

Appendix III ♦ Project elements within Brighton and Hove: summary of design and access considerations

SEWERAGE INTERCEPTION AT BRIGHTON MARINA

A3.1 This element of the project is required to intercept the flow of wastewater in the existing sewerage system, redirecting it into the new flow transfer tunnel at the Black Rock penstock chamber. The penstock chamber will be located at the foot of the cliff, adjacent to the Asda supermarket car park, at the western end of Brighton Marina. The interception shaft would be sunk beside the existing penstock chamber and connected to the existing chamber by a short culvert. A new penstock would be fitted to the outlet pipe of the new shaft, which would require the roof of the chamber to be raised above existing ground level by approximately one metre. The existing kiosk housing electrical equipment for the existing penstock would be replaced with a larger kiosk.

A3.2 The location of the interception shaft was determined by the position of the existing penstock. However, relevant design considerations included the design of the shaft cover, which will protrude above ground, and the associated control kiosk. Being close to the cliff, which has suffered recent falls, the safety of construction and maintenance staff was also taken into account in the design.

A3.3 Vehicular access to the interception shaft will be gained via the main marina access road and across the car park of the adjacent ASDA superstore. Southern Water undertook discussions with ASDA about the most appropriate means of access across this car park and the shape of the temporary construction hoarding, which would occupy a section of the superstore car park.

A3.4 The development will comprise a vertical covered shaft ten metres deep to invert and six metres in internal diameter, built to the south of the existing penstock chamber and with an interconnecting tunnel four metres wide and three metres high; the demolition of an existing surface-level electrical kiosk and its replacement with a new kiosk 1.8 metres long, 0.6 metres deep and 1.0 metres high.

A3.5 In finished form the development will be an unobtrusive feature, set below ground with the exception of the raised shaft cover and kiosk.

MARINE GATE DRIVESHAFT

A3.6 This shaft is required to enable the flow transfer tunnel to be driven from a point adjacent to the Marine Drive pumping station to the east at Roedean to the existing penstock chamber.

A3.7 The alternative approach of driving the tunnel in the opposite direction would require more difficult engineering works and consequent disruption in the vicinity of the penstock chamber beside the Asda superstore at Brighton marina.

A3.8 This drive shaft needs to be located on the clifftop between the Marine Drive pumping station and the existing penstock chamber. A review of potential shaft sites revealed that land to the south of the A259 Marine Drive is too close to the cliff, and the road is too busy to consider sinking the shaft within the carriageway of Marine Drive. Land to the north of this section of Marine Drive is occupied by Marine Gate, a substantial apartment block, a vacant area of land in the ownership of the City Council with planning permission for low density housing, and the rear quarters of gardens of properties on The Cliff, a residential road to the north.

A3.9 The proposed site for the drive shaft is in the south-east corner of the vacant council-owned site, which is the furthest from existing housing. Road access would be gained directly from Marine Drive. This site offers the prospect of causing least disruption to road traffic and residential amenity, and to future development proposals for the site.

A3.10 The development will comprise a covered vertical shaft 39 metres deep to invert and six metres in internal diameter with a surface-level access cover and a 2.4 metre high 150 mm diameter ventilation pipe with carbon deodouriser fitted in a small compartment at the top of the shaft or in a small chamber adjacent to the shaft. The access cover would be set into the ground in a walled recess, cut into the back beside the road.

MARINE DRIVE PUMPING STATION, ROEDEAN

A3.11 This pumping station is required in order to lift the flows to a higher level in order allow the intercepted wastewater to flow by gravity eastwards towards the proposed wastewater treatment works at Peacehaven. It needs to be located in East Brighton to ensure that the flow transfer tunnel can be kept above the water table, below which saline intrusion might occur, to the detriment of biological wastewater treatment processes.

A3.12 Southern Water undertook an extensive appraisal of potential pumping station site options in the East Brighton area from planning, environmental, engineering and operational perspectives, The appraisal included consideration of the new sewerage required to connect the pumping station to existing drainage infrastructure. It also took into account considerations such as the effects of construction on local amenity.

A3.13 The alternative sites considered were:

- Black Rock
- Kemp Town gasworks
- East Brighton Park
- Brighton Marina
- Land east of Marine Gate
- Roedean miniature golf course
- Marine Drive traffic island, west of Roedean cafe

A3.14 On the basis of this analysis, SWS selected the A259 Marine Drive traffic island option as its preferred site for the East Brighton pumping station. This site distinguished itself from the other options for a combination of reasons.

- i). The land serves no positive function at present, being in a central reservation and surrounded by highways.
- ii). The land is not allocated for any alternative form of development, and is not required to support the regeneration of East Brighton.
- iii). The site itself had little identified intrinsic environmental interest or value.
- iv). The site is comparatively well separated from housing or other sensitive land uses, reducing the risk of construction-related disturbance.
- v). It lies almost directly above the preferred route of the proposed flow transfer tunnel.
- vi). If the connection to the existing coastal sewer was made from an existing penstock chamber lying beneath the undercliff path behind Brighton Marina, the need for complex inter-connecting pipework is further minimised.

