

Nine ♦ Portobello pumping station: design evolution

THE SITE

9.1 The proposed pumping station site lies within Southern Water's existing operational headworks site on the coast at Portobello, to the South of the A259 South Coast Road and between the residential neighbourhoods of Telscombe Cliffs to the east and Saltdean to the west. The site lies at the lower end of Telscombe Tye, an area of fenced downland that slopes gently downhill between Saltdean and Telscombe Cliff to the top of the chalk cliffs.

9.2 The Portobello site has been used in association with the disposal of the catchment's wastewater since the nineteenth century. In its modern form it comprises a level platform cut into the cliffs at promenade level, on which stands a 1970s concrete headworks building within which wastewater receives a preliminary level of treatment before being discharged to the English Channel through a long sea outfall. The headworks building and its associated service yard are served by an access road from that curves in a combination of cutting and embankment down to the site from the A259 on the clifftop.

9.3 In 1997, Southern Water applied for planning permission to build a wastewater treatment works and sludge recycling centre at Portobello. This proposal was dismissed on appeal in 2001.

9.4 At clifftop level, the existing headworks site comprises areas of grassland and service roads and hardstanding, the latter being used by Southern Water for occasional open storage. On the western edge of the site stands a brick and concrete building with a flat roof, containing an electricity sub-station, and further to the west is a small group of houses, built originally to accommodate headworks staff.

9.5 The northern site boundary is marked by a brick wall with flint panels facing on to the A259 South Coast Road. Other boundaries are marked by post and wire fences. Along the cliff edge, a more recent fence stands inside the surviving sections of an older clifftop fence.

9.6 Though largely open at clifftop level, the character of the existing headworks site could not be described as open downland, its character having been substantially modified over time by the various structures just described. This assessment is shared by the Government Inspector who, in his 2007 proposed revision of the draft boundary of the South Downs National Park, recommended the inclusion of the open clifftop to the west of the headworks, but the continued exclusion of the headworks site from the national park.

Micro-siting

9.7 The site of the proposed pumping station within the headworks site was determined with reference to the design cues identified at the end of the previous chapter, and to operational considerations. As explained in part C of this design and access statement, it was desirable to align the main wastewater flow transfer tunnel from Black Rock generally along the corridor of the A259. This reduces the need for tunnelling under residential property and enables tunnel access shafts to be located within highway verges and other roadside open spaces. The tunnel alignment also ensures that the tunnel would be set sufficiently far back from the cliffs so as to obviate any risk of causing cliff instability whilst protecting the tunnel from the foreseeable long term effects of future cliff erosion.

9.8 Having established that the Portobello headworks site was the preferred location for the pumping station (see the previous chapter), Southern Water gave consideration to four locations within its operational site at which the pumping station might be located. These were:

Option A To the west of the site entrance from the A259. This option would require excavation undesirable close to the cliff to the south and would also encroach into the back gardens of houses to the north-west.

Option B In a cavern behind the cliff face, with access from the service yard beside the existing Portobello headworks. It was found that this option would necessitate excavation in poor quality chalk, with risk of causing instability to the ground above. Furthermore, extensive grout treatment would be required for the roof and walls of the cavern to prevent water seepage and consequent saline contamination of the wastewater.

Option C To the south of the existing access road. In many respects, this option would afford most of the benefits associated with option D (below). However, in common with options A and B, option C would give rise to conflicts in the alignment of existing and new sewers.

Option D To the north of the existing access road. It was evident that a site on the northern edge of the headworks site would be most suitable. This location would provide sufficient room for required construction activities and would not compromise the continued operation of the existing headworks infrastructure.

9.9 Option D, the selected site, comprises a grassed area between the brick-and-flint wall alongside the A259 and the cutting through which the headworks access road descends.

THE SURROUNDINGS

9.10 As already noted, the headworks site lies at the lower end of Telscombe Tye, an area of open downland extending down to the coast. The Tye is one of only a limited number of places where the South Downs have not been severed

from the cost by twentieth century suburban residential development.

