



Net Zero Teesside – Environmental Statement

Planning Inspectorate Reference: EN010103

Volume III – Appendices

Appendix 12D: Bat Survey Report

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)



Prepared by: **AECOM**

Table of Contents

12D. Bat Survey Report	12-1
12.1 Introduction.....	12-1
12.2 Wildlife Legislation and Planning Policy	12-2
12.3 Methods.....	12-3
12.4 Results	12-10
12.5 Conclusions.....	12-18
12.6 References	12-22

Annexes

Annex A	Photographs
Annex B	Results of the Emergence Survey of Structure B1b (Canteen and Welfare Block)
Annex C	Raw Survey Data – 2018 PCC Site Activity Survey
Annex D	Raw Survey Data – 2020 Coatham Sands Activity Survey
Annex E	Results of the 2020 Static Detector Survey at Coatham Sands

Figures

Figure 12D.1 Structures Subject to Preliminary Roost Assessment.....	12-24
Figure 12D.2 Location of Surveyors During the 2020 Emergence Survey at Structure B1b	12-26
Figure 12D.3. Walked Transect and Static Monitoring Locations in 2018 (proposed PCC Site)	12-28
Figure 12D.4 Walked Transect and Static Monitoring Locations in 2020 (Coatham Sands)	12-30

Tables

Table 12D-1: Static Monitoring Survey Dates and Environmental Conditions – August to September 2018.....	12-7
Table 12D-2: Static Monitoring Survey Dates and Environmental Conditions – May to September 2020	12-7
Table 12D-3: Static Monitoring Survey Results – August and September 2018..	12-17
Table 12D-4: Static Monitoring Survey Results – May and September 2020	12-18
Table 12D-5: Assessment of the value of foraging and commuting habitats for the species recorded (PCC Site)	12-20
Table 12D-6: Assessment of the value of foraging and commuting habitats for the species recorded (Coatham Sands)	12-21

12D. Bat Survey Report

12.1 Introduction

- 12.1.3 This report describes the approach and findings of bat surveys undertaken in support of the ecological impact assessment (EclA) of the Proposed Development. The terms of reference used to describe the Proposed Development in this report are consistent with those defined within the main chapters of the Environmental Statement (ES) (Volume I, Document Ref. 6.2).
- 12.1.4 Bat surveys were undertaken in 2018 by Quants Environmental Ltd, on behalf of AECOM, at the former Redcar Steelworks within and adjacent to the land required for the Power, Capture and Compression (PCC) Site (Figure 12.D1) for the Proposed Development. The surveys completed within the PCC Site comprised:
- Preliminary bat roost assessment of eight structures (buildings and other built features such as bridges): B1 to B4, B5a, B5b, B6 and B7. This was an external survey only;
 - Two bat activity walked transect surveys; and
 - Two periods of bat activity monitoring using static recording devices.
- 12.1.5 In 2020, AECOM updated the preliminary bat roost assessment for the structures that would be demolished prior to construction of the PCC Site (structures B1 to B4). During this survey, structure B1 was split into structures B1a to 1c, reflecting the presence of three discrete buildings in this area. All structures were subject to an external inspection, and structure with potential access points for bats were also inspected internally (structures B1a-c, B2 and B3).
- 12.1.6 In 2020, AECOM also completed a suite of monthly bat surveys in suitable foraging habitats with the sand dune system at Coatham Sands, part of Teesmouth and Cleveland Coast SSSI, to investigate the bat interest associated with a complex of rough grassland and wetland habitats at the rear of the dune system. These were considered to be the most suitable habitats for bats at Coatham Sands, so the level of bat activity associated with these habitats would provide a good indication of the quality of the wider foraging habitat resource within Coatham Sands for bats. At the time of survey, options were being considered for the use of open cut pipeline construction methods within the SSSI. However, use of such methods is no longer proposed and instead trenchless construction methods would be used to avoid construction works within the SSSI.
- 12.1.7 The survey data gathered by Quants Environmental Ltd and AECOM has been used to determine the likely baseline importance of the PCC Site and Coatham Sands (part of Teesmouth and Cleveland Coast SSSI) for bats in terms of the species present, their distribution, movements and habitat use.

12.2 Wildlife Legislation and Planning Policy

- 12.2.3 Nine species of bat are known to occur in the Tees Valley (Tees Valley Nature Partnership, 2012). These species (in alphabetical order) are Brandt's bat (*Myotis brandtii*), brown long-eared bat (*Plecotus auratus*), common pipistrelle (*Pipistrellus pipistrellus*), Daubenton's bat (*Myotis daubentonii*), Nathusius' pipistrelle (*Pipistrellus nathusii*), Natterer's bat (*Myotis nattereri*), noctule (*Nyctalus noctule*), soprano pipistrelle (*Pipistrellus pygmaeus*) and whiskered bat (*Myotis mystacinus*).
- 12.2.4 The following wildlife legislation, national planning policy and guidance is specifically relevant to the identification and assessment of potential constraints posed by the presence of the named bats. At this stage of assessment, this legislation, policy and guidance is primarily listed to demonstrate that an appropriate level of survey and assessment has been undertaken to meet likely data requirements for future decision-making regarding these material considerations.
- 12.2.5 Wider relevant biodiversity legislation, policy and guidance is detailed in Appendix 12A Legislation and Policy (ES Volume III, Document Ref. 6.4).
- 12.2.6 The named bat species, and indeed all native bat species, are afforded legal protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended). The relevant aspects of this legislation, when taken together, results in a level of protection that prohibits the intentional, deliberate or reckless:
- killing, injuring, taking or disturbance of bats; and
 - damaging, destroying or obstructing any place used by bats for the purposes of breeding, sheltering or protection.
- 12.2.7 Certain bat species are also listed as 'Species of Principal Importance for Nature Conservation in England' pursuant to Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Section 40 of the NERC Act requires that public bodies have regard to the conservation of biodiversity in England, when carrying out their normal functions. Of the species listed above, this is relevant to brown long-eared bat, noctule and soprano pipistrelle. Despite the presence of the Section 41 list, it is emphasised that the biodiversity duty of public bodies is not specific to the named species and instead this duty applies more broadly.
- 12.2.8 The Government has published standing advice (Natural England and Department of Environment, Food and Rural Affairs (Defra), 2020) to guide decision-makers on the determination of proposals with potential to affect protected species such as bats. The guidance sets out responsibilities and minimum requirements for survey and mitigation.
- 12.2.9 The Overarching National Policy Statement for Energy (EN-1) addresses protected species and species of principal importance, including reptiles, within Part 5.3. This requires that the applicant shows how the project has taken advantage of opportunities to conserve and enhance such species. This report supports this requirement by providing baseline information on reptiles within the Site boundary.

12.3 Methods

- 12.3.3 All survey work was undertaken by appropriately experienced surveyors from Quants Environmental Limited and AECOM.

Bat Commuting and Foraging Habitat Appraisal

- 12.3.4 AECOM appraised the suitability of the PCC Site and adjacent land in 2020, based on observations on habitat quality derived from site walkover surveys and cross-reference to Table 4.1 in Collins (2016).
- 12.3.5 The suitability of Coatham Sands was appraised using online resources (e.g. Google Earth) to permit scoping of requirements for further activity surveys in 2020. At this time, the relative quality of the habitats present for bats was not fully understood and did not become fully apparent until further ecological surveys had been completed in summer 2020 when vegetation was in peak growth. Specifically, the desk-based scoping indicated the potential presence of high-quality wetland habitats, but subsequent field investigation found this not to be the case.
- 12.3.6 The results of these habitat appraisals were used to inform the survey effort applied by AECOM in 2020 and/or interpretation of the 2018 and 2020 bat survey data provided in this report.

Preliminary Roost Assessment of Structures

Quants Environmental Ltd Survey in 2018

- 12.3.7 The Preliminary Roost Assessment (RPA) survey, undertaken by Quants Environmental Limited in 2018, covered all structures of potential value for bats within the potential zone of influence of demolition and construction works for the Proposed Development, and therefore coincided with the location of the PCC Site. At the time of PRA survey, the extent of the land required for the PCC Site was still uncertain, so requirements for survey were broadly defined.
- 12.3.8 PRA is a standardised method (Collins, 2016) for the inspection of the exterior and, if accessible, the interior of a structure to look for features that bats could use for entry/exit and roosting. The aim of survey is to determine the actual or potential presence of bats, the need for additional survey work to investigate this further, and/or likely requirements for risk avoidance and mitigation.
- 12.3.9 Eight potentially relevant structures were identified for survey and were subject to a PRA survey on 8 August 2018. The location of each structure is shown on Figure 12.D1 (including the structures reclassified by AECOM as B1a to 1c), and photographs are provided in Annex A. Based on the final preliminary design of the Proposed Development only structures B1 to B4 are located within the PCC Site.
- 12.3.10 The exterior of the eight structures was assessed from ground level. An internal inspection was not undertaken.

- 12.3.11 The results of the external inspection were used to assign each structure to one of the following five categories of roost suitability based on guidance given in Collins (2016):
- Negligible – unlikely to be used by roosting bats;
 - Low – one or more potential roost features that could be used by individual bats opportunistically;
 - Moderate - one or more potential roost features that could be used by bats but unlikely to support a roost of high nature conservation value (e.g. maternity and hibernation roosts);
 - High - one or more potential roost features that are obviously suitable for use by larger numbers of bats on a regular basis; and
 - Confirmed roost.

AECOM Survey in 2020

- 12.3.12 The approach taken in 2020 was consistent with the approach taken in 2018, with the exception of the following:
- Only structures still relevant to the Proposed Development were surveyed (structures B1 to B4, as shown on Figure 12.D1);
 - Structure B1 was sub-divided into B1a, b and c (as shown on Figure 12.D1); and
 - All structures with access for bats were subject to an internal inspection, as well as an external inspection (structures B1a-c to B3).
- 12.3.13 The results of this more comprehensive AECOM survey updated and replaced the findings of the original Quants Environmental Ltd survey for structures B1a-c to B4 (as previously submitted with the Preliminary Environmental Information Report).

