



The Sizewell C Project

6.4 Volume 3 Northern Park and Ride Chapter 3 Alternatives and Design Evolution

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Figures

None provided.

Appendices

None provided.

3 Alternatives and Design Evolution

3.1 Introduction

3.1.1 In accordance with Schedule 4 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (hereafter referred to as the “EIA Regulations”) (Ref. 3.1), this chapter of the **Environmental Statement (ES)** presents a description of the main alternatives considered in relation to the proposed northern park and ride at Darsham (herein referred to as the ‘proposed development’).

3.1.2 The site selection and design evolution process for the proposed development has been iterative and informed by consultation with statutory consultees and the public.

3.1.3 This chapter provides details of the supporting studies and assessment that have informed the final design choices for the proposed development, taking into account potential environmental, transport and socio-economic impacts, where relevant. In summary this includes the following:

- alternative sites considered for the proposed development; and
- alternative layouts, including sizing, land uses, access and landscaping.

3.1.4 This includes details of how the choice of site and layout have been influenced by environmental, transport and socio-economic considerations.

3.1.5 This chapter should be read in conjunction with **Volume 1, Chapter 5** of the **ES**, the **Transport Assessment** (Doc Ref. 8.5) and the **Planning Statement** (Doc Ref. 8.4), which provides further details on the strategic site selection process for the park and ride facilities. Further details on the formal Stage 1 Consultation, Stage 2 Consultation, Stage 3 Consultation and Stage 4 Consultation are described in the **Consultation Report** (Doc Ref. 5.1).

