Appendix R – Chambers Wharf (formerly King’s Stairs Gardens)

R.1  Introduction

R.1.1 This appendix sets out the site selection process that we used and our rationale for identifying our preferred phase one and phase two consultation sites for constructing the eastern sections of the main tunnel.

Type of site

R.1.2 We need to identify a series of suitable worksites to allow us to build the main tunnel. The main tunnel will transfer the collected overflows to the Abbey Mills Pumping Station and they will then transfer via the Lee Tunnel (under construction) to Beckton Sewage Treatment Works.

R.1.3 Larger sites are required where a TBM will be inserted into the ground (known as a main tunnel drive site). This type of worksite will need to handle all the materials excavated by the TBM as it constructs a section of the tunnel. Smaller sites are required to remove the TBM from the ground at the end of a tunnel drive (known as a main tunnel reception/intermediate site). A more detailed description of the different types of worksite required to construct and operate the Thames Tunnel project and the size requirements of these sites can be found in the Site selection background technical paper.

Site selection process

R.1.4 All potential worksites have been identified in accordance with our site selection methodology (SSM), which involved a ‘sieving’ approach, commencing with identification of all potentially suitable areas of land (excluding concentrated residential sites and World Heritage Sites) and passing these sites through increasingly detailed levels of assessment to move from a long list to a draft short list, a final short list and finally a list of preferred sites for phase one consultation.

R.1.5 The SSM recognises the vital complementary relationship between the site selection process and engineering design developments. Accordingly, as the site selection process has progressed, it has been increasingly important to compare sites against engineering requirements. A fundamental consideration is the need to identify sufficient sites, in the right locations, to enable the scheme to be built.

Preferred site for phase one and phase two consultation

R.1.6 The table below identifies our preferred phase one and phase two consultation sites. Section R.2 in this appendix provides the details of how we identified our preferred phase one site. Sections R.3 to R.5 provide details of why we have identified a different main tunnel preferred site for phase two consultation.
R.2 Site selection up to phase one consultation

Assessment of the long list sites

R.2.1 The long list of potential main tunnel sites for the eastern section of the tunnel route was created by conducting a desktop survey of the land within the London boroughs of Southwark and Tower Hamlets and the City of London.

R.2.2 In total, 116 sites were included on the long list as potential main tunnel sites. These sites were assessed having regard to the high-level considerations set out in Table 2.2 of the SSM (hereafter referred to as Table 2.2) including engineering (site size, site features, availability of jetty/wharf and access), planning and environment (heritage, landscape/townscape, open space and ecological) and community and property (neighbouring land uses, site use, Special Land/Crown Land and acquisition costs) considerations.

R.2.3 Sites which were assessed as being the least constrained when considered against Table 2.2 considerations passed to the next stage of assessment. This did not necessarily mean that these sites would ultimately be judged as suitable for use as a main tunnel shaft site, but that no significant constraints were identified in relation to the high-level considerations addressed at Table 2.2. Sites that were judged to be more constrained were not recommended to be retained on the draft short list for more detailed assessment. Full details of these assessments are provided in the Table 2.2 assessment tables and accompanying plans.

R.2.4 Of the 116 sites identified as suitable for main tunnel shafts for the construction of the central and eastern sections of the tunnel, 12 were assessed as potentially suitable and passed to the draft short list, while 104 sites were eliminated as being unsuitable.

Assessment of draft short list sites

R.2.5 The 12 draft short list sites identified as potentially suitable in Table 2.2 were then further assessed by the engineering, planning, environment, community and property disciplines, having regard to the considerations set out in Table 2.3 of the SSM (hereafter referred to as Table 2.3). This stage of the process built on the information gathered and assessment undertaken at long list stage but focused on more detailed local considerations.

R.2.6 At this stage, we also consulted with each of the London boroughs and pan-London stakeholders, such as the Environment Agency and English Heritage, to seek their views on the suitability of sites for the short list.
R.2.7 As with the Table 2.2 assessment, sites which were assessed as being the least constrained when considered against Table 2.3 considerations were retained on the short list to pass to the next stage of assessment. This did not necessarily mean that a site would ultimately be judged as suitable, but that no significant constraints were identified in relation to the considerations addressed at Table 2.3. Sites judged to be more constrained were not recommended to be retained on the short list for more detailed assessment. Full details are provided in the Table 2.3 assessment tables and accompanying plans.

R.2.8 Of the 12 sites on the draft short list, initially only one (S020T: Shadwell Basin) was assessed as potentially suitable for use as either as a main tunnel drive or reception/intermediate site. However, subsequently a number of engineering factors were identified that made this site difficult to use and potentially undesirable. It was therefore necessary to revisit the draft short list to identify additional potential locations for main drive sites in the Tower Bridge area to allow for the risk of the Shadwell Basin site not being suitable. As a result, two further sites, S54SK: King's Stairs Gardens and S021T: King Edward Memorial Park, were additionally taken forward for assessment as main tunnel drive sites (on the basis that these represented the sites on the draft short list large enough for a main tunnel drive).

R.2.9 Therefore, three main tunnel sites and two main tunnel reception/intermediate sites passed to the final short list.

Assessment of the final short list sites

R.2.10 The six final shortlisted sites retained for more detailed assessment as potential main tunnel shaft sites were:

Site identified as suitable for use as main tunnel drive or reception/intermediate sites:
- S020T: Shadwell Basin
- S021T: King Edward Memorial Park
- S54SK: King's Stairs Gardens.

Sites identified as suitable for use as main tunnel reception/intermediate sites only:
- S024T and S025T: Heckford Street – two sites considered together
- S036T: Limehouse Basin.

R.2.11 A site suitability report (SSR) was prepared for each of these final shortlisted sites. These reports contained an assessment of each site’s suitability, having regard to engineering, planning, environment, community and property considerations. At this stage in the process, sites were assessed in isolation without comparison to other sites or regard to tunnelling strategy. Sites were evaluated by each discipline, using technical knowledge and professional judgement as appropriate, and assessed as either suitable, less suitable or not suitable from that discipline’s perspective.
R.2.12 A summary of the conclusions of each discipline’s assessment from the site suitability reports is provided below.

**S020T: Shadwell Basin**

R.2.13 Site S020T is located in Wapping, in the London Borough of Tower Hamlets. The site is irregular in shape and accessible by Newlands Quay, Maynards Quay, and Wapping Wall. The surrounding area is predominantly residential, with all buildings orientated to overlook the basin.

**Engineering:** This site was considered less suitable as a main tunnel drive site because of its distance from the river, the significant preparatory works needed to construct the shaft and the considerable difficulties in providing barge movement into and within the site. This site is also considered less suitable as a main tunnel reception/intermediate site for similar reasons.

**Planning:** This site was considered not suitable for use as either a main tunnel drive or reception/intermediate site. There are a series of planning designations applicable to the site and it is unlikely that mitigation measures will balance out the potential cumulative adverse impacts of the proposed construction works on this site.