Bat Emergence Survey

- 12.3.14 As a result of the above PRA survey work, a requirement was identified for further presence/absence survey work at one structure within the PCC Site. This structure (B1b) was assessed as having low suitability for roosting bats.
- 12.3.15 To investigate this further, AECOM undertook a dusk bat emergence survey on 15 September 2020, in accordance with the standard methods described in Collins (2016).
- 12.3.16 Three surveyors were used to ensure appropriate coverage of all of the identified features of structure B1b with potential suitability for bats. The survey positions of the three surveyors are shown on Figure 12.D2. Each surveyor was equipped with a Batbox Duet bat detector, and a Song Meter SM2BAT+ static bat detector was positioned at each of the northern and southern ends of the B1b (as shown on Figure 12.D2) to record bat activity over the duration of the survey.
- 12.3.17 The survey team was in position at 19:00 to allow commencement of observations at 15 minutes before sunset (which was 19:20). The survey was completed during a stable period of warm dry weather, with a temperature of 18°C at the time of survey, no rain, light air (Beaufort 1), and

patchy cloud cover (Oktas 4) (see weather categories in Annex D). The survey was completed at 20:50.

- 12.3.18 All bat activity observed or heard was recorded, including records of bat activity in the vicinity of, but not directly related to, the B1b. The results of the survey are provided in Annex B.

Bat Activity Surveys – Walked Transects

Quants Environmental Ltd Survey in 2018 at the PCC Site

- 12.3.19 Two walked bat activity transect surveys (one per month) were undertaken by Quants Environmental Ltd in August and September 2018. The methods applied during each survey visit followed those described in Collins (2016).
- 12.3.20 The transect route is shown on Figure 12D.3. The transect route was walked once per survey.
- 12.3.21 The transect survey involved walking the transect route slowly, with stops at pre-determined Stationary Listening Points (SLPs, see Figure 12.D3), and recording all bat observations on scaled maps with notes on species and activity/behaviour. At each of the SLPs the surveyors stopped for a period of approximately 3 minutes to record all bat activity during that period. Any bat activity observed whilst walking between the SLPs was also recorded. The survey dates, timings and weather conditions are presented in Annex C.
- 12.3.22 Equipment used during the survey comprised a Pettersson D200 bat detector and Echo Meter Touch 2 bat detector.

AECOM Survey in 2020 at Coatham Sands

- 12.3.23 Walked transect surveys were undertaken monthly between the period May to September 2020, and therefore encompass all seasons of the year when bats are active (spring, summer and autumn). Surveys commenced in May as an April visit was not possible due to restrictions imposed by the start of the Covid-19 pandemic. Surveys were completed in September once it became apparent that (a) the habitat conditions were not as optimal for foraging bats as originally anticipated during the original desk-based scoping of survey requirements, and (b) once it was known that the Proposed Development would avoid all habitats of highest potential value to foraging bats (i.e. the ponds and wetland vegetation).
- 12.3.24 The survey approach followed methods described in Collins (2016). All of the surveys were taken at dusk except for the July survey, which was a dusk to dawn survey. Survey visits were undertaken during appropriate weather conditions for detecting bats i.e. an absence of rain and/or strong winds and with air temperatures above 7°C. The survey dates, timings and weather conditions are provided in Annex D.
- 12.3.25 The survey transect route is shown on Figure 12.D4. The transect route was walked twice per survey to ensure adequate coverage of bat activity of all parts of the transect whilst bats were actively foraging/commuting. The transect route was walked at a steady speed in ascending sequence of the identified SLPs (i.e. from SLP 1 onwards), and bat activity was detected and recorded using a handheld full spectrum Elekon Batlogger M bat detector with integrated recording capabilities, heterodyne monitoring and GPS log. Several SLPs were incorporated along the transect route where the

surveyors stopped for periods of typically 3 to 5 minutes to monitor bat activity. All bat activity detected during the surveys is detailed in Annex D and is shown on Figure 12.D4.

Bat Activity Surveys – Static Monitoring

Quants Environmental Ltd Survey in 2018 at the PCC Site

- 12.3.26 Static surveys were undertaken in August and September 2018 based on methods described in Collins (2016) using Anabat Express static bat detectors. Static bat recorders were placed at two locations (see Figure 12.D3) during both survey periods. These locations coincided with the entrance of an underpass (Anabat 1 (A1)) and open ground (A2); both of which were considered likely to be used as foraging/commuting features.
- 12.3.27 Minimum requirements for activity surveys require the monitoring of bat activity during each monitoring period for five consecutive nights during suitable weather conditions. Both static detectors were successful in recording bat passes for 11 nights in August 2018. During September, Anabat 1 recorded for 10 successive nights, however a technical fault with Anabat 2 prevented any recordings beyond the sixth night of the recording period. Minimum survey requirements for five consecutive nights of data were therefore still achieved despite the failure of Anabat 2.
- 12.3.28 The static detectors were manually set to start recording half an hour before the published sunset time and to stop recording half an hour after the published sunrise time. The static bat recorders recorded frequency division¹ bat sound.
- 12.3.29 The weather conditions during the period were mostly dry with occasional light rain. The survey dates and associated environmental conditions are summarised in Table 12D-1. Minimum and maximum temperatures are logged automatically by the device whilst it is activated, so a range of temperatures for each monitoring period is provided. These location specific temperatures may not reflect the weather forecast and associated advised temperatures that were used to select appropriate survey periods, and that otherwise will be determining bat activity in the wider landscape.

¹ Frequency division is one of the 'broad band' systems that simultaneously monitors the full range of frequencies contained within all bat calls.

Table 12D-1: Static Monitoring Survey Dates and Environmental Conditions – August to September 2018

Month	Static detector location	Survey period	Number of nights of data	Air temperature range over survey period
August	A1	08/08/2018 – 18/08/2018	11	5-22°C
	A2	08/08/2018 – 18/08/2018	11	9-24°C
September	A1	13/09/2018 – 22/09/2018	10	5-20°C
	A2	13/09/2018 – 18/09/2018	6	6-21°C

AECOM Survey in 2020 at Coatham Sands

- 12.3.30 Static surveys were undertaken monthly between May and September, based on methods described in Collins (2016) using Song Meter SM2BAT or Song Meter SM2BAT+ full spectrum static bat detectors. The same settings and microphones were used for these detectors.
- 12.3.31 The static detectors were installed at one (May only) or two locations to target habitat features of potential suitability as foraging or commuting habitat for bats. The locations chosen are shown on Figure 12.D4. Data was collected for a period of five consecutive nights during each monthly monitoring period.
- 12.3.32 The static detectors were manually set to start recording half an hour before the published sunset time and to stop recording half an hour after the published sunrise time. Bat calls were recorded in WAV format.
- 12.3.33 The survey dates and associated environmental conditions are summarised in Table 12D-2 (minimum and maximum temperatures are logged automatically by the device whilst it is activated, so a range of temperatures for each monitoring period is provided).

Table 12D-2: Static Monitoring Survey Dates and Environmental Conditions – May to September 2020

Month	Static detector location	Survey period	Number of nights of data	Air temperature range over survey period
May	1	20/05/2020 – 24/05/2020	5	12.3-24.1°C
	2	Not surveyed	-	-
June	1	24/06/2020 – 28/06/2020	None – equipment failure	-
	2	24/06/2020 – 28/06/2020	5	9.6-19.7°C
July	1	20/07/2020 – 24/07/2020	5	13.5–23.9°C

Month	Static detector location	Survey period	Number of nights of data	Air temperature range over survey period
	2	20/07/2020 – 24/07/2020	5	15.1–23.4°C
August	1	17/08/2020 – 21/08/2020	5	17.1–25.2°C
	2	17/08/2020 – 21/08/2020	5	16.5–25.2°C
September	1	14/09/2020 – 18/09/2020	5	10.5–29.2°C
	2	14/09/2020 – 18/09/2020	5	7.1–27.9°C

Analysis of Static Detector Data

- 12.3.34 The bat sound recordings made during the surveys were later analysed using undertaken using BatSound v4 and Analook W software v4.2 to identify the bat species present and calculate an indication of bat activity levels. The number of bat passes recorded was used to calculate a value for the level of bat activity present during the survey period. A bat pass is defined as a single static detector file made up of bat pulses of a single species, therefore a single bat pass may comprise recordings of one or more bats. It is not possible to separate the pulses out to identify the number of bats involved, so the number of bat passes recorded on static detectors cannot be reliably correlated to actual bat abundance. However, it does provide an indication of the level of bat activity at a site over a longer period of time than is recorded during bat activity transect survey.
- 12.3.35 There is no published guidance to inform interpretation of relative levels of bat using static bat detector data. For the purpose of this report, the bat activity levels recorded are classified as follows:
- Very low activity - defined as a mean of <2 passes per hour (per static location);
 - Low activity - defined as a mean of 2 to 25 passes per hour;
 - Moderate activity - defined as a mean of 26 to 99 passes per hour; and
 - High activity - defined as a mean of over 100 passes per hour.

Limitations

- 12.3.36 Access was restricted during the 2018 PRA surveys such that internal inspections and at height external examinations were not possible for most structures. In these cases, the potential of the structures to support bats was assessed visually from ground level. However, this was rectified in 2020 when all relevant structures were subject to an appropriate internal and external inspection.
- 12.3.37 The bat activity, emergence, walked transect surveys and automated surveys in 2018 and 2020 were undertaken in good weather conditions and therefore no limitations have been identified with respect to weather

- conditions. The bat activity emergence survey was completed on 15th September outside the recommended May to August period for this due to restrictions on survey planning due to the covid-19 pandemic. Weather conditions were otherwise suitable for bats to be active and recordable. This is not considered a limitation given the relevant structure, as described in this report, was not considered a potential maternity roost so the later timing of the survey did not result in a risk that such a roost would be missed.
- 12.3.38 The 2018 bat activity walked transect surveys commenced 10 to 20 minutes after sunset. This was due to the site being a large flat open area where there was little or no shade either from topographical features, habitats or structures therefore the environment remained light for some time after sunset. The survey start times were therefore adjusted to take this into account.
- 12.3.39 One of the static bat detectors suffered a technical fault during the September 2018 bat activity survey. However, this is not believed to have been a significant limitation to the surveys when considered in context with the results of the activity surveys, the data collected from the other static recording devices and the fact that the recording period for this month still exceeded the minimum period of five consecutive nights recommended in good practice guidance (Collins, 2016).
- 12.3.40 Overall there were no major limitations to the surveys completed in 2018 and 2020. However, the following is acknowledged.
- 12.3.41 Only one static bat detector (Static 1) was deployed in May 2020 as until the first survey event it was assumed that one static bat detector would be sufficient. Given the patchy distribution of habitats most optimal for bats it was decided to deploy a second static detector from June 2020 to improve habitat coverage.
- 12.3.42 Static bat detector 1 failed to record during June 2020 and there were not enough days left in the remainder of the month to allow it to be re-deployed once the failure was identified. The absence of this dataset is not considered important to the understanding of bat usage of Coatham Sands given the wider survey data strongly indicates that bats only make limited use of the habitats present.
- 12.3.43 The only limitations on the analysis of the survey data arises from issues common to all bat surveys, and therefore these are no survey-specific limitations. Identification of bat echolocation calls recorded by bat detectors is not always possible due to poor recording quality, which can be a result of bats recorded at distance, interference caused by weather or bats altering their calls in response to different environmental factors. The detectability of bat echolocation calls on bat detectors varies between different species of bat and this is taken in account in the assessment (Barataud, 2015). Species identification within a genus is not always possible due to the similar nature of the echolocation calls.
- 12.3.44 As an example of this, four species belonging to the *Myotis* genus are known to be present within the Tees Valley (Tees Valley Nature Partnership, 2012; Bat Conservation Trust, 2018), namely whiskered bat, Brandt's bat, Daubenton's bat and Natterer's bat. There is a significant overlap between the echolocation call characteristics of these species and subsequently a

conclusive identification of *Myotis* bats to species level is rarely possible. When species identification cannot be made such calls are recorded to genus level (e.g. unidentified *Myotis* species) or simply as ‘bat’.