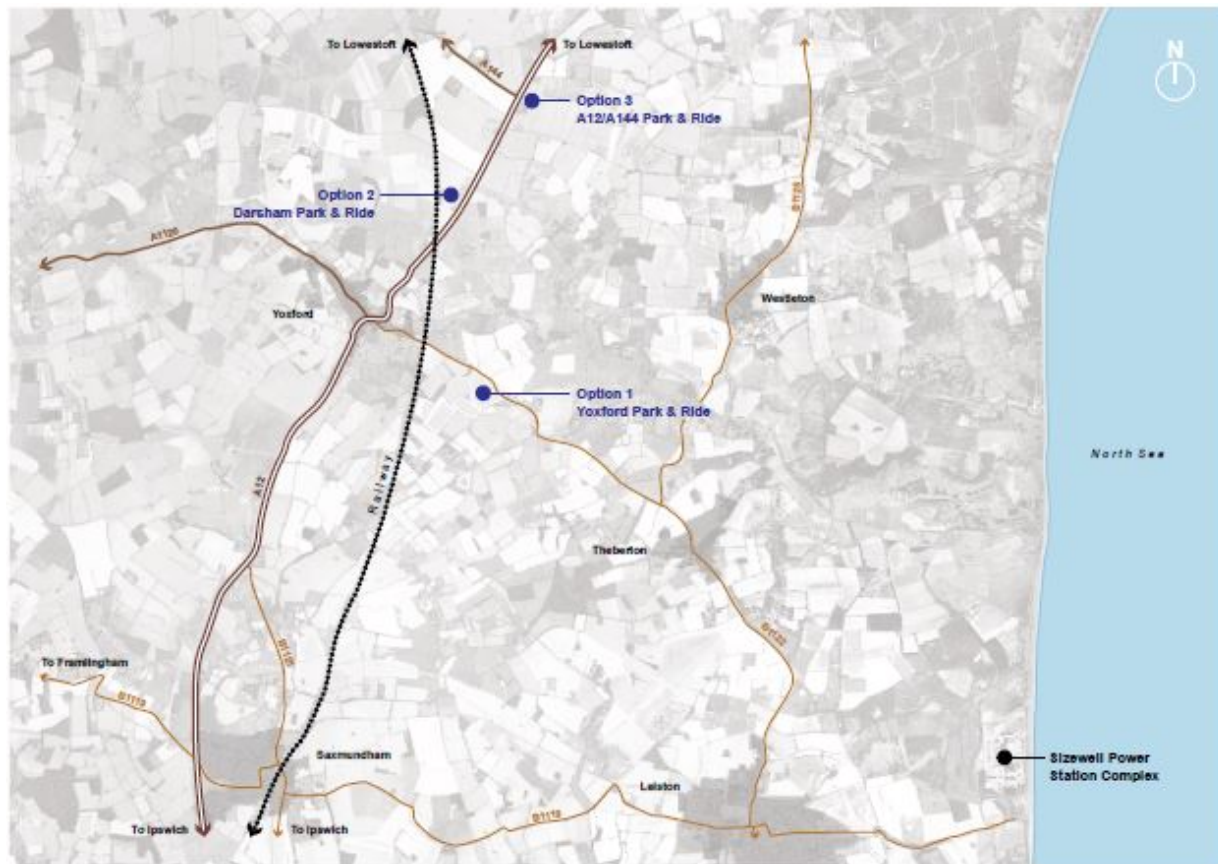
3.2 Alternative sites

a) Background

3.2.1 To reduce the amount of additional traffic generated by the construction workforce on local roads, and through local villages, park and ride facilities were proposed. By having a park and ride facility located adjacent to the A12, a significant number of Sizewell C construction worker vehicle movements would be taken off the wider highway network close to the main development site.

- 3.2.2 In considering appropriate locations for the park and ride sites, the Sizewell C Transport Strategy and Supporting Information that accompanied the Stage 1 Consultation anticipated that the majority of the construction workforce would use the A12. Therefore, two sites (one north of Yoxford and the other south of Saxmundham) were sought along this road to cater for those travelling from both directions. Both park and ride sites would also intercept traffic movements from locations west of the A12.
- 3.2.3 Further detail on the rationale for proposing two park and ride facilities, one to the north and one to the south of the Sizewell C main development site, is detailed in **Volume 1, Chapter 4** of the **ES**.
- 3.2.4 The principal consideration in the location of the northern park and ride site was to reduce the volume of traffic passing through smaller settlements, such as Yoxford, Middleton Moor, and Theberton, and to reduce traffic volumes on the A12 and the local road network east of the A12.
- 3.2.5 Having identified the benefits of intercepting construction worker vehicle movements in these general locations, SZC Co. commenced a site selection exercise to identify potentially suitable locations. This exercise is described in the Site Selection Report, appended to the **Planning Statement** (Doc Ref. 8.4).
- 3.2.6 SZC Co.'s Sizewell C gravity model, which estimated the residential location of the peak construction workforce provided in **Volume 2, Chapter 9** of the **ES**, informed the required number of car parking spaces at each of the park and ride facilities. At the Stage 1 Consultation, for the northern park and ride, it was determined that over 1,000 car parking spaces would be required, together with other infrastructure and on-site storage areas (this number changed in later stages of consultation as described later in this chapter).
- 3.2.7 Three sites were considered to be potentially suitable as a park and ride facility north of the Sizewell C main development site, as illustrated in **Plate 3.1**.

Plate 3.1: Stage 1 Consultation: northern park and ride options.



3.2.8 These sites were presented as options at the Stage 1 Consultation. Each of the three site options comprised ‘greenfield’ sites in agricultural use.

Table 3.1: Description of the three northern park and ride options at the Stage 1 Consultation.

Option 1 (Yoxford).
<ul style="list-style-type: none"> • This option would have been approximately 23 hectares (ha) and located next to the B1122 (Yoxford Road), north of Littlemoor Road and approximately 1.5 kilometres (km) to the south-east of Yoxford. • Option 1 was comprised of arable fields separated by hedges. A residential property, and a care home, Norwood House, stand at the junction of the B1122 and Littlemoor Road, at the eastern corner of the site. • The southern half of the site, and the section along the B1122 frontage were reasonably well screened locally, whereas the inclining ground on the central portion would have made it more open in aspect, with potential long-distance views from the generally higher ground to the north of the B1122 (Yoxford Road). • The site had no public rights of way (PRoW) passing through it, or adjoining its boundaries. • No designated heritage assets were located within the site, although three listed buildings were within 500 metres (m) of the eastern site boundary, and one at just over 500m from the western site boundary.