**Environment:** Overall, the site was considered less suitable as either a main tunnel drive or a reception/intermediate site, and further investigation would be required as to whether transport, built heritage and townscape, ecology, flood risk, surface water, noise, air quality and land quality impacts could all be adequately mitigated.

**Socio-economic and community:** The use of the site was considered less suitable as either a main tunnel drive or reception/intermediate site from a community impacts perspective as it is likely to have a significant detrimental impact on the large number of residents living in the surrounding residential properties, and is also likely to lead to the loss or displacement of the Shadwell Basin Outdoor Activity Centre, which may be quite difficult to relocate or otherwise mitigate.

**Property:** The site was considered suitable as both a main tunnel drive and a reception/intermediate site, although subject to acquisition risk, which will be proportionately greater in respect of a main shaft site.

**S021T: King Edward Memorial Park**

R.2.19 Site S021T is an area of public open space located in Wapping, in the London Borough of Tower Hamlets. The park is irregular in shape and has numerous entrances, accessed primarily by The Highway (A1203) and Glamis Road.

**Engineering:** This site was considered suitable for use as either as a main tunnel drive or reception/intermediate site. The site is sufficiently large to readily accommodate the required construction facilities, it has good road access and it has good potential for jetty/wharfage facilities.

**Planning:** The site was considered not suitable for a main tunnel drive site. The site is a vibrant and well maintained public park, hosting a wide
variety of sport and leisure activities. Its use as a main shaft site would result in the temporary loss of a significant area of the park and the remaining areas of open space may not be useable, given the level of construction activity proposed and potential associated impacts from noise, dust and traffic movements. Replacement open space is likely to be required by the council and this may be problematic in this location, due to an existing deficiency and on the scale which would be associated with the main shaft.

R.2.22 This site is considered less suitable for a main tunnel reception/intermediate site as it would result in the temporary loss of around a third of the public open space, and would impact on the continued integrity and enjoyment of the remaining areas of the park.

R.2.23 **Environment:** Overall, the site may be suitable for use as either a main tunnel drive or reception/intermediate site, although mitigation would be required to enable the site to be used for each of these.

R.2.24 Based on current information, all site options are suitable from the perspective of transport, archaeology, water resources, flood risk, and land quality. All site options are considered less suitable from the perspective of built heritage and townscape, noise and air quality.

R.2.25 **Socio-economic and community:** This site was considered not suitable for use as a main tunnel drive site. There are likely to be significant impacts on the park and users of the sports and leisure facilities. Mitigation is likely to involve finding acceptable alternative facilities which are easily accessible to the local community. This site was considered less suitable for use as a reception/intermediate site. There are likely to be some impacts on the park and users of the sports and leisure facilities. Mitigation is likely to involve finding acceptable alternative facilities which are easily accessible to the local community.

R.2.26 **Property:** The site was considered suitable for use as either a main tunnel drive or reception/intermediate site, although the potential acquisition risk would be proportionately greater for the larger main shaft site.

**S54SK: King’s Stairs Gardens**

R.2.27 Site S54SK is located within King’s Stairs Gardens, a public park within the London Borough of Southwark.

R.2.28 **Engineering:** This site was considered suitable for use as either a main tunnel drive or reception/intermediate site because it is large enough to fit all the site facilities, there is no demolition required other than the playground, and wharfage/jetty facilities could be provided.

R.2.29 **Planning:** This site was considered suitable for a main tunnel drive or reception/intermediate site, subject to appropriate mitigation measures. There are a number of designations in the Unitary Development Plan that are applicable to the site and it may be possible to mitigate potential impacts with appropriate mitigation measures, but will require further consideration. However, potential impacts on residential amenity should be considered further and, in particular, the potential to relocate
construction works within the site to increase the separation distance between the works and the facades of adjacent dwellings. There would be a loss of amenity space. Notwithstanding the metropolitan park deficiency area, which affects the borough as a whole, the immediate area is well served by parks and open spaces locally, especially Southwark Park.

R.2.30 **Environment:** Overall, the site was considered **suitable** as a main tunnel drive or reception/intermediate site, although mitigation would be required to enable the site to be used. Based on information available at the time, the site was considered **suitable** from the perspective of transport, archaeology, built heritage, water resources, flood risk and land quality. The site was considered **less suitable** from the perspective of townscape, ecology, air quality and noise.

R.2.31 **Socio-economic and community:** This site was considered **not suitable** as a main tunnel drive site from a community impacts point of view, as the use of the majority of King’s Stairs Gardens is considered as likely to have a severe impact on the local community. It was considered **less suitable** as a main tunnel reception/intermediate site, even though around only half the site would be used. There may be a number of significant impacts on the local community, including impacts on the playground on site, dense residential properties adjacent to the site on both east and west, as well as two churches adjacent to the site.

R.2.32 **Property:** The site was considered **less suitable** as a main tunnel drive site and **suitable** as a main tunnel reception/intermediate site.

**S024T and S025T: Heckford Street**

R.2.33 Sites S024T and S025T are both accessed from Heckford Street, which adjoins The Highway (A1203) in the London Borough of Tower Hamlets. The sites are roughly rectangular in shape and are currently occupied by commercial buildings, warehouses and offices of one to two storeys in height, with associated parking areas.

R.2.34 **Engineering:** This site was considered **less suitable** as a split main tunnel reception/intermediate site because the impact on third-party assets could be significant. There is a requirement for the warehouses within both sites (S024T and S025T) to be demolished to allow construction of the shaft. The site is a minimum of 100m away from the river and there are multi-storey residential buildings and the Rotherhithe Tunnel between the site and the river. There is no direct route for the 10m-wide overflow culvert to the river that would avoid going under a building and there is potential for the culvert to clash with the Rotherhithe Tunnel. This will present significant issues.

R.2.35 **Planning:** The sites are considered **suitable** as a split main tunnel reception/intermediate shaft site. There are few planning designations that are applicable to the site and it is considered that, with appropriate mitigation measures, these designations are unlikely to be unacceptably impacted upon. However, implementation of the future mixed-use redevelopment of the Highway Business Park may present a constraint to the use of the site for the Thames Tunnel project, and the status of development proposals will require ongoing monitoring.
R.2.36 **Environment:** Overall, the site was considered **suitable** as a split main tunnel reception/intermediate site, although mitigation will be required to enable the use of site. Based on information available at the time, the site was considered **suitable** from the perspective of transport, archaeology, built heritage, townscape, water resources, ecology, and flood risk, and **less suitable** from the perspective of air quality, noise and land quality.

R.2.37 **Socio-economic and community:** This site was considered **less suitable** for a main tunnel reception/intermediate site from a community impacts perspective, due to the potential combined number of impacts likely to occur. Foremost among these is the likely loss of several commercial units onsite requiring the relocation of businesses. This may impact on owners, operators and employees in terms of their livelihood. Mitigation may involve discussions around relocation and/or compensation.