12.4 Results

Bat Commuting and Foraging Habitat Appraisal

- 12.4.3 The potential bat commuting and foraging habitats associated with the PCC Site were assessed as having low suitability in accordance with the definitions given in Table 4.1 of Collins (2016).
- 12.4.4 The PCC Site is located in an exposed setting adjacent to the coast. The associated habitats are open grassland and open mosaic habitats on previously developed land. There are no areas of woodland within or near to the PCC Site, and only isolated small stands of scrub are present. The PCC Site has poor connectivity to areas of habitat more optimal for commuting and foraging bats. Given this, the PCC Site could be used by small numbers of commuting and foraging bats but is unlikely to be specifically attractive to commuting and foraging bats.
- 12.4.5 The adjacent Coatham Sands dune system has many of the same potential limitations on bat use as the PCC Site i.e. the conditions are largely open and even more exposed, there is no substantive woody vegetation, and there is poor connectivity to areas of habitat more optimal for commuting and foraging bats. The initial (pre-survey) desk-based assessment of habitat conditions led to the conclusion that the dune system could be of moderate bat commuting and foraging habitat suitability, due to the inferred presence of extensive ponds and good quality wetland habitat. However, once surveys commenced this was found to be an incorrect assumption, as most of the perceived wetland was actually rough species-poor grassland and dry species-poor reedbed. For this reason, the suitability of the Coatham Sands dune system as potential bat commuting and foraging habitat was kept under review during the survey until vegetation was in peak growth, and then was revised to low to moderate suitability.

Preliminary Roost Assessment of Structures

- 12.4.6 The results of the PRA survey inspections completed in 2020 (structures B1a-c to B4) and 2018 (all other structures) are provided below.

Structure B1a – Within the PCC Site

- 12.4.7 Structure B1a is a large disused warehouse covering approximately 6,000 m². It is constructed over a series of connected metal ‘A’ frames. The structure is of mixed material construction, with the lower sections of the outer external walls constructed of brick with intact mortar, and the upper external walls and roof elevations clad in corrugated metal sheeting (Photograph 1, Annex A). Much of the roof has been removed and therefore the B1a is not weatherproof. Site staff identified that the condition of the remaining roof continues to decline now that wind can get under the roof to lift the sheeting.

- 12.4.8 The interior (Photographs 2 to 4, Annex A) is drafty and there is extensive damp penetration. The interior space is subdivided by a number of brick and/or metal sheeting walls. There is no enclosed roof space, and where the roof remains intact it is unlined. The interior brickwork is undamaged and the mortar remains intact. There are also several small enclosed rooms that housed welfare facilities. These have rendered internal walls and the only minor crevices present within the walls, or where the walls meet ceilings, were covered with layers of cobwebs.
- 12.4.9 No evidence of bats was found within B1a. It is assessed as having negligible suitability for roosting bats due to its metal construction and poor condition. It is considered that this building can only decrease in suitability for bats over time given its existing poor state of repair and the absence of large sections of the roof resulting in the lack of a suitable roosting environment.
- 12.4.10 Feral pigeon (*Columba livia*) activity was noted within the building.
- Structure B1b (Welfare Block and Canteen) – Within the PCC Site**
- 12.4.11 Adjacent to Structure B1a there is a disused (last used in 1970's) single-storey building of brick construction with a pitched corrugated roof (Photographs 5 to 7, Annex A).
- 12.4.12 The eastern half of the B1b is a former welfare block and has a roof constructed of corrugated metal sheeting. There is no access for bats into the ridge of the roof. There is a doorway on the gable end which is open, and several broken windows. The windows on the south-western side of the building were boarded up and, in most cases, these had a close fit. Minor gaps were present behind one window board, affording potential access points into the interior of the building through the broken window (Photographs 5 and 6, Annex A). The relevant windows could be inspected from inside B1b.
- 12.4.13 The exterior brickwork was generally in good condition and the mortar was intact. One 10cm long and 1cm wide subsidence crack was observed on the south-western aspect near the division between the welfare block and the canteen (Photograph 8, Annex A). This might afford access for bats into a wall cavity, but the presence of cobwebs indicates this is not currently used by bats. There was also some erosion of mortar at the top of the wall below the fascia (Photograph 9, Annex A). The latter could not be accessed for inspection and may provide access into a wall cavity.
- 12.4.14 Timber barge and fascia boarding is present on the external elevations of the welfare block. At the eastern gable end the barge boarding sits well away from the wall such that there are no gaps or crevices suitable for use as roosting features by bats. On the southern-western and north-eastern aspects the fascia boarding is generally tight and does not afford access for bats. Very short sections have lifted slightly and might provide access under the metal sheet roof. It is considered that bats are unlikely to use such gaps. This is because the fascia boarding is generally very damp, due to the poor condition of the roof and the absence of functional guttering. Cobwebs were also extensive along the bottom edge of the fascia boarding, indicating that bats have not used these features recently.

- 12.4.15 The interior of the welfare block (Photographs 10 to 12, Annex A) is subdivided by internal rendered or exposed brick walls that have no features suitable for use by roosting bats. Generally, there is no ceiling above these walls and instead there are views up to the sheet metal roof. There are numerous holes allowing light and weather to penetrate into the interior. Locally, remnants of a former roof lining were present directly below the metal roof, but this was in poor condition and any cavities underneath are considered sub-optimal due to the construction and poor condition of the roof. The internal walls lacked cracks suitable for use by bats, the mortar was in good condition, and cobwebs were extensive.
- 12.4.16 No evidence of bats was found within the interior of the welfare block.
- 12.4.17 The western half of Structure B1b is the former canteen (Photographs 13 to 15, Annex A) and could not be accessed for inspection through the welfare block. Instead, the former access is on the western gable end. All doors were sealed and there was no survey access into the canteen. The pitched roof is constructed of corrugated asbestos sheeting and the ridge is sealed with mortar.
- 12.4.18 The western gable end includes a subsidiary lean-to extension with a pitched corrugated metal sheeting roof, and broken windows. There are no other windows on the canteen (these are bricked up), and there is no access through the extension into the wider canteen (internal doors visible through the windows and seen to be closed). However, bats could potentially access the interior of the wider canteen under the corrugated roof, if the roof structure is comparable to that observed within the welfare block.
- 12.4.19 The exterior walls are comparable to the welfare block, and in similar condition. The only feature of potential suitability for bats is an extensive crack in the gable wall at a height where it is not accessible for inspection. It is possible that this crack could provide access into a wall cavity. The barge and fascia boarding is also comparable with the welfare block, with minor gaps present under the fascia but again with extensive cobwebs and affected by damp. It is possible that gaps under the fascia boarding could provide access under the roof of the extension, where there is potentially a space between this and the internal ceiling. However, any such space is likely to be sub-optimal for use given the roof is constructed of metal sheeting.
- 12.4.20 Only the interior of the extension could be viewed (Photograph 15, Annex A). This comprises a sealed space defined by intact interior walls and ceiling. No features were observed that were likely to be suitable for use by roosting bats. The interior is well lit due to the number of windows present.
- 12.4.21 The welfare block and canteen building is assessed as having low suitability due to the presence of minor gaps/crevices within the interior brickwork, potential access into sealed-off parts of the canteen (albeit with the expectation, based on available information, that the interior will be sub-optimal) and minor gaps behind the timber fascia boards. Given the poor state of repair and the nature of the relevant features, it was considered that B1b was most suitable for use by small numbers of bats as a summer or transitional roost, and that it is not suitable for use by maternity colonies of bats.
- 12.4.22 Feral pigeon activity was noted within both halves of the building.

Structure B1c (Fabrication Building) – Within the PCC Site

- 12.4.23 Structure B1c is small square single-storey brick structure with a flat concrete slab roof (Photographs 16, Annex A). The external brickwork is in good condition and the mortar is generally intact. In localised areas on the southern aspect the mortar has started to erode but this does not provide access to cavities and these features have a covering of cobwebs (Photograph 17).
- 12.4.24 All of the windows are broken and the door is missing, providing access into the interior but also meaning that the interior is drafty. The internal walls are exposed brickwork and the mortar is generally in good condition (Photograph 18, Annex A). One 10cm long and 1cm deep crack in the mortar was observed. This could be fully inspected and did not lead to a larger cavity. It also contained cobwebs, indicating that bats had not used this feature recently. Some of the interior walls are damp.
- 12.4.25 No evidence of bats was found, and B1c is considered to have negligible bat suitability for roosting bats.