- No statutory designated ecological sites were within or immediately adjacent to the site. The site was within 150m to the south of the Minsmere River Special Landscape Area (SLA).

Option 2 (Darsham).

- This option was approximately 30ha and located west of the village of Darsham. The site lies to the north of Darsham railway station, between the A12 to the east, and the East Suffolk line to the west.
- The site is currently part of an agricultural holding. The surrounding area is dominated by agricultural fields separated by hedgerows and pockets of woodland, with the closest residential properties located along the A12, adjacent to the site boundary. Darsham service station and Darsham Nurseries, including a shop and café, are located adjacent to the southbound A12 carriageway opposite the site.
- The site is relatively open and there are views across the site from individual properties in close proximity, as well as adjoining roads and nearby footpaths.
- No PRoWs are located within the site boundary.
- An on-road Sustrans link to a National Cycle Route runs from Darsham railway station, northwards along the A12 and then turns west, crossing the site along Willow Marsh Lane.
- There are no designated heritage assets or listed buildings located within or immediately adjacent to the site.
- There are no statutory designated ecological sites within or immediately adjacent to the site. The site lies approximately 600m to the north of the Minsmere River SLA.

Option 3 (A12/A144) Junction.

- This option was approximately 15ha in area and located to the east of the A12 opposite the A12/A144.
- Option 3 included the former ‘Little Chef’ (now closed) on the existing minor road junction. The site was in agricultural use and was generally flat with a slight slope from west to east.
- No PRoWs passed through the site or adjoined the site boundaries.
- No designated heritage assets were located within the site. However, one Grade II listed building (Stone Cottage) was located within 250m (on the other side of the A12 at the junction between the A12 and A144). There was also potential for below ground archaeological remains (there was a Scheduled Monument approximately 700m south-east of Option 3).
- No statutory designated ecological sites were within 1km of the site. The River Yox SLA was located approximately 1.7km to the south.

3.2.9 The analysis of environmental, transport and socio-economic impacts associated with the three options is set out in the following sections.

i. Environmental considerations

3.2.10 Option 1 (Yoxford Road) would have been the most constrained of the three options in terms of landscape and visual impacts, due to the Minsmere River SLA to the north. The increase in the number of vehicles travelling along the B1122 would have also had the potential to impact on the amenity of residential properties located along this stretch of the highway. This option would have been located furthest from the A12, and so would not have had the benefit of intercepting traffic on the A12 prior to

reaching the B1122. This would have resulted in a greater number of vehicle movements on the B1122.

3.2.11 At Option 2 (Darsham), there was potential for amenity impacts on the residential properties along the A12, adjacent to the eastern boundary of the site. There was also the potential for there to be bat habitat in the woodland along the western boundary. However, it was considered that these impacts were capable of being managed by way of careful layout design and appropriate boundary treatment (such as bunds or fencing), so that no significant impacts would occur.

3.2.12 As no designated heritage assets were located within the site boundary or the 250m study area around the site, no significant residual effects on the terrestrial historic environment were anticipated.

3.2.13 Of the three options, Option 3 (A12/A144 Junction) would have had the highest number of residential properties close to its site boundary. However, Option 3 had a greater level of existing boundary screening, which had the potential for new planting and also scope for layout flexibility. Similar to Option 2, there would have been potential for bat habitat within the existing woodland to the west and north of the site. However, it was considered that any potential impacts on this habitat could have been minimised with appropriate design mitigation. Option 3 could also have had an adverse impact on the setting of the Grade II listed cottage located on the junction of the A12/A144.