9.11 Neighbouring residential neighbourhoods - Saltdean to the west and Telscombe Cliffs to the east - largely comprise suburban houses and bungalows with pitched roofs, built in styles typical of the inter-war and postwar periods and set within gardens of reasonably generous proportion. The neighbourhoods also feature occasional low-rise blocks of flats, include a block to the north-east of the headworks site on the northern side of South Coast Road.

9.12 Beyond the eastern boundary of the headworks site stands the Badger's Watch public house, a grade II listed building. The original building comprises a two storey house of domestic proportion, fronting on to the South Coast Road. In recent times this building has undergone substantial extension on the rear, seaward, side, and also features a beer garden to the south and a sizeable car park to the east. With suburban residential development to the north and north-east, from which the pub is now separated by a four-lane section of the A259, the character and setting of the Badger's Watch has thus undergone a substantial transformation.

9.13 Whereas this section of the Sussex coast is thus largely urban in character, the distinctive downland topography remains in evidence. Travelers along the A259 will notice a succession of swooping downland slopes, where the road traverses downland ridges extending southwards to the coast. These have the effect of containing views of Portobello more distant views, whilst providing elevated viewpoints locally - particularly from a ridge within Telscombe Tye that extends along the eastern edge of Saltdean, and from clifftop paths to the east and west of the site.

9.14 The important viewpoints are identified in the landscape and visual effects chapter of the *Environmental Statement* that accompanies Southern Water's planning application.

CONSULTATIONS

9.15 The option of building a pumping station at Portobello was the subject of the same consultations summarised in chapter three of this document.

9.16 Given that Portobello is an existing operational site, that the pumping station would be largely underground, and that the proposed development would help to address concerns about odour emanating occasionally from the existing 1970s headworks, the proposals were generally not regarded as contentious.

9.17 Southern Water entered into specific dialogue with Mitchells and Butlers, the operator of the Badger's Watch pub, to provide reassurance that the amenity of the pub would be safeguarded during the construction phase of the project. Following consultations with East Sussex County Council, the current proposals also include provision for the removal of redundant clifftop fencing and hardstanding. More generally, East Sussex County Council and the South Downs Joint Committee were concerned to ensure that the development did not compromise the openness of views from Telscombe Tye to the sea, and views along the clifftop.

DESIGN RATIONALE

9.18 Southern Water's site assessment and consultations indicated that an important design objective should be to render the pumping station visually unobtrusive, in order to respond to landscape and visual concerns, maintain the setting of the listed Badger's Watch pub and generally to protect local amenity.

9.19 With the pumping station of necessity largely an underground structure - given its role in transferring wastewater between underground tunnels - Southern Water determined that the most effective means of responding to this design objective was to set the surface-level pumping station building into the ground, with vehicular access taken from the existing headworks access road that descends in a cutting from cliff-top level.

9.20 Provision of an intermediate pumping station at Portobello has the following benefits for the engineering design of the project.

- i). It allows the adoption of a 1-in-500 fall within the wastewater transfer tunnel to provide enhanced self-cleansing velocities with one transfer pump running, whilst generally maintaining the tunnel above the level of the saline water table. Excessive fluctuations in wastewater salinity that might result from a significant cyclical infiltration of tidally influenced saline groundwater would be detrimental to biological treatment processes, particularly the BAFF process.
- ii). It allows the use of relatively low lift, low voltage 'submersible' pumpsets, which would provide more robust operating conditions.
- iii). It provides a positive wastewater flow control device downstream of the interception of all flows, with the exception of the flow draining from the Peacehaven sub-catchment. Only a flow equivalent to the treatment works capacity will be transferred forward by the Portobello pumping station. During intense periods of wet weather, any excess flow arriving at Portobello would surcharge and overflow to the existing Portobello headworks, where it would receive appropriate stormwater treatment prior to discharge through the existing long sea outfall. In the event of a power failure at the proposed Peacehaven wastewater treatment works, an immediate shut-down of the Portobello pumping station would follow and all flows of wastewater arriving at Portobello would surcharge, overflow and discharge via the existing long sea outfall, as permitted under the emergency discharge consent.

9.21 In summary, this arrangement provides a robust engineering solution with good hydraulic characteristics and positive provisions for flow management under different conditions. Under emergency conditions, it would provide an inherently fail-safe system.