Structure B2 (Tube City) – Within the PCC Site

- 12.4.26 Structure B2 is a medium sized warehouse with an approximate footprint of 770 m². The lower walls are of brick construction with the upper walls clad in corrugated metal sheeting. Large roller doors are located on the northern and southern elevations. The pitched roof is constructed of corrugated metal sheeting. B2 was previously used as a car workshop and garage. All doors are kept closed (Photographs 19 and 20, Annex A).
- 12.4.27 The exterior brickwork and mortar is generally in good condition, with minor erosion only and insufficient to provide cavities deep enough for use by bats. An occasional brick has been removed at the top of the brick walls on the eastern and western aspects, presumably for venting, which provides potential access into the interior.
- 12.4.28 Internally, B2 is unsuitable for use by bats as shown in Photograph 21 (Annex A). The roof is not lined. There is extensive damp penetration, and the walls support extensive cobwebs.
- 12.4.29 There are two freestanding portacabins within B2 which had formerly been used for offices and welfare. The doors of these are open. The interior of the portacabins is clean and the internal partitions and ceilings are in good condition. No evidence of bats was found, and it is considered (given the internal structure and clean floors and surfaces) that any evidence present would have been readily found if bats utilise the portacabins.
- 12.4.30 Given the structure of B2, it is assessed as having negligible suitability for use by roosting bats.

Structure B3 – Within the PCC Site

- 12.4.31 Structure B3 is a four-storey building, constructed in the 1970's and was last used in the 1990's. It is of brick construction and all the walls are in good condition with intact mortar (Photographs 22 to 24, Annex A). It is kept sealed with the external doors closed and locked. Most windows are intact, but one had a cracked pane affording access into the interior.

- 12.4.32 The ground floor houses a number of storage bays accessible from the exterior (Photograph 23, Annex A). These have brick walls with intact mortar, and concrete slab roofs.
- 12.4.33 The interior of B3 has large rooms on the first to third floors. On the first and second floors the rooms are sealed, and the brick walls and concrete roofs have no features likely to conceal bat roosts (Photograph 25 and 26, Annex A). The fourth floor has a corrugated metal sheet roof with gaps opening to the exterior, resulting in conditions that are very drafty. This floor is used heavily by feral pigeons. No features were found that were likely to be used by roosting bats. No signs of bats were found during the interior inspection.
- 12.4.34 Structure B3 is assessed as having negligible suitability.

Structure B4 (Runtech Garage) – Within the PCC Site

- 12.4.35 Structure B4 is a rectangular metal garage building with an attached office block of brick construction (Photographs 27 and 28, Annex A). It is contemporaneous with the adjacent Structure B3. B4 has a flat roof and the offices and garage remain in use.
- 12.4.36 All brickwork and mortar are in good condition. The office block has no access points to allow bats to enter the interior. The garage is of unsuitable design and construction for use by bats.
- 12.4.37 Given the structure of B4 and the lack of access for bats is assessed as having negligible suitability for used by roosting bats.

Structure B5a

- 12.4.38 Structure B5a is a road bridge of steel construction that is approximately 18 m wide and supported by reinforced vertical concrete abutments (Photograph 29, Annex A).
- 12.4.39 A bat dropping was found on a piece of disused steel pipe under the bridge. This dropping was not positioned directly underneath any visible structure that could be used as a bat roost therefore it is likely to be the result of a bat commuting or foraging under the bridge.
- 12.4.40 The bridge is considered to be of negligible bat roost potential due to its construction, with the only crevices being between the concrete abutments and the steel girders beneath the bridge deck. It is subject to regular noise and vibration disturbance from passing traffic.
- 12.4.41 Structure B5a is not in the PCC Site, so requires no further consideration.

Structure B5b

- 12.4.42 Structure B5b is a small outbuilding of brick construction with a north-facing sloped concrete slab roof (Photograph 30, Annex A). The building is located to the south of the watercourse known as 'The Fleet'. It has no windows and there is an open doorway on the southern elevation. Internally it contains a single room and is not in current use. It is in a poor state of repair with gaps noted in the external and internal walls and around the timber doorframe.
- 12.4.43 Structure B5b is considered to be of low bat roost potential based on the presence of these features.
- 12.4.44 Structure B5b is not in the PCC Site, so requires no further consideration.

Structure B6

- 12.4.45 Structure B6 consists of a pair of bridges supported by three parallel lines of steel columns, with each line containing eight individual supports (Photograph 31, Annex A). The bridges are approximately 25 m wide and supports road and rail infrastructure. The bridges span four vehicle lanes. The underside of the bridges is clad in steel sheeting with paving located on the sloping abutments. Artificial lighting is installed on the bridges.
- 12.4.46 The bridges are assessed as having negligible suitability for roosting bats. They lack significant gaps or crevices in the walls of the bridges and are subject to regular noise and vibration disturbance.
- 12.4.47 Structure B6 is not in the PCC Site, so requires no further consideration

Structure B7

- 12.4.48 Structure B7 is a large office block of brick construction with a complex structure formed of a series of interlocking hexagons that span up to six floors (Photograph 32). The immediate surroundings include areas of car parking, ornamental planting, amenity grassland and a pond. It was built in 1977 and closed in 2016, since which time it has been disused. It was advised that the interior suffers from extensive water ingress via the flat roofs.
- 12.4.49 This structure is assessed as having low suitability. Features of potential value to roosting bats included gaps/crevices in the external walls (i.e. around windows), behind ivy on the external elevations and gaps behind the corrugated sheeting that covers some of the windows.
- 12.4.50 Structure B7 is not in the PCC Site, so requires no further consideration.

Bat Emergence Survey of Structure B1b

- 12.4.51 No bats were recorded emerging from structure B1b during the survey. Given this, B1b is not considered a bat roost, and no further consideration of roosting bats is required at this time. Depending on the timeframe for progression of the Proposed Development, it may be appropriate to update the survey prior to demolition and this is considered further in Chapter 12 of the ES Volume I, Document Ref. 6.2.
- 12.4.52 Limited bat activity was recorded in the vicinity of, but not emerging from, B1b during the survey. This related to a small number of passes by common pipistrelle and is considered to relate to one or two bats only. The first bat was heard at 19:47, approximately 30 minutes after sunset, indicating that the recorded bat(s) were commuting into the PCC site from a roost site located elsewhere.

Bat Activity Surveys – Walked Transects

Quants Environmental Ltd Survey in 2018 at the PCC Site

- 12.4.53 The results of the bat activity surveys are provided in Annex C.
- 12.4.54 The only bat species recorded was common pipistrelle and the majority of the bat activity observed involved flights in close proximity to the waterbodies along the boundaries of the Site.

12.4.55 The overall bat activity observed during the transect surveys was low with bats observed and/or heard at SLPs 4 and 7 (as located on Figure 12.D3) only. These locations are outside the land required for the PCC Site. The highest number of bat passes recorded was two passes at SLP 4. No bat calls were recorded while walking between the SLPs.

AECOM Survey in 2020 at Coatham Sands

12.4.56 The results of the bat activity surveys are provided in Annex D. Where bats were observed by the surveyor, the locations of these observations are shown on Figure 12.D4. These observations do not account for all the bat activity recorded during the surveys (as reported in Annex D). For example, all bats in August were heard but not seen.

12.4.57 Three bat species were recorded during the surveys, with the majority of the bat activity relating to common pipistrelle. This species was recorded during all surveys and was present in small numbers only (typically only one or two bats) within the relatively sheltered central area of Coatham Sands where there is extensive rank grassland grading into reedbed and wetland habitats. Some common pipistrelle activity was also observed in more exposed areas in the east of the survey area during August. This was a particularly warm and calm night, creating conditions optimal for foraging in less sheltered locations.

12.4.58 In addition, limited activity by noctule bat and an unidentified *Myotis* species was also recorded. Single passes by noctule bats were recorded in May and July only. These bats were not seen so are presumed to have been flying high over the survey area, and this is supported by the brief nature of the bat calls recorded.

12.4.59 Only one pass by the *Myotis* species was recorded and this was in July. While it is not possible to be certain which of the four potential candidate species was present, it is most likely that this was a Daubenton's bat given the prevailing habitat conditions within Coatham Sands and the adjacent landscape. The other species tend to favour landscapes with at least some woodland present in proximity to wetland habitats, conditions which are not present in the vicinity of Coatham Sands.

Bat Activity Surveys – Static Monitoring

Quants Environmental Ltd Survey in 2018 at the PCC Site

12.4.60 The numbers of bat passes and species recorded for each static bat recorder location in August and September 2018 are summarised in Table 12D-3.

12.4.61 In August three species of bat were recorded by Anabat 1: common pipistrelle, soprano pipistrelle and noctule bat. Anabat 2 recorded two species of bat: common pipistrelle and soprano pipistrelle.

12.4.62 Most of the activity recorded related to common pipistrelle, and this was mainly at the location of Anabat 2 where moderate levels of bat activity were recorded. In comparison, only a very low level of bat activity was recorded at the location of Anabat 1.

12.4.63 In September common pipistrelle and noctule were recorded at both of the static detector positions. During this survey most of the bat activity was at the location of Anabat 1, and again mainly related to common pipistrelle. A

moderate level of bat activity as recorded by Anabat 1, and a very low level of bat activity at the location of Anabat 2.

- 12.4.64 While multiple passes were recorded for all species it should be recognised that the static recording devices are unable to distinguish between individual bats. Therefore, the number of bat passes recorded does not necessarily relate to the number of bats in a location. A single bat could be foraging within the area throughout the night and subsequently this would result in multiple passes. This is likely to be the cases here, given the results of the walked transect surveys.

Table 12D-3: Static Monitoring Survey Results – August and September 2018

Month	Static detector location	Total bat passes for recording period			Total passes (all species)	Mean passes per hour (all species)	Activity level
		Common pipistrelle	Soprano pipistrelle	Noctule			
August	A1	93	2	5	100	1.0	Very low
	A2	3656	56	0	3712	36.7	Moderate
September	A1	1430	0	6	1436	12.8	Moderate
	A2	16	0	23	39	0.6	Very low

AECOM Survey in 2020 at Coatham Sands

- 12.4.65 The numbers of bat passes and species recorded during static monitoring over the period May to September 2020 are summarised in Table 12D-4. The survey results are provided as Annex E.
- 12.4.66 The same three bat species recorded during the 2020 walked transect survey were recorded during the static survey i.e. common pipistrelle, noctule and an unidentified *Myotis* bat species. The later species is probably Daubenton's bat, but this is not known for certain (see results of the walked transect survey). A similar species composition was recorded at each location.
- 12.4.67 The largest proportion of bat passes were attributable common pipistrelle, consistent with the findings of the walked transect survey. Passes of noctule were recorded monthly but in very low numbers, only a few passes within each survey period. The unidentified *Myotis* species was only recorded in the period May to July, and the level of activity recorded strongly suggests the presence of a single bat.
- 12.4.68 The overall level of bat activity recorded was very low to low across the survey period.