R.2.38 **Property:** The site was considered **suitable** as a main tunnel reception/intermediate site.

**S036T: Limehouse Basin**

R.2.39 Site S036T is located north of Narrow Street, in the London Borough of Tower Hamlets. Limehouse Basin hosts a well-used marina with three large pontoons. The basin is accessed from the south via the River Thames, through a swing bridge and lock. The basin is surrounded on all sides by modern, high-rise flats. The flats are within a series of blocks ranging from three to twelve storeys in height, with habitable rooms and balconies overlooking the basin. In addition, there is the Cruising Association Members Club to the east and a boat keepers’ office located to the south of the site. The DLR line runs along the northern boundary of the site behind apartments within Basin Approach.

R.2.40 **Engineering:** This site was considered **not suitable** for a main tunnel reception/intermediate site because of the requirements for extensive enabling and reinstatement works prior to and following construction. The site does not have good vehicular access and a neighbouring building may need to be demolished to create sufficient access to the site. There are residential buildings and other third-party assets in close proximity to the site. The overflow culvert would need to run a significant distance under existing structures as a siphon (which is not desirable) or through demolished buildings to reach the river.

R.2.41 **Planning:** This site was considered **not suitable** for use as a main tunnel reception/intermediate site. A series of planning designations are applicable to the site and it is unlikely that any mitigation measures would balance out the cumulative adverse effects of the proposed construction works on this site.

R.2.42 **Environment:** Overall, the site was considered to be **less suitable** as a main tunnel reception/intermediate site. The site was considered **suitable** from the perspectives of transport, archaeology and hydrogeology, and **less suitable** from the perspectives of built heritage, townscape, surface water, ecology, flood risk, air quality, noise, and land quality.
R.2.43 **Socio-economic and community:** This site was considered less suitable for use as a main tunnel reception/intermediate site, as it would appear likely to have significant impacts on the use of the basin as a marina and the surrounding dense residential development, many of which will be difficult to mitigate. Also, following the use of the site, the need to maintain permanent access and place a concrete structure in the marina will decrease the area of the basin and is likely to reduce the number of pontoons available.

R.2.44 **Property:** The site is considered less suitable as a main tunnel reception/intermediate shaft site. Disadvantages include the potential classification of the site as special land, requiring ministerial procedure for acquisition, temporary and permanent disturbance to the marina operation, the potential for high discretionary purchase costs, and the possibility that residential flats might have to be acquired and demolished for the overflow culvert.

**Identification of the preferred site**

R.2.45 Consideration of the main tunnel sites up until short list stage principally focussed on each as an individual site in isolation from the assessment of tunnel drive and alignment options (ie, how the tunnel will be constructed and the route it will take). However, due to the nature of the scheme, it is necessary to select a package of main tunnel sites, paying attention to how they will work in combination and in relation to the tunnel alignment and CSO connections.

R.2.46 The *Engineering options report* describes the process of identifying the tunnelling options, taking into account engineering requirements. The main points are summarised below.

R.2.47 The engineering team took into consideration possible drive options – the combination of ways in which the tunnel could be constructed by ‘driving’ between combinations of shortlisted main tunnel sites – paying particular attention to changes in ground conditions and the requirement for different types of tunnelling machines, construction risks and timescales.

R.2.48 To manage the total number of combinations of tunnel drive and reception/intermediate site options, which together make up a ‘drive option’, the available shortlisted main tunnel sites were grouped together in zones. The zones were based on the geographical locations of the sites along the line of the River Thames, as shown in Figure R.1 below. The zones were numbered and named for convenient referencing as shown in the figure.
R.2.49 Our preferred route for the main tunnel runs from west London to Abbey Mills Pumping Station and involves zones S1 to S7 and Zone S11. Zones S8 to S10 were only required for the previously considered River Thames and Rotherhithe routes, which are not our preferred option so are not considered further in this appendix.

R.2.50 Multidisciplinary workshops were held to identify the most suitable main tunnel shortlisted site within each zone, taking into account the conclusions reached in the SSRs, as described above.

R.2.51 An important consideration in relation to zones S6 and S7 is that downstream of Tower Bridge, the geology through which the tunnel has to be constructed changes and a change in the type of TBM used to construct the tunnel is desirable. This is further explained in the Site selection background technical paper. As a result, a possible need for a main tunnel site in the area downstream of Tower Bridge was identified.

R.2.52 A series of comparisons were then made of how best to use the potential sites identified across all the zones to construct the main tunnel.

R.2.53 As detailed in paragraph R.2.8, a number of engineering factors were identified which made the use of site S020T: Shadwell Basin, Garnet Street difficult and potentially undesirable as a main tunnel drive site. This meant that in zones S6 and S7 a choice had to be made between the use of S54SK: King’s Stairs Gardens or S021T: King Edward Memorial Park as a main tunnel site. The following factors were taken into account and resulted in King’s Stairs Gardens being identified as the preferred site:

- Use of King Edward Memorial Park would extend the length of the main tunnel drive and increase the challenges associated with tunnelling in chalk.
- In planning policy terms, a distinction can be made between the two sites in relation to the availability of alternative public open space in the vicinity. King Edward Memorial Park is located within an area which has been defined as a public open space deficiency area. Therefore, identifying locations where suitable replacement facilities could be provide to mitigate for the temporary loss of a proportion of...
King Edward Memorial Park would be difficult, if not impossible. In comparison, Southwark Park is located immediately to the south of King’s Stairs Gardens and is considered a useable local alternative.

- While use of King Edward Memorial Park would avoid the creation of a separate CSO site (to intercept the North East Storm Relief Sewer which runs beneath the park), cost and programme issues associated with the longer tunnel drive to this site outweigh the potential benefit.

- King Edward Memorial Park is within a conservation area. At this stage of the site selection process, no conservation areas would be affected by the use of King’s Stairs Gardens. There also appears to be less opportunity to mitigate townscape impacts at King Edward Memorial Park.

- In environmental terms, the use of either site has the potential to give rise to noise disturbance and air quality impacts and would require extensive mitigation measures.

- For both sites, use of special parliamentary procedures may be needed to secure their use.

R.2.54 On balance, S54SK: King’s Stairs Gardens was considered more acceptable and was therefore identified as the preferred site in zones S6 to S7 and was identified as suitable for use as a main tunnel reception/intermediate site. This site would also be used to drive connection tunnels to connect the four south-eastern CSOs (Druid Street, Earl Pumping Station and Deptford Storm Relief, and Greenwich Pumping Station).

R.2.55 At the same time, and using the same process, site S79WH with S80WH: Tideway Walk was identified as a preferred main drive shaft site in Zone S5 and S84NM: Abbey Mills Pumping Station as the preferred location for a main tunnel drive site in Zone S11. These tunnels would be driven towards King’s Stairs Gardens, where the TBMs would be received.

