RSP

RiverOak Strategic Partners

Updated 5.2-12 Environmental Statement Volume 12: Appendices 10.1, Appendix B - 12.14

TR020002/D1/5.2-12

Examination Document

Project Name:	Manston Airport Development Consent Order
Application Ref:	TR020002
Submission Deadline:	**1**
Date:	18 January 2019

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Appendix 11.1
Wirelines

Existing view

Proposed wireline view

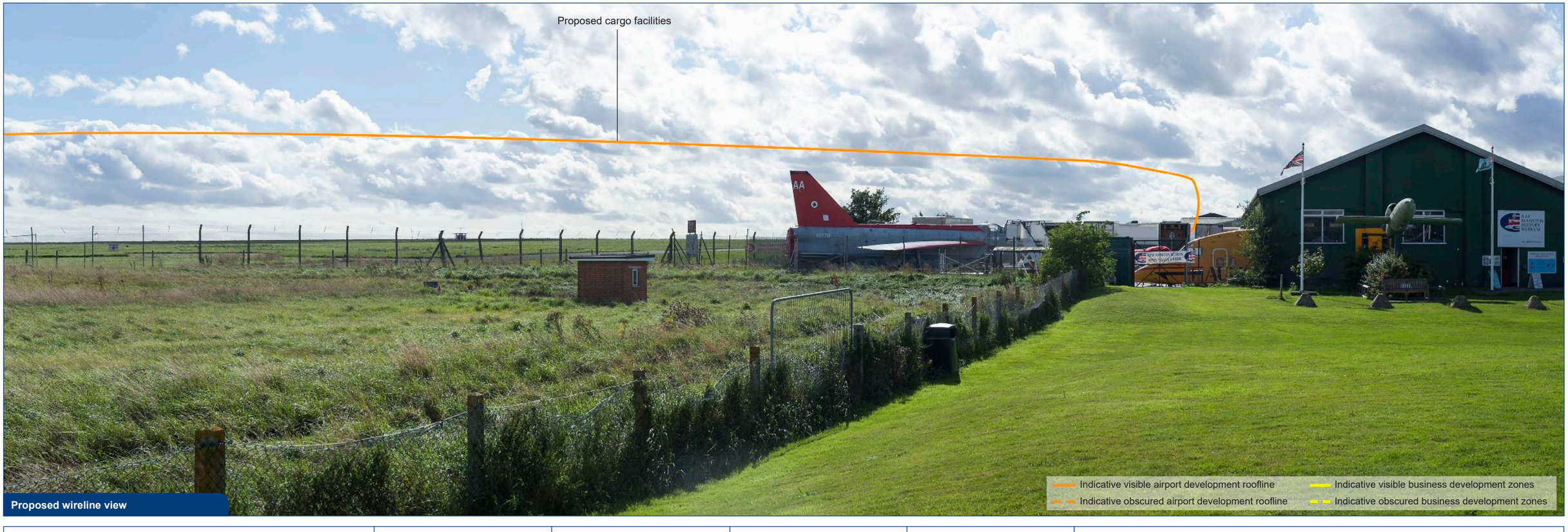
Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 13/09/2017 Lens: 50mm (35mm format)	Distance to site: 0km OS reference: 633315, 166524	Direction to site: east Viewpoint height: 40m AOD	Horizontal field of view: Approx. 75⁰ Viewing distance: 300mm @ A3	**Viewpoint 1: RAF Manston Museum Carpark** **Figure: 1**

Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 13/09/2017 Lens: 50mm (35mm format)	Distance to site: 0km OS reference: 633315, 166524	Direction to site: southeast Viewpoint height: 40m AOD	Horizontal field of view: Approx. 75° Viewing distance: 300mm @ A3	**Viewpoint 1: RAF Manston Museum Carpark** **Figure: 2**

Existing view



Proposed wireline view

Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 13/09/2017 Lens: 50mm (35mm format)	Distance to site: 0km OS reference: 633315, 166524	Direction to site: south Viewpoint height: 40m AOD	Horizontal field of view: Approx. 75⁰ Viewing distance: 300mm @ A3	**Viewpoint 1: RAF Manston Museum Carpark** **Figure: 3**

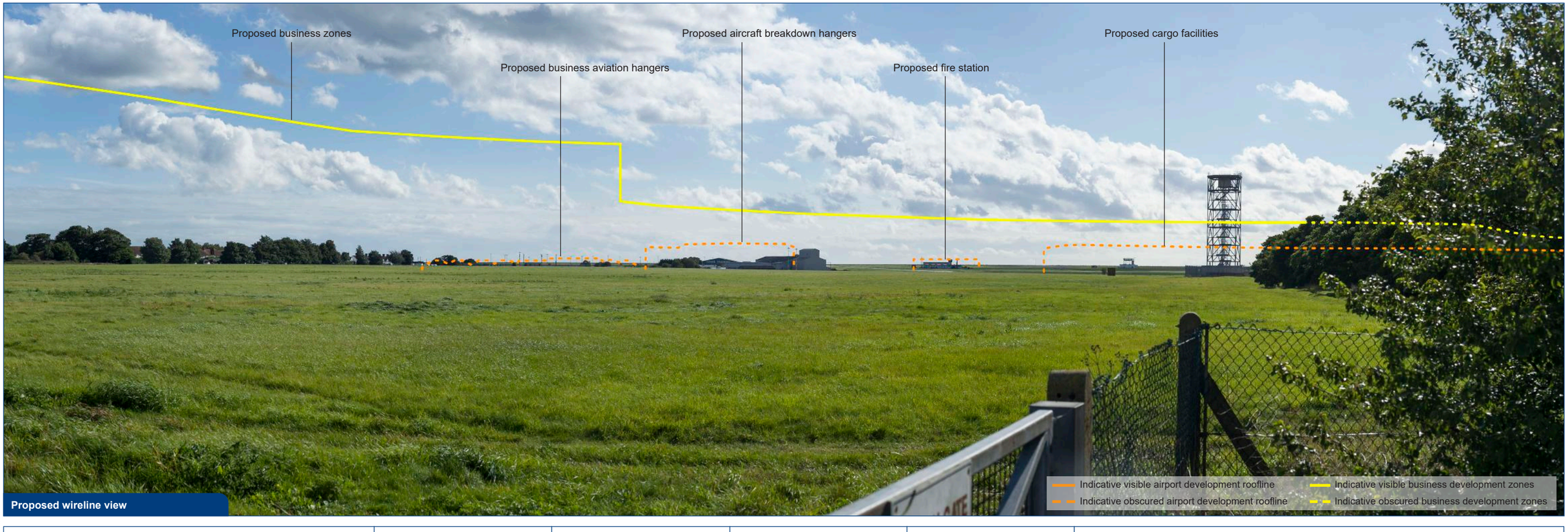
Existing view

Proposed wireline view

Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 13/09/2017 Lens: 50mm (35mm format)	Distance to site: 0km OS reference: 634032, 167145	Direction to site: south Viewpoint height: 47m AOD	Horizontal field of view: Approx. 75^{0} Viewing distance: 300mm @ A3	**Viewpoint 2: Manston Road** **Figure: 4**

Existing view



Proposed wireline view

Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 13/09/2017 Lens: 50mm (35mm format)	Distance to site: 0km OS reference: 634032, 167145	Direction to site: south Viewpoint height: 47m AOD	Horizontal field of view: Approx. 75° Viewing distance: 300mm @ A3	**Viewpoint 2: Manston Road** **Figure: 5**

Existing view

Proposed wireline view

Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 14/09/2017 Lens: 50mm (35mm format)	Distance to site: 0.1km OS reference: 634366, 165089	Direction to site: northwest Viewpoint height: 39m AOD	Horizontal field of view: Approx. 75° Viewing distance: 300mm @ A3	**Viewpoint 3: Canterbury Road West PRoW** **Figure: 6**

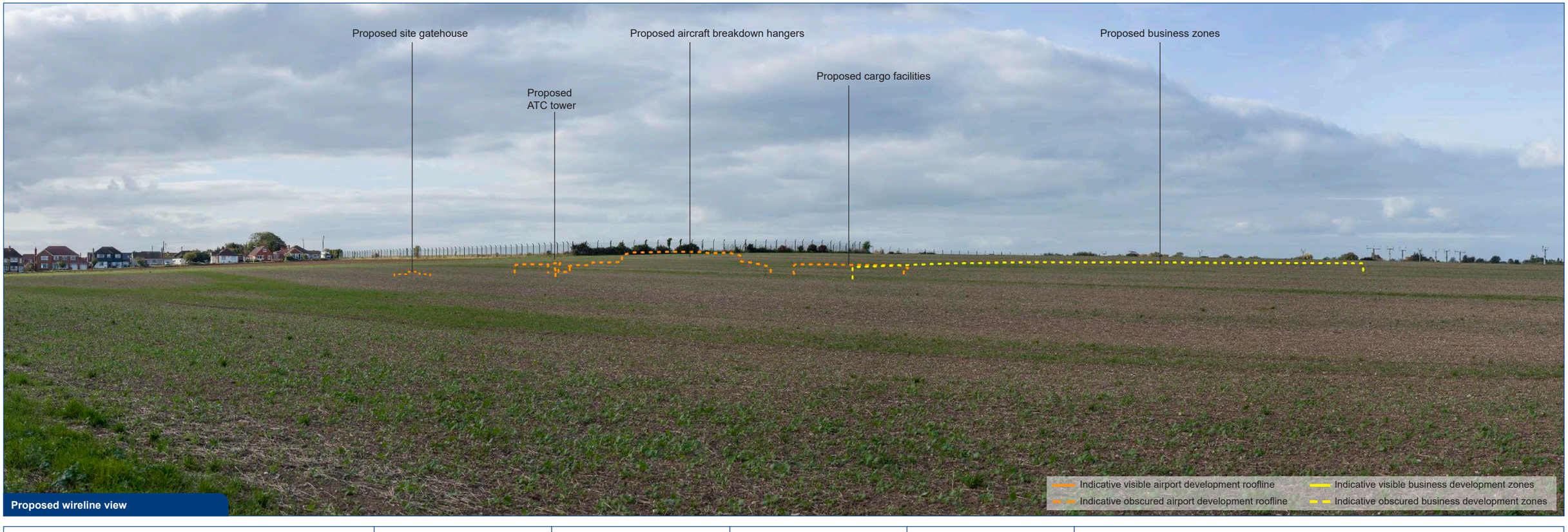
Existing view

Proposed wireline view

Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 13/09/2017 Lens: 50mm (35mm format)	Distance to site: 0.6km OS reference: 631122, 16585	Direction to site: east Viewpoint height: 52m AOD	Horizontal field of view: Approx. 75° Viewing distance: 300mm @ A3	**Viewpoint 4: B2190, Minster Road** **Figure: 7**

Existing view



Proposed wireline view

Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 03/10/2017 Lens: 50mm (35mm format)	Distance to site: 0.6km OS reference: 635205, 165114	Direction to site: northwest Viewpoint height: 40m AOD	Horizontal field of view: Approx. 75° Viewing distance: 300mm @ A3	**Viewpoint 5: A256 Haine Road** **Figure: 8**

Existing view

Proposed wireline view

Ref: 10772-0003-004

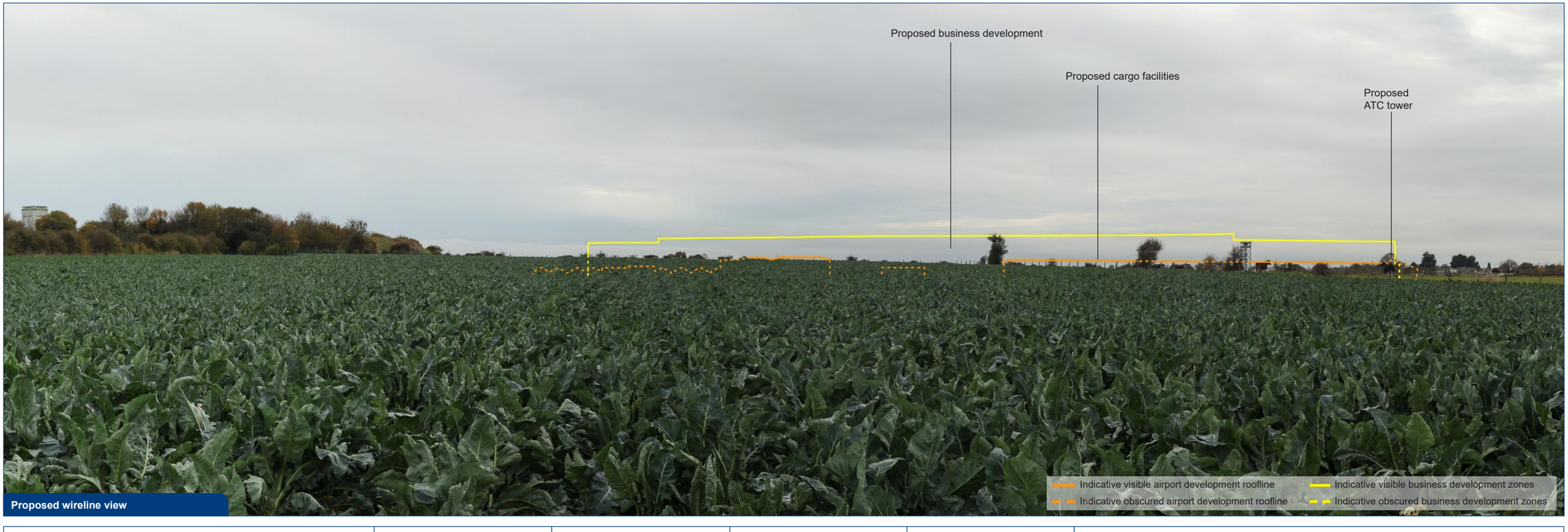
RPS **Manston Airport DCO**	Date of photography: 14/09/2017 Lens: 50mm (35mm format)	Distance to site: 0.3km OS reference: 634619, 166204	Direction to site: west Viewpoint height: 49m AOD	Horizontal field of view: Approx. 75⁰ Viewing distance: 300mm @ A3	**Viewpoint 6: B2050 western edge of Manston** **Figure: 9**

Existing view

Proposed wireline view

Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 14/09/2017 Lens: 50mm (35mm format)	Distance to site: 0.3km OS reference: 634619, 166204	Direction to site: west Viewpoint height: 49m AOD	Horizontal field of view: Approx. 75⁰ Viewing distance: 300mm @ A3	**Viewpoint 6: B2050 western edge of Manston** **Figure: 10**



Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 14/09/2017 Lens: 50mm (35mm format)	Distance to site: 0.5km OS reference: 634481, 167555	Direction to site: southwest Viewpoint height: 48m AOD	Horizontal field of view: Approx. 75^{0} Viewing distance: 300mm @ A3	**Viewpoint 7: Vincent Road near Fleet Farm** **Figure: 11**

Existing view

Proposed wireline view

Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 14/09/2017 Lens: 50mm (35mm format)	Distance to site: 0.9km OS reference: 632564, 167096	Direction to site: southeast Viewpoint height: 37m AOD	Horizontal field of view: Approx. 75⁰ Viewing distance: 300mm @ A3	**Viewpoint 8: Woodchurch Road, southern edge of Woodchurch** **Figure: 12**

Existing view

Proposed wireline view

Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 14/09/2017 Lens: 50mm (35mm format)	Distance to site: 1.2km OS reference: 630872, 166840	Direction to site: west Viewpoint height: 30m AOD	Horizontal field of view: Approx. 75^{0} Viewing distance: 300mm @ A3	**Viewpoint 9: Minster Road, Acol** **Figure: 13**

Existing view

Proposed wireline view

Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 14/09/2017 Lens: 50mm (35mm format)	Distance to site: 1.4km OS reference: 631819, 167446	Direction to site: southwest Viewpoint height: 31m AOD	Horizontal field of view: Approx. 75° Viewing distance: 300mm @ A3	**Viewpoint 10: Pumping station south of Quex Park** **Figure: 14**

Existing view

Proposed wireline view

Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 14/09/2017 Lens: 50mm (35mm format)	Distance to site: 1.1km OS reference: 633107, 164479	Direction to site: northeast Viewpoint height: 16m AOD	Horizontal field of view: Approx. 75^{0} Viewing distance: 300mm @ A3	**Viewpoint 11: Viking Coastal Trail, Cottington Road** **Figure: 15**

Existing view

Proposed wireline view

Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 14/09/2017 Lens: 50mm (35mm format)	Distance to site: 1.1km OS reference: 633790, 164232	Direction to site: north Viewpoint height: 21m AOD	Horizontal field of view: Approx. 75^0 Viewing distance: 300mm @ A3	**Viewpoint 12: A256, Cottington Road Bridge** **Figure: 16**

Existing view

Proposed wireline view

Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 14/09/2017 Lens: 50mm (35mm format)	Distance to site: 2.1km OS reference: 635654, 168600	Direction to site: southwest Viewpoint height: 36m AOD	Horizontal field of view: Approx. 75^{0} Viewing distance: 300mm @ A3	**Viewpoint 13: Nash Court, Nash Road, Margate** **Figure: 17**

Existing view

Proposed wireline view

Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 14/09/2017 Lens: 50mm (35mm format)	Distance to site: 1.8km OS reference: 633511, 168850	Direction to site: south Viewpoint height: 29m AOD	Horizontal field of view: Approx. 75⁰ Viewing distance: 300mm @ A3	**Viewpoint 14: Junction of High Street and Shottendane Road, southern Garlinge** **Figure: 18**

Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 13/09/2017 Lens: 50mm (35mm format)	Distance to site: 2.1km OS reference: 632531, 168633	Direction to site: south Viewpoint height: 29m AOD	Horizontal field of view: Approx. 75⁰ Viewing distance: 300mm @ A3	**Viewpoint 15: PRoW, Shottenden Road** **Figure: 19**

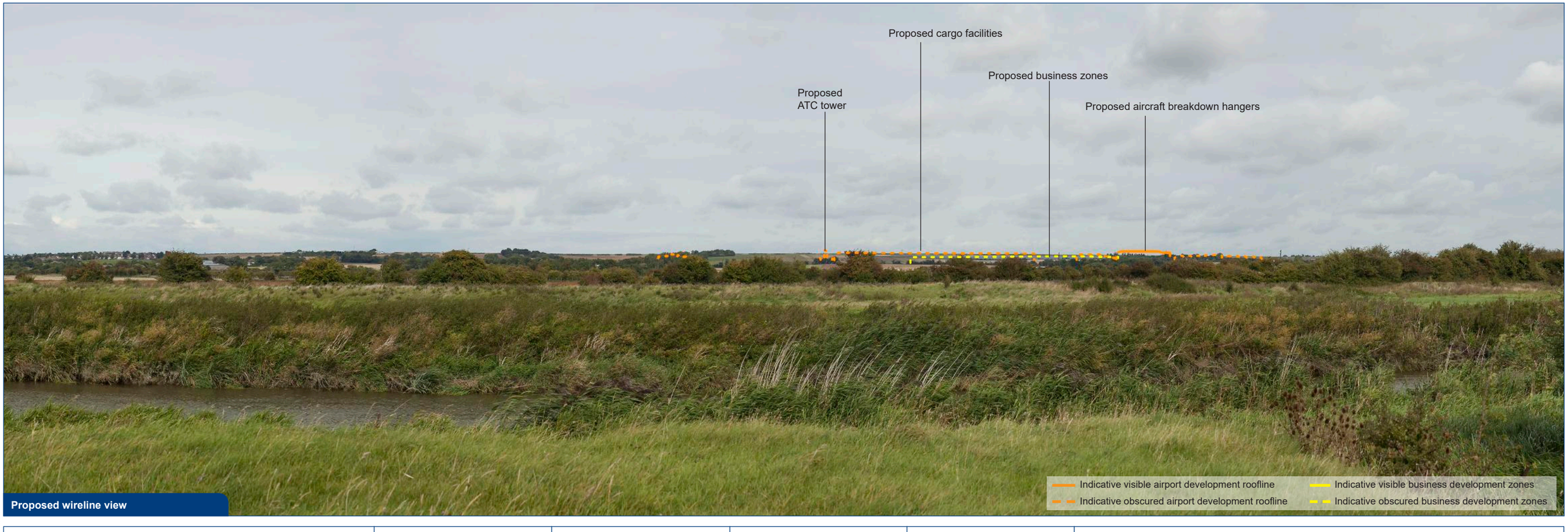
Existing view

Proposed wireline view

Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 14/09/2017 Lens: 50mm (35mm format)	Distance to site: 2.0km OS reference: 634328, 163120	Direction to site: north Viewpoint height: 6m AOD	Horizontal field of view: Approx. 75⁰ Viewing distance: 300mm @ A3	**Viewpoint 16: Northern side of Pegwell Country Park** **Figure: 20**

Existing view

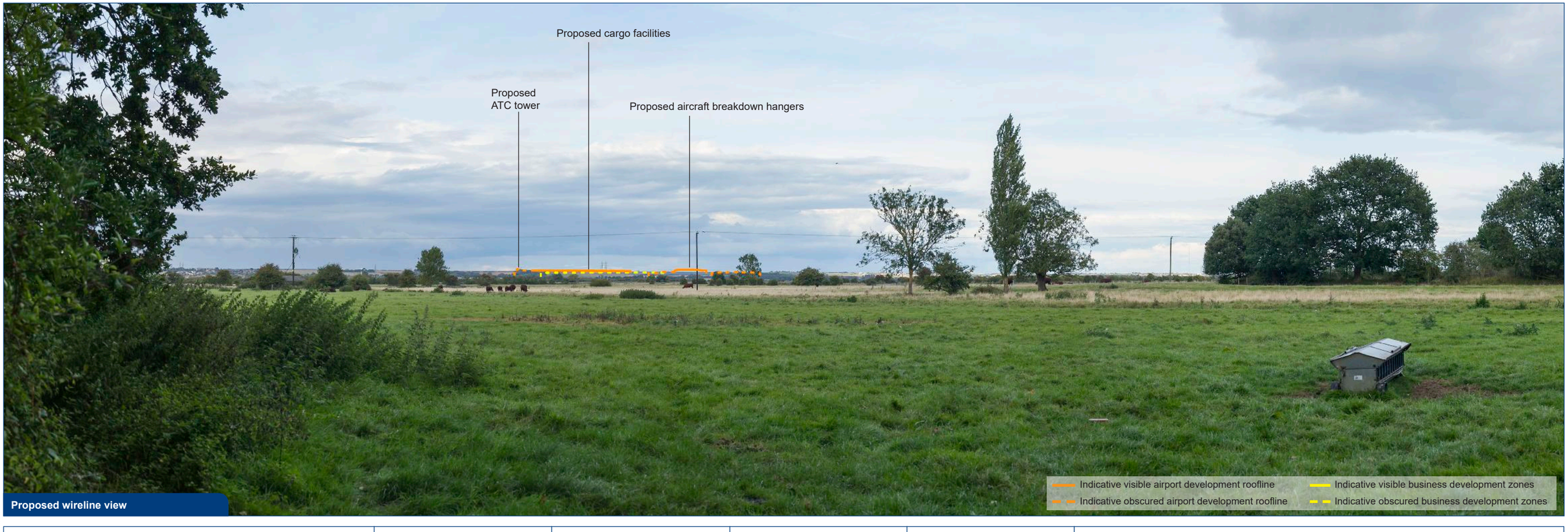


Proposed wireline view

Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 14/09/2017 Lens: 50mm (35mm format)	Distance to site: 3.0km OS reference: 631780, 162767	Direction to site: northeast Viewpoint height: 5m AOD	Horizontal field of view: Approx. 75^{0} Viewing distance: 300mm @ A3	**Viewpoint 17: South Saxon Way alongside River Stour** **Figure: 21**

Existing view

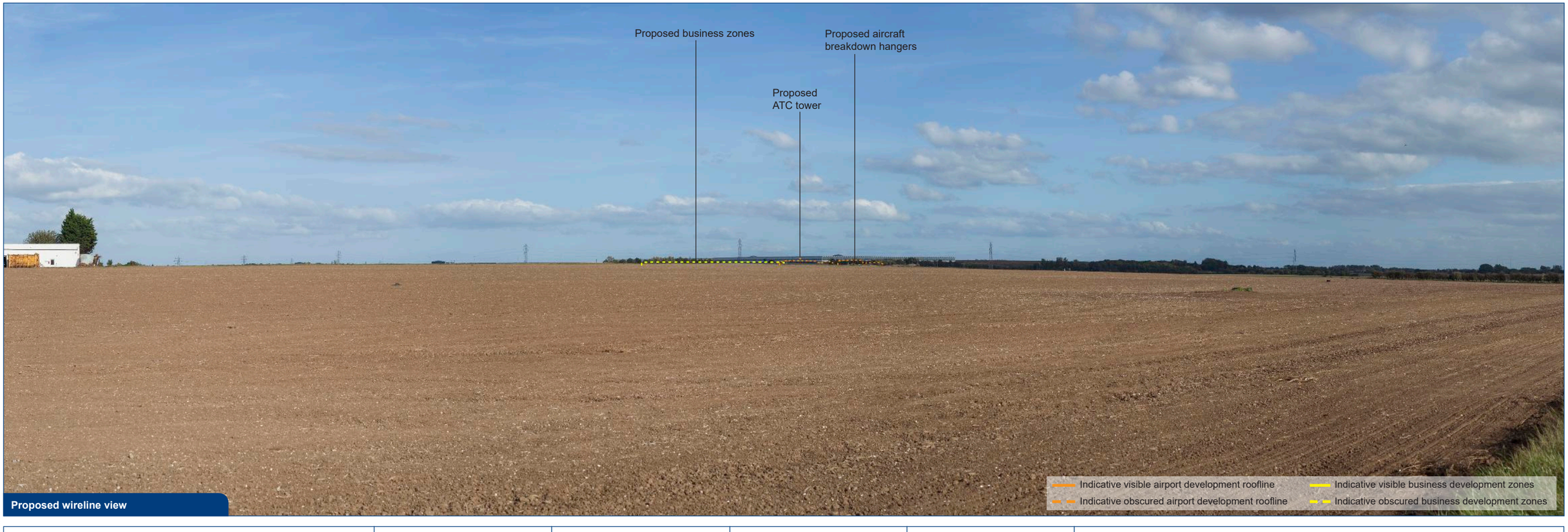


Proposed wireline view

Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 14/09/2017 Lens: 50mm (35mm format)	Distance to site: 5.1km OS reference: 629443, 161275	Direction to site: northeast Viewpoint height: 3m AOD	Horizontal field of view: Approx. 75⁰ Viewing distance: 300mm @ A3	**Viewpoint 18: Goldstone Drove PRoW, west of Lower Goldstone** **Figure: 22**

Existing view

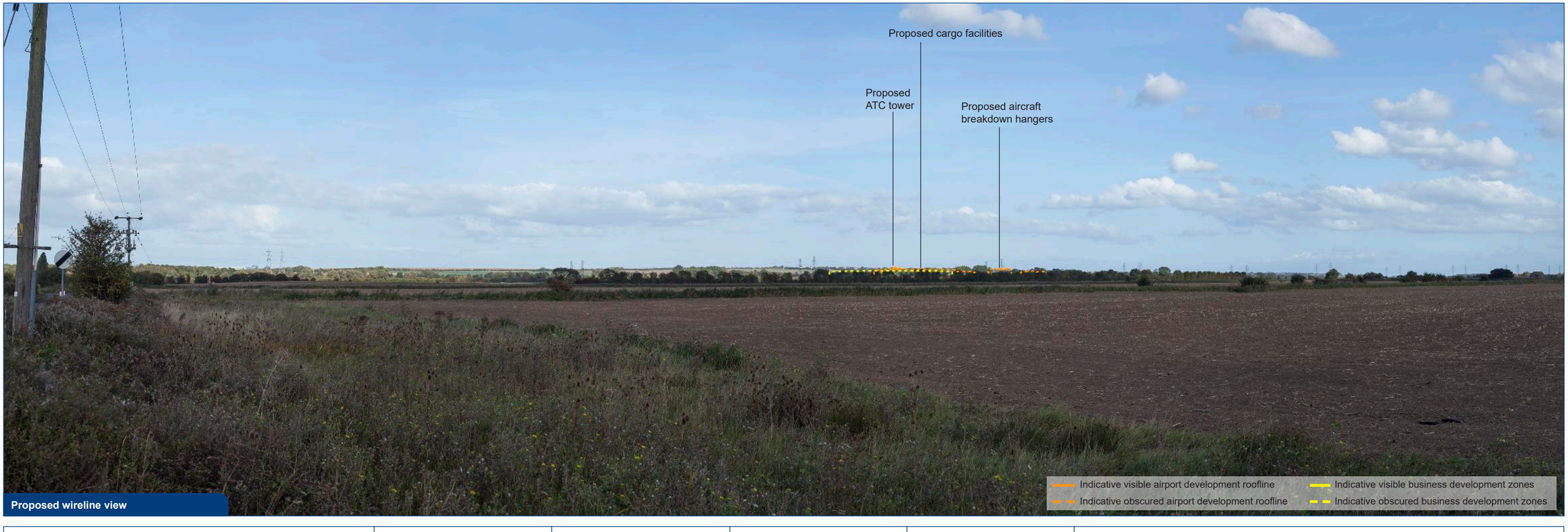


Proposed wireline view

Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 03/10/2017 Lens: 50mm (35mm format)	Distance to site: 4.9km OS reference: 626863, 166205	Direction to site: east Viewpoint height: 24m AOD	Horizontal field of view: Approx. 75^{0} Viewing distance: 300mm @ A3	**Viewpoint 19: Eastern edge of St Nicholas at Wade** **Figure: 23**

Existing view



Proposed wireline view

Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 03/10/2017 Lens: 50mm (35mm format)	Distance to site: 5.3km OS reference: 626980, 163458	Direction to site: northeast Viewpoint height: 4m AOD	Horizontal field of view: Approx. 75^{0} Viewing distance: 300mm @ A3	**Viewpoint 20: North side of bridge at Plucks Gutter** **Figure: 24**

Existing view

Proposed wireline view

Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 03/10/2017 Lens: 50mm (35mm format)	Distance to site: 4.6km OS reference: 637905, 169846	Direction to site: southwest Viewpoint height: 49m AOD	Horizontal field of view: Approx. 75° Viewing distance: 300mm @ A3	**Viewpoint 21: St Michael's Avenue, Northdown** **Figure: 25**

Existing view

Proposed wireline view

Ref: 10772-0003-004

RPS **Manston Airport DCO**	Date of photography: 14/09/2017 Lens: 50mm (35mm format)	Distance to site: 5.2km OS reference: 632440, 160311	Direction to site: north Viewpoint height: 13m AOD	Horizontal field of view: Approx. 75^{0} Viewing distance: 300mm @ A3	**Viewpoint 22: PRoW, north of Richborough Castle** **Figure: 26**

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Appendix 11.2
Landscape Character Areas: Sensitivity Assessment

1. Methodology

1.1.1 The sensitivity assessment has been undertaken in accordance with the methodology presented in **Section 11.7** of the ES.

1.1.2 The sensitivity assessments have been undertaken for those Landscape Character Areas (LCAs) which lie within the LVIA study area for the Manston Airport Site and where the Zone of Theoretical Visibility (ZTV) indicates the potential for landscape effects to occur. The LCAs are shown in **Figure 11.37** and the sensitivity assessments are contained within **Tables 3.1** to **3.14** of this appendix.

1.1.3 Landscape sensitivity is described as 'high', 'medium' or 'low'. This is assessed by taking into account the landscape value and landscape susceptibility to change, which may vary in response to both the type of development proposed and the specific characteristics of the study area, such that landscape sensitivity needs to be considered on a case by case basis. The following generic type of development and parameters have been considered when undertaking the sensitivity assessment:

- Manston Airport Site: the construction and operation of an airport with a number of large-scale hangars and buildings and the movement of aircraft, vehicles and heavy goods vehicles.

2. Summary of LCAs Sensitivity Assessment

2.1.1 A summary of the LCAs Sensitivity Assessment is presented in **Table 2.1**.

Table 2.1 Summary of the Sensitivity Assessment

LCA Reference	Landscape Designation	Overall Value	Overall Susceptibility	Overall Landscape Sensitivity
Landscape Character Areas				
A1: Manston Chalk Plateau	Undesignated	Medium	Low	Low
B1: Wantsum North Shore	Undesignated	Medium	Medium	Medium
C1: St Nicholas-at-Wade Undulating Chalk Farmland	Undesignated	Medium	Medium	Medium
C2: Central Thanet Undulating Chalk Farmland	Undesignated	Medium	Low	Low
C3: St Peters Undulating Chalk Farmland	Undesignated	Medium	Low	Low
D1: Quex Park	Undesignated	High	Low	Medium
E1: Stour Marshes	Undesignated	Medium	Medium	Medium
E2: Wade Marshes	Undesignated	Medium	High	High
F1: Pegwell Bay	Undesignated	High	Medium	High
Ash Level	Undesignated	Medium	High	High
Richborough Castle	Undesignated	High	High	High
The Sandwich Corridor	Undesignated	Low	Low	Low
Sandwich Bay	Undesignated	High	Medium	High

3. Sensitivity Assessments

3.1 Landscape Character Areas

Table 3.1 Landscape Sensitivity Assessment: LCA A1 Manston Chalk Plateau (host LCA)

Character Area: A1 Manston Chalk Plateau

LVIA photographic viewpoint locations within the Landscape Character Area: 1, 2, 4, 5, 6 and 7 (see Figure 11.7)

Direct landscape effects: Manston Airport Site | **Indirect landscape effects: Manston Airport Site**

Key Characteristics
(as defined in the *Thanet Landscape Character Assessment* (2017))

- *"Elevated, flat landform with gently rolling undulations between 40-55m AOD, characterised by an underlying chalk geology and an isolated area of Thanet sand formation in the east.*
- *Predominantly regular, medium to large scale arable and horticultural fields on ALC Grade 1 and 2 soils with little defining features which create a very open landscape.*
- *Tree belts and linear woodland with localised areas of paddocks and pasture provide enclosure around small villages of Manston and Woodchurch as well as scattered farmsteads.*
- ***The disused Kent International Airport consisting of dilapidated terminal buildings and neglected grassland defined by security fencing occupy the southern area**.*
- *A road network of roads and lanes dissect the plateau and includes the A299 which provides a main connection into Thanet.*
- *Settlement comprises low density, 1-2 storey detached properties including the small village of Manston and buildings along minor roads. A variety of building materials including traditional flint, plus red brick, render and timber cladding. Area of former plotland at Woodchurch.*
- *Elevated plateau results in long distance panoramic views in the south over Minster Marshes and across Pegwell Bay and, in the west, across the Wantsum.*
- ***The elevated central chalk plateau also forms a skyline in many views back from lower landscapes in Thanet, including the coast and marshlands**.*
- *Other land uses include Manston Golf Club and a solar farm and are generally well integrated into the landscape due to the flat topography and bordering vegetation.*
- *Urban influences in form of exposed adjoining settlement edges including large scale buildings at Westwood Cross Shopping Centre. Areas of cropping (brassicas) in stark contrast to adjacent urban areas.*
- *Military influences including the Defence Fire Training Centre and RAF Manston Spitfire and Hurricane Museum."*

* Those characteristics which are highlighted in **Bold** may be susceptible to change as a result of development within the Manston Airport Site

Value criteria	Commentary	Value
Landscape designations	There are no national or local landscape designations within this LCA	Medium
Condition/quality	This Is a landscape where features are of moderate condition although the piecemeal nature of built development has fragmented the agricultural landscape. The published assessment cites this as a "*fragmented landscape with little coherence*". Manston Airport itself contains a "*barren landscape of derelict terminal buildings and unmanaged grassland bound by high security fencing*" (*Thanet Landscape Character Assessment*, 2017). The field survey indicated a high proportion of roadside debris and litter.	Low
Scenic quality	The agricultural landscape within this LCA is interspersed with a number of developments including the Defence Fire Training and Development Centre as well as smaller sites including DDS Building Supplies. Large-scale developments close to the boundary of the LCA, such as Manston Business Park, Thanet Earth and Westwood Cross Shopping Area also exert an urban influence. Tree cover within the LCA reduces the visual role of this remnant development and ad-hoc business parks as noted in the published assessment which states that "*tree belts allow other less-characteristic land uses such as a solar farm and golf course to partially assimilate into the landscape*" (*Thanet Landscape Character Assessment*, 2017).	Medium

Table 3.1 (continued) Landscape Sensitivity Assessment: LCA A1 Manston Chalk Plateau (host LCA)

Character Area: A1 Manston Chalk Plateau

Value criteria	Commentary	Value
Rarity	This is a LCA which contains landscape features that are common and not rare.	Low
Conservation interests	In terms of heritage designations, the LCA contains a single scheduled monument (enclosure and ring ditches 200yds (180m) ENE of Minster Laundry) as well as approximately 10 listed buildings.	Medium
Recreation value	There are no long distance recreational routes within this LCA although there are a moderate number of local PRoWs and the areas also hosts a number of caravan and camping sites.	Medium
Perceptual aspects	Reference to CPRE's Tranquillity Mapping (CPRE, 2007) indicates that levels of tranquillity are expected to be moderate with areas around Manston Airport moderately low. The field survey indicated that the network of local roads to the north of the airport are particularly busy with traffic reducing any sense of remoteness and leading to a busy landscape with high levels of movement.	Low
Associations	Manston Airport and runway were used for the making of the James Bond film *Die Another Day* in 2001. Smuggler's Leap close to the A253/A299 roundabout is a chalk pit which features in the poem *The Smuggler's Leap* by Richard Harris Barham.	Medium
Overall value	The overall value of this LCA is assessed as being Medium.	**Medium**
Susceptibility commentary (to development within the Manston Airport Site)		**Susceptibility**
Physical characteristics: This is a typically large-scale landscape which is already influenced by a number of large-scale developments and buildings which are either located within or close to the boundaries of the LCA. This existing presence of large-scale development similar to that proposed within the Manston Airport Site and whose visual role is reduced by tree cover, which although not extensive is sufficient to provide screening, suggests a susceptibility of low to the type of development proposed within the Manston Airport Site.		Low
Visual characteristics: This is an open landscape where views are interrupted by tree cover or locally by built development. Visual intrusion includes not only those developments sited within the LCA but also the urban fringes of the surrounding coastal conurbations including the large retail units at Westwood Cross. Movement of traffic along the local road network as well as the A299 is also an existing influence within this LCA.		Low
Perceptual characteristics: Reference to CPRE's *Tranquillity Mapping* (CPRE, 2007) indicates that levels of tranquillity are expected to be moderate with areas around Manston Airport moderately low. This is supported by the findings of the field survey. The presence of ad-hoc built development and a moderately dense road network reduces any sense of remoteness. CPRE's *Night Blight Mapping* (CPRE, 2016) and night-time field surveys suggest that levels of radiance are generally moderate across this LCA with higher levels of light intrusion present around the eastern and western fringes of the LCA due to the presence of Thanet Earth and Manston Business Park to the west and proximity to the suburbs of Northwood and Newington as well as Westwood Cross to the east.		Low
Overall susceptibility	The overall susceptibility of this LCA is assessed as being Low.	**Low**

Overall sensitivity		Susceptibility		
		High	**Medium**	**Low**
Value	**High**	High	High	Medium
	Medium	High	Medium	**Low**
	Low	Medium	Low	Low

Overall Sensitivity to proposed development at the Manston Airport Site
The overall value of this LCA is Medium. The overall susceptibility is judged to be Low indicating a **Low** overall sensitivity**.**

Table 3.2 Landscape Sensitivity Assessment: LCA B1 Wantsum North Shore

Character Area: B1 Wantsum North Shore

LVIA photographic viewpoint locations within the Landscape Character Area: 3, 11and 12 (see Figure 11.7)

Direct landscape effects: None | **Indirect landscape effects: Manston Airport Site**

Key Characteristics
(as defined in the *Thanet Landscape Character Assessment* (2017))

- *"Sloping arable fields characterised by a transitional underlying geology formed of chalk and Thanet Sand formations.*
- *Former channel side 'port' villages of Minster, Monkton and Sarre evidencing the growth of settlement and commerce via the Wantsum – retaining strong historic character.*
- *Regular, rectilinear field pattern with few defining boundary features between fields creating a large scale and open landscape.*
- *Asparagus cultivation on the south facing sandy slopes creating a distinctive seasonal agricultural landscape.*
- *Localised areas of tree planting containing isolated farmsteads and roadside houses with intermittent hedgerows lining connecting roads and around settlements.*
- *Settlements with distinct local vernacular and historic cores arranged in a grid pattern with irregular settlement edges and modern additions comprising linear development rising up the landform, generally well contained by trees.*
- *St Augustine's Cross, a stone memorial with carvings of significant Christian figures and events near to the village of Cliffsend.*
- *Long views over the marshes into Dover and Canterbury Districts as well as sea views from the elevated ground and cliff tops over Pegwell Bay and the English Channel.*
- *Outside the villages there is relatively little development resulting in an **undeveloped ridgeline** and slopes interspersed with occasional woodland and tree belts. Some quiet rural lanes."*

* Those characteristics which are highlighted in **Bold** may be susceptible to change as a result of development within the Manston Airport Site

Value criteria	Commentary	Value
Landscape designations	There are no national or local landscape designations within this LCA	Medium
Condition/quality	The condition of the landscape features within this LCA is considered to be moderate; this is primarily a managed agricultural landscape although many field boundaries have been removed.	Medium
Scenic quality	This is an open landscape with views to the north (from lower lying land either side of Minster) curtailed by the rising southern face of the plateau, whilst from elevated areas there are long distance views available across the Wantsum Channel or from locations towards the east, across Pegwell Bay. These long distance views across the marshes and towards the sea contribute to a high scenic quality. The higher proportion of tree cover present around the settlements of Monkton, Minster and St Nicholas at Wade means that the urban edges of these settlements are generally screened and softened. The published assessment cites the A299 and A256 as visual and aural detractors on the boundaries of the LCA.	High
Rarity	This is a landscape which contains features that common within the southeast of England.	Low
Conservation interests	There are a considerable number of heritage assets within the LCA including three scheduled monuments. There are also conservation areas at Minster and Monkton with high numbers of listed buildings found both within the settlements and attached to the isolated properties and farmsteads that lie beyond the settlement boundaries. A small part of the Pegwell conservation area also lies within this LCA. The churchyard associated with St Mary Magdalene at Monkton is highlighted as a Local Wildlife Site.	High
Recreation value	Recreational routes within this LCA include the Viking Coastal Trail Cycle Route and a short section of the Thanet Coastal Path which coincides with the England Coast Path as it passes through this LCA. A single caravan and camping site is also present within the LCA together with a moderate number of local PRoWs.	Medium

Table 3.2 (continued) Landscape Sensitivity Assessment: LCA B1 Wantsum North Shore

Character Area: B1 Wantsum North Shore

Value criteria	Commentary	Value
Perceptual aspects	Reference to CPRE's *Tranquillity Mapping* (CPRE, 2007) indicates that moderate levels of tranquillity may be expected within this LCA when considered on a regional basis. The lowest levels are likely to be found around the settlements of Minster and Cliffs End and influenced by the high levels of built form and overt human influence. The higher levels of tranquillity are likely within the western fringes of the LCA and across the rural landscape between Minster and Cliffs End. The LCA is traversed and bordered by a number of busy A roads and railway, which locally disturb levels of tranquillity.	Medium
Associations	Ebbsfleet on the eastern fringes of this LCA is noted on OS mapping and is said to have been the site of two important arrivals in English history: the Saxon landing of Hengist and Horsa in 449 AD and Augustine of Canterbury in 597 AD, who converted the English to Christianity. St Augustine's Cross, a stone memorial is located near to Cliffs End and marks the landing of St Augustine from Rome.	High
Overall value	The overall value of this LCA is assessed as being Medium.	**Medium**
Susceptibility commentary (to development within the Manston Airport Site)		**Susceptibility**
Physical characteristics: There would be no physical changes to this LCA as a result of development with the Manston Airport Site.		N/A
Visual characteristics: This is an open landscape providing wide and open views that are primarily oriented southwards and across the former Wantsum Channel, Pegwell Bay and the adjacent marshes towards the sea. Views to the north are restricted by the largely undeveloped ridgeline of the chalk plateau along which the A299 is aligned. Development sited close to this ridgeline has the potential to create skyline intrusion in views from locations to the south thereby increasing susceptibility.		Medium
Perceptual characteristics: Reference to CPRE's *Tranquillity Mapping* (CPRE, 2007) indicates moderate levels of tranquillity on a regional basis reducing slightly around Minster and at Cliffs End. These expected levels are periodically reduced locally by the aural and visual presence of trains along the railway lines which pass through and adjacent to this LCA. The field survey also indicated that the busy A roads (the A299 and A256) also locally disrupt the perceptual quality of tranquillity and reduce any sense of remoteness. Levels of radiance are generally moderate as shown in CPRE's *Night Blight Mapping* (CPRE, 2016) influenced by lighting within the settlements of Monkton, Minster and Cliffs End and highway lighting along the A299 west of Minster.		Medium
Overall susceptibility	The overall susceptibility of this LCA is assessed as being Medium.	**Medium**

Overall sensitivity		Susceptibility		
		High	**Medium**	**Low**
Value	**High**	High	High	Medium
	Medium	High	**Medium**	Low
	Low	Medium	Low	Low

Overall Sensitivity to proposed development at the Manston Airport Site
The overall value of this LCA is Medium. The overall susceptibility is judged to be Medium indicating a **Medium** overall sensitivity**.**

Table 3.3 Landscape Sensitivity Assessment: LCA C1 St Nicholas-at-Wade Undulating Chalk Farmland

Character Area: C1 St Nicholas-at-Wade Undulating Chalk Farmland

LVIA photographic viewpoint locations within the Landscape Character Area: 19 (see Figure 11.7)

Direct landscape effects: None | **Indirect landscape effects: Manston Airport Site**

Key Characteristics
(as defined in the *Thanet Landscape Character Assessment* (2017))

- *"Agricultural fields on undulating landform characterised by chalk geology.*
- *Large scale arable fields with mostly denuded open field boundaries, with tree planting limited to a small number of copses and tree belts.*
- *The vast horizontal expanse of the greenhouses at Thanet Earth is a dominant feature on the skyline.*
- *Monkton Nature Reserve (LNR/RIGS) comprising a former quarry now regenerated, including distinct white chalk exposures and rich biodiversity, and use for astronomy.*
- *Larger ridge top village at St Nicholas-at-Wade, and smaller linear village at Acol both with historic cores (Conservation Areas), smaller surrounding fields and tree planting contrast with open arable farmland.*
- *Distinct built vernacular comprising flint and ragstone, red brick and clay roof tiles as well as some brick and render contributing to rural character. Flemish/Dutch gables and Oast houses are locally distinctive built form.*
- ***Long distance panoramic views across the agricultural landscape** and to the Thames Estuary and the Channel.*
- *The church tower within St Nicholas-at-Wade and woodland at St Nicholas Court form a distinct landmark appearing as a wooded ridge within views from the lower lying marshes.*
- *Main roads cross and divide the farmland - key routes into and out of Thanet, with moving traffic."*

* Those characteristics which are highlighted in **Bold** may be susceptible to change as a result of development within the Manston Airport Site

Value criteria	Commentary	Value
Landscape designations	There are no national or local landscape designations within this LCA	Medium
Condition/quality	The condition of the landscape features within this LCA is considered to be moderate; this is primarily a managed agricultural landscape although many field boundaries have been removed.	Medium
Scenic quality	This is an open LCA with long distance panoramic views across a primarily rural landscape. The large-scale glasshouses at Thanet Earth are cited in the published assessment as a feature which "*dominates the skyline*" and as being "*incongruous*". The A299, A28 and A253 are also cited as being "*highly visible in the open landscape*" (*Thanet Landscape Character Assessment* (2017)).	Medium
Rarity	This is a landscape which contains features that common within the southeast of England.	Low
Conservation interests	Conservation areas are present at St Nicholas at Wade and Acol with a high concentration of listed buildings within each settlement. Also present within the LCA is a scheduled monument (Anglo-Saxon cemetery, parish church of St Giles and associated remains) which lies immediately east of Sarre Mill. Monkton Nature Reserve occupies a former quarry.	High
Recreation value	The Wantsum Walk passes through this LCA along with part of the Viking Coastal Trail Cycle Route. Two camping and caravan sites are present close to St Nicholas at Wade whilst the agricultural landscape is traversed by a moderately high number of PRoWs.	High
Perceptual aspects	Reference to CPRE's *Tranquillity Mapping* (CPRE, 2007) indicates that moderate to moderately high levels of tranquillity may be expected within this LCA when considered on a regional basis. The LCA is traversed and bordered by a number of busy A roads (A299 and A28), which locally disturb levels of tranquillity and together with the presence of settlements and Thanet Earth, reduce any sense of remoteness.	Medium
Associations	The village of St Nicholas at Wade is known locally for the custom of Hoodening, a folk custom found in Kent.	Low

Table 3.3 (continued) Landscape Sensitivity Assessment: LCA C1 St Nicholas-at-Wade Undulating Chalk Farmland

Character Area: C1 St Nicholas-at-Wade Undulating Chalk Farmland		
Overall value	The overall value of this LCA is assessed as being Medium.	**Medium**
Susceptibility commentary (to development within the Manston Airport Site)		**Susceptibility**
Physical characteristics: There would be no physical changes to this LCA as a result of development with the Manston Airport Site.		N/A
Visual characteristics: This is an open landscape providing wide long distance panoramic views. Visual intrusion includes the large-scale glasshouses at Thanet Earth sited within the LCA and those concentrated around Manston Business Park which lies to the east of the LCA. Movement of traffic along the A299, A28 and A253 is also an existing visual influence within this LCA.		Low
Perceptual characteristics: Reference to CPRE's *Tranquillity Mapping* (CPRE, 2007) indicates moderate to moderately high levels of tranquillity on a regional basis. These expected levels of tranquillity are locally reduced by the aural and visual presence of the busy A roads which also reduce any sense of remoteness. CPRE's *Night Blight Mapping* (CPRE, 2016) indicates that levels of radiance are high around Thanet Earth with moderate levels found across the remainder of the LCA as a result of the influence of this development, proximity to the settlement of St Nicholas at Wade and highway lighting along the A299.		Medium
Overall susceptibility	The overall susceptibility of this LCA is assessed as being Medium.	**Medium**

Overall sensitivity		Susceptibility		
		High	**Medium**	**Low**
Value	**High**	High	High	Medium
	Medium	High	**Medium**	Low
	Low	Medium	Low	Low

Overall Sensitivity to proposed development at the Manston Airport Site
The overall value of this LCA is Medium. The overall susceptibility is judged to be Medium indicating a **Medium** overall sensitivity**.**

Table 3.4 Landscape Sensitivity Assessment: LCA C2 Central Thanet Undulating Chalk Farmland

Character Area: C2 Central Thanet Undulating Chalk Farmland

LVIA photographic viewpoint locations within the Landscape Character Area: 8, 9, 10, 13, 14 and 15 (see Figure 11.7)

Direct landscape effects: None **Indirect landscape effects: Manston Airport Site**

Key Characteristics
(as defined in the *Thanet Landscape Character Assessment* (2017))

- "*Gently undulating, agricultural landscape underlain by the Chalk formation.*
- *Large, intensively farmed fields of arable and horticultural crops regular in shape and with few defining boundary features resulting in a large scale pattern and very open landscape.*
- *Limited structural planting in the landscape with concentrations of woodland at St John's Cemetery and around the perimeter of Quex Park forming key features in views across the open landscape.*
- *Isolated farm buildings along minor roads and rural lanes with some urban fringe influences development near to the built edge including paddocks, and occasional large scale industrial units.*
- *Stark exposed residential urban edges abut the farmland forming very visible urban boundaries, with fingers of farmland often penetrating the urban area and providing glimpses to the sea beyond. Church spires and towers within the urban areas are landmark features.*
- *Salmestone Grange, a 14th century monastic grange (Scheduled Monument) and chapel formed of distinctive ragstone and situated in gardens*
- *Largely open landscape with glimpsed sea views across the Margate skyline from the higher ground. Long distance views across the marshes and across to off-shore windfarms in the North Sea from the A28.*
- *Subdivided by a network of minor roads and lanes used as short cut routes and often busy with traffic, adding a further urban influence.*"

* Those characteristics which are highlighted in **Bold** may be susceptible to change as a result of development within the Manston Airport Site

Value criteria	Commentary	Value
Landscape designations	There are no national or local landscape designations within this LCA	Medium
Condition/quality	The published assessment (under the quality and condition heading) cites this LCA as "*The open arable/horticultural fields, denuded boundaries, plus general absence of tree and woodland create a fragmented open landscape with views to the stark urban edges of Birchington, Westgate and Margate which bound this area to the north*".	Low
Scenic quality	The published assessment cites that "*Views are generally contained by the adjoining urban edge to the north and east and the plateau to the south. Urban edges are stark…*". The large-scale buildings within the Manston Business Park are present within the southern part of the LCA.	Medium
Rarity	This is a landscape which contains features that common within the southeast of England.	Low
Conservation interests	There are five scheduled monuments present within the LCA as well as a number of listed buildings, primarily clustered within Margate Cemetery.	High
Recreation value	There are no long distance recreational routes which pass through the LCA. Two camping and caravan sites are present as well as Westgate and Birchington Golf Club and a moderately high proportion of local PRoWs.	Low
Perceptual aspects	Reference to CPRE's *Tranquillity Mapping* (CPRE, 2007) indicates that moderate to moderately low levels of tranquillity may be expected within this LCA when considered on a regional basis. The lowest levels are likely to be found around the settlement fringes influenced by the high levels of neighbouring built form and overt human influence. The field survey indicated that the minor roads within this LCA are busy with traffic introducing movement into the open landscape.	Medium
Associations	There are no known historic or cultural associations within this LCA, beyond any local associations that may exist but are undocumented.	Low

Table 3.4 (continued) Landscape Sensitivity Assessment: LCA C2 Central Thanet Undulating Chalk Farmland

Character Area: C2 Central Thanet Undulating Chalk Farmland

Value criteria	**Commentary**	**Value**
Overall value	The overall value of this LCA is assessed as being Medium.	**Medium**
Susceptibility commentary (to development within the Manston Airport Site)		**Susceptibility**
Physical characteristics: There would be no physical changes to this LCA as a result of development with the Manston Airport Site.		N/A
Visual characteristics: This is an open landscape providing long distance views. The large industrial units within Manston Business Park along Columbus Avenue dominate the skyline in some views. In other views the stark exposed built edge of the adjacent coastal conurbations means that urban influences are experienced across much of the area.		Low
Perceptual characteristics: Reference to CPRE's *Tranquillity Mapping* (CPRE, 2007) indicates moderate to moderately low levels of tranquillity may be expected within this LCA when considered on a regional basis as a result of its proximity to the coastal conurbations allied with the open landscape and long views which mean that "*urban influences are experienced across much of the area*". CPRE's *Night Blight Mapping* (CPRE, 2016) indicates that levels of radiance are moderate as a result of the influence of the adjacent development to the north.		Low
Overall susceptibility	The overall susceptibility of this LCA is assessed as being Low.	**Low**

Overall sensitivity		Susceptibility		
		High	**Medium**	**Low**
Value	**High**	High	High	Medium
	Medium	High	Medium	**Low**
	Low	Medium	Low	Low

Overall Sensitivity to proposed development at the Manston Airport Site
The overall value of this LCA is Medium. The overall susceptibility is judged to be Low indicating a **Low** overall sensitivity**.**

Table 3.5 Landscape Sensitivity Assessment: LCA C3 St Peters Undulating Chalk Farmland

Character Area: C3 St Peters Undulating Chalk Farmland

LVIA photographic viewpoint locations within the Landscape Character Area: 21 (see Figure 11.7)

Direct landscape effects: None **Indirect landscape effects: Manston Airport Site**

Key Characteristics
(as defined in the *Thanet Landscape Character Assessment* (2017))

- *"Undulating landform characterised by an underlying geology of chalk and an outcrop of sands, dropping in elevation to the east.*
- *Large scale, arable (brassica) fields, regular in form and dissected by a number of transport routes.*
- *Intact roadside hedgerows and mature hedgerow trees contrast with the open internal boundaries creating a generally open landscape.*
- *Well-treed farmsteads and nurseries/glass house complexes interspersed along the roads and throughout the landscape.*
- *Strong urbanising influences in the form of school buildings and fencing edge, views to the abrupt residential edge and roads.*
- *Open fieldscape allowing for views across the landscape but generally limited by the surrounding built edge. Sea views in the east at North Foreland.*
- *Distinctive landscape/seascape at Kingsgate/North Foreland, with rural lanes, flint walls, holm oak and sea views.*
- *Cultural associations including scheduled monuments and landmarks at North Foreland Lighthouse and Kingsgate Castle.*
- *An Anglo-Saxon cemetery and double ring ditch with enclosures provide cultural links to the past.*"

* Those characteristics which are highlighted in **Bold** may be susceptible to change as a result of development within the Manston Airport Site

Value criteria	Commentary	Value
Landscape designations	There are no national or local landscape designations within this LCA	Medium
Condition/quality	The quality and condition section of the published assessment cites this as being "*a semi-intact landscape, the roadside hedgerows with their mature trees create a rural character and pattern and the fields remain well managed of agriculture. The area is fragmented by numerous roads….*".	Medium
Scenic quality	The published assessment cites "*strong urbanising influences……views to abrupt residential edge and roads*".	Medium
Rarity	This is a landscape which contains features that common within the southeast of England.	Low
Conservation interests	There are two scheduled monuments present within the part of the LCA which lies within the study area as well as a number of listed buildings, primarily clustered around Westwood Lodge.	High
Recreation value	The Turner and Dickens Way passes through the LCA following St Peters footpath. Dane Valley Woods and Windmill Community Gardens are two publically accessible open spaces and the LCA contains a moderately high proportion of local PRoWs. Drapers Windmill is also seasonally open to the public.	High
Perceptual aspects	Reference to CPRE's *Tranquillity Mapping* (CPRE, 2007) indicates that moderately low levels of tranquillity may be expected within this LCA when considered on a regional basis. Levels are likely to be influenced by the high levels of neighbouring built form and overt human influence and by the busy road network and railway which bisect the area.	Low
Associations	There are no known artistic, literary or cultural associations beyond those that may exist at a local level and are undocumented.	Low
Overall value	The overall value of this LCA is assessed as being Medium.	**Medium**

Table 3.5 (continued) Landscape Sensitivity Assessment: LCA C3 St Peters Undulating Chalk Farmland

Character Area: C3 St Peters Undulating Chalk Farmland

Susceptibility commentary (to development within the Manston Airport Site)	**Susceptibility**
Physical characteristics: There would be no physical changes to this LCA as a result of development with the Manston Airport Site.	N/A
Visual characteristics: Views are generally limited by the extent of the urban edge and often contain the taller vertical structures of the steel lattice pylons that cross this LCA.	Low
Perceptual characteristics: Reference to CPRE's *Tranquillity Mapping* (CPRE, 2007) indicates that moderately low levels of tranquillity may be expected within this LCA influenced by the high levels of neighbouring built form and by the busy road network and railway which bisect the area. CPRE's *Night Blight Mapping* (CPRE, 2016) indicates that levels of radiance are high within this LCA, again as a result of the influence of the neighbouring urban development.	Low
Overall susceptibility The overall susceptibility of this LCA is assessed as being Low.	**Low**

Overall sensitivity		Susceptibility		
		High	**Medium**	**Low**
Value	**High**	High	High	Medium
	Medium	High	Medium	**Low**
	Low	Medium	Low	Low

Overall Sensitivity to proposed development at the Manston Airport Site
The overall value of this LCA is Medium. The overall susceptibility is judged to be Low indicating a **Low** overall sensitivity**.**

Table 3.6 Landscape Sensitivity Assessment: LCA D1 Quex Park

Character Area: D1 Quex Park

LVIA photographic viewpoint locations within the Landscape Character Area: None (see Figure 11.7): None

Direct landscape effects: None **Indirect landscape effects: Manston Airport Site**

Key Characteristics
(as defined in the document Landscape Character Areas (TDC, 2012))

- *"Flat, plateau landform at 25m AOD underlain by the chalk of central Thanet.*
- *An irregular pattern of small-scale arable fields interspersed with parkland pasture, small circular copses and some mature specimen oaks creating a formal landscape structure.*
- *Grade II Listed Quex House, an early 19th century regency-style mansion, contained by an area of deciduous woodland at the centre of the estate.*
- *A winding track provides the main access to Quex Park through ornamental gates which provide a sense of formality and grandeur.*
- *A well-enclosed and private landscape with limited permeability or intervisibility with adjacent areas, whilst Waterloo Tower, a distinctive bell tower is a local landmark.*
- *Other land uses include farm buildings at Quex Farm and a caravan park and Quex Park Holiday Park.*
- *Appear as a wooded enclosed landscape in contrast to the surrounding open intensively managed arable plateau."*