Table 12D-4: Static Monitoring Survey Results – May and September 2020

Month	Static detector location	Total bat passes for recording period			Total passes (all species)	Mean passes per hour (all species)	Activity level
		Common pipistrelle	Noctule	Myotis species			
May	1	312	27	1	340	9.0	Low
	2	-	-	-	-	-	-
June	1	-	-	-	-	-	-
	2	117	1	4	182	5.4	Low
July	1	440	3	1	444	11.7	Low
	2	191	3	1	195	5.1	Low
August	1	236	6	0	242	5.2	Low
	2	34	0	0	34	0.7	Very low
September	1	103	1	0	104	1.9	Very low
	2	34	16	1	51	0.9	Very low

12.5 Conclusions

Potential for Bat Roosts Within the PCC Site

- 12.5.3 Of the six structures (B1a-c to B4) within and relevant to the PCC Site, five (B1a, B1c, B2, B3 and B4) are all considered unsuitable for use by roosting bats and there is confidence that this status would not change in the lead into construction of the Proposed Development.
- 12.5.4 Structure B1b is of low suitability given its condition and also with regard to the sub-optimal commuting and foraging habitats within and surrounding the PCC Site. An emergence survey was completed in 2020 to investigate this further and no bat roosts were found.
- 12.5.5 The suitability of structure B1b may change (increase or decrease in suitability, the latter is the most likely given the current condition of the building) over the next 5 years, so it would be precautionary to update the PRA surveys prior to commencement of the Proposed Development if B1b would be affected.

Bat Activity

The PCC Site

- 12.5.6 Three bat species were recorded during bat activity surveys: common pipistrelle, soprano pipistrelle and noctule. While legally protected, these species remain widespread and at favourable conservation status nationally. Consequently, they are not considered threatened (Mathews and Harrower, 2020).
- 12.5.7 The transect and static survey data has been considered together to assess the relative geographic importance (nature conservation value) of the

relevant part of the PCC Site for bats based on the methods and scoring system described in Wray *et al.* (2010), supplemented (if appropriate) by professional judgement and consideration of available information on the current status of the bat species concerned.

- 12.5.8 The results of this assessment are provided below as Table 12D-5. Based on this assessment, the PCC Site is considered to be of between local and district geographic importance as foraging habitat and commuting habitat for the three bat species recorded.
- 12.5.9 The overall levels of bat activity recorded through walked transect and static survey was very low to moderate and mainly attributable to common pipistrelle. Only very low levels of activity by the other two bat species.
- 12.5.10 Accordingly, the available evidence indicated that the PCC Site supports only small numbers and a limited assemblage of common bat species that is likely to be typical of or less than the species diversity and activity present in the wider landscape.
- 12.5.11 Although a relatively large number of common pipistrelle passes was recorded during some survey events this does not necessarily imply there was a large number of individual common pipistrelle bats present. This is supported by the much-reduced mean hourly levels of bat activity detected. Therefore, the activity recorded could result from a single bat foraging within the area continually throughout the night. Given the habitat context within the PCC Site (predominantly open grassland and open mosaic habitats), and observations made during the walked transects, this is considered to be the most likely explanation for the common pipistrelle activity recorded on the static detectors.
- 12.5.12 Given this, there is no compelling evidence that the PCC Site provides either functionally important foraging habitat, except perhaps for a small population of common pipistrelle roosting nearby, or otherwise provides important habitat connections (commuting habitat) for bats moving between roosts and preferred feeding areas. Habitat features optimal for use by bats to navigate across the landscape are also largely absent (except for watercourse present on adjacent land) and further restrict the suitability and accessibility of the PCC Site for bats.
- 12.5.13 Given this additional context and the favourable nature conservation status of the recorded species, the geographic importance of the PCC Site for bats is revised to local value based on professional judgement.

Table 12D-5: Assessment of the value of foraging and commuting habitats for the species recorded (PCC Site)

Species	Relative rarity in UK ¹	Number of bats	Roosts/potential roosts nearby ²	Type and complexity of linear features	Commuting value ³	Character of foraging habitat	Foraging value ³
Common pipistrelle	Common	Small numbers	Small number	Largely open, small watercourses nearby	Local to district	Largely sub-optimal, patchy areas of higher quality	Local to district
Soprano pipistrelle	Common	Small numbers	Small numbers	Largely open, small watercourses nearby	Local to district	Largely sub-optimal, patchy areas of higher quality	Local to district
Noctule	Rarer	Individuals	None	Largely open, small watercourses nearby	Local to district	Largely sub-optimal, patchy areas of higher quality	Local to district

¹This is based on minimum estimated population size with the most current reference for this, superseding the references cited in Wray *et al.* (2010), being Mathews *et al.* (2018).

²Recorded or potential based on desk study and field survey data (including consideration of habitat suitability as described in Appendix 12C Preliminary Ecological Appraisal Report, ES Volume III, Document Ref. 6.4).

³Refer to paragraphs 12.5.9 to -12.5.13 for resolution of this initial assessment.

Coatham Sands

- 12.5.14 Three bat species were recorded during bat activity surveys: common pipistrelle, noctule and an unidentified *Myotis* species (probably Daubenton's bat). While legally protected, the first two species remain widespread and at favourable conservation status nationally. Consequently, they are not considered threatened (Mathews and Harrower, 2020). The status of the *Myotis* species is less certain, while Daubenton's bat (the most likely species) and Natterer's bat are of favourable conservation status, consistent with the other species, the other two potential species are too poorly known ('Data Deficient') to permit assessment to determine their relative threat status. These latter two species are very unlikely to occur at this location, for the reasons given previously in this report.
- 12.5.15 The transect and static survey data has been considered together to assess the relative geographic importance (nature conservation value) of the relevant part of Coatham Sands for bats based on the methods and scoring system described in Wray *et al.* (2010), supplemented (if appropriate) by professional judgement and consideration of available information on the current status of the bat species concerned.
- 12.5.16 The results of this assessment are provided below as Table 12D.6. Based on this assessment, Coatham Sands is considered to be of between local

and district geographic importance as foraging habitat and commuting habitat for the three bat species recorded.

- 12.5.17 As all of the identified species make only limited use of Coatham Sands (very low to low levels of activity), there is no evidence that Coatham Sands provides either functionally important foraging habitat, or otherwise provides important habitat connections (commuting habitat) for bats moving between roosts and preferred feeding areas. This is not surprising given the location, exposed setting and prevailing habitat context of Coatham Sands. The main habitat features of potential value to bats were considered to be the two ponds and limited extent of wetland habitat, but the survey results do not indicate any substantive use of these habitats by bats. Consequently, there are no habitats of high attractant value to bats within the PCC Site.
- 12.5.18 Habitat features optimal for use by bats to navigate across the landscape are also absent and further restrict the suitability and accessibility of Coatham Sands for bats. Instead, Coatham Sands is an open and exposed area of sand dune habitat.
- 12.5.19 Given this additional context, the geographic importance of Coatham Sands is revised to local value based on professional judgement.

Table 12D-6: Assessment of the value of foraging and commuting habitats for the species recorded (Coatham Sands)

Species	Relative rarity in UK ¹	Number of bats	Roosts/potential roosts nearby ²	Type and complexity of linear features	Commuting value ³	Character of foraging habitat	Foraging value ³
Common pipistrelle	Common	Small numbers	Small number	Absent	Local to district	Largely sub-optimal, patchy areas of higher quality	Local to district
Noctule	Rarer	Individuals	None	Absent	Local to district	Largely sub-optimal, patchy areas of higher quality	Local to district
<i>Myotis</i> species (assume Daubenton's or Natterer's bat)	Common	Individuals	None	Absent	Local to district	Largely sub-optimal, patchy areas of higher quality	Local to district

¹This is based on minimum estimated population size with the most current reference for this, superseding the references cited in Wray *et al.* (2010), being Mathews *et al.* (2018).

²Recorded or potential based on desk study and field survey data (including consideration of habitat suitability as described in Appendix 12C Preliminary Ecological Appraisal Report, ES Volume III, Document Ref. 6.4).

³Refer to paragraph 12.5.16 to 12.5.19 for resolution of this initial assessment.

12.6 References

- Barataud, M. (2015) Acoustic ecology of European bats. Species Identification and Studies of Their Habitats and Foraging Behaviour. Biotope Editions, Mèze.
- CIEEM (2019) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.
- Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London
- Bat Conservation Trust (2018). UK Bats. Available online at: <https://www.bats.org.uk/about-bats/what-are-bats/uk-bats>.
- Mathews F. and Harrower C. (2020) IUCN – compliant Red List for Britain’s Terrestrial Mammals. Assessment by the Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage. Available online at: <https://www.mammal.org.uk/science-research/red-list/> [accessed October 2020].
- Mathews, F., Kubasiewicz, L.M., Gurnell, J., Harrower, C.A., McDonald, R.A. and Shore, R.F. (2018) A Review of the Population and Conservation Status of British Mammals. A report by the Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage. Natural England, Peterborough. Available online at: <http://publications.naturalengland.org.uk/publication/5636785878597632> [accessed October 2020].
- Natural England and Defra (2020) Bats: surveys and mitigation for development projects. Available online at: <https://www.gov.uk/guidance/bats-surveys-and-mitigation-for-development-projects#history> [accessed October 2020].
- Tees Valley Nature Partnership (2012) Priority habitats and species in the Tees Valley. Available online at: <https://teesvalleynaturepartnership.org.uk/> [accessed October 2020].
- Wray. S., Wells. D., Long. E. and Mitchell-Jones. T. (2010) Valuing bats in ecological impact assessment. *In Practice* 70.