R.3 Review of site selection following phase one consultation

Phase one consultation responses

R.3.1 As part of the site selection methodology, all feedback received during the phase one consultation was reviewed and taken into account in the development of our scheme for phase two consultation.

R.3.2 The main issues and concerns raised during phase one consultation in relation to the King’s Stairs Gardens site are summarised below:

- Loss of green space and valued local amenity in a densely populated and deprived part of London
- Impact on residential amenity and property values
- The impact on the wildlife, vegetation and mature trees
- Impact on footpaths, including the Thames Path
- Impact on existing heritage features
- Design of our permanent proposals.
R.3.3 The main comments received in support included:
- agreement that this is the best choice of site
- Southwark Park can compensate for the temporary loss of green space at King’s Stairs Gardens
- after-use designs are acceptable.

R.3.4 More detail on the consultation responses relating to this site and our response to the comments received are provided in the Report on phase one consultation.

R.3.5 During phase one, an important change of circumstances emerged in relation to a brownfield site known as Chambers Wharf, located to the west of King’s Stairs Gardens. Prior to the launch of our phase one consultation, we were aware that a developer had secured planning approval for housing on the Chambers Wharf site and appeared to have started work on this permission (demolition and site clearance had commenced). Since then, the site has been put up for sale and we, in conjunction with property developers St James Group Limited (part of Berkley Group), have purchased the site as a possible alternative to King’s Stairs Gardens.

Back-check process

R.3.6 In response to the change in circumstances of the Chambers Wharf site, feedback we received during the phase one consultation, a number of engineering design developments and the availability of new technical information, we undertook a ‘back-check’ to review our selection of S54SK: King’s Stairs Gardens as our preferred site.

R.3.7 This ‘back-check’ involved a targeted repeat of each relevant stage of our site selection process (as detailed in the site selection methodology) to reconsider which site would be the most suitable main tunnel drive shaft site in zones S6 to S7.

R.3.8 The main factors which triggered this back-check process were:
- potential availability of Chambers Wharf which had previously been considered unavailable, as the redevelopment of the site has started and the site was being cleared
- various consultees’ comments which challenged the use of King’s Stairs Gardens as a main tunnel site due to the potential impact on the surrounding environment and community.

Engineering assumptions

R.3.9 As part of the back-check process, the engineering assumptions which had been used during the initial phase of site selection were reviewed to see if any of the design developments or new technical information altered any of the original assumptions.

R.3.10 The outcome of this review was that the size of construction sites required for main tunnel drive sites for the western sections of the tunnel, which is constructed predominantly in London Clay, was reduced from 18,000m² to
15,000m². This change did not, however, affect the sites in zones S6 to S7 which involve construction in predominantly chalk.

R.3.11 The following section outlines the results from each stage of the back-check process.

Assessment of the back-check long list

R.3.12 The original long list sites for main tunnel sites in zones S6 to S7 contained 116 sites. These sites were reviewed alongside any newly identified sites to determine the ‘scope’ of the back-check exercise (ie, which sites would be subject to reappraisal as a result of the relevant change of site circumstances or new information that had emerged). The result of this scoping exercise found we needed to assess the following 19 sites:

- S50SK: St James Church, St James’ Road
- S54SK: King’s Stairs Gardens
- S55SK: Southwark Park, Jamaica Road
- S76SK: Chambers Wharf
- S003T with S004T: Car Park, Vaughan Way/East Smithfield
- S009T: John Orwell Sports Centre, Tench Street
- S010T: Wapping Gardens, Tench Street
- S011T: Waterside Gardens, Wapping High Street
- S012T: Tobacco Dock, Wapping Lane/Pennington Street
- S013T with S014T: Princes Court Business Estate, Wapping Lane
- S015T: Industrial building, Wapping Lane
- S016T: Open space, rear of Garnet Street
- S020T: Shadwell Basin
- S021T: King Edward Memorial Park
- S024T and S025T: Heckford Street
- S036T: Limehouse Basin.

R.3.13 All the other sites on the original long list were scoped out as there had been no change in circumstances necessitating a reappraisal. The potential group of sites listed above were put on the back-check long list. It should be noted that at this stage, consideration was also given to alternative sites suggested by consultees.

R.3.14 The back-check long list sites were then assessed against the engineering, planning, environment, community and property considerations set out in Table 2.2.

R.3.15 The table below summarises the outcome of the ‘back-check’ assessment of the back-check long list of sites. Sites which were assessed as being the least constrained when considered against Table 2.2 considerations
passed to the next phase of assessment. This did not necessarily mean that these sites would ultimately be judged as suitable, but that no significant constraints were identified in relation to the high-level considerations addressed at Table 2.2. Sites that were judged to be more constrained were not recommended to be passed to the back-check draft short list for more detailed assessment. The main rationale for the exclusion of these sites at this stage is summarised in the table.

R.3.16 For sites not excluded at this stage, we then determined how these sites would be assessed at the Table 2.3 assessment based on size. For some sites, this also included examining neighbouring sites to see if they could be used together.

Table R.1 Long list to draft short list for main tunnel sites in zones S6 to S7 (Table 2.2 assessment)