A3.15 In making this choice, SWS acknowledged that the island site occupies a prominent position in vistas along this stretch of the A259, and is overlooked in seaward views from the adjacent miniature golf course, albeit against the backdrop of Brighton Marina. From the west, the site can be viewed against the backdrop of Roedean School, which includes several listed buildings. The approved architectural solution responds to these considerations.

A3.16 The architectural design process began with a function engineering layout to provide a baseline, and progressed through a series of architectural iterations that sought to respond to the sensitivities identified. The approved design, shown in figures 2.3-2.5 in chapter two of this document, features a domed metal-clad structure 6.5 metres above the surrounding ground level, with service yard, set between two five metre high curved and sloping 'berm' walls, clad in rough-faced stone sets and topped with a metal safety railing. The inside face of the berm walls will be finished in a smooth fair-faced concrete. The surrounding ground will be raised slightly and grassed, to reduce the apparent height of the berm walls. The building will be set as low as possible into the ground commensurate with maintaining a safe gradient on the vehicular access.

A3.17 The intention of this design is to integrate the building into the wider landscape whilst providing a feature of interest for passers-by.

A3.18 Beneath the building would be a shaft of 17.5m internal diameter approximately 44 m deep. Two underground ancillary spaces approximately 22 x 6 x 4 m high would house the motor control centre, electrical equipment, ventilation fans and ancillary rooms. Lighting would be located at the entrance to the pumping station building and would not be in constant use during darkness. The site is lit by existing streetlamps in any event.

A3.19 In consultation with the local highway authority, Southern Water considered various access options for the pumping station, including access points off the carriageways to the north and south of the traffic island, before selecting an access point off the connecting land between the two carriageways to the west of the pumping station, which affords lower traffic volumes and speeds and a long line-of-sight for approaching vehicles.

ROEDEAN WAY SHAFT

A3.20 A three metre diameter shaft is required beside a car park east of the junction between the A259 Marine Way and the B2118 Roedean Way in order to intercept the Roedean main sewer. The proposed site is in the most appropriate position for making the connection and, being off the public highway and well separated from housing and other sensitive land uses, is thus considered to be the most appropriate location for the shaft.

A3.21 The covered vertical shaft will be 20.5 metres deep, up to a maximum six metres in internal diameter and fitted with a surface-level access cover. It will have 525 mm diameter sewer pipes connecting to existing sewerage.

A3.22 Following construction, the only evidence of the shafts at surface level will be the flush-fitting access covers. Access to the shaft would be required for maintenance on an occasional basis, and would be gained directly from the A259 Marine Drive.

OVINGDEAN SHAFT

A3.23 This shaft would be sited in vacant land immediately west of the junction of A259 and Greenways Road south of Ovingdean. The shaft is required both to facilitate the interception of local sewerage and to serve as the driveshaft for the tunnel drives to the Marine Drive pumping station in the west and the Portobello pumping station in the east.

A3.24 The development will comprise a covered vertical shaft 9.5 metres total depth to invert, up to a maximum six metres in internal diameter and fitted with a surface-level access cover and with 600 mm pipes connecting to existing sewerage. Access to the shaft would be required for maintenance on an occasional basis, and would be gained directly from the Greenways Road.

ROTTINGDEAN SHAFT

A3.25 This shaft would be located in central Rottingdean at the eastern corner of a car park off West Street. This shaft is required to intercept the local sewer flows and to provide service access to the tunnel. Several locations were considered for this shaft, including sites within local highways, but the lack of suitable open areas and the desire to avoid the interruption of traffic flows at what is a busy junction in the centre of Rottingdean informed a preference for a site in the West Street car park.

A3.26 Southern Water consulted with representatives of local traders to ensure that the construction compound for the shaft would be positioned in such a way as to minimise any temporary inconvenience for shoppers and public transport users.

A3.27 The development will comprise a covered vertical shaft 9.5 metres in total depth to invert and up to a maximum six metres in internal diameter, with a surface-level access cover; and 600 mm diameter pipes connecting to the local sewerage network.

A3.28 Access to the shaft would be required for maintenance on an occasional basis, and would be gained directly from the A259 Marine Drive.

SALTDEAN SHAFT

A3.29 This shaft would be sited within the verge to the west of Saltdean Park Road, east of Saltdean Lido and beside an area of public open space, and is required to intercept the local sewer flows. Several shaft locations were considered, including sites in the carriageway of Saltdean Park Road and closer to the Lido, and the chosen shaft location was considered to give rise to least disruption to traffic and local amenity.

A3.30 The shaft will be 13.5 metres in total depth to invert, up to a maximum six metres in internal diameter and fitted with a surface-level access cover and 375 mm pipes connecting to existing sewerage.

A3.31 Access to the shaft would be required for maintenance on an occasional basis, and would be gained directly from the A259 Marine Drive.

* * *