3.2.14 Both Option 1 (Yoxford Road) and Option 3 (A12 and A144 Junction) were more distinctly rural in character than Option 2 (Darsham). This meant that Option 2 was preferable as its location and setting was considered to result in fewer environmental impacts than the other two options. The increased traffic along part of the B1122 and visibility from the Minsmere River SLA made Option 1 (Yoxford Road) the least preferable site.

ii. Transport considerations

3.2.15 Option 1 would have been well placed to intercept southbound commuter traffic from the A12 near Yoxford. It is also ideally placed to intercept commuters travelling east along the A1120, without the need to divert north along the A12, as would be required with the other two options. The site would not have any beneficial impact on traffic flows through Yoxford, but would reduce traffic passing through Theberton. Initial transport assessments also noted that this site would increase the number of vehicles travelling along the B1122, with potential for amenity effects to the residential properties located along this stretch of the highway. During the consultation, the Suffolk Coastal District Council stated that Option 1 should

be discounted as it was too close to the main development site, and therefore would not have the benefits that a park and ride should offer.

- 3.2.16** Being in close proximity to Darsham railway station, Option 2 (Darsham) had the ability to facilitate worker interchange between rail and bus. As such, it was considered to have the most potential to reduce overall traffic movements compared with the other site options, as workers travelling by train would not require any additional vehicle movements to get to the park and ride site.
- 3.2.17** Option 3 (A12 and A144 Junction) was the option located furthest from the Sizewell C main development site, and would have required some workers to divert further north to make use of it (an additional 3.2km north on the A12 for workers travelling east on the A1120, substantially increasing journey times when compared to Option 2). Option 3 would have been less disruptive to existing traffic on the A12 as southbound vehicles would not have needed to cross the carriageway to enter or leave the site. However, there were concerns over the capacity of the existing A12 and A144 junction.
- 3.2.18** Both Options 2 and 3 would have avoided additional car movements on the B1122, although these options would have required workers joining the A12 from the A1120 to take a slightly longer route (by 1-2km) to reach the park and ride site.
- 3.2.19** Whilst potential highway safety issues were identified in relation to the access arrangements at Option 1 (Yoxford Road) and Option 3 (A12/A144 Junction), it was considered that these could have been resolved through road improvement works, including appropriate junction design. An initial assessment in respect of Option 2 (Darsham) indicated that the proposed junction arrangements in the Stage 1 Consultation would be able to operate safely in all the traffic movement scenarios considered.
- 3.2.20** Overall, Option 2 (Darsham) was considered to be preferable from a transport perspective as it offered the potential to reduce overall traffic movements by acting as a rail and bus interchange, as well as a car and bus interchange. It was also considered to be the best option in terms of highway safety for access. A location on the A12 for the park and ride was also considered the most suitable as it would enable traffic to be intercepted on the network prior to reaching the B1122.

iii. Socio-economic considerations

- 3.2.21** Option 1 (Yoxford Road) would have been the least likely to generate socio-economic benefits due to its rural location away from existing businesses. Furthermore, concerns were raised during the Stage 1 Consultation relating to the potential for adverse impacts on the Norwood House care home.

3.2.22 Option 2 (Darsham) was considered to offer a number of socio-economic benefits, including the potential for increased business to the nearby Darsham service station and Darsham Nurseries, shop and café.

3.2.23 Option 3 (A12/A144 Junction) may have generated some increased business activity in the surrounding area, although to a lesser extent than compared to Option 2 (Darsham). Businesses with the potential to benefit would have included the nearby caravan park and golf course, and, to some extent, local businesses at Darsham.

iv. Conclusions

3.2.24 Option 2 (Darsham) fulfilled the requirement of the park and ride facility to reduce the amount of additional traffic generated by the construction workforce on local roads and through local villages such as Yoxford, Middleton Moor and Theberton. Being adjacent to the A12, a significant number of Sizewell C construction worker vehicle movements would be taken off the wider highway network close to the main development site.