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site name/ description</th>
<th>Recommendation and rationale</th>
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| S50SK   | St James Church, St James’ Road | **Recommendation:** Not to shortlist  
**Rationale:** A church on the site is likely to preclude use of this site. |
<p>| S54SK   | King’s Stairs Gardens    | <strong>Recommendation:</strong> To draft shortlist as a main tunnel site and main tunnel reception/intermediate site. |
| S55SK   | Southwark Park, Jamaica Road | <strong>Recommendation:</strong> To draft shortlist as a main tunnel reception/intermediate site. |
| S76SK   | Chambers Wharf           | <strong>Recommendation:</strong> To draft shortlist as a main tunnel site, a main tunnel reception/intermediate site and a main tunnel reception/intermediate site with a CSO connection tunnel drive. |
| S003T   | Car Park, Vaughan Way/East Smithfield | <strong>Recommendation:</strong> To draft shortlist as a split main tunnel reception/intermediate site with S004T. |
| S004T   | Car Park, Vaughan Way/East Smithfield | <strong>Recommendation:</strong> To draft shortlist as a split main tunnel reception/intermediate site with S003T. |
| S009T   | John Orwell Sports Centre, Tench Street | <strong>Recommendation:</strong> To draft shortlist as a main tunnel site and main tunnel reception/intermediate site. |
| S010T   | Wapping Gardens, Tench Street | <strong>Recommendation:</strong> To draft shortlist as a main tunnel reception/intermediate site. |
| S011T   | Waterside Gardens, Wapping High Street | <strong>Recommendation:</strong> To draft shortlist as a main tunnel reception/intermediate site. |</p>
<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site name/ description</th>
<th>Recommendation and rationale</th>
</tr>
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</table>
| S012T  | Tobacco Dock, Wapping Lane/Pennington Street | Recommendation: Not to shortlist  
Rationale: The site includes Grade I listed building which cannot be demolished. Furthermore, this building has been newly converted to shopping complex. |
| S013T  | Princes Court Business Estate, Wapping Lane | Recommendation: Not to shortlist  
Rationale: The site would be too small without S014T. However, there are employment and linkages to S014T, so there is likely to be an impact on the local economy. |
| S014T  | Princes Court Business Estate, Wapping Lane | Recommendation: Not to shortlist  
Rationale: This site includes a residential block, while it may be possible to exclude it, without it would make the site too small. Also, the site appears to be interrelated to S013T so it looks unlikely that parts of the site could be used without disrupting the operation of this business park. |
| S015T  | Industrial building, Wapping Lane | Recommendation: Not to shortlist  
Rationale: The site is currently being redeveloped as residential property. |
| S016T  | Open space, rear of Garnet Street | Recommendation: To draft shortlist as a main tunnel reception/intermediate site. |
| S020T  | Shadwell Basin | Recommendation: To draft shortlist as a main tunnel site and main tunnel reception/intermediate site. |
| S021T  | King Edward Memorial Park | Recommendation: To draft shortlist as a main tunnel site and main tunnel reception/intermediate site. |
| S024T  | Heckford Street | Recommendation: To draft shortlist as a split main tunnel reception/intermediate site with S025T. |
| S025T  | Heckford Street | Recommendation: To draft shortlist as a split main tunnel reception/intermediate site with S024T |
| S036T  | Limehouse Basin | Recommendation: To draft shortlist as a main tunnel reception/intermediate site. |

NB. The Site ID and Site name/description were used as an internal mechanism to record and describe the site but may be updated if necessary.

R.3.17 Full details are provided in back-check Table 2.2 assessment tables and accompanying plans.
R.3.18 Of the 19 sites identified, 14 were assessed as potentially suitable and passed to the draft short list. Five were eliminated as being unsuitable.

**Assessment of the back-check draft short list sites**

R.3.19 The 14 back-check draft shortlisted sites were then further assessed by the engineering, planning, environment, community and property disciplines, having regard to the considerations set out in Table 2.3 of the SSM.

R.3.20 The table below summarises the outcome of the ‘back-check’ assessment of the draft short list of sites. Sites which were assessed as being the least constrained when considered against Table 2.3 considerations were retained on the back-check short list to pass to the next stage of assessment. This did not necessarily mean that a site would ultimately be judged as suitable, but that no significant constraints were identified in relation to the considerations addressed at Table 2.3. Sites that were judged to be more constrained were not recommended to be retained on the short list for more detailed assessment.

R.3.21 The main rationale for the exclusion of these sites at this stage is summarised below.

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site name/description</th>
<th>Recommendation and rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>S54SK</td>
<td>King’s Stairs Gardens</td>
<td><strong>Recommendation</strong>: Retain on short list as a main tunnel drive site and main tunnel reception/intermediate site.</td>
</tr>
<tr>
<td>S55SK</td>
<td>Southwark Park, Jamaica Road</td>
<td><strong>Recommendation</strong>: Not to shortlist&lt;br&gt;&lt;br&gt;&lt;strong&gt;Rationale:&lt;/strong&gt;&lt;br&gt;- Engineering – Tunnelling and hydraulic considerations make this site less favourable. No direct access to the river.&lt;br&gt;- Planning/Environment – Impact on a large number of designations (more than S54SK), such as Metropolitan Open Land, Site of Importance for Nature Conservation and Historic Park and Garden.&lt;br&gt;- Community – Temporary loss of park, impact on park users and a wide number of sensitive receptors.</td>
</tr>
<tr>
<td>S76SK</td>
<td>Chambers Wharf</td>
<td><strong>Recommendation</strong>: Retain on short list as a main tunnel drive site, a main tunnel reception/intermediate site and a main tunnel reception/intermediate site with a CSO connection tunnel drive.</td>
</tr>
<tr>
<td>Site ID</td>
<td>Site name/ description</td>
<td>Recommendation and rationale</td>
</tr>
<tr>
<td>----------</td>
<td>-------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| S003T    | Car park of businesses, Vaughan Way/East Smithfield         | **Recommendation:** Not to shortlist<br><br><strong>Rationale:</strong>  
  - Engineering – Tunnelling and hydraulic considerations.  
  - Property – Impact on existing businesses and acquisition risks.  
  - Community – Impact on operation of existing businesses. |
| S009T    | John Orwell Sports Centre, Tench Street                     | **Recommendation:** Not to shortlist<br><br><strong>Rationale:</strong>  
  - Community – Potential partial loss of sports and leisure facilities through use of this site is likely to impact on community cohesion, health and wellbeing, equalities considerations as well as a number of potentially sensitive receptors in the surrounding area.  
  - Planning/Environment – There are a number of constraints to the use of this site, mainly transport and amenity impacts. The adjacent site is also a designated Site of Nature Conservation Importance, Conservation Area and Public Open Space.  
  - Property – There is a risk of special land procedures and Rule 5 Equivalent Reinstatement. |
| S010T    | Wapping Gardens, Tench Street                               | **Recommendation:** Not to shortlist<br><br><strong>Rationale:</strong>  
  - Planning/Environment – There are significant constraints to the use of the site with the site designated Public Open Space, a site of Nature Conservation Importance and located within a Conservation Area. Furthermore, road access to site is difficult.  
  - Property – Risk of special land procedures and equivalent reinstatement.  
  - Community – Potential partial loss of public open space, sports and leisure facilities through use of this site is likely to impact on community cohesion, health and well-being, equalities considerations as well as a number of potentially sensitive receptors in the surrounding area. |
### Site ID | Site name/description | Recommendation and rationale
--- | --- | ---
S011T | Waterside Gardens, Wapping High Street | **Recommendation:** Not to shortlist  
**Rationale:**  
- Engineering – Site presents a number of engineering constraints including poor access over canal and under railway bridge.  
- Community – Potential cumulative impact on sensitive receptors including nearby residential properties, community facilities, open space, playground and tennis courts. Use of the site may therefore affect community cohesion, the local economy, the health and wellbeing of the local community and could disproportionately impact on equalities groups.

S016T | Open space, real of Garnet Street | **Recommendation:** Not to shortlist  
**Rationale:**  
- Engineering – Access to the site is poor.  
- Community – Temporary partial loss of the public open space may impact on community cohesion, health and wellbeing, as well as equalities considerations.

S020T | Shadwell Basin | **Recommendation:** Retain on short list as a main tunnel drive site and a main tunnel reception/intermediate site.

S021T | King Edward Memorial Park | **Recommendation:** Retain on short list as a main tunnel drive site and a main tunnel reception/intermediate site.