* Those characteristics which are highlighted in **Bold** may be susceptible to change as a result of development within the Manston Airport Site

Value criteria	Commentary	Value
Landscape designations	There are no national or local landscape designations within this LCA	Medium
Condition/quality	This is a managed landscape with a strong sense of time depth whose features are in good condition.	High
Scenic quality	This is an attractive and planned landscape.	High
Rarity	A landmark within the Park is the Waterloo Tower built 1819 with its extremely rare secular peal of 12 bells.	High
Conservation interests	Whilst there are no nature conservation designations within this small LCA, there are eight grade II listed buildings.	High
Recreation value	Quex Park is a recreational destination with parkland and gardens, Quex House and the Powell-Cotton Museum. The park also hosts a Children's Indoor and Outdoor Play Centre, a Craft Village, a Garden Nursery, Quex Carriages, an Activity Centre, Farm shop and Restaurant and in the summer, a giant Maize Maze.	High
Perceptual aspects	Reference to CPRE's *Tranquillity Mapping* indicates that this LCA is likely to possess moderate to moderately low levels of tranquillity due to its proximity to the urban areas of Birchington and Margate and high numbers of visitors.	Medium
Associations	Quex Park was the base of fictional criminal activities in Dennis Wheatley's 1938 thriller Contraband. The Waterloo Tower within the grounds was used as a film location for the BBC 1970's science fiction series Blake's 7.	High
Overall value	The overall value of this LCA is assessed as being High.	High

Table 3.6 (continued) Landscape Sensitivity Assessment: LCA D1 Quex Park

Susceptibility commentary (to development within the Manston Airport Site)	Susceptibility
Physical characteristics: There would be no physical changes to this LCA as a result of development with the Manston Airport Site.	N/A
Visual characteristics: The wooded nature of this LCA and its peripheral tree belts means that outward views towards adjacent LCAs are rare. Where infrequent and usually glimpsed outward views are available, they invariably contain existing built form found within the surrounding urban fringes or the large-scale buildings within Manston Business Park.	Low
Perceptual characteristics: Reference to CPRE's *Tranquillity Mapping* (CPRE, 2007) indicates that this LCA is likely to possess moderate to moderately low levels of tranquillity due to its proximity to the urban areas of Birchington and Margate. The high numbers of visitors are also likely to reduce levels of tranquillity and any perception of remoteness. CPRE's *Night Blight Mapping* (CPRE, 2016) shows levels of radiance to be moderately high with light intrusion from the nearby urban development and Thanet Earth playing a role.	Low
Overall susceptibility The overall susceptibility of this LCA is assessed as being Low.	**Low**

Overall sensitivity		Susceptibility		
		High	**Medium**	**Low**
Value	**High**	High	High	**Medium**
	Medium	High	Medium	Low
	Low	Medium	Low	Low

Overall Sensitivity to proposed development at the Manston Airport Site
The overall value of this LCA is High. The overall susceptibility is judged to be Low indicating a **Medium** overall sensitivity**.**

Table 3.7 Landscape Sensitivity Assessment: LCA E1 Stour Marshes

Character Area: E1 Stour Marshes

LVIA photographic viewpoint locations within the Landscape Character Area: 20 (see Figure 11.7)

Direct landscape effects: None **Indirect landscape effects: Manston Airport Site**

Key Characteristics
(as defined in the document Landscape Character Areas (TDC, 2012))

- *"Low-lying and flat marshland landscape occupying the former Wantsum river channel.*
- *A vast, open landscape with huge skies,* ***extensive views and a strong rural, even remote, character****.*
- *Irregular arable fields defined by straight and meandering drainage ditches representing an ancient enclosure pattern, plus small tributaries of the River Stour and River Wantsum.*
- *Small embanked reservoirs are a feature within the arable fields highly visible by their bunded topography and associated scrub /tree growth.*
- *Limited tree cover with occasional small wooded copses absence of enclosure.*
- *A* ***largely undeveloped landscape****, with few roads or buildings, crossed by the railway and two roads at Pluck's Gutter and Marsh Farm Road.*
- *Long uninterrupted views across the marshes and Pegwell Bay and into marshes of neighbouring districts (Dover and Canterbury).*
- *Contained to the north by the slopes of the north shore (LCA B1)."*

* Those characteristics which are highlighted in **Bold** may be susceptible to change as a result of development within the Manston Airport Site

Value criteria	Commentary	Value
Landscape designations	There are no national or local landscape designations within this LCA	Medium
Condition/quality	This is a landscape which has altered little since the channel silted up by the 16th century. As such there is a strong sense of time depth and a unified distinctive character.	High
Scenic quality	This is an area of reclaimed marshes with limited landscape features defined by an ancient ditch and dyke field system and long distance views with wide, open skies. There is some local visual intrusion and detractors towards the eastern side of the LCA through the presence of the A256, Weatherlees Hill Wastewater Treatment Plant, neighbouring Ebbsfleet Farm Solar Part and single wind turbine at the former Richborough Power Station site (now Richborough Energy Park). Parallel 132kV overhead lines also pass through part of the LCA and are locally prominent.	Medium
Rarity	The landscape is of historical and cultural value consisting of the former sea channel, the Wantsum Channel.	Medium
Conservation interests	The Sandwich Bay to Hacklinge Marshes SSSI lies within this LCA at Weatherlees Hill. A number of local wildlife sites are present (as designated in the Thanet Local Plan). A single listed building is sited at Sherrifs Court north of the railway line.	Medium
Recreation value	There are a limited number of local footpaths which cross the marshes. A camping and caravan site (The Foxhunter Park) is located on the southern edge of Monkton.	Low
Perceptual aspects	Reference to CPRE's Tranquillity Mapping (CPRE, 2007) indicates that this landscape is one of the most tranquil on a regional level. However, levels of tranquillity are likely to be periodically disturbed by the audible and visual presence of trains along the railway lines that pass adjacent to the boundary of or through this LCA. The published character assessment notes, as one of the key sensitivities, the "*strong sense of remoteness and tranquillity and absence of development"*.	High
Associations	There are cultural associations and history as part of the Wantsum Channel. There are no known other artistic, literary or cultural associations beyond those that may exist at a local level and are undocumented.	Medium

Table 3.7 (continued) Landscape Sensitivity Assessment: LCA E1 Stour Marshes

Character Area: E1 Stour Marshes		
Overall value	The overall value is judged to be Medium.	**Medium**
Susceptibility commentary (to development within the Manston Airport Site)		**Susceptibility**
Physical characteristics: There would be no physical changes to this LCA as a result of development within the Manston Airport Site.		N/A
Visual characteristics: This is a vast, flat, open landscape of reclaimed marshes with long distance views towards neighbouring LCAs. Some visual intrusion is already present in the form of parallel 132kV lines crossing the landscape which are locally prominent vertical elements and a higher concentration of built development towards the eastern edge of the LCA. Development sited close to the ridgeline former by the southern edge of the chalk plateau has the potential to create skyline intrusion in views from locations to the south thereby increasing susceptibility. This is one of the key sensitivities cited in the published landscape character assessments; "*Views to the rising valley slopes to the north (LCA B1 and C1) and the sensitive undeveloped crest line which provides a rural setting that contains and provides a backdrop to the marshes*".		Medium
Perceptual characteristics: Reference to CPRE's *Tranquillity Mapping* (CPRE, 2007) indicates high levels of tranquillity on a regional basis. However, these expected levels of tranquillity are likely to be periodically disturbed by the audible and visual presence of trains along the railway lines that pass adjacent to the boundary of or through this LCA and by the presence of development and highway infrastructure within the eastern fringes of the LCA which display an overly human influence. Levels of radiance are moderate to moderately low as shown in CPRE's *Night Blight Mapping* (CPRE, 2016) although the night-time photography from Viewpoint 20 at Plucks Gutter (**Figure 11.29**) shows the presence of highway lights along the A299 located beyond the LCA's boundary.		Medium
Overall susceptibility	The overall susceptibility is judged to be Medium.	**Medium**

Overall sensitivity		Susceptibility		
		High	**Medium**	**Low**
Value	**High**	High	High	Medium
	Medium	High	**Medium**	Low
	Low	Medium	Low	Low

Overall Sensitivity to proposed development at the Manston Airport Site
The overall value of this LCA is Medium. The overall susceptibility is judged to be Medium indicating a **Medium** overall sensitivity**.**

Table 3.8 Landscape Sensitivity Assessment: LCA E2 Wade Marshes

Character Area: E2 Wade Marshes

LVIA photographic viewpoint locations within the Landscape Character Area: None (see Figure 11.7)

Direct landscape effects: None **Indirect landscape effects: Manston Airport Site**

Key Characteristics
(as defined in the document Landscape Character Areas (TDC, 2012))

- *Flat and low-lying, open landscape with a coastal influence; underlying geology of Sussex White Chalk and Thanet Sands formations.*
- *Large intensively managed arable fields on former grazing marsh, defined by a complex network of drainage ditches.*
- *Unsettled apart from occasional isolated farmsteads on the marsh edges.*
- *Crossed by the A299 and railway both on embankment, which form prominent linear features. Embanked reservoirs are further structures in this otherwise flat landscape.*
- *Structural planting limited to tree buffers along the A299, railway and around the reservoirs resulting in a very open landscape.*
- ***Strong sense of isolation and remoteness experienced within this open, windswept landscape**.*
- ***Long distance views with big skies across the marshes**.*
- *The Northern Sea Wall providing some visual and physical containment from the sea within the marshes, but itself offering long sea views creating an element of contrast and surprise.*
- *To the west, the towers at Reculver create a distinct landmark overlooking the low lying marshes.*
- *Contained by the rising slopes inland, including the wooded horizon at St Nicholas-at-Wade, emphasising the island quality of Thanet.*

* Those characteristics which are highlighted in **Bold** may be susceptible to change as a result of development within the Manston Airport Site

Value criteria	Commentary	Value
Landscape designations	There are no national or local landscape designations within this LCA	Medium
Condition/quality	This is a landscape which has altered little since the channel silted up by the 16th century. As such there is a strong sense of time depth and a unified distinctive character.	High
Scenic quality	This is an area of reclaimed marshes with limited landscape features with long distance views with wide, open skies. There is some local visual intrusion from the railway which passes through the LCA and the periodic high speed trains along it.	Medium
Rarity	The landscape is of historical and cultural value consisting of the former sea channel, the Wantsum Channel.	Medium
Conservation interests	There are no historic or nature conservation designations within the part of the LCA which lies within the study area.	Low
Recreation value	The Wantsum Walk passes through this LCA and continues along the coast on the same alignment as the Thanet Coastal Path and Viking Coastal Trail Cycle Path. Elsewhere within the marshes there are few recreational opportunities.	High
Perceptual aspects	Reference to CPRE's Tranquillity Mapping (CPRE, 2007) indicates that this landscape is one of the most tranquil on a regional level. However, levels of tranquillity are likely to be periodically disturbed by the audible and visual presence of trains along the railway line. The published character assessment notes, as one of the key sensitivities, the "*rare sense of isolation and remoteness experienced in this open, expansive windswept landscape, with absence of development*".	High
Associations	There are cultural associations and history as part of the Wantsum Channel. There are no known other artistic, literary or cultural associations beyond those that may exist at a local level and are undocumented.	Medium
Overall value	The overall value is judged to be Medium.	**Medium**

Table 3.8 (continued) Landscape Sensitivity Assessment: LCA E2 Wade Marshes

Character Area: E2 Wade Marshes

Susceptibility commentary (to development within the Manston Airport Site)	**Susceptibility**
Physical characteristics: There would be no physical changes to this LCA as a result of development within the Manston Airport Site.	N/A
Visual characteristics: This is a flat, open landscape of reclaimed marshes with long distance views. Some limited visual intrusion is already present in the form of the railway but there is a general absence of development. The long distance views include the rising landform of the edges of LCAs C1 and C2 which form a generally undeveloped skyline and backdrop to the marshes.	High
Perceptual characteristics: Reference to CPRE's *Tranquillity Mapping* (CPRE, 2007) indicates high levels of tranquillity on a regional basis. However, these expected levels of tranquillity are likely to be periodically disturbed by the audible and visual presence of trains along the railway line that pass through this LCA. Levels of radiance are moderate to moderately low as shown in CPRE's *Night Blight Mapping* (CPRE, 2016) influenced by the proximity of the eastern edge of this LCA to Birchington and Thanet Earth.	High
Overall susceptibility The overall susceptibility is judged to be High.	**High**

Overall sensitivity		Susceptibility		
		High	**Medium**	**Low**
Value	**High**	High	High	Medium
	Medium	**High**	Medium	Low
	Low	Medium	Low	Low

Overall Sensitivity to proposed development at the Manston Airport Site
The overall value of this LCA is Medium. The overall susceptibility is judged to be High indicating a **High** overall sensitivity**.**

Table 3.9 Landscape Sensitivity Assessment: LCA F1: Pegwell Bay

Character Area: Pegwell Bay

Landscape and Visual Impact Assessment (LVIA) photographic viewpoint locations within the Landscape Character Area: 16 (see Figure 11.7)

Direct landscape effects: None | **Indirect landscape effects: Manston Airport Site**

Key Characteristics
(as defined in *Thanet Landscape Character Assessment* (2017))

- "*Shallow waters with underlying sedimentary sandstone and mudstone partially contained by low chalk and flint cliffs.*
- *Flat expanses of marshes and mudflats. Mudflats at low tides contrast with high tide waters with the slack tide keeping the bay full of sea water for longer.*
- *The estuary of the River Stour enters the Strait in the bay marking the former Wantsum Channel.*
- *Ancient dune pasture and swards of sandy grassland within Pegwell Bay Country Park as well as extensive intertidal mudflats, salt marsh and shingle beach.*
- *High biodiversity value, with internationally significant numbers of waders and wildfowl recognised by SSSI, Ramsar, SAC and SPA designations.*
- *River Stour/Wantsum Channel providing a strategic entry point for successive invasions and landings (Roman, Saxon and reintroduction of Christianity) – events celebrated and commemorated in the landscape today.*
- *Long, panoramic views seaward across the Dover Strait with container ships and ferries forming features on the skyline, with the low white cliffs at Ramsgate forming a distinctive feature in view to the north.*
- ***A tranquil and natural area with a strong sense of remoteness prevailing**. Exposed and windswept landscape created by sea winds channelled into the bay and across the coast."*

* Those characteristics which are highlighted in **Bold** may be susceptible to change as a result of development within the Manston Airport Site

Value criteria	Commentary	Value
Landscape designations	There are no national or local landscape designations within this LCA	Medium
Condition/quality	Landscape condition is judged to be medium to high. There are few signs of litter. This is supported by the published landscape character assessment which states "*The undeveloped character and general absence of detracting features* [….] *create an area of good condition and high landscape quality*."	High
Scenic quality	Scenic quality is deemed to be high. Uninterrupted panoramic views are focussed east across the low-lying bay and Dover Strait and include the white chalk and flint cliffs at Ramsgate as well as the urban fringes of Pegwell and Ramsgate and the more distant presence of the Port of Ramsgate and shipping vessels in the Dover Strait. There are limited inland views.	High
Rarity	The internationally important nature reserve at Pegwell Bay encompasses a combination of habitats unique in southeast England. The white chalk and flint cliffs are a distinctive feature in views from the south.	High
Conservation interests	In terms of nature conservation interests, this LCA contains the Thanet Coast & Sandwich Bay Ramsar Site (international nature conservation designation), Sandwich Bay Special Area of Conservation (SAC) (international nature conservation designation), Thanet Coast and Sandwich Bay Special Protection Area (SPA) and Sandwich Bay to Hacklinge Marshes Site of Special Scientific Interest (SSSI) (national nature conservation designation). The Sandwich and Pegwell Bay National Nature Reserve also lies within this LCA. There are no heritage designations (listed buildings, scheduled monuments or conservation areas) within the LCA.	High
Recreation value	Recreational interest includes Pegwell Bay Country Park, a section of the England Coast Path and Thanet Coast Path.	High
Perceptual aspects	The description of the LCA includes the "*strong sense of remoteness and wildness experienced despite proximity of urban development"*. Reference to CPRE's *Tranquillity Mapping* (CPRE, 2007) indicates moderately high levels of tranquillity on a regional basis.	High

Table 3.9 (continued) Landscape Sensitivity Assessment: LCA F1: Pegwell Bay

Character Area: Pegwell Bay

Value criteria	Commentary	Value
Associations	Pegwell Bay is recorded in a landscape painting *Pegwell Bay, Kent – a Recollection of October 5th 1858* by William Dyce, which now hangs in the Tate Gallery. The Bay also features in the 1938 book *Contraband* by Dennis Wheatley. A full-size replica Scandinavian longboat is situated by the main road on the low cliff tops above Pegwell Bay to commemorate the 1500th anniversary of the Anglo-Saxon invasion at nearby Ebbsfleet.	High
Overall value	The majority of value criteria have been assessed as High leading to a High overall value.	**High**
Susceptibility commentary (to development within the Manston Airport Site)		**Susceptibility**
Physical characteristics: There would be no physical changes to this LCA as a result of development within the Manston Airport Site.		N/A
Visual characteristics: This is a large-scale and open landscape where long distance views are available although these are primarily orientated east across the sea. Within these views existing visual intrusion includes the urban fringes of Pegwell and Ramsgate with the tall flats at Staner Court visible on the skyline. The Port of Ramsgate and the movement of vessels into and out of the port have a more distant visual presence. Inland views are limited by the layers of scrub present within the western fringes of this LCA.		Medium
Perceptual characteristics: Reference to CPRE's *Tranquillity Mapping* (CPRE, 2007) indicates moderately high levels of tranquillity on a regional basis. The sense of remoteness and wildness is noted in the published description for this LCA despite the relative proximity of development and is cited as one of the key sensitivities and a quality that should be conserved. Levels of radiance are generally moderate (as shown in CPRE's *Night Blight* Mapping (CPRE, 2016)) and influenced by the proximity to the urban settlements and highway lighting along Sandwich Road.		Medium
Overall susceptibility	The overall susceptibility is deemed to be Medium	**Medium**

Overall sensitivity		Susceptibility		
		High	**Medium**	**Low**
Value	**High**	High	**High**	Medium
	Medium	High	Medium	Low
	Low	Medium	Low	Low

Overall Sensitivity to proposed development at the Manston Airport Site
The overall value of this LCA is High. The overall susceptibility is judged to be Medium indicating a **High** overall sensitivity**.**

Table 3.10 Landscape Sensitivity Assessment: LCA Ash Level

Character Area: Ash Level		
LVIA photographic viewpoint locations within the Landscape Character Area: 17 and 18 (see Figure 11.7)		
Direct landscape effects: None	**Indirect landscape effects: Manston Airport Site**	
Key Characteristics (as defined in the Dover District Landscape Character Assessment (DDC, 2006))		
• *"Flat topography* • *Alluvium soils* • *Arable and pastoral use* • *Grazed primarily by cows* • *Small fields* • *Ditches define field boundaries* • *Occasional hawthorn or willow, reeds and flax along ditch lines* • *Sedges define wetter areas* • *No roads or buildings* • *Few footpaths in north-south direction* • *Unenclosed* • ***Open views**." (DDC, 2006)* * Those characteristics which are highlighted in **Bold** may be susceptible to change as a result of development within the Manston Airport Site		
Value criteria	**Commentary**	**Value**
Landscape designations	There are no national or local landscape designations within this LCA.	Medium
Condition/quality	The *Landscape Assessment of Kent* (KCC, 2004) notes that this area is "*coherent as reclaimed marsh but few natural grasslands now exist and the intensive use for arable cultivation - with intensive management of ditches - have reduced the visual and ecological interest*".	Medium
Scenic quality	The flat topography and lack of tree cover and subsequent lack of physical and visual enclosure results in an open landscape in which wide, long distance views are available including those to the higher chalk plateau to the north of the former Wantsum Channel. Three 132kV lines runs through the eastern part of the LCA and the supporting pylons are locally prominent vertical features in a large-scale horizontal landscape. Other visual intrusions include views of the Pfizer Science and Technology Park located just beyond the boundary of the LCA to the southeast.	Medium
Rarity	This is a low-lying agricultural landscape, not uncommon in this part of Kent.	Low
Conservation interests	There are no nature conservation designations within this LCA. A single grade II listed building is present at Plucks Gutter.	Low
Recreation value	The Saxon Shore Way passes along the northern boundary of this LCA. A limited number of local PRoW cross the marshes following old drove roads in a north-south direction.	High
Perceptual aspects	Reference to CPRE's *Tranquillity Mapping* (CPRE, 2007) indicates that this LCA contains some of the most tranquil levels on a regional basis. There is likely to be some periodic disturbance from the audible presence of trains along the railway running through the eastern part of the LCA and the proximity to the A256 and this is reflected in the *Tranquillity Mapping* where slightly lower levels of tranquillity are expected to be found. Observations made during the field survey support this with audible external influences (machinery, reversing alarms etc.) from the light industry lining the A256 to the east of the LCA recorded. The absence of buildings and roads and inaccessible nature of this LCA further to the west leads to a sense of remoteness.	High to Medium
Associations	There are no known literary or artistic associations within this LCA.	Low
Overall value	The overall value is assessed as Medium.	**Medium**

Table 3.10 (continued) Landscape Sensitivity Assessment: LCA Ash Level

Character Area: Ash Level				
Susceptibility commentary (to development within the Manston Airport Site)				Susceptibility
Physical characteristics: There would be no physical changes to this LCA as a result of development with the Manston Airport Site.				N/A
Visual characteristics: This is an open landscape with long distance views across the flat, generally featureless landscape which extends to the north to meet the low rises of the chalk plateau and to the south towards the East Kent Horticultural Belt. Development sited close to ridgeline formed by the chalk plateau has the potential to create distant skyline intrusion in views from within this LCA thereby increasing susceptibility. There is some visual intrusion already present in the form of the 132kV lines which cross the landscape and large-scale buildings such as those within the Pfizer Science and Technology Park in adjoining LCAs.				Medium
Perceptual characteristics: Reference to CPRE's *Tranquillity Mapping* (CPRE, 2007) indicates high levels of tranquillity on a regional basis which may be periodically disturbed by the presence of trains along the railway in the eastern fringes the LCA. This LCA displays a sense of remoteness due to it inaccessible nature and absence of buildings and roads. CPRE's *Night Blight Mapping* (CPRE, 2016) indicates that light intrusion is limited with levels of radiance classified as moderately low across the majority of this LCA.				High
Overall susceptibility	The overall susceptibility is assessed as High.			**High**
Overall sensitivity		Susceptibility		
		High	**Medium**	**Low**
Value	**High**	High	High	Medium
	Medium	**High**	Medium	**Low**
	Low	Medium	Low	Low
Overall Sensitivity to proposed development at the Manston Airport Site The overall value of this LCA is Medium. The overall susceptibility is judged to be High indicating a **High** overall sensitivity**.**				

Table 3.11 Landscape Sensitivity Assessment: LCA Richborough Castle

Character Area: Richborough Castle		
LVIA photographic viewpoint locations within the Landscape Character Area: 22 (see Figure 11.7)		
Direct landscape effects: None	**Indirect landscape effects: Manston Airport Site**	
Key Characteristics (as defined in the Dover District Landscape Character Assessment (DDC, 2006))		
• *"Higher knoll of land* • *Flint castle remains* • *Manmade landform features, such as amphitheatre* • *Mown grass* • *Narrow winding lanes* • *Surrounding arable fields* • *Native hedgerows* • *Variety of building types and ages* • ***Open views of surrounding area**."* (DDC, 2006) * Those characteristics which are highlighted in **Bold** may be susceptible to change as a result of development within the Manston Airport Site		
Value criteria	**Commentary**	**Value**
Landscape designations	There are no national or local landscape designations within this LCA	Medium
Condition/quality	The grounds of the castle are maintained by English Heritage and contain manicured mown grass. There is a strong sense of time depth.	High
Scenic quality	The higher elevation of this LCA compared to the surrounding flat topography of Ash Level facilitates long distance views north towards the edge of the chalk plateau from the LCA. The intervening low laying mashes contain few visual intrusions, with the exception of occasional pylons and light coloured large sheds, which are discernible due to their contrasting colour. Views out to the east contain the large-scale buildings within the Pfizer Science and Technology Park at Great Stonar which are prominent due to their proximity.	Medium
Rarity	This is a site supported by designation with derelict stonewalls, ditches and other manmade changes in the landform which are rare in a regional context.	High
Conservation interests	This small LCA contains a single scheduled monument: A Saxon Shore fort, Roman port and associated remains at Richborough, which covers a large proportion of the eastern half of the LCA. Three grade II listed farmhouses are also present within the LCA.	High
Recreation value	Sections of the Saxon Shore Way and National Cycle Route 1 pass through this LCA. Richborough Roman Fort and Amphitheatre is a site owned by English Heritage with year round access to the site and car parking.	High
Perceptual aspects	Reference to CPRE's Tranquillity Mapping (CPRE, 2006) indicates moderately high levels of tranquillity across this LCA. These expected levels are likely to be periodically disturbed by the audible presence of trains along the railway line adjoining the LCA to the east with the field survey recording distant sounds of farm machinery and traffic along the A256.	Medium
Associations	There are no known literary or artistic associations.	Low
Overall value	The overall value is assessed as High.	**High**

Table 3.11 (continued) Landscape Sensitivity Assessment: LCA Richborough Castle

Character Area: Richborough Castle

Susceptibility commentary (to development within the Manston Airport Site)	**Susceptibility**
Physical characteristics: There would be no physical changes to this LCA as a result of development with the Manston Airport Site.	N/A
Visual characteristics: The elevated nature of this LCA facilitates long distance views north towards the edge of the chalk plateau. Development sited close to ridgeline formed by the chalk plateau has the potential to create distant skyline intrusion in views from within this LCA thereby increasing susceptibility. There is some visual intrusion already present in the form of the 132kV lines which cross the intervening landscape and large-scale buildings such as those within the Pfizer Science and Technology Park in adjoining LCAs.	Medium
Perceptual characteristics: Reference to CPRE's *Tranquillity Mapping* (CPRE, 2007) indicates moderately high levels of tranquillity across this LCA on a regional basis. These expected levels are likely to be periodically disturbed by the audible presence of trains along the railway line adjoining the LCA to the east and the nearby A256. This is a small LCA in which visitors to Richborough Castle may also influence seasonal levels of tranquillity and the perception of remoteness. CPRE's *Night Blight Mapping* (CPRE, 2016) indicates that light intrusion is limited with levels of radiance classified as moderately low across the majority of this LCA.	**High**
Overall susceptibility The overall susceptibility is assessed as High.	**High**

Overall sensitivity		Susceptibility		
		High	**Medium**	**Low**
Value	**High**	**High**	High	Medium
	Medium	High	Medium	Low
	Low	Medium	Low	Low

Overall Sensitivity to proposed development at the Manston Airport Site
The overall value of this LCA is High. The overall susceptibility is judged to be High indicating a **High** overall sensitivity**.**

Table 3.12 Landscape Sensitivity Assessment: LCA The Sandwich Corridor

Character Area: The Sandwich Corridor		
LVIA photographic viewpoint locations within the Landscape Character Area: None (see Figure 11.7): None		
Direct landscape effects: None	**Indirect landscape effects: Manston Airport Site**	
Key Characteristics **(as defined in the Dover District Landscape Character Assessment (DDC, 2006))**		
• *""Flat landscape* • *Broad native hedgerows and tall metal fencing along roads* • *Huge, modern buildings with brick and glass dominant* • *Large car parks* • *River Stour and boat culture* • *Associated mudflats and bird life* • *Large lake* • *Industrial pockets* • *Straight, wide main road* • *Limited views due to buildings dominating landscape.*" (DDC, 2006) * Those characteristics which are highlighted in **Bold** may be susceptible to change as a result of development within the Manston Airport Site		
Value criteria	**Commentary**	**Value**
Landscape designations	There are no national or local landscape designations within this LCA.	Medium
Condition/quality	Landscape features are in a moderate condition.	Medium
Scenic quality	As noted in the published description for the LCA, this is a landscape which is dominated by the large-scale buildings within the Pfizer Science and Technology Park, smaller units and warehouses and extensive car parks and storage areas which line the A256 and River Stour. External views are limited as a consequence of this built form. The LCA is also host to movement from vehicles along the A256.	Low
Rarity	This is a landscape which contains features which are common and not rare.	Low
Conservation interests	There are no nature conservation or heritage designations within the part of the LCA that lies within the study area.	Low
Recreation value	A section of the England Coast Path passes through this LCA.	High
Perceptual aspects	CPRE's *Tranquillity Mapping* (CPRE, 2007) indicates that levels of tranquillity are expected to be moderate to moderately low on a regional basis. These levels are likely to be locally disturbed by the A256 as it passes though the LCA.	Medium
Associations	There are no known literary or artistic associations.	Low
Overall value	The overall value is assessed as Low.	**Low**
Susceptibility commentary (to development within the Manston Airport Site)		**Susceptibility**
Physical characteristics: There would be no physical changes to this LCA as a result of development with the Manston Airport Site.		N/A
Visual characteristics: External views are restricted by large-scale built form and as such this LCA has limited intervisibility with surrounding LCAs.		Low

Table 3.12 (continued) Landscape Sensitivity Assessment: LCA The Sandwich Corridor

Character Area: The Sandwich Corridor				
Perceptual characteristics: Reference to CPRE's *Tranquillity Mapping* (CPRE, 2007) indicates that levels of tranquillity are expected to be moderate to moderately low on a regional basis. The high volumes of traffic and built form are also expected to reduce any perception of remoteness. CPRE's *Night Blight Mapping* (CPRE. 2016) shows high levels of radiance and light intrusion within this corridor.				Low
Overall susceptibility	The overall susceptibility is assessed as Low			**Low**
Overall sensitivity		Susceptibility		
		High	**Medium**	**Low**
Value	**High**	High	High	Medium
	Medium	High	Medium	Low
	Low	Medium	Low	**Low**
Overall Sensitivity to proposed development at the Manston Airport Site The overall value of this LCA is Low. The overall susceptibility is judged to be Low indicating a **Low** overall sensitivity**.**				

Table 3.13 Landscape Sensitivity Assessment: LCA Sandwich Bay

Character Area: Sandwich Bay

LVIA photographic viewpoint locations within the Landscape Character Area: None (see Figure 11.7)

Direct landscape effects: None **Indirect landscape effects: Manston Airport Site**

Key Characteristics
(as defined in the Dover District Landscape Character Assessment (DDC, 2006))

- *"Flat to gently undulating topography*
- *Dunes*
- *Sand and shingle*
- *Sea kale and sea holly along shingle*
- *Occasional scrub*
- *Birdlife*
- *Wide expanse of sea*
- *Golf courses*
- *Coarse coastal grasses*
- *Some farmland*
- *Large houses in open plan estate*
- *Few roads*
- *Seasonal change*
- *Exposed landscape with extensive views out to sea."* (DDC, 2006)

* Those characteristics which are highlighted in **Bold** may be susceptible to change as a result of development within the Manston Airport Site

Value criteria	Commentary	Value
Landscape designations	There are no national or local landscape designations within this LCA	Medium
Condition/quality	This is a landscape whose features are largely intact with the amenity landscape within the golf courses maintained.	Medium
Scenic quality	Scenic quality is variable with views eastwards of higher aesthetic appeal and across an open landscape towards Sandwich Bay. Views inland however, largely feature the prominent built form within the Pfizer Science and Technology Park and other infrastructure present along the sandwich corridor.	High to Medium
Rarity	The internationally important habitats and species within this area are rare.	High
Conservation interests	In terms of nature conservation interests, this LCA contains the Thanet Coast & Sandwich Bay Ramsar Site (international nature conservation designation), Sandwich Bay SAC (international nature conservation designation), Thanet Coast and Sandwich Bay SPA and Sandwich Bay to Hacklinge Marshes SSSI (national nature conservation designation). The Sandwich and Pegwell Bay National Nature Reserve also lies within this LCA. There are no heritage designations (listed buildings, scheduled monuments or conservation areas) within the part of the LCA which lies within the study area.	High
Recreation value	The Stour Valley Walk passes through this LCA along with a section of the England Coast Path. Other recreational interests include the Prince's Golf Club. The beach is publicly accessible although access is considered to be challenging and there are limited facilities or parking available.	High
Perceptual aspects	Reference to CPRE's Tranquillity Mapping (CPRE, 2007) indicates that this LCA is expected to possess high levels of tranquillity including areas considered to be most tranquil on a regional basis. The general absence of noise and human influence, together with proximity to the sea leads to this strong sense of tranquillity. There may be seasonal changes in the levels of tranquillity with increased number so visitors and associated increase in noise and activity in summer months.	High

Table 3.14 (continued) Landscape Sensitivity Assessment: LCA Sandwich Bay

Character Area: Sandwich Bay

Value criteria	**Commentary**	**Value**
Associations	There are no known historic or cultural associations within this LCA, beyond any local associations that may exist but are undocumented.	Low
Overall value	The overall value is assessed as High.	**High**

Susceptibility commentary (to development within the Manston Airport Site)	**Susceptibility**
Physical characteristics: There would be no physical changes to this LCA as a result of development with the Manston Airport Site.	N/A
Visual characteristics: This is a flat, open landscape with expansive views. Visual intrusion is generally limited to the landward views of the Pfizer Science and Technology Park visible to the west beyond the LCA boundary.	Medium
Perceptual characteristics: Reference to CPRE's *Tranquillity Mapping* (CPRE, 2007) indicates high levels of tranquillity on a regional basis. The qualities of naturalness and of being largely undeveloped may be vulnerable to intrusion from large-scale infrastructure in adjacent landscapes. CPRE's *Night Blight Mapping* (CPRE, 2016) shows levels of radiance as being variable; with moderate levels present along the eastern fringes rising to high brightness values inland due to the proximity and influence of the Pfizer Science and Technology Park. The absence of roads and settlements means that a sense of remoteness may be perceived from within the LCA.	Medium
Overall susceptibility The overall susceptibility is assessed as Medium	**Medium**

Overall sensitivity		Susceptibility		
		High	**Medium**	**Low**
Value	**High**	High	**High**	Medium
	Medium	High	Medium	Low
	Low	Medium	Low	**Low**

Overall Sensitivity to proposed development at the Manston Airport Site
The overall value of this LCA is High. The overall susceptibility is judged to be Medium indicating a **High** overall sensitivity**.**

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Appendix 11.3
Viewpoint Assessment

1. Introduction

1.1.1 This appendix sets out the viewpoint assessment for the 22 viewpoints agreed with consultees, the locations of which are illustrated in **Figures 11.7** and **11.8**. Annotated baseline daytime photographs from the 22 viewpoints are shown in **Figures 11.9** to **11.21** with night-time photography from 12 of these viewpoints (Viewpoints 1, 2, 3, 5, 6, 7, 9, 11, 12 14, 15 and 20) presented in **Figures 11.22** to **11.29**. Photowires are contained within **Appendix 11.1**.

1.1.2 As described in Section 11.6 of the ES, the viewpoint assessment considers the effects of construction and operational activities within the site boundary. It does not include the visual effects associated with aircraft overhead given the transient and intermittent nature of these changes which on their own will only give rise to a small proportion of the overall visual effect.

2. Viewpoint Assessment

2.1.1 The viewpoint assessments for the 22 viewpoints are presented in **Tables 2.1** to **2.22**.

Table 2.1 Viewpoint 1 – RAF Manston Museum Car Park

Viewpoint Information			
Viewpoint OS grid reference:	633315, 166524	Figure Nos:	Annotated baseline photos - Figures 11.9a & 11.9b Photowires - Appendix 11.1 Figures 1, 2 & 3
Visual receptor groups located at or close to Viewpoint:		Recreational receptors visiting the Museum	
Visual receptor sensitivity:		**Medium**	
Night-time Viewpoint:		Yes (Figures 11.22a & 22b)	

Description of Baseline View and Role of the Existing Non-Operational Airport

The foreground and middle ground consist of the Northern Grass area and the part of the existing non-operational airport to the immediate south of Manston Road (B2050). The dominant land-use is mown grass within which are sited a moderate number of individual buildings associated with the non-operational airport. These buildings are seen in an open context. The most prominent are the former ATC on the left-hand (northern) side of the view and the distinctively shaped aircraft maintenance hangar in the central part of the view. These buildings, along with the more distant passenger terminal building, FBO and Fire Rescue Building are outlined above the horizon. The other readily visible man-made element is the security fence along the southern side of B2050.

The flat plateau topography has the consequence that there are no long distance views. In the northern part of the panorama views extend across the Northern Grass area to the western edge of Manston with residential properties and, more extensively, trees sited alongside Manston Court Road. These form the horizon in this section of the panorama.

The night-time panorama presented in **Figures 11.22a & 22b** shows that the principal source of lighting is located on and close to the passenger terminal building. There are isolated points of light from a small number of the windows at the properties site along Manston Court Road. No other light sources are visible in the remainder of the panoramic view.

Description of Changes in the View at Year 1

The photowire in **Appendix 11.1 Figures 1, 2 and 3** shows the elements that will be constructed as part of the proposed development. Those taking place in the view in Year 1 include the excavation of the attenuation ponds as part of the surface water drainage system as well as the extensive earthworks associated with the cargo facilities and aircraft stands. Depending upon the detailed construction programme, construction activities would be visible in the foreground and the middle ground at the following proposed facilities: the eastern most cargo facility,, the landside access and parking associated with this cargo facility, the northern aircraft stands and the southernmost units in the Northern Grass area which would foreshorten north-easterly views . The main contractors' compound may be visible as a small scale component in the background to the left of the existing maintenance hangar which will be retained in Year 1.

As a consequence there would be extensive, large-scale changes in comparison with the baseline view. The balance and composition of the foreground and middle ground across the entire view would be dominated by a wide range of earthworks and construction activities with no foreground or middle-ground screening. Collectively, these will substantially reduce the baseline sense of openness. Some of the construction activities, in particular the two mobile cranes and the new built development will extend above the horizon across much of the view and reduce the availability of views to the western edge of Manston.

Magnitude of visual change: **High**	Type of effect: **Adverse and temporary (construction activities) / permanent (buildings)**	Significance: **Significant**

Table 2.2 (continued) Viewpoint 1 – RAF Manston Museum Carpark

Description of Changes in the View at Year 10

Most of the built elements that are shown in the photowire in **Appendix 11.1 Figures 1, 2 & 3** will be operational by Year 10. Principal elements in the foreground would include the attenuation ponds and three of the four proposed cargo facilities with associated HGV areas, airside car park and storage areas to the north. In the partial, framed views to the middle ground between these built elements, the passenger terminal building and the southern units of the Northern Grass area will be prominent. All the buildings will extend above the horizon with a resultant increase in the sense of visual enclosure. Some ground level construction activities associated with the final cargo facility and parking area would be visible as would a proportion of the crane activities, although the latter will be likely to be only periodically present by Year 10. Views of aircraft on the ground will be highly partial as the runway, taxiways and stands would be mostly screened by the three intervening, 20 m high cargo facilities. There would be views of aircraft taxiing to and at the stands to the west of the passenger terminal building.

In summary, the baseline view would be largely changed by Year 10 through the introduction a wide range of new built development throughout the panoramic view. The buildings and ground level activities would become the dominant visual elements. The view would become more enclosed compared with the baseline but recently introduced landscape planting especially that proposed along the B2050 corridor would begin to provide some softening and filtering of many of the built elements, especially when in leaf.

Magnitude of visual change: **High**	Type of effect: **Adverse and temporary (construction activities) / permanent (buildings and operational activity)**	Significance: **Significant**

Description of Changes in the View at Year 20

The only change resulting from the presence of the fully operational Airport in comparison with Year 10 would be the presence of the closest, western-most fourth proposed cargo facility. The fourth cargo facility's roof and part of its western gable end would be visible close to the ATC tower on the right-hand (southern) side of the view. The planting introduced along the B2050 corridor would partially filter and soften views of the facades of the cargo units, the landside access and parking for the cargo facilities and more distant views towards the passenger terminal and aircraft taxiing to and at the stands. When compared to the baseline view, the magnitude of change would remain as High.

Magnitude of visual change: **High**	Type of effect: **Adverse and permanent**	Significance: **Significant**

Table 2.2 Viewpoint 2 – Manston Road

Viewpoint Information			
Viewpoint OS grid reference:	634032, 167147	Figure Nos:	Annotated baseline photos - Figure 11.10 Photowires - Appendix 11.1 Figures 4 & 5
Visual receptor groups located at or close to Viewpoint:		Residential receptors in properties on western side of Manston Road	
Visual receptor sensitivity:		**High**	
Night-time Viewpoint:		Yes (Figure 11.23)	

Description of Baseline View and Role of the Existing Non-Operational Airport

The foreground and middle ground consist of the open Northern Grass area within which the dominant land-use is mown grass. On the right-hand side (southern) of the view the open grass area is punctuated by the presence of some of the buildings associated with the existing non-operational airport: principally the passenger terminal building, the adjacent aircraft maintenance hangar and, at a smaller scale, the Fire Rescue Building. These buildings can be seen above the section of the view where the flat horizon is formed by the area around the runway (which itself is not visible). The largest built element associated with the existing non-operational airport is the open lattice radar tower (approximately 22m high) whose proximity and height make it the most visually prominent individual built element although it is sited at the right-hand extent of the panoramic view.

The flat plateau topography ensures that there are no long-distance views with the reminder of the horizon formed by the tree cover in north-western edge of Manston, around the substation on Manston Court Road and within the overgrown hedgerow that forms the northern boundary of the Northern Grass area (and therefore the development site). Within this tree cover some properties sited alongside Manston Court Road are readily visible but the remainder of Manston is well screened. The surfaced roadway that leads south-eastwards from the viewpoint leads the viewer's eye to the horizon.

The night-time baseline is shown in **Figure 11.23** shows that the principal concentration of light is at and around the passenger terminal building and includes several lighting columns with associated localised sky glow. Other sources of light are window illumination at some of the properties sited alongside Manston Court Road in the middle distance and some low-level lighting at the base of the radar tower.

Description of Changes in the View at Year 1

Due to the flat topography and proximity of the viewpoint to the site, construction activities would be widely visible. Depending on the precise programme and order of construction works during Year 1 these would include the placement of site won material into stockpiles close to the northern boundary of the site and to the immediate south (right) of the surfaced roadway in baseline views with the associated movement of machinery. Behind the stockpiles to the east would be the Northern Grass construction compound, which is likely to be at least periodically visible depending on the gradual placement and re-distribution of the stockpiled material. Alternatively, and if implemented first, views would be foreshortened by the construction of a landscape bund within the 45m buffer zone sited opposite the properties on the western side of Manston Road upon which trees and shrubs would be planted, enclosing views to the east and south with a reduction in the current open feel of views. Should this be implemented early in Year 1 then the construction activities at the first cargo facility where two mobile cranes would be deployed as well as ground level activities across a greater proportion of the site and the main contractor's compound in middle distance oblique views would be screened by this feature. The construction and subsequent presence of business units in the southern part of the Northern Grass area would also be screened.

There will be large-scale changes in comparison with the baseline view with open views foreshortened by landform and planting.

Magnitude of visual change: **High**	Type of effect: **Adverse and temporary (construction activities) / permanent (buildings)**	Significance: **Significant**

Table 2.2 (continued) Viewpoint 2 – Manston Road

Description of Changes in the View at Year 10

The photo wire in **Appendix 11.1 Figures 4 and 5** shows the elements that would have been constructed by Year 10. The most prominent new features visible would be the upper sections and rooflines of a large proportion of the business units of the Northern Grass area north of the airport site, which would extend above the landscape bund and across the full field of view to further alter the current open feel of the view. Planting introduced across the bund in Year 1 would play a further screening role to soften and filter views of the large-scale built form particularly during the summer months There would be no views of the cargo facilities, business aviation hangers or aircraft breakdown hangars or aircraft on the ground, as these would all be screened by the landscape buffer and intervening business units.

There will be extensive, large-scale changes in comparison with the baseline view. The balance and composition of the foreground and middle ground across the entire view will be dominated by the foreground screening bund, associated planting and the upper facades of a series of buildings up to 18m in height. Collectively these would substantially reduce the baseline sense of openness.

Magnitude of visual change: **High**	Type of effect: **Adverse and temporary (construction activities) / permanent (buildings and operational activity)**	Significance: **Significant**

Description of Changes in the View at Year 20

The principle changes between Year 10 and 20 would be associated with the continued maturation of trees and shrubs to further screen and soften the upper facades of the Northern Grass area units. The presence of the landscape bund and glimpses of large-scale built elements would continue to significantly alter the view compared to that of the baseline.

Magnitude of visual change: **High**	Type of effect: **Adverse and permanent**	Significance: **Significant**

Table 2.3 Viewpoint 3 – Canterbury Road West PRoW

Viewpoint Information			
Viewpoint OS grid reference:	634366, 165089	Figure Nos:	Annotated baseline photos - Figure 11.11 Photowires - Appendix 11.1 Figure 6
Visual receptor groups located at or close to Viewpoint:		Northbound users of the footpath, residents in properties along the southern side of Canterbury Road West and vehicular receptors travelling along Canterbury Road West.	
Visual receptor sensitivity:		**High** (users of PRoW and residents) **Medium** (vehicular receptors)	
Night-time Viewpoint:		Yes (Figure 11.24)	

Description of Baseline View and Role of the Existing Non-Operational Airport

A single open arable field with gently rising topography and absence of vegetation forms the foreground of the view. Along the northern edge of the field lies Canterbury Road West, with associated road signage and adjacent highway lighting columns (approximately 8m high) extending across the full field of view. Immediately beyond Canterbury Road West is a bund (approximately 3m high) covered by grasses and occasional shrubs on top of which runs the boundary of the existing non-operational airport. This perimeter boundary is marked by an open mesh fence approximately 1.8m high and intermittent concrete fence posts which together with the lighting columns introduce a series of regular vertical elements into this wide open view. The other man-made element on the right-hand side (east) of the view is the edge of one of the residential properties to the on the southern side of the Canterbury Road West.

The screening provided by the low bund and vegetation is sufficient to foreshorten the view with the consequence that there are no long-distance views to the north and no views of any components of the current built development on the existing non-operational airport. The only exception is the perimeter fence and one red and white camera mast within the airport extending above the bund and vegetation.

The baseline night-time view is shown in **Figure 11.24**. This shows a dark foreground with the highway lighting from the tall lighting column adjacent to the properties and illuminating highway signage the only sources of light in the view. There are no views of light sources within the current non-operational airport or any sky glow in a northerly direction.

Description of Changes in the View at Year 1

No ground level construction activities would be visible from the PRoW, however there may be periodic views of the very top of two mobile cranes, but only when constructing the ATC tower during Year 1. All other elevated activities associated with the construction of the eastern most cargo facility, the southernmost business units on the Northern Grass area and new business aviation centre and hangars would be screened by the bund along the northern side of Canterbury Road West leading to a negligible magnitude of change for users of the footpath.

With regards to users of vehicular receptors travelling eastbound or westbound along Canterbury Road West and residents in properties along the southern side of the road, northerly views would be of construction activities associated with the fuel farm including an additional two-storey office building and similar height warehouse building as well as the 6m high tanks. All of the new structures would be sited behind the existing structures available within views of the current Jentex Site leading to an incremental effect and a medium magnitude of change during Year 1. No other views of construction activities within the airport site would be discernible.

The photowire in **Appendix 11.3 Figure 6** shows the views of elements that would be constructed in Phase 1. None of the new built elements associated with the airport or the Northern Grass area would be visible to any of the receptors close to this viewpoint due to the existing intervening screening, principally the low bund and associated vegetation.

Magnitude of visual change:	**Negligible** (users of the PRoW) **Medium** (residents and vehicular receptors).	Type of effect: **Adverse and temporary (construction activities) / permanent (buildings)**	Significance:	**Significant** (residents) **Not Significant** (users of the PRoW and vehicular receptors

Table 2.3 (continued) Viewpoint 3 – Canterbury Road West PRoW

Description of Changes in the View at Year 10

Views at Year 10 would be similar to the views available at Year 1. There may be periodic views of the two mobile cranes when they are used to construct built elements in the eastern part of the Airport (i.e. the recycling hangars) although construction activities would be much less extensive than in Year 1 and only the top of elevated crane activity would be discernible. There would be no views of aircraft on the ground or along the runway or any construction or other ground level operational activities. The photo wire shows that the rooflines of all built elements are below the top of the airport boundary bund. Residents in properties and vehicular receptors travelling eastbound or westbound along Canterbury Road West would continue to have the fuel farm present in their northerly views.

Magnitude of visual change:	**Negligible** (users of the PRoW) **Medium** (residents and vehicular receptors).	Type of effect: **Adverse and temporary (construction activities) / permanent (buildings)**	Significance:	**Significant** (residents) **Not Significant** (users of the PRoW and vehicular receptors

Description of Changes in the View at Year 20

In contrast to previous periods there would be no periodic crane activity, which would have ceased by Year 18. There would be no visual evidence of any built elements, aircraft or ground level operational activities resulting from the presence of the fully functional Airport or Northern Grass area, with all of the new buildings and aircraft movement including that along the runway being be screened by the intervening airport boundary bund and vegetation cover. As such the Year 20 view would not alter in comparison with the baseline view for northbound users of the PRoW.

The exception to this will be the continued presence of the fuel farm in the northerly views of residents and vehicular receptors travelling eastbound or westbound along Canterbury Road West.

Magnitude of visual change:	**Negligible** (users of the PRoW) **Medium** (residents and vehicular receptors).	Type of effect: **Adverse and permanent**	Significance:	**Significant** (residents) **Not Significant** (users of the PRoW and vehicular receptors

Table 2.4 Viewpoint 4 - B2190, Minster Road

Viewpoint Information			
Viewpoint OS grid reference:	631122, 16585	Figure Nos:	Appendix 11.1 Figure 7
Visual receptor groups located at or close to Viewpoint:		Vehicular receptors using the B2190	
Visual receptor sensitivity:		**Low**	
Night-time Viewpoint:		No	

Description of Baseline View and Role of the Existing Non-Operational Airport

The foreground of the view consists of the Minster Road (B2190), immediately beyond the carriageway and highway verge lies the boundary of the existing non-operational airport which is formed by a mesh fence and intermittent concrete fence posts. The fence is approximately 3m high and extends across the full field of view. Other man-made elements in the foreground are lighting columns and signage. The boundary fence and lighting columns are the most prominent features in the view due to their proximity. The views from Viewpoint 4 extend through the fence into the middle ground which is mostly occupied by the extensive managed grass at the western end of the existing non-operational airport. Two large buildings are visible in the middle distance: on the left-hand (northern) side a large white business unit located on the southern edge of Manston Business Park is prominent due to its white colouration; whilst in centre of middle ground the more architecturally distinctive Summit Aviation Building is prominent. In between these two large buildings flat topography allows views to extend to a greater distance with several buildings and street lighting columns visible on the horizon in the direction of Woodchurch. To the right of the Summit Aviation Building the upper sections of some of the buildings in the freight area and the Aircraft Maintenance Hangar can be identified low on a narrow section of the horizon. To their right-hand side (south) the gently rising topography within the western section of the runway at the existing non-operational airport is sufficient to foreshorten the view. This provides a level grassed middle distance horizon and prevents longer distance views.

Viewpoint 4 illustrates how even minor changes in elevation can serve to foreshorten middle and long-distance views so that even on the western edge of the existing non-operational airport there are views in which the built development within the existing non-operational airport is largely screened below the horizon. The few built components with sufficient height to extend above short sections of the horizon are minor visual elements.

Description of Changes in the View at Year 1

Some ground level construction activities would be visible, principally any construction equipment activities associated with relaying the current runway and adjacent asphalt overlay. Additionally, there would be periodic views of the two mobile cranes that would be regularly present on site. The cranes would always be much smaller vertical elements than the concrete fence posts and lighting columns already present in the foreground.

The photo wire in **Appendix 11.1 Figure 7** shows there would be partial views of the roofs of a proportion of the business units, the upper section of the ATC tower, and upper sections of the first (eastern-most) cargo facility unit. These would extend almost continuously across a moderate proportion of the central and southern sections of the view where they would be visible low above the existing horizon, in part replacing the existing buildings in the freight area. The roof line of the business units and the cargo facility would reflect the strong horizontal alignment of the horizon. The ATC tower would provide a more pronounced profile thereby potentially drawing the eye of receptors at this viewpoint. None of the visible proposed built developments would exceed the scale and mass of the two baseline built developments (southern edge of Manston Business Park and Summit Aviation Building).

In summary, the built development and periodic crane activity would introduce many new built elements into the view of similar prominence to the existing Summit Aviation Building. The open nature of the foreground (beyond the boundary fence) would ensure a sense of separation would be retained. When completed the partly visible built elements would reflect the form, scale and appearance of most of the built elements in the view that are sited within or close to the existing non-operational airport. In summary, the Year 1 view would not be significantly altered from the baseline.

Magnitude of visual change: **Medium**	Type of effect: **Adverse and temporary (construction activities) / permanent (buildings)**	Significance: **Not Significant**

Table 2.4 (continued) Viewpoint 4 – B2190, Minster Road

Description of Changes in the View at Year 10

As with Year 1, there would be periodic views of the two mobile cranes when they are used to construct built elements although construction activities would be much less extensive than in Year 1. Within Phase 3 and therefore potentially at Year 10 the construction activities for the western-most aircraft standing areas would be partly and temporarily visible in the same field of the view. There are likely to be some views of taxiing aircraft on the western side of the runway and the upper sections of the larger aircraft parked at aircraft stands. As only a proportion of the aircraft landing and taking off from the operational airport would take off and land from the west, low flying aircraft will be a periodic, short-lived component within Viewpoint 4 by Year 10.

By Year 10 the roofs of the business units, the upper section of the ATC tower, upper sections of three of the cargo facilities (central two and eastern-most), and upper sections of the aircraft recycling hangars would be visible in the middle distance through the airport boundary fence. Depending upon the detailed construction schedule the second and third cargo facility would screen the other two (most eastern) cargo facilities and a portion of the Northern Grass area units temporarily visible for some of the intervening period.

In summary, when compared to the baseline view the Year 10 view would not be significantly altered.

Magnitude of visual change: **Medium**	Type of effect: **Adverse and temporary (construction activities) / permanent (buildings and operational activity)**	Significance: **Not Significant**

Description of Changes in the View at Year 20

In contrast to previous periods there would be no periodic crane activity which would have ceased by Year 18. The only change resulting from the presence of the fully operational Airport in comparison with Year 10 will be the presence of the closest, western-most fourth proposed cargo facility and a third recycling hangar. The fourth cargo facility would screen the other cargo units, its upper sections and roof would be visible close to the ATC tower. Aircraft numbers are forecast to increase in comparison with Year 10, therefore there would be an increase in numbers of partly visible parked and taxiing aircraft.

In summary, present in the Year 20 view would be the roofs of the business units, the upper section of the ATC tower, upper sections of the forth cargo facility (screening other cargo facilities), and upper sections of the aircraft recycling hangars in the middle distance through the airport boundary fence.

Magnitude of visual change: **Medium**	Type of effect: **Adverse and permanent**	Significance: **Not Significant**

Table 2.5 Viewpoint 5 - A256 Haine Road

Viewpoint Information			
Viewpoint OS grid reference:	635205, 165114	Figure Nos:	Annotated baseline photos - Figure 11.12 Photowires - Appendix 11.1 Figure 8
Visual receptor groups located at or close to Viewpoint:		Westbound vehicular receptors travelling along Canterbury Road West.	
Visual receptor sensitivity:		**Medium**	
Night-time Viewpoint:		Yes (Figure 11.24)	

Description of Baseline View and Role of the Existing Non-Operational Airport

The foreground and middle ground of the view are formed by a single open arable field. The topography of the land gently rises towards the airport with no other intervening elements to screen views. Looking to the west several residential properties located along Windsor Road in Cliffs End are visible surrounded by trees and telephone masts.

Beyond these properties to the north lies the boundary of the existing non-operational airport marked by an open mesh fence and intermittent concrete fence posts. The fence is approximately 3m high and extends from behind these properties across most of the full field of view. Occasional shrubs line the far eastern end of the fence. The only other manmade structures are a series of former approach lights on poles distributed on an east-west alignment with some north-south aligned sections along the horizon to the east of the perimeter fence. These, together with the fence posts form a regular series of readily apparent vertical visual elements in this simply composed open view.

There are no views of any components of the current built development on the existing non-operational airport, the only exception being the airport boundary fence.

The existing night-time view is shown in **Figure 11.24**. This shows a foreground lit by highway lighting along Canterbury Road West with a dark middle ground in the direction of the site. Domestic lights associated with housing in the northern part of Cliffs End and on the southern edge of Manston are visible to the west.

Description of Changes in the View at Year 1

No ground level construction activities would be visible with the exception of any upgrade of the eastern approach lights to CAT III which would take place both within and outside of the existing perimeter fence line with the likely removal of the existing former approach lighting (on posts) being removed from the view. There will be periodic views of the two mobile cranes when they are deployed to construct the ATC tower, the eastern most cargo facility and the southernmost business units, however the rising topography means that only the very top of these elevated construction activities may be visible and would appear on a similar scale as other man made built vertical elements (fence posts) located in the middle-ground of the current view.

The photo wire in **Appendix 11.1 Figure 8** shows the views of elements that would be constructed in Year 1. None of the new built elements associated with the airport or the Northern Grass area would be visible because the airport site is set back from the edge of the plateau.

In summary, the only visible element associated with the construction of the proposed development would be periodic crane activity and upgrade of the approach lights, the built development and other ground level construction activities will not be visible due to screening by the gently rising topography. In the context of other man made built elements, the periodic presence of cranes which would be small in scale would not significantly alter the overall composition and balance of the view in comparison with the baseline view.

Magnitude of visual change: **Negligible**	Type of effect: **Adverse and temporary (construction activities) / neutral and permanent (buildings)**	Significance: **Not Significant**

Description of Changes in the View at Year 10

There would be no views of any ground level construction activities, aircraft on the ground or ground level operational activities. There may be periodic views of the two mobile cranes when they are used to construct built elements in the eastern part of the airport, in particular the extension to the aircraft recycling hangars where they may become more prominent than in Year 1 but only occupying a narrow section of the horizon. All built elements present at Year 10 would be situated below the horizon. The overall composition and balance of the view would not significantly alter in comparison with the baseline.

Magnitude of visual change: **Low**	Type of effect: **Adverse and temporary (construction activities) / neutral and permanent (buildings and operational activity)**	Significance: **Not Significant**

Table 2.5 (continued) Viewpoint 5 - A256 Haine Road

Description of Changes in the View at Year 20

In contrast to previous periods there would be no periodic crane activity, which would have ceased by Year 18.

There will be no views of the built structures within the site or the movement of aircraft or other ground level operational activity with the slight rise in landform towards the site sufficient to screen views. The only change from baseline views would l be associated with the removal of the former approach lights from the view in Year 1. The overall composition and balance of the view would not significantly alter in comparison with the baseline.

Magnitude of visual change: **Negligible**	Type of effect: **Neutral and permanent**	Significance: **Not Significant**

Table 2.6 Viewpoint 6 - B2050 western edge of Manston

Viewpoint Information			
Viewpoint OS grid reference:	634619, 166204	Figure Nos:	Annotated baseline photos - Figure 11.13 Photowires - Appendix 11.1 Figures 9 & 10
Visual receptor groups located at or close to Viewpoint:		Residential receptors on the fringe of Manston	
Visual receptor sensitivity:		**High**	
Night-time Viewpoint:		Yes (Figure 11.25)	

Description of Baseline View and Role of the Existing Non-Operational Airport

The foreground and middle ground consist of two-large open arable fields extending across the full field of view, divided by Manston Road (B2050). Looking towards the south (left of **Appendix 11.1 Figure 9**) a mature hedgerow and tree is visible forming the perimeter of a residential property on the fridge of Manston. Looking to the north (right of **Appendix 11.1 Figure 10**) Manston Road is visible beyond which lies a band of mature trees (mainly deciduous) screening views towards Manston Court Holiday Park.

The flat topography of the plateau top allows views to extend to the middle ground and far distance. Looking to the south-west (left of **Appendix 11.1 Figure 9**) the perimeter fence to the current non-operational airport site is visible through which a grassy field is visible. A proportion (most eastern) section of the non-operational airport runway lies within this area, however due to the nature of the runway being flat and at ground level it is not visible.