3.2.25 Whilst all three options would have given rise to environmental impacts, the increased traffic along part of the B1122 and visibility from the Minsmere River SLA, made Option 1 (Yoxford Road) the least favourable. Option 3 (A12/A144 Junction) would have had the potential to impact on a greater number of residential dwellings than Option 2 (Darsham) and also the setting of a nearby Grade II listed cottage.

3.2.26 The anticipated environmental impacts associated with Option 2 (Darsham) were considered capable of being mitigated. Option 2 (Darsham) is also less rural in character than Option 1 (Yoxford Road) and Option 3 (A12/A144 Junction).

3.2.27 Option 2 (Darsham) was considered to be preferable from a transport perspective as it offers the potential to reduce overall traffic movements by acting as a rail and bus interchange, as well as a car and bus interchange, and would intercept traffic on the local transport network prior to reaching the B1122. It was also considered to be the best option in terms of highway safety for access.

3.2.28 Option 2 (Darsham) was considered to offer a number of socio-economic benefits, including the potential for increased business to the nearby Darsham service station and Darsham Nurseries, shop and café.

3.2.29 Option 2, a park and ride at Darsham, was therefore considered to be the most appropriate site for the location of the northern park and ride, and was selected as the location for the proposed development.

3.3 Alternative designs and design evolution

3.3.1 This section provides a summary of the evolution of the design of the proposed development, including the alternative designs considered, and modifications made throughout the design process, including any environmental considerations which have led to those modifications.

a) Stage 1 Consultation

3.3.2 Each of the three options presented at the Stage 1 Consultation illustrated initial concepts for the layouts of the sites, including indications of where the hard surfacing and buildings would be located, with 5–10m buffers between existing properties and businesses and the site boundaries.

3.3.3 For Option 2 (Darsham), the main aim of the design was to position buildings, parking and structures as far as practicable to the southern end of the site. The rationale was that this would concentrate the key operational elements near the existing built-up area, which comprised a number of businesses including Darsham service station, Darsham Nurseries and Darsham railway station.

3.3.4 As shown in **Plate 3.2**, the car parking areas were proposed in the centre of the site, and the buildings were proposed to the south of the site with landscape screening proposed along the southern, eastern and northern boundaries of the site. Additionally, the possibility of co-locating an induction centre and postal consolidation facility at the northern park and ride facility was consulted on.

Plate 3.2: Stage 1 Consultation: Park and Ride Darsham – masterplan.



b) Stage 2 Consultation

3.3.5 At the Stage 2 Consultation, SZC Co. presented a more detailed masterplan for the chosen option of a park and ride at Darsham, as illustrated in **Plate 3.3**, although Option 3 (A12/A144 Junction) was held in reserve. The site was again designed to minimise the visual impact of the park and ride facility by positioning the main facilities, which included buildings, a bus terminus area and an internal road network accessed off the A12, at the south of the site, close to the surrounding commercial development and Darsham railway station.

3.3.6 By the Stage 2 Consultation, the preference was for the induction centre to be located at the Sizewell C main development site provided in **Volume 2** of the **ES**, as this would offer the greatest efficiencies for the Sizewell C Project, allowing for the management and integration of induction activities into the wider operation of the construction site and accommodation campus. The postal consolidation facility, which had formed part of the northern park and ride facility during the Stage 1 Consultation, was proposed to be located instead within the southern park and ride facility

provided in **Volume 4** of the **ES**, due to that facility's closer proximity to larger distribution centres in Ipswich.