S024T and S025T | Heckford Street | **Recommendation:** Retain on short list as a main tunnel reception/intermediate site.

S036T | Limehouse Basin | **Recommendation:** Retain on short list as a main tunnel reception/intermediate site.

**NB.** The Site ID and Site name/description were used as an internal mechanism to record and describe the site but may be updated if necessary.

**R.3.22** Full details are provided in back-check Table 2.3 assessment tables and accompanying plans.

**R.3.23** Of the 14 sites on the back-check draft short list, six were assessed as potentially suitable and passed to the final short list, while the remaining eight sites were not shortlisted.
Assessment of the back-check final short list sites

R.3.24 Following back-check the six final shortlisted sites identified for assessment at the next stage were:

Sites identified as suitable for use as main tunnel drive or reception/intermediate sites:
- S54SK: King’s Stairs Gardens
- S76SK: Chambers Wharf
- S020T: Shadwell Basin
- S021T: King Edward Memorial Park.

Sites identified as suitable for use as main tunnel reception/intermediate sites only:
- S024T with S025: Heckford Street – two sites considered together
- S036T: Limehouse Basin.

R.3.25 For some of the sites listed above, the construction layouts considered at phase one are still applicable for consideration at phase two. The SSRs produced for these sites were therefore re-evaluated to consider if any new information would have a bearing on any of the disciplines recommendations. For those sites where we are proposing new configurations and new sites, we conducted a new assessment.

S020T: Shadwell Basin

R.3.26 The presence of an overflow culvert was a significant issue in the original assessment. However, this is no longer required. The engineering recommendation remains suitable for a main tunnel drive site but would change to suitable for a reception/intermediate site because the culvert is not required and the distance of the site from river is not really significant.

R.3.27 Some UDP planning policies are now superseded by the London Borough of Tower Hamlets Core Strategy. However, these are not significant changes that would alter the assessment or conclusion.

R.3.28 There is no change to the property assessment for the reception/intermediate site. However, the assessment for the single main tunnel drive site should be changed from suitable to less suitable on the grounds of special land acquisition risk and the potentially high discretionary purchase costs.

R.3.29 All other discipline recommendations remain unchanged.

S021T: King Edward Memorial Park

R.3.30 The UK Power networks (nee EDF) cable tunnel is no longer a constraint on this site. However, this does not change the engineering recommendation of less suitable.

R.3.31 Some UDP policies have been superseded by the London Borough of Tower Hamlets Core Strategy and some Interim Planning Guidance policies are also relevant. Two additional minor planning applications,
specifically for the Rotherhithe Vent Shaft, are of relevance. None of these changes in circumstances would result in a different conclusion.

R.3.32 There is no change to the property assessment for the reception/intermediate site. However, the assessment for the single main tunnel drive site should be changed from **suitable** to **less suitable** on the grounds of special land acquisition risk and the potentially high discretionary purchase costs.

R.3.33 All other discipline recommendations remain unchanged.

**S024T with S025T: Heckford Street**

R.3.34 The planning recommendation has changed to **less suitable** to reflect employment policy designations. We now have more detailed knowledge of the businesses operating from this site and the conclusions have been amended to reflect this.

R.3.35 There is no change to the recommendation for the reception/intermediate site as **suitable**. However, the assessment would change to **less suitable** if planning permission is granted on the site for residential redevelopment.

R.3.36 All other discipline recommendations remain unchanged.

**S036T: Limehouse Basin**

R.3.37 Some UDP policies have been superseded by the *London Borough of Tower Hamlets Core Strategy* and some Interim Planning Guidance policies are also relevant. An EIA screening opinion for additional moorings for water taxis has been issued, and a planning application for change of use of leisure moorings to residential moorings has been approved. However, there are no significant changes that would alter the assessment or conclusion.

R.3.38 All other discipline recommendations remain unchanged.

**S54SK: King’s Stairs Gardens**

R.3.39 The site was reassessed as:

- a main tunnel site
- a main tunnel reception/intermediate site – north side of site
- a main tunnel reception/intermediate site – south side of site
- a main tunnel reception/intermediate site with CSO connection tunnel.

R.3.40 **Engineering:** This site is assessed **suitable** as a main tunnel drive site because it is large enough to fit all the site facilities, there is no demolition required other than the playground, and wharfage/jetty facilities could be provided. For these reasons, this site is also **suitable** as a main tunnel reception/intermediate site (north side of site) and a reception/intermediate site with a CSO connection tunnel.

R.3.41 However, under the reception/intermediate layout south of the site is considered **less suitable** because of potential issues associated with the alignment of the main tunnel.
R.3.42 **Planning:** Use of King’s Stairs Gardens as a main tunnel drive or reception/intermediate site under all scenarios is considered less suitable. There are a number of planning designations in the adopted Core Strategy that are applicable to the site, including its designation as Metropolitan Open Land and as a conservation area. The site is also surrounded by sensitive receptors, including residential dwellings, a church, convent and the Bosco Centre, which includes a nursery and college.

R.3.43 The use of King’s Stairs Gardens will result in a loss of amenity space. Notwithstanding the metropolitan park deficiency area, which affects the borough as a whole, the immediate area is well served by parks and open spaces locally, especially Southwark Park.

R.3.44 **Environment:** Overall, the site is considered suitable as a main tunnel reception/intermediate site (both options or with a CSO connection tunnel) or a main tunnel drive site. Based on current information, the site is suitable from the perspective of transport, archaeology, built heritage, water resources (hydrogeology and surface water) and flood risk, and noise (for all main tunnel reception/intermediate site options). The site is considered less suitable from the perspective of townscape, ecology, air quality, and noise (for all site options). While use of the site is suitable from the perspective of land quality for the other site layout options, it is considered less suitable under the south reception/intermediate site layout.

R.3.45 **Socio-economic and community:** This site is not suitable for use as a main tunnel drive site and a main tunnel reception/intermediate site with CSO connection tunnel site as the temporary loss of the majority of King’s Stairs Gardens is considered likely to have a severe impact on the local community. The temporary loss of the playground on site and potential impact on the dense residential properties adjacent to the site on both east and west, as well as the church, convent and Bosco Centre adjacent to the south of the site, compound the potential community impact. Both these options would also involve substantial tunnelling works on site and a large jetty in the river.

R.3.46 The site is less suitable for use as a main tunnel reception/intermediate site to the north and south, even though around only half the gardens would be used because of the impacts on the receptors outlined previously. However, these options would not involve tunnelling works on site or a jetty in the river.