Several built elements of the current non-operational airport are visible partially screened by weak intermittent tree cover. The most prominent is the maintenance hangar, the longer section of the hangar is only partially visible as a portion is screened by an intervening bund of trees sited on the airport site. The taller section of the maintenance hangar extends well above the tree cover into the horizon. To the left the most southerly section of a blue FBO hangar is fully visible but a majority of the structure is screened by band of trees located on the airport site. To the right of the maintenance hangar several street lighting columns are moderately prominent, with the columns extending above the horizon across a small proportion of the view. Between the lighting columns in the background, the passenger terminal of the current airport development is visible, mostly screened by vegetation sited on the perimeter of the airport site.

Several man-made built elements not associated with the current airport site are visible, with three blocks of white houses fully visible off Manston Court Road. The only other prominent man-made element not associated with the airport site is the open lattice telecommunications tower, which extends above the current tree cover boarding Manston Court Road to the right of the white houses. To the right of this structure, the top of the current radar tower within the Northern Grass area of the site is visible above the tree line.

In summary, there are several built elements of the current non-operational airport in view, these are accompanied by other built elements not associated with the airport such as housing and the telecommunications tower.

The baseline night-time view is presented in **Figure 11.25**. This shows a cluster of light sources close to the existing passenger terminal within the non-operational site. Other light sources are associated with the residential properties on Manston Court Road and on top of the telecommunications tower west of Manston Road.

Description of Changes in the View at Year 1

Due to the flat topography and limited screening construction activities would be widely visible across the view. The Contractors main compound would be visible occupying ground to the east (i.e. in front of) the existing maintenance hangar and FBO hangar. Other ground level construction activities occupying this section of the view would be associated with the runway and asphalt overlay. The construction and gradual emergence of structures during Year 1 include (from left to right) the business aviation centre and two associated hangars and the eastern most cargo facility with two mobile cranes operational across the site. When present the cranes would be prominent in the view. Most of the existing built development associated with the existing non-operational airport in the view would be retained during Year 1 including the blue FBO hangar and the aircraft maintenance hangar. The southernmost business units would become prominent new components of the view above the residential properties on Manston Court Road..

The photo wire in **Appendix 11.1 Figures 9 and 10** shows that there would be several new built elements prominently visible across the full field of view in Year 1.

In summary there would be extensive, large-scale changes in comparison with the baseline view. The balance and composition of the middle ground across the entire view would be dominated by a wide range of earthworks and construction activities with no screening. Collectively, these would reduce the baseline sense of openness. Some of the construction activities, in particular the two mobile cranes and the new built development would extend above the horizon across much of the view and reduce the current open views over the current non-operational airport site.

Magnitude of visual change: **High**	Type of effect: **Adverse and temporary (construction activities) / permanent (buildings)**	Significance: **Significant**

Table 2.6 (continued) Viewpoint 6 - B2050 western edge of Manston

Description of Changes in the View at Year 10

Some ground level construction activities associated with the continued presence of the contractors main compound would visible as would a proportion of the crane activities centred on the construction of the third cargo facility and the extension to the recycling hangar introduced in Phase 2 (the existing maintenance hangar being demolished during Phase 2), although the latter will be likely to be only periodically present by Year 10. Views of aircraft on the ground would be highly partial as the runway, taxiways and stands would be mostly screened by the three intervening new airport facilities (mainly the business aviation hangars and aircraft recycling hangars) leaving only some partial views of taxiing aircraft at intervals between the proposed new buildings.

By Year 10 the new passenger terminal, three of the cargo facilities (central two and most eastern), the business aviation hangars and the aircraft recycling hangar would be prominently visible in the view. All of the new built elements would extend above the horizon to some degree thus increasing the sense of visual enclosure. To the northeast, the business units, extended to the north in Phase 2, would be visible, with planting introduced into the buffer to the rear of properties on Manston Road in Year 1 beginning to provide some filtering and softening of the lower facades.

In summary, the baseline view would be completely changed by Year 10 through the introduction a wide range of new built development throughout the panoramic view. The buildings and ground level activities would become the dominant visual elements. The view would become more enclosed compared with the baseline but the establishing landscape planting along the eastern edge of the Northern Grass area will provide some softening and filtering of the facades of the business units, especially when in leaf.

Magnitude of visual change: **High**	Type of effect: **Adverse and temporary (construction activities) / permanent (buildings and operational activity)**	Significance: **Significant**

Description of Changes in the View at Year 20

In contrast to previous periods there would be no ground level construction activity present or periodic crane activity, which would have ceased by Year 18. The new built elements visible in the Year 20 view in comparison with Year 10 would be the presence of the furthest, western-most proposed cargo facility which would be mostly screened by the closest first built cargo facility present at Year 1, as well as the extension to the recycling hangar, business aviation hangar and terminal extension. All of these structures would continue to be prominently visible in the view with the gradually maturing vegetation along the eastern edge of the Northern Grass area providing further softening and filtering of the facades of the business units. Ground level operational activities would include the car park to the east of the passenger terminal and partial views of aircraft taxiing to and from the runway. Aircraft numbers are forecast to increase in comparison with Year 10, therefore there would be an increase in numbers of partly visible taxiing aircraft. The combined effect off all the proposed airport and Northern Grass buildings present would result in the Year 20 view being significantly altered compared to the baseline view.

Magnitude of visual change: **High**	Type of effect: **Adverse and permanent**	Significance: **Significant**

Table 2.7 Viewpoint 7 - Vincent Road near Fleet Farm

Viewpoint Information			
Viewpoint OS grid reference:	634481, 167555	Figure Nos:	Annotated baseline photos - Figure 11.14 Photowires - Appendix 11.1 Figure 11
Visual receptor groups located at or close to Viewpoint:		Vehicular receptors using Vincent Road	
Visual receptor sensitivity:		**Medium**	
Night-time Viewpoint:		Yes (Figure 11.26)	

Description of Baseline View and Role of the Existing Non-Operational Airport

The foreground and middle ground consist of a large open arable field. Flat topography allows views to extend to the background, looking to the south east (left hand side of the photo) a band of mature trees is located on the perimeter of Fleet pumping station with a large square tower located within the pumping station premises extending above the tree line. Centrally, most of the horizon is made up of the same arable field as in the foreground with the intermittent presence of individual trees breaking the horizon. To the south-west (right) there are more trees located intermittently across the horizon beyond a grass paddock. No built elements within the current non-operational site are visible the exception of the open lattice radar tower which extends above the vegetation cover boarding the Manston Road.

In summary, the view is predominately rural and open with limited man made built elements on the horizon.

The baseline night-time view is shown in **Figure 11.26**. This shows a dark fore, middle and background to the central part of the view with light sources present to the southwest clustered along Manston Road. The most notable of these is the radar tower within the application site with its red warning light on the top.

Description of Changes in the View at Year 1

There is the potential for the top of the site won materials stockpile and adjacent Northern Grass area contractor's compound located close to the northern boundary of the site to be partially visible through the sparse vegetation along the horizon in the central part of the view. During Year 1 there would also be views of the two mobile cranes when they are used to construct the taller built elements including the eastern most cargo facility and the southernmost cluster of business units. Only the upper sections of these cranes would be visible above the horizon line.

In terms of emerging built elements, the roof of the eastern proposed cargo facility would partially extend above the tree cover and horizon although only slightly thereby reducing its visual role in the view. This structure would be partially screened by the more prominent proposed business units introduced into the southern half of the Northern Grass area during Year 1. Additionally, the height of the already visible radar tower would be extended by an estimated 5m by the introduction of new radar equipment which would slightly increase the visual prominence of the radar tower.

In summary, the emerging development and periodic crane activity would introduce a series of new elements above a moderate proportion of the horizon although the separation distance means that these new visual components are unlikely to reduce the overall open feel of the view.

Magnitude of visual change: **Medium**	Type of effect: **Adverse and temporary (construction activities) / permanent (buildings)**	Significance: **Not Significant**

Description of Changes in the View at Year 10

No ground level operational elements or construction activities would be visible. Periodic views of the two mobile cranes would be possible although it is anticipated that their use on site would be reduced by Year 10.

The photowire in **Figure 11, Appendix 11.1** shows that by Year 10 the northern most business units would be prominent built elements of the view, screening (along with the topography) the more distant roofs of the cargo facilities, recycling hangars, and all ground level activities and movement of aircraft. Although not shown on the masterplan so as to allow for flexibility in the layout of the northern business development, planting is highly likely to be introduced along the northern boundary of the site and this may begin to soften the lower facades of the units and break up their visual mass.

Magnitude of visual change: **Medium**	Type of effect: **Adverse and temporary (construction activities) / permanent (buildings and operational activity)**	Significance: **Not Significant**

Table 2.7 (continued) Viewpoint 7 - Vincent Road near Fleet Farm

Description of Changes in the View at Year 20

It is unlikely that the view would have altered considerably between Year 10 and Year 20 with the northern most business units and topography screening any additional infrastructure such as the western most cargo facility and the extension to the aircraft recycling hangars in views from this location. All ground level operational activity and aircraft movements will be screened by the intervening built form. Any planting introduced along the northern boundary would play a greater role in filtering views of the façades of the business units although the effectiveness of this screening will be dependent upon its density and type hence to the predicted Medium to Low magnitude of change to allow for this uncertainty.

Magnitude of visual change: **Medium to Low**	Type of effect: **Adverse and permanent**	Significance: **Not Significant**

Table 2.8 Viewpoint 8 – Woodchurch Road, southern edge of Woodchurch

Viewpoint Information			
Viewpoint OS grid reference:	632564, 167096	Figure Nos:	Annotated baseline photos - Figure 11.14 Photowires - Appendix 11.1 Figure 12
Visual receptor groups located at or close to Viewpoint:		Residential receptors in Woodchurch	
Visual receptor sensitivity:		**High**	
Night-time Viewpoint:		No	

Description of Baseline View and Role of the Existing Non-Operational Airport

The foreground of the view consists of a single, open arable field with a paddock field and the security fencing around the 'Reclamet' vehicle dismantling business forming a visual contrast on the left-hand (northern) side of the view. Flat topography allows the view to extend to the middle ground that is formed by mature (deciduous and coniferous) tree cover around the Defence Fire Training and Development Centre which forms the horizon. Only a small proportion of the buildings within the Defence Fire Training and Development Centre can be identified within the vegetation cover which extends across the full field of view.

As a consequence of the flat topography and the dense middle-distance vegetation cover there are no long distance views and no visual evidence of the current built development on the existing non-operational airport. The only exception is the open lattice radar tower which extends above the left hand portion of the horizon. A second taller transmission tower sited to the north of the Defence Fire Training and Development Centre is located in the same field of view. These two open lattice towers are the only man-made elements visible above the treed horizon.

Description of Changes in the View at Year 1

No ground level construction activities would be visible but there would be periodic views of the two mobile cranes extending above narrow sections of the horizon when they are used to construct built elements in the western part of the Airport and the units in the Northern Grass area.

The photo wire in **Appendix 11.1 Figure 12** shows that components of the development potentially present within this view in Year 1, will be confined to the ATC tower and the rooflines and upper facades of some of the units proposed in the southern half of the Northern Grass area through and above the top of the intervening tree cover. The first (eastern-most) of the four proposed cargo facilities that is scheduled for construction in Year 1 would be screened by the middle-distance tree cover. The height of the radar tower would be extended by an estimated 5m by the introduction of new radar equipment and this would slightly increase the visual prominence of the radar tower.

In summary, the built development and periodic crane activity would introduce a limited number of new elements above short sections of the treed horizon in the same field of view as two existing man-made vertical elements but the overall composition and balance of the view would not alter significantly in comparison with the baseline.

Magnitude of visual change: **Low**	Type of effect: **Adverse and temporary (construction activities) / permanent (buildings)**	Significance: **Not Significant**

Description of Changes in the View at Year 10

There would be periodic views of the two mobile cranes when they are used to construct the taller built elements although construction activities would be much less extensive than in Year 1. There would be no views of aircraft on the ground or any other ground level construction or operational activities.

By Year 10 the ATC tower, the extended radar tower and the upper sections of a proportion of the units in the Northern Grass area would be visible low above narrow sections of the treed horizon. There is potential for partial and filtered views of the roofs on the second and third of the proposed cargo facilities, especially in winter months.

In summary, considering all new built elements present the Year 10 view the overall composition and balance of the view would not alter significantly in comparison with the baseline view.

Magnitude of visual change: **Low**	Type of effect: **Adverse and temporary (construction activities) / permanent (buildings)**	Significance: **Not Significant**

Table 2.8 (continued) Viewpoint 8 – Woodchurch Road, southern edge of Woodchurch

Description of Changes in the View at Year 20

The fourth cargo facility's roof and part of its western gable end would be visible close to the ATC tower on the right-hand (southern) side of the view. Other than the radar tower, the ATC tower and some of the rooflines at the cargo facilities and the units in the Northern Grass area no built components, planes on the ground or other ground level operational activities would be visible. Taking into account all new built elements present in the Year 20 view, the overall composition and balance of the view would not alter significantly in comparison with the baseline view.

Magnitude of visual change: **Low**	Type of effect: **Adverse and permanent**	Significance: **Not Significant**

Table 2.9 Viewpoint 9 - Minster Road, Acol

Viewpoint Information			
Viewpoint OS grid reference:	630872, 166840	Figure Nos:	Annotated baseline photos - Figure 11.15 Photowires - Appendix 11.1 Figure 13
Visual receptor groups located at or close to Viewpoint:		Residential properties located in Acol	
Visual receptor sensitivity:		**High**	
Night-time Viewpoint:		Yes (Figure 11.26)	

Description of Baseline View and Role of the Existing Non-Operational Airport

The immediate foreground of the view consists of the Minster Road, beyond which is a large open arable field extending across the full field of view to the middle ground.

In the middle ground of the view the upper sections and roofs of several business units are visible within the Manston Business Park including the Cummings large warehouse units to the left and Kent Office Solutions to the right. The roofs and upper sections of these large units only are visible above the dense mature tree cover sited on the edge of the existing business park. Despite this screening the scale of the business units at a separation distance of 0.5km means that they are prominent components of the view. Other man-made elements extending partially into the horizon are two telephone masts and associated wirescape extending across the full field of the view.

In summary, the view is mainly of the large arable field, however there is obvious visual evidence of development extending above the tree cover in the background. There is no visual evidence of the current built development on the existing non-operational airport.

The baseline night-time view is presented in **Figure 11.26** and shows a dark foreground but a well-lit middle-ground with numerous light sources visible within the Manson Business Park

Description of Changes in the View at Year 1

The density of the screening vegetation presence of the intervening large-scale built forms within the Manston Business Park means that only the very top of any cranes deployed to construct the ATC tower, southern most business units and the eastern most cargo facility would be visible above the top of the rooflines. These periodic new additions to the view would not be out of context given the urban fringe elements and vertical structures in the view which would remain the most prominent components.

Magnitude of visual change: **Negligible**	Type of effect: **Adverse and temporary (construction activities) / Neutral and permanent (buildings)**	Significance: **Not Significant**

Description of Changes in the View at Year 10

The combination of built form and tree cover ensure that no built elements, aircraft on the ground or on-going ground level construction activities would be visible. The occasional presence of the top of cranes deployed to build the third cargo facility would be visible above the intervening tree cover and structures but would not be out of context in a view which already contain numerous large-scale built elements.

In summary, the Year 10 view will not be significantly altered compared to the baseline view.

Magnitude of visual change: **Negligible**	Type of effect: **Adverse and temporary (construction activities) / Neutral and permanent (buildings)**	Significance: **Not Significant**

Description of Changes in the View at Year 20

The photowire in **Appendix 11.1 Figure 13** shows the views of elements that would be fully operational by Year 20, and due to the dense tree cover situated on the edge of Manston Business Park located off Columbus Avenue and the large scale units themselves there would be no visual evidence of any built elements, aircraft on the ground or ground level operational activities resulting from the presence of the fully operational Airport in comparison to the baseline view.

Magnitude of visual change: **No change**	Type of effect: **Neutral and permanent**	Significance: **Not Significant**

Table 2.10 Viewpoint 10 - Pumping Station south of Quex Park

Viewpoint Information			
Viewpoint OS grid reference:	631819, 167446	Figure Nos:	Annotated baseline photos - Figure 11.15 Photowires - Appendix 11.1 Figure 14
Visual receptor groups located at or close to Viewpoint:		Representative of open views available to recreational receptors using PRoW TE16 and vehicular visual receptors using the B2050 Manston Road.	
Visual receptor sensitivity:		**High** (users of PRoW) **Medium** (vehicular receptors)	
Night-time Viewpoint:		No	

Description of Baseline View and Role of the Existing Non-Operational Airport

The foreground of the view consists of a single, open arable field extending across the full field of view. Views extend to the middle ground which is largely consists of the same open arable field bound on the left-hand side (east) by an overgrown hedgerow alongside Manston Road. This hedgerow provides some visual containment and screens any potential eastern views. In the central section of the view the horizon is formed by tree cover located around Alland Grange Lane and Woodchurch Road. Several man-made built elements are visible within and above tree cover. The most readily apparent is the telecommunications tower which is located to the west of the Northern Grass area part of the existing non-operational airport as well as several closer wooden telegraph poles. There are filtered views of some farm and residential buildings located close to either Alland Grange Lane or Woodchurch Road.

The relatively flat topography combined with the moderate levels of vegetation cover away from the arable fields combines to ensure that there are no long-distance views. They also ensure that there is no visual evidence of the current built development on the existing non-operational airport.

Description of Changes in the View at Year 1

No ground level construction activities would be visible, there would be periodic views of the upper sections of the two mobile cranes.

The photo wire in **Appendix 11.1 Figure 14** shows that there would be partial views of the rooflines and upper facades of the units proposed within the southern part of the Northern Grass area extending above the intervening hedgerow In the central part of the view the upper section of the first (eastern-most) of the four proposed cargo facilities would be intermittently visible through and sometimes above the tree cover along Alland Grange Lane. The most prominent new visual element would be the ATC tower as it is aligned with a low section in the tree cover along Alland Grange Lane. No ground level construction activities would be visible. These elements would be seen in the context of existing man-made elements that are visible above the horizon i.e. the telegraph poles and telecommunications tower. The site visit also demonstrated that in the wider panoramic view available from Viewpoint 10, large-scale units at Manston Business Park are readily apparent further to the right-hand side.

In summary, the built development and periodic crane activity would introduce some new man-made elements above sections of the horizon in the same field of other moderately prominent built elements. The general composition of the view may appear slightly more built up, but overall the composition and balance of the view would not alter significantly in comparison with the baseline.

Magnitude of visual change: **Low**	Type of effect: **Adverse and temporary (construction activities) / permanent (buildings)**	Significance: **Not Significant**

Description of Changes in the View at Year 10

There would be periodic views of the two mobile cranes when they are used to construct the taller proposed built elements in the western part of the Airport although construction activities would be much less extensive than in Year 1. There would be no views of aircraft on the ground or any other ground level construction or operational activities.

By Year 10 the ATC tower, the upper section of some of the units in the Northern Grass area, and three cargo facilities (eastern most and central two), will be partially visible above sections of the treed horizon.

In summary, when compared to the baseline the overall composition and balance of the view will not significantly alter.

Magnitude of visual change: **Low**	Type of effect: **Adverse and temporary (construction activities) / permanent (buildings)**	Significance: **Not Significant**

Table 2.10 (continued) Viewpoint 10 - Pumping Station south of Quex Park

Description of Changes in the View at Year 20

Views of the fourth cargo facility unit would be filtered and mostly screened by vegetation, so that the fourth unit would have a reduced presence in the view in comparison with the other three units introduced in Phases 1-3. As with Year 10 and Year 1, aircraft on the ground or other ground level operational activities would not be visible due to intervening screening. The presence of all fully operational buildings and infrastructure would not significantly alter the overall composition and balance of the view when compared to the baseline.

Magnitude of visual change: **Low**	Type of effect: **Adverse and permanent**	Significance: **Not Significant**

Table 2.11 Viewpoint 11 - Viking Coastal Trail, Cottington Road

Viewpoint Information			
Viewpoint OS grid reference:	633107, 164479	Figure Nos:	Annotated baseline photos - Figure 11.16 Photowires - Appendix 11.1 Figure 15
Visual receptor groups located at or close to Viewpoint:		Residential properties at Dyas farm and receptors traveling along the minor road which forms part of the Regional Cycle Route (RCR) 15 (Viking Coastal Trail).	
Visual receptor sensitivity:		**High**	
Night-time Viewpoint:		Yes (Figure 11.27)	

Description of Baseline View and Role of the Existing Non-Operational Airport

The foreground of the view consists largely of two open arable fields with field margins spanning either side of Thorne Hill (road) with telephone masts following the line of the road. The vegetation boundary and masts extend into the middle distance, where they meet a wooded tree belts surrounding Thorne Farm. A series of further, telephone masts cross the field of view and extend above the treeline. There are filtered views of residential properties at Red Cottages within the western edge (left) of the wooded area, behind these in the background a field of solar panels at Thorne Solar Park are visible on the rising landform of the southern face of the chalk plateau. Long distance views are restricted by the southern edge of the plateau in the direction the current non-operational airport.

In summary, several manmade elements are visible, the most predominate features are the telephone masts due to the vertical structure and proximity to the viewpoint, and solar panels in the distance due to the contrast in text and colour with the surrounding landscape. There are no views of any components of the current built development on the existing non-operational airport.

The baseline night-time photograph in **Figure 11.27** shows a dark foreground and horizon with very few light sources visible. The exceptions are a small cluster of lights at Red Cottages.

Description of Changes in the View at Year 1

There would be no views of any ground level construction activities although the upper sections of the two mobile cranes deployed for the construction of the ATC tower would be visible above a short section of the horizon. Any crane activity associated with the construction of the first, eastern most cargo facility would be screened by the intervening tree cover around Thorne Farm with the potential for heavily filtered views of the upper sections only during the winter months. This is due to the density of the screening vegetation and distance below and beyond the horizon line that the proposed built development will be sited.

The photo wire in **Appendix 11.1 Figure 15** shows the view of elements of the completed scheme with those constructed in Year 1 limited to the ATC tower, gate house, fire station, first cargo facility, southern most business units and a business aviation centre with two hangars. **Figure 15** illustrates that due to the topography of the rising southern face of the plateau allied with the woodland in around Throne Farm there would be no views of any of the built elements. In summary, the built development emerging in Year 1 would be screened in views from Viewpoint 11, with only periodic crane activity periodically visible above the short sections of the horizon.

Magnitude of visual change: **Low**	Type of effect: **Adverse and temporary (construction activities) / permanent (buildings)**	Significance: **Not Significant**

Description of Changes in the View at Year 10

The combination of screening and the location of the built development being set back from the southern edge of the plateau results in none of the built elements or on-going ground level construction activities being visible. Any elevated construction activity associated with the cranes deployed for the construction of the central cargo facility would be visible above a narrow section of the horizon with the cranes used for the extension of the recycling hangars screened by intervening woodland around Throne Farm. The tops of the tail fins on the largest aircraft using the runway are likely to be intermittently visible moving above the horizon.

Magnitude of visual change: **Low**	Type of effect: **Adverse and temporary (construction activities) / permanent (operational activity)**	Significance: **Not Significant**

Table 2.11 (continued) Viewpoint 11 - Viking Coastal Trail, Cottington Road

Description of Changes in the View at Year 20

There would be no visual evidence of any built elements within the site or ground level operational activities with the exception of the tops of the tail fins on the largest aircraft using the runway which are likely to be intermittently visible moving above the horizon. Aircraft numbers are forecast to increase in comparison with Year 10, therefore there would be an increase in numbers of partly visible aircraft although these would be transient and periodic.

Magnitude of visual change: **Negligible**	Type of effect: **Adverse and permanent**	Significance: **Not Significant**

Table 2.12 Viewpoint 12 - A256, Cottington Road Bridge

Viewpoint Information			
Viewpoint OS grid reference:	633790, 164232	Figure Nos:	Annotated baseline photos - Figure 11.16 Photowires - Appendix 11.1 Figure 16
Visual receptor groups located at or close to Viewpoint:		Northbound vehicular receptors on A256	
Visual receptor sensitivity:		**Low**	
Night-time Viewpoint:		Yes (Figure 11.27)	

Description of Baseline View and Role of the Existing Non-Operational Airport

The foreground of the view consists of the Cottington link road (to the left) and A256 (to the right), separated by a steep grass verge. The roads run from the foreground into the background of the view in the direction of the current airport site. Road barriers running alongside the A256 form the foreground whilst street lamp posts and various roadside signage are visible in the middle distance. Looking to the north east beyond the roads, arable fields are visible on the southern slopes of the chalk plateau, with the southern edge of the plateau forming the horizon. To the left of the view looking towards the north west, a large arable field forms the majority of the view, beyond which lies a dense band of mature (mixed) woodland which forms the boundary to Throne Farm. This screens the majority of the long-distance views to the north west. Just beyond the eastern edge of the tree cover a field of solar panels (Thorne Solar Farm) are partially visible on the rising ground.

The tree cover on the boundary of Thorne Farm and the topography raising towards the airport in the background results in a vast majority of any components of the current built development on the existing non-operational airport being screened. The only exceptions are a single small building extending marginally above the horizon and perimeter fence along the southern boundary of the airport.

The night-time baseline photograph is shown in **Figure 11.27**. This shows high levels of light sources along the main A roads and junctions. Elsewhere there are limited sources of light visible, with lighting at Thorne Farm a single light source to the west.

Description of Changes in the View at Year 1

The overwhelming majority of ground level construction activities would not be visible with the exception being any movement of construction plant along the southern boundary of the site. There would be periodic views of the upper sections of the two mobile cranes extending above the horizon line when constructing the ATC tower, passenger terminal and the first eastern most cargo facility. When present, the cranes would become the most prominent manmade structures along the horizon line and disrupt the horizontal line structure of the current view.

The photowire in **Appendix 11.1 Figure 16** shows that new built elements associated with the airport or the Northern Grass area would not be visible due to them being set back from the southern edge of the plateau.

In summary, the proposed built development would be screened by the topography and tree cover located at Throne Farm. There would be periodic views of upper sections of the two mobile cranes above a limited proportion of the horizon. There would be no significant change in the Year 1 view compared to the baseline view.

Magnitude of visual change: **Low**	Type of effect: **Adverse and temporary (construction activities) / neutral and permanent (buildings)**	Significance: **Not Significant**

Description of Changes in the View at Year 10

There would be no views any ground level construction activities. There may be periodic views of the two mobile cranes when they are used to construct built elements in the eastern part of the Airport although construction activities would be much less extensive than in Year 1.

The photowire shows the proposed aircraft recycling hangars would be present above the horizon in the centre of the view and although the roofline would not extend far above the horizon, this would become the most prominent built element on the horizon. The movement of aircraft along the runway is also likely to be intermittently evident close to the southern boundary of the site.

In summary, the overall composition and balance of the view would partially alter due to the presence of the aircraft recycling hangar and movement of aircraft when compared to the baseline view.

Magnitude of visual change: **Low**	Type of effect: **Adverse and temporary (construction activities) / permanent (buildings and operational activity)**	Significance: **Not Significant**

Table 2.12 (continued) Viewpoint 12 - A256, Cottington Road Bridge

Description of Changes in the View at Year 20

In contrast to previous periods there would be no periodic crane activity which would have ceased by Year 18. Any new elements constructed between Year 10 and 20 would be screened by the intervening vegetation and topography. In summary, the overall composition and balance of the Year 20 view would be partially altered compared to the baseline due to the continued presence of the aircraft recycling hangars and movement of aircraft along the runway. Aircraft numbers are forecast to increase in comparison with Year 10, therefore there would be an increase in numbers of partly visible aircraft.

Magnitude of visual change: **Low**	Type of effect: **Adverse and permanent (buildings and operational activity)**	Significance: **Not Significant**

Table 2.13 Viewpoint 13 – Nash Court, Nash Road, Margate

Viewpoint Information			
Viewpoint OS grid reference:	635654, 168600	Figure Nos:	Annotated baseline photos - Figure 11.17 Photowires - Appendix 11.1 Figure 17
Visual receptor groups located at or close to Viewpoint:		Residential receptors in Westwood	
Visual receptor sensitivity:		**High**	
Night-time Viewpoint:		No	

Description of Baseline View and Role of the Existing Non-Operational Airport

The foreground and middle ground of the view consists of a two, open arable fields with a post and wire fence extending into the background which marks the route of a public bridleway. Isolated shrub planting alongside the fence provide the only naturalistic vertical elements. To the right-hand side (west) of the view, a 132kV electricity pylon (estimated height of 25m) is the dominant visual element.

Flat topography allows the view to extend to the middle-distance horizon that is formed by telephone pylons to the east near Bradgate Caravan Park and a belt of the mature (deciduous and coniferous) tree cover. A couple of residential buildings can be identified within this tree cover whilst the telecommunications mast that is sited to the west of the Manston Road (i.e. west of the existing non-operational airport) just extends above the treed horizon close to the lower radar tower that is located within the Northern Grass area of the non-operational airport.

As a consequence of the flat topography and the tree cover sited on the horizon, there is no visual evidence of the current built development within the existing non-operational airport. The only exception is the open lattice radar tower which extends above the tree cover in the centre of the horizon.

Description of Changes in the View at Year 1

No ground level construction activities would be visible but there would be periodic views of the two mobile cranes when they are used to construct built elements. Only the upper sections of the cranes would be visible above the tree line and they would be seen in the context of existing man-made elements above the horizon i.e. the radar and telecommunications towers and the closer, more prominent pylons.

The photowire in **Appendix 11.1 Figure 17** shows the elements that would be constructed in Phase 1, and therefore potentially present within this view in Year 1, would be the upper sections of a proportion of units located in the Northern Grass area. The height of the radar tower (already visible) would be extended by an estimated 5m by the introduction of new radar equipment which would slightly increase the visual prominence of the radar tower. Much of the Year 1 development would not be visible and is screened by the topography and tree cover on the horizon.

In summary, the built development and periodic crane activity would introduce a limited number of new elements above short sections of the horizon in the same field of view as the more prominent electricity pylons. The general composition of the view would not significantly alter in comparison with the baseline.

Magnitude of visual change: **Low**	Type of effect: **Adverse and temporary (construction activities) / neutral and permanent (buildings)**	Significance: **Not Significant**

Description of Changes in the View at Year 10

By Year 10 the extended radar tower and the upper sections of a proportion of the units within the northern half of the Northern Grass area and aircraft recycling hangars would be visible above the treed horizon. The rooflines would not extend far above the tree cover thereby minimising their visual role. As with Year 1, no ground level elements or construction activities would be visible. Periodic views of the two mobile cranes would be possible but their use on site would be reduced.

In summary, the overall composition and balance of the view would not significantly alter in comparison with the baseline.

Magnitude of visual change: **Low**	Type of effect: **Adverse and temporary (construction activities) / neutral and permanent (buildings)**	Significance: **Not Significant**

Table 2.13 (continued) Viewpoint 13 – Nash Court, Nash Road, Margate

Description of Changes in the View at Year 20

In contrast to previous periods there would be no periodic crane activity which would have ceased by Year 18. Any new developments introduced between Year 10 and Year 20 would be sited below the horizon line. The new built elements present when compared to the baseline are the aircraft recycling hangars, the upper sections of a proportion of units located in the Northern Grass area and an increase in the height of the radar tower (already visible). The general composition of the view would not alter significantly in comparison with the baseline.

Magnitude of visual change: **Negligible**	Type of effect: **Neutral and permanent**	Significance: **Not Significant**

Table 2.14 Viewpoint 14 - Junction of High Street and Shottendane Road

Viewpoint Information			
Viewpoint OS grid reference:	633500, 168850	Figure Nos:	Annotated baseline photos - Figure 11.17 Photowires - Appendix 11.1 Figure 18
Visual receptor groups located at or close to Viewpoint:		Residential receptors on the southern fringe of Margate.	
Visual receptor sensitivity:		**High**	
Night-time Viewpoint:		Yes	

Description of Baseline View and Role of the Existing Non-Operational Airport

The foreground and middle ground of the view consist of a large open arable field. Due lack of screening and the relatively flat topography in the foreground and middle ground long distance views are available. In the background looking to the south east (left of view) there is another arable field separated by a low hedgerow. Beyond this there are filtered partial views of residential properties off Bramble lane and Manston Road which are largely screened by surrounding tree cover on the perimeters of the properties. Central long-distance views are made up of an arable field gently rising away from the view point. The other feature central on the horizon line is a raised bund of land with a hedge row and trees located on the perimeter of DDS Demolition on Manston Road. There are several man-made vertical elements extending above the horizon line, the most prominent is the open lattice telecommunications mast in the centre of the view, followed by the open lattice radar tower (to the east/ left of the telecommunications tower). There are several other less prominent telephone masts extending across a majority of the horizon partially screed by intervals of vegetation cover.

As a consequence of the topography gently rising towards the site, the bund of raised land located at DDS demolition and the tree cover sited on the horizon, there is no visual evidence of the current built development within the existing non-operational airport. The only exception is the open lattice radar tower which extends above the raised land towards the centre of the horizon in this view.

The night-time baseline is presented in **Figure 11.28** which shows isolated sources of light above or close to the horizon beyond a dark foreground. The telecommunications mast west of Manston Road has light sources with a red warning on the top whilst light from the tall columns within the Defence Fire Training and Development Centre site are visible either side. Further to the left pf the view, occasional light sources associated with individual properties and farmsteads are visible.

Description of Changes in the View at Year 1

No ground level construction activities would be visible but there would be periodic views of the two mobile cranes when they are used to construct built elements. Only the upper sections of the cranes would be visible above horizon line and they would be seen in the context of existing man-made vertical elements above the horizon i.e. the radar and telecommunications towers.

The photowire in **Appendix 11.1 Figure 18** shows the elements that would be present within this view in Year 1 includes the upper most section of the ATC tower, and a proportion of the units located in the Northern Grass area. The roof of the first cargo facility (most eastern) would be screened by the intervening units introduced within the southern half of the Northern Grass area. The height of the radar tower (already visible) would be extended by an estimated 5m by the introduction of new radar equipment which would slightly increase the visual prominence of the radar tower. Much of the Year 1 development would not be visible and is screened by the rising topography and tree cover on the horizon. Due to the flat topography and sparse vegetation screening in the south-east direction, the business units introduced into the southern half of the Northern Grass area would l be the most prominent built element in the view.

In summary, the built development and periodic crane activity would introduce a limited number of new elements, extending above short sections of the horizon in the same field of view as the more prominent telecommunications mast. No significant visual change is predicted when compared to the baseline view.

Magnitude of visual change: **Low**	Type of effect: **Adverse and temporary (construction activities) / permanent (buildings)**	Significance: **Not Significant**

Table 2.14 (continued) Viewpoint 14 - Junction of High Street and Shottendane Road

Description of Changes in the View at Year 10

No ground level elements or construction activities would be visible. There would be periodic views of the two mobile cranes but their use on site would be reduced.

In Year 10 the extended radar tower, the upper most section of the ATC tower, and the rooflines and upper facades of units within the Business Park would be visible above the horizon. A large proportion of the built elements including the additional two (central) cargo units would be screened by the raised land bund sited on the perimeter of DDS demolition and vegetation cover on the horizon. The rooflines of the built elements visible will not extend far above the tree cover thereby reducing their visual role.

In summary, **t**he general composition of the view would appear slightly more built up as there would be the roofs and upper facades of built elements above a greater proportion of the horizon. However, any views of the new built elements would be distant and partial and there would be no significant visual changes when compared to the baseline view.

Magnitude of visual change: **Low**	Type of effect: **Adverse and temporary (construction activities) / permanent (buildings)**	Significance: **Not Significant**

Description of Changes in the View at Year 20

In contrast to previous periods there would be no periodic crane activity which would have ceased by Year 18. Structures introduced between Year 10 and Year 20 would be sited below the horizon line, with the final western most cargo facility screened by the land bund and tree cover sited at DDS demolition. The units within the Business Park would continue to be visible although planting introduced during Year 1 to the east of the northern most units would be of a sufficient height to screen the northern most buildings.

In summary, the overall composition and balance of the view would not significantly alter in comparison with the baseline.

Magnitude of visual change: **Low**	Type of effect: **Adverse and permanent**	Significance: **Not Significant**

Table 2.15 Viewpoint 15 - PRoW, Shottenden Road

Viewpoint Information			
Viewpoint OS grid reference:	632531, 168633	Figure Nos	Annotated baseline photos - Figure 11.18 Photowires - Appendix 11.1 Figure 19
Visual receptor groups located at or close to Viewpoint:		Representative of middle distance views from PRoW TM39	
Visual receptor sensitivity:		**High**	
Night-time Viewpoint:		Yes	

Description of Baseline View and Role of the Existing Non-Operational Airport

The foreground of the view is largely formed by a single open arable field. In the middle ground of the view there are some greenhouses, solar panels, and the upper section of a farm warehouse building, located at Woodchurch Farm. Although the built elements are surrounded by mature vegetation (mixed) the greenhouses are prominently visible due to their lighter colour against the dark vegetative background. Above the horizon behind Woodchurch Farm, the upper section of the telecommunications mast (adjacent to the Manston Road) is visible through an interval in the treeline. Relatively flat topography and absence of any vegetation or buildings in the foreground and middle ground allows for views to extend towards Park Road to the west of Woodchurch Farm where views become interrupted by the roadside hedge. To the left (east) of the farm complex slightly longer distance views are available and comprise open farmland with distant hedgerows and trees on the horizon with intermittent filtered views of residential properties (off the Woodchurch Road) and telegraph poles extend slightly above sections of the horizon.. The wirescape associated with electricity pylons cross the full field of view of the skyline.

The night-time baseline view presented in **Figure 11.28** shows few sources of light in the view. Woodchurch Farm is lit with lighting including a red warning light visible on the telecommunications mast to the west of Manston Road. Further east, individual light sources associated with isolated farmsteads and properties are discernible.

The screening in the middle/ long distance that is provided by the combination of built elements and vegetation around Woodchurch Farm result in no long-distance views of any components of the current built development on the existing non-operational airport.

Description of Changes in the View at Year 1

There would be periodic views of the upper sections of the two mobile cranes extending partially above the intervening screening provided by the roadside hedgerow that runs along Park Road when the cranes are used to construct the cargo facilities and ATC tower. There would be no views of ground level construction activities.

The photowire in **Appendix 11.1 Figure 19** shows the views of elements that will be constructed and operational in Year 1. None of the new built elements associated with the airport or the business development would be visible due to a combination of the topography and screening provided by the tree cover and built elements at Woodchurch Farm.

In summary, the operational built development would be screened. There would be periodic views of upper sections of the two mobile cranes above small sections of the horizon as are deployed to construct the more elevated components of the development. In the context of other man made built elements in the view the addition of a small number of vertical cranes would not significantly alter the overall composition and balance of the view in comparison with the baseline view.

Magnitude of visual change: **Negligible**	Type of effect: **Adverse and temporary (construction activities) / neutral and permanent (buildings)**	Significance: **Not Significant**

Description of Changes in the View at Year 10

There would be periodic views of the two mobile cranes when they are used to construct the third cargo unit although the emerging building itself would be screened. There would be no views of aircraft on the ground or any other ground level construction or operational activities.

In summary, the proposed built development would be screened and the view would not significantly alter in comparison with the baseline view.

Magnitude of visual change: **Negligible**	Type of effect: **Adverse and temporary (construction activities) / neutral and permanent (buildings)**	Significance: **Not Significant**

Table 2.15 (continued) Viewpoint 15 - PRoW, Shottenden Road

Description of Changes in the View at Year 20

There would be no views of any built elements, planes or ground level operational activities resulting from the presence of the fully functional Airport or Northern Grass area due to a combination of the topography and middle ground screening elements. In contrast to previous periods there would be no periodic crane activity which would have ceased by Year 18.

Magnitude of visual change: **None**	Type of effect: **Neutral and permanent**	Significance: **Not Significant**

Table 2.16 Viewpoint 16 - Northern side of Pegwell Country Park

Viewpoint Information			
Viewpoint OS grid reference:	634328, 163120	Figure Nos:	Annotated baseline photos - Figure 11.18 Photowires - Appendix 11.1 Figure 20
Visual receptor groups located at or close to Viewpoint:		Recreational Receptors using Country Park	
Visual receptor sensitivity:		**High**	
Night-time Viewpoint:		No	

Description of Baseline View and Role of the Existing Non-Operational Airport

The foreground and middle ground of the view consists of coastal scrub vegetation within the Country Park which becomes more open as extensive coastal marshland that extends eastwards into Pegwell Bay. Beyond the marshland the right-hand section of the view extends to the south-western edge of Ramsgate (including a solitary tower block) and the southern part of Cliffs End in the background. Elsewhere there are no views beyond the dense foreground vegetation in the Country Park.

The dense vegetation cover in Pegwell Bay Country Park ensures that are no views out of the Park in the direction of the existing non-operational airport with the result that there is no visual evidence of the current built development on the existing non-operational airport.

Description of Changes in the View at Year 1

The photowire in **Appendix 11.1 Figure 20** shows the views of elements that would be constructed and due to the dense vegetation cover in Pegwell Bay Country Park there would be no views of any of the built elements or any ground level construction activities introduced in Year 1. The presence and density of the screening vegetation and distance below the horizon line that the proposed built development would be sited combine to prevent possible views of the mobile cranes to be used for elevated construction activities.

In summary, the built development potentially taking place at Year 1 would be screened in views from Viewpoint 16.

Magnitude of visual change: **None**	Type of effect: **Neutral and temporary (construction activities) / and permanent (buildings)**	Significance: **Not Significant**

Description of Changes in the View at Year 10

Views at Year 10 would be consistent of those at Year 1 with the combination of screening and the location of the built development at the Airport being set back from the southern edge of the plateau ensuring that none of the built elements, the aircraft on the ground or ongoing construction activities would be visible.

Magnitude of visual change: **None**	Type of effect: **Neutral and temporary (construction activities) / and permanent (buildings)**	Significance: **Not Significant**

Description of Changes in the View at Year 20

There would be no changes resulting from the presence of the fully operational airport in comparison with Year 10. Any developments introduced between Year 10 and Year 20 would be screened by the intervening vegetation and topography associated with the southern edge of the chalk plateau.

Magnitude of visual change: **None**	Type of effect: **Neutral and permanent**	Significance: **Not Significant**

Table 2.17 Viewpoint 17 - South Saxon Way alongside River Stour

Viewpoint Information			
Viewpoint OS grid reference:	631780, 162767	Figure Nos:	Annotated baseline photos - Figure 11.19 Photowires - Appendix 11.1 Figure 21
Visual receptor groups located at or close to Viewpoint:		Northern views available from some open sections of this regional trail (Saxon Way).	
Visual receptor sensitivity:		**High**	
Night-time Viewpoint:		No	

Description of Baseline View and Role of the Existing Non-Operational Airport

The foreground of the view consists of the River Stour, running between two vegetated steep banks covered in grasses and riparian vegetation. Beyond this in the middle ground is a vegetated belt formed by field boundary shrubs and small trees extending across the full field of view. Where the trees are denser towards the north east (right of the view), longer distance views are restricted. Where partial and frames views are available through and above the vegetation, they are towards the rising background topography of the southern face of the chalk plateau. Looking towards the north west (left of the view) beyond the intervening screening vegetation there are partial filtered views of some residential properties in the northern (most elevated) part of Minster and a white warehouse building at Abbey Farm located on the eastern fringes of Minster. The remainder of the southern slopes comprise arable fields separated by hedgerows and belts of mature trees). Solar panels south of the airport (Thorne Solar Farm) are visible on the slopes below the horizon and the telecommunications tower (west of the Manston Road) extends above the ridge line but not prominently above the horizon.

In summary, the view is predominately fields and hedgerows with a rural character, several man-made built elements are visible in the distant background of the view. There are no views of current built development within the existing non-operational airport as a consequence of the crest of the plateau which forms the distant horizon.

Description of Changes in the View at Year 1

No ground level construction activities would be visible but there would be views of the two mobile cranes when they are used to construct the taller built elements. Only the upper sections of the cranes would be visible as minor elements above the crest of the plateau.

The photowire in **Appendix 11.1 Figure 21** shows the elements potentially present within this view in Year 1 is limited to the upper section of the ATC tower only. The photowire shows much of the Year 1 development would not be visible and would be screened by the topography of the southern edge of the plateau. The upper section of the proposed ATC tower would only marginally extend above the horizon.

In summary, the built development and periodic crane activity would introduce a limited number of new elements above a short section of the horizon in the same field of view as other distant man made built elements. The general composition of the view would not significantly alter in comparison with the baseline

Magnitude of visual change: **Low**	Type of effect: **Adverse and temporary (construction activities) / neutral and permanent (buildings)**	Significance: **Not Significant**

Description of Changes in the View at Year 10

No ground level elements or construction activities would be visible. Periodic views of the two mobile cranes would be possible although it is anticipated that their use across the site would be reduced.

By Year 10 the ATC tower and the upper sections of the aircraft recycling hangars would be visible above the crest of the plateau and small groups of trees located on the upper slope. These built elements would be mostly screened by the topography with the roofline and upper facades of the aircraft recycling hangars and upper section of the ATC tower not extending far above the horizon thereby reducing their visual role.

In summary, taking into account all developments now present in the Year 10 view, the general composition of the view would not alter significantly in comparison with the baseline view.

Magnitude of visual change: **Low**	Type of effect: **Adverse and temporary (construction activities) / permanent (buildings)**	Significance: **Not Significant**

Table 2.17 (continued) Viewpoint 17 - South Saxon Way alongside River Stour

Description of Changes in the View at Year 20

The majority of developments introduced between Year 10 and Year 20 would be sited below the horizon leaving the top of the ATC tower and the aircraft recycling hangars (including the extension implemented in Phase 4) as the only visible components of the development rising above the crest of the chalk plateau. In contrast to previous periods there would be no periodic crane activity which would have ceased by Year 18. In summary, taking into account all developments now present in the Year 20 view the general composition of the view would not alter significantly in comparison with the baseline view.

Magnitude of visual change: **Low**	Type of effect: **Adverse and permanent**	Significance: **Not Significant**

Table 2.18 Viewpoint 18 – Goldstone Drove PRoW, west of Lower Goldstone

Viewpoint Information			
Viewpoint OS grid reference:	629443, 161275	Figure Nos	Annotated baseline photos - Figure 11.19 Photowires - Appendix 11.1 Figure 22
Visual receptor groups located at or close to Viewpoint:		Long distance residential farm properties at Lower Goldstone and recreational receptors traveling north along Goldstone Drove	
Visual receptor sensitivity:		**High**	
Night-time Viewpoint		No	

Description of Baseline View and Role of the Existing Non-Operational Airport

The foreground of the view consists of an open grazing field; to the west (left of the view) there is a hedgerow with trees which forms the boarder to the field. In the middle distance there are three wooden telegraph poles and wirescape extending across the full field of view and clusters of semi-mature to mature trees all of which extend above the distant horizon formed by the crest of the chalk plateau. Looking to the north west (far left of the view) several built elements at Minster are visible but not individually distinguishable. The Thorne Solar Farm and the settlement of Cliffs End are also components of the view sited on the raising southern slopes of the plateau. Looking to the north (central) there are two electricity pylons extending above the horizon but below the height of the more prominent telegraph poles in the middle ground.

In summary, several man-made elements are visible in the middle distance and background to the view. There is no visual evidence of the current built development within the existing non-operational airport as a consequence of the crest of the plateau which forms the distant horizon.

Description of Changes in the View at Year 1

No ground level construction activities would be visible but there would be periodic views of the two mobile cranes when they are used to construct built elements. Only the upper sections of the cranes would be visible above the crest of the plateau and at distances in excess of 5km, these cranes will be very minor components of the view.

The photowire in **Appendix 11.1 Figure 22** shows the elements that would potentially be present within this view in Year 1, would be a very small portion of the upper section of the ATC tower, and the roof of the first cargo facility. The ATC tower and cargo unit would be very discreet visual components sitting just above the horizon and would be small in scale given the separation distance. All ground level construction activity and the lower height structures would not be visible due to the screening provided by the crest of the plateau.

In summary, the emerging built development and periodic crane activity would introduce a limited number of new elements above a short section of the horizon in the same field of view as the more prominent telegraph poles in the middle ground. The general composition of the view would not significantly alter in comparison with the baseline.

Magnitude of visual change: **Low**	Type of effect: **Adverse and temporary (construction activities) / neutral and permanent (buildings)**	Significance: **Not Significant**

Description of Changes in the View at Year 10

As with Year 1, no ground level elements or construction activities would be visible. Periodic views of the two mobile cranes would be possible but their use on site is anticipated to be infrequent. At Year 10, the ATC tower and the rooflines and upper sections of the aircraft recycling hangars and three cargo facilities would be partially visible. These built elements would be small in scale given the separation distance from the view point and mostly screened by the crest of the plateau. With the exception of the aircraft recycling hangars which would sit slightly more prominently above the horizon, the rooflines of the remaining visible elements would not extend far above the horizon thereby minimising their visual role.

In summary, there will be no significant change from the baseline view.

Magnitude of visual change: **Low**	Type of effect: **Adverse and temporary (construction activities) / permanent (buildings and operational activities)**	Significance: **Not Significant**

Table 2.18 (continued) Viewpoint 18 – Goldstone Drove PRoW, west of Lower Goldstone

Description of Changes in the View at Year 20

The only new built elements visible compared to the Year 10 view would be the fourth (most western) cargo facility and an extension to the recycling hangars. Similar to the other cargo facilities, the roof of the final cargo facility would only extend marginally above the horizon in the background of the view whilst the recycling hangars would sit slightly more prominently above the horizon. Any other structures introduced between Year 10 and Year 20 would be screened by the crest of the plateau and it is unlikely that there would be views of ground level plane activity which is likely to be too small in scale at distances in excess of 5km to be readily discernible.

In summary, taking into account all developments now present in the Year 20 view the general composition of the view would not significantly alter in comparison with the baseline view**.**

Magnitude of visual change: **Low**	Type of effect: **Adverse and permanent**	Significance: **Not Significant**

Table 2.19 Viewpoint 19 - Eastern edge of St Nicholas at Wade

Viewpoint Information			
Viewpoint OS grid reference:	626863, 166205	Figure Nos	Annotated baseline photos - Figure 11.20 Photowires - Appendix 11.1 Figure 23
Visual receptor groups located at or close to Viewpoint:		Residents on eastern edge of St Nicholas at Wade.	
Visual receptor sensitivity:		**High**	
Night-time Viewpoint:		No	

Description of Baseline View and Role of the Existing Non-Operational Airport

The foreground and middle ground of the view are formed by a single open arable field. On the left-hand side (north) of the view there is a prominent white building (Thanet Stage School of Performing Arts) surrounded by some tree cover. A combination of the flat topography and absence of any foreground vegetation or building cover to provide screening allows for views to extend to a relatively distant horizon. The horizon is formed primarily by a coalescence of vegetation near Minster and Woodchurch and the Thanet Earth greenhouses. Electricity pylons (132kV electricity pylon - estimated height of 25m) periodically extend above the horizon across the full field of view. The pylons' vertical form ensures that they are contrasting and readily apparent visual elements in this simply composed wide open view.

The screening in the long distance that is provided by the combination of built elements (primarily the greenhouses at Thanet Earth) and vegetation result in no long-distance views being available to the east. These features also ensure that there are no views of any components of the current built development on the existing non-operational airport.

Description of Changes in the View at Year 1

No ground level construction activities would be visible but there would be periodic views of the two mobile cranes as they are deployed to construct the taller built elements. Only the upper sections of the cranes would be visible above a small section of the horizon. The mobile cranes would be seen in the visual context of the existing electricity pylons, which would remain the most prominent man-made structure on the horizon.

The photowire in **Appendix 11.1 Figure 23** shows that none of the new built elements associated with the airport or the Northern Grass area would be visible due to the existing intervening screening, principally the greenhouses at Thanet Earth.

In summary, the proposed built development would be screened by intervening built development and tree cover. There would be periodic views of upper sections of the two mobile cranes above a limited proportion of the horizon. In the context of other man made built elements, the cranes would not alter the overall composition and balance of the view in comparison with the baseline..

Magnitude of visual change: **Negligible**	Type of effect: **Adverse and temporary (construction activities) / neutral and permanent (buildings)**	Significance: **Not Significant**

Description of Changes in the View at Year 10

The photowire in **Appendix 11.1 Figure 23** shows that even the taller elements of the proposed airport such as the ATC tower would be screened by the greenhouses at Thanet Earth. As at Year 1, there may be periodic views of the two mobile cranes when they are used to construct the taller built elements in the eastern part of the Airport although construction activities wouldbe much less extensive than in Year 1. There would be no views of aircraft on the ground or any other ground level operational activities.

In summary, the overall composition and balance of the view would not alter in comparison with the baseline.

Magnitude of visual change: **Negligible**	Type of effect: **Adverse and temporary (construction activities) / neutral and permanent (buildings and operational activities)**	Significance: **Not Significant**

Description of Changes in the View at Year 20

There would be no visual evidence of any built elements, planes or ground level operational activities resulting from the presence of the fully functional Airport or Northern Grass area. All of these elements would be screened by the intervening vegetation and built developments, primarily the greenhouses at Thanet Earth. In contrast to previous periods there would be no periodic crane activity which would have ceased by Year 18.

In summary, no new built elements would be visible. The overall composition and balance of the view would not alter in comparison with the baseline.

Magnitude of visual change: **None**	Type of effect: **Neutral and permanent**	Significance: **Not Significant**

Table 2.20 Viewpoint 20 - North side of bridge at Plucks Gutter

Viewpoint Information			
Viewpoint OS grid reference:	626980, 163458	Figure Nos:	Annotated baseline photos - Figure 11.20 Photowires - Appendix 11.1 Figure 24
Visual receptor groups located at or close to Viewpoint:		Residential receptors at Pluck Gutter and receptors travelling north along Gore street.	
Visual receptor sensitivity:		**High** (residents) **Medium** (vehicular receptors)	
Night-time Viewpoint:		Yes (Figure 11.29)	

Description of Baseline View and Role of the Existing Non-Operational Airport

The foreground of the view consists of an arable field which boarders Gore Street and which field surveys have recorded as seasonally being under a maize crop which substantially foreshortens views. To the far left of the view (looking north), there are telephone poles and wires running alongside Gore Street extending into the middle ground. The middle ground and background consists mostly of large open arable fields, divided by low level hedgerows and occasional trees. The flat topography of the foreground and middle ground allows long distance views towards the rising southern slope of the chalk plateau upon which, to the left-hand side looking north, there are filtered views of residential properties and farm units at Monkton between a dense area of vegetation around Monkton Marshes. Looking north on the horizon, the upper section of a white building within Thanet Earth is partially visible. Central long-distance views towards the airport site are mainly screened by the coalescence of mature trees along the railway and Minster Woods located between the viewpoint and the site close to Minster. Due to the flat topography and where screening cover is less dense, built elements located in the more northern elevated parts of Minster are partially visible. Long distance views to the right (east) are similar to views to the north, and are made up primarily of distant vegetation cover and the far distant presence of Cliffs End. Electricity pylons can be seen extending above the horizon across the full field of view (north to east) and the pylons' vertical form ensures that they are the most prominent manmade visual elements in this simply composed view.

The screening that is provided by vegetation cover in the direction of Minster and the crest of the plateau edge result in no long-distance views being available of any components of the current built development within the existing non-operational airport.

The night-time baseline view shown in **Figure 11.29** shows the line of highway lighting along the A299 with some sky glow evident in the direction of the coastal conurbations. Light sources within Cliffs End are also discernible towards the east (right-hand side of the view).

Description of Changes in the View at Year 1

No ground level construction activities would be visible but there would be periodic views of the two mobile cranes as they are deployed to construct the taller built elements. Only the upper sections of the cranes would be visible as very minor elements above a small section of the horizon.

The photowire in **Appendix 11.1 Figure 24** shows that the business units that would be constructed during Year 1 and most of the built elements of the proposed airport (such as the cargo facilities) introduced during Year 1 would be screened by the crest of the chalk plateau. The only exception is shown by the photowire which indicates that the upper most section of the ATC tower only would be partially visible above the rising topography.

In summary, the proposed built development would predominately be screened by the topography and intervening built development and vegetation cover. The exception is upper sections of the ATC tower and periodic views of upper sections of the two mobile cranes above a limited proportion of the horizon. In the context of other existing man made built elements in the view, the cranes and ATC tower would not alter the overall composition and balance of the view in comparison with the baseline.

Magnitude of visual change: **Negligible**	Type of effect: **Adverse and temporary (construction activities) / neutral and permanent (buildings)**	Significance: **Not Significant**

Table 2.20 (continued) Viewpoint 20 - North side of bridge at Plucks Gutter

Description of Changes in the View at Year 10

As with Year 1, there may be periodic views of the two mobile cranes when they are used to construct the taller built elements. There would be no views of aircraft on the ground or any other ground level operational activities. The photo wire in **Appendix 11.1 Figure 24** shows that there would continue to be filtered partial views of the proposed ATC tower as well as a proportion of the proposed aircraft recycling hangars above the crest of the chalk plateau.

In summary, there would only be partial filtered views of the top section of the ATC tower and the roof of a proportion of the proposed aircraft hangars, above a small proportion of the horizon. As man-made elements are present in the baseline view, these additional features would not alter the overall composition and balance of the view.

Magnitude of visual change: **Negligible**	Type of effect: **Adverse and temporary (construction activities) / neutral and permanent (buildings and operational activities)**	Significance: **Not Significant**

Description of Changes in the View at Year 20

Similar to Year 1 and Year 10 the top section of the ATC tower and the roofline of the proposed aircraft recycling hangars wouild continue to be partially visible above the intervening southern edge of the plateau. In contrast to previous years (Years 1and 10) there would be no periodic crane activity as this would have ceased by Year 18. This is likely to result in a negligible change to the baseline view.

Magnitude of visual change: **Negligible**	Type of effect: **Neutral and permanent**	Significance: **Not Significant**

Table 2.21 Viewpoint 21 – St Michaels Avenue, Northdown

Viewpoint Information			
Viewpoint OS grid reference:	637905, 169846	Figure Nos:	Annotated baseline photos - Figure 11.21 Photowires - Appendix 11.1 Figure 25
Visual receptor groups located at or close to Viewpoint:		Residential receptors in Margate and Broadgate	
Visual receptor sensitivity:		**High**	
Night-time Viewpoint:		No	

Description of Baseline View and Role of the Existing Non-Operational Airport

The foreground of the view consists of a single open arable field which extends into the middle ground. Towards the right (west) of the view in the middle ground houses along Broadley Road are visible with the more distant development lining the A254 also discernible. On the left-hand side (east) of the view warehouse buildings along Dene Valley Road are visible with the rooflines of other large buildings visible through and above the tree cover which lines the railway line and occupies a moderate proportion of the middle ground. Electricity pylons (132kV electricity pylon with an estimated height of 25m) extend intermittently above this tree cover.

There are no clear views of the current built development within the existing non-operational airport through or above the intervening tree cover and built form.

Description of Changes in the View at Year 1

The photowire in **Appendix 11.1 Figure 25** shows that in Year 1, elevated crane activity associated with the construction of the ATC tower and the first, eastern most cargo facility would be visible above the intervening woodland and built form with the gradual emergence of the rooflines of these structures appearing low above the intervening components of the view. The proposed southernmost business units in the Northern Grass area would become components of the view during Year 1 again sitting low on the horizon.

No ground level construction activities would be visible.

In summary, although these new elements of the airport would be visible, they would be less prominent than the electricity pylons and would not be out of context with the existing man-made infrastructure which surrounds them. As such, the overall composition and balance of the view would not alter significantly in comparison with the baseline.

Magnitude of visual change: **Negligible**	Type of effect: **Adverse and temporary (construction activities) / neutral (buildings)**	Significance: **Not Significant**

Description of Changes in the View at Year 10

By Year 10 the ATC tower, the upper sections and rooflines of three of the four proposed cargo units, the aircraft recycling hangars and a proportion of the business units would be visible above intervening tree and building cover. As with Year 1, there would be periodic views of the two mobile cranes when they are used to construct the remaining elevated built elements in the western part of the Airport although construction activities are anticipated to be far less extensive than in Year 1. There would be no views of aircraft on the ground or any other ground level operational activities.

In summary, the only additional features associated with the now operational Airport in comparison with Year 1 would be some partial and filtered views of two more of the cargo facilities (central two) and two of the aircraft recycling hangars. When taking into account all of the proposed built elements, the overall composition and balance of the view would not alter significantly in comparison with the baseline.

Magnitude of visual change: **Negligible**	Type of effect: **Adverse and temporary (construction activities) / neutral (buildings and operational activities)**	Significance: **Not Significant**

Table 2.21 (continued) Viewpoint 21 – St Michaels Avenue, Northdown

Description of Changes in the View at Year 20

The only changes resulting from the presence of the fully operational Airport in comparison with Year 10 would be a very partial view of the western-most fourth proposed cargo facility, filtered by tree cover and an extension to the recycling hangars. The fourth cargo facility's roof and part of its western gable end would be visible close to the ATC tower in the centre of the view. Other than the ATC tower and some of the rooflines at the cargo facilities, aircraft recycling hangars and the proposed business units, no built components, planes on the ground or other ground level operational activities would be visible. The view may appear slightly more built up when compared to Year 10 but this is not out of context given the proportion of built form in the current view. Any views of built elements that would be visible are incremental and less prominent than the middle ground electricity pylons.