- 3.3.7** The landscaping design was also further developed at the Stage 2 Consultation, with consideration for minimising potential impacts on ecological, heritage and landscape and visual receptors. A 20m buffer zone and sustainable drainage infrastructure (proposed as surface water attenuation) was located such that it would separate the parking area from Little Nursery Wood. This would help to minimise the potential impacts of noise and light spill on the woodland habitat. Additionally, it was proposed that excess material would be stored on-site, and used to create landscape bunds at appropriate locations. The site masterplan, as illustrated in **Plate 3.3**, shows the provision of a 3m high landscape bund along part of the eastern boundary, which would provide visual and acoustic screening between the park and ride site and the closest existing residential dwellings (Moate Hall, Darsham Cottage and White House Farm).
- 3.3.8** A lighting strategy was also developed for the Stage 2 Consultation, providing perimeter lighting of the facility, and within the car parking areas for security and safety reasons. Consideration was given to minimising potential impacts on neighbouring residential properties and ecological receptors, given the value of dark skies in the locality.
- 3.3.9** The masterplan presented at Stage 2 Consultation is shown in **Plate 3.3**.

Plate 3.3: Stage 2 Consultation: Darsham park and ride – masterplan.



3.3.10 As part of the Stage 2 Consultation, some respondents were concerned about the potential noise and light pollution, and the associated impacts on residents and the local wildlife. However, it was considered that the impacts of noise and light pollution could be mitigated by way of careful layout design and appropriate boundary treatments (such as bunding and fencing). Following the Stage 2 Consultation, SZC Co. carried out further surveys to ensure that appropriate mitigation could be accommodated to address any impacts on local habitats and wildlife.

3.3.11 In addition, some respondents were concerned about the local hydrology being negatively impacted, and whether the additional surface water run-off would lead to increased flood risk for residential properties and local habitats and species, including European otters and great-crested newts.

3.3.12 Suffolk County Council and Suffolk Coastal District Council (now part of East Suffolk Council) raised concerns about the size of the Darsham site, and whether the area could be consolidated. In addition, they raised concerns over the location of the proposed vehicular access to the site which would have been close to Darsham railway station, the level crossing and accesses for the Darsham service station and Darsham Nurseries. There was concern that adding another vehicular access point in this location could contribute significantly to congestion and potentially create a bottleneck on the A12, particularly because vehicles accessing the park and ride from the south would need to cross the A12 to enter the site. The proposed access to the Darsham site was a concern shared by the general public in response to the Stage 2 Consultation.

3.3.13 Furthermore, some respondents were concerned that the rural character of Darsham would be harmed by the impacts of the proposed development.