Figures

Figure 12D.1 Structures Subject to Preliminary Roost Assessment

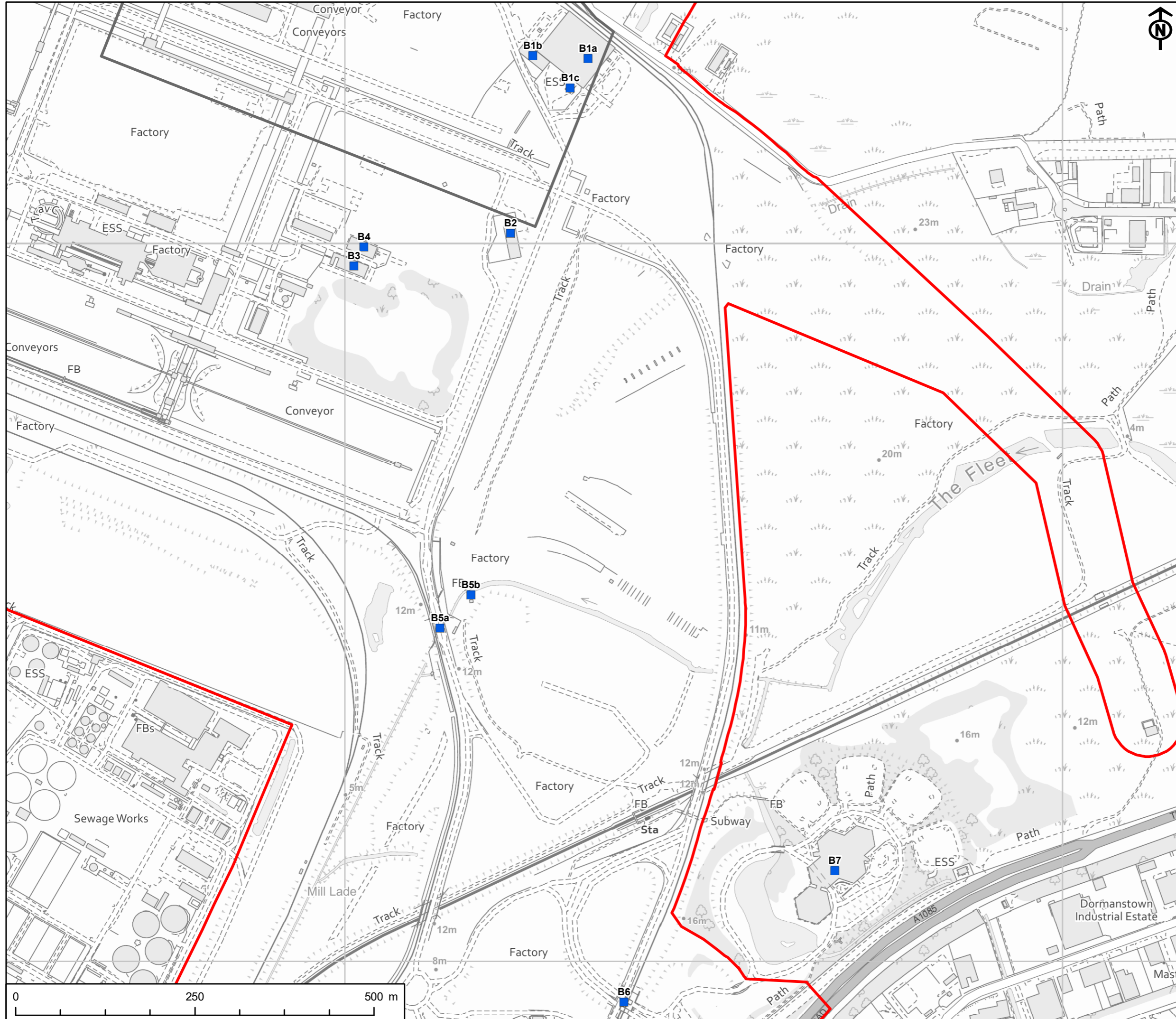
PROJECT
NET ZERO TEESIDE

CLIENT
NZT POWER AND NZNS STORAGE

- KEY
- Site Boundary
 - Power, Capture and Compressor Site
 - Structure Location

Project Management Initials: RL Designer: LC Checked: AR Approved: DB

Scale @ A3 1:5,000



TITLE
FIGURE 1
STRUCTURES SUBJECT TO PRELIMINARY
ROOST ASSESSMENT

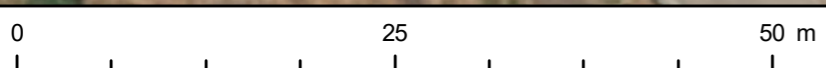
REFERENCE
NZT_210105_CSBA_1_v1

SHEET NUMBER
1 of 1

DATE
05/01/2021

This drawing has been produced for the use of AECOM's client. It may not be used, modified or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies upon this drawing without AECOM's express written consent. All dimensions are indicative and in metres unless otherwise noted. Do not scale this document.

Figure 12D.2 Location of Surveyors During the 2020 Emergence Survey at Structure B1b



PROJECT
NET ZERO TEESIDE

CLIENT
NZE POWER AND NZNS STORAGE

KEY

- Structure Location
- Surveyor Location
- ▲ Song Meter SM2BAT+ Static Bat Detector

TITLE
FIGURE 2
LOCATION OF SURVEYORS DURING THE 2020
EMERGENCE SURVEY AT STRUCTURE B1b

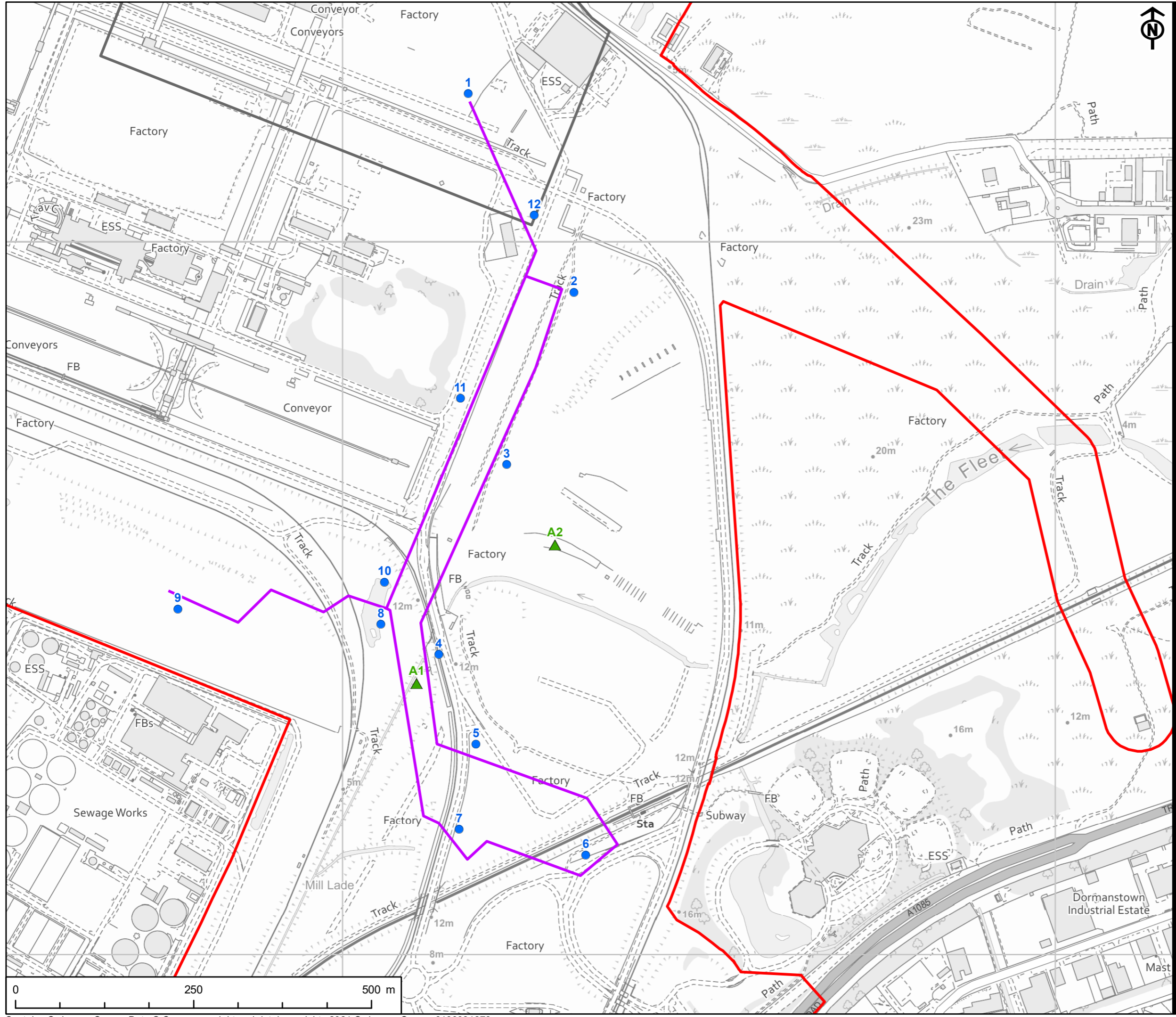
REFERENCE
NZE_210105_CSBA_2_v1

SHEET NUMBER
1 of 1

DATE
05/01/2021

This drawing has been produced for the use of AECOM's client. It may not be used, modified or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies upon this drawing without AECOM's express written consent. All dimensions are indicative and in metres unless otherwise noted. Do not scale this document.