When taking into account all of the proposed built elements present in the view at Year 20, the overall composition and balance of the view would not alter significantly in comparison with the baseline.

Magnitude of visual change: **Negligible**	Type of effect: **Neutral Adverse and permanent**	Significance: **Not Significant**

Table 2.22 Viewpoint 22 - PRoW, north of Richborough Castle

Viewpoint Information			
Viewpoint OS grid reference:	632440, 160311	Figure Nos:	Annotated baseline photos - Figure 11.21 Photowires - Appendix 11.1 Figure 26
Visual receptor groups located at or close to Viewpoint:		Receptors at the tourist attraction of Richborough Castle Roman Fort	
Visual receptor sensitivity:		**High**	
Night-time Viewpoint:		No	

Description of Baseline View and Role of the Existing Non-Operational Airport

The foreground and the middle ground of the view consist largely of open arable land, with wooden post and wire fencing and intermittent hedgerow bushes dividing the fields. Due to the relatively flat topography and lack of foreground screening, views extend further north to the rising southern face of the chalk plateau. This rising land consists of open arable fields, with intermittent wooded areas and the Thorne Solar Farm. Evidence of settlement is apparent across the view; looking to the north-west built elements at Minster are visible amongst screening vegetation, with the roofs of other isolated buildings visible above tree cover throughout the view. Several more prominent man-made features are visible; looking to the north, two mast structures are sited either side of a single wind turbine in the central middle ground of the view. The agricultural landscape is also crossed by several steel lattice electricity pylons and associated wirescape, all of which extend above the horizon across the full field of view.

The view is predominately rural, with views of discrete residential properties in the distance and more prominent vertical built elements in the middle ground. There are no views of any built development associated with the non-operational airport sited on top of the plateau.

Description of Changes in the View at Year 1

No ground level construction activities would be visible but there would be periodic views of the two mobile cranes as they are deployed to construct the taller built elements. Only the upper sections of the cranes would be visible above a small section of the horizon and at distances in excess of 5km they would be very minor components of the wider view and viewed in the context of existing man-made elements i.e. wind turbines and electricity pylons.

The photowire in **Appendix 11.1 Figure 26** shows that Year 1 effects generated by proposed built structures would be confined to distant views of the roof of the first cargo facility (most eastern) with filtered views through the intervening tree cover of the ATC tower during winter months. The proposed business units in the Northern Grass area would sit below the horizon formed by the edge of the plateau. The proposed new built elements would all appear less prominent than other man made built elements already present in view.

In summary, the periodic crane activity and gradual emergence of built development would introduce a limited number of new elements above a short section of the horizon in the same field of view as other man made built elements. These new elements would sit low on the horizon and the general composition of the view would not alter significantly in comparison with the baseline.

Magnitude of visual change: **Low**	Type of effect: **Adverse and temporary (construction activities) / permanent (buildings)**	Significance: **Not Significant**

Description of Changes in the View at Year 10

By Year 10 the upper section the aircraft recycling hangars, business aviation hangars and three of the four cargo facilities would be visible extending above the distant horizon. The lower sections of these built elements would be mostly screened by the topography of the plateau edge with intervening tree cover leading to filtered views of the ATC tower and Terminal Building in the winter months. The rooflines of the aircraft recycling hangars and cargo facilities would not extend far above the horizon and would not be greater in height than the intervening vertical elements thereby reducing their visual role. As with Year 1, no ground level elements or construction activities would be visible. Periodic views of the two mobile cranes would be possible when they are occasional deployed but it is anticipated that their use on site would be much reduced when compared to the activities of Year 1. The movement of aircraft taxiing along the runway is unlikely to be readily discernible.

In summary, there would be no significant change in the overall composition and balance of the view when taking into account all the new elements present in the Year10 scenario compared to the baseline view.

Magnitude of visual change: **Low**	Type of effect: **Adverse and temporary (construction activities) / permanent (buildings and operational activities)**	Significance: **Not Significant**

Table 2.22 (continued) Viewpoint 22 - PRoW, north of Richborough Castle

Description of Changes in the View at Year 20

The only changes associated with the presence of the fully operational airport in comparison with Year 10, would be the addition of the forth (most western) cargo facility and further extensions to the recycling hangar and business aviation hangars. As shown in the photowire in **Appendix 11.1 Figure 26** the forth cargo facility would likely be screened by tree cover present within the in the middle distance of the view with only filtered partial views available in winter months. The completed recycling hangar would be the most noticeable component within the site given its presence above the horizon. The movement of aircraft taxiing along the runway would be unlikely to be readily discernible. In summary, there would be no significant change in the overall composition and balance of the view when taking into account all the new elements present in the Year 20 view compared to the baseline.

Magnitude of visual change: **Low**	Type of effect: **Adverse and permanent**	Significance: **Not Significant**

Appendix 12.1
Consultation Responses

This appendix provides detailed description of consultation responses from the Scoping Report and Preliminary Environmental Impact Report (PEIR) in addition to how these comments have been addressed in the noise and vibration Environmental Statement (ES) chapter.

Scoping Report Consultation

The Scoping Opinion comments and how these have been addressed are presented in **Table A12.1.1**.

Table A12.1.1 Scoping Opinion comments

Consultee	Comments and considerations	How this has been addressed
PINS	Vibration effects on residential receptors from construction is listed as being scoped out in Chapter 11 paragraph 11.6.7 but is not listed in Chapter 14. The Secretary of State considers that further justification is required to scope out this effect, based on whether activities with potential to give rise to vibration will occur within a set distance from receptors, e.g. less than 100m, otherwise it is expected that a vibration assessment would be carried out in accordance with a recognised standard such as BS5228-2:2009+A1:2014 or equivalent.	Vibration effects on residential receptors from construction are considered within this assessment. It should be noted that vibration from the operation of the airport has been scoped out of the detailed assessment based on experience of undertaking similar studies for other airports and the types of activities that will be undertaken at the Proposed Development. Should any activities be planned for the airport that may result in operational vibration effects then operational vibration will be assessed.
PINS	The ES will need to provide a full, detailed description of sensitive receptors within the area adjacent to the airport, whilst avoiding duplication of baseline information between chapters where possible. The description should include reference to nearby properties in the northern part of Minster, off Alland Grange Lane, Woodchurch and immediately north of Spitfire Way. This may in part be addressed under Scoping Report paragraph 11.5.13 but it is unclear from the description.	The ES includes the potential noise sensitive receptors as suggested by PINS and survey work of the current baseline near these receptors has been undertaken.
PINS	Scoping Report paragraph 11.7.4 states that baseline noise monitoring will be undertaken at locations around the airport. The position and duration of noise monitoring should be agreed with Thanet District Council (TDC) Environmental Health Officers (EHOs). Monitoring should be undertaken in accordance with BS7445-1:2003 as highlighted in Scoping Report Table 11.3. Base data such as survey reports should be presented as part of the ES.	All baseline sound monitoring has been undertaken in accordance with BS7445-1:2003 and a baseline survey report is included as **Appendix 12.4.** The format and methodology of the baseline survey was communicated with TDC prior to undertaking any surveys.
PINS	Scoping Report paragraphs 11.5.4 and 11.5.5 reference future baseline conditions assuming that the airport will remain closed. The Secretary of State considers that the future baseline should also consider potential changes in road/rail traffic and in housing development in the locality, e.g. such as Manston Green.	The ES considers the current and future baseline with the airport closed and the current and future baseline will be informed by road and rail traffic and noise surveys.

Consultee	Comments and considerations	How this has been addressed
PINS	The Secretary of State considers that the 'ABC method' in BS5228-1:2009+A1:2014 is an appropriate methodology for the construction noise assessment. The Secretary of State notes the Scoping Report paragraph 11.6.8 comment that it is 'not clear what construction activities will take place'. The noise assessment should be based on a robust and consistent set of worst case assumptions regarding the duration, phasing and type of construction activity to be undertaken and on a clear description of operational activity. Where the two phases of activity overlap a combined worst case assessment should be provided.	A precautionary assessment of construction noise has been undertaken. The assessment assumes construction activities which are consistent with the most recent masterplan, including noise levels when two phases of activity overlap.
PINS	The Scoping Report does not explicitly reference construction traffic noise assessment, although BS5228 allows for assessment of noise effects on haul routes. For the avoidance of doubt, the Secretary of State considers that construction traffic noise assessment should be undertaken, particularly in light of the potential requirement to import large volumes of fill material.	The assessment undertaken as part of the ES includes construction traffic, incorporating on-site construction vehicles, predicted noise from which is determined using the 'Haul Road Calculation Methodology' as per BS 5228-1:2009+A1:2014.
PINS	The Applicant proposes to model operational air noise using the AEDT or Integrated Noise Model (INM) (Scoping Report paragraph 11.7.8). It is understood that INM was withdrawn in 2015; therefore, the Secretary of State considers that modelling based on the most up to date version of AEDT should be undertaken.	Air noise modelling for the ES has been undertaken using the FAA's Aviation Environment Design tool (AEDT). Optioneering modelling used for options appraisal was undertaken using the FAA's Integrated Noise Model (INM). AEDT and INM were both produced by the US Federal Aviation Administration (FAA) and follow the same calculation methodology and therefore little material difference is expected by the use of the two models.
PINS	The Secretary of State agrees with the use of the ISO9613-2:1996 standard to inform modelling of ground noise from static sources. The noise modelling should transparently identify the location of any noisy operational activities such as Engine Ground Runs (EGR) and their proximity to sensitive receptors.	For the ES, modelling of operational airside ground noise has been undertaken using the calculation methodology advocated within ISO 9613-2:1996 and locations of static aircraft noise (for example runway hold points, aircraft parking stands and EGRs) has been considered.
PINS	The Secretary of State considers that the ES should also include an assessment of vortex strike arising from plane movements.	Vortex strike is not a noise related effect and therefore is not included within the scope of the noise and vibration assessment.
PINS	Scoping Report paragraph 11.7.3 states that the assessment will assume a no-airport baseline, and that a review of environmental noise conditions at Manston Airport when last operational will also be undertaken. Any comparison with previous operations should acknowledge the differences in the types of aircraft used, against the likely aircraft predicted to use the airport.	An overview of baseline conditions that considers the airport when previously operational has been provided for context. It is recognised that the aircraft fleet mix is different to that previously operated due to the change in focus towards airfreight from mainly passenger-led operations.
PINS	The Secretary of State considers that operational road traffic noise can be assessed using the Calculation of Road Traffic Noise (CRTN) 1998 methodology as adapted by the Design Manual for Roads and Bridges (DMRB) 2011. The Secretary of State recommends that the detailed methodology and choice of noise receptors should be agreed with the relevant TDC EHO.	For the ES, the assessment of road traffic noise has been undertaken using the Calculation of Road Traffic Noise (CRTN) 1998 methodology as adapted by the Design Manual for Roads and Bridges (DMRB) 2011.

Consultee	Comments and considerations	How this has been addressed
PINS	Where appropriate, effective measures should be provided to mitigate against noise nuisance and these should demonstrate the balanced approach set out in the Aviation Policy Framework, minimising the number of people affected by aircraft noise, particularly night noise, where possible. This may include physical measures such as bunds, screens and the orientation of buildings on site as well as management measures relating to flight paths and vehicle management. The Applicant should also outline how previous airport noise controls and commitments delivered through s106 agreements with TDC would be reflected as part of any operational environmental management system.	A Noise Mitigation Strategy is being prepared that is consistent with the proposer's business plan, the aims of the NPSE and the ICAO's Balanced Approach to Aircraft Noise Management. The noise mitigation strategy will also recognise the previous airports Section 106 (s106) agreement with TDC and as a minimum include the s106 requirements, and update where appropriate.
Cliffsend Parish Council	This subject is covered quite comprehensively in the scoping report, but we would like to make the suggestion that aircraft for disposal (which most probably will have noisier engines) be scheduled to land (wherever possible) from the West to minimise noise, especially in Ramsgate.	The noise consultant and the airspace consultant are working together to identify airspace options that are consistent with the aims of the NPSE, safe to operate and conform to CAA guidance including the existing and emerging guidance on airspace change proposals.
Thanet District Council	Operational noise is a significant concern of the Council, and the impact assessment and significance criteria will need further consideration particularly as guidance used for assessing significance does not correspond well with aircraft noise; for instance, a C-weighted metric is more highly correlated to aircraft noise impact in communities than A-weighted metrics.	Operational aircraft noise is to be assessed in accordance with all relevant policies, standards and guidance, much of which rely on A-weighted noise exposure metrics. Furthermore, the saved Policy EP7 (Aircraft Noise) from TDC's local plan determines applications for residential developments using noise exposure categories specified using an A-weighted dB $L_{Aeq.}$
Thanet District Council	The proposed noise assessment makes reference to both the existing baseline conditions and conditions prior to the airport closing. Whilst this will prove a useful comparison, in EIA terms the baseline of the site is as existing i.e. a vacant site and not operating as an airport. Notwithstanding this it will be a useful comparison to make but the weight given to this will be determined by the decision maker.	An overview of baseline conditions that considers the airport when previously operational has been provided for context. The ES relies upon current baseline conditions for assessment purposes that consider the airport whilst closed.
Minster Parish Council	Topics to be covered assume a zone of influence of 5km or, in the case of the road network, the local impact. The potential for the impact of operational development to exceed this distance seems clear, particularly with regard to noise impact upon the resident population beneath and adjacent to flight paths and the impact upon the nearby SPA and Ramsar site in terms of ecology.	The operational aircraft noise assessment has considered locations under potential flight paths and outside the 5km zone of influence. The study area to be considered for the aircraft noise assessment is bound by noise exposure levels rather than distances.
Minster Parish Council	This paragraph refers to a level of at least 18-night time movements, presumably on the basis of no definitive number of aircraft movements the statement will need to assess the impact of this large number of night time movements and demonstrate whether mitigation will be able to sufficiently reduce the level of the significant adverse effects of such a level of flying.	The number of night flights assessed are consistent with the most recent aircraft forecasts. This paragraph is not stating that there are to be 18 night-time movements, but merely that if there were, then this could be considered likely to result in a significant effect should external noise levels be above 80 dB LA_{Smax} for each movement.

Consultee	Comments and considerations	How this has been addressed
Natural England	We note that there is no cross reference here to Biodiversity as there is within the Air Quality chapter and would advise the applicant to address this when preparing the ES so that all relevant chapters are cross referenced.	The noise effects of the Proposed Development on ecological receptors has been assessed within the Biodiversity ES chapter (see Chapter 7).

PEIR Responses

The comments on the PEIR and how these have been addressed are presented in **Table A12.1.2**. The table includes clarifications from KCC and TDC as requested by Wood on 16th November 2017 in response to the initial PEIR comments.

Table A12.1.2. PEIR comments

Consultee	Comments and considerations	How this is addressed in this assessment
Thanet District Council	We are significantly concerned about the potential impact from your proposed development on the living conditions of those residential occupiers within close proximity of the airport, those residents living under the (indicative) flight paths, especially in relation to night flights, as well as disruption to multiple schools within Ramsgate. This impact has been characterised as major adverse – significant in the PEIR, and it is noted that further detailed assessment work is being carried out regarding construction and operational noise, including aircraft air noise which is pending further work on routes, aircraft type and specification. It will be necessary to consider the cumulative impact of existing aircraft operations in the vicinity, proposed airside operations as well as all training flights at the airport, and that this information should be submitted within the ES.	A noise insulation scheme will be offered as part of the Proposed Development to help avoid significant adverse effects of health and quality of life. The insulation scheme will take into account both daytime and night-time noise exposure. The eligibility of the scheme will be consistent with current and emerging Government Policy. The Proposed Development will therefore be based upon the extents of both the daytime 63 dB $L_{Aeq,16hr}$ and night-time 55 dB $L_{Aeq,8hr}$ contours. Where properties are affected by levels of noise at or above 55 dB $L_{Aeq,8hr}$, the insulation scheme will include bedrooms. Consistent with policy, the scheme would also include all schools and other noise sensitive buildings. The noise assessment will include all aircraft operating from Manston Airport, this will include training flights. With respect to the cumulative assessment, overflights from other airports contribute to the existing baseline and have been captured during the baseline survey. It is assumed that the volumes of air traffic during the baseline surveyed will continue during the operation of the airport. During the site visit, the only evident contribution to noise levels from air traffic was from occasional helicopter activity. The helicopter operations would be incorporated into the proposed airport and have been therefore included within the noise modelling and assessment. A full cumulative assessment will be undertaken considering all permitted and/or planned applications for the final EIA.
Thanet District Council	We would expect the final submission to include the full details of the proposed noise mitigation strategy as well as the noise insulation scheme (include those properties that you believe would be covered by the scheme on the basis of the information available at the time).	Consistent with policy, a package of mitigation measures will be included in the application, having been designed against the 'Balanced Approach' concept and therefore will consider local land use planning and management. Furthermore, the final DCO ES submission will also include proposals as to how these mitigation measures will be secured and enforced.

Consultee	Comments and considerations	How this is addressed in this assessment
		Details of the noise mitigation strategy and noise insulation scheme are provided in the Noise Mitigation Plan (Document 2.4, APP-009).
Thanet District Council	It is noted that the document states that the noise contour map for the project will extend daytime and night-time contours in comparison to the previously produced contour map for the previous use of the airport, but this is not being consulted on at this stage.	Contour maps for the previous use of the airport were described in the PEIR to provide context to the areas affected by aircraft noise from the former airport only. The insulation scheme will be based upon the extents of the worst-case assessment year of future operations only. The insulation scheme will be consistent with policy and industry best practice and therefore will include the extents of both the daytime and night-time SOAEL contours.
Thanet District Council	We would advise that an additional noise baseline observation location should be included within the Nethercourt residential estate, given its proximity to the airport and the anticipated landing/take off routes, as well as the approved Manston Green development location, with consideration of a permanent noise monitoring station on the site if any Development Consent Order (DCO) is approved.	An additional long-term noise baseline monitoring location has been included in the Nethercourt Estate at a location on Windermere Avenue. Permanent noise monitoring will be installed as part of the overall noise strategy and the suitability of Manston Green along with other locations are being considered. It should be noted however that permanent aircraft noise monitoring equipment which are used for noisy jet surcharging are typically located at a location consistent with the 'flyover' point used for aircraft noise certification and hence 6.5km from the start of runway roll (SoR). Manston Green is less than 4km from the SoR.
Thanet District Council	It is noted that the Secretary of State has required consideration of Vortex Strike arising from plane movements, but this has not been included in the noise assessment. We would welcome information on where this has been considered within the submission.	Consistent with other airports, the airport operator will implement the Wake Turbulence Policy. Damage will be repaired should, after investigation, it be verified that it was caused as a result of airport operations. Detail is provided in Appendix 2 of the Noise Mitigation Plan (Document 2.4, APP-009).
Cogent Land LLP	Having assumed the closure of the airport in the long term, CL's Manston Green scheme has been designed around a certain noise level, with the expectation that there would be no significant noise disturbance and no need therefore for specific noise attenuation/mitigation measures to be designed in. It's anticipated that such measures will be required if the airport expansion proposals proceed and the associated costs of these measures will have a material impact on scheme viability.	Noted, the associated costs of noise attenuation measures will have a material impact on scheme viability and The Manston Green scheme is considered within the noise mitigation strategy and noise insulation scheme is provided in the Noise Mitigation Plan (Document 2.4, APP-009).
Dover District Council	DDC welcomes the preparation of a Noise Mitigation Strategy (paragraph 12.5.1) and would seek to work proactively with the Applicant to ensure the provision of necessary mitigation measures associated with the proposed development. With regard to paragraph 12.3.15, the reporting criteria to utilised in the assessment is robust and will consider the impacts of both construction phase and operational phase of the proposed development. The inclusion and consideration of sensitive residential properties in the Dover DC administrative area (e.g. West Stourmouth) in the assessment is welcomed. Paragraph 12.5.3 refers to a noise insulation scheme to help to avoid the significant effects of health and quality of life. It is recommended that careful consideration is given to the impact on residential properties (particularly at night) in the assessment. In addition, paragraph 3.2.152 (Chapter 3: Project Description) makes reference	No additional requirement.

Consultee	Comments and considerations	How this is addressed in this assessment
	to the following proposed operational flight timings: "Normal operating hours…are defined as 07.00 to 23.00 but with limited exceptions during a shoulder period from 06.00 to 07.00 for certain passenger flights… …Air freight operations…daytime, 07.00 to 23.00…There may be a requirement for a small number of night-time flights…" DDC notes that further details on this will be determined as part of project design associated with the DCO process and would welcome discussion with the applicant as this process advances. Furthermore, engagement regarding the preparation of the supporting Construction Environmental Management Plan would be welcomed.	
Kent County Council	For the avoidance of doubt, the following comments only relate to noise from aircraft operations. Construction traffic and ground noise will be of greater relevance to Thanet District Council's Environmental Health team.	No additional requirement.
Kent County Council	Aircraft noise, as the PEIR correctly identifies, is not a statutory nuisance. However, particularly in recent years, the disturbance and potential health impacts (not just quality of life but impacts on educational attainment, cardiovascular conditions, etc.) have attracted an increasing level of scrutiny. This has been reflected in the most recent consultations on the draft Airports National Policy Statement, the draft UK Airspace Policy: a framework for balanced decisions on the design and use of airspace, and the Civil Aviation Authority's guidance on the revised Airspace Change Process. Notwithstanding the current status of these policies, the applicant should still have due regard where they are stricter on noise impacts as this would at least demonstrate best practice. The reference at paragraph 12.10.51 (pg. 12-45) to the consideration of recent draft policy is therefore welcomed. It is also noted that the PEIR uses a Lowest Observed Adverse Effect Level (LOAEL) which is lower than proposed in the UK Airspace Policy consultation – the LOAEL being the level of noise at which the average person will begin to experience measurable adverse effects on health and quality of life due to noise exposure. However, such noise contours show the average level of noise exposure over a defined period of time and therefore they can mask the nature of the individual events that are in fact what is causing the disturbance (and thus the health impacts) in the first place. Consequently, the draft Civil Aviation Authority Airspace Change Process guidance and UK Airspace Policy propose greater use of N-above metrics, which show the number of noise events in a defined time period as a means of communicating the impact of airspace changes to the public in a manner that correlates with actual experience. The draft UK Airspace Policy recognises that increased frequency of aircraft noise, not just average noise overall, is an issue and could require compensation (paragraph 4.48).	In this noise assessment consideration has been given to the number of night-time noise events above 80dB L_{Amax}. In addition, supplementary metrics have been used alongside L_{Aeq} contours including aircraft overflight (i.e. CAP 1498) and N-above contours.
Kent County Council	As the airspace design has not been undertaken, aircraft noise impacts have not been quantified but a qualitative assessment has been undertaken	The airspace proposals will be subject to extensive consultation as part of the separate airspace decision making process established by the Civil Aviation

Consultee	Comments and considerations	How this is addressed in this assessment
	of the areas that are likely to be adversely affected. During the Airspace Change Process (and assuming that the new Civil Aviation Authority guidance is adopted by this time), the applicant should go through a very rigorous and transparent process of engaging the community in the design options and appraisal of the impacts. Furthermore, there is an understanding of the areas that were affected by noise when the airport was last operational, so this proposal will potentially mark a change to the frequency and volume, rather than the areas affected.	Authority (i.e. Airspace Change Proposal) and this will include all measures that must be produced including N-above metrics if required. This assessment has considered prototype airspace route options within a 'design swathe' within which the Airspace Change Proposal will decide specific flight paths.
Kent County Council	In the case of night noise, the least acceptable form of noise, the PEIR uses the, "… working assumption for illustrative purposes only that there might be a maximum of eight aircraft movements" between 2300 and 0700 (paragraph 12.11.21, pg. 12-51), and this is a worst case. The modelling uses the Significant Observed Adverse Effect Level (SOAEL) of 55 dB Lnight. This is the same level that the World Health Organisation (WHO) showed above which the noise situation is considerably dangerous to public health (2009 Night Noise Guidelines for Europe). The WHO showed effects beginning as low as 40 dB Lnight and the draft UK Airspace Policy LOAEL is 45dB Lnight and therefore it would have been beneficial for the applicant to demonstrate the area also affected at this level.	This assessment includes both the LOAEL and SOAEL contours. The night-time LOAEL for aircraft noise was defined as 40 dB $L_{Aeq,8hr}$ within the PEIR.
Kent County Council	Following the experience in West Kent associated with Gatwick Airport, noise from aircraft, and particularly increased overflight, is a divisive and often unacceptable consequence of living in proximity to an airport. The applicant should go to great lengths to engage local communities in the design of airspace (as part of the Airspace Change Process). It should also be recognised that people are likely to have moved to the area in the period since the airport was closed, and therefore will have no previous understanding of the noise associated with the airport.	The airspace proposals will be subject to extensive consultation as part of the separate airspace decision making process established by the Civil Aviation Authority (i.e. Airspace Change Proposal) and this will include all relevant measures including N-above metrics if required.
Kent County Council	Full consideration should be given to re-establishing the Consultative Committee, including representation from any local community groups concerned with noise and environmental impacts. At the appropriate time, a full quantitative assessment should be presented to residents, businesses and others (particularly noise-sensitive sites such as schools and places of worship) who are likely to be affected. This should include frequency contours and a plain-English presentation of the likely number of noise events of a disruptive volume that they will be exposed to in the daytime and night-time periods. The threshold volume should take account of the most recent evidence and research into the health impacts of noise exposure, as reflected in the consultation draft UK Airspace Policy: A framework for balanced decision making.	As part of the future operation of Manston a consultative committee will be re-established and its role and make-up will be informed by the most recent Government Guidance (i.e. section 35 of the Civil Aviation Act 1982 and Guidelines for Airport Consultative Committees, 2014). The Noise Mitigation Plan (Document 2.4, APP-009) includes further details of the proposals.
Kent County Council	Mitigation for the noise impacts should also be discussed with the local communities alongside a comprehensive package of insulation developed for all those affected. Where mitigation would not be effective (such as for outdoor spaces), financial	A noise mitigation strategy has been developed and will form part of the proposed application when it is made. The noise mitigation strategy will seek to combine noise restrictions and procedures. With regards to airspace and flightpaths a consultation

Consultee	Comments and considerations	How this is addressed in this assessment
	compensation may be the most appropriate compensation measure. In the design of the flight paths used, where possible, consideration should be given to respite by the use of multiple routes. Given that the consultation documents use 8 flights a night as an indication of the number of likely night flights, then the airport operator should ensure that there is a limit on the noise Quota Count (QC) category of those aircraft arriving between 2300 and 0700, especially given that freighters tend to be noisier aircraft. It may be possible to limit noise at night and the total number of night movements through the provisions and requirements set out in the Development Consent Order - the draft UK Airspace Policy encourages a local planning led approach.	consistent with CAA's ACP guidelines will be undertaken and will consider respite if appropriate. For outdoor spaces, measures will be investigated and may include measures such as community trust funds. The Noise Mitigation Plan is presented in Document 2.4 (APP-009).
Acol Parish Council	Acol lies within one mile of the western end of the runway and no complaints about impact have ever been received. Knowing that modern engines are much more efficient and less polluting, we have no concerns at all.	No further requirements.
Thanet Green Party	The damage caused to physical and mental health from noise and from disturbed sleep is well documented. … We are concerned that this, added to the effects of particulate air pollution, will result in serious damage to the health of Thanet and Herne Bay residents. Finally, Thanet is an area where many schools are not thriving and educational achievement needs a boost. One of our members taught in a primary school at Feltham, near Heathrow, some years ago and had to stop her lessons for several minutes every 20 minutes or so while flights went over, as it was impossible to hear or be heard during those periods. This resulted over a year in a considerable loss of teaching and learning time. Such a deficit is the last thing an area of poor educational achievement like Thanet needs! Add to this the impact on children of disturbed sleep from night flights and the prospects for our young people if this proposal is allowed to go ahead look grim.	The impact on schools in the local area is covered within the noise assessment.

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Appendix 12.2
Summary of Relevant Noise Legislation, Policy and Guidance

1.1.1 Noise from airports is considered in a number of planning policy documents and is subject to legislative control and regulation. At an international level, standards governing aircraft noise emissions are set by the International Civil Aviation Organization (ICAO). In the UK, the Department for Transport (DfT) and the Department for Environment, Food and Rural Affairs (Defra) are responsible for regulating the various environmental aspects of the aviation industry.

1.1.2 The following sections provides an outline of the regulatory context, legal requirements, policy and guidance that has informed the noise and vibration assessment.

International Regulatory Framework

1.1.3 The ICAO is the body that oversees the regulation of civil aviation internationally. The primary ICAO policy on aircraft noise is the *Balanced Approach to Aircraft Noise Management*, details of which are contained within *Doc 9829 AN/451* ('*Guidance on the Balanced Approach to Aircraft Noise Management')*.

ICAO Resolution A33-7, (*'The Balanced Approach'*), 2001

1.1.4 Whilst historically technological improvements and noise restrictions have helped reduce and limit noise, the ICAO Balanced Approach recognises that effective land-use planning policy is also required to ensure that activities near to airports are compatible with aviation. The primary goal of the Balanced Approach is to[1]:

> ***"Address noise problems on an individual airport basis and to identify the noise-related measures that achieve maximum environmental benefit most cost-effectively using objective and measurable criteria."***

1.1.5 In order to achieve its goal, the Balanced Approach introduces four principals that should be considered when managing aircraft noise:

- Reduction of noise at source for example by making aircraft quieter by setting noise standards;
- Land use planning and management, for example zoning of land with regards to noise;
- Noise abatement operational procedures that reduce the noise impact on the ground; and
- Operating restrictions, for example those which restrict the noisiest aircraft.

The Aerodromes (Noise Restrictions) (Rules and Procedures) Regulations, 2003

1.1.6 In the UK, *The Aerodromes Regulations 2003* implements into UK law the provisions of *EU Directive 2002/30/EC* concerning the Balanced Approach.

[1] ICAO. The Balanced Approach to Aircraft Noise Management. http://www.icao.int/environmental-protection/Pages/noise.aspx. Accessed 15/03/2017

EU Regulation 598/2014 (on the establishment of rules and procedures with regard to the introduction of noise-related operating restrictions at Union airports within a Balanced Approach and repealing Directive 2002/30/EC), 2014

1.1.7 In 2016 *EU Regulation 598/2014* came into force and *Directive 2002/30/EC* (on the establishment of rules and procedures with regard to the introduction of noise-related operating restrictions at Community airports) was repealed. The Regulation relates to the procedures concerning the introduction of noise related operating restrictions and connects together *Directive 2002/49/EC ('the Environmental Noise Directive'),* with the ECAC Doc 29 (*Report on Standard Method of Computing Noise Contours around Civil Airports*) and the ICAO Balanced Approach.

1.1.8 It should be noted that *EU Regulation 598/2014* is 'regulation' and therefore unlike *Directive 2002/30/EC*, it is directly binding on Member States and therefore does not need to be transposed into national Law as a Directive would be.

Directive 2002/49/EC (relating to the assessment and management of environmental noise (the Environmental Noise Directive – END), 2002

1.1.9 *The Environmental Noise Directive* provides a basis for developing community measures to reduce noise emitted by major sources, including aircraft and defines a common approach for Member States to avoid, prevent or reduce the harmful effects of effects of exposure to aircraft noise, including annoyance. To achieve its aims, the Directive requires Member States to:

- Determine the level of exposure to environmental noise through noise mapping;
- Ensure that information on environmental noise and its effects are made available to the public; and
- Adopt action plans based upon the results of noise mapping, which aim to prevent and reduce the harmful effects of environmental noise on health and preserve environmental noise quality where it is good.

The Environmental Noise (England) Regulations, 2006

1.1.10 In the UK, *The Environmental Noise (England) Regulations 2006* give effect to the *Environmental Noise Directive*, relating to the assessment and management of environmental noise.

National Regulatory Framework

1.1.11 This Chapter provides an assessment of the potential noise and vibration effects that could arise as a result of the re-opening of Manston Airport (the 'Proposed Development') as a dedicated airfreight facility capable of handing over 10,000 air cargo movements per year. A description of the Proposed Development is provided in **Chapter 3: Description of the Proposed Development**.

1.1.12 In the UK, the DfT and Defra are responsible for regulating the various environmental aspects of the aviation industry. At a local level, local planning authorities such as Thanet District Council (TDC) also have some control through planning conditions and legal agreements.

National Planning Policy and Guidance

1.1.13 In the UK, the overarching planning policy is the National Planning Policy Framework (NPPF) and this framework is intended to act as guidance to planning authorities on the approval of applications. The NPPF is supported by a number of policy statements, including specific policy relating to noise, the Noise Policy Statement for England (NPSE). Furthermore, the policy statements are supported by guidance documents including the Planning Practice Guidance - Noise. There is also an aviation specific framework, the Aviation Policy Framework and the Government is also currently consulting on specific updated aviation policy for the determination of a new runway at Heathrow Airport, the draft Airports National Policy Statement and an updated

Aviation Policy Framework is expected to be released after the adoption of the Heathrow specific policy statement.

National Planning Policy Framework (NPPF): Draft for Consultation (March 2018)

1.1.14 The NPPF is the overarching planning policy framework in the UK and is taken into account by Local Authorities when preparing their local and neighbourhood plans, which form the basis for noise (including vibration) policies within an area.

1.1.15 The Draft NPPF (paragraph 168) states that the planning system should contribute to and enhance the natural and local environment by:

> ***"Preventing new and existing development from contributing to or being put at unacceptable risk from being adversely affected by unacceptable levels of soil, water or noise pollution or land instability".***

1.1.16 The Draft NPPF (paragraph 178) goes on to state that:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health and living conditions, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

> ***a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and quality of life; and***
>
> ***b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."***

National Planning Policy Framework (NPPF), 2012[2]

1.1.17 The NPPF is the overarching planning policy framework in the UK and is taken into account by Local Authorities when preparing their local and neighbourhood plans, which form the basis for noise (including vibration) policies within an area.

1.1.18 In relation to noise, the NPPF advises that significant adverse impacts on health and quality of life because of noise from new development should be avoided. The NPPF also advises that other adverse impacts on health and quality of life arising from noise from new development should be reduced to a minimum.

1.1.19 The NPPF (paragraph 109) states that the planning system should contribute to and enhance the natural and local environment by:

> ***"Preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, water or noise pollution or land instability".***

1.1.20 The NPPF (paragraph 123) goes on to state that:

- ***"Planning policies and decisions should aim to:***
  - ***Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;***
  - ***Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through use of conditions;***
  - ***Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable***

[2] National Planning Policy Framework (2012). DCLG; London

restrictions put on them because of changes in nearby land use since they were established; and

- ***Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."***

1.1.21 The NPPF (references 27 and 28) refers to the Explanatory Note to the National Policy Statement for England (NPSE) and the provisions of the *Environmental Protection Act 1990* and other relevant law.

1.1.22 It should be noted that the NPPF does not invalidate the considerable range of British Standards and other guidance documents relevant to the assessment of environmental noise in the UK.

Noise Policy Statement for England (NPSE), 2010

1.1.23 The Noise Policy Statement for England (NPSE) was published by Defra in March 2010 and forms the overarching statement of noise policy for England (and hence is of direct relevance to the assessment of planning applications under the NPPF for developments in England only). It sets out the long-term vision of the Government, as follows:

"[to] Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development".

1.1.24 This long-term vision of NPSE is supported by the following aims, which are reflected in the provisions of the NPPF:

- ***"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:***
  - ***Avoid significant adverse impacts on health and quality of life;***
  - ***Mitigate and minimise adverse impacts on health and quality of life; and***
  - ***Where possible, contribute to the improvement of health and quality of life".***

1.1.25 The Explanatory Note to the NPSE (paragraph 2.14) acknowledges that noise contributing to annoyance and/or sleep disturbance in human populations can have long-term consequences for health and wellbeing. It introduces three '*Effect Levels*' relevant to the assessment of noise. These are:

- **NOEL** – No Observed Effect Level:
  - No effect can be detected below this level. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.
- **LOAEL** - Lowest Observed Adverse Effect Level:
  - This is the level above which adverse effects on health and quality of life can be detected.
- **SOAEL** – Significant Observed Adverse Effect Level:
  - This is the level above which significant adverse effects on health and quality of life occur."

1.1.26 The aim of the NPSE is to avoid all noise occurring at the SOAEL level and to minimise all noise occurring between the LOAEL and SOAEL level.

1.1.27 The NPSE states that it is not possible to have a single, numerical definition of the SOAEL that is applicable to all sources of noise in all situations, since the SOAEL is likely to be different for different noise sources, for different receptors and at different times. Further research is required to increase understanding of what constitutes a significant adverse impact on health and quality of life due to noise, and the NPSE states that not stating specific SOAEL levels provides a suitable degree of policy flexibility until such evidence is available.

Planning Practice Guidance - Noise (PPG-N), 2014

1.1.28 The Planning Practice Guidance for Noise (PPG-N) introduces a fourth effect level the '*UOAEL - Unacceptable Observed Adverse Effect Level'* (See **Table A12.2.1** for definition). It should be noted that the UOAEL has not yet been updated in the NPSE.

1.1.29 The PPG-N advises that local planning authorities should consider whether the overall effect of the noise exposure is, or would be, above or below the SOAEL and the UOAEL. The UOAEL was introduced because it was recognised that increasing noise exposure:

> **"will at some point cause the significant observed adverse effect level boundary to be crossed"** and therefore where this does occur **"the planning process should be used to avoid this effect occurring, by use of appropriate mitigation such as by altering the design and layout".**

1.1.30 The PPG-N gives a noise exposure hierarchy based on the likely average response as detailed in **Table A12.2.1.**

Table A12.2.1 PPG-N Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not Noticeable	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect (NOAEL)			
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level (LOAEL)			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Unacceptable Observed Adverse Effect Level (UOAEL)			
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Observed Adverse Effect	Prevent

1.1.31 In cases where existing noise-sensitive locations already experience high noise levels, PPG-N suggests that a development that is expected to cause even a small increase in noise may cause a significant adverse effect, even though little to no change in behaviour would be likely to occur.

1.1.32 PPG-N advises that the noise impact may be partially offset if the residents of the relevant dwellings have access to:

- A relatively quiet facade (containing windows to habitable rooms) as part of their dwelling, and/or;
- A relatively quiet external amenity space for their sole use (e.g. a garden or balcony). Although the existence of a garden or balcony is generally desirable, the intended benefits will be reduced with increasing noise exposure and could be such that significant adverse effects occur, and/or;
- A relatively quiet, protected, nearby external amenity space for sole use and by a limited group of residents as part of the amenity of their dwellings; and/or
- A relatively quiet, protected, external publicly accessible amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within 5 minutes walking distance).

1.1.33 The potential effect of an existing business on a new residential development being located close to it should be carefully considered, as the existing noise levels from the business may be regarded as unacceptable by the new residents and subject to enforcement action. In the case of an established business, the policy set out in the third bullet of Paragraph 123 of the NPPF should be followed. The third bullet recognises that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them.

Aviation Policy Framework (APF), 2013

1.1.34 The Aviation Policy Framework (APF) was published in March 2013. In relation to aviation noise, the APF states that the Government's overall policy is:

> ***"to limit and, where possible, reduce the number of people in the UK significantly affected by aircraft noise".***

1.1.35 The APF states that this objective is consistent with the Government's Noise Policy as set out in the NPSE. Chapter 3 of the APF focuses specifically on noise and other local environmental impacts. The APF states that the Government's policy on aviation noise will be consistent with international approaches and European law. It states that the Government fully recognises ICAO Resolution A33-7 for the Balanced Approach as transposed into UK law, currently through *The Aerodromes (Noise Restrictions) (Rules and Procedures) Regulations 2003.*

1.1.36 In relation to noise policy metrics, the APF reaffirms the use of the 57 dB $L_{Aeq,\ 16h}$ as the:

> ***"Approximate onset of significant community annoyance".***

1.1.37 The 57dB $L_{Aeq,\ 16h}$ has been incumbent within Government aircraft noise policy for several decades however, the APF states that:

> ***"Although there is some evidence that people's sensitivity to aircraft noise appears to have increased in recent years, there are still large uncertainties around the precise change in relationship between annoyance and the exposure to aircraft noise".***

1.1.38 The APF goes on to state that Government will:

> ***"…continue to treat the 57 dB $L_{Aeq,\ 16h}$ as the average level of daytime aircraft noise marking the approximate onset of significant community annoyance".***

1.1.39 The APF does however point out that:

> ***"… this does not mean that all people within this contour will experience significant adverse effects from aircraft noise. Nor does it mean that no-one outside of this contour will consider themselves annoyed by aircraft noise".***

1.1.40 The APF acknowledges that The Airports Commission has recognised that there is no firm consensus as to how to measure the noise impacts from aviation and that further detailed work will be carried out. On this basis, the APF states that the Government will keep the policy under review in light of any new emerging evidence.

1.1.41 Paragraph 3.19 identifies that the Government considers other noise metrics than just the $L_{Aeq, 16hr}$ to be important in communicating noise impacts to local stakeholders. The APF states that:

> ***"Average noise exposure contours are a well-established measure of annoyance and are important to show historic trends in total noise around airports. However, the Government recognises that people do not experience noise in an average manner and that the value of the $L_{Aeq, 16h}$ indicator does not necessarily reflect all aspects of the perception of aircraft noise. For this reason, we recommend that average noise contours should not be the only measure used when airports explain how locations under flight paths are affected by noise. Instead the Government encourages airport operators to use alternative measures which better reflect how aircraft noise is experienced in different localities, developing these measures in consultation with their consultative committee and local communities. The objective should be to ensure a better understanding of noise impacts and to inform the development of targeted noise mitigation measures".***

1.1.42 With respect to compensation schemes, Paragraphs 3.36 – 3.41 of the APF set out the Government's expectations. Paragraph 3.36 of the APF states that:

> ***"The Government continues to expect airport operators to offer households exposed to levels of noise of 69 dB $L_{Aeq, 16h}$ or more, assistance with the costs of moving".***

1.1.43 Paragraph 3.37 of the APF states that:

> ***"The Government also expects airport operators to offer acoustic insulation to noise-sensitive buildings, such as schools and hospitals, exposed to level of noise of 63dB $L_{Aeq, 16h}$ or more. Where acoustic insulation cannot provide an appropriate cost-effective solution, alternative mitigation measures should be offered".***

1.1.44 The APF goes on to state in Paragraph 3.40 that:

> ***"Where airport operators are considering developments which result in an increase in noise, they should review their compensation schemes to ensure that they offer appropriate compensation to those potentially affected. As a minimum, the Government would expect airport operators to offer financial assistance towards acoustic insulation to residential properties which experience an increase in noise of 3dB of more which leaves them exposed to levels of noise of more than 63dB $L_{Aeq, 16h}$ or more".***

Revised Draft Airports National Policy Statement: new runway capacity and infrastructure at airports in the South East of England (draft Airports National Policy Statement), 2017

1.1.45 At the date of publication of the ES, the Revised Draft Airports NPS was subject to public consultation and Parliament scrutiny. This document presents and describes the background situation and decisions related to the expansion of Heathrow Airport; it also proposes requirements

that need to be met for the project completion and elements to be included within an Environmental Impact Assessment (EIA).

1.1.46 In this document it is stated that:

> ***"4.31 A good design should meet the principal objectives of the scheme by eliminating or substantially mitigating the identified problems by improving operational conditions and simultaneously minimising adverse impacts. It should also mitigate any existing adverse impacts wherever possible, for example in relation to safety or the environment. A good design will also be one that sustains the improvements to operational efficiency for as many years as is practicable, taking into account capital cost, economics and environmental impacts."***

1.1.47 Although this document has been set out primarily for Heathrow Airport it should be taken into account for other airport infrastructure projects in the South East of England:

> ***"1.12 The Airports NPS provides the primary basis for decision making on development consent applications for a Northwest Runway at Heathrow Airport, and will be an important and relevant consideration in respect of applications for new runway capacity and other airport infrastructure in London and the South East of England. Other NPSs may also be relevant to decisions on airport capacity in this geographical area."***

1.1.48 A section specifies requirements for noise assessment and mitigation considerations stating:

> ***"5.59 The applicant should put forward plans for a noise envelope. Such an envelope should be tailored to local priorities and include clear noise performance targets. As such, the design of the envelope should be defined in consultation with local communities and relevant stakeholders, and take account of any independent guidance such as from the Independent Commission on Civil Aviation Noise."***

1.1.49 It is recognised that the Government expects a ban on scheduled night-time flights (between 23:00 and 07:00) to be implemented.

Draft UK Airspace Policy: A framework for balanced decisions: on the design and use of airspace, 2017

1.1.50 The draft UK airspace policy was published in 2017 and outlines the Government's draft future policy for airspace. The policy aligns the Government's noise policy (NPSR) with decision making on airspace and aviation noise. Furthermore, the policy suggests that noise affects are observed from 51dB $L_{Aeq,\ 16hr}$ (i.e. LOAEL), based on the CAA'S Survey of Noise Attitudes 2014 and from 45dB $L_{Aeq,\ 8hr}$ during the night. At the time of publication of the ES the Policy has been commented on within the *Summary report of consultation feedback* (October 2017) and these comments have been considered within the *Consultation Response on UK Airspace Policy: A framework for balanced decisions on the design and use of airspace* (October 2017). The key result in terms of criteria is the reduction in the noise metric for LOAEL from 54dB(A) $L_{Aeq,\ 16\ hr}$ to 51dB $L_{Aeq,\ 16\ hr}$.

Regulatory Framework for the Operation of an Airport in relation to Noise

1.1.51 For the operation of the airport, relevant legislation exists for the control of aircraft and environmental noise. For most commercial UK airports, the DfT and Defra are responsible for regulating environmental noise.

1.1.52 Furthermore, under section 78-80 of the Civil Aviation Act 1982 (as amended in 2006), The Secretary of State also has powers under the Civil Aviation Act 2006 to control aircraft noise at certain 'designated' airports. However, at present only Heathrow, Gatwick and Stansted are designated for aircraft noise. At these airports, Government has the power to regulate directly in relation to noise and Government therefore defines the noise preferential routes (NPRs or PNRs),

sets noise quota limits and budgets for night-time operations and produces the air noise contour maps.

Civil Aviation Act, 2006

1.1.53 *The Civil Aviation Act* is the principal legislation for the regulation of aircraft operations. The Act was updated in 2006 when additional powers to avoid, limit or mitigate the effects of noise connected with departures or arrivals of aircraft at an aerodrome were introduced. The Act makes provisions for airport operators to establish a "*noise control scheme*". The noise control scheme may for example limit the number and types of aircraft permitted to operate.

Environmental Protection Act (EPA), 1990

1.1.54 Relevant legislation exists for the protection of the environment and Section 79 of the *Environmental Protection* Act *(EPA) 1990* (as amended by the *Noise and Statutory Nuisance Act 1993*) provides the principal controls for "*statutory nuisance*", and declares a number of items as statutory nuisances, including:

- Noise emitted from premises so as to be prejudicial to health or a nuisance; and
- Noise that is prejudicial to health or a nuisance and is emitted from or caused by a vehicle, machinery or equipment on a highway, road, footway, square or court open to the public.

1.1.55 The EPA (1990) requires local authorities to inspect their areas periodically to detect any nuisances, and where a complaint of statutory nuisance is made, to take such steps as are reasonably practicable to investigate the complaint.

1.1.56 Should a local authority be satisfied of the existence of a statutory nuisance, it is obliged to serve an Abatement Notice on the person responsible. However, businesses have a defence of "*best practicable means*". It should be noted that failure to comply with an Abatement Notice is a criminal offence.

Statutory Nuisance (Aircraft Noise) Bill 2016-17

1.1.57 The EPA (1990), does not currently relate to noise emitted from airports or aircraft, however, in 2016 a Private Member's Bill was introduced to Parliament under the Ten Minute Rule, to amend Part 3 of the Environmental Protection Act 1990 to make noise caused by aircraft a statutory nuisance. The Bill was expected to have its second debate in Parliament before summer 2017, but due to the 2017 General Election the Bill has been withdrawn with no further news as to re-submitting the Bill to Parliament

Regulatory Framework to Construction at an Airport

Control of Pollution Act (CoPA), 1974[3]

1.1.58 Sections 60 and 61 of the *Control of Pollution Act (CoPA) 1974* give the local authority special powers to deal with noise and vibration arising from construction and demolition works, regardless of whether a statutory nuisance has been caused or is likely to be caused. The powers may be exercised either before works start or after they have started.

1.1.59 Under Section 61 (s61) a developer may apply to the local authority for prior consent to carry out construction or demolition works. The advantage of s61 is that, as long as the developer complies with the s61 consent application, it protects the developer from any subsequent action by the local authority under Section 60 (s60) of the CoPA.

[3] Control of Pollution Act (1974). HMSO; London

1.1.60 Additionally, the CoPA grants the Secretary of State (SoS) powers to approve Codes of Practice for the minimisation of noise (e.g. construction noise), and these may be used as evidence in legal proceedings.

The Land Compensation Act (1973)[4]

Part 1 of the Land Compensation Act 1973 allows a residential property that has been reduced in value due to physical factors (for example noise and pollution) caused by public works (i.e. airport development) to make a claim for compensation. Claims cannot be made until 12 months after date of opening. A number of UK airports have been or in some instances are currently subject to claims under Part 1 of the Land Compensation Act 1973, for example Manchester Airport 2nd Runway, London Southend Runway Extension, Farnborough West One Development, Stansted Expansion Works and London City Airport Expansion Works.

The Noise Insulation Regulations (1975)[5]

1.1.61 The Noise Insulation Regulations make it compulsory for noise insulation to be provided to residential dwellings where noise from new or realigned road schemes and the associated works result in certain levels and changes in road traffic noise. It specifies and defines which conditions it shall be applied and establishes the form and procedure of the insulation works and compensation grants.

Regional and Local Policy

1.1.62 Consistent with the aims of the Balanced Approach, regional policy also exists for land use planning and zoning around airports to define the use of land exposed to certain levels of noise. The saved policies and emerging policies from the Thanet District Council local plan contain noise exposure categories to be used in determining applications and a requirement for proposals to include adequate levels of sound insulation.

1.1.63 Furthermore, when the airport was previously operational, planning obligations under Section 106 of the Town and Country Planning Act 1990 (as amended) existed. The Section 106 (s106) was made between Thanet District Council and the airport operator and required a number of obligations for the management, control and mitigation of aircraft noise.

Regional Spatial Strategy for the South East, 2009

1.1.64 Within ‘Natural Resource Management’, the regional plan includes Core Policy NRM10: Noise, which states that ‘Measures to address and reduce noise pollution will be developed at regional and local level through means such as:

i) locating new residential and other sensitive development away from existing sources of significant noise or away from planned new sources of noise;

ii) traffic management and requiring sound attenuation measures in major transport schemes; and

iii) encouraging high levels of sound-proofing and screening as part of sustainable housing design and construction.’

Kent County Council (KCC) responses

1.1.65 KCC has provided responses to various papers and policies regarding aviation. These responses are largely in relation to proposals for a second runway at Gatwick airport and do not relate to proposals at Manston Airport. The responses from KCC highlight concerns in regard to increased noise from flight paths over the Kent County area. KCC responses include consultation on ‘UK

[4] The Land Compensation Act (1973), HMSO 1973
[5] The Noise Insulation Regulations (1975), HMSO 1974

Airspace Policy: A framework for balanced decisions on design and use of airspace' where it proposes more stringent in noise limits and consideration of night-noise.

Thanet District Council Local Plan, 2006

1.1.66 As part of the transitional arrangements from the old Local Plan to the new Local Development Framework (LDF), the Local Plan expired on 17th June 2009 and only those policies that have been saved by the Secretary of State's direction will continue to be part of the Development Plan until an updated Development Plan is approved.

Saved Policies EP7 (Aircraft Noise) and EP8 (Residential Developments and Aircraft Noise)

1.1.67 Policy EP7 (Aircraft Noise) is part of the Thanet Council Environmental Protection policy and seeks to limit the effect of aircraft noise on sensitive receptors (dwellings, schools and hospitals) by restricting the location of these types of developments. To achieve its aim, Policy EP8 sets a framework for determining the planning requirement for new developments in sites where aircraft noise is likely to be an issue. The requirement is based on levels similar to those expressed by the now defunct PPG24 and therefore presents the criteria shown in **Table A12.2.2.**

Table A12.2.2 Policy EP7 – Aircraft Noise – Noise Exposure Categories (NEC)

NEC	PREDICTED AIRCRAFT NOISE LEVELS (dB $L_{Aeq,}$ 0700-23.00)	
A	<57	Noise will not be a determining factor
B	57 - 63	Noise will be taken into account in determining applications, and where appropriate, conditions will be imposed to ensure an adequate level of protection against noise (policy EP8 refers).
C	63 - 72	Planning permission will not be granted except where the site lies within the confines of existing substantially built-up area. Where residential development is exceptionally granted, conditions will be imposed to ensure an adequate level of protection against noise (policy EP8 refers).
D	>72	Residential development will not be permitted.

1.1.68 Furthermore, where planning consent is provided and aircraft noise is likely to be an issue, Policy EP8 details the requirements for sound insulation (as shown in **Table A12.2.3**).

Table A12.2.3 Policy EP8 – Aircraft Noise – Noise Exposure Categories (NEC)

NEC	Predicted Aircraft Minimum Noise Levels Attenuation REQUIRED (dB(A) (frequency range 100-3150 Hz)	
A	<57	No attenuation measures required
B	57-63	20dB
C	63-72	30dB

Thanet District Council Preferred Options Draft Local Plan, 2016

1.1.69 The TDC Preferred Options Draft Local Plan sets out the preferred policies to be used to guide decisions on developments up to 2031. The plan defines how and where homes, community facilities and infrastructure will be developed.

1.1.70 Similar to saved policy EP7, Policy SE08 (Aircraft Noise) provides criteria for consenting of applications for noise sensitive developments on sites expected to be affected by aircraft noise.

1.1.71 Similar to EP8, Policy SE09 (Aircraft Noise and Residential Development) sets criteria for the level of sound insulation required for residential developments that are approved on sites expected to be affected by aircraft noise.

1.1.72 Policy SP05 (Manston Airport) states that applications for development at Manston Airport would need to be supported by an assessment of cumulative noise impact.

Noise Standards and Guidance

1.1.73 In addition to the legislative framework governing the regulation of airport noise, a number of calculation standards and guidance documents exist informing the measurement, calculation and assessment of environmental noise effects.

Airspace Change Guidance

CAP 725: Airspace Change Process Guidance Document (2016)

1.1.74 CAP 725 sets out the CAA's current process for airspace change and ensuring that the CAA reduce, control and mitigate the environmental impacts of civil aircraft operations, particularly from noise and aircraft engine emissions.

CAP 1129: Noise Envelopes (2013)

1.1.75 CAP 1129 describes the process for defining noise envelopes in terms of characteristics and parameters. The setting of limits is discussed as is the process of implementation and consideration of compliance monitoring and enforcement. The document is not prescriptive, but provides the guidance to allow for a flexible approach to form noise envelopes appropriate to the individual development as agreed by relevant stakeholders.

CAP 1520: Draft airspace design guidance (2017)

1.1.76 In 2017, draft updated airspace design guidance was published in the form of CAP1520. CAP1520 operates within the Government's framework and presents the draft guidance to support the new process of assessing airspace change and outlines the process and metrics for environmental assessments, including noise.

CAP 1521: Draft airspace design guidance, Annex 1: Draft environmental technical annex (2017)

1.1.77 This Annex provides supporting information to the CAP 1520 design guidance, including guidance on metrics, noise contour presentation, noise measurements and computer noise modelling (including the use of AEDT). The Annex also briefly considers 'Tranquillity', though there is no formal guidance and the conclusion is limited to maintaining a watch on changes in policy and guidance.

CAP 1522: Draft airspace design guidance – consultation, Annex 2: Tier 2 airspace change (2017)

1.1.78 Provides an update to the consultation process for Tier 2 airspace change and describes CAA's potential role as part of the changes.

Aircraft Noise Calculation

SAE-AIR-1845 Procedure for the Calculation of Airplane Noise in the Vicinity of Airports, 1986

1.1.79 The Aerospace Information Report (AIR) describes the methodology used by aircraft noise modelling software for calculating sound exposure levels from aircraft.

ECAC Doc.29 3rd Edition, 2005

1.1.80 The report on *'Standard Method of Computing Noise Contours around Civil Airports'* provides guidance on aircraft noise modelling, and is consistent with the methodology presented in *SAE-AIR-1845*.

Environmental Noise Measurement and Calculation

ISO 9613-2 1996: Acoustics – Attenuation of sound during propagation outdoors: Part 2 General method of calculation

1.1.81 *ISO 9613-2 1996* describes the methodology for calculating the attenuation of sound propagation outdoors. The methodology is intended to be used for the prediction of environmental noise and outputs are express as L_{Aeq}.

BS 7445-1:2003 Description and measurement of environmental noise – Part 1: Guide to quantities and procedures (BS7445-1:2003), 2003

1.1.82 *BS 7445-1:2003* provides guidance for describing and measuring noise from all sources. The standard recommends equivalent continuous A-weighted sound pressure level (L_{Aeq}) as the most appropriate basic noise indicator.

BS 7445-2:1991 Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use (BS7445-2:1991), 1991

1.1.83 *BS 7445-2:1991* provides guidance for describing noise, including tonal and impulsive adjustments, for the purposes of assessing compatibility of the noise environment with land use.

BS 7445-3:1991 Description and measurement of environmental noise – Part 3: Guide to application of noise limits (BS7445-3:1991), 1991

1.1.84 *BS 7445-2:1991* provides guidance for the specification of noise limits (but does not provide noise limits) and describes methods for acquiring data to enable noise limits to be set.

Construction Noise Calculation and Assessment

BS 5228-1:2009+A1-2014 'Code of practice for noise and vibration control on construction and open sites', 2014 - Part 1: Noise

1.1.85 *BS 5228-1:2009+A1-2014* provides guidance on the assessment and control of noise from construction sites, along with suggestions for the derivation of guideline noise limits. BS 5228 also provides a methodology for calculating noise from construction and provides reference information for noise from construction plant. The '*ABC Method*' and '*+5 dB(A)*' method presented within Annex E require an understanding of existing ambient sound levels at nearby dwellings.

Industrial and Commercial Sound Calculation and Assessment

BS 4142:2014 'Methods for Rating and Assessing Industrial and Commercial Sound', 2014

1.1.86 *BS 4142:2014* is used to rate and assess sound of an industrial and commercial nature, including but not limited to assessing sound from proposed, new, modified or additional sources of industrial sound. It contains guidance on the monitoring and assessment of industrial and commercial sound sources (including fixed installations comprising mechanical and electrical plant and equipment) affecting sensitive receptors.

Road Traffic Noise Calculation and Assessment

Calculation of Road Traffic Noise (CRTN), 1988

1.1.87 *CRTN* is a prediction methodology for road traffic noise. Using detailed information on two-way traffic flows, percentage of HGV movements, road gradient, vehicle speed, ground conditions and screening, the methodology calculates the propagation of noise from roads. Although *CRTN* is predominantly a prediction methodology, it also provides advice on measurements, including a "shortened measurement procedure" whereby a continuous measurement taken for 3-hours between 10:00 hrs and 17:00 hrs can be converted to the $L_{A10,\ 18h}$.

Design Manual for Roads and Bridges Vol. 11 - Environmental Assessment (DMRB), 2011

1.1.88 *DMRB* contains advice on the assessment of noise from road traffic, particularly from new and altered roads and sets out the following assessment methods on Volume 11 Section 3 Part 7 HD 213/11. It sets out a method for undertaking a tiered approach to assessment by scoping first, conducting a simple assessment and, if it is clear than the project under assessment will result in noise and vibration changes greater than the threshold levels, conduct a detailed assessment.

Table A12.2.4 Classification of Magnitude of Noise Impacts in the Short Term

Noise change, $L_{A10,18h}$	Magnitude of Impact
0	No change
0.1– 0.9	Negligible
1 – 2.9	Minor
3 – 4.9	Moderate
5+	Major

Table A12.2.5 Classification of Magnitude of Noise Impacts in the Long Term

Noise change, $L_{A10,18h}$	Magnitude of Impact
0	No change
0.1 – 2.9	Negligible
3 – 4.9	Minor
5 – 9.9	Moderate
10+	Major

Railway Noise Calculation and Assessment

Calculation of Railway Noise (CRN), 1995

1.1.89 *CRN* provides procedures for calculating noise from moving railway vehicles. *CRN* also describes procedures needed to determine the noise from other guided transport systems included in the Railway Noise Insulation Regulations.

