore installed the piles from a jack-up barge in the

river. To control the risks, we produced a detailed noise and vibration management plan, including real-time feedback enabling machine operators to keep noise and vibration levels within agreed limits.



#### • Reducing impacts on

**Shoreham's houseboat community**. Our engineers worked directly with the houseboat owners, client and designers to improve the detailed design, realigning the defences behind the existing river wall. This retained the houseboat access jetties and made the defences easier to build.

- **Reptiles**: The river wall in W4 was home to a small population of reptiles. We moved them to pre-prepared areas of grassland which included turfs taken from elsewhere in the scheme to preserve the local flora seedbank.
- **Protecting Shoreham's Heritage:** We helped re-design the car park in W1 to complement the historic setting of Shoreham Fort and used low vibration piling methods whilst installing defences directly adjacent to WWII pill boxes alongside Brighton City Airport.



### Outcome

The scheme raised Shoreham's coastal flood defences protecting homes and business. We installed over 3km of footpaths and cycle tracks in Reaches W7 and E3, which are now the southernmost stretch of the Downs Link. We installed a new ramp down to the foreshore at Shoreham Fort, making this sandy beach accessible at low tide. Project completion was over 12 months later than planned due to early problems gaining landowner permissions and blocked access from third party works to the rail bridge. We worked with the Client to mitigate delays, arranging access permissions and prioritising other areas of the scheme until we could access under the rail bridge.

Shoreham and Adur Tidal Walls won 10 industry awards including the 2020 RICS Social Impact Awards infrastructure scheme of the year 'Recognising the built environment's positive and transformational contribution to society' and the 2019 British Construction Industry Awards Category: Climate Resilience Project of the Year.

### Innovation

We used innovative techniques to build the scheme whilst protecting and enhancing the environment:

**New wetland habitats in Reach W7**: We moved 1km of the existing river wall back by over 100m allowing the area to flood at high tide, creating 1.5 Ha of new saltmarsh and mudflats. This is a new approach called 'managed realignment'. The new coastal wetland habitats are valuable in themselves and will also become feeding grounds for the estuary's birds.

**Geoconnect+ mapping tool:** Our team developed digital mapping enabling a link to photos, borehole logs, drawings etc. anywhere along the

scheme.

How to pile with no access: With no landside access in W5, we used a Giken piling rig which runs on top of the previously installed piles to install the next section (pictured right).

**Property adaptation**: We re-designed defences for the Bridge Inn, adapting the existing structure for flood defence rather than building a new riverside



wall that would block views from the beer garden.



### **Emergency Flood Response**

We provided emergency response during the works when a tidal surge and heavy rainfall put the town at risk from flooding. Our teams responded within 72 hours, deploying sandbag barriers in several low spots along the river.

We had previously responded within 24 hours to flooding of the airport. We first installed temporary bag work defences to plug the breach in the riverbank and later installed a sheet piled and rock defence, pictured right.

Mackley is the Environment Agency's first response contractor for flood emergencies in the Southeast and supports local authorities with coastal flood emergencies. Recently, we deployed rapidly for BHCC to clear shingle from hove promenade following Storm Eunice.

We have a full-time emergency hotline and can attend within 24 hours of a call, inside the period required by BHCC.



The project demonstrated ECL's ability to achieve BHCC's key outcomes for this Highways Services Contract as follows:

BHCC Key Outcomes	Project achievements
Environmental	Reptile population preserved and protected
	Coastal flood defences successfully raised
	Wetland habitat created
Cost management	Delivered to budget
Customer satisfaction	Houseboat access retained throughout
Quality assurance	Specialist river plant and piling rigs ensured quality of workmanship
Safety	Emergency response provided to protect from tidal surges and heavy
	rainfall
Social value	Paths connected to the Downs Link
Schedule management	Multiple engineering works scheduled to work with tides
Well planned Permits	Works within EA Permits