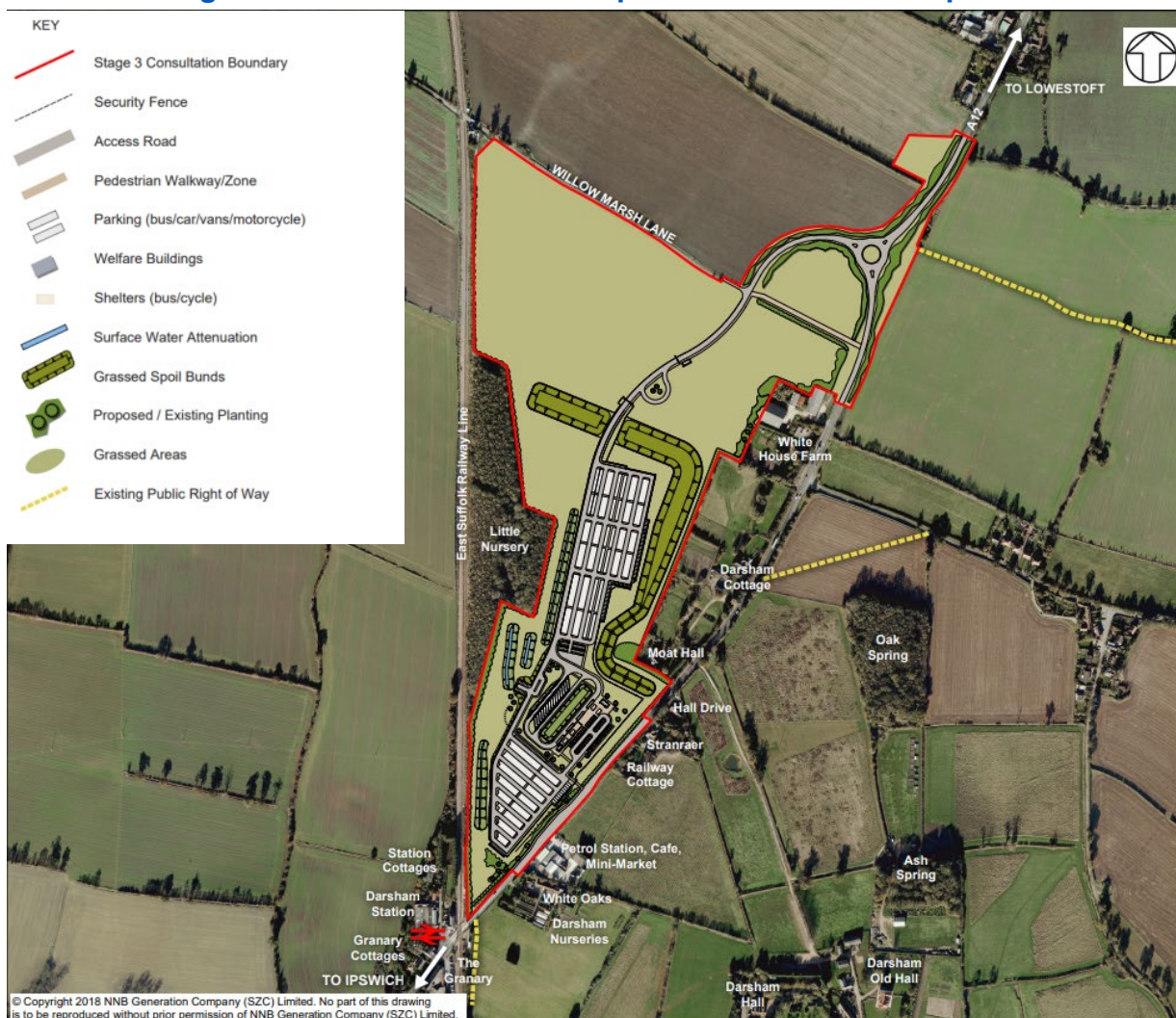
c) Stage 3 Consultation

3.3.14 The Stage 2 Consultation feedback showed that there was continued support for a northern park and ride as an appropriate way to capture traffic on the A12 from the north. The majority of respondents agreed that Darsham was an appropriate site for this facility. At the Stage 3 Consultation, Darsham continued to be the preferred site for the northern park and ride, and Option 3 (A12/A144 Junction) was no longer held in reserve. Additional surveys of the site were undertaken to develop a greater understanding of the environmental baseline which had fed into the design proposals.

3.3.15 In response to feedback received at the Stage 2 Consultation, a northern access to the site was proposed at the Stage 3 Consultation. This access was proposed to include a roundabout on the A12 to the north of the existing Willow Marsh Lane junction to take southbound vehicles off the A12 earlier, avoiding the residential and commercial properties on the A12 further south. The access road would form the western arm of the roundabout and enter the site at its northern end.

3.3.16 The masterplan for the site presented at the Stage 3 Consultation is shown in **Plate 3.4**.

Plate 3.4: Stage 3 Consultation: Darsham park and ride – masterplan.



3.3.17 **Table 3.2** sets out the key project and design changes presented at Stage 3 in response to the Stage 2 Consultation feedback.