1.1.90 *CRN* is divided into three sections; Section I provides a general methodology for predicting noise levels from a railway; Section II contains procedures for dealing with the prediction of railway noise

where Section I cannot be used; and Section III provides the procedures and requirements for the measurement of railway noise.

1.1.91 *CRN* methodology provides guidance on how the track shall be subdivided on different segments ensuring that the variation of noise within segments is less than 2 dB(A). It provides the single vehicle Sound Exposure Levels (SEL_V) associated with different types of trains in Table A1.1 in the Appendix A1. *CRN* also gives the corrections necessary to account for the speed of the train, as well as the number of vehicles in the convoy the type of track and its support and the roughness of the wheel-track contact. *CRN* indicates how to convert the resultant level into the total L_{Aeq} for the railway.

Community Noise Guidance

World Health Organisation Guidelines for Community Noise, 1999

1.1.92 World Health Organisation (WHO) Guidelines for Community Noise presents guideline noise levels for community noise in specific residential environments, e.g. outdoor living areas. The pertinent details of the guidelines include:

- An introduction to community noise by defining it as noise emitted from all sources except noise the industrial workplace;
- Distinction between sound and noise where sound is a sensory perception and noise is defined as unwanted sound; and
- Details of adverse health effects of noise including the health significance of noise pollution, including hearing impairment, interference with speech communication, disturbance of rest and sleep, psychophysiological, mental health and performance effects, effects on residential behaviour and annoyance, and interference with intended activities.

1.1.93 A summary of the guidelines values is presented in **Table A12.2.6**.

Table A12.2.6 Summary of WHO Guidelines for Community Noise

Guideline	Period	Situation
30 dB $L_{Aeq, 16hrs}$	Night (2300 to 0700)	Inside bedrooms
45 dB L_{AFmax}	Night (2300 to 0700)	Inside bedrooms
45 dB $L_{Aeq, 16hrs}$	Night (2300 to 0700)	Outside bedrooms with an open window
60 dB L_{AFmax}	Night (2300 to 0700)	Outside bedrooms with an open window
35 dB $L_{Aeq, 16hrs}$	Day (0700 to 2300)	Inside living rooms
50 to 55 dB $L_{Aeq, 16\text{-}hrs}$	Day (0700 to 2300)	Outdoor living area
35 dB $L_{Aeq, 16hrs}$	During Class	Inside school class rooms and preschools
50 to 55 dB $L_{Aeq, 16hrs}$	During Play	In school playground
30 dB $L_{Aeq, T}$	Day, evening and night	Inside hospitals and ward rooms
45 dB L_{AFmax}	Night (2300 to 0700)	Inside hospitals and ward rooms
70 dB $L_{Aeq, 24hrs}$	24-hours	Industrial, commercial, shopping and traffic areas

World Health Organisation Night Noise Guidelines for Europe, 2009

1.1.94 The WHO Night Noise Guidelines for Europe present the conclusions of the WHO working group responsible for providing guideline exposure values for noise during sleep and presents guideline noise levels for community noise at night. The document sets target of outdoor night noise limit of 40dB and short-term interim target of 55dB for countries where 40dB target cannot be met.

Sound Insulation and Reduction for Buildings

BS 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings', 2014

1.1.95 *BS 8233:2014* presents design criteria for internal noise levels in residential living rooms and dining rooms during the day and in bedrooms at night. It applies to the design of new buildings, or refurbished buildings undergoing a change of use and therefore does not provide guidance on assessing the effects of changes in noise for an existing building. The standard also recommends noise level design ranges for offices, workplaces and other non-domestic buildings.

1.1.96 Where an applicable building is affected by aircraft noise the standard recommends an approach to measuring aircraft sound for the determination of sound insulation in new buildings. This includes ensuring different modes of operation are considered and also that the frequency content of the sound (with special attention to low frequencies) is taken into account for insulation purposes.

EIA Assessment Guidelines

Institute of Environmental Management and Assessment Guidelines for Environmental Noise Impact Assessment (IEMA), 2014

1.1.97 These guidelines aim to provide guidance for undertaking a noise impact assessment applicable for all types of projects, regardless of the size, where noise effects are likely to happen.

1.1.98 Emphasis is made on the need of taking into account the noise features (such as continuous/intermittent/periodic, frequency content, time of occurrence) and the noise sensitive receptors' perception of the noise.

1.1.99 The guidelines define the concepts of Noise Impact (as the difference in the acoustic environment before and after implementing the proposals), Noise Effect (as the consequence of the Noise Impact) and Significance of Effect (as the assessment of the Noise Effect).

1.1.100 The guidelines provide guidance on how the noise impact assessment shall be carried out and where it fits within the EIA process. The process requires the following sections:

- Scoping;
- Baseline condition: showing understanding and description of the existing acoustic environment including noise sensitive receptors (NSRs);
- Impact identification;
- Effect description: an assessment of the significance of the expected noise impact at the NSRs;
- Significance evaluation: an evaluation of the effects to determine their significance;
- Identification of mitigation measures; and
- Monitoring of the noise effects post-consent.

Vibration Standards and Guidance

BS 5228-2:2009: 2014 'Code of practice for noise and vibration control on construction and open sites', - Part 2: Vibration

1.1.101 Part 2 of BS 5228 provides a recommended method for vibration control for construction activities and for sites where activity is likely to cause significant vibration levels.

BS 6472-1:2008 Guide to Evaluation of Human Exposure to Vibration in Buildings

1.1.102 BS 6472:2008 Part 1: Guide to Evaluation of Human Exposure to Vibration in Buildings (BS 6472-1:2008) covers vibration sources other than those associated with blasting. The standard provides guidance on predicting human response to vibration over the frequency range 0.5Hz to 80Hz. The standard uses typical human responses to whole-body vibration in order to determine a Vibration Dose Value (VDV) which may be used to determine the potential for unfavourable reaction and adverse comment to vibration from residential occupants.

1.1.103 The response of the human body to vibration is very complex and depends on many different factors, one of which (but not necessarily the most important), is the magnitude of vibration. Once an individual has perceived a vibration then it is possible for concern to be raised about the source of that vibration. This concern is usually expressed, as fear of the vibration's potential to cause damage to the occupant's property and that further damage may occur from repeated vibration events.

1.1.104 BS 6472-1:2008 discusses the fact that structural vibration within buildings can be detected by the occupants and examines how the occupant's quality of life and/or working efficiency may be reduced. Tentative guidance is given on the various magnitudes of vibration at which adverse comment by the occupants may begin to arise. The standard also discusses how and where to measure vibration and gives the factors which influence human response.

1.1.105 The standard discusses the possible effects that various types of vibration may have on the inhabitants of any building. BS6472-1:2008 at Section 6 describes methods for the evaluation of such vibration and indicates levels that might possibly give rise to adverse comment under a given range of circumstances.

Guidance on Health Effects

CAA Survey of noise attitudes 2014: Aircraft, 2017

1.1.106 The SoNA (Survey of Noise Attitudes) report was published by the CAA in 2017 and describes the research undertaken by the CAA on attitudes to aircraft noise around airports in England and also how attitudes relate to noise exposure indices commonly used by the industry (for example $L_{Aeq,\ 16\ hr}$). However, whilst the survey was undertaken around nine UK airports, the majority of responses were from people living around Heathrow.

1.1.107 The report examined alternative metrics to determining annoyance from aircraft noise and recommends the continued use of the $L_{Aeq,\ 16hr}$ indicator as a way of measuring annoyance (p. 41):

> ***"There is, however, no evidence to suggest that any of the indicators assessed is better than $L_{Aeq,\ 16h}$."***

1.1.108 However, even though the report recommends the continued use of the $L_{Aeq,\ 16hr}$ indicator it found that, unlike previous research that suggested annoyance started (i.e. LOAEL) at 57dB $L_{Aeq,\ 16hr}$, sensitivity to aircraft noise has increased and therefore annoyance due to aircraft noise can begin at 51dB $L_{Aeq,16hr}$. Furthermore, the level at which people could be 'highly annoyed' by aircraft noise is now 54dB $L_{Aeq,\ 16hr}$ and that annoyance levels were likely to increase with increasing noise exposure levels.

1.1.109 The report also found that non-acoustical factors often influence annoyance, for example time of day, socio economic status, age, expectations and length of residence.

CAP 1278 Aircraft Noise and Health Effects: Recent Findings, 2016

1.1.110 This report updates the Environmental and Research Consultancy Department Report 0907 (Environmental Noise and Health Effects) that examines the impacts on health due to transportation and specifically aircraft noise. The report examines the most recent findings on cardiovascular impacts, sleep disturbance and children's learning.

European Environment Agency Good practice guide on noise exposure and potential health effects, 2010

1.1.111 This guidance aims to describe the effects on health of noise so that any effect on health can be predicted and calculated. This guide aims to raise the wariness about the health effects of noise and to provide tools to predict and assess these effects. It introduces the most common indicators to be used, the most common health effects documented. The guide also presents reference threshold levels for some of the indicators that have been related to health effects, and therefore should be avoided:

Table A12.2.7 Effects of noise on health and wellbeing with sufficient evidence

Effect Dimension Acoustic	Effect Dimension Acoustic	Effect Dimension Acoustic	Effect Dimension Acoustic	Effect Dimension Acoustic
Annoyance disturbance	Psychosocial, quality of life	Lden	42	Chronic
Self-reported sleep disturbance	Quality of life, somatic health	L_{night}	42	Chronic
Learning, memory	Performance	L_{eq}	50	Acute, chronic
Stress hormones	Stress Indicator	L_{max} L_{eq}	NA	Acute, chronic
Sleep (polysomnographic)	Arousal, motility, sleep quality	$L_{max, indoors}$	32	Acute chronic
Reported awakening	Sleep	$SEL_{indoors}$	53	Acute
Reported health	Wellbeing clinical health	L_{den}	50	Chronic
Hypertension	Physiology somatic health	L_{den}	50	Chronic
Ischaemic heart diseases	Clinical health	L_{den}	60	Chronic

* Lden and Lnight are defined as outside exposure levels. Lmax may be either internal or external as indicated.

** Level above which effects start to occur or start to rise above background.

World Health Organisation Burden of disease from environmental noise: Quantification of healthy life years lost in Europe, 2011

1.1.112 The WHO Burden of disease from environmental noise provides a methodology for measuring the burden of disease from environmental noise, including aviation using a process called the disability-adjusted-life-year (DALY) and summarises the evidence on the relationship between environmental noise and health effects. The DALY methodology measures the combined years lost due to premature death and the time lost due to years lived at less than full health.

Appendix 12.3 Methodology

The following sections provide further detail in support of the noise and vibration chapter with regards to the methodology to the assessment and data sources utilised.

Data Resources

Table A12.3.1 presents a summary of the data resources that were used both with regards to forming a baseline and undertaking the noise survey, as well as for purposes of assessing noise.

Table A12.3.1 Data Resources

Source	Data
Aerial imagery	Aerial imagery of the local area was obtained using Google Earth Pro version 7.1.7.2606. The aerial imagery was used to inform the relevant study area for the baseline sound survey, including identification of potential noise sensitive receptors (both residential and non-residential). It has also been used to identify locations further away from the airport, which may be overflown by arriving and/or departing aircraft.
CACI population dataset	Dataset for the identification of dwellings and other noise sensitive receptors within Study Areas and extents.
Address Point Data	Address point data obtained under license for this project from Emapsite was used to form the location of addresses, including non-residential receptors.
Historical meteorological data	Weather data was obtained from the Met Office for the previous 10 years, including information on wind direction and wind speed. The weather data has been used to inform parameters for noise modelling, including average ambient temperature, average air pressure, average humidity and average headwind speed. The average wind direction has been used to determine the modal split of runway direction.
Manston Airport Aircraft Night Noise Assessment Report (2010)	An assessment of aircraft night noise from future operations was undertaken by Bickerdike Allen Partners in 2010. The assessment was undertaken when the airport was previously open and assessed the potential noise effects of night-time operations. The report was reviewed to understand noise effects associated with the operation of Manston Airport and any conditions or limitations for the operation of the airport at that time.
Manston Airport Night Noise Assessment Review (2010)	On behalf of Thanet District Council (TDC), Bureau Veritas reviewed the Bickerdike Allen Partners night noise assessment. The review was undertaken to provide assurance to the local council of the assessment undertaken for the airport on plans for night-time operations. The report was reviewed to understand noise effects associated with the operation of Manston Airport and any conditions or limitations associated with the operation of the airport.
Manston Airport Noise Action Plan – First Draft (2014)	Prior to the airport closing, the airport was required to produce a Noise Action Plan (NAP), under the requirements of the *Environmental Noise (England) Regulations 2006*. The action plan was undertaken as part of the second round of noise action plans, due to the airport location and ability to affect noise exposure within the Thanet agglomeration. However only a draft NAP was produced as the airport closed before the NAP was adopted and approved by the relevant Secretary of State. The draft NAP included noise contours that were produced based on annual average airport operations and conditions in 2011. The noise contours represented sound exposure levels in terms of L_{den}, L_{day}, $L_{evening}$ and L_{night} and were produced to

Source	Data
	fulfil the former airport's commitments under the Regulations. The draft NAP was reviewed to inform the noise exposure associated with Manston Airport when previously operational and the noise controls and amelioration schemes that were in place.
Round 2 Strategic Noise Maps	Noise maps for the Thanet Agglomeration, as produced under the *Environmental Noise (England) Regulations 2006* have been reviewed. This include noise exposure levels for major roads and railways within the agglomeration and noise maps for 'major' roads and railways near the airport. These are considered to provide an indication of the level of noise exposure from these transport modes within the agglomeration. The noise maps include the A299, A28, A291 and Ashford to Ramsgate Railway Line
Manston Airport UK Aeronautical Information Publication, AIP (2005)	Details of airport's noise abatement and flight procedures from when previously operational have been reviewed to determine the locations previously overflown by aircraft.
Manston Airport Masterplan	Airport masterplan drawings have been produced for the promoter. The drawings set out potential airfield infrastructure. These drawings will be used to inform the construction and operational airside noise assessments.
Manston Airport construction programme	Information of construction methods, phasing and plant have been produced for the promoter. These have been used to inform a qualitative assessment of construction noise.
Indicative future airspace design procedures	Indicative future aircraft departure and arrival procedures have been produced for the promoter. These have been produced to inform the arrival and departure flight paths, including the design swathe.
Forecast of future aircraft movements	Forecasts of future aircraft movements have been produced for the promoter for the first year of operations until the twentieth year of operations. These have been reviewed to determine the forecast aircraft fleet mix for future operations.
Digital Terrain Mapping	Digital terrain mapping obtained under license for this project from Emapsite was used to form the local topography.

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Receptors

Table A12.3.2 presents further details on the location of receptors identified for the prediction and assessment of noise.

Table A12.3.2 Identified receptors for assessment

Receptor	Type of receptor	Location in relation to airport	Distance from site boundary	Reason for selection
Plumstone Road, Acol	Residential	North west	840m	Closest residential area to northwest of site
Alland Grange, Minster	Residential	North west	380m	Close residence to northwest boundary of airport and recommended for inclusion by PINS
Spitfire Way, Manston	Residential	North	<100m	Closest residential area to proposed access road
Bell Davies Drive (Woodchurch), Manston	Residential	North	<100m	Closest residential area to maintenance area and Woodchurch recommended for inclusion by PINS
Manston Court Road, Manston	Residential	North	<100m	Closest residential area to airport terminal building
High Street, Manston	Residential	North east	<100m	Closest residential area to easterly runway end
Kentmere Road, St Lawrence	Residential	East	480m	Closest residential area to east of site
King Arthur Road, Cliffsend	Residential	South east	<100m	Closest residential area to south east of site
Ivy Cottage Hill, Manston	Residential	South	120m	Closest residential area to south of site
Southall Close, Minster	Residential	South west	240m	Closest residential area to south west of site
Smugglers Close, Minster	Residential	West	<100m	Closest residential area to west of site
Manston Court/Haine Road, Newington	Residential	North east	1.2km	Reserved for mixed development in *Proposed Revisions to draft Local Plan (preferred options)*, 2017 (ref OL/TH/14/0050)
Shottendane Road, Manston	Residential	North	2.3km	Reserved for future residential development in *Proposed Revisions to draft Local Plan (preferred options)*, 2017
The Street, Acol	Residential	North west	1.2km	Survey location
Beamont Close, Manston	Residential	North	160m	Survey location
Manston Road, Manston	Residential	North east	500m	Survey location

Receptor	Type of receptor	Location in relation to airport	Distance from site boundary	Reason for selection
St John's Avenue, Ramsgate	Residential	North east	1.3km	Survey location
Cliff View Road, Cliffsend	Residential	South east	140m	Survey location
Tothill Street, Minster	Residential	South west	700m	Survey location
St Nicholas at Wade	Residential community	West	3 km	Observation location and likely to be overflown
Beltinge	Residential community	North	600m	Observation location and likely to be overflown
Avenue of Remembrance, Herne Bay	Residential community	West	13.4km	Observation location and likely to be overflown
Studd Hill, Herne Bay	Residential community	West	15.4km	Observation location and likely to be overflown
Sarre	Residential community	West	3.8km	Observation location and likely to be overflown
West Stourmouth	Residential community	South west	1 km	Observation location and likely to be overflown
Upstreet	Residential community	South west	800m	Observation location and likely to be overflown
Reculver	Residential community	North west	4.5km	Observation location and likely to be overflown
Birchington-on-Sea	Residential community	North	13.5km	Observation location and likely to be overflown
Staner Court, Ramsgate	Residential	East	880m	High-rise residential dwellings under final stages of westerly aircraft arrival route
St Lawrence	Residential community	East	11.5km	Observation location and likely to be overflown
Ramsgate	Residential community	West	0.4km	Observation location and likely to be overflown
Pegwell Bay	Residential community	South east	5.3km	Observation location and likely to be overflown

Table A12.3.3 presents the non-residential potential noise sensitive receptors used for the assessment

Table A12.3.3 Non-residential receptors

Receptor	Receptor Category	Address	Impact threshold (dB $L_{Aeq,16hr}$)
St. Laurence Junior School	Educational	Newington Road, Ramsgate, Kent, CT11 0QX	50
Chilton Primary School	Educational	Chilton Lane, Ramsgate, Kent, CT11 0LQ	50
Penzance Language School	Educational	Priory Rd, Ramsgate, Kent, CT11 9PG	50
Pinewood Studios	Acoustical	St. Augustines Road, Ramsgate, Kent, CT11 9PD	50
St. Augustines Rc Church	Worship	St Augustines Road, Ramsgate, Kent, CT11 9NY	50
Sailors Church	Worship	Military Road, Ramsgate, Kent, CT11 9LG	50
Manston School House Nursery	Educational	Preston Road, Ramsgate, Kent, CT12 5BA	50
Chatham & Clarendon Grammar School	Educational	Cavendish Street, Ramsgate, Kent, CT11 9AL	50
The Elms Nursery School	Educational	Richmond Road, Ramsgate, Kent, CT11 9QP	50
St. Nicholas At Wade C Of E Primary School	Educational	Down Barton Road, Birchington, Kent, CT7 0PY	50
Priory County Infant School	Educational	Cannon Road, Ramsgates, Kent, CT11 9XT	50
Churchill House School	Educational	Spencer Square, Ramsgate, Kent, CT11 9EQ	50
Masque Theatre School	Educational	Meeting St, Ramsgate, Kent, CT11 9RT	50
Fledgelings Nursery School	Educational	Chapel Road, Ramsgate, Kent, CT11 0BS	50
Ellington Cp School	Educational	High Street, Ramsgate, Kent, CT11 0QH	50
Christ Church School	Educational	London Road, Ramsgate, Kent, CT11 0ZZ	50
Newington Childrens Centre	Educational	Princess Margaret Avenue, Ramsgate, Kent, CT12 6HX	50
Christchurch Church	Worship	Vale Square, Ramsgate, Kent, CT11 9DE	50
Newington Community Primary School	Educational	Princess Margaret Avenue, Ramsgate, Kent, CT12 6HX	50
Old Priory School	Educational	Priory Road, Ramsgate, Kent, CT11 9PG	50
St. Laurence Junior School	Educational	Newington Rd, Ramsgate CT11 0QX	50
Minster Abbey	Worship	Minster Abbey, Church Street, Minster, Ramsgate CT12 4HQ	50
Spitfire & Hurricane Memorial Building	Community	Manston Rd, Ramsgate CT12 5DF	50
Mother Goose Nurseries	Educational	Bellevue Rd, Ramsgate CT11 8LB	50
Minster Library & Community Centre	Community	Monkton Rd, Minster, Ramsgate CT12 4EA	50
Newington Community	Community	Princess Margaret Avenue, Ramsgate CT12 6HX	50

Receptor	Receptor Category	Address	Impact threshold (dB $L_{Aeq,16hr}$)
Centre			
Village Hall	Community	High St, Ramsgate CT12 4BU	50
St Johns Ambulance	Healthcare	High St, Ramsgate CT12 4BU	50
Ramsgate Christian Fellowship	Worship	Station Approach Road, Ramsgate CT11 7RN	50
Pie Factory Music	Acoustical	Youth Centre, High Street, Ramsgate CT11 0QG	50
Newington Road Surgery	Healthcare	Newington Road, Ramsgate CT11 0QU	50

Modelling Overview

To facilitate the assessment of ground-based noise sources, a modelling exercise has been undertaken of the following:

- Construction noise – earthworks, fixed and mobile plant;
- Construction and operational noise – road traffic;
- Operational noise – aircraft noise (including aircraft air noise and airside noise); and
- Operational noise – industrial and commercial sound (fixed plant).

Ground-based noise sources have been modelled using three-dimensional information within proprietary noise modelling software (LimA v.11.2). Digital information has been incorporated into the model including a Digital Terrain Model (DTM), and datasets describing the location of buildings, bridges, barriers, and other obstacles to sound propagation.

Where direct measurement of construction vibration cannot be taken, empirical modelling techniques using spreadsheet models have been utilised (earthworks, fixed and mobile plant).

With respect to aircraft air noise, noise modelling exercises have been undertaken using the Federal Aviation Administration's (FAA) Integrated Noise Model (INM) v.7.0d and the FAA's Aviation Environmental Design Tool v2d (AEDT). Manston Airport was previously modelled using INM as were other airports undertaking airspace change proposals consistent with CAA's CAP 725 guidance, and for airport noise mapping under the Environmental Nosie Directive (2002/49/EC).

Construction Assessment Methodology

Direct Effects

Temporary direct impacts from airborne sound may be caused by construction activities such as demolition, earthworks, concrete paving, asphalt paving and building construction.

Potential effects have been assessed at the closest noise sensitive receptors to the proposed locations for specific extended or major construction activities for each phase of the development programme.

The assessments have been undertaken at locations that are representative of a number of dwellings or other sensitive receptors. For groups of properties, receptors are chosen to be representative of the worst case (most exposed) location in the group of properties. Where a building has multiple uses the assessment has been based on the most sensitive use.

Construction noise levels have been predicted as an $L_{pAeq,T}$ as a free-field level relating to a position 3.5m from any building. The predictions consider the variation in the working area for multiple activities for the period assessed. The assessment considers conservative, but realistic, daily noise levels calculated at a worst-case location, i.e. when the process is closest to the receptor. Noise levels could potentially be substantially lower on other days where the works is not as intense and as construction processes move progressively around the site. The resulting noise levels have been analysed to determine whether significance thresholds would be exceeded as the works take place close to the receptor.

Direct effects also include noise from construction traffic within the boundary of the site, which accounts for the majority of construction traffic transporting soil and earth between cut and fill areas, soil storage and the construction works.

Indirect effects

Indirect impacts of airborne noise could be caused by temporary changes to road traffic patterns on the existing road network during construction. An assessment has been completed for local and strategic roads in the vicinity of the Proposed Development used for the movement of materials. A screening assessment has been undertaken based on Design Manual for Roads methodology (DMRB). Forecast construction traffic will increase traffic flow on existing roads by less than 25% and there will not be a significant change in the number of HGVs using existing roads. This means that noise increases on existing roads during construction are expected to be less than1dB.

Construction Phasing

The construction of the development will span across four separate phases. Phase 1 will take place prior to the airfield re-opening whilst Phases 2-4 will take place whilst the airfield is fully operational. A general overview of the phases is as follows:

Phase 1: Eight aircraft cargo stands and 12,000m^2 of cargo warehousing completed by Year 2. This phase will also involve the rehabilitation of the runway and a new parallel taxiway; development of internal roads and parking; upgrading of the highway and access off site; demolition and refurbishment of existing buildings as well as construction of new buildings; and development of a new Fuel Farm.

Phase 2: Additional six aircraft cargo stands and 16,000m^2 of cargo warehousing completed by Year 5. This phase will also involve the extension of associated to lorry and car parking; construction of a new passenger terminal; and construction of a new aircraft maintenance hangar as well as demolition of the existing.

Phase 3: Additional two aircraft cargo stands and 14,000m^2 of cargo warehousing completed by Year 12. This phase will also involve the extension of associated lorry and car parking; the internal road will be constructed in its permanent alignment; and an additional aircraft maintenance hangar with an associated stand will be constructed with existing buildings adjacent to Spitfire Way to be demolished.

Phase 4: Additional three aircraft cargo stands and 23,000m^2 of cargo warehousing completed by Year 18. This phase will also involve the extension of associated lorry and car parking; an additional terminal building with an associated stand; an extension to the maintenance hangar with an associated stand; and an airside hardstand storage area.

During Phases 2, 3 and 4 some night time working will be required because works in certain areas cannot be carried out whilst the airport is operational.

Construction assumptions

This section provides information on the assumptions used to predict construction noise resulting from the Proposed Development using the methodology defined in BS 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites. Noise'.

Table A12.3.3 lists the main construction activities considered in the assessment.

Table A12.3.3 Construction activities considered in the noise predictions

Activities	Description
1	Cut and Fill
2	Concrete Paving
3	Asphalting
4	Building Construction
5	Demolition
6	Highways Improvements

Each phase of the construction works involves a combination of activities.

The approximate location and extent of the individual construction activities are shown in Figure 12.3a and Figure 12.3b of the main ES for each of the daytime and night-time construction phases respectively.

Each construction activity contains a number of sub-activities to make up the construction works. Table A12.3.4 to Table A12.3.26 detail the sound power levels estimated for each construction sub-activity for each phase.

The closest distance to each noise sensitive receptor from the construction activity for each phase is given in Table A12.3.27 to Table A12.3.30. It should be noted that this does not include for the compound areas or prospective haul routes.

A summary of the construction noise predictions for each phase is shown in Table A12.3.31 to Table A12.3.33.

Phase 1

Table A12.3.4 Assumed source sound power levels for works associated with cut and fill

Activity Sub-name	BS 5228 Source No.	Equipment	Pond and Business Park	Stands and Compound Area	Taxiways	% on-time	L_W dB(A)
Cut	C2.14	Tracked Excavator	2	2	1	83%	107
	C5.16	Dump truck	2	6	3	33%	109
	C2.45	Water pump	2	0	0	100%	93
	C6.28	Bulldozer	1	1	0	50%	113
Fill	C2.14	Tracked Excavator	1	1	1	83%	107
	C5.16	Dump truck	2	6	3	15%	109
	D3.112	Broken Concrete Tipper Truck	4 (tipping per hour)			66% (total)	108
	C6.28	Bulldozer	0	0	1	50%	113
	C5.19	Compactor	1	1	1	50%	107
Compound Area	C1.14	Mobile Crusher	1			100%	110
	Measured Data	Mobile Screens	1			100%	109
	C2.26	Wheeled Loader	1			83%	107
	C6.21	Site Haulage	1			83%	108
Breaking out for Concrete	C2.14	Tracked Excavator	1			83%	107
	C1.9	Hydraulic Breaker on Excavator	1			50%	118
	C5.16	Dump truck	1			33%	109
Haul Road	C5.16	Dump Truck	12 (trips per hour)			N/A	109

Table A12.3.5 Assumed source sound power levels for works associated with concrete paving

Activity Sub-name	BS 5228 Source No.	Equipment	Number	% on-time	L_W dB(A)
Concrete Paving	C4.27	Concrete Mixing Truck	4 (dispensing per hour)	100% (total)	107
	D8.20	Paving Train	1	83%	109
Compound Area	D6.11	Concrete Batching Plant	1	100%	108
	C2.26	Loading Shovel	1	83%	107
	C4.27	Concrete Mixer Truck	4 (filling per hour)	100% (total)	107
Haul Road	C4.27	Concrete Mixer Truck	8 (trips per hour)	N/A	107

Table A12.3.6 Assumed source sound power levels for works associated with asphalting

Activity Sub-name	BS 5228 Source No.	Equipment	Number	% on-time	L_W dB(A)
Runway Rehabilitation	C5.7	Road Planer	2	83%	110
	C5.30	Asphalt Paver and Lorry	2	75%	103
	C6.21	Road Lorries supplying Asphalt	6 (tipping per hour)	75%	103
	C5.19	Road Roller	2	50%	108
	C5.29	Vibratory Compactor	1	50%	110
Compound Area	D6.11	Asphalt Batching Plant	1	100%	108
	C2.26	Wheeled Loader	1	83%	107
Haul Road	C6.21	Road Lorries	12 (trips per hour)	N/A	108

Table A12.3.7 Assumed source sound power levels for works associated with building construction

Activity Sub-name	BS 5228 Source No.	Equipment	Number	% on-time	L_W dB(A)

Activity Sub-name	BS 5228 Source No.	Equipment	Number	% on-time	L_w dB(A)
New Cargo Warehousing	C4.46	Mobile Crane	2	83%	95
	C4.59	Mobile Extended Work Platform	2	83%	106
	C4.27	Concrete Mixer Truck	4 (dispensing per hour)	100% (total)	107
	C3.33	Welding Plant	1	50%	101
	Measured Data	Nut Runners	1	50%	105
Additional Plant	C4.65	Small Excavator	1	83%	99
	C5.30	Site Dumper	1	83%	104
	C5.54	Site Forklift	1	83%	107
	C4.88	Pump	1	100%	96
	C4.78	Generator	1	100%	94
	C4.86	Lighting Rig	1	100%	93
	C5.5	Compressor	1	100%	103
Haul Road	C4.27	Concrete Mixer Truck	4 (trips per hour)	N/A	107
Other Airport Buildings	C4.46	Mobile Crane	1	83%	95
	C4.59	Mobile Extended Work Platform	1	83%	106
		Concrete Mixer Truck	1	83%	107
	C4.29	Concrete Pumps	1	83%	108
	C6.21	Road Lorries supplying Building Material	2	33%	108
Haul Road	C4.27	Concrete Mixer Truck	4 (trips per hour)	N/A	107
Haul Road	C6.21	Road Lorries	4 (trips per hour)	N/A	108

Table A12.3.8 Assumed source sound power levels for works associated with building demolition

Activity Sub-name	BS 5228 Source No.	Equipment	Number	% on-time	L_W dB(A)
Demolition Works	C2.14	Tracked Excavator	1	83%	107
	C5.16	Dump truck	1	33%	109
	C4.46	Mobile Crane	1	83%	95
	C4.59	Mobile Extended Work Platform	1	83%	106
	C4.78	Generator	1	100%	94
	C6.28	Bulldozer	1	50%	113
Haul Road	C5.16	Dump Trucks	4 (trips per hour)	N/A	109

Table A12.3.9 Assumed source sound power levels for works associated with highways improvements

Activity Sub-name	BS 5228 Source No.	Equipment	Number	% on-time	L_W dB(A)
Road Works	C5.7	Road Planer	1	83%	110
	C5.30	Asphalt Paver and Lorry	1	75%	103
	C6.21	Road Lorries supplying Asphalt	3 (tipping per hour)	75%	103
	C5.19	Road Roller	1	50%	108

Phase 2

Table A12.3.10 Assumed source sound power levels for works associated with cut and fill

Activity Sub-name	BS 5228 Source No.	Equipment	Business Park	Stands and Parking	% on-time	L_W dB(A)
Cut	C2.14	Tracked Excavator	2	1	83%	107
	C5.16	Dump truck	2	3	33%	109
	C6.28	Bulldozer	1	1	50%	113
Fill	C2.14	Tracked Excavator	1	1	83%	107
	C5.16	Dump truck	2	3	15%	109
	D3.112	Broken Concrete Tipper Truck	4 (tipping per hour)		66% (total)	108
	C5.19	Compactor	1	1	50%	107
Compound Area	C1.14	Mobile Crusher	1		100%	110
	Measured Data	Mobile Screens	1		100%	109
	C2.26	Wheeled Loader	1		100%	107
	C6.21	Site Haulage	1		100%	108
Breaking out for Concrete	C2.14	Tracked Excavator	1		83%	107
	C1.9	Hydraulic Breaker on Excavator	1		50%	118
	C5.16	Dump truck	1		33%	109
Haul Road	C5.16	Dump Truck	10 (trips per hour)		N/A	109

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Table A12.3.11 Assumed source sound power levels for works associated with concrete paving

Activity Sub-name	BS 5228 Source No.	Equipment	Number	% on-time	L_W dB(A)
Concrete Paving	C4.27	Concrete Mixing Truck	4 (dispensing per hour)	100% (total)	107
	D8.20	Paving Train	1	83%	109
Compound Area	D6.11	Concrete Batching Plant	1	100%	108
	C2.26	Loading Shovel	1	83%	107
	C4.27	Concrete Mixer Truck	4 (filling per hour)	100% (total)	107
Haul Road	C4.27	Concrete Mixer Truck	8 (trips per hour)	N/A	107

Table A12.3.12 Assumed source sound power levels for works associated with building construction

Activity Sub-name	BS 5228 Source No.	Equipment	Number	% on-time	L_W dB(A)
New Cargo Warehousing	C4.46	Mobile Crane	2	83%	95
	C4.59	Mobile Extended Work Platform	2	83%	106
	C4.27	Concrete Mixer Truck	4 (dispensing per hour)	100% (total)	107
	C3.33	Welding Plant	1	50%	101
	Measured Data	Nut Runners	1	50%	105
Additional Plant	C4.65	Small Excavator	1	83%	99
	C5.30	Site Dumper	1	83%	104
	C5.54	Site Forklift	1	83%	107
	C4.88	Pump	1	100%	96
	C4.78	Generator	1	100%	94
	C4.86	Lighting Rig	1	100%	93
	C5.5	Compressor	1	100%	103
Haul Road	C4.27	Concrete Mixer Truck	4 (trips per hour)	N/A	107
Other Airport Buildings	C4.46	Mobile Crane	1	83%	95
	C4.59	Mobile Extended Work Platform	1	83%	106
	C4.27	Concrete Mixer Truck	1	83%	107
	C4.29	Concrete Pumps	1	83%	108
	C6.21	Road Lorries supplying Building Material	2	33%	108
Haul Road	C4.27	Concrete Mixer Truck	4 (trips per hour)	N/A	107
Haul Road	C6.21	Road Lorries	4 (trips per hour)	N/A	108

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Table A12.3.13 Assumed source sound power levels for works associated with building demolition

Activity Sub-name	BS 5228 Source No.	Equipment	Number	% on-time	L_W dB(A)
Demolition Works	C2.14	Tracked Excavator	1	83%	107
	C5.16	Dump truck	1	33%	109
	C4.46	Mobile Crane	1	83%	95
	C4.59	Mobile Extended Work Platform	1	83%	106
	C4.78	Generator	1	100%	94
	C6.28	Bulldozer	1	50%	113
Haul Road	C5.16	Dump Trucks	4 (trips per hour)	N/A	109

Phase 3

Table A12.3.14 Assumed source sound power levels for works associated with cut and fill

Activity Sub-name	BS 5228 Source No.	Equipment	Pond and Stands	Other Hard Standing	% on-time	L_W dB(A)
Cut	C2.14	Tracked Excavator	2	1	83%	107
	C5.16	Dump truck	2	3	33%	109
	C2.45	Water pump	2	0	100%	93
	C6.28	Bulldozer	1	1	50%	113
Fill	C2.14	Tracked Excavator	1	1	83%	107
	C5.16	Dump truck	2	3	15%	109
	D3.112	Broken Concrete Tipper Truck	4 (tipping per hour)		66% (total)	108
	C5.19	Compactor	1	1	50%	107
Compound Area	C1.14	Mobile Crusher	1		100%	110
	Measured Data	Mobile Screens	1		100%	109
	C2.26	Wheeled Loader	1		100%	107
	C6.21	Site Haulage	1		100%	108
Breaking out for Concrete	C2.14	Tracked Excavator	1		83%	107
	C1.9	Hydraulic Breaker on Excavator	1		50%	118
	C5.16	Dump truck	1		33%	109
Haul Road	C5.16	Dump Truck	10 (trips per hour)		N/A	109

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Table A12.3.15 Assumed source sound power levels for works associated with concrete paving

Activity Sub-name	BS 5228 Source No.	Equipment	Number	% on-time	L_W dB(A)
Concrete Paving	C4.27	Concrete Mixing Truck	4 (dispensing per hour)	100% (total)	107
	D8.20	Paving Train	1	83%	109
Compound Area	D6.11	Concrete Batching Plant	1	100%	108
	C2.26	Loading Shovel	1	83%	107
	C4.27	Concrete Mixer Truck	4 (filling per hour)	100% (total)	107
Haul Road	C4.27	Concrete Mixer Truck	8 (trips per hour)	N/A	107

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Table A12.3.16 Assumed source sound power levels for works associated with building construction

Activity Sub-name	BS 5228 Source No.	Equipment	Number	% on-time	L_W dB(A)
New Cargo Warehousing	C4.46	Mobile Crane	2	83%	95
	C4.59	Mobile Extended Work Platform	2	83%	106
	C4.27	Concrete Mixer Truck	4 (dispensing per hour)	100% (total)	107
	C3.33	Welding Plant	1	50%	101
	Measured Data	Nut Runners	1	50%	105
Additional Plant	C4.65	Small Excavator	1	83%	99
	C5.30	Site Dumper	1	83%	104
	C5.54	Site Forklift	1	83%	107
	C4.88	Pump	1	100%	96
	C4.78	Generator	1	100%	94
	C4.86	Lighting Rig	1	100%	93
	C5.5	Compressor	1	100%	103
Haul Road	C4.27	Concrete Mixer Truck	4 (trips per hour)	N/A	107
Other Airport Buildings	C4.46	Mobile Crane	1	83%	95
	C4.59	Mobile Extended Work Platform	1	83%	106
	C4.27	Concrete Mixer Truck	1	83%	107
	C4.29	Concrete Pumps	1	83%	108
	C6.21	Road Lorries supplying Building Material	2	33%	108
Haul Road	C4.27	Concrete Mixer Truck	4 (trips per hour)	N/A	107
Haul Road	C6.21	Road Lorries	4 (trips per hour)	N/A	108

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Table A12.3.17 Assumed source sound power levels for works associated with building demolition

Activity Sub-name	BS 5228 Source No.	Equipment	Number	% on-time	L_W dB(A)
Demolition Works	C2.14	Tracked Excavator	1	83%	107
	C5.16	Dump truck	1	33%	109
	C4.46	Mobile Crane	1	83%	95
	C4.59	Mobile Extended Work Platform	1	83%	106
	C4.78	Generator	1	100%	94
	C6.28	Bulldozer	1	50%	113
Haul Road	C5.16	Dump Trucks	4 (trips per hour)	N/A	109

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Phase 4

Table A12.3.18 Assumed source sound power levels for works associated with cut and fill

Activity Sub-name	BS 5228 Source No.	Equipment	Stands	% on-time	L_W dB(A)
Cut	C2.14	Tracked Excavator	2	83%	107
	C5.16	Dump truck	2	33%	109
	C6.28	Bulldozer	1	50%	113
Fill	C2.14	Tracked Excavator	1	83%	107
	C5.16	Dump truck	2	15%	109
	D3.112	Broken Concrete Tipper Truck	4 (tipping per hour)	66% (total)	108
	C5.19	Compactor	1	50%	107
Compound Area	C1.14	Mobile Crusher	1	100%	110
	Measured Data	Mobile Screens	1	100%	109
	C2.26	Wheeled Loader	1	100%	107
	C6.21	Site Haulage	1	100%	108
Breaking out for Concrete	C2.14	Tracked Excavator	1	83%	107
	C1.9	Hydraulic Breaker on Excavator	1	50%	118
	C5.16	Dump truck	1	33%	109
Haul Road	C5.16	Dump Truck	8 (trips per hour)	N/A	109

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Table A12.3.19 Assumed source sound power levels for works associated with concrete paving

Activity Sub-name	BS 5228 Source No.	Equipment	Number	% on-time	L_W dB(A)
Concrete Paving	C4.27	Concrete Mixing Truck	4 (dispensing per hour)	100% (total)	107
	D8.20	Paving Train	1	83%	109
Compound Area	D6.11	Concrete Batching Plant	1	100%	108
	C2.26	Loading Shovel	1	83%	107
	C4.27	Concrete Mixer Truck	4 (filling per hour)	100% (total)	107
Haul Road	C4.27	Concrete Mixer Truck	8 (trips per hour)	N/A	107

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Table A12.3.20 Assumed source sound power levels for works associated with building construction

Activity Sub-name	BS 5228 Source No.	Equipment	Number	% on-time	L_W dB(A)
New Cargo Warehousing	C4.46	Mobile Crane	2	83%	95
	C4.59	Mobile Extended Work Platform	2	83%	106
	C4.27	Concrete Mixer Truck	4 (dispensing per hour)	100% (total)	107
	C3.33	Welding Plant	1	50%	101
	Measured Data	Nut Runners	1	50%	105
Additional Plant	C4.65	Small Excavator	1	83%	99
	C5.30	Site Dumper	1	83%	104
	C5.54	Site Forklift	1	83%	107
	C4.88	Pump	1	100%	96
	C4.78	Generator	1	100%	94
	C4.86	Lighting Rig	1	100%	93
	C5.5	Compressor	1	100%	103
Haul Road	C4.27	Concrete Mixer Truck	4 (trips per hour)	N/A	107
Other Airport Buildings	C4.46	Mobile Crane	1	83%	95
	C4.59	Mobile Extended Work Platform	1	83%	106
	C4.27	Concrete Mixer Truck	1	83%	107
	C4.29	Concrete Pumps	1	83%	108
	C6.21	Road Lorries supplying Building Material	2	33%	108
Haul Road	C4.27	Concrete Mixer Truck	4 (trips per hour)	N/A	107
Haul Road	C6.21	Road Lorries	4 (trips per hour)	N/A	108

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Phase 2 – Evening and Night-time

Table A12.3.21 Assumed source sound power levels for works associated with cut and fill

Activity Sub-name	BS 5228 Source No.	Equipment	Main Stands	Other Stands	% on-time	L_W dB(A)
Cut	C2.14	Tracked Excavator	2	1	83%	107
	C5.16	Dump truck	2	2	33%	109
	C6.28	Bulldozer	1	1	50%	113
Fill	C2.14	Tracked Excavator	1	1	83%	107
	C5.16	Dump truck	2	2	15%	109
	D3.112	Broken Concrete Tipper Truck	2 (tipping per hour)		66% (total)	108
	C5.19	Compactor	1	1	50%	107
Compound Area	C2.26	Wheeled Loader	1		83%	107
	C6.21	Site Haulage	1		83%	108
Haul Road	C5.16	Dump Truck	6 (trips per hour)		N/A	109

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Table A12.3.22 Assumed source sound power levels for works associated with concrete paving

Activity Sub-name	BS 5228 Source No.	Equipment	Number	% on-time	L_W dB(A)
Concrete Paving	C4.27	Concrete Mixing Truck	4 (dispensing per hour)	100% (total)	107
	D8.20	Paving Train	1	83%	109
Compound Area	D6.11	Concrete Batching Plant	1	100%	108
	C2.26	Loading Shovel	1	83%	107
	C4.27	Concrete Mixer Truck	4 (filling per hour)	100% (total)	107
Haul Road	C4.27	Concrete Mixer Truck	8 (trips per hour)	N/A	107
Additional Plant	C4.65	Small Excavator	1	83%	99
	C5.30	Site Dumper	1	83%	104
	C5.54	Site Forklift	1	83%	107
	C4.88	Pump	1	100%	96
	C4.78	Generator	3	100%	94
	C4.86	Lighting Rig	3	100%	93
	C5.5	Compressor	1	100%	103

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Phase 3 – Evening and Night-time

Table A12.3.23 Assumed source sound power levels for works associated with cut and fill

Activity Sub-name	BS 5228 Source No.	Equipment	Main Stands	Other Stands	% on-time	L_W dB(A)
Cut	C2.14	Tracked Excavator	2	1	83%	107
	C5.16	Dump truck	2	2	33%	109
	C6.28	Bulldozer	1	1	50%	113
Fill	C2.14	Tracked Excavator	1	1	83%	107
	C5.16	Dump truck	2	2	15%	109
	D3.112	Broken Concrete Tipper Truck	2 (tipping per hour)		66% (total)	108
	C5.19	Compactor	1	1	50%	107
Compound Area	C2.26	Wheeled Loader	1		83%	107
	C6.21	Site Haulage	1		83%	108
Haul Road	C5.16	Dump Truck	6 (trips per hour)		N/A	109

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Table A12.3.24 Assumed source sound power levels for works associated with concrete paving

Activity Sub-name	BS 5228 Source No.	Equipment	Number	% on-time	L_W dB(A)
Concrete Paving	C4.27	Concrete Mixing Truck	4 (dispensing per hour)	100% (total)	107
	D8.20	Paving Train	1	83%	109
Compound Area	D6.11	Concrete Batching Plant	1	100%	108
	C2.26	Loading Shovel	1	83%	107
	C4.27	Concrete Mixer Truck	4 (filling per hour)	100% (total)	107
Haul Road	C4.27	Concrete Mixer Truck	8 (trips per hour)	N/A	107
Additional Plant	C4.65	Small Excavator	1	83%	99
	C5.30	Site Dumper	1	83%	104
	C5.54	Site Forklift	1	83%	107
	C4.88	Pump	1	100%	96
	C4.78	Generator	3	100%	94
	C4.86	Lighting Rig	3	100%	93
	C5.5	Compressor	1	100%	103

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Phase 4 – Evening and Night-time

Table A12.3.25 Assumed source sound power levels for works associated with cut and fill

Activity Sub-name	BS 5228 Source No.	Equipment	Main Stands	% on-time	L_W dB(A)
Cut	C2.14	Tracked Excavator	2	83%	107
	C5.16	Dump truck	2	33%	109
	C6.28	Bulldozer	1	50%	113
Fill	C2.14	Tracked Excavator	1	83%	107
	C5.16	Dump truck	2	15%	109
	D3.112	Broken Concrete Tipper Truck	2 (tipping per hour)	66% (total)	108
	C5.19	Compactor	1	50%	107
Compound Area	C2.26	Wheeled Loader	1	83%	107
	C6.21	Site Haulage	1	83%	108
Haul Road	C5.16	Dump Truck	6 (trips per hour)	N/A	109

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Table A12.3.26 Assumed source sound power levels for works associated with concrete paving

Activity Sub-name	BS 5228 Source No.	Equipment	Number	% on-time	L_W dB(A)
Concrete Paving	C4.27	Concrete Mixing Truck	4 (dispensing per hour)	100% (total)	107
	D8.20	Paving Train	1	83%	109
Compound Area	D6.11	Concrete Batching Plant	1	100%	108
	C2.26	Loading Shovel	1	83%	107
	C4.27	Concrete Mixer Truck	4 (filling per hour)	100% (total)	107
Haul Road	C4.27	Concrete Mixer Truck	8 (trips per hour)	N/A	107
Additional Plant	C4.65	Small Excavator	1	83%	99
	C5.30	Site Dumper	1	83%	104
	C5.54	Site Forklift	1	83%	107
	C4.88	Pump	1	100%	96
	C4.78	Generator	3	100%	94
	C4.86	Lighting Rig	3	100%	93
	C5.5	Compressor	1	100%	103

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Table A12.3.27 Closest distance adopted from each construction activity to receiver (m) – Phase 1

Receiver[2]	Construction Activity[1]					
	1	2	3	4	5	6
Bell Davis Drive	200	200	850	580	700	100
Spitfire Way	280	280	500	140	400	100
Smugglers Close	780	780	1240	1450	1950	1100
Southall Close	820	820	1100	1460	1960	1140
Ivy Cottage Hill	580	580	400	720	1140	740
King Arthur Road	360 B	360 B	800 B	70 B	1100 B	1200 B
High Street	290 A	290 A	720 A	340 A	630 A	660 A
Manston Court Road	140	140	1020	140	340	230
Manston Road	160	160	1440	370	750	320

[1] refer to Table A12.3.3
[2] as shown in Figure 12.3a
A includes a 5dB reduction for local screening or site mitigation for some or all of works associated with activity
B includes a 10dB reduction for local screening or site mitigation for some or all of works associated with activity

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Table A12.3.28 Closest distance adopted from each construction activity to receiver (m) – Phase 2

Receiver[2]	Construction Activity[1] - Daytime				Construction Activity[1] – Evening and Night-time	
	1	2	4	5	1	2
Bell Davis Drive	480 B	480	440	920	820	480
Spitfire Way	900 B	900	800	1250	1200	680
Smugglers Close	2460 B	2460	2340	2760	2700	2130
Southall Close	2450 B	2450	2320	2720	2670	2080
Ivy Cottage Hill	1460 B	1460	1260	1580	1500	980
King Arthur Road	840 B	840 B	750 B	1020 B	730 B	800 B
High Street	430 A	430 A	460 A	620 A	450 A	320 A
Manston Court Road	240 B	240	240 B	560 B	420 B	420 B
Manston Road	140 B	140	140 B	930 B	720 B	720 B

[1] refer to Table A12.3.3
[2] as shown in Figure 12.3a
A includes a 5dB reduction for local screening or site mitigation for some or all of works associated with activity
B includes a 10dB reduction for local screening or site mitigation for some or all of works associated with activity

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Table A12.3.29 Closest distance adopted from each construction activity to receiver (m) – Phase 3

Receiver[2]	Construction Activity[1] - Daytime				Construction Activity[1] – Evening and Night-time	
	1	2	4	5	1	2
Bell Davis Drive	100 A	100 A	290 A	200 A	280 A	280 A
Spitfire Way	160 A	160 A	630 A	230 A	300 A	240 A
Smugglers Close	1740	1740	2200	1790	1670	1670
Southall Close	1750	1750	2200	1800	1670	1670
Ivy Cottage Hill	850	850	1170	910	760	760
King Arthur Road	1680 B	1680 B	800 B	1920 B	800 B	800 B
High Street	1040 A	1040 A	580 A	1630 A	550 A	550 A
Manston Court Road	670 B	670 B	610 B	1300 B	700 B	700 B
Manston Road	650 B	650 B	860 B	1240 B	1060 B	1060 B

[1] refer to Table A12.3.3
[2] as shown in Figure 12.3a
A includes a 5dB reduction for local screening or site mitigation for some or all of works associated with activity
B includes a 10dB reduction for local screening or site mitigation for some or all of works associated with activity

Table A12.3.30 Closest distance adopted from each construction activity to receiver (m) – Phase 4

Receiver[2]	Construction Activity[1] - Daytime			Construction Activity[1] – Evening and Night-time	
	1	2	4	1	2
Bell Davis Drive	390 A	100 A	100 A	420 A	360 A
Spitfire Way	120 A	150 A	450 A	220 A	230 A
Smugglers Close	1600	1630	2000	1620	1660
Southall Close	1600	1650	2010	1590	1640
Ivy Cottage Hill	750	870	1050	700	720
King Arthur Road	1010 B	750 B	820 B	1050 B	1050 B
High Street	650 A	300 A	530 A	720 A	720 A
Manston Court Road	550 B	370 B	360 B	570 B	570 B
Manston Road	880 B	840 B	750 B	870 B	870 B

[1] refer to
[2] as shown in Figure 12.3a
A includes a 5dB reduction for local screening or site mitigation for some or all of works associated with activity
B includes a 10dB reduction for local screening or site mitigation for some or all of works associated with activity

Table A12.3.31 Daytime construction noise assessment (Weekdays 0800 to 1800 and Saturdays between 0800 and 1300)

Receptor Location	Baseline			Phase 1		Phase 2		Phase 3		Phase 4	
	Ambient Noise Levels (dB L_{Aeq})	**ABC Category (BS 5228)**	**ABC Threshold (dB L_{Aeq})**	**Construction noise level during loudest activity (dB L_{Aeq})**	**Construction Activity** (Table A12.3.3)	**Construction noise level during loudest activity (dB L_{Aeq})**	**Construction Activity** (Table A12.3.3)	**Construction noise level during loudest activity (dB L_{Aeq})**	**Construction Activity** (Table A12.3.3)	**Construction noise level during loudest activity (dB L_{Aeq})**	**Construction Activity** (Table A12.3.3)
Bell Davis Drive	52	A	65	63	1	56	1	62	1	59	4
Spitfire Way	52	A	65	63	7	54	1	61	1	65	1
Smugglers Close	53	A	65	58	1	57	1	57	1	52	1
Southall Close	53	A	65	52	1	49	1	49	1	47	1
Ivy Cottage Hill	53	A	65	55	1	51	1	52	1	52	1
King Arthur Road	52	A	65	57	6	55	1	55	1	54	1
High Street	53	A	65	59	1	52	1	54	1	55	1
Manston Court Road	53	A	65	65	1	60	1	50	1	50	1
Manston Road	53	A	65	65	1	61	1	45	1	44	1

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Table A12.3.32 Evening construction noise assessment (Weekdays 1900 to 2300 and Saturdays 1300 to 2300)

Receptor Location	Baseline			Phase 2		Phase 3		Phase 4	
	Ambient Noise Levels (dB L_{Aeq})	**ABC Category (BS 5228)**	**ABC Threshold (dB L_{Aeq})**	**Construction noise level during loudest activity (dB L_{Aeq})**	**Construction Activity** (Table A12.3.3)	**Construction noise level during loudest activity (dB L_{Aeq})**	**Construction Activity** (Table A12.3.3)	**Construction noise level during loudest activity (dB L_{Aeq})**	**Construction Activity** Table A12.3.3)
Bell Davis Drive	50	A	55	47	2	53	1	50	1
Spitfire Way	50	A	55	46	2	53	1	55	1
Smugglers Close	54	B	60	35	2	39	1	39	1
Southall Close	54	B	60	35	2	39	1	39	1
Ivy Cottage Hill	54	B	60	42	2	46	1	47	1
King Arthur Road	50	A	55	40	1	40	1	47	1
High Street	48	A	55	51	2	50	2	50	2
Manston Court Road	48	A	55	45	1	43	1	43	1
Manston Road	48	A	55	40	1	39	1	40	1

Table A12.3.33 Night-time construction noise assessment (Weekdays 2300 to 0700)

Receptor Location	Baseline			Phase 2		Phase 3		Phase 4	
	Ambient Noise Levels (dB L_{Aeq})	**ABC Category (BS 5228)**	**ABC Threshold (dB L_{Aeq})**	**Construction noise level during loudest activity (dB L_{Aeq})**	**Construction Activity** (Table A12.3.3)	**Construction noise level during loudest activity (dB L_{Aeq})**	**Construction Activity** (Table A12.3.3)	**Construction noise level during loudest activity (dB L_{Aeq})**	**Construction Activity** (Table A12.3.3)
Bell Davis	45	B	50	47	2	53	1	50	1

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Receptor Location	Baseline			Phase 2		Phase 3		Phase 4	
	Ambient Noise Levels (dB L_{Aeq})	**ABC Category (BS 5228)**	**ABC Threshold (dB L_{Aeq})**	**Construction noise level during loudest activity (dB L_{Aeq})**	**Construction Activity** (Table A12.3.3)	**Construction noise level during loudest activity (dB L_{Aeq})**	**Construction Activity** (Table A12.3.3)	**Construction noise level during loudest activity (dB L_{Aeq})**	**Construction Activity** (Table A12.3.3)
Drive									
Spitfire Way	45	B	50	46	2	53	1	55	1
Smugglers Close	48	C	55	35	2	39	1	39	1
Southall Close	48	C	55	35	2	39	1	39	1
Ivy Cottage Hill	48	C	55	42	2	46	1	47	1
King Arthur Road	47	B	50	40	1	40	1	47	1
High Street	46	B	50	51	2	50	2	50	2
Manston Court Road	46	B	50	45	1	43	1	43	1
Manston Road	46	B	50	40	1	39	1	40	1

Traffic Assessment Methodology

The assessment scenarios and extents are consistent with the advice set out within The Highways Agency (now Highways England) DMRB. The baseline year and future assessment year have been selected to identify the periods when likely noise effects from road traffic would be greatest. The future assessment year has been selected to be representative of the road traffic flows during the busiest construction periods and the periods immediately after the commissioning of the Proposed Development (both 'short-term'), and the greatest traffic flows in Year 20 (2039[1]) year after opening ('long-term').

The objective of the assessment is to gain an understanding of the noise climate both with and without the project, referred to as the 'Do-Something' and 'Do-Minimum' scenarios respectively.

For each of the future assessment years, a minimum of the following scenarios will be considered:

- Do-Minimum scenario in the baseline year against Do-Minimum in the future assessment(s) year (long-term);
- Do-Minimum scenario in the baseline year against Do-Something scenario in the baseline year (short-term); and
- Do-Minimum scenario in the baseline year against Do-Something in the future assessment year (long-term).

In addition to the scenarios outlined above, the assessment takes into account the absolute predicted road traffic noise levels at selected receptors.

The extents of the road traffic noise model are consistent with the guidance set out within DMRB (2011), being dictated by both distances from 'affected routes' and the likely magnitude of change on those routes.

The affected routes are generally defined as:

- All routes that have been bypassed or improved, any proposed new routes or where the road has altered the alignment of any existing carriageway;
- All road segments that were predicted to experience a 25% increase or 20% decrease in vehicle flows, and/or a noticeable change in %HGV content, and all roads within 2km of these;
- All routes where there has been a change in traffic speed or proportion of heavy goods vehicles which would lead to a 1dB change in road traffic noise levels; and
- Construction traffic haul routes (on public roads).

It is considered that locations within 1km of the affected routes could be affected by road traffic noise and therefore the road traffic noise model is based upon extents of 1km around the affected routes.

The calculation of construction and operational road traffic noise is undertaken with reference to the following guidance documents:

- DofT's document 'Calculation of Road Traffic Noise' (CRTN, 1988); and
- Transport and Road Research Laboratory 'Converting the UK traffic noise index $L_{A10,18hr}$ to EU noise indices for noise mapping' (TRL PR/SE/451/02, 2002).

The data used for the traffic noise assessment is as follows:

[1] It is acknowledged that Year 20 is not consistent with the methodology presented in DMRB which requires noise to be assessed in the 'long-term' and typically within a 15-year period. However, Year 20 has been considered for this assessment for consistency with the aircraft noise assessment.