Figure 12D.3. Walked Transect and Static Monitoring Locations in 2018 (proposed PCC Site)



PROJECT
NET ZERO TEESIDE

CLIENT
NZT POWER AND NZNS STORAGE

KEY

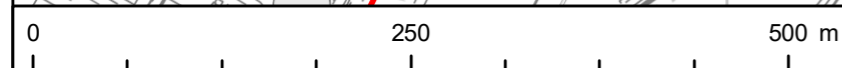
- Site Boundary
- Power, Capture and Compressor Site
- ▲ Anabat Position
- Stationary Listening Point (SLP)
- Bat Transect Route

TITLE
FIGURE 3
WALKED TRANSECT AND STATIC
MONITORING LOCATIONS IN 2018
(PROPOSED PCC SITE)

REFERENCE
NZT_210104_CSBA_3_v1

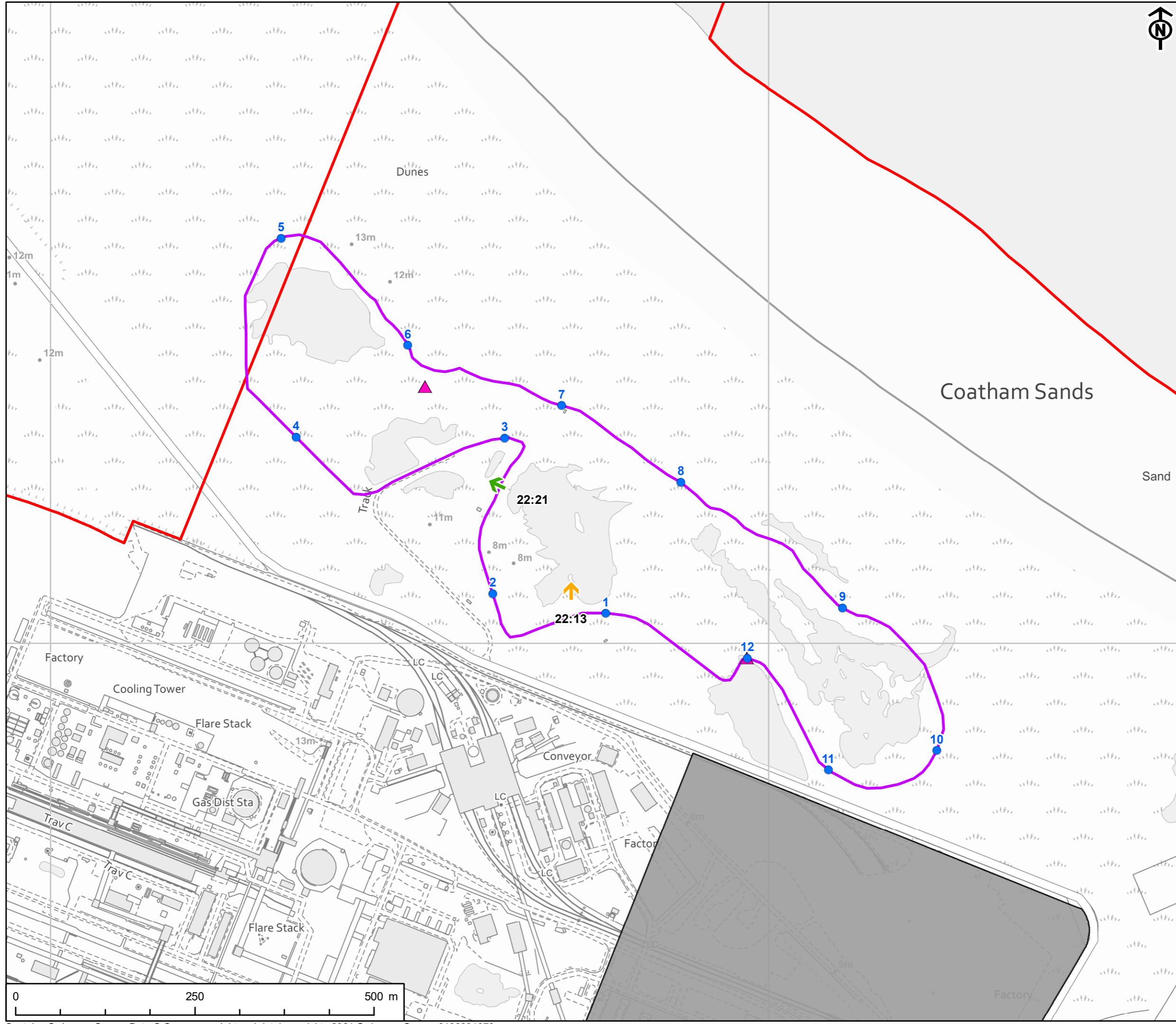
SHEET NUMBER
1 of 1

DATE
04/01/2021



This drawing has been produced for the use of AECOM's client. It may not be used, modified or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies upon this drawing without AECOM's express written consent. All dimensions are indicative and in metres unless otherwise noted. Do not scale this document.

Figure 12D.4 Walked Transect and Static Monitoring Locations in 2020 (Coatham Sands)



PROJECT
NET ZERO TEESIDE

CLIENT
NZT POWER AND NZNS STORAGE

KEY

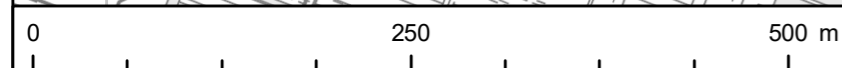
- Site Boundary
- Power, Capture and Compressor Site
- ▲ Song Meter SM2BAT+ Static Bat Detector
- Stationary Listening Point (SLP)
- Bat Transect Route
- Bat Activity - Species**
- ↑ NYNO
- ↑ PIPI

TITLE
FIGURE 4.1
WALKED TRANSECT AND STATIC
MONITORING LOCATIONS IN 2020
(COATHAM SANDS) - MAY 2020

REFERENCE
NZT_210104_CSBA_4.1_v1

SHEET NUMBER
1 of 1

DATE
04/01/2021



This drawing has been produced for the use of AECOM's client. It may not be used, modified or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies upon this drawing without AECOM's express written consent. All dimensions are indicative and in metres unless otherwise noted. Do not scale this document.

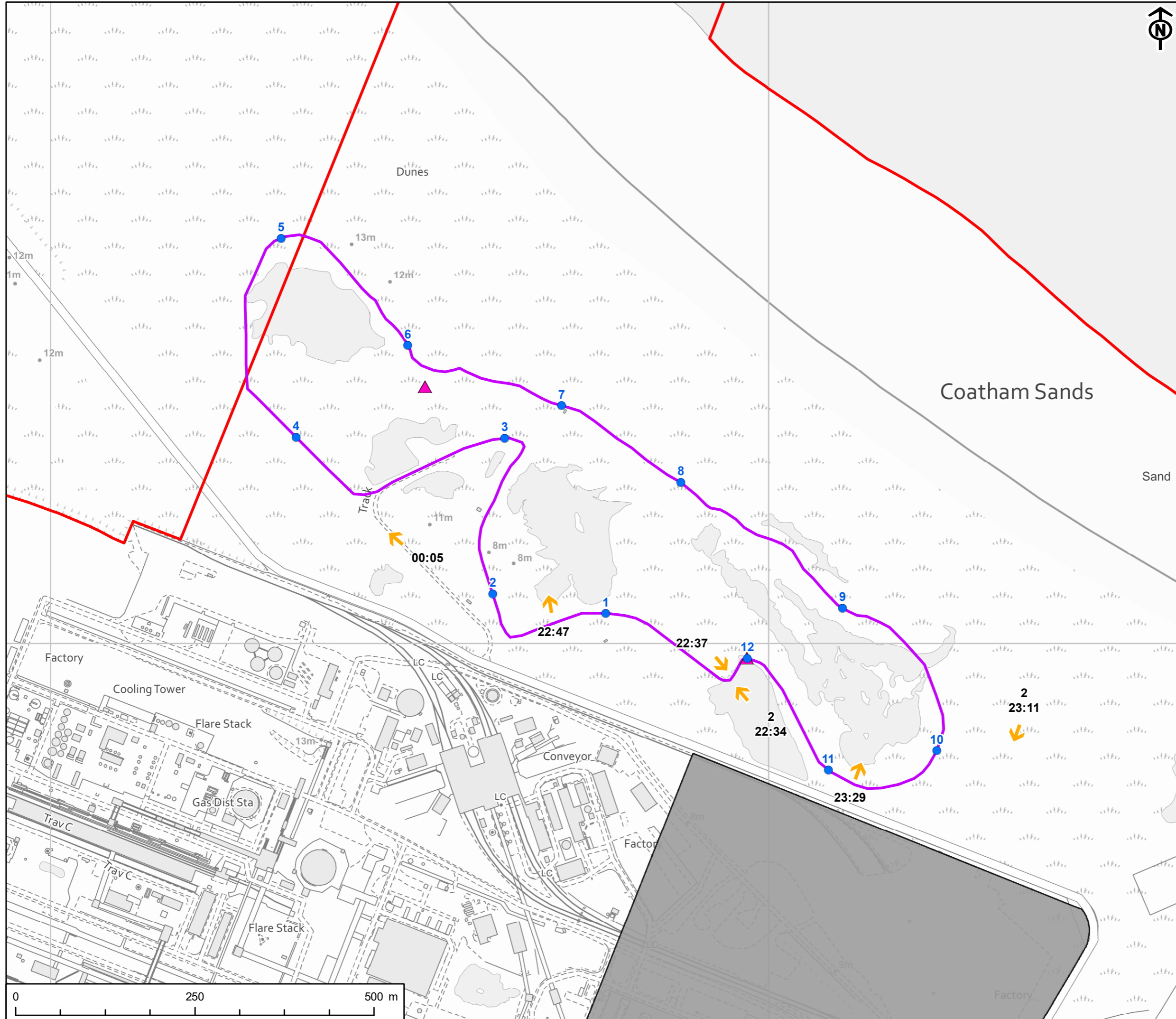
PROJECT
NET ZERO TEESIDE

CLIENT
NZT POWER AND NZNS STORAGE

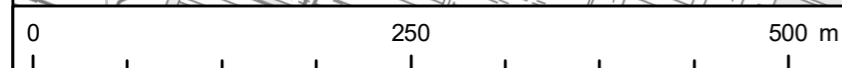
KEY

- Site Boundary
- Power, Capture and Compressor Site
- ▲ Song Meter SM2BAT+ Static Bat Detector
- Stationary Listening Point (SLP)
- Bat Transect Route
- Bat Activity - Species
- ↑ PIPI