R.3.47 **Property:** The site is considered to be less suitable as a main tunnel drive site. A special parliamentary procedure may be required as the foreshore is likely to be Crown land. Furthermore, acquisition costs could be significant, but possibly acceptable. However, the site is suitable as a main tunnel reception/intermediate site under all layout options. Acquisition costs are likely to be acceptable and the site is undeveloped. As with the main tunnel drive option, a special parliamentary procedure may be required.
Appendix R – Chambers Wharf (formerly King’s Stairs Gardens)

**S76SK: Chambers Wharf**

R.3.48 Site S76SK is Chambers Wharf, a redevelopment site within the London Borough of Southwark. Chambers Wharf comprises vacant sites either side of Chambers Street, with the northern part of the site fronting onto the River Thames.

R.3.49 The wider area is largely residential in character with flats overlooking the site, to the east. St Michael’s Roman Catholic Secondary School is located to the southwest of the site with further residential dwellings to the southeast.

R.3.50 The western edge of the site is formed primarily by the rear of Luna House and Axis Court. Luna House fronts the river with Axis Court located to its rear, fronting East Lane. Properties to the rear of these buildings overlook this site. The eastern edge of the site is bounded by Loftie Street and the south by Chambers Street.

R.3.51 Additional land to the south of Chambers Street is required to use the site as a main shaft site. This land is located to the east of St Michael’s Roman Catholic School, adjacent to green space on the corner of Chambers Street and Bevington Street. This land would house temporary offices and welfare facilities to include parking, and no permanent structures would be left on this area of the site.

R.3.52 The site was assessed as a main tunnel drive site and main tunnel reception/intermediate site.

R.3.53 **Engineering:** The site was also assessed as **suitable** for use as a main tunnel reception/intermediate site and reception/intermediate site with a CSO connection as the site is of sufficient size, there is limited demolition required, there is an existing wharf and jetty facilities could be provided. The site is also considered **suitable** for use as a main tunnel drive shaft site, although the site would need to be extended into the river by provision of a temporary deck or cofferdam of sufficient area to include all the site facilities. This structure would also provide access to river transport.

R.3.54 **Planning:** The site is considered **less suitable** as a main tunnel drive site and a reception/intermediate site with CSO connection drive site. A number of planning designations are applicable to the site and it is considered that, with appropriate mitigation measures, these designations are unlikely to be unacceptably impacted upon. However, the site and, in particular, the land to the south of Chambers Street, is in close proximity to St Michael’s Roman Catholic Secondary School, which is considered to be a particularly sensitive receptor both to the construction works and the associated road traffic movements. The use of the site as a main tunnel site or CSO connection tunnel drive site also requires the use of a temporary jetty to transport excavated materials by river, and an additional temporary decked out area over the Thames. This may contravene London Plan policy.

R.3.55 The site is also considered **less suitable** for a reception/intermediate site, although this site configuration would not require jetty facilities.
R.3.56 Environment: Overall, the site was considered suitable as a main tunnel drive or reception/intermediate shaft site or reception/intermediate shaft site with CSO connection, although mitigation will be required to enable the use of site.

R.3.57 Based on information available at the time, the site is considered suitable for a main tunnel site, a reception/intermediate site or a reception/intermediate site with CSO connection tunnel from the perspective of transport, archaeology, built heritage, townscape and water resources (hydrogeology).

R.3.58 The site was, however, considered less suitable as a main tunnel site, a reception/intermediate site or a reception/intermediate site with CSO connection tunnel from the perspectives of flood risk, ecology, air quality, noise and land quality. The site is also considered less suitable as a main tunnel site from the perspective of water resources.

R.3.59 Socio-economic and community: This site is considered less suitable as a main tunnel site due to the close proximity of the works area to residential property and the large number of residential properties either adjacent, overlooking or opposite the site. In addition, works appear likely to impact on properties in the vicinity and potentially St Michael’s RC Secondary School and Riverside Primary School.

R.3.60 This site is also considered less suitable for a reception/intermediate site, both with and without a CSO connection tunnel. The reduced scope of work and area of land required suggests it may be possible to manage some of the most potentially disruptive construction works within the site to increase the separation distance between the works and the residential properties adjacent to the east and west. It should also be possible to mitigate potential impacts on other residential properties in the vicinity and prevent disruption to St Michael’s RC Secondary School.

R.3.61 Property: The site was considered suitable as a main tunnel drive or reception/intermediate site, with or without a CSO connection tunnel. The site is not a developed site, having recently been cleared for redevelopment. Furthermore, the land is under Thames Water ownership. However, the foreshore is likely to be Crown land and the riverbed held by the PLA. Also, the permanent structure will need to be located in order to minimise impact on redevelopment of the remaining site.

R.4 Preferred site recommendation

R.4.1 Following the completion of the back-check process, a multidisciplinary workshop was held to choose the most suitable sites in main tunnel zones S6 Shad and S7 Limehouse out of all the shortlisted sites (see main report, Table 6.1). These were identified as Chambers Wharf for Zone S6 Shad and King Edward Memorial Park for Zone S7 Limehouse. In coming to this decision, this workshop took into account the SSR findings, feedback received during the phase one consultation and additional engagement activities.

R.4.2 These sites were then used in main tunnel drive options (see main report, Table 6.2). It was then necessary to compare drive options that used King
Edward Memorial Park with those that used Chambers Wharf (as described in R.4.6 below).

**Figure R.2 Location of main tunnel preferred and shortlisted main tunnel sites**

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**R.4.3** In summary, S76SK: Chambers Wharf was identified as the most suitable site for Zone S6 Shad for the following reasons:

- Chambers Wharf is an available and feasible brownfield site that has already been earmarked for redevelopment, while King’s Stairs Gardens is a greenfield site.
- Use of the site would not interfere with the future redevelopment plans of this cleared site.
- Chambers Wharf would have better river access through the construction of the cofferdam. New wharfage/jetties would need to be constructed at King’s Stairs Gardens to allow the removal of excavated materials and delivery of construction materials to site.
- Use of Chambers Wharf provides greater flexibility in terms of drive options for constructing the eastern sections of the main tunnel as the site was assessed as suitable for a main tunnel drive site, while King’s Stairs Gardens had only been assessed as suitable for a main tunnel reception shaft site – these drive option considerations are set out in more detail below.
- Use of Chambers Wharf is likely to cause less disruption to the Thames Path as it is already diverted around the site.
- Use of this site will have less impact on the natural and built environment than is likely to be the case at King’s Stairs Gardens.
• Planning policies are more favourable to the use of the Chambers Wharf than King’s Stairs Gardens.

• Use of this site presents less programme risks and enabling works can also be progressed more easily.

R.4.4 The workshop also recognised that Chambers Wharf, like King’s Stairs Gardens, has a number of residential properties in close proximity to the proposed works, so mitigation will be required to reduce the potential impacts of construction activities.

Tunnelling strategy

R.4.5 The main report discusses the decision (made by all disciplines at a multidisciplinary workshop) to favour drive options that used Chambers Wharf over the alternative drive options that use King Edward Memorial Park in Zone S7: Limehouse (see main report, Section 6.6, Comparison 1). It goes on to describe tunnelling options and drive option comparisons that involve Chambers Wharf (see main report, Section 6.6, Comparison 3, options A-C).