Table A12.3.34 Year 2 Traffic Data and Calculated Noise Level ($L_{A10,\ 18\ hour}$) at 10 metres

Road	Speed (kph)	Do nothing (Baseline)			Do something (Baseline + construction traffic)			Change in BNL dB $L_{A10,18h}$
		Flow (vehicles AAWT)	%HGV	BNL dB $L_{A10,18h}$	Flow (vehicles)	%HGV	BNL dB $L_{A10,18h}$	
A256, south of the junction with Sandwich Road/Jutes Lane	80	32739	13	77.6	33067	13	77.6	0.0
A299, east of the Sandwich Road/A256 junction	64	26262	11	75.1	26378	11	75.1	0.0
B2050 Manston Road, east of junction with Princess Margaret Avenue	48	12434	7	69.7	12521	7	69.8	0.0
A254 Margate Road, south of the junction with Coxes Lane/Highfield Road	48	18480	8	71.6	18507	8	71.6	0.0
A256 Westwood Road, west of the junction with Northwood Road	48	25433	6	72.5	25670	6	72.5	0.0
A254 Ramsgate Road, south of the junction with Farley Road	48	25303	8	73.0	25303	8	73.0	0.0
A254 Ramsgate Road, near junction with Connaught Road	48	12496	11	70.6	12496	11	70.6	0.0
A28 Canterbury Road, east of the junction with Hartsdown Road	48	24947	7	72.7	24958	7	72.7	0.0
A28 Canterbury Road, east of junction with Domneva Road	48	24103	13	73.8	24103	13	73.8	0.0

Road	Speed (kph)	Do nothing (Baseline)			Do something (Baseline + construction traffic)			Change in BNL dB $L_{A10,18h}$
		Flow (vehicles AAWT)	%HGV	BNL dB $L_{A10,18h}$	Flow (vehicles)	%HGV	BNL dB $L_{A10,18h}$	
A299 Thanet Way, west of the roundabout junction with A28/Potten Street Road	112	39551	17	81.5	40234	18	81.6	0.2
A28 Canterbury Way, south west of the junction with Manor Road/Orchard lane	64	5954	14	69.1	5963	14	69.1	0.0
A253, west of the junction with Orchard Lane/Monkton Street	96	8831	12	73.1	8831	12	73.1	0.0
A299 Hengist Way, east of the roundabout junction with Tothill Street/B2190 Spitfire Way	112	30284	17	80.3	30318	17	80.3	0.0
B2190 Spitfire Way, east of the junction with Alland Grange Lane	96	11043	16	74.6	11763	19	75.2	0.6
Minster Road, south east of the junction with Plumstone Road	48	6656	11	67.9	6657	11	67.9	0.0
B2050 Manston Road, south east of the junction with Shottendane Road	96	6532	10	71.4	6713	9	71.5	0.1
Shottendane Road, north east of the junction with Park Lane	96	9849	13	73.7	9849	13	73.7	0.0
Manston Road, north of junction with Bramble Lane	96	4906	15	71.0	5090	15	71.0	0.1

Road	Speed (kph)	Do nothing (Baseline)			Do something (Baseline + construction traffic)			Change in BNL dB $L_{A10,18h}$
		Flow (vehicles AAWT)	%HGV	BNL dB $L_{A10,18h}$	Flow (vehicles)	%HGV	BNL dB $L_{A10,18h}$	
Manston Road, south of junction with Vincent Road	96	6246	12	71.6	6430	12	71.6	0.1
Manston Court Road,east of Valley Road	48	4909	10	66.3	5107	10	66.4	0.1
Manston Court Road,south of the junction with Preston Road	96	2911	12	68.3	3109	11	68.4	0.2
B2050 Manston Road, west of the junction with Greensole Lane	48	11203	11	70.1	11823	10	70.2	0.1

Table A12.3.35 Year 6 Traffic Data and Calculated Noise Level ($L_{A10,\ 18\ hour}$) at 10 metres

Road	Speed (kph)	Do nothing (Baseline)			Do something (Baseline + construction traffic)			Change in BNL dB $L_{A10,18h}$
		Flow (vehicles AAWT)	%HGV	BNL dB $L_{A10,18h}$	Flow (vehicles)	%HGV	BNL dB $L_{A10,18h}$	
A256, south of the junction with Sandwich Road/Jutes Lane	80	34215	13	77.8	35346	13	77.9	0.1
A299, east of the Sandwich Road/A256 junction	64	27436	11	75.3	27816	11	75.4	0.0
B2050 Manston Road, east of junction with Princess Margaret Avenue	48	12977	8	70.0	13281	7	70.0	0.1
A254 Margate Road, south of the junction with Coxes Lane/Highfield Road	48	19290	8	71.9	19376	8	71.9	0.0
A256 Westwood Road, west of the junction with Northwood Road	48	26534	6	72.7	27079	6	72.8	0.1
A254 Ramsgate Road, south of the junction with Farley Road	48	26412	8	73.2	26412	8	73.2	0.0
A254 Ramsgate Road, near junction with Connaught Road	48	13053	11	70.8	13053	11	70.8	0.0
A28 Canterbury Road, east of the junction with Hartsdown Road	48	26036	7	73.0	26059	7	73.0	0.0
A28 Canterbury Road, east of junction with Domneva Road	48	25190	13	74.1	25190	13	74.1	0.0
A299 Thanet Way, west of the roundabout	112	41380	18	81.7	43104	18	81.9	0.2

Road	Speed (kph)	Do nothing (Baseline)			Do something (Baseline + construction traffic)			Change in BNL dB $L_{A10,18h}$
		Flow (vehicles AAWT)	%HGV	BNL dB $L_{A10,18h}$	Flow (vehicles)	%HGV	BNL dB $L_{A10,18h}$	
junction with A28/Potten Street Road								
A28 Canterbury Way, south west of the junction with Manor Road/Orchard lane	64	6225	14	69.4	6247	14	69.4	0.0
A253, west of the junction with Orchard Lane/Monkton Street	96	9228	13	73.4	9234	13	73.4	0.0
A299 Hengist Way, east of the roundabout junction with Tothill Street/B2190 Spitfire Way	112	31683	18	80.5	31733	18	80.5	0.0
B2190 Spitfire Way, east of the junction with Alland Grange Lane	96	11551	17	74.9	13392	18	75.6	0.8
Minster Road, south east of the junction with Plumstone Road	48	6953	11	68.1	6964	11	68.1	0.0
B2050 Manston Road, south east of the junction with Shottendane Road	96	6821	10	71.6	7442	9	71.9	0.2
Shottendane Road, north east of the junction with Park Lane	96	10294	13	73.9	10294	13	73.9	0.0
Manston Road, north of junction with Bramble Lane	96	5131	16	71.2	5750	14	71.5	0.2
Manston Road, south	96	6526	12	71.8	7145	11	72.0	0.2

Road	Speed (kph)	Do nothing (Baseline)			Do something (Baseline + construction traffic)			Change in BNL dB $L_{A10,18h}$
		Flow (vehicles AAWT)	%HGV	BNL dB $L_{A10,18h}$	Flow (vehicles)	%HGV	BNL dB $L_{A10,18h}$	
of junction with Vincent Road								
Manston Court Road,east of Valley Road	48	5127	10	66.6	5750	9	66.8	0.2
Manston Court Road,south of the junction with Preston Road	96	3042	12	68.5	3665	10	69.0	0.5
B2050 Manston Road, west of the junction with Greensole Lane	48	11703	11	70.4	13861	9	70.7	0.3

Table A12.3.36 Year 20 Traffic Data and Calculated Noise Level ($L_{A10, 18 hour}$) at 10 metres

Road	Speed (kph)	Do nothing (Baseline)			Do something (Baseline + construction traffic)			Change in BNL dB $L_{A10,18h}$
		Flow (vehicles AAWT)	%HGV	BNL dB $L_{A10,18h}$	Flow (vehicles)	%HGV	BNL dB $L_{A10,18h}$	
A256, south of the junction with Sandwich Road/Jutes Lane	80	39133	13	78.4	40906	12	78.5	0.1
A299, east of the Sandwich Road/A256 junction	64	31357	12	75.9	31953	11	76.0	0.0
B2050 Manston Road, east of junction with Princess Margaret Avenue	48	14803	8	70.6	15275	7	70.6	0.1
A254 Margate Road, south of the junction with Coxes Lane/Highfield Road	48	21877	8	72.4	22012	8	72.4	0.0
A256 Westwood Road, west of the junction with Northwood Road	48	30246	6	73.3	30935	6	73.3	0.1
A254 Ramsgate Road, south of the junction with Farley Road	48	30138	8	73.8	30138	8	73.8	0.0
A254 Ramsgate Road, near junction with Connaught Road	48	14917	11	71.4	14917	11	71.4	0.0
A28 Canterbury Road, east of the junction with Hartsdown Road	48	29699	8	73.6	29731	8	73.6	0.0
A28 Canterbury Road, east of junction with Domneva Road	48	28813	13	74.7	28813	13	74.7	0.0
A299 Thanet Way, west of the roundabout	112	47432	18	82.3	50118	18	82.6	0.3

Road	Speed (kph)	Do nothing (Baseline)			Do something (Baseline + construction traffic)			Change in BNL dB $L_{A10,18h}$
		Flow (vehicles AAWT)	%HGV	BNL dB $L_{A10,18h}$	Flow (vehicles)	%HGV	BNL dB $L_{A10,18h}$	
junction with A28/Potten Street Road								
A28 Canterbury Way, south west of the junction with Manor Road/Orchard lane	64	7123	14	70.0	7157	14	70.0	0.0
A253, west of the junction with Orchard Lane/Monkton Street	96	10553	13	74.0	10562	13	74.0	0.0
A299 Hengist Way, east of the roundabout junction with Tothill Street/B2190 Spitfire Way	112	36313	18	81.1	36351	18	81.1	0.0
B2190 Spitfire Way, east of the junction with Alland Grange Lane	96	13234	17	75.5	16104	18	76.4	1.0
Minster Road, south east of the junction with Plumstone Road	48	7928	11	68.7	7949	11	68.7	0.0
B2050 Manston Road, south east of the junction with Shottendane Road	96	7884	10	72.3	8848	9	72.6	0.3
Shottendane Road, north east of the junction with Park Lane	96	11901	14	74.6	11901	14	74.6	0.0
Manston Road, north of junction with Bramble Lane	96	5933	16	71.9	6894	13	72.2	0.3
Manston Road, south	96	7230	12	72.3	8191	11	72.6	0.3

Road	Speed (kph)	Do nothing (Baseline)			Do something (Baseline + construction traffic)			Change in BNL dB $L_{A10,18h}$
		Flow (vehicles AAWT)	%HGV	BNL dB $L_{A10,18h}$	Flow (vehicles)	%HGV	BNL dB $L_{A10,18h}$	
of junction with Vincent Road								
Manston Court Road,east of Valley Road	48	5815	10	67.1	6779	8	67.4	0.3
Manston Court Road,south of the junction with Preston Road	96	3473	12	69.1	4437	9	69.7	0.6
B2050 Manston Road, west of the junction with Greensole Lane	48	13331	11	70.9	16697	9	71.4	0.4

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Aircraft Noise Modelling

Introduction

The government's overall policy on aviation noise as stated is in the Air Navigation Guidance 2017[2] is to *"limit and, where possible, reduce the number of people in the UK significantly affected by adverse impacts from aircraft noise".* The Consultation Response on UK Airspace Policy (2017)[3] defines 'adverse' effects as *"those related to health and quality of life"* and therefore these should be assessed using a *"a risk-based approach above the lowest-observed adverse-effect level (LOAEL), using the DfT's transport appraisal guidance WebTAG".* Furthermore, the Air Navigation Guidance 2017 states that *"below 4,000 feet, there is a strong likelihood that aircraft could create levels of noise exposure above the LOAELs*".

Therefore, as part of the assessment of noise from the reopening Manston Airport it has been necessary to develop an aircraft noise model to determine the potential effect of aircraft air noise based on the identified route options available at this stage of the assessment.

The work presented in this appendix demonstrates that the different potential route options will result in different noise impacts on the population overflown by the routes. The ES has considered the range indicative prototype airspace route options. The exact airspace options and aircraft flight paths will be formalised through an Airspace Change Proposal (ACP), which is a separate consenting regime. The work presented in this chapter is intended to provide information relating to the potential variation in noise impact which may result during the ACP.

Scope of report

This report has been produced to present the methodology used to model aircraft air noise, determine airspace options for consideration within the DCO ES. The report therefore presents:

i. Choice of noise model to calculate potential noise effects;

ii. Noise modelling methodology and model settings;

iii. Option appraisal of airspace route options; and

iv. Adopted procedures and routes for the DCO ES.

In addition, Amec Foster Wheeler have undertaken extensive noise modelling to inform the developing noise abatement procedures for the airport. The results of this modelling are reported separately in Osprey Consulting Services Limited Report *Review of Potential Aircraft Noise Abatement Operational Procedures*[4].

Aircraft Air Noise

Air noise begins at the point that aircraft begin their start of take-off roll (SoR), and ends when aircraft exit the runway and begin their taxi. This means that some aircraft air noise is produced by aircraft on the ground and this occurs when the aircraft are on the runway for SoR and after landing when aircraft are rolling down the runway and if aircraft are using reverse thrust for braking.

[2] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/653978/air-navigation-guidance-2017.pdf
[3] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/653801/consultation-response-on-uk-airspace-policy-web-version.pdf
[4] Osprey Consulting Services Limited - Review of Potential Aircraft Noise Abatement Operational Procedures. Report 70992-011 Version 2.1 for RiverOak Strategic Partners 18 December 2017.

Choice of noise model

Historically airports in the UK generally use one of two noise models to calculate air noise; the UK civil aircraft noise contour model (ANCON), developed and maintained by the UK CAA or the INM, produced by the US Federal Aviation Administration (FAA).

However, in 2015 INM was replaced by AEDT, also produced by FAA. Both AEDT and INM are produced by FAA, however due to the release of AEDT the FAA stopped supporting INM and therefore will not update the model or its associated database with new aircraft technology. The CAA states in CAP 1521[5] that following the release of AEDT version 2c in March 2017, AEDT "gives similar if not identical results to INM 7.0d" and therefore advocates the use of AEDT as an alternative to its own ANCON model for use on airspace change proposals.

Regarding the use of ANCON or INM, the INM software is commercially available from the FAA whereas ANCON is not commercially available and, as such, any modelling undertaken using ANCON must be undertaken by the CAA.

There are significant similarities between the INM, AEDT and ANCON models in terms of their calculation methodologies. All models are based on the same guidance material produced by the ICAO, European Civil Aviation Conference (ECAC) and Society of Automotive Engineers (SAE), namely SAE-AIR-1845 (1986)[6] and ECAC Doc.29 (2016)[7]. SAE-AIR-1845 describes the methodology used by aircraft noise modelling software for calculating sound exposure levels from aircraft and ECAC Doc. provides guidance on aircraft noise modelling, and is consistent with the methodology presented in SAE-AIR-1845.

For the purposes of modelling aircraft air noise for the reopening of Manston Airport INM has been used. All options appraisal work and modelling presented as part of the PEIR are undertaken using INM. AEDT has not been used because at the point in time when options appraisal and work for the PEIR commenced early versions of AEDT were not endorsed for use in UK. Furthermore, it is considered that for the Proposed Development, both AEDT and INM produce near identical outputs. This is because the primary change between INM and AEDT is the incorporation of new and next generation aircraft into AEDT, however, the schedule of aircraft movement produced for the Proposed Development considers aircraft in use today, which are included in the INM database.

Noise Model Development

For the purposes of the PEIR and options appraisal all aircraft air noise modelling has been undertaken using INM v7.0d. The development of an INM noise model requires several key data inputs. These key data inputs can be split into the following broad categories:

v. Airport layout;

vi. Average Meteorological Conditions;

vii. Aircraft movements;

viii. Aircraft flight paths;

ix. Aircraft vertical flight profiles;

x. Aircraft procedures;

xi. Terrain; and

xii. Population.

[5] https://publicapps.caa.co.uk/docs/33/CAP1521_Environmental_Annex.pdf
[6] SAE-AIR-1845 Procedure for the Calculation of Airplane, Noise in the Vicinity of Airports, 1986
[7] ECAC Doc.29 4th Edition, 2016

Airport Layout

The airport layout refers to the INM definitions used for the airport infrastructure, including the modelled airport centre point and the runway geometry. The airport layout is a key factor for the model as it defines the locations that aircraft noise emissions occur. Table A12.3.37 presents the model settings used for the airport layout for a 'Do Nothing' scenario.

Table A12.3.37 'Do nothing' Airport Layout Model Settings

Location	Latitude	Longitude	Elevation (AMSL)	Runway Width	Glide slope	Displaced Approach Threshold	Displaced Departure Threshold	Threshold Crossing Height
Airport Centre	51.341994°	1.347807°	53 m	N/A	N/A	N/A	N/A	N/A
Runway 10	51.344550°	1.326830°	51 m	61 m	3.0°	0 m	0 m	*15.2 m
Runway 28	51.339725°	1.365558°	52 m	61 m	3.0°	0 m	0 m	*15.2 m

* Threshold crossing height assumed to be standard INM setting

Displaced (Inset) Thresholds

At some airports, the departure and arrival thresholds are displaced inwards towards the runway centre. A displaced threshold therefore makes some of the runway unusable. Generally, greater take-off distance available (TODA)[8] is required for departing aircraft than for arriving aircraft, and therefore typically displaced thresholds are used for arriving aircraft, only where the required landing distance available (LDA)[9] can be preserved for higher maximum landing weights (MLW) and adverse speed reduction conditions, rather than departing aircraft that will prefer the full length of the runway ahead at the start of the take-off run. An arrival threshold may be displaced for example to keep arriving aircraft higher for longer to avoid obstacles beneath the flight path, however departing aircraft are still permitted to use the full runway length for take-off.

Threshold Crossing Height

Threshold crossing height refers to the height at which aircraft cross the threshold when landing and therefore is used to represent the theoretical touch down zone. For this study, the INM standard threshold crossing height of 15.2m has been used and therefore if an aircraft was arriving at an approach angle of 3° the aircraft would touchdown approximately 290m further along the runway

Glide Slope

The glide slope refers to the angle of approach for aircraft and is an imaginary line that travels from the approach end of the runway upwards to the aircraft. Typically, most airports operate a 3° glide slope, which is considered industry standard. The effect of a larger approach angle is a steeper approach and therefore aircraft are kept higher for longer.

Average Meteorological Conditions

Meteorological conditions can influence the propagation of sound; therefore, to model accurate noise levels representative ambient weather conditions for the period are required. For the purposes of the noise modelling for the Proposed Development is was determined the INM standard setting were appropriate and these are as follows:

[8] TODA – The length of the take-off run available plus the length of the clearway beyond the runway, where provided.
[9] LDA – The length of the runway that is declared available and suitable for the ground run of an aeroplane landing.

xiii. Temperature: 14.7° C;

xiv. Pressure: 759.97 mmHg;

xv. Average Headwind: 14.8 km/h; and

xvi. Humidity 70%.

Terrain

The surrounding topography or terrain can influence propagation of sound, particularly where the landform can produce reflections and shielding. Terrain data was obtained under license for this project as 50m digital terrain mapping from Emapsite[10].

Population

Population data was inputted into the model to count the number of people and dwellings exposed to certain levels of noise. Population data was obtained under license for this project from CACI and is based on the most recent census data with uplifts for population growth across the year. The population data is presented at postcode level and contains details of the total number of dwellings and inhabitants at that post code point.

Aircraft Movements

The number of aircraft operations have been obtained from the latest forecast of aircraft operations. The forecast contains the aircraft type with an indication of the aircraft operator. The aircraft operator and aircraft type field was then cross-referenced with the latest electronic version of Flight International's JP data feed to identify the aircraft engine fitted to the aircraft. This engine variant was then cross-referenced with the INM aircraft database to identify the relevant INM Type for the noise model.

Assessments of aircraft noise typically consider an *'average summers day'* period of movement from 16th June to 15th September. This 92-day period is used to account for the increased aircraft traffic during the summer season. However, the Proposed Development will focus on freight aircraft and an increase in flights is forecast during the winter season. Therefore, the assessment of aircraft noise for the Proposed Development is based on a *'typical busy day'* regardless of season and used a 'busy day' multiplier.

Stage Length

INM does not have a setting for aircraft weight, and instead adjusts the noise based on the aircraft stage. Using the stage length, it assumed that the longer the sector, the heavier the aircraft would be due to the increase in fuel load required. Stage length is only applicable to departing aircraft as it is assumed that aircraft burn all fuel before arrival. The stage length was determined using the identified 'Mean Sector' Length in the aircraft forecast. The stage length categorisation and equivalent sector distance used by the INM are shown in Table A12.3.38.

[10] https://www.emapsite.com/mapshop/

Table A12.3.38 INM Stage Lengths

INM Stage	Sector Distance (km)	Example Destination
1	<926	Amsterdam
2	<1852	Oslo
3	<2778	Moscow
4	<4630	Tehran
5	<6482	Doha
6	<8334	Los Angeles
7	<10186	Hong Kong

Future Aircraft Type

In later years next generation aircraft types currently not in operation are forecast, namely the Boeing 777X. The Boeing 777X is an updated version of the Boeing 777 and is expected to be significantly quieter on departure and marginally quitter on arrival, however actual noise emissions are uncertain and therefore, the aircraft was modelled as the Boeing 777-200 aircraft. This is considered a conservative approach since the new generation Boeing 777X is expected to be quieter on both arrival and departure.

Flight Profiles and Procedures

Flight profiles and procedures describe the altitude, speed and related flap configuration for aircraft operations. Manston Airport is not currently operating and therefore there is no radar data relative to the current operations. Therefore, all arrivals and departures have been assumed as standard INM procedure.

Aircraft flight paths

The aircraft flight paths define the ground tracks taken by aircraft in the INM model and hence locations of noise emissions from aircraft in flight. The exact airspace options and aircraft flight paths will be formalised through an Airspace Change Proposal (ACP), which is a separate consenting regime. The ACP will be submitted through the CAA's airspace change process and the potential noise effects will be assessed following the CAA guidance within the Civil Aviation Publications (CAP). The ACP will therefore provide opportunities for communities to engage on future flight paths through an extensive consultation process.

The assessment of aircraft air noise for ES has therefore considered six indicative airspace route options within a design swathe as provided by the airspace consultant Osprey Consulting Services Limited. The design swathe has taken into account the 'knowns' of the local airspace, including airways and navigational aids.

The route swathe and indicative flight paths are presented in **Figure A12.3.1** and show the different routes within the design swathe for future departure and approach routes and Table A12.3.39 presents the six design principles considered.

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Figure A12.3.1 Routes modelled – segments selected

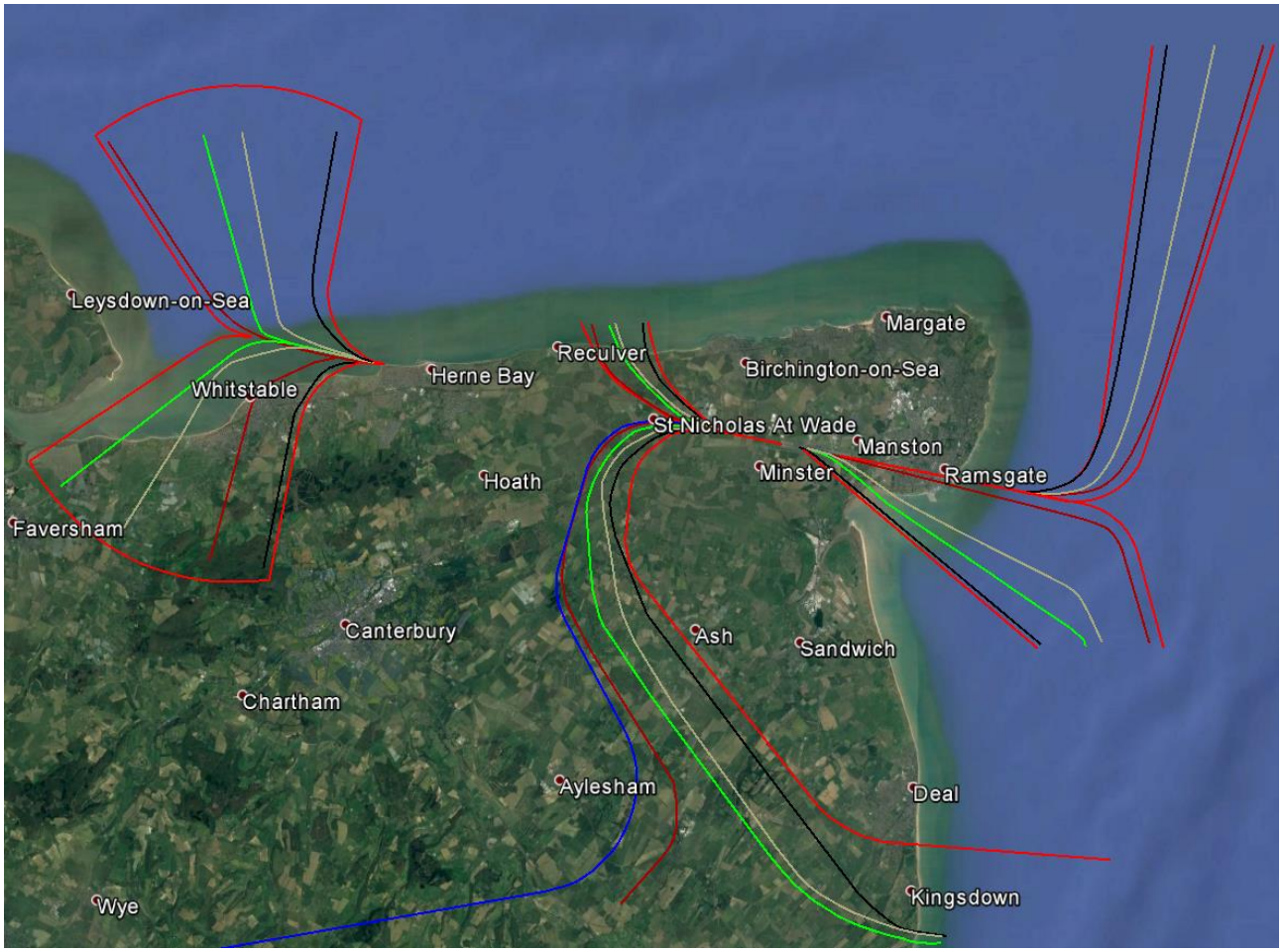

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Table A12.3.39 Indicative airspace option design principles

Design principle	ARR 10	ARR 28	DEP 10 N	DEP 10 S	DEP 28 N	DEP 28 S
Avoiding urban concentration	Green	Straight In	Grey (No green route available)	Green	Green	Green
Swathe Centreline	Grey	Straight In	Grey	Grey	Grey	Grey
Tight Turns	Black	Straight In	Black	Black	Black	Black
Over or Near Urban Concentration	Dark Red	Straight In	Dark Red	Dark Red	Dark Red	Dark Red
Swathe Line (closest to airport)	Red – Swathe (earliest turn)	Straight In	Red – Swathe (earliest turn)	Red – Swathe (earliest turn)	Red – Swathe (earliest turn)	Red – Swathe (earliest turn)
Swathe Line (Furthest from airport)	Red- Swathe (latest turn)	Straight In	Red- Swathe (latest turn)	Red- Swathe (latest turn)	Red- Swathe (latest turn)	Blue

Lateral Track Dispersion

Typically, at airports operating RNAV routes aircraft are dispersed laterally around the route centreline due to several factors including prevailing weather conditions, instructions from Air Traffic Control (ATC) and pilot judgement. The INM model therefore allows dispersion around a 'main' route or track to be modelled. In locations where noise levels are dominated by aircraft departures, dispersion has the effect of widening the air noise contours but reducing the length.

Manston Airport is not currently operating and therefore no radar data is available and hence the standard INM binomial dispersion pattern was assumed with four sub tracks either side of the centre track as presented in Table A12.3.40**.**

Table A12.3.40 Lateral Track Dispersion

Track	Traffic Distribution	Lateral Distance from Main Track
Centre	28.2 %	0 m
Sub track 1	22.2 %	309 m
Sub track 2	10.6 %	617 m
Sub track 3	3.1 %	926 m

Track Proportion

Typically, aircraft arrive and depart into wind and therefore to determine the future runway direction historical weather data was assessed. The historical weather data suggests that for an average year approximately 70% of arriving aircraft will arrive over Ramsgate and 30% will arrive over Herne Bay. For departing aircraft approximately 70% will depart to Herne Bay and 30% towards Ramsgate.

For aircraft departing to the west there are two likely flight paths, one turning north and one turning south and it is assumed that there will be a 50/50 traffic distribution. Table A12.3.41 presents the traffic distribution along each flight path as a percentage of the total aircraft movements.

Table A12.3.41 Traffic split

Runway ID	Operation Type	INM Track	SID name considered	Traffic Distribution
RWY 10	Arrival	A_10_N_P	All Instrument Approaches Runway 10 (From North)	7.5%
RWY 10	Arrival	A_10_S_P	All Instrument Approaches Runway 10 (From South)	7.5%
RWY 10	Departure	D_10_N_P	SID DVR RINTI KONAN 1Z SID JACK KOPUL ODROB 1Z (Heading North)	7.5%
RWY 10	Departure	D_10_S_P	SID DVR RINTI KONAN 1Z SID JACK KOPUL ODROB 1Z (Heading South)	7.5%
RWY 28	A	A_28_P	All Instrument Approaches Runway 28	35%
RWY 28	D	D_28_E_P	SID VABIK TANET ERING 1Z	17.5%
RWY 28	D	D_28_W_P	SID WIZ WIN KON 1Z	17.5%

Options Appraisal Approach

As described above, the route options will not be finalised until an ACP is completed. This will not occur until after the powers to build and operate the airport are obtained under the DCO process. The assessment of the noise impact of the airport in the ES is based on an indicative route. The noise impact of the Airport may be different to that presented in the ES following the finalisation of the ACP. The purpose of the options appraisal presented here is to provide an indication of the potential variability in the noise impact which remains until the routes are finalised in the ACP.

The methodology used in the options appraisal is consistent with the latest draft Airspace Change Proposal guidance in CAP1616 (2017) and is therefore a mock of the assessment that will be undertaken during the ACP.

It is stated in the draft CAP1616 (2017) that:

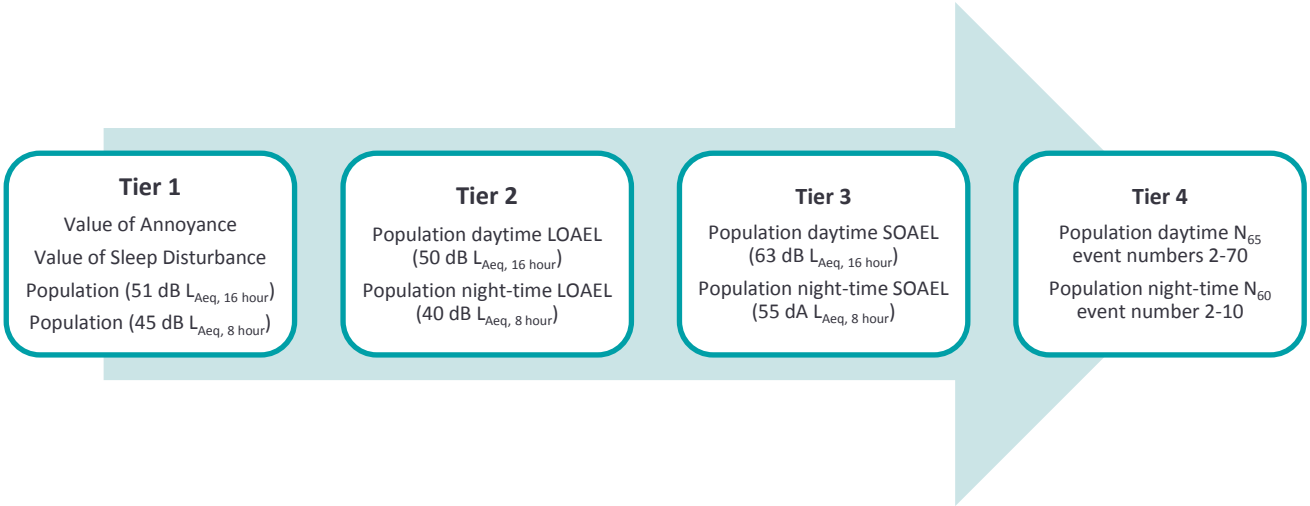
"When considering noise impacts CAA will weight the outcomes from 'primary' metrics over 'secondary' metrics. Primary metrics will be those that are used to quantity significant noise impacts, such as L_{eq} contours and WebTAG outputs. Secondary metrics will be those that are not being used to determine significant impacts but which are still able to convey noise effects, such as N_{65} contours and L_{max} levels."

Therefore, for option appraising procedures and routes for the Proposed Development an appraisal procedure was developed as shown in **Figure A12.3.**. The procedure has four tiers and the next tier is only used where the results of the earlier tier are uncertain. The tiers are therefore used as filters to obtain the final preferable route by ranking the values of the metrics of the different options. If more than one option is selected as a better performing option, the options can go to the next tier until the preferred option is identified.

The process has prioritised both monetisation and population above both LOAEL as key decision-making tools. It should be noted that the LOAEL defined for Tier 1 tests, are those as defined in recent Government Guidance, including CAP 1616 and Air Navigation Guidance (2017) and therefore a LOAEL of 51dB $L_{Aeq,16hr}$ (daytime) and 45dB $L_{Aeq,\ 8hr}$ (night-time) has been used. The monetisation was undertaken using WebTAG Aviation but with the dose response cover replaced by RIVM 2014 as it was identified as being the best fit for the Proposed Development. Whilst WebTAG is the preferred approach by DfT, SONA 2014 provides a UK airport specific noise response curve. However, the weakness of SONA 2014 is it was designed for an airport already operating.

If the results of the first-tier tests are inconclusive then the second-tier tests are to be used. The second-tier takes account of the project LOAEL of 50dB $L_{Aeq,16hr}$ (daytime) and 40dB $L_{Aeq, 8hr}$ (night-time). The third-tier tests then consider the population above SOAEL and finally the fourth-tier tests take account of population within the N65 (daytime) and N60 (night-time) contours.

Figure A12.3.2 The Options Appraisal Process proposed for this assessment.



Options appraisal scenarios

There are three stages to option appraisal process for noise:

xvii. Stage A – appraisal of noise abatement procedures;

xviii. Stage B- airspace routes options appraisal (with adopted procedures from Stage 1);

1. Modelling of annual scenario using each route design principle;
2. Modelling of 100% LAeq for individual tracks, e.g. 100% of departures on one track;

xix. Stage C- Model refinement;

3. Model refinements after early turn for easterly departures was discounted due to location of Pegwell Bay RAMSAR;
4. Noisy aircraft removed from fleet; and
5. Inclusion of General Aviation traffic.

It should be noted that noise is not the only factor for options appraisal and noise forms part of the cost-effectiveness assessment for determining restrictions and procedures as per Regulation (EU) No 598/2014.

Stage A – Noise Abatement Procedures

Osprey Consulting Services Limited has undertaken a review of potential noise abatement procedures for Manston Airport [4]. Review considered a number of aircraft noise abatement operational procedures that Manston Airport could consider in an Aircraft Noise Abatement Operational Procedure strategy. The review was informed by predictions made with the noise model described in this section.

Inset thresholds were determined to have a very minimal impact on noise and were therefore deemed not feasible as part of an aircraft noise abatement operational procedure strategy.

Increased approach angles were also found to have a theoretical effect on the reduction of noise however operational evidence suggests that when actually undertaken, the more technically challenging approach

may result in an increased level of aborted approaches nullifying noise benefits. Equally, in the context of the Manston Airport project, the theoretical noise benefit gained, compared to potential operational impacts, could not justify use of this non-standard procedure.

The report found that a preferential runway strategy would have a significant noise reduction effect. The biggest limiting factor to preferential runway operations will be the movement rate that Manston Airport would like to be able to achieve. Above a movement rate of 5 movements per hour, Manston Airport would no longer be able to support opposite runway direction operations. Modelling data indicates that employing a preferential runway strategy at night could reduce the impact of noise by over 80%.

Stage B - Airspace Routes Options Appraisal

Stage B appraised the different route options within the design swathe. The routes were appraised in terms of the design principles (for example. all aircraft on avoid population routes) and with 100% of traffic using a single route. The modelling adopted the realistic avoid Ramsgate scenario from Stage A (i.e. noise abatement procedure 4.g). This was adopted as it was identified as being the most realistic scenario when annual weather conditions are considered and provided a significant improvement in noise exposure, whilst being operationally feasible and safe to operate.

Design Principles – Options Appraisal

Table A12.3.42 presents the results for an annual scenario assuming all aircraft operate one of the design principles. The table demonstrates the relative 'performance' of the design principles in terms of noise impact. The routes have been ranked according to noise impact (1 being lowest noise impact and 6 being the noise impact). The modelling shows that the best performing route is the route designed to avoid concentrations, whereas the worst is the swathe Line (furthest from airport). Furthermore, after discussions with the airspace consultants it was identified that the 'swathe centreline' should be considered as an indicative 'probable' route.

Table A12.3.42 Tier 1 Options Appraisal of Route Design Principles

Design principle	Annoyance*	Sleep Disturbance*	Population 51 dB $L_{Aeq, 16 hours}$	Population 45 dB $L_{Aeq, 8 hours}$
Avoiding Urban Concentration	£17,600,000 (1)**	£13,850,000 (1)	26,600 (3)	17,100 (1)
Swathe Centreline	£17,880,000 (3)	£14,920,000 (4)	26,900 (4)	18,700 (4)
Tight Turns	£17,840,000 (2)	£13,950,000 (2)	26,000 (2)	17,200 (2)
Over or Near Urban Concentration	£19,170,000 (5)	£17,910,000 (5)	28,600 (5)	21,700 (5)
Swathe Line (closest to airport)	£17,990,000 (4)	£14,020,000 (3)	25,700 (1)	17,300 (3)
Swathe Line (Furthest from airport)	£19,550,000 (6)	£18,530,000 (6)	29,500 (6)	22,500 (6)

* The value is £10,000 ceiling
** The numbers in the brackets indicate the ranking of the values

100% Mode – Options Appraisal

To further compare the noise impacts of the individual tracks of the routes, 100% of departures were set to be operated in one track each time, for the six indicative departure tracks for the four departure route swathes:

xx. Runway 10 departure northern turn (D_10_N_P);

xxi. Runway 10 departure early turn (D_10_S_P);

xxii. Runway 28 departure eastern turn (D_28_E_P); and

xxiii. Runway 28 departure western turn (D_28_W_P).

The modelling results and value of annoyance and sleep disturbance for Stage B are presented in Table A12.3.43 and indicate that for the D_10_N_P and D_10_S_P route swathe the of 'Swathe Centreline' and 'Swathe Line (closest to airport)' respectively are the better performing flight tracks.

For D_28_E_P and D_28_W_P, it is not clear which ones are the best, so the flight tracks were selected for further comparison suing the Tier 2 appraisal process, as shown in Table A12.3.44**.** However, no best flight tracks can be identified using Tier 2 appraisal process and therefore the comparison continues to the Tier 3 appraisal process as shown in Table A12.3.45.

In Tier 3, the flight tracks share the same SOAEL population for both daytime and night-time. Therefore, a total LOAEL population of daytime and night-time in Procedure 2 is considered, which shows that D_28_E_P of 'Tight Turns' and D_28_W_P of 'Over or Near Urban Concentration' have the lowest LOAEL population, although the differences are not considered significant.

Table A12.3.43 Tier 1 Option Appraisal

Runway	Design principle	Annoyance*	Sleep Disturbance*	Population 51 dB $L_{Aeq, 16 hours}$	Population 45 dB $L_{Aeq, 8 hours}$
D_10_N_P	Avoiding urban concentration	£21,750,000 (2)**	£31,470,000 (2)	38,400 (1)	34,600 (2)
	Swathe Centreline	£21,720,000 (1)	£31,400,000 (1)	38,400 (1)	34,500 (1)
	Tight Turns	£21,810,000 (5)	£31,520,000 (3)	38,400 (1)	34,600 (2)
	Over or Near Urban Concentration	£21,800,000 (4)	£31,560,000 (4)	38,500 (4)	34,700 (4)
	Swathe Line (closest to airport)	£21,860,000 (6)	£31,600,000 (5)	38,500 (4)	34,700 (4)
	Swathe Line (Furthest from airport)	£21,800,000 (3)	£31,600,000 (5)	38,500 (4)	34,800 (6)
D_10_S_P	Avoiding urban concentration	£7,330,000 (3)	£4,240,000 (3)	6,300 (3)	4,600 (3)
	Swathe Centreline	£10,340,000 (4)	£7,340,000 (4)	11,800 (4)	8,600 (4)
	Tight Turns	£5,350,000 (2)	£3,230,000 (2)	4,000 (2)	3,200 (2)
	Over or Near Urban Concentration	£19,870,000 (5)	£26,620,000 (5)	33,500 (5)	29,300 (5)
	Swathe Line (closest to airport)	£4,750,000 (1)	£2,950,000 (1)	3,600 (1)	2,900 (1)

Runway	Design principle	Annoyance*	Sleep Disturbance*	Population 51 dB $L_{Aeq, 16 hours}$	Population 45 dB $L_{Aeq, 8 hours}$
	Swathe Line (Furthest from airport)	£21,590,000 (6)	£30,900,000 (6)	38,000 (6)	33,900 (6)
D_28_E_P	Avoiding urban concentration	£3,680,000 (3)	£2,960,000 (4)	5,400 (5)	3,500 (4)
	Swathe Centreline	£3,700,000 (4)	£2,760,000 (3)	5,200 (3)	3,200 (3)
	Tight Turns	£4,040,000 (5)	£2,500,000 (1)	4,400 (2)	2,900 (1)
	Over or Near Urban Concentration	£3,640,000 (2)	£3,270,000 (6)	5,500 (6)	3,900 (6)
	Swathe Line (closest to airport)	£4,190,000 (6)	£2,510,000 (2)	4,300 (1)	2,900 (1)
	Swathe Line (Furthest from airport)	£3,580,000 (1)	£3,060,000 (5)	5,300 (4)	3,600 (5)
D_28_W_P	Avoiding urban concentration	£3,990,000 (2)	£3,360,000 (4)	5,600 (2)	4,000 (4)
	Swathe Centreline	£4,000,000 (3)	£3,480,000 (6)	5,700 (4)	4,200 (6)
	Tight Turns	£4,310,000 (5)	£3,410,000 (5)	5,800 (5)	4,100 (5)
	Over or Near Urban Concentration	£4,010,000 (4)	£3,230,000 (1)	5,600 (2)	3,800 (1)
	Swathe Line (closest to airport)	£4,400,000 (6)	£3,240,000 (2)	5,800 (5)	3,900 (3)
	Swathe Line (Furthest from airport)	£3,990,000 (1)	£3,250,000 (3)	5,500 (1)	3,800 (1)

* The value is £10,000 ceiling
** The numbers in the brackets indicate the ranking of the values

Table A12.3.44 Tier 2 Option Appraisal

Runway	Design principle	Population daytime LOAEL (50 dB $L_{Aeq, 16 hour}$)	Population night-time LOAEL (40 dB $L_{Aeq, 8 hour}$)
D_28_E_P	Swathe Centreline	6,400 (3)*	7,400 (1)
	Tight Turns	5,800 (2)	7,800 (2)
	Swathe Line (closest to airport)	5,700 (1)	8,000 (3)
D_28_W_P	Avoiding urban concentration	6,400 (1)	8,600 (3)
	Over or Near Urban Concentration	6,500 (2)	8,400 (2)
	Swathe Line (Furthest from airport)	6,600 (3)	8,000 (1)

* The numbers in the brackets indicate the ranking of the values

Table A12.3.45 Tier 3 Option Appraisal

Runway	Design principle	Population daytime SOAEL (63 dB $L_{Aeq, 16 hour}$)	Population night-time SOAEL (55 dB $L_{Aeq, 8 hour}$)
D_28_E_P	Swathe Centreline	200 (1)*	300 (1)
	Tight Turns	200 (1)	300 (1)
	Swathe Line (closest to airport)	200 (1)	300 (1)
D_28_W_P	Avoiding urban concentration	400 (3)	300 (1)
	Over or Near Urban Concentration	200 (1)	300 (1)
	Swathe Line (Furthest from airport)	200 (1)	300 (1)

* The numbers in the brackets indicate the ranking of the values

The results show that daytime and night-time results are not related and some tracks with high ranking of daytime LOAEL population have relatively low ranking of night-time LOAEL. Therefore, the flight tracks that have lowest noise impact for daytime and night time were also identified. The best routes for daytime and night-time are shown below:

Best Daytime flight tracks:

xxiv. D_10_N_P of Swathe Centreline;

xxv. D_10_S_P of Swathe Line (closest to airport);

xxvi. D_28_E_P of Swathe Line (closest to airport); and

xxvii. D_28_W_P of Swathe Line (furthest from airport).

Best Night-time flight tracks:

xxviii. D_10_N_P of Swathe Centreline;

xxix. D_10_S_P of Swathe Line (closest to airport);

xxx. D_28_E_P of Tight Turns; and

xxxi. D_28_W_P of Over or Near Urban Concentration.

Stage B – Conclusion

The modelling has shown that different routes perform better at day than at night. However, when considering the routes in-terms of the design principles the avoid populations route is the best performing and hence indicative ‘best’ route, whereas the Swathe Line (furthest from airport) is the worst performing and hence indicative ‘worst’ route. The swathe centreline is considered the ‘probable route’.

Stage C – Refinement of Route Modelling

For Stage C, the modelling assumed an annual scenario using the best and worst routes from Stage B. However, for Stage C the early turn before Ramsgate was discounted after it became apparent the route was not operationally feasible given the location of the Pegwell Bay Ramsar and also the night runway preference was not applied after advice from the airspace consultants. Further refinements to the model were also undertaken including:

xxxii. Aircraft fleet was updated and the Ilyushin IL-76 and Antonov An-124 were replaced in the fleet with by the Boeing 747400 after discussions with forecasting team;

xxxiii. The night preference was removed after advice from Airspace Consultants that the preference is unlikely to be achieved until airspace change proposal assessment; and

xxxiv. General Aviation (GA) traffic was added, comprising of a worst-case daily scenario of 40 arrivals and departures, eight circuits flight comprising six circuits per flight and eight touch and go operations. General Aviation flights will only occur during the daytime and therefore there is no change in-terms of night-time contours.

The three routes, Avoiding Urban Concentration, Swathe Centreline and Over or Near Urban Concentration, were modelled in the final stage for Year 20. For Year 2, the Swathe Centreline (i.e. 'Probable Route') route was also modelled.

The modelling results from Stage C are those that are presented as part of the PEIR. The modelling shows that when General Aviation flights are considered there is a negligible change in the LOAEL contour however because the circuits routes overfly new areas there is a noticeable change in the SOAEL contours.

xxxv. Table A12.3.46 presents the options appraisal using the Tier 1 process;

xxxvi. Table A12.3.47 presents the options appraisal using the Tier 2 process;

xxxvii. Table A12.3.48 presents the options appraisal using the Tier 3 process;

xxxviii. Table A12.3.49 presents the population within UAEL;

xxxix. Table A12.3.50 presents the number of non-residential noise sensitive buildings (for example schools and hospitals).

Table A12.3.46 Tier 1 – Options Appraisal

	Design principle	Annoyance*	Sleep Disturbance*	Population 51 dB $L_{Aeq, 16 hours}$	Population 45 dB $L_{Aeq, 8 hours}$	Household 51 dB $L_{Aeq, 16 hours}$	Household 45 dB $L_{Aeq, 8 hours}$
Year 20	Avoiding Urban Concentration	£14,530,000	£15,810,000	23,600	18,700	11,194	8,942
	Swathe Centreline (probable)	£14,480,000	£15,790,000	23,500	18,700	11,167	8,930
	Over or Near Urban Concentration	£14,450,000	£16,090,000	23,600	19,100	11,213	9,106
Year 2	Swathe Centreline (probable)	£7,520,000	£6,700,000	7,600	8,700	3,396	3,963

* The value is £10,000 ceiling

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Table A12.3.47 Tier 2 – Options Appraisal

	Design principle	Population daytime LOAEL (50 dB $L_{Aeq, 16 hour}$)	Population night-time LOAEL (40 dB $L_{Aeq, 8 hour}$)	Household daytime LOAEL (50 dB $L_{Aeq, 16 hour}$)	Household night-time LOAEL (40 dB $L_{Aeq, 8 hour}$)
Year 20	Avoiding Urban Concentration	26,700	33,600	12,534	15,485
	Swathe Centreline (probable)	26,700	33,600	12,505	15,500
	Over or Near Urban Concentration	26,800	33,700	12,574	15,556
Year 2	Swathe Centreline (probable)	10,400	21,000	4,693	10,032

Table A12.3.48 Tier 3 – Options Appraisal

	Design principle	Population daytime SOAEL (63 dB $L_{Aeq, 16 hour}$)	Population night-time SOAEL (55 dB $L_{Aeq, 8 hour}$)	Household daytime SOAEL (63 dB $L_{Aeq, 16 hour}$)	Household night-time SOAEL (55 dB $L_{Aeq, 8 hour}$)
Year 20	Avoiding Urban Concentration	300	500	114	246
	Swathe Centreline (probable)	300	500	114	246
	Over or Near Urban Concentration	300	500	114	246
Year 2	Swathe Centreline (probable)	100	0	48	0

Table A12.3.49 The modelling results of population and household UAEL

	Design principle	Population daytime UAEL (69 dB $L_{Aeq, 16 hour}$)	Household daytime UAEL (69 dB $L_{Aeq, 16 hour}$)
Year 20	Avoiding Urban Concentration	20	8
	Swathe Centreline (probable)	20	8
	Over or Near Urban Concentration	20	8
Year 2	Swathe Centreline (probable)	0	0

Table A12.3.50 The modelling results of Non-Residential Buildings

	Design principle		60 dB $L_{Aeq, 16 hour}$	50 dB $L_{Aeq, 16 hour}$
Year 20	Avoiding Urban Concentration	Acoustical	0	2
		Community	0	4
		Healthcare	0	2

		Worship	0	5
		Education	0	18
	Swathe Centreline (probable)	Acoustical	0	2
		Community	0	4
		Healthcare	0	2
		Worship	0	5
		Education	0	18
	Over or Near Urban Concentration	Acoustical	0	2
		Community	0	4
		Healthcare	0	2
		Worship	0	5
		Education	0	18

Stage C – Conclusion

Stage C has been used to inform the assessment of operational air noise as presented in the PEIR. The modelling shows that there is little discernible change to the populations affected above by SOAEL by the different routes considered. However, at values above LOAEL there is a noticeable change. However, because of the relatively low volumes of air traffic the level of LOAEL does not change significantly because the contours do not extend to the location of the initial turns.

The modelling for Stage C has considered conventional aircraft procedures, and should a night-time runway preference be considered, as identified in Stage A the level of night-time disturbance can be reduced significantly. However, the benefits are not only applicable at night and will also be applicable to daytime. Therefore, it is intended that through the ACP the Proposed Development will seek to secure a runway preference to avoid overflying Ramsgate. This preference in accordance with CAA guidance and the aircraft operator's own limitations and safety management systems, would be operated when weather conditions allow, and take into account other operational and safety considerations including runway utilisation.

Furthermore, the Proposed Development will seek to secure the following noise abatement procedures through the ACP:

xl. The airport will establish a policy which minimises the use of reverse thrust except where operationally urgent essential;

xli. Other than General Aviation training that is based at Manston Airport, there will be no routine training flights; and

xlii. Aircraft operators will be encouraged to keep noise disturbance to a minimum by operating a low power/low drag procedure subject to ATC speed control requirements and the maintenance of safe operation of the aircraft.

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Airside Noise Modelling

Introduction

Airside ground noise sources are from aircraft activities on the airfield. These activities typically occur where aircraft are operating or manoeuvring on the ground and also includes activities required for the operation of the airport. The following activities are considered as airside ground noise:

- Aircraft taxiing to and from runways;
- Aircraft holding at runway ends before take-off;
- Aircraft parked on stand, with auxiliary power units (APUs) or ground power units (GPU) running;
- Aircraft engine ground running (EGR) which is undertaken to test aircraft engines;
- Aircraft ground support equipment (GSE) activities that are required to service aircraft when on the ground;
- Maintenance repair and overhaul activities (MRO);
- Aircraft refuelling activities and fuel farm; and
- Mobile and static plant essential to the running of the airport.

Purpose of this assessment

In order to assess future levels of noise exposure from airside ground noise, it has been necessary to develop a 3D sound propagation model of airside ground noise from proposed airside operations. This report outlines the development of the 3D sound propagation model, details all assumptions included within the model and presents measures that have been adopted to reduce and mitigate airside ground noise.

Scope of this assessment

The scope of this airside ground assessment includes all aircraft sources that occur on the ground up to the point at which aircraft turn on to the runway for take-off and exit the runway after landing. In addition, the assessment includes any sources of noise that occur on or in the vicinity of the airfield that are required for the operation of the airport, these include all airside vehicles and plant, airport fuel farm, MRO facilities, aircraft hangars and terminal buildings.

Airport Operations

For safety purposes aircraft take-off and land into wind so the direction in which aircraft operate is dependent on the prevailing wind. Historical weather data suggests that 70% of aircraft will operate in a westerly mode and 30% in an easterly mode. A westerly mode means that aircraft will take-off towards Herne Bay and approach for landing over Ramsgate. This also affects the direction in which aircraft will operate on the ground. During a westerly mode aircraft will taxi to the eastern runway end and exit the runway at the western end.

Airfield Locations

At its capacity, the airport will have a total of 19 freight stands and four passenger stands. The freight stands will be constructed at the north of the site, and the terminal building and passenger stands will be constructed on the north east of the site.

The airport will also offer a small MRO facility with approximately 10 aircraft per year being dismantled and recycled. This will be located at the east of the site. Furthermore, the aircraft fuel farm will be redeveloped in

the same location as the previous fuel farm. This fuel farm will therefore be located at the south-eastern airport boundary. An indicative site layout for Phase 4 is presented in **Figure A12.3.33**.

Figure A12.3.3 Manston Airport Masterplan

Development of Noise Model

This section details the development of the noise model, which includes:

- The scenarios, development phases and years modelled;
- Details of the noise modelling software, including the calculation methodology and model input data; and
- The model outputs and noise indicators.

Modelling Scenarios

The future operations of the Proposed Development will have a degree of seasonality with aircraft movements increasing during busy periods. Therefore, to account for the seasonality, the modelling assumes a 'typical busy day' scenario for Year 2 and Year 20:

- Year 2 is based on the airfield layout after Phase 1 of the Proposed Development and is the first year of aircraft operations and therefore considered as the year of 'opening'; and

- Year 20 is based on the final airfield layout after Phase 4 of the Proposed Development and the year where the maximum aircraft movements are reached.

The aircraft forecasts assume that aircraft movements will be linear throughout the daytime (07:00 to 23:00) and night-time (23:00 to 07:00). However, it is expected that aircraft will typically be prepared for departure one hour before take-off and therefore it is assumed that the aircraft departing early in the morning (i.e. from 07:00 to 08:00) will be prepared for take-off on the ground from 06:00 to 07:00.

Modelling Software

An airside ground noise model was created using the Stapelfeldt LimA modelling suite. The LimA noise-modelling suite allows a 3D environmental model to be constructed using digital mapping and topographic data. LimA takes into account the following factors potentially affecting levels of noise propagation in the area surrounding a particular noise source:

- Noise source location as shown by digital mapping data;
- Calculation of source emission sound pressure levels for static and moving plant;
- Relative distances between noise sources/receptors, and any noise attenuating barriers;
- Locations and dimensions of barriers between noise source and receptor;
- Ground contours contributing to the relative heights of source, receptor and barriers; and
- Ground attenuation relating to the attenuation provided by ground cover between the source and receptors.

Calculation Methodology

The calculation methodology outlined within ISO 9613-2 was implemented for the sound propagation model. The ground cover was assumed to be a mix of hard and soft ground (G=0.5). In the absence of detailed frequency information of proposed sound sources, calculations were undertaken using the 500Hz frequency band.

Model Input Data

The model has been developed using plans and elevations for the relevant masterplan phases and a daytime and night-time model was developed for each phase. Furthermore, a number of other sources of data were added to the model, including;

- Ordnance Survey (OS) Vector Map Local mapping data, including locations of all buildings;
- Building and receptor locations outside the development boundary and assuming all buildings heights to be 8m above local ground;
- Topographical information in the form of 5m DTM terrain contours and obtained NextMap Britain; and
- Population data at a postcode point level and obtained from the latest CACI Postcode Level data feed.

Model Outputs

The outputs of the model were expressed as 10m x 10m grids, with the results aligned to 10m vertices of the British National Grid reference system for the following noise indicators:

- $L_{Aeq,16h}$ (07:00 to 23:00) - The equivalent continuous daytime sound exposure level; and
- L_{night} (23:00 to 07:00) - The night-time sound exposure level.

Sound Source Data

This section outlines the data and assumptions used in the model. This data includes the number and associated sound emission data for:

- Aircraft taxiing and manoeuvring;
- Aircraft activity on-stand, including operations of APU;
- Mobile ground equipment and GSE;
- Aircraft hold points;
- Aircraft refuelling activities;
- Testing or ground running of aircraft engines;
- Fixed and static services plant; and
- Sound sources considered as de minimis.

Aircraft Taxi Movements

Noise from aircraft taxiing is an inevitable part of aircraft operations and required for aircraft to travel from runway to stand. Whilst taxiing the dominant sources of sound is the aircraft engines and the aircrafts APU. The engine thrust setting is lower than that required for take-off and landing and hence the level of sound is quieter than from aircraft take-off and landing, however, due to the distance of the taxiway from stand to runway, time required to taxi and number of aircraft taxiing, the noise is much more continuous. Noise emission data was derived using the following procedure:

- Noise emission data for each aircraft type was taken from "*Aircrafts' taxi noise, Sound power level and directivity frequency band results*[11]*(2009)"*. This was a study in which aircraft taxiing were measured at Madrid Airport and sound power levels of specific aircraft types were calculated;
- Aircraft were categorised into their relevant ICAO aerodrome reference codes. The ICAO aerodrome reference code is a categorisation of aircraft types which groups aircraft according to wingspan. This was used to give data as a proxy to other aircraft types of similar wingspan in the absence of measured data; and
- The derived emissions and source heights used for aircraft are presented in Table A12.3.51.

[11] Asensio, C., Pavón, I., Ruiz, M., Pagán, R. and Recuero, M. (2009). Aircrafts' taxi noise. Sound power level and directivity frequency band results. Applied Acoustics, 70(7), pp.986-1008.

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Table A12.3.51 Aircraft Noise Emission Data

Aircraft Description	ICAO Code	Engine L_{WA}	APU L_{WA}	Emission Height (m)
Airbus A320	C	129.3	118.0	4.0
Airbus A330	E	132.2	118.0	6.0
Boeing 747-400	E	135.7	123.0	7.5
Boeing 747-800	F	135.7	123.0	7.5
Boeing 757-200	D	132.1	118.0	6.0
Boeing 757-300	D	132.1	118.0	6.0
Boeing 737-800	C	129.3	118.0	4.0
Boeing 737-300	C	129.3	118.0	4.0
Boeing 767-200	D	132.2	118.0	6.0
Boeing 767-300	D	132.2	118.0	6.0
Boeing 777-200	E	123.5	118.0	6.0
ATR 72	C	134.0	118.0	4.0
Boeing C-17 Globemaster III*	E	135.7	123.0	6.0
Fokker 70	C	129.3	118.0	4.0
Lockheed L-100 Hercules*	D	135.7	123.0	6.0

*Data for Boeing 747-400 used as a proxy

Traffic Distribution

As discussed in **Airport Operations**, aircraft typically take off and land into wind and therefore the operating direction of the airport will vary. The operating mode also effects the runway ends which aircraft will taxi to and from. The distribution of traffic assumed for the ground model is summarised and described below:

- Arrivals during westerly operations (i.e. 70% of the time) - it is assumed that aircraft exit the runway at the western end and taxi to the relevant stand;
- Arrivals during easterly operations (i.e. 30% of the time) - it is assumed that aircraft will exit the runway at the eastern end and taxi to stand;
- For 70% Code C passenger aircraft (for example Airbus A320) it is assumed that 70% will use the intermediate taxiway to exit the runway;
- Departures during westerly operations (i.e. 70% of the time) - it is assumed that aircraft taxi from stand to the eastern runway end; and
- Departures during easterly operations (i.e. 30% of the time) - it is assumed that aircraft taxi from stand to the western runway end.

Table A12.3.52 Air Traffic Distribution Summary

Operation	Runway Operating Mode	Passenger Aircraft		Freight Aircraft	
		Intermediate Taxiway	Taxiway A	Intermediate Taxiway	Taxiway A
Arriving Aircraft	Westerly Mode	0%	100%	0%	100%
	Easterly Mode	70%	30%	0%	100%
Departing Aircraft	Westerly Mode	0%	100%	0%	100%
	Easterly Mode	0%	100%	0%	100%

Taxi Speeds

It has been assumed that there is a constant thrust setting for taxiing aircraft, regardless of speed, and therefore an average taxi speed has been used. Aircraft have been assumed to taxi at 8.5knots, this is based upon operations from comparable airport layouts, the relatively straight taxiways and low traffic volumes.

On-stand activity

When on-stand, aircraft require power for the on-board systems including air conditioning. This can either come from aircrafts APU, from mobile ground power units (GPU) or fixed electric ground power (FEGP) using the airport's mains electricity supply. All stands will be served by FEGP and therefore APU usage will be kept to a minimum, whilst GPU usage will only be used should FEGP be un-available.

A number of mobile and fixed GSE are required to service aircraft during the turnaround and typically, these will be deployed around aircraft stands. During the day, the level of noise produced by GSE is much lower than from aircraft manoeuvring on the ground. However, during periods where the airport is less busy, especially during the night, GSE can be the dominant source of ground noise and can be disturbing for receptors close to the source.

Aircraft APU

Freight and passenger aircraft will operate their APUs differently, but as FEGP is available on all stands APU usage will be limited. Upon arrival at the stand, both passenger and freight movements both allow 30 seconds of APU until the FEGP is connected. During departure, 50% of the passenger fleet have been assumed to use APU for 25 minutes with the other 50% using no APU at all. Freight movements are assumed to use no APU during departure.

It should be noted that APUs are directional sources, however, in the absence of data they are considered as omnidirectional, which is considered a conservative approach. This is considered conservative because it assumes equal radiation in all directions, rather than reduced in some directions.

Ground Support Equipment (GSE)

It has been assumed that GSE, including refuelling trucks, high loaders and powered stairs operate during each arrival and departure for 30 minutes per operation. The emission data for GSE has been obtained using comparable plant outlined within BS 5228-1:2009+A1:2014 and is presented in Table A12.3.53.

Table A12.3.53 Ground Service Equipment Noise Emission Data

	Sound Power Level L_{wA}	Number per aircraft movement	On-time per aircraft movement	Source of emission data
Fuel tankers pumping fuel into aircraft*	100.0	1	30 minutes on departure	Fuel tanker lorry - BS 5228-1:2009 Ref no. 23 Table C.6
High loaders	110.0	1	30 minutes on arrival	HGV - BS 5228-1:2009 Ref no. 23 Table C.6
Portable water vehicle	110.0	1	30 minutes on arrival	HGV - BS 5228-1:2009 Ref no. 23 Table C.6
Powered stairs	110.0	2 per passenger movement 1 per freight movement	30 minutes on arrival and departure	HGV - BS 5228-1:2009 Ref no. 23 Table C.6
Pushback tugs	110.0	1	10 minutes on departure	HGV - BS 5228-1:2009 Ref no. 23 Table C.6
Toilet Vehicle	110.0	1	30 minutes on arrival	HGV - BS 5228-1:2009 Ref no. 23 Table C.6

*Bowser movements to stand from the fuel farm and vice versa have been included in the fuel farm imissions

Arrival on-stand

Aircraft have been assumed to use their own engines when arriving on-stand as they can taxi straight on facing forward.

Aircraft Pushback

Aircraft are unable to manoeuvre off stand without being pushed back by a pushback tug. Pushback operations have been assumed at 10 minutes per departure for both freight and passenger movements. The pushback tug has been assumed to be operating for the entire duration.

Engine Ground Running (EGR)

Aircraft EGR involves the running of aircraft main-engines while the aircraft is on the ground. Aircraft EGR is undertaken for maintenance purposes to test the aircraft engines, with the engines run at a thrust setting between idle and high power.

There are no plans for a dedicated EGR facility in the form of a running pen and therefore all EGRs will occur on runway. The runway has been chosen as a suitable location as the types of sound during and EGR already occur at this location.

Indicative modelling of EGR was undertaken in order to choose the most suitable location on the runway to perform ground run tests with respect to noise. This was done by splitting the runway into eight equal parts and testing locations at 350m intervals along the runway, and then testing intermediate locations between the best results from the previous exercise. The outputs of this exercise concluded that the most suitable location is 50m east of the runway centre.

Future forecasts predict that there would be no more than 50 ground run tests a year, lasting 10 minutes each, with the engine thrust setting at idle (i.e. less than 25%). As a precautionary approach modelling assumed engine tests were undertaken by the noisiest aircraft in the fleet, namely the Boeing 747-400. The sound power (L_w) data was obtained from the Aviation Environment Design Tool (AEDT) and assumed to be 112 dB(A).

Aircraft Hold Points

Aircraft are often required to hold before entering the runway and occasionally at points on the taxiways. These locations are called ‘hold points’ and at these points aircraft will be stationary with engines running for extended periods. The runway hold points have been included in the model, and it assumed that 20% of departing aircraft hold for 5 minutes and the noise level is the same as that during taxi.

Taxiway hold points are not included within the model as it is assumed that no holding is necessary, due to low aircraft traffic and the relatively simple layout of the airport.

Refuelling Activities

Refuelling activities play a vital role in the operation of the airport and therefore a location where aviation fuel is processed and stored is necessary. Due to the location of the Simplified Planning Zone (SPZ) and the possibility of leakage, a fuel pipeline is not possible at the airport and, therefore, fuel is required to be tankered in by road lorries. The former airport previously had a dedicated fuel farm and it is proposed that the fuel farm for the future operation of the airport will be in the same location. This fuel farm is situated in the south-eastern corner of the airport development adjacent to Canterbury Road West. The activities presented in Table A12.3.54 will form the future operation of the fuel farm along with the associated sound emission data for the activity.

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Table A12.3.54 Fuel Farm Noise Emission Data

Noise source	Activity	Sound power level L_{WA}	Occurrences	Source of emission data
Fuel deliveries	Fuel deliveries at fuel farm	104.0	21 tanker movements per day during daytime period (0700-2300)	Fuel tanker lorry - BS5228-1:2009 Ref no. 15 Table C.4
Fuel lorry	Fuel tanker lorry idling	104.0	2 Constant over daytime period (0700-2300)	Fuel tanker lorry - BS5228-1:2009 Ref no. 15 Table C.4
Fuel pumping	Fuel pumping into tanks from tankers at fuel farm	100.0	Constant over daytime period (0700-2300)	Fuel tanker lorry - BS5228-1:2009 Ref no. 16 Table C.4
Fuel for aircraft	Bowser transporting to aircraft	104.0	1 per aircraft movement	Fuel tanker lorry - BS5228-1:2009 Ref no. 15 Table C.4
Fuel farm airside maintenance workshop HVAC	Ventilation system at the fuel farm airside maintenance workshop	95.0	Constant over 24-hour period	Assumption based on typical HVAC systems

Fixed and Static Plant

Building services noise has been included in the model, which includes heating, ventilation and air conditioning (HVAC). Building services plant has been assumed to be on various buildings throughout the airport, these buildings include the passenger terminal, all freight terminal buildings, MRO building, and fuel farm workshop.

The specific building services equipment has not been specified and therefore an assumption was made upon typical levels of plant and assumed to have a sound power level of 95dB(A). The plant was assumed to have no directivity and also no corrections were not applied for tonality, impulsivity and intermittency.

De Minimis Sources

A number of sound sources, which have significantly lower noise levels than other airport activities are considered as de minimis. This is because the level of noise will make a negligible difference to the overall noise emissions of the airport. These include the following:

- Items of GSE such as general airside vehicles (i.e. 4x4s, forklifts and tractors) which have an insignificant impact when compared with aircraft and other GSE;
- Winter weather equipment including snow blower and de-icers have not been included as the noise emissions are negligible when compared with aircraft and these are only used in adverse weather conditions and therefore do not have a significant effect on the overall noise emissions of the airport;
- The MRO activities were deemed to be a negligible source of noise as it is forecast to be operating with only hand tools. Aircraft movements to the MRO facility have been included in the model however and it is forecast that a maximum of 10 aircraft per year will use the facility;
- Backup generators were deemed to be a negligible source of noise due to the low run-times. These will only be used in emergency and tested for one hour per month; and
- Firefighting activities were deemed to be a negligible source of noise as all training will be off-site and therefore it will only be required for emergency situations.

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Embedded Mitigation

Embedded Noise mitigation has been assumed for the modelling and has taken the form of operational mitigation and physical mitigation. The aim of operational mitigation is to reduce noise at the source through operational procedures, e.g. strategic use of aircraft stands during noise sensitive periods. Physical mitigation is the use of purposefully designed measures to screen ground noise from airside, e.g. acoustic fencing in key locations to reduce propagation of noise to nearby noise sensitive receptors.

Screening

A 3m acoustic fence will be erected on the southern and eastern perimeter of the fuel farm in order to provide screening to the nearby receptors on Canterbury Road West and King Arthur Road. Modelling has shown this fence provides a reduction between 0.4 to 2.5dB(A) at identified receptors on Canterbury Road West and King Arthur Road.

Engine Ground Runs (i.e. engine testing)

The location of the designated EGR test area will be chosen in order to reduce the effects of noise. The modelled EGR test area is on the runway and 50m east from the runway centre. It is forecast that the number of EGRs at this test area will not exceed 50 tests per calendar year and the typical EGR will be undertaken at an engine thrust setting of idle (i.e. less than 25% power). Furthermore, modelling assumes no open-field EGRs will take place between 23:00 and 07:00.

APU on times

To reduce the run time of APU, all stands will be served by FEGP. It is expected that for freight APU will last for approximately 30 seconds per arrival onto stand and will no APU will then be used on stand until pushback. For passenger aircraft it is assumed that APU will last for approximately 12 minutes and 45 seconds per aircraft arrival onto stand, this relates to 50% of aircraft using APU for 25 minutes and the other 50% only using APU for 30 seconds.

Fuel Farm Deliveries

Due to the proximity of the fuel farm to residential receptors, there will be no deliveries to the fuel farm during the hours of 23:00 and 07:00.

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Methodology for predicting additional awakenings

Introduction

As described in Section 12.6 of Chapter 12 Noise and Vibration an awakening metric has be defined as a SOAEL for the assessment of significant effects of aircraft noise. The metric has been informed by emerging best practice and research into aircraft induced sleep disturbance, namely research undertaken by Basner et al (2006) [12]. At dwellings with no specific form of noise insulation, operational noise is considered to give rise to significant adverse effects if there is an absolute external noise level of at least 80 dB L_{ASmax} (approximately 90 dB SEL[13]) and the average number of noise events during the night above this level is at least 18.

The Basner research defines a dose-response relationship between the noise level inside a bedroom during the passage of an aircraft and the probability that the noise level will result in an awakening. Assumptions have been made about the noise reduction provided by an open window in order to derive a dose-response relationship between external noise level during the passage of an aircraft and the probability of awakening. This section of the appendix provides background to the research undertaken by Basner et al (2006) and how it has been applied to the assessment of Manston Airport.

Basner study

The Institute of Aerospace Medicine at the German Aerospace Centre (DLR) investigated the influence of nocturnal aircraft noise on sleep in polysomnographic laboratory and field studies between 1999 and 2004. The results of the field studies were used by the Regional Council of Leipzig (Germany) for the establishment of a noise protection plan in the official approval process for the expansion of Leipzig/Halle airport. Basner et al (2006) described methods and results of the DLR field study in detail in the paper. Special attention is given to the dose-response relationship between the maximum sound pressure level of an aircraft noise event and the probability of awakening ("a sleep stage change to awake"), which was used to establish noise protection zones directly related to the effects of noise on sleep.

Several potential indicators for noise-induced sleep disturbance have been identified and proposed in the past. Brief EEG (brain current diagram) and EMG (muscle tension) activations are called arousals. Because of their short duration, they are not classified a sleep stage change to awake according to Rechtschaffen and Kales[14]. Awakenings are longer arousals, defined as EEG and EMG activations that last for at least 15s and therefore lead to a classification of the sleep stage as "awake". Polysomnographic studies conducted in the past predominantly used awakenings as the primary indicator of sleep disturbances induced by environmental noise.

The DLR field study developed a multivariable random effects logistic regression model, which contain the maximum A-weighted SPL (L_{ASmax}) and the background noise level in the minute preceding the aircraft noise event (ANE) ($L_{eq,1min}$) as well as their interaction term $L_{ASmax} \times L_{eq,\ 1min}$ as statistically significant variables. Additionally, the sleep stage prior to the occurrence of an ANE as well as elapsed sleep time are incorporated as statistically significant moderators in the model.

Fig. A12.3.4 illustrates the relationship between the maximum SPL of an ANE and the probability of a sleep stage change to awake based on results of the regression model (black line). The background noise level was assumed constant with 27.1 dB (median). Awakenings are not specific to noise, as they also occur spontaneously and regularly. The probability of noise-induced awakenings is calculated by subtracting the baseline spontaneous awakening probability (dashed line in Fig. A12.3.4) from awakening probability

[12] Based on the findings of Basner et. al. (2006) Aircraft noise effects on sleep: Application of the results of a large polysomnographic field study.
[13] 90 dB SEL has been used by Department for Transport and at other UK airports as a measure of sleep disturbance and the basis of for night-noise insulation schemes when considering the number and nature of aircraft night operations.
[14] A. Rechtschaffen, A. Kales et al. (1968) A Manual of Standardized Terminology, Techniques and Scoring System for Sleep Stages of Human Subjects," Public Health Service, U.S. Government, Printing Office, Washington, DC.

observed under the influence of only aircraft noise (black line in Fig. A12.3.4). The resulting aircraft-noise-induced awakening probability depending on the maximum SPL of an ANE is shown in Figure A12.3.5.

Figure A12.3.4 Probability of a sleep stage change to awake resulting from a maximum SPL $L_{AS,max}$ inside a bedroom. Point estimates (black line), 95% confidence limits (gray lines), and spontaneous reaction probabilities (dashed line) are shown.

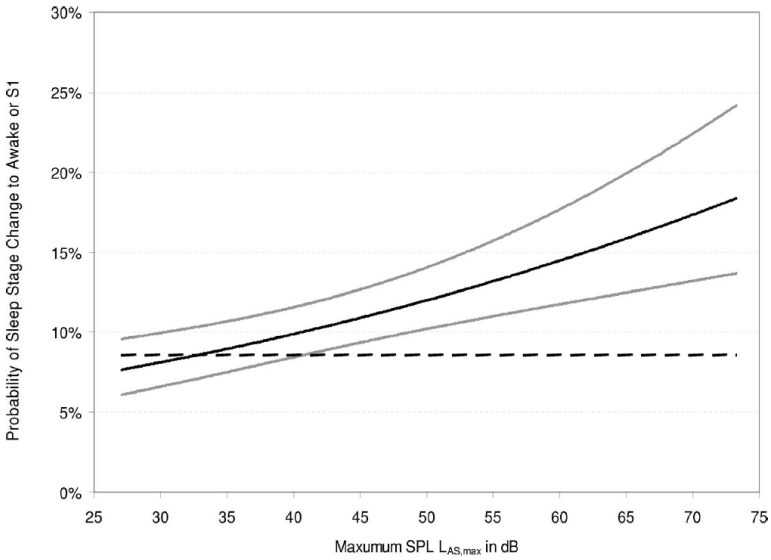
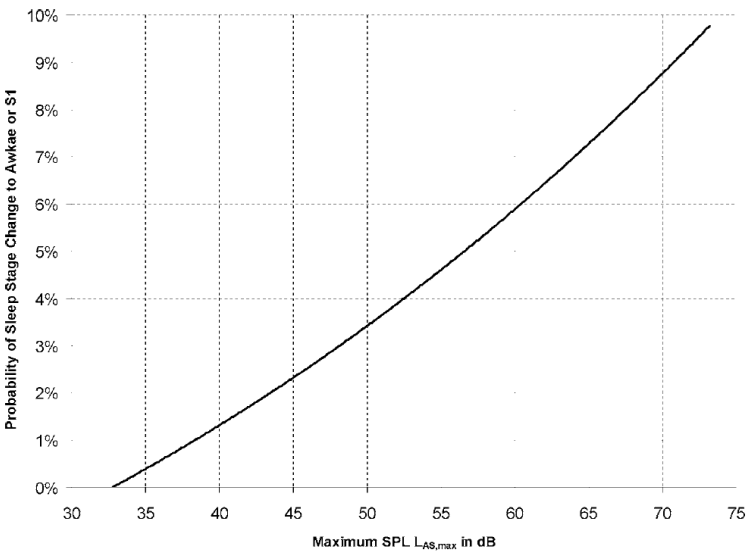


Figure A12.3.5 Probability of aircraft-noise-induced awakenings depending on maximum SPL of ANEs. First reactions occur above maximum SPLs of 32.7 dB.



The regression line can be approximated with a second-degree polynomial between 32.7 and 73.2 dB. Awakening probability in % is calculated as:

$$P_{AWR} = 1.894 \times 10^{-3} L_{AS,max}^2 + 4.008 \times 10^{-2} L_{AS,max} - 3.3243$$

Calculation of the probability of awakening from external noise levels

As described above, the dose-response relationship presented in Figure A12.3.5 is for internal noise levels. A dose-response relationship between external noise level and awakening can be derived if assumptions are made about the sound reduction that can be achieved with an open window. In Basner et al. (2006) the sound reduction resulting from an open window was assumed to be 15dB. This value is stated in the WHO Guidelines for Community Noise (1999)[15].

In WHO Night Noise Guidelines for Europe an average level of 21 dB difference between internal levels and external levels is proposed to represent an open window, as this takes into account that even in well-insulated houses windows may be open a large part of the year[16].The seasonal average 21 dB difference is taken from a study by Passchier-Vermeer et al. (2002)[17], where a level difference was derived from noise measurements inside and outside a bedroom whilst the window position was measured with sensors. The results (Table A12.3.55) showed that windows are fully closed only in 25% of the nights between April and November. This results in average inside/outside differences of around 21 dB, with there being only a slight difference between single- and double-glazed windows. The average difference at night is 21.3 dB for single-glazed window and 22.2 for a double-glazed window. This value has been used to determine the number of events of 80 dB L_{ASmax} which would result in an additional awakening.

Applying a correction of 21 dB between internal and external levels means an internal level of 59 dB L_{ASmax} would result from and external level of 80 dB L_{ASmax}.

According to the Equation of P_{AWR} above, probability of aircraft-noise-induced awakening is 5.6% when the internal level $L_{AS\ max}$ is 59 dB, i.e. outside level of aircraft noise is 80 dB.

Therefore 18 aircraft noise at 80 dB L_{ASmax} will induce one additional awakening of aircraft noise (5.6% ×18 = 100%).

It is worth noting that if the sound reduction of an open window was assumed to be 15dB as in Basner et al. (2006), the number of events above 80 dB L_{ASmax} predicted to induce one additional awakening would be 14.

Table A12.3.55 Window positions during research period (April–November)

Window position	% nights
Closed	25
Slightly open	43
Hand width	23
Half open	5
Fully open	4

[15] WHO (1999) Guidelines for Community Noise [online] Available at http://apps.who.int/iris/handle/10665/66217 [Accessed 14/02/2018]
[16] WHO (2009) Night Noise Guidelines for Europe [online] Available at http://www.euro.who.int/__data/assets/pdf_file/0017/43316/E92845.pdf [Accessed 14/02/2018]
[17] Passchier-Vermeer W et al. (2002). Sleep disturbance and aircraft noise exposure. TNO-PG, Leiden, Report No. 2002.027.

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Appendix 12.4
Baseline Study

Overview

12.4.1 To identify the baseline noise levels at residences close to the airport, sound measurements were taken over a period of 24 days from Sunday 26th February 2017 to Wednesday 22nd March 2017. Further to Thanet District Council's request, an additional survey was undertaken at the Nethercourt Estate from 10th October 2017 to 30th November 2017, a period of 20 days.

12.4.2 The instrumentation used for the sound surveys was set up to simultaneously log, $L_{Aeq,T}$, $L_{A90,T}$, $L_{A10,T}$, and L_{AFmax} sound levels over continuous 5-minute sampling periods ('*T*'). All measurements were undertaken, in accordance with the methodologies presented in BS 7445-1:2003[1] and BS 4142:2014[2].

12.4.3 All sound monitoring was completed using an IEC 61672-1[3] Class 1 Rion NL31 Sound Level Meter (SLM) and microphones were positioned at height of 1.2m above ground level in a free-field position.

12.4.4 Field calibration checks of the SLMs were undertaken before and after each measurement. Each SLM used for the surveys was within two years of calibration and each calibrator was within one year of calibration.

12.4.5 The equipment used for the noise survey was as follows:

Table A12.4.1 LT1 - NL31 #13 Details

Instrument	Manufacturer	Type	Serial Number	Last Calibration Date
Sound Level Meter	Rion	NL - 31	01283509	15/12/2016
Preamplifier	Rion	NH – 21	29266	15/12/2016
Microphone	Rion	UC – 53A	320738	15/12/2016

Table A12.4.2 LT2 - NL31 #04 Details

Instrument	Manufacturer	Type	Serial Number	Last Calibration Date
Sound Level Meter	Rion	NL - 31	00541624	11/01/2017
Preamplifier	Rion	NH – 21	13939	11/01/2017
Microphone	Rion	UC – 53A	310266	11/01/2017

Table A12.4.3 LT3 - NL31 #10 Details

Instrument	Manufacturer	Type	Serial Number	Last Calibration Date
Sound Level Meter	Rion	NL - 31	01141954	10/05/2016

[1] BS 7445-1: 2003 Description and measurement of environmental noise. Guide to quantities and procedures.
[2] BS 4142: 2014 Methods for rating and assessing industrial and commercial sound.
[3] BS EN 61672-1:2013 Electroacoustics. Sound level meters. Specifications.

Preamplifier	Rion	NH – 21	36882	10/05/2016
Microphone	Rion	UC – 53A	320323	10/05/2016

Table A12.4.4 LT4 - NL31 #11 Details

Instrument	Manufacturer	Type	Serial Number	Last Calibration Date
Sound Level Meter	Rion	NL - 31	00583298	10/05/2016
Preamplifier	Rion	NH – 21	27528	10/05/2016
Microphone	Rion	UC – 53A	320415	10/05/2016

Table A12.4.5 LT5 - NL31 #06 Details

Instrument	Manufacturer	Type	Serial Number	Last Calibration Date
Sound Level Meter	Rion	NL - 31	00541623	12/01/2017
Preamplifier	Rion	NH – 21	11609	12/01/2017
Microphone	Rion	UC – 53A	318928	12/01/2017

Table A12.4.6 LT6 - NL31 #14 Details

Instrument	Manufacturer	Type	Serial Number	Last Calibration Date
Sound Level Meter	Rion	NL - 31	01283508	15/12/2016
Preamplifier	Rion	NH – 21	29265	15/12/2016
Microphone	Rion	UC – 53A	315530	15/12/2016

Table A12.4.7 LT7 - NL31 #11 Details

Instrument	Manufacturer	Type	Serial Number	Last Calibration Date
Sound Level Meter	Rion	NL - 31	583298	15/05/2017
Preamplifier	Rion	NH – 21	27528	15/05/2017
Microphone	Rion	UC – 53A	314461	15/05/2017

12.4.6 The following sections present the results of each measurement and a description of the noise environment noted by the site engineer during survey works.

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Measurement description and results

Position
LT1 – Orchard Cottage

Location
Acol

Period
21/02/2017 – 22/03/2017

Description of Monitoring Location

LT1 was located approximately 1.2km northwest of the western site perimeter. The Sound Level Meter (SLM) was positioned in a free-field location in the rear garden of the property, approximately 20m from the western façade of the house. The acoustic environment was considered representative of the background sound level within the area. Error! Reference source not found. provides a summary of the measured baseline noise data at LT1.

General Observations

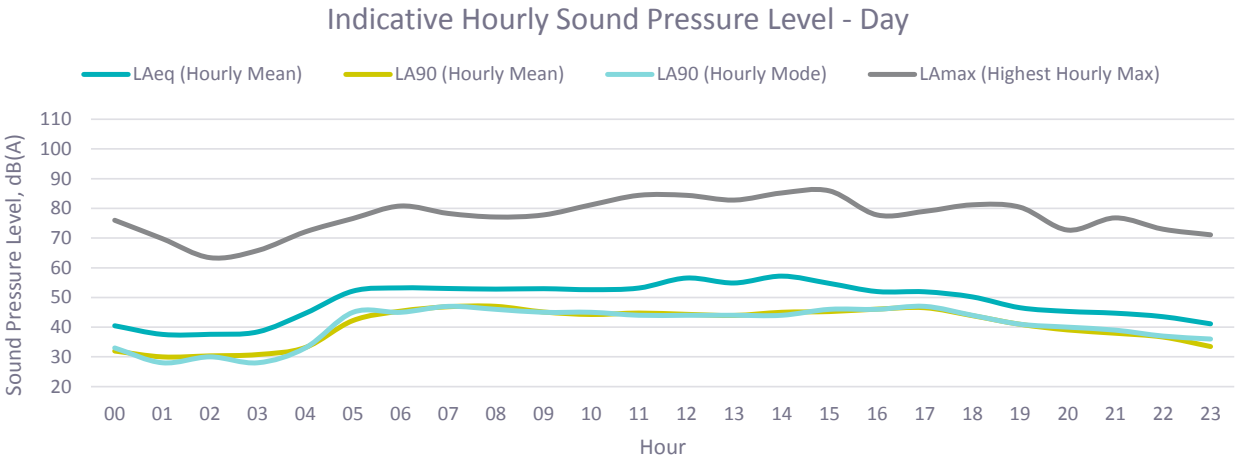
The acoustic environment was observed to be dominated by distant road traffic noise from the A28 (located 1.5km to the northwest) and the A299 (located 2.6km to the west). Intermittent road traffic noise was audible on Minster Road (located 40m to the east).

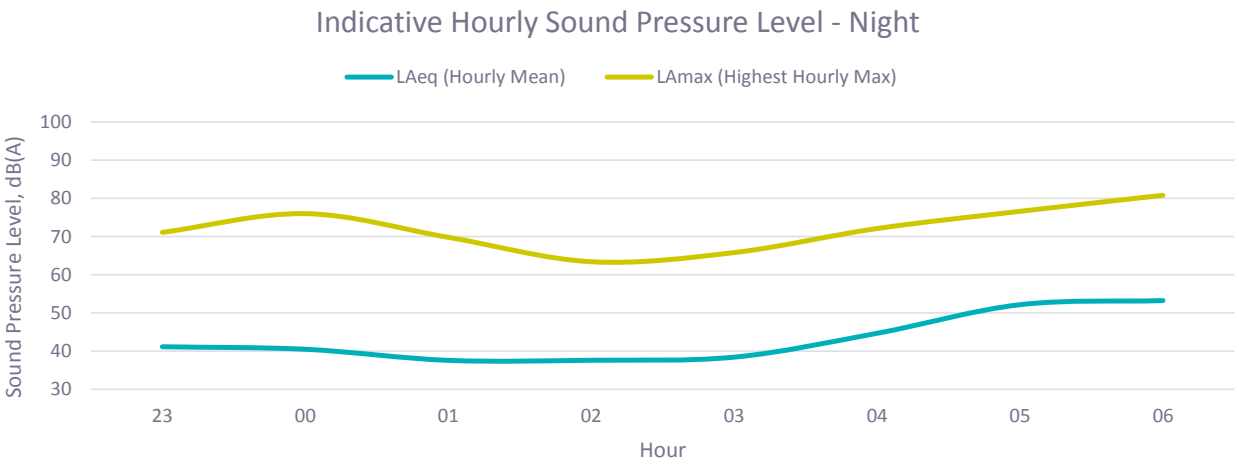
Night-time observations were undertaken and it was observed that distant road traffic noise from the A28 and A299 was dominant and road traffic noise on Minster road remained intermittent. However, the overall traffic flow had reduced and hence the background level of noise had subsided. Furthermore, because the road traffic noise was reduced, an electricity pylon located 100m north was audible at a low level. It was noted that the electricity pylon was not audible during the day.

Monitoring Location

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	$L_{A90,T}$ (dB) [modal average]	Total No. of 5 minute periods	Periods affected by rain %
Daytime	Monday to Sunday (0700-2300)	51	44	44	5492	28
Construction night-time	Monday to Sunday (2300-0700)	46	35	31	2784	28
Construction evenings & weekends	Monday to Friday (1900-2300), Saturday (1300-2300) and Sunday (0700-2300)	48	42	42	2256	29
Construction daytime	Monday to Friday (0700-1900) and Saturday (0700-1300)	52	46	46	3236	28
Operational night-time	Monday to Sunday (2300-0700)	46	35	31	2784	28
Operational daytime	Monday to Friday (0700-2300)	52	45	46	3956	25
	Saturday (0700-2300)	50	44	44	768	36
	Sunday (0700-2300)	49	42	42	768	38

Photographs


Indicative Hourly Sound Pressure Level - Day
LAeq (Hourly Mean)
LA90 (Hourly Mean)
LA90 (Hourly Mode)
LAmax (Highest Hourly Max)
Sound Pressure Level, dB(A)
110
100
90
80
70
60
50
40
30
20
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Hour


Indicative Hourly Sound Pressure Level - Night
LAeq (Hourly Mean)
LAmax (Highest Hourly Max)
Sound Pressure Level, dB(A)
100
90
80
70
60
50
40
30
23 00 01 02 03 04 05 06
Hour

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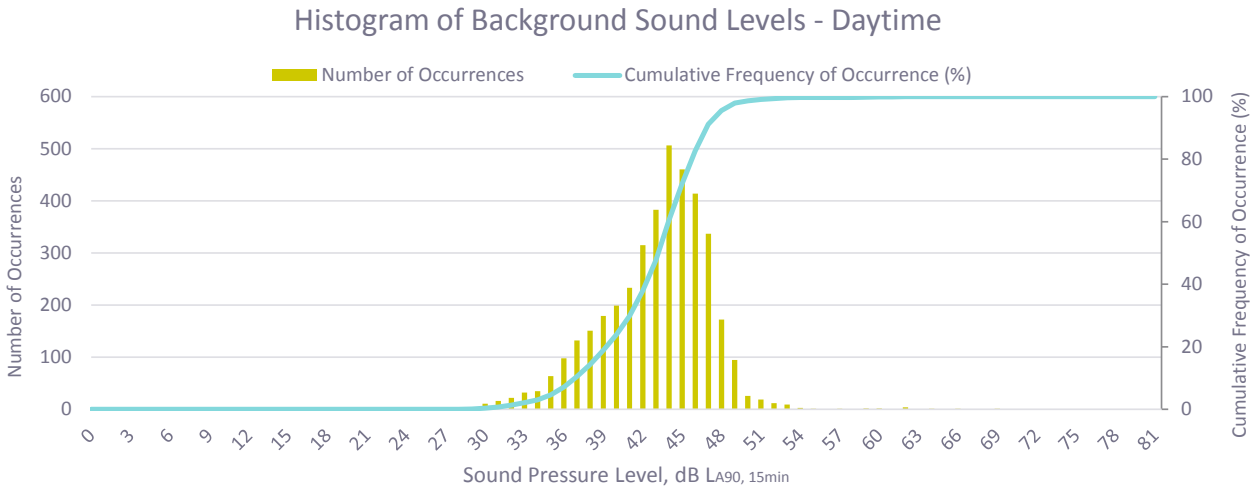

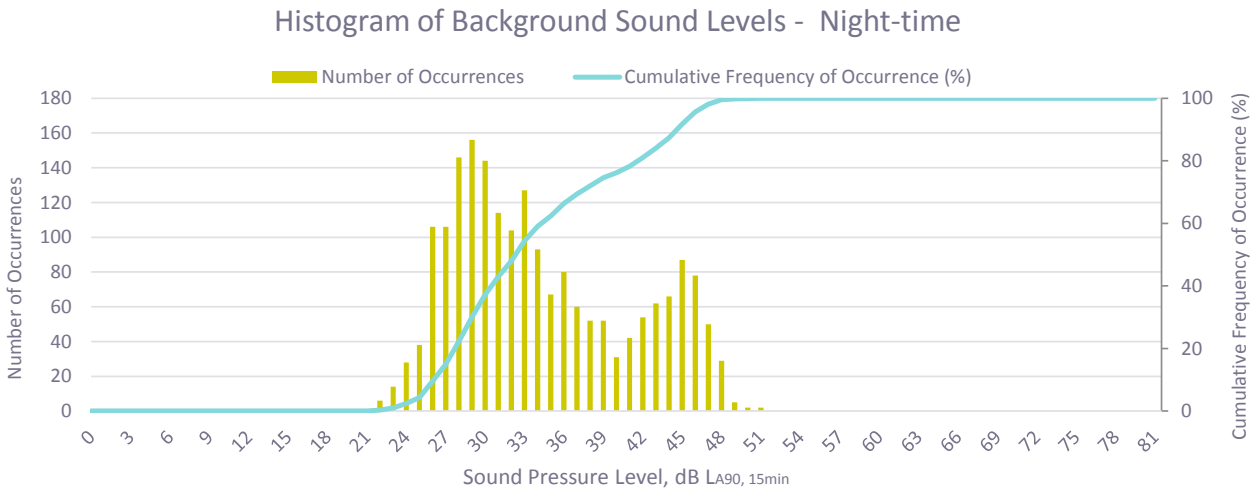

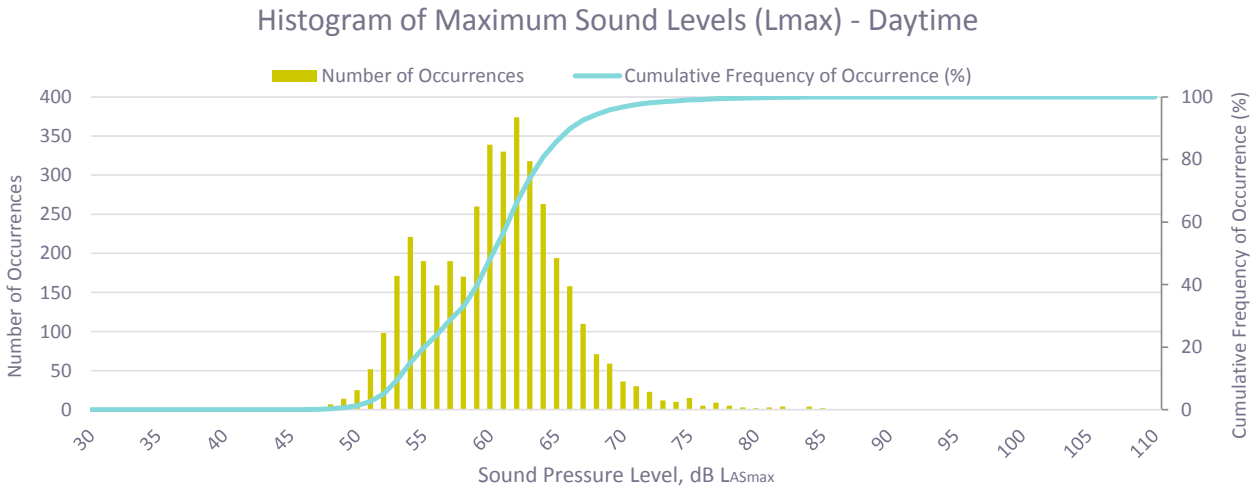

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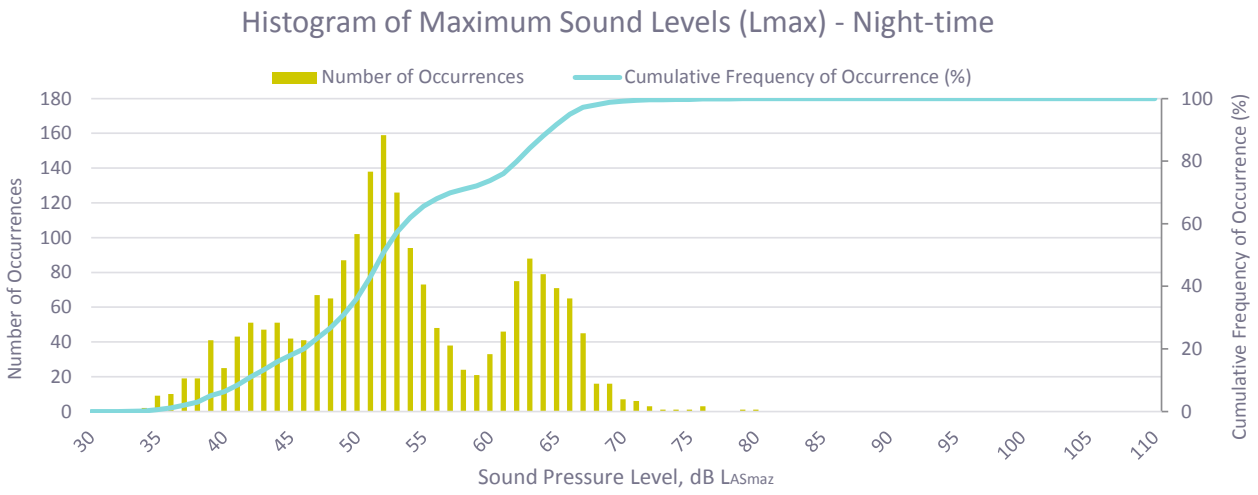
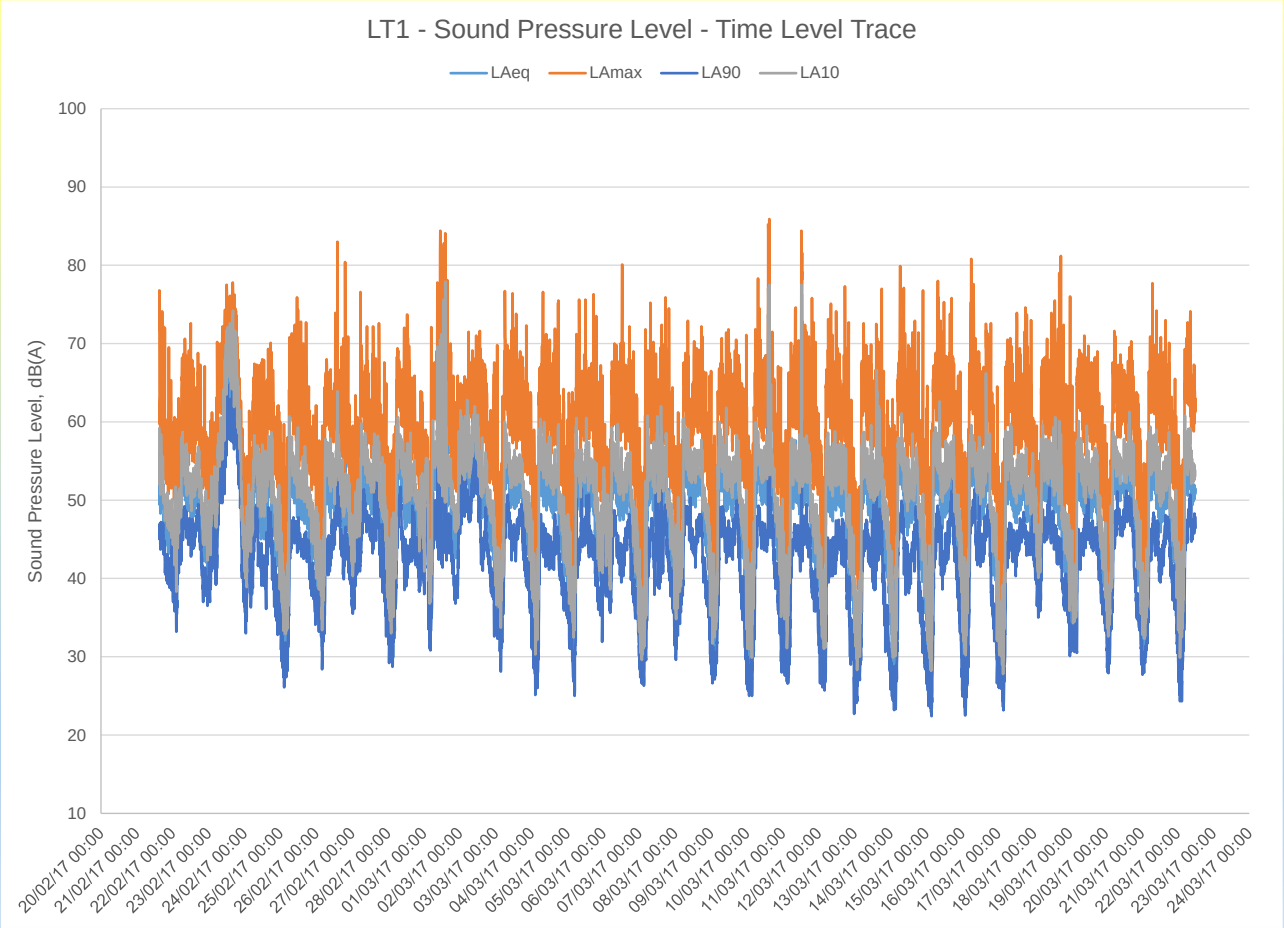




Position
LT2 –
14 Beaumont Close

Location
Manston

Period
21/02/2017 – 22/03/2017

Description of Monitoring Location

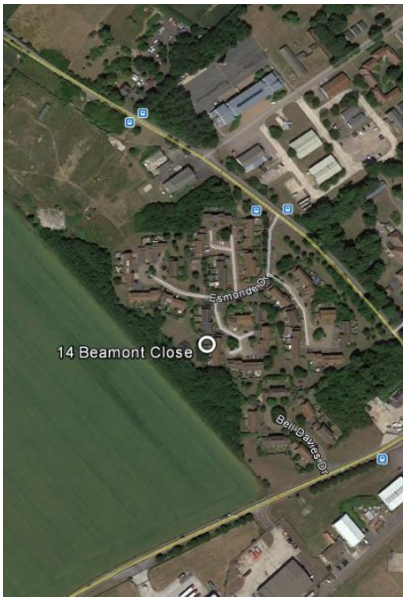
LT2 was located approximately 170m northwest of the north western site perimeter. The SLM was positioned in a free-field location in the rear garden of the property, located 7m from the western façade of the house. The acoustic environment was considered representative of the background noise level within the area. Error! Reference source not found. provides a summary of the baseline noise data measured at LT2.

General Observations

The acoustic environment was observed to be dominated by road traffic noise emanating from the south and southwest, including the B2190 (located 180 m to the south), the A299 (located 1km to the south) and the A253 (located 1.8km to the south west). Bird song was constant and there was intermittent low level construction noise emanating from the northwest.

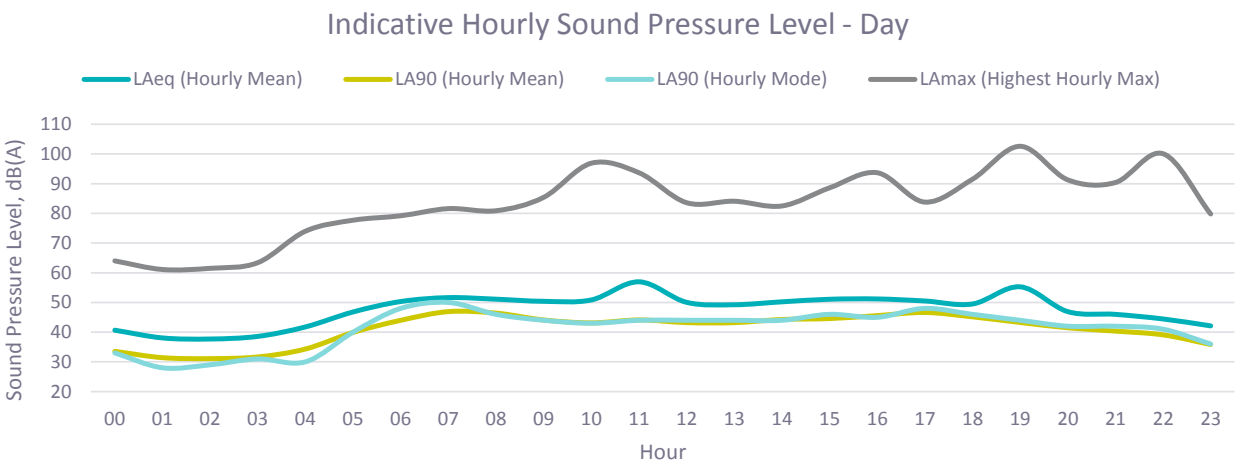
Night-time observations were undertaken and it was noted that road traffic noise from the A253 (located to the southwest) was dominant, and the road traffic noise from the B2190 had reduced. Furthermore, intermittent local road traffic noise along the B2050 (located 150m to the northwest) was audible during the night, and this was not observed during the day. Furthermore, a noise similar to a fan and likely to be from the industrial facilities located along Columbus Ave 1.4km to the west was noted to be audible at a low level.

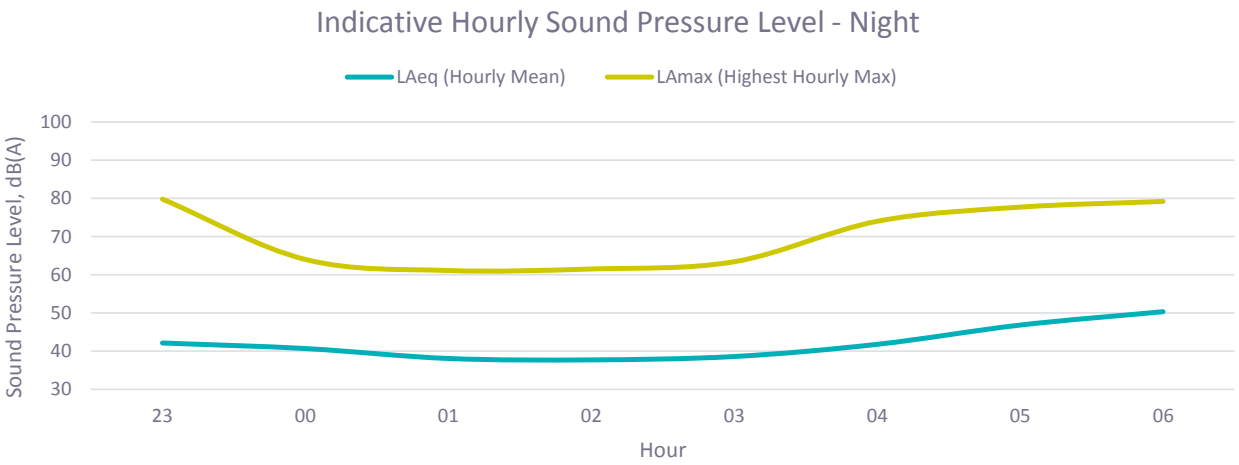
Monitoring Location



Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	$L_{A90,T}$ (dB) [modal average]	Total No. of 5 minute periods	Periods affected by rain %
Daytime	Monday to Sunday (0700-2300)	51	44	44	5556	29
Construction night-time	Monday to Sunday (2300-0700)	44	35	33	2784	28
Construction evenings & weekends	Monday to Friday (1900-2300), Saturday (1300-2300) and Sunday (0700-2300)	50	42	41	2256	29
Construction daytime	Monday to Friday (0700-1900) and Saturday (0700-1300)	52	45	44	3300	29
Operational night-time	Monday to Sunday (2300-0700)	44	35	33	2784	28
Operational daytime	Monday to Friday (0700-2300)	52	44	44	4020	26
	Saturday (0700-2300)	49	43	43	768	36
	Sunday (0700-2300)	49	42	46	768	38

Photographs


Indicative Hourly Sound Pressure Level - Day
LAeq (Hourly Mean)
LA90 (Hourly Mean)
LA90 (Hourly Mode)
LAmax (Highest Hourly Max)
Sound Pressure Level, dB(A)
110
100
90
80
70
60
50
40
30
20
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Hour


Indicative Hourly Sound Pressure Level - Night
LAeq (Hourly Mean)
LAmax (Highest Hourly Max)
Sound Pressure Level, dB(A)
100
90
80
70
60
50
40
30
23 00 01 02 03 04 05 06
Hour

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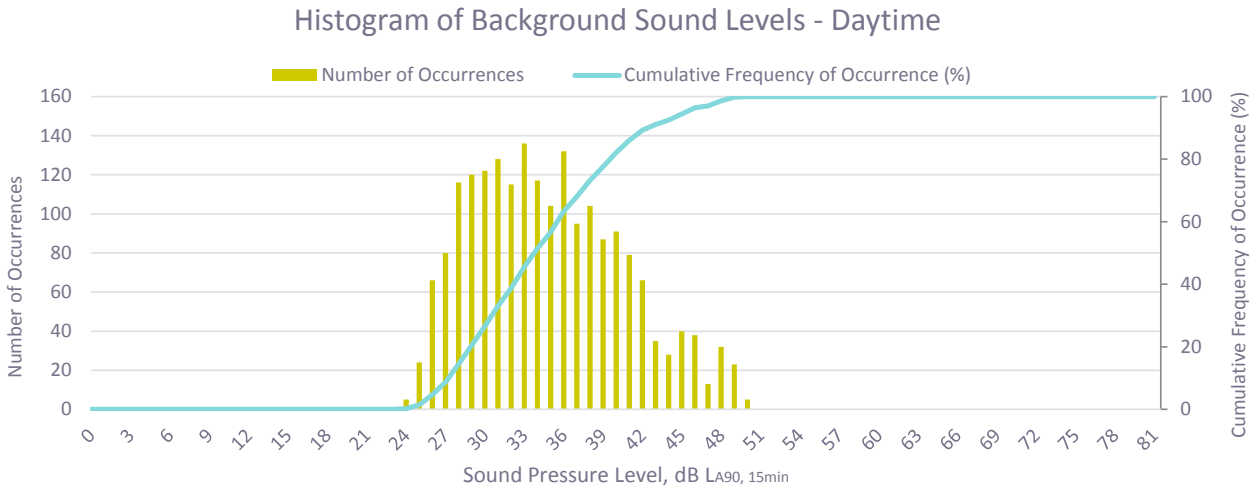

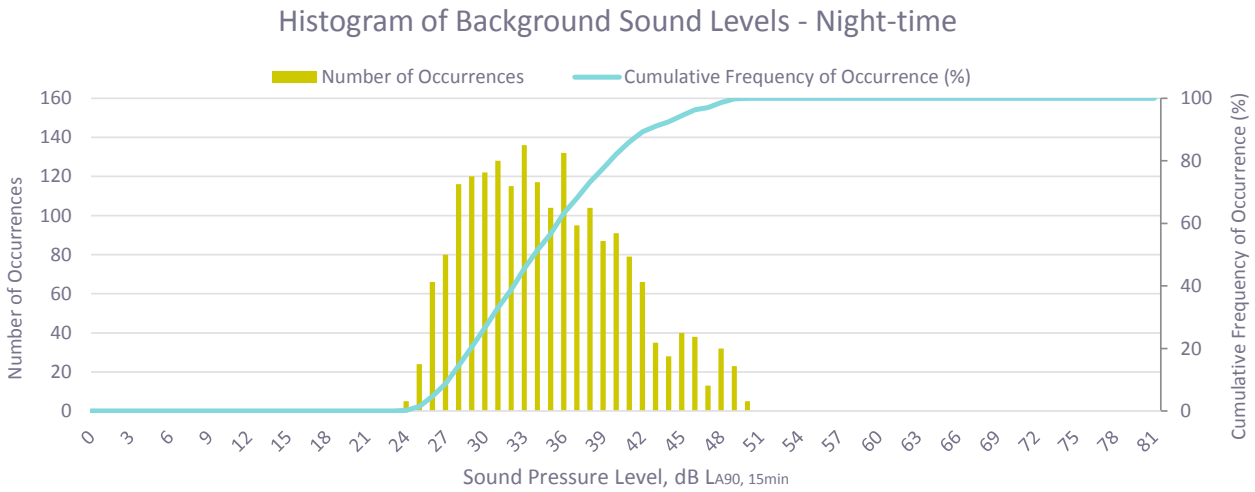

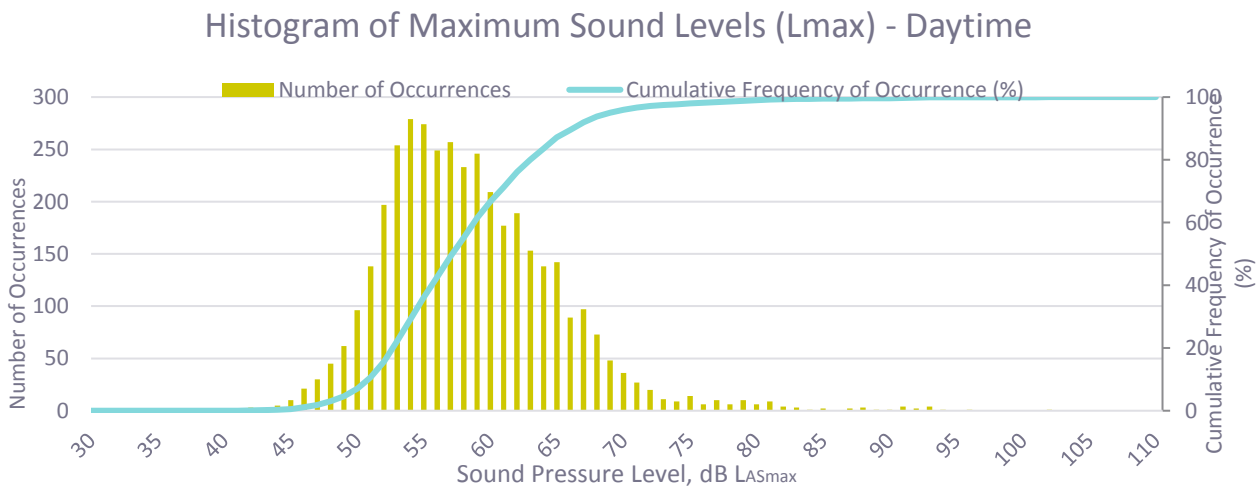

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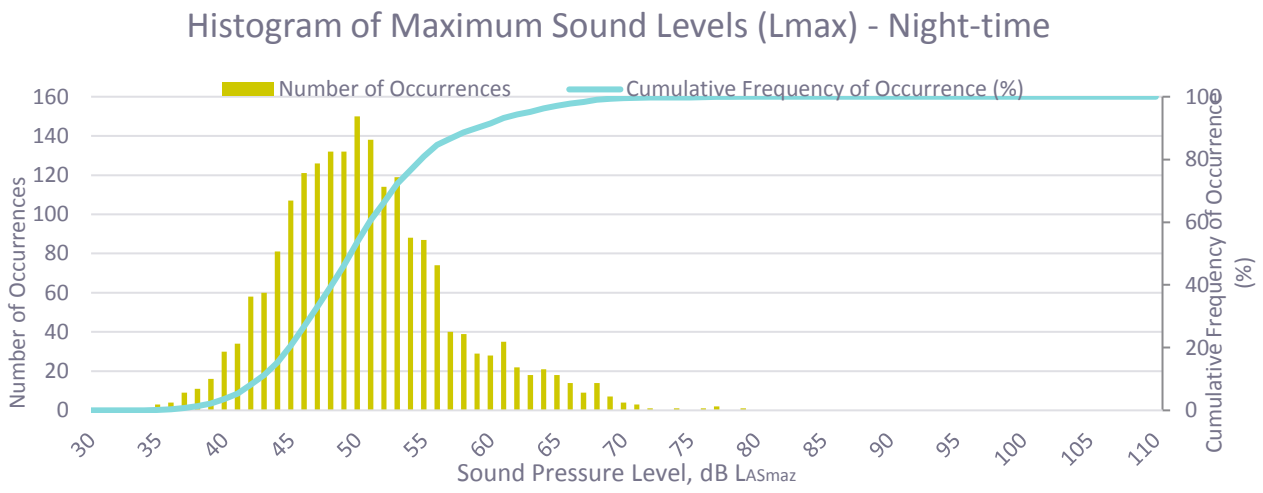

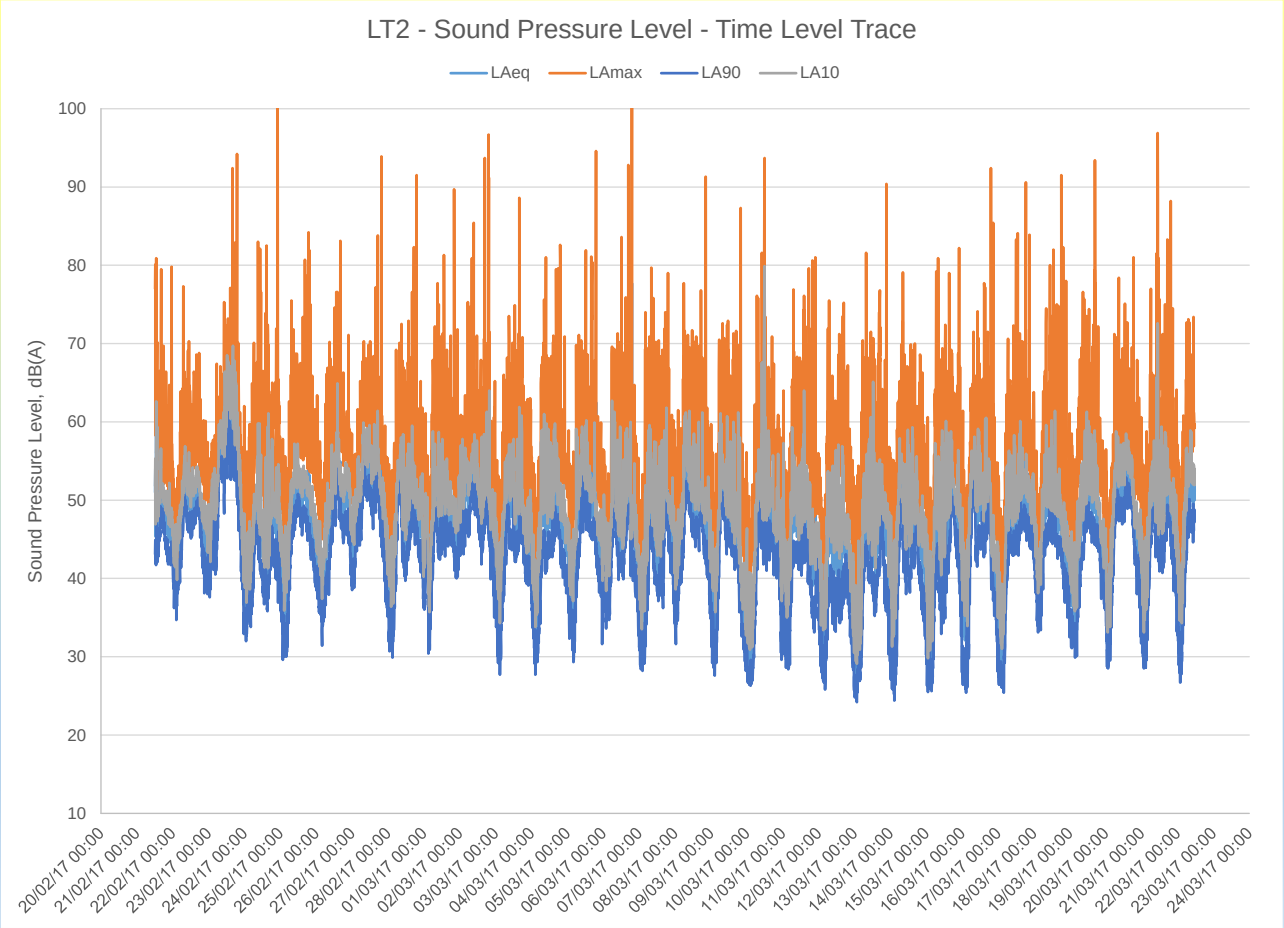

Position
LT3 – Grove House

Location
Manston

Period
21/02/2017 – 22/03/2017

Description of Monitoring Location

LT3 was located approximately 480m east of the eastern site perimeter. The SLM was positioned in a free-field location in the rear garden of the property approximately 8m from the southern façade of the house. The acoustic environment was considered representative of the background noise level within the area. Error! Reference source not found. presents a summary of the measured baseline noise data from LT3.

General Observations

The acoustic environment was observed to be dominated by road traffic noise from the B2050 (located 50m to the north) and during periods of low traffic flows on the B2050, road traffic noise from the A256 (located 1km to the east and south) became more dominant. Bird song, in particular from seagulls, was constant throughout. A train horn was also noted as being audible from the Ashford to Ramsgate railway located 1.1km to the south.

Night-time observations were undertaken and it was noted that road traffic noise from the A256 was dominant. During the night, road traffic noise from the B2050 was considered intermittent, with approximately one car every five minutes and therefore was considered not to be the dominant noise source.

Monitoring Location

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	$L_{A90,T}$ (dB) [modal average]	Total No. of 5 minute periods	Periods affected by rain %
Daytime	Monday to Sunday (0700-2300)	51	44	44	5492	28
Construction night-time	Monday to Sunday (2300-0700)	46	35	31	2784	28
Construction evenings & weekends	Monday to Friday (1900-2300), Saturday (1300-2300) and Sunday (0700-2300)	48	42	42	2256	29
Construction daytime	Monday to Friday (0700-1900) and Saturday (0700-1300)	52	46	46	3236	28
Operational night-time	Monday to Sunday (2300-0700)	46	35	31	2784	28
Operational daytime	Monday to Friday (0700-2300)	52	45	46	3956	25
	Saturday (0700-2300)	50	44	44	768	36
	Sunday (0700-2300)	49	42	42	768	38

Photographs

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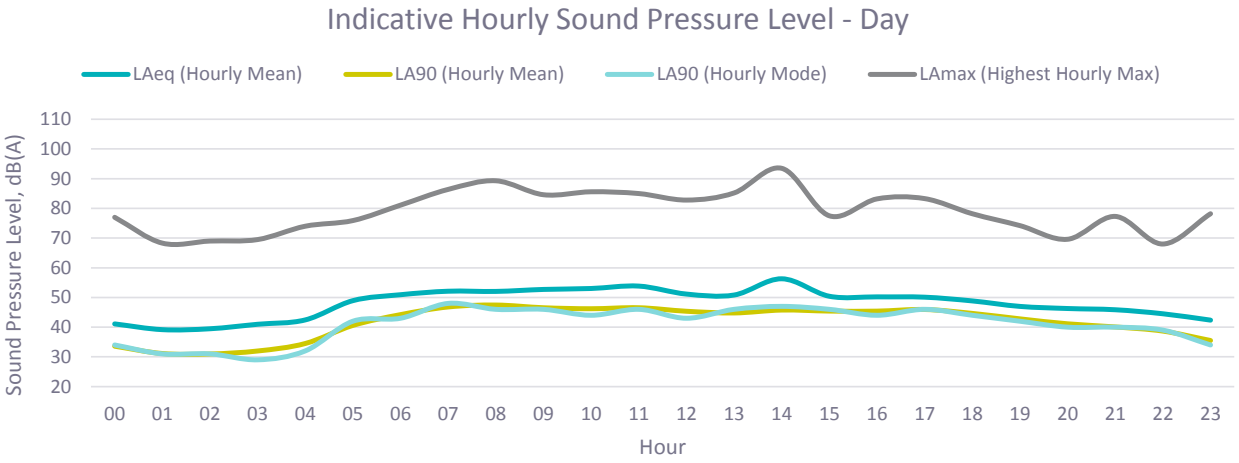

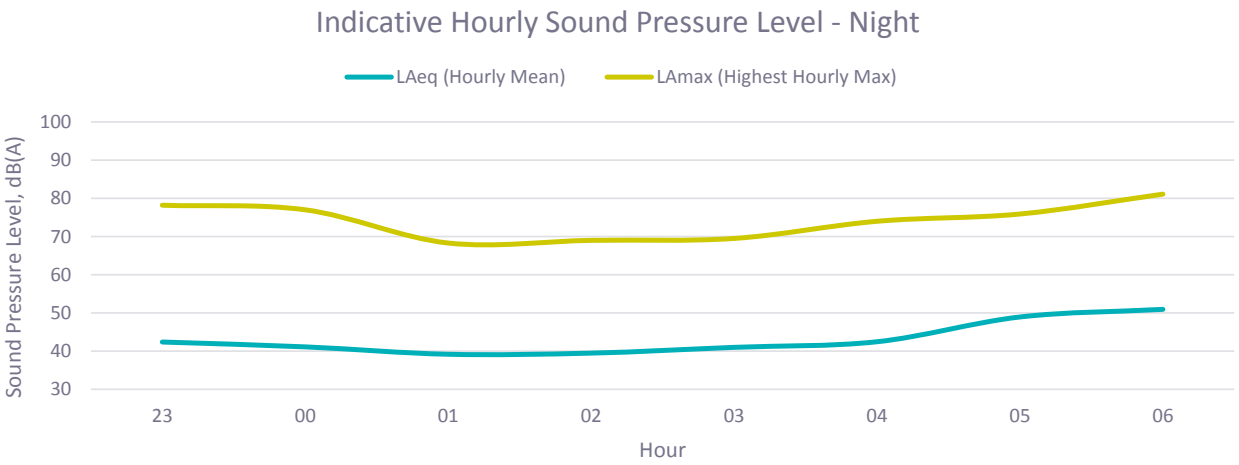

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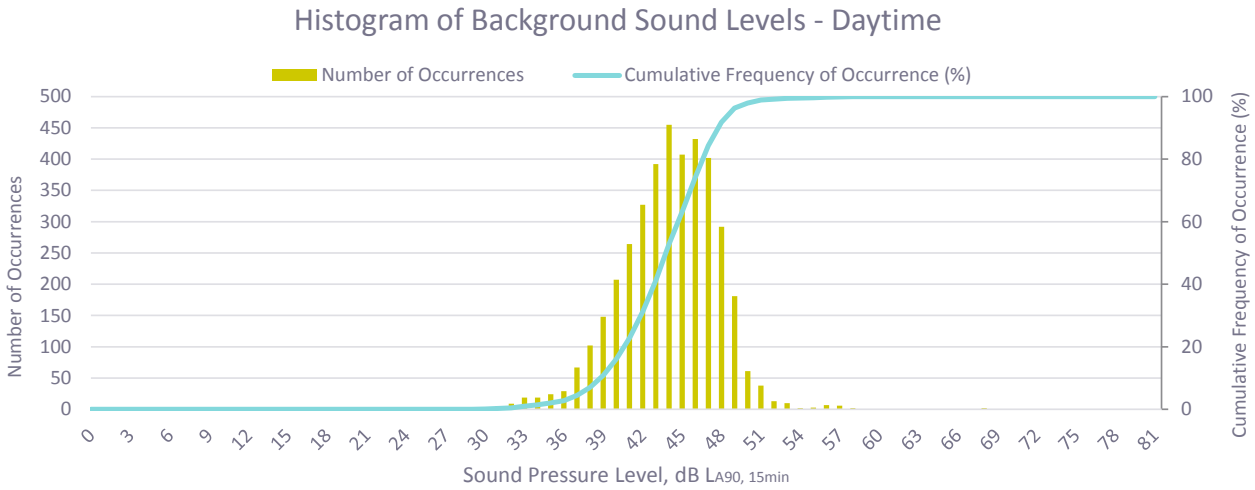

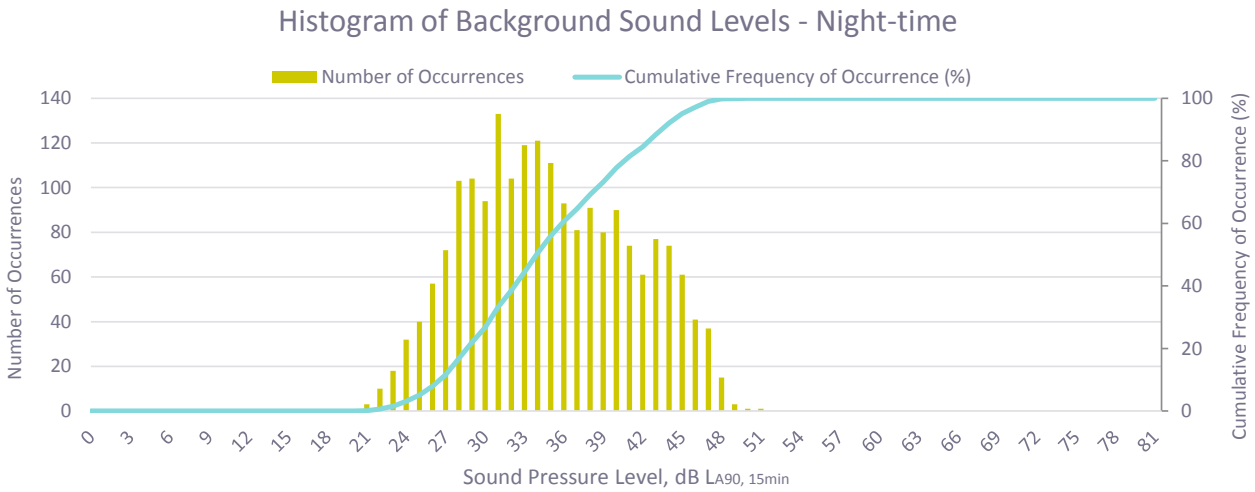

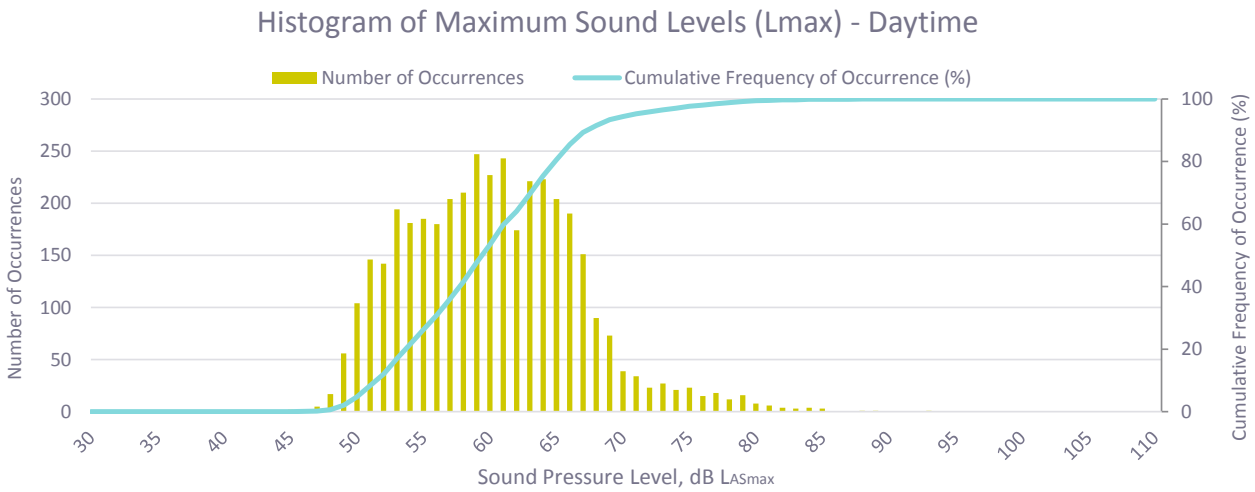

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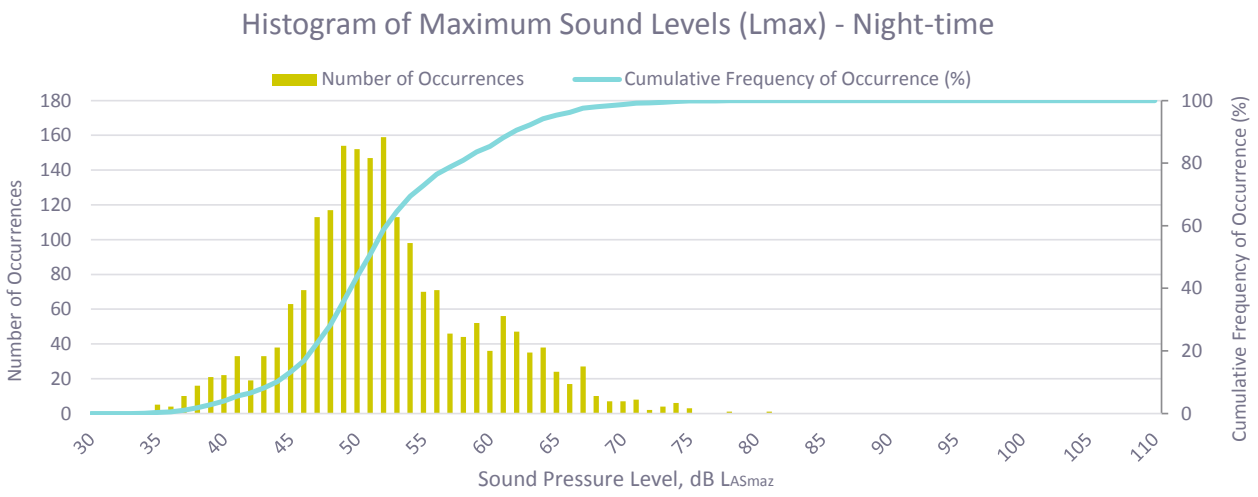

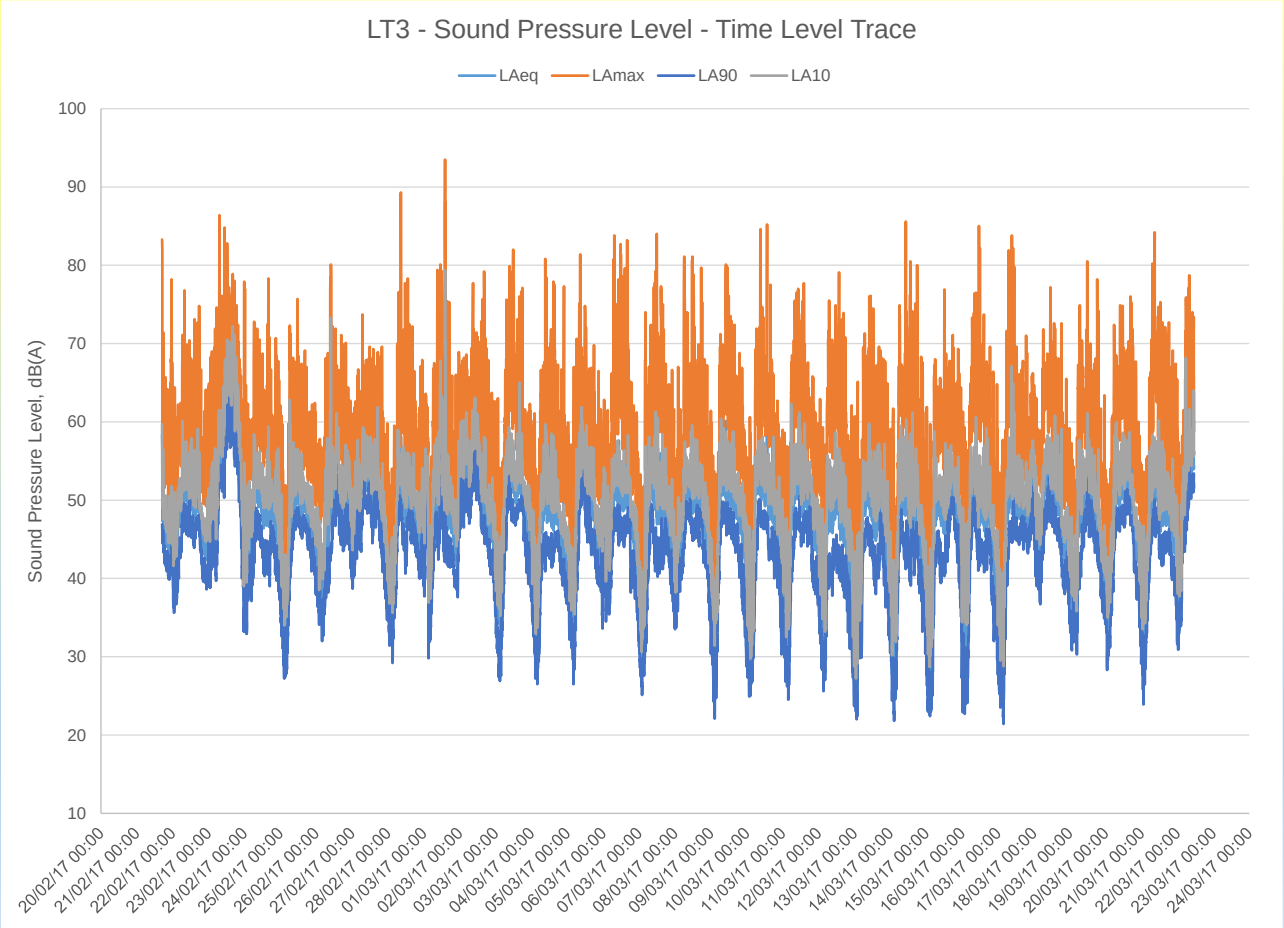

Position
LT4 – 23a St John's Avenue

Location
Ramsgate

Period
21/02/2017 – 22/03/2017

Description of Monitoring Location

LT4 was located approximately 1.4 km east of the eastern site boundary. The SLM was positioned in a free-field location in the rear garden of the property approximately 5 m from the south western façade of the house. The acoustic environment was considered representative of the background noise level within the area. Error! Reference source not found. presents a summary of the measured baseline noise data from LT4.

General Observations

The acoustic environment was observed to be dominated by road traffic noise from the A256 (located 650 m to the north), and intermittent local road traffic noise along St. John's Avenue (located 20m to the northwest) was audible. Furthermore, bird song was constant throughout. Additionally it was noted that children playing at a nearby school to the south was audible.

Night-time observations were undertaken and it was noted that road traffic noise from the A256 was not audible and road traffic noise from the southwest (B2050) was dominant. During night-time observations there was no road traffic on St John's Avenue. Intermittent bird song was also audible throughout.

Monitoring Location

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	$L_{A90,T}$ (dB) [modal average]	Total No. of 5 minute periods	Periods affected by rain %
Daytime	Monday to Sunday (0700-2300)	52	40	40	5492	28
Construction night-time	Monday to Sunday (2300-0700)	46	32	29	2784	28
Construction evenings & weekends	Monday to Friday (1900-2300), Saturday (1300-2300) and Sunday (0700-2300)	48	38	37	2256	29
Construction daytime	Monday to Friday (0700-1900) and Saturday (0700-1300)	54	41	40	3236	28
Operational night-time	Monday to Sunday (2300-0700)	46	32	29	2784	28
Operational daytime	Monday to Friday (0700-2300)	53	40	40	3956	25
	Saturday (0700-2300)	50	39	39	768	36
	Sunday (0700-2300)	49	38	36	768	38

Photographs

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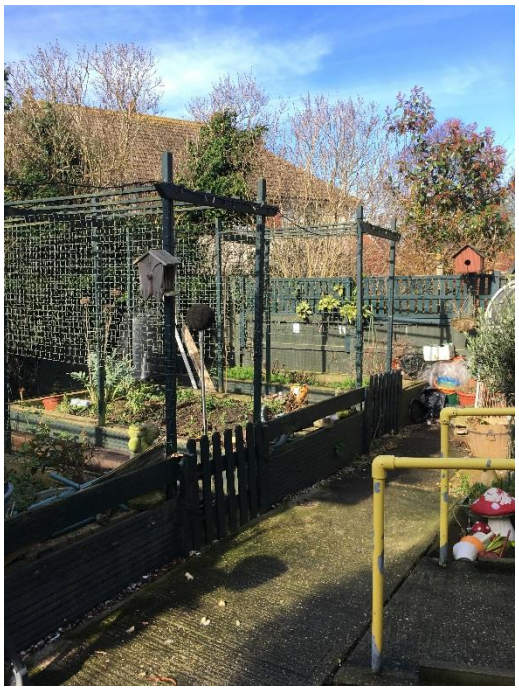

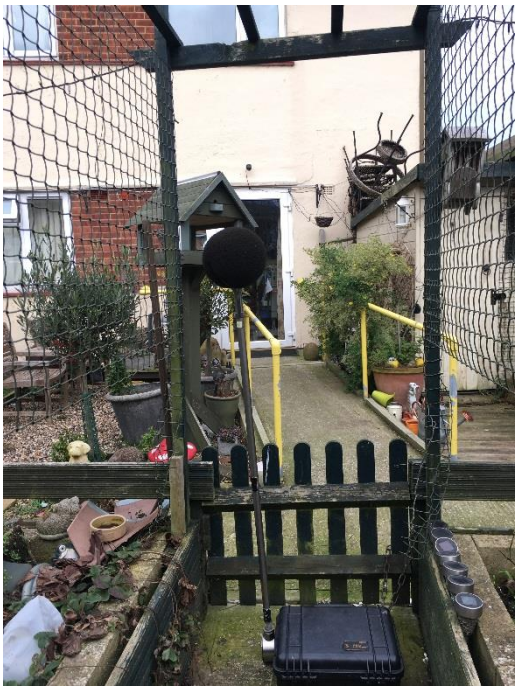

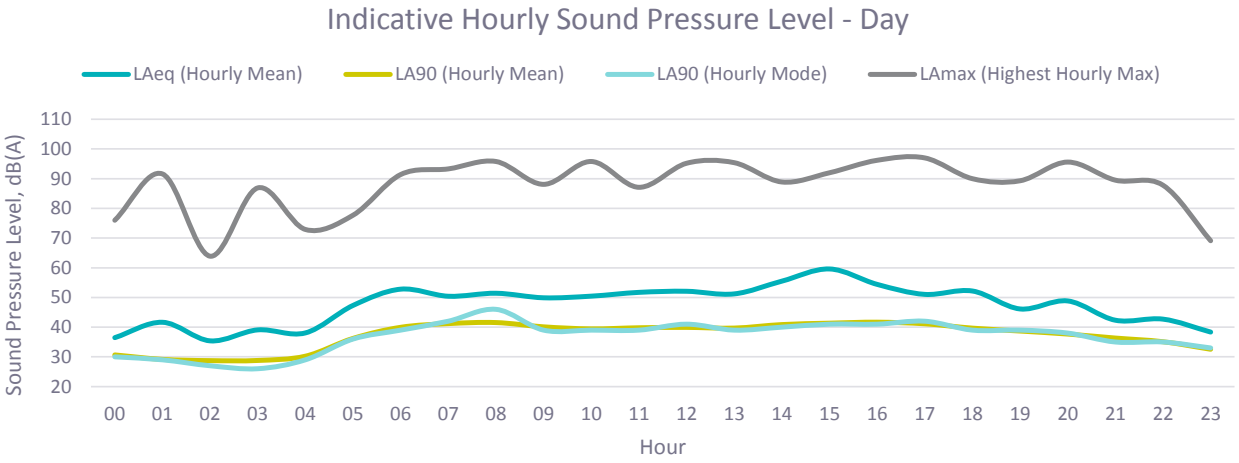

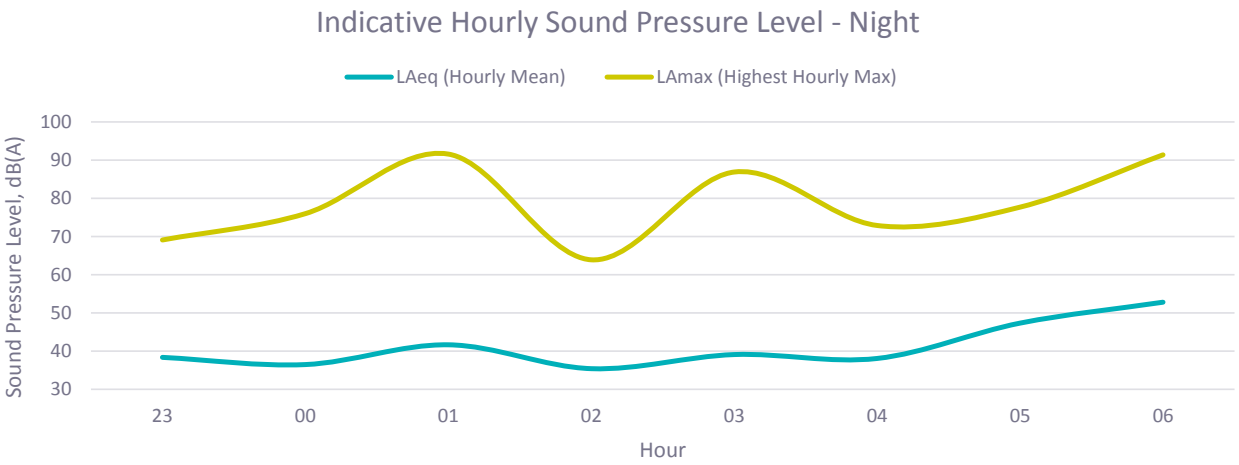

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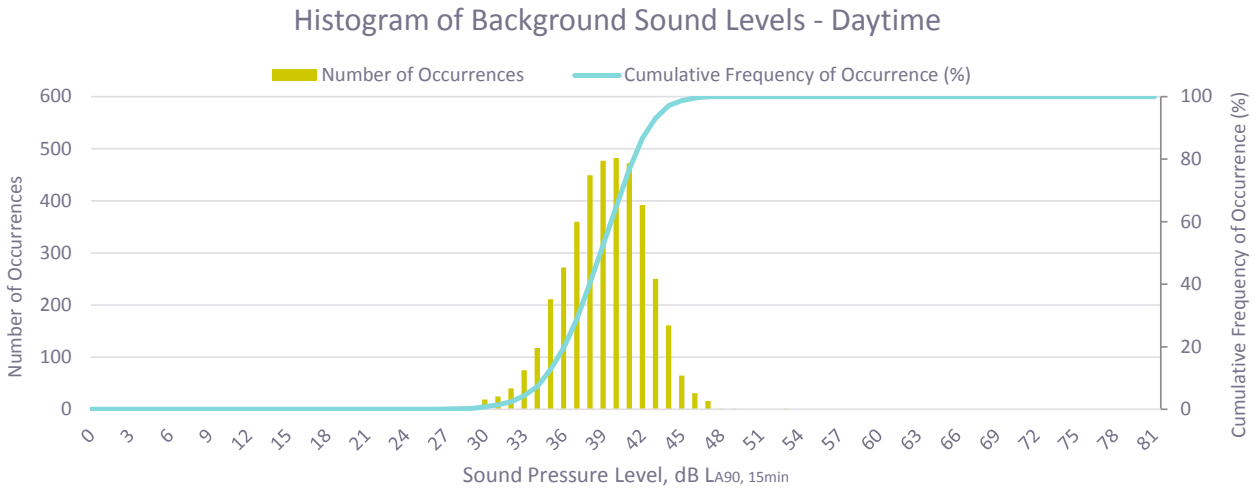

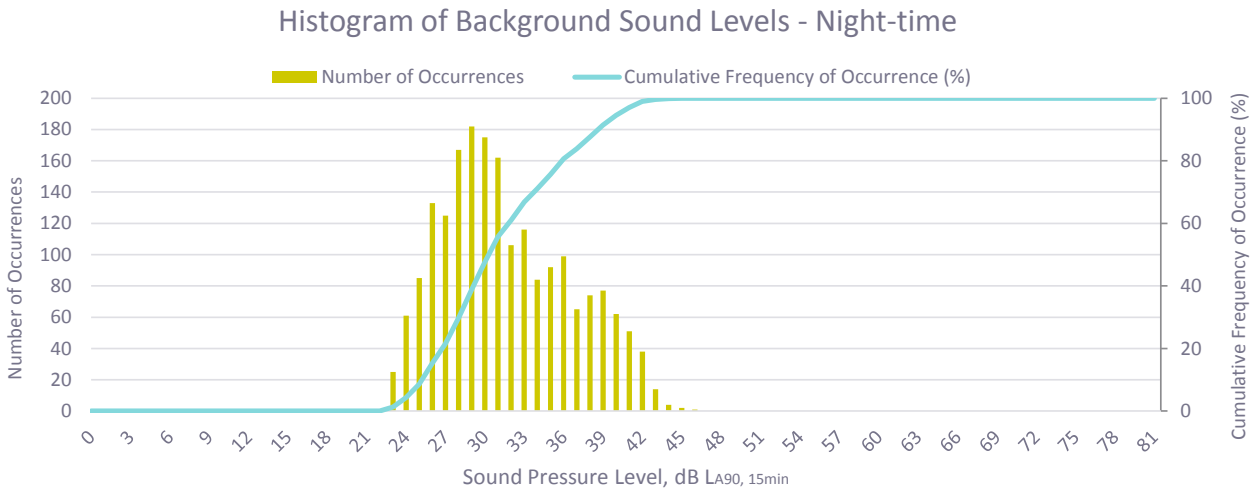

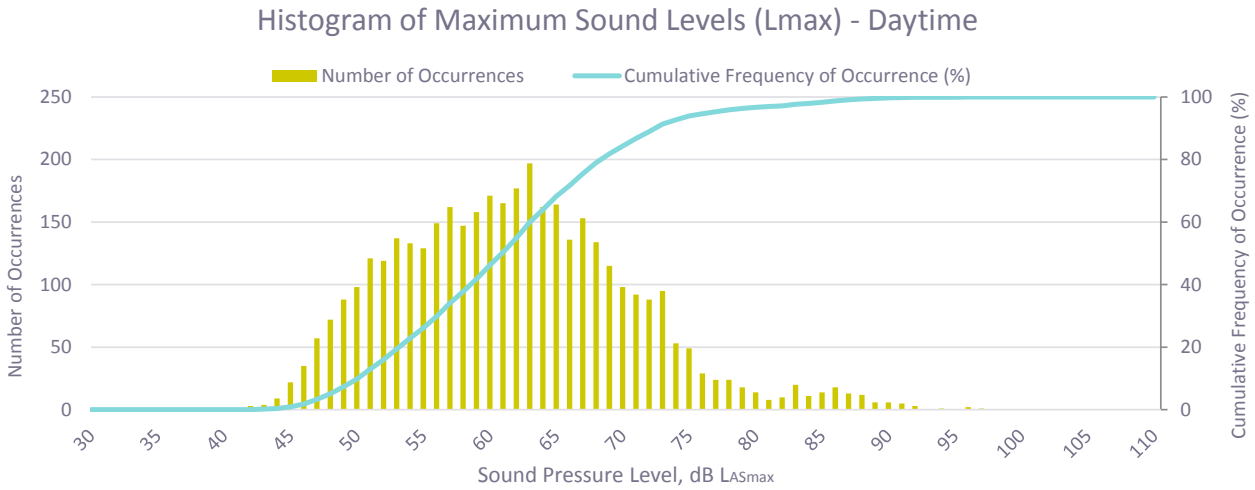

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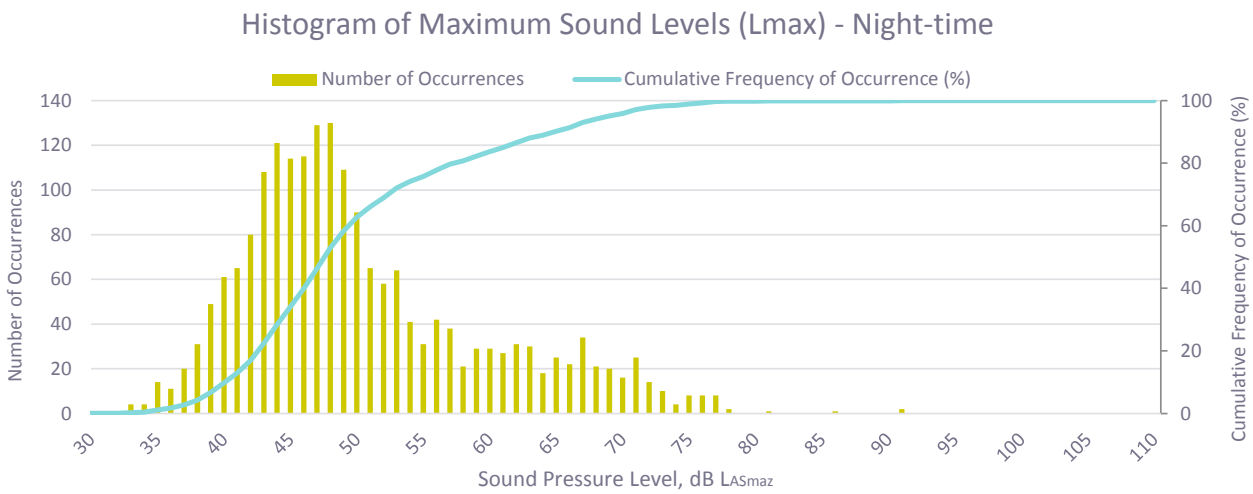

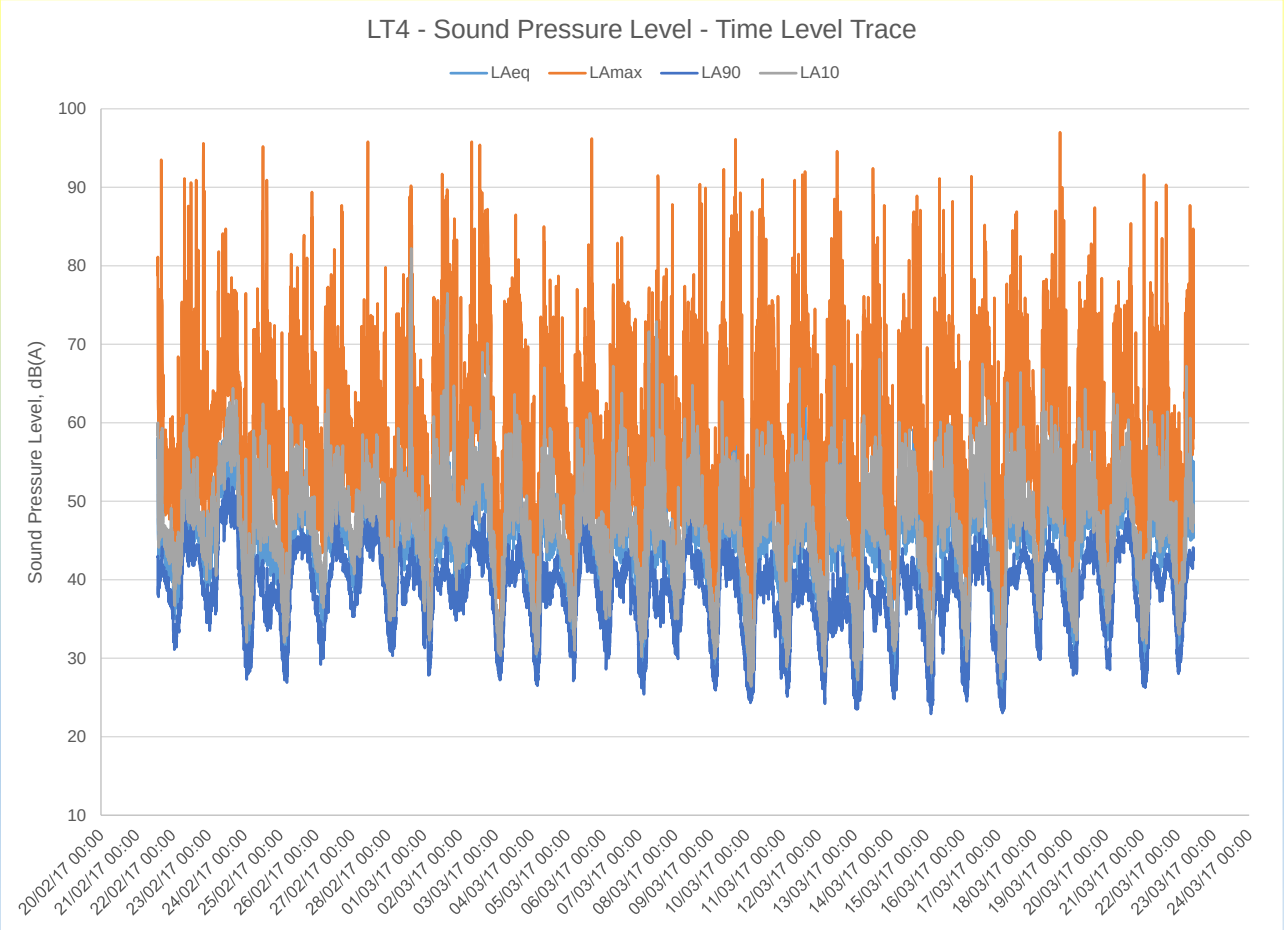

Position
LT5 –17a Cliff View Road

Location
Cliffsend

Period
21/02/2017 – 22/03/2017

Description of Monitoring Location

LT5 was located approximately 150m south of the southern site boundary. The SLM was positioned in a free-field location in the rear garden of the property, approximately 7 m from the western façade of the house. It was considered that the acoustic environment was representative of the background noise level within the area. Error! Reference source not found. presents a summary of the measured noise data during the baseline survey at LT5.

General Observations

The acoustic environment was observed to be dominated by road traffic noise from the A299 and the A256, which are located 620 m to the west and 700 m to the southwest respectively. Aircraft noise from a single helicopter flyover was also audible and dominated the noise environment when occurring, with the event lasting for approximately 1 minute. Furthermore, intermittent bird song was observed. Additionally, on one observation visit the electricity pylons that run along the western perimeter of the gardens on Cliff View Road were audible at a low level.

Night-time observations were undertaken in which it was noted that road traffic noise was dominant, in particular noise from the A256. A single aircraft noise event from a high flying aircraft was also observed.

Monitoring Location

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	$L_{A90,T}$ (dB) [modal average]	Total No. of 5 minute periods	Periods affected by rain %
Daytime	Monday to Sunday (0700-2300)	51	46	47	5492	28
Construction night-time	Monday to Sunday (2300-0700)	47	38	37	2784	28
Construction evenings & weekends	Monday to Friday (1900-2300), Saturday (1300-2300) and Sunday (0700-2300)	50	44	47	2256	29
Construction daytime	Monday to Friday (0700-1900) and Saturday (0700-1300)	52	47	47	3236	28
Operational night-time	Monday to Sunday (2300-0700)	47	38	37	2784	28
Operational daytime	Monday to Friday (0700-2300)	52	47	47	3956	25
	Saturday (0700-2300)	50	45	48	768	36
	Sunday (0700-2300)	51	44	45	768	38

Photographs

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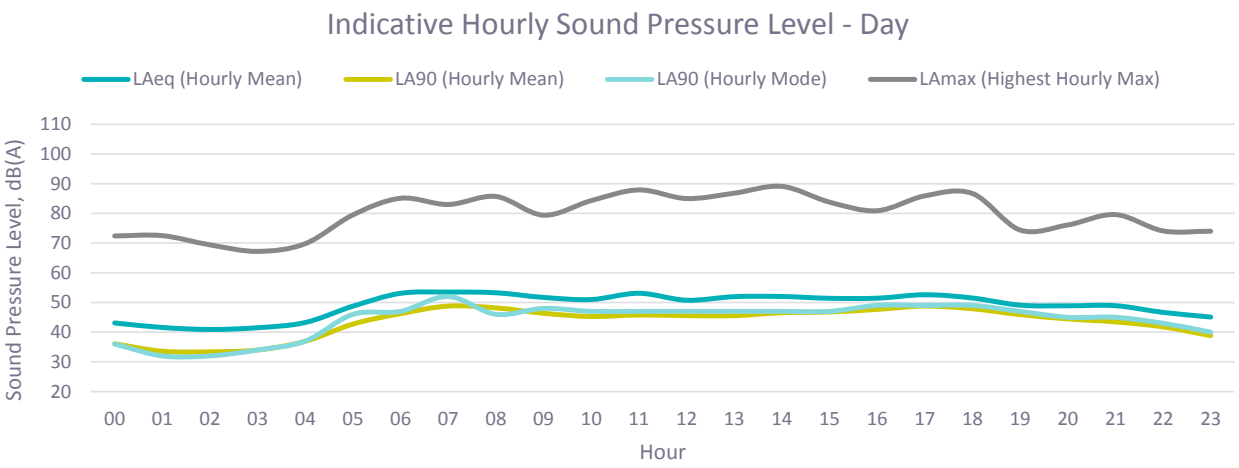

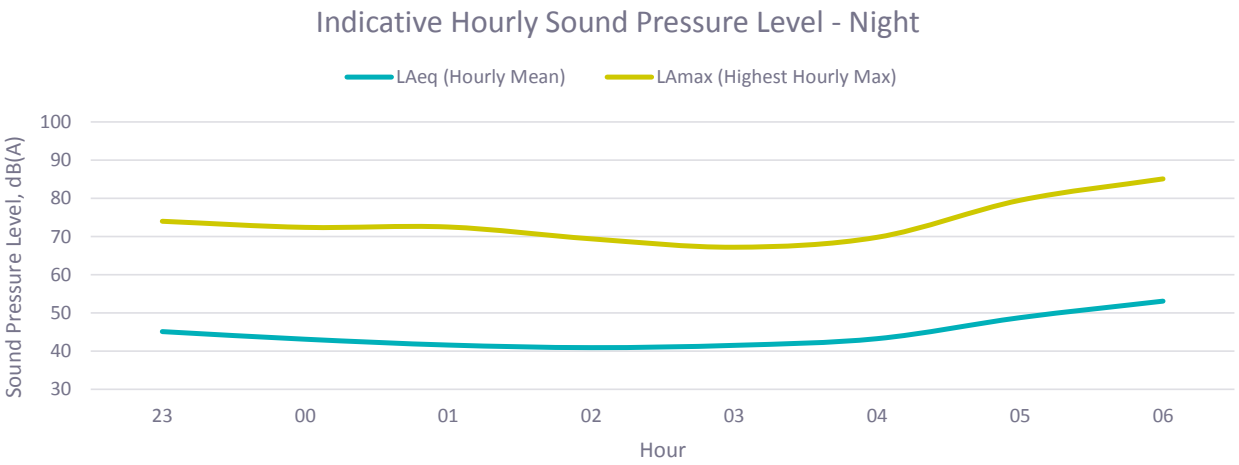

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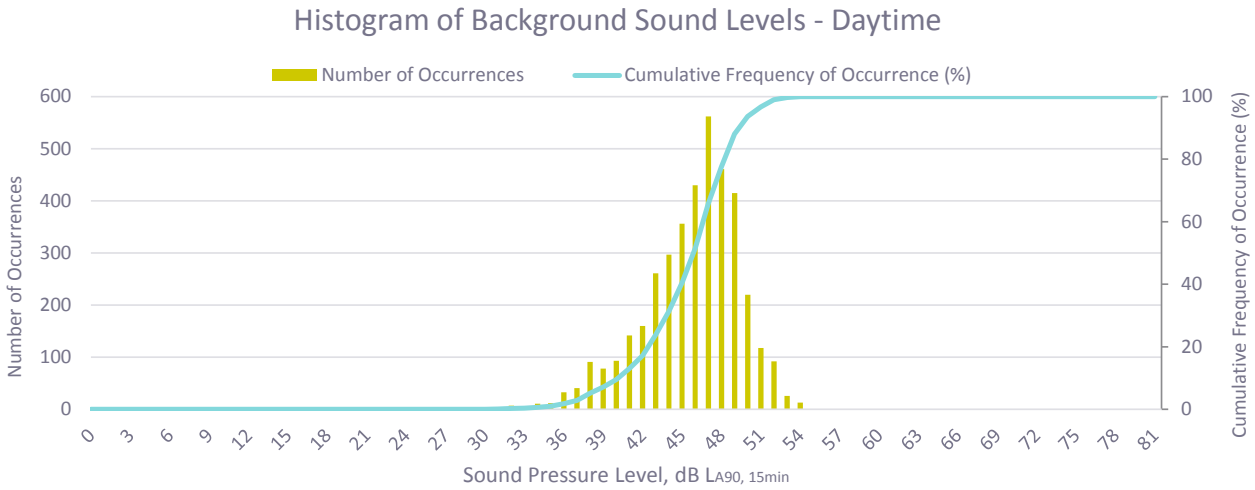

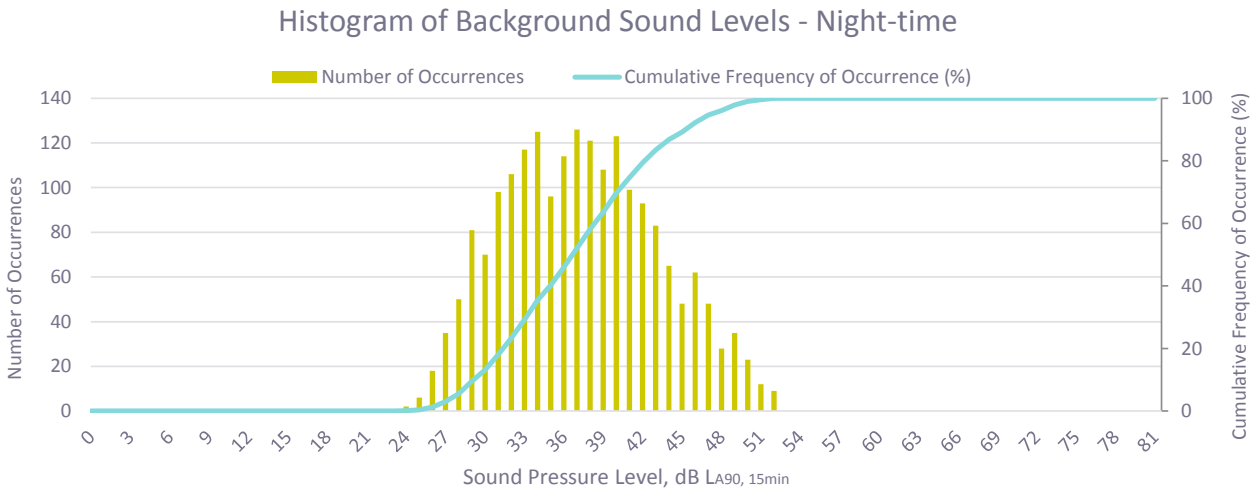

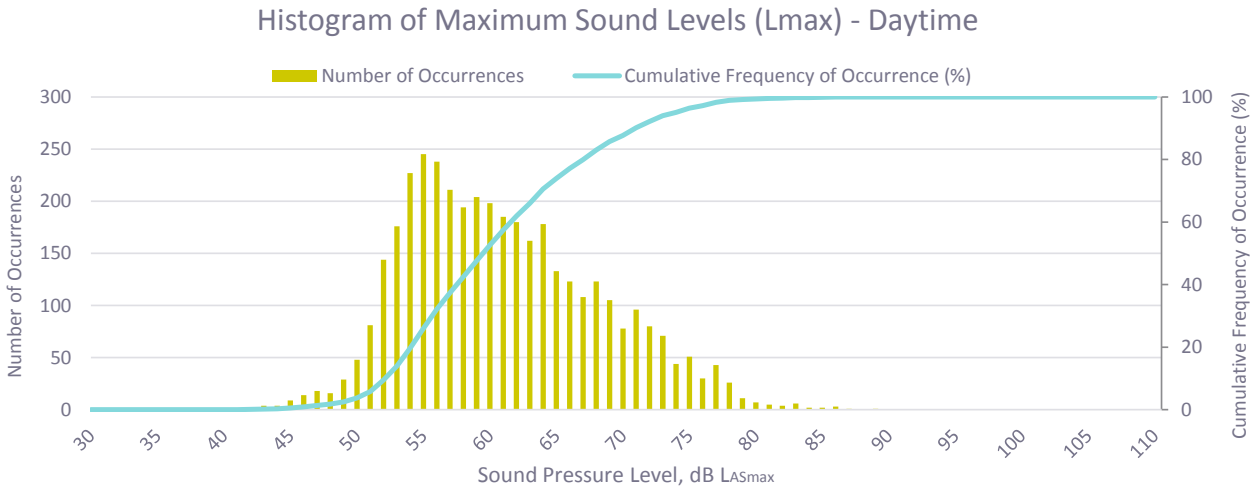

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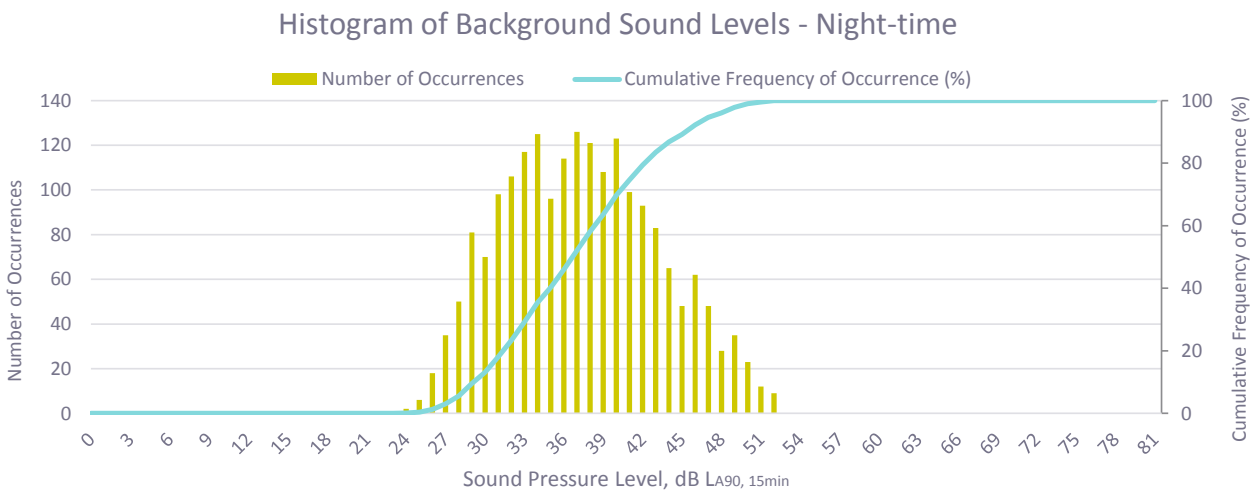

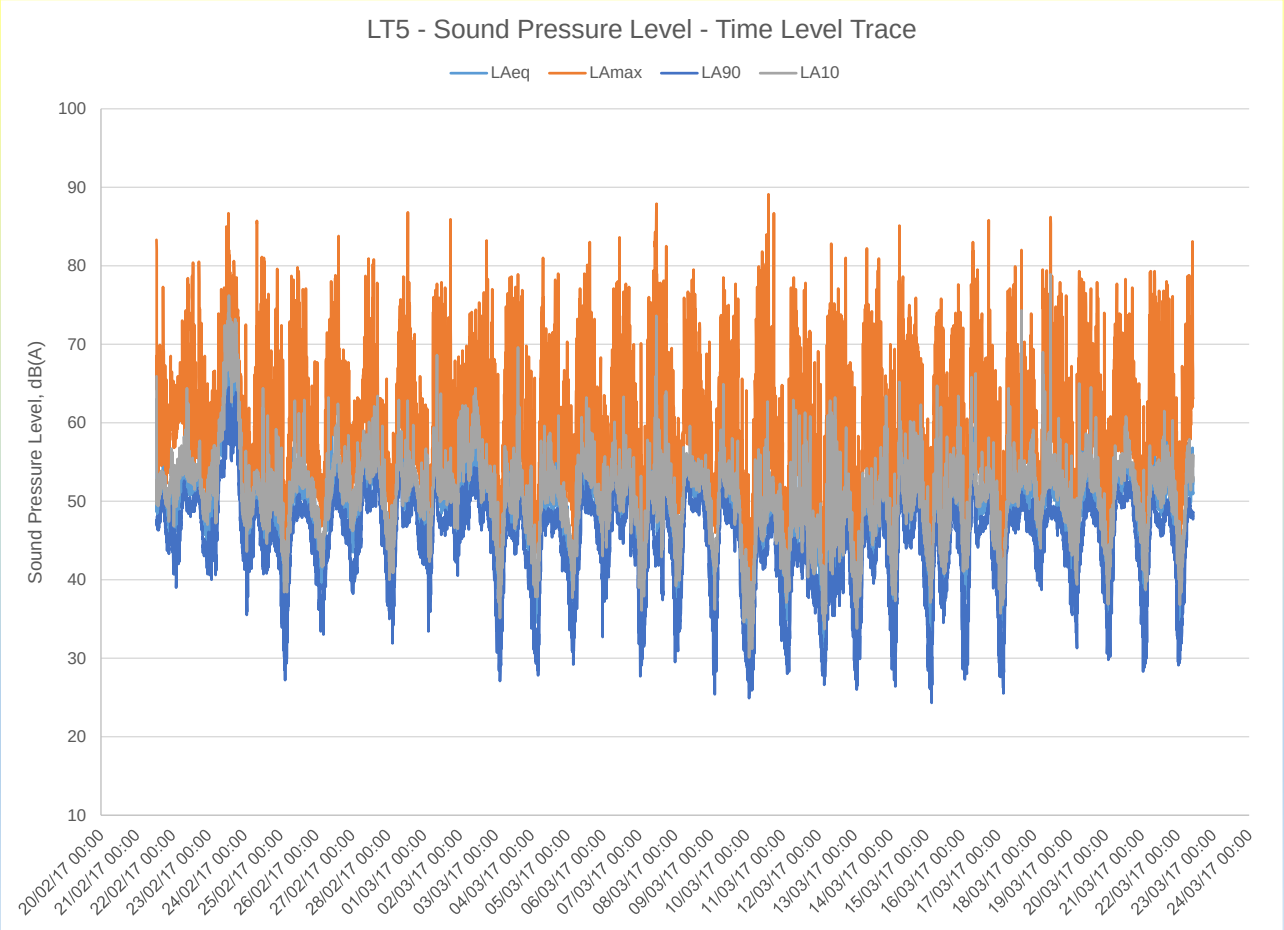

Position
LT6 – 45 Tothill Street

Location
Minster

Period
21/02/2017 – 22/03/2017

Description of Monitoring Location

LT6 was located approximately 750 m south of the southern site boundary. The SLM was positioned in a free-field location in the rear garden of the property, 5 m from the eastern façade of the house. Tothill Street runs south from the roundabout at which the A299 meets the A253. The acoustic environment was considered representative of the background noise level within the area. Error! Reference source not found. presents a summary of measured baseline noise data at LT6.

General Observations

The acoustic environment was observed to be dominated by road traffic noise from the A253/A299 (located 700 m to the north), and local road traffic noise along Tothill Street (located 35m to the west) was intermittently audible. Bird song was constant and aircraft noise was intermittent, both high flying aircraft and a helicopter fly over which lasted for approximately 1 minute.

Night-time observations were undertaken and it was noted that background noise levels were low. Wind rustling the trees was the dominant noise source. A single train pass-by was audible to the south. The A253 was not audible and very occasional local road traffic along Tothill Street was observed.

Monitoring Location

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	$L_{A90,T}$ (dB) [modal average]	Total No. of 5 minute periods	Periods affected by rain %
Daytime	Monday to Sunday (0700-2300)	53	42	43	5492	28
Construction night-time	Monday to Sunday (2300-0700)	48	34	37	2784	28
Construction evenings & weekends	Monday to Friday (1900-2300), Saturday (1300-2300) and Sunday (0700-2300)	54	40	41	2256	29
Construction daytime	Monday to Friday (0700-1900) and Saturday (0700-1300)	53	44	43	3236	28
Operational night-time	Monday to Sunday (2300-0700)	48	34	37	2784	28
Operational daytime	Monday to Friday (0700-2300)	51	43	43	3956	25
	Saturday (0700-2300)	53	41	42	768	36
	Sunday (0700-2300)	51	44	45	768	38

Photographs

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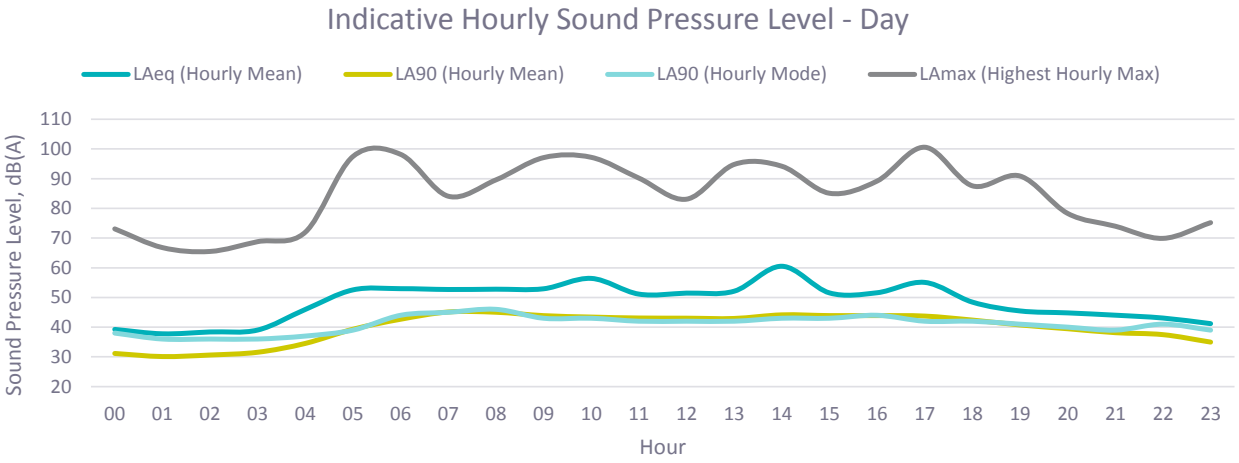

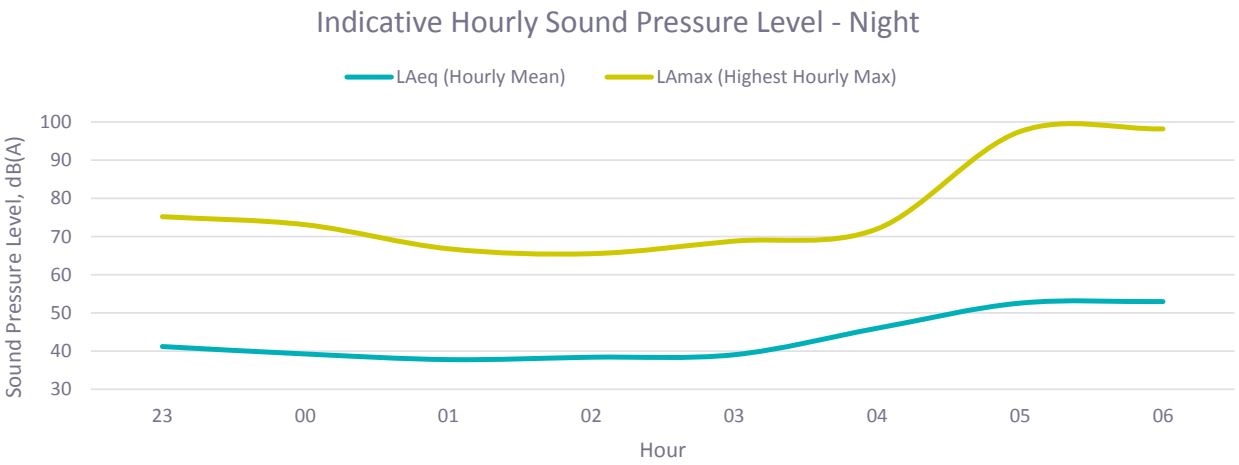

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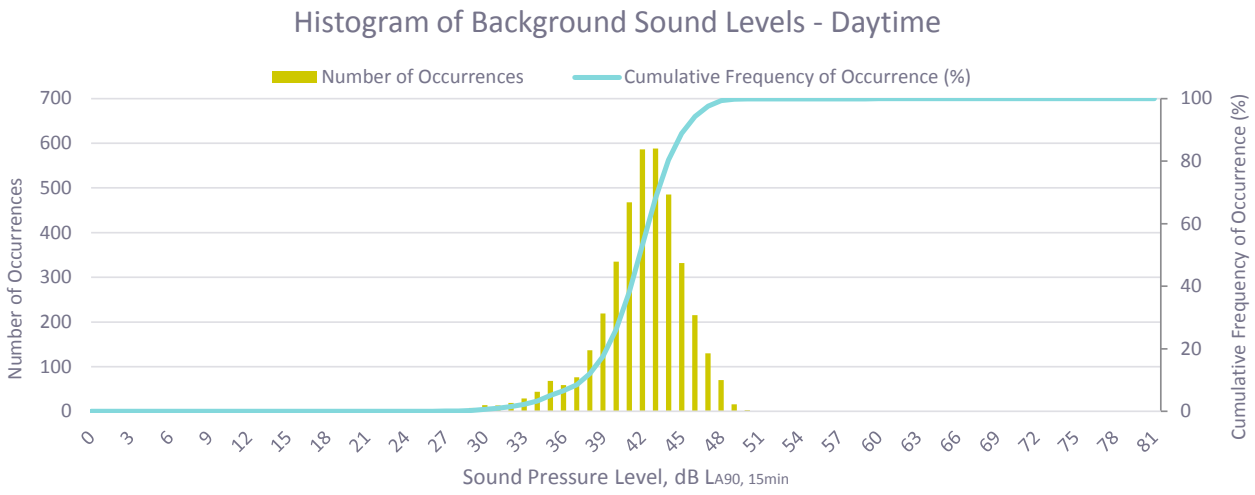

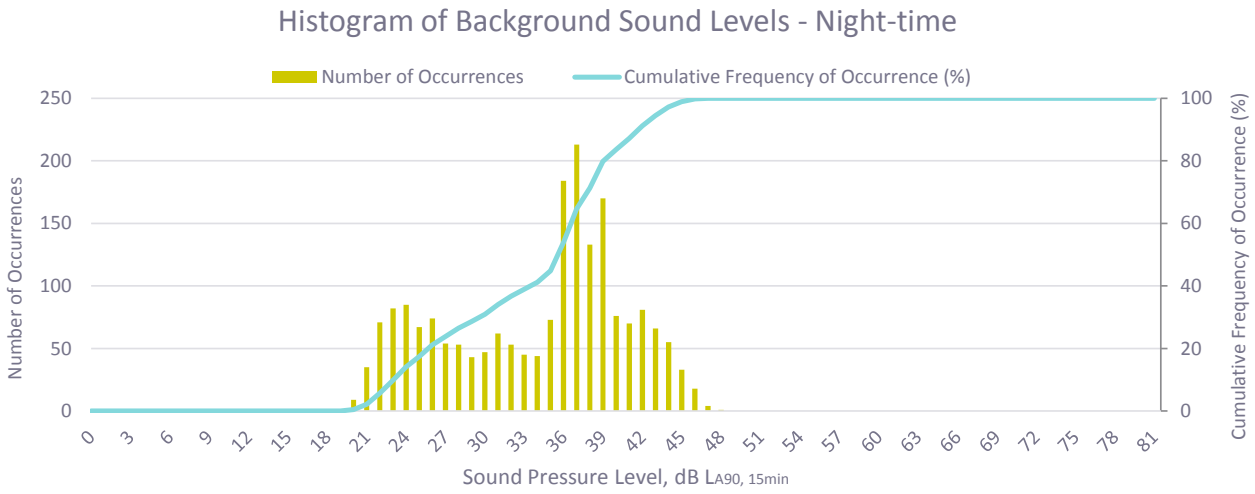