Project Management Initials: RL Designer: LC Checked: AR Approved: DB



Scale @ A3 1:5,000

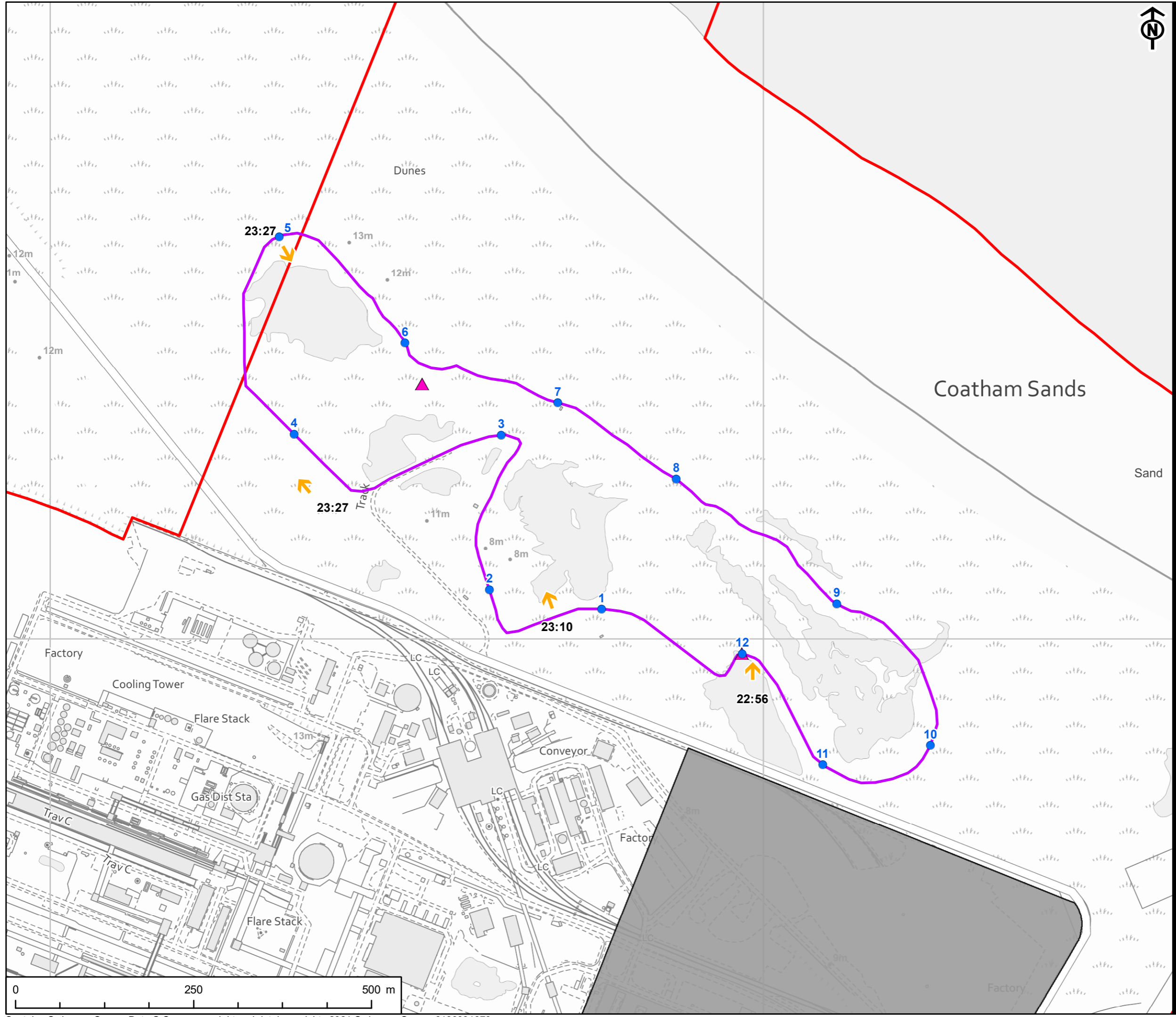


TITLE
FIGURE 4.2
WALKED TRANSECT AND STATIC
MONITORING LOCATIONS IN 2020
(COATHAM SANDS) - JUNE 2020

REFERENCE
NZT_210104_CSBA_4.2_v1

SHEET NUMBER 1 of 1 DATE 04/01/2021

This drawing has been produced for the use of AECOM's client. It may not be used, modified or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies upon this drawing without AECOM's express written consent. All dimensions are indicative and in metres unless otherwise noted. Do not scale this document.



PROJECT
NET ZERO TEESIDE

CLIENT
NZN POWER AND NZNS STORAGE

KEY

- Site Boundary
- Power, Capture and Compressor Site
- ▲ Song Meter SM2BAT+ Static Bat Detector
- Stationary Listening Point (SLP)
- Bat Transect Route
- Bat Activity - Species
- ↑ PIFI

TITLE
FIGURE 4.3
WALKED TRANSECT AND STATIC
MONITORING LOCATIONS IN 2020
(COATHAM SANDS) - JULY 2020

REFERENCE
NZN_210104_CSBA_4.3_v1

SHEET NUMBER
1 of 1

DATE
04/01/2021

This drawing has been produced for the use of AECOM's client. It may not be used, modified or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies upon this drawing without AECOM's express written consent. All dimensions are indicative and in metres unless otherwise noted. Do not scale this document.

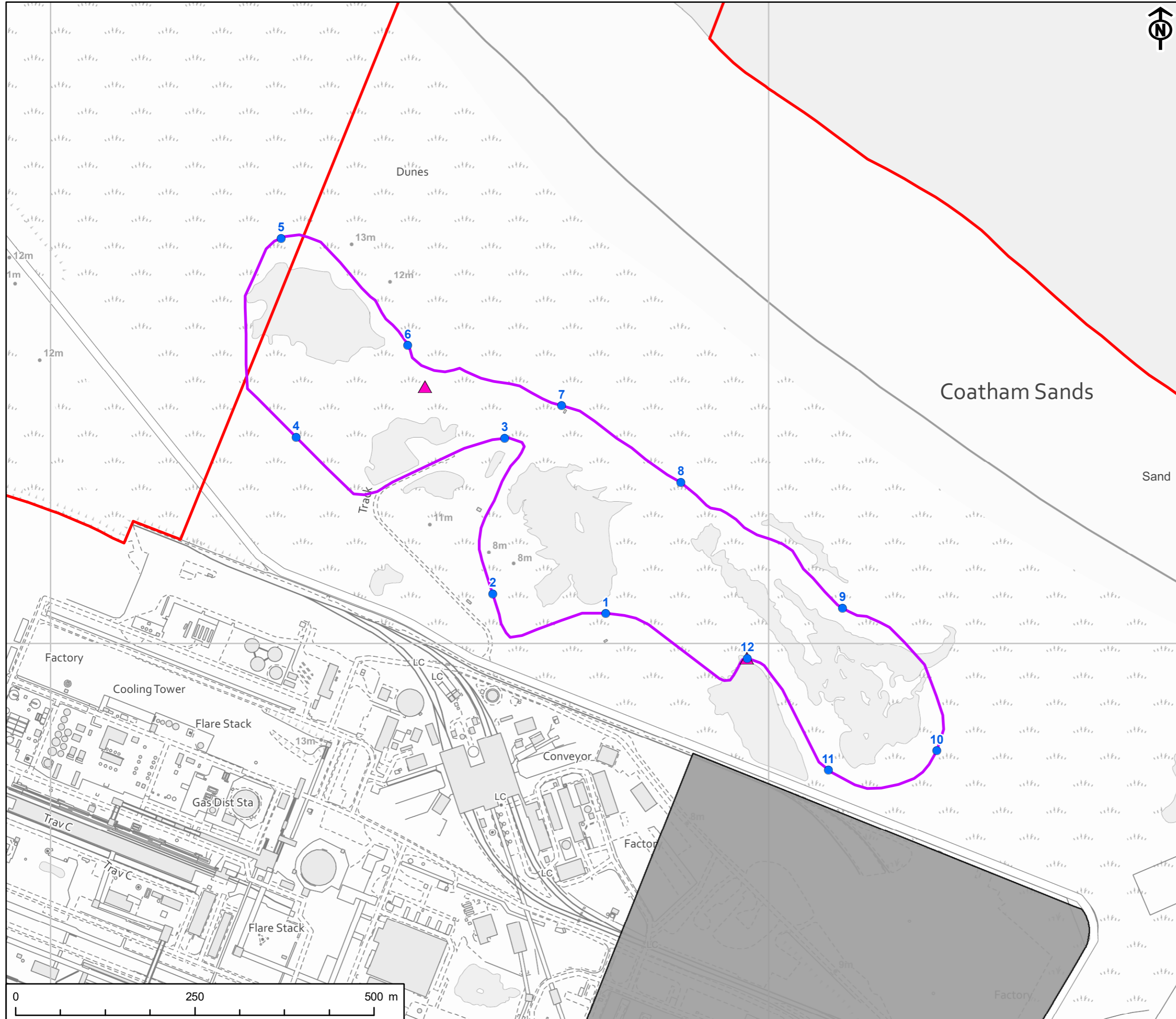
PROJECT
NET ZERO TEESIDE

CLIENT
NZE POWER AND NZNS STORAGE

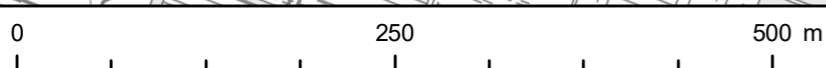
KEY

- Site Boundary
- Power, Capture and Compressor Site
- ▲ Song Meter SM2BAT+ Static Bat Detector
- Stationary Listening Point (SLP)
- Bat Transect Route

Project Management Initials: RL Designer: LC Checked: AR Approved: DB



Scale @ A3 1:5,000



TITLE
FIGURE 4.4
WALKED TRANSECT AND STATIC
MONITORING LOCATIONS IN 2020
(COATHAM SANDS) - AUGUST 2020

REFERENCE
NZE_210104_CSBA_4.4_v1

SHEET NUMBER 1 of 1 DATE 04/01/2021

This drawing has been produced for the use of AECOM's client. It may not be used, modified or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies upon this drawing without AECOM's express written consent. All dimensions are indicative and in metres unless otherwise noted. Do not scale this document.



PROJECT	
NET ZERO TEESIDE	
CLIENT	
NZT POWER AND NZNS STORAGE	
KEY	
	Site Boundary
	Power, Capture and Compressor Site
	Song Meter SM2BAT+ Static Bat Detector
	Stationary Listening Point (SLP)
	Bat Transect Route
Bat Activity - Species	
	PIPI

TITLE	
FIGURE 4.5 WALKED TRANSECT AND STATIC MONITORING LOCATIONS IN 2020 (COATHAM SANDS) - SEPTEMBER 2020	
REFERENCE	
NZT_210104_CSBA_4.5_v1	
SHEET NUMBER	DATE
1 of 1	04/01/2021

This drawing has been produced for the use of AECOM's client. It may not be used, modified or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies upon this drawing without AECOM's express written consent. All dimensions are indicative and in metres unless otherwise noted. Do not scale this document.

Annex A Photographs

Structure B1a



Photograph 1 – View south-west along the rear of the structure B1a



Photograph 2 – Interior of structure B1a



Photograph 3 – Interior of structure B1a



Photograph 4 – Interior of structure B1a