Table 3.2: Key project and design changes between the Stage 2 and Stage 3 consultation

Change	Rationale
Access to the northern end of the site via a roundabout on the A12 instead of access from the southern end. Willow Marsh Lane would branch off this access road (see Plate 3.3).	Responding to feedback from Stage 2 about the safety and congestion concerns of a southern access and based on further studies, the access was changed to the north of the site via a new roundabout. It was considered this would be a more appropriate way to capture traffic from the north and minimise congestion at the junction of the A12 and Willow Marsh Lane.

Change	Rationale
An exit loop and security booth at the north of the site on the proposed access road.	This was added to the design to ensure smooth operation of the access to the north of the site.
Changes to parking numbers (1,250 parking spaces as opposed to 1,000).	A greater number of car parking spaces are now proposed, as the traffic modelling at Stage 3 was based on a larger workforce size (7,900) than assumed at Stage 2 (5,600). Although 5,600 was still the expected workforce size, the additional parking provided additional flexibility and robustness.
Layout of landscaping (the northern bunds would be split into two sections to allow the new access road to enter the site from the north).	The northern access road would be required to intersect the landscape bund to enter the operational part of the site.
Surface water features (minor changes to lengths and area of surface water features) were included in the Stage 3 proposals.	Surface water drainage was amended to suit the revised site layout.

3.3.18 The positioning of the parking area behind the landscape bund and set away from Little Nursery Wood to the west was retained from Stage 2 to mitigate potential noise and light impacts on the nearby properties and local wildlife.

3.3.19 A Preliminary Environmental Information (PEI) report produced for Stage 3 concluded that additional appropriate boundary treatment, such as fencing, could be considered if necessary and would be sufficient to mitigate any further harm should it be required.

3.3.20 The PEI also found that, with the implementation of appropriate sustainable drainage systems (SuDS), no significant adverse residual effects would be expected in terms of local hydrology and increased surface water runoff from the Stage 3 proposals.

d) Stage 4 Consultation

3.3.21 Darsham continued to be the proposed site for the northern park and ride at the Stage 4 Consultation. The masterplan for the site presented at Stage 4 is shown in **Plate 3.5**. This was broadly the same as at the Stage 3 Consultation, save for the following updates:

- The site boundary was extended to the north to facilitate land access.
- A route for abnormal indivisible loads was added to the access roundabout.
- The existing alignment of the A12 would be retained for future reinstatement.

3.3.22 The Stage 3 PEI was reviewed in light of the proposed design changes to considered whether there would be any change to the Stage 3 baseline conditions in terms of terrestrial ecology and ornithology, terrestrial historic environment, and soils and agriculture. It was found that the changes would not substantially alter the baseline, mitigation proposals, the assessment of potential impacts or the residual effects for any of the environmental assessment topic areas as presented in the Stage 3 PEI.

e) The proposed development

3.3.23 A combination of public consultation feedback and options testing has determined that Darsham is the most appropriate location for the northern park and ride site. It would allow for the capturing of wider workforce traffic from the north and west of the Sizewell development, reducing the impact of workers commuting to site on the local road network.

3.3.24 The location of the site in Darsham was considered to have the least environmental impact compared to the two alternative options, principally due to its less rural setting and favourable location on the A12 and close to Darsham railway station. The design was developed over the four consultation stages, with measures proposed and refined to mitigate any potential environmental impacts.

3.3.25 The design proposed at Stage 4 has been carried through to the Sizewell C Development Consent Order application based on the PEI assessments carried out at Stage 4, and previously Stage 3 for a similar overall proposal, which demonstrated that the development would be appropriate subject to appropriate mitigation.

3.3.26 The design for the proposed development is described in **Chapter 2** of this volume and illustrated in **Figure 2.1**.

3.3.27 Since Stage 4 Consultation, the following updates have been made:

- reduced site boundary to the west of White House Farm; and
- refinements to the lighting and drainage designs (to include up to three infiltration basins, an existing pond and nine swales).

References

- 3.1 The Town and Country Planning (Environmental Impact Assessment) Regulations 2017