R.4.6 In summary, for zones S6 Shad and S7 Limehouse, we selected, in our multidisciplinary workshop, S76SK: Chambers Wharf as the most suitable site main tunnel drive or reception site, but due to site size and programme, this site can only support a drive in one direction. In Zone S11 Abbey Mills we selected S84: Abbey Mills Pumping Station as the most suitable main tunnel drive or reception site (see Appendix W). We selected Greenwich Pumping Station as the most suitable site to drive or receive the Greenwich connection tunnel (see Appendix V).

R.4.7 The workshop using the most suitable sites listed in paragraph R.4.6 above was then used to discuss the tunnelling option comparisons. The three drive options were considered to construct the eastern sections of the main tunnel, and the Greenwich connection tunnel required to pick up the Earl Pumping Station CSO and Greenwich Pumping Station CSO so they can be connected to the main tunnel. Summary of the options:

• **Option A1:** Drive the main tunnel from S84NM: Abbey Mills Pumping Station to S76SK: Chambers Wharf and drive the connection tunnel from S76SK: Chambers Wharf to C33XV: Greenwich Pumping Station. Option A2 is the same, but would reverse the drive of the connection tunnel so it would be driven from C33XV: Greenwich Pumping Station.

• **Option B:** Drive the main tunnel from S84NM: Abbey Mills Pumping Station to S76SK: Chambers Wharf and drive the connection tunnel from C33XV: Greenwich Pumping Station to S76SK: Chambers Wharf.

• **Option C:** Drive the main tunnel from S76SK: Chambers Wharf to S84NM: Abbey Mills Pumping Station and drive the connection tunnel from C33XV: Greenwich Pumping Station to S76SK: Chambers Wharf.

R.4.8 On balance, based on the above drive options assessment, it was decided to drive the eastern section of the main tunnel from S76SK: Chambers Wharf to S84NM: Abbey Mills Pumping Station (see main report, Section
6.6, Comparison 3, options A-C). A summary of the key reasons for this decision:

- Further technical work and discussions with the Lee Tunnel project team and Olympic Delivery Authority on their experience for the Olympic Park has shown that transporting materials to and from S84NM: Abbey Mills Pumping Station by the River Lee is highly undesirable when material needs to be transported daily over a two- to three-year period. This level of barge movements would be required if the site was used as main tunnel drive site, given the volume of excavated material that would be produced.

- At S76SK: Chambers Wharf, 1,500 tonne barges or potentially larger ones can be used on the River Thames to remove excavated material produced by a main tunnel drive site, while at S84NM: Abbey Mills Pumping Station there are more constraints in using Bow Creek to remove excavated material due to the fact that only small 350 tonne barges could be used during a short tidal window.

- Use of S76SK: Chambers Wharf as the main tunnel drive site avoids the need to work in Channelsea River, which avoids the potential health and safety risks associated with the contaminated materials in the river. Also means less impact on the foreshore ecology and water resources at Abbey Mills.

- Work to construct campsheds and wharf facilities in the Channelsea River at S84NM: Abbey Mills Pumping Station has been assessed as introducing high health and safety risks, including the handling of contaminated materials, whereas this risk does not exist at S76SK: Chambers Wharf.

- Driving the connection tunnel from Greenwich means that the main tunnel can be driven from Chambers Wharf, allowing excavated materials from the larger main tunnel to be removed by river (see the main report, Section 6.6, Comparison 3 and Section 6.8 and the Greenwich Pumping Station site information paper).

R.4.9 On the basis of the assessments described above and professional judgement, overall it was agreed **S76SK: Chambers Wharf should become the recommended phase two preferred main tunnel drive site**.

R.4.10 Figure R.3 below shows the preferred sites and tunnelling strategy for the construction of the eastern section of the main tunnel.
R.5 Site development

R.5.1 Following the selection of Chambers Wharf as the recommended preferred site, further feedback from stakeholders and ongoing scheme development work have contributed to a number of further site changes.

Engagement with stakeholders

R.5.2 Engagement with stakeholders has been ongoing and has continued beyond the phase one consultation period. This has resulted in continual development of our proposals to take on board the comments made by stakeholders.

R.5.3 We have engaged with community and interest groups through ongoing meetings and correspondence. Furthermore, we have had regular meetings and workshops with officers from the London Borough of Southwark, Transport for London (TfL), the Environment Agency and English Heritage and our other pan-London stakeholders with respect to developing the design and construction of our works, mitigating our impacts on the river and the scope of our environmental assessments. To ensure our design process is transparent, we undertook a series of design reviews, hosted and chaired by the Design Council CABE (formerly the Commission for Architecture and the Built Environment). The review for Chambers Wharf was attended by the London Borough of Southwark and our pan-London stakeholders.
R.5.4 We have undertaken a series of drop-in sessions to present and discuss the potential suitability of Chambers Wharf as an alternative preferred site. These comments have been considered and details are provided in the *Interim engagement report*.

**Construction layout**

R.5.5 In response to stakeholder engagement, phase one consultation responses and scheme development, the construction layout of the site has been altered to minimise impact on the local community and environment, and is guided by operational and functional requirements. Particular factors at this site that have influenced the layout are as follows:

- While continuous tunnelling is taking place, the working area would be enclosed in a temporary, purpose-built building which would significantly reduce noise levels.

- A one-way system would operate for construction vehicles through the site. This would improve site and highway safety by reducing the need for construction vehicles to reverse.

R.5.6 Further information on the construction logistics and the site layouts for the construction and operational phases can be found in the *Chambers Wharf site information paper*.

**Design**

R.5.7 Since this site was selected as our recommended preferred site, we have also progressed the design for the permanent use and look of Chambers Wharf, taking into account comments made at our phase one consultation and the ongoing engagement with stakeholders, including the London Borough of Southwark and other technical consultees.

R.5.8 Full details of design development for Chambers Wharf are provided in the *Design development report*.

**R.6 Phase two consultation**

R.6.1 A final preferred sites workshop was held in summer 2011 to verify the choice of preferred sites and to consider any outcomes of further engagement and scheme development. The conclusion reached was that **S76SK: Chambers Wharf should become the phase two consultation preferred site for a main tunnel drive site to construct the eastern section of the main tunnel**.

R.6.2 Site C33XV: Greenwich Pumping Station was also confirmed as a drive site for the connection tunnel to pick up the Greenwich Pumping Station, Deptford Street and Earl Pumping Station CSOs and S93WH: Kirtling Street was confirmed as a main site which would be used to drive the main tunnel to S76SK: Chambers Wharf.

R.6.3 Phase two consultation will provide an opportunity for the public to comment on our revised preferred site and scheme for the Thames Tunnel project, before we publicise our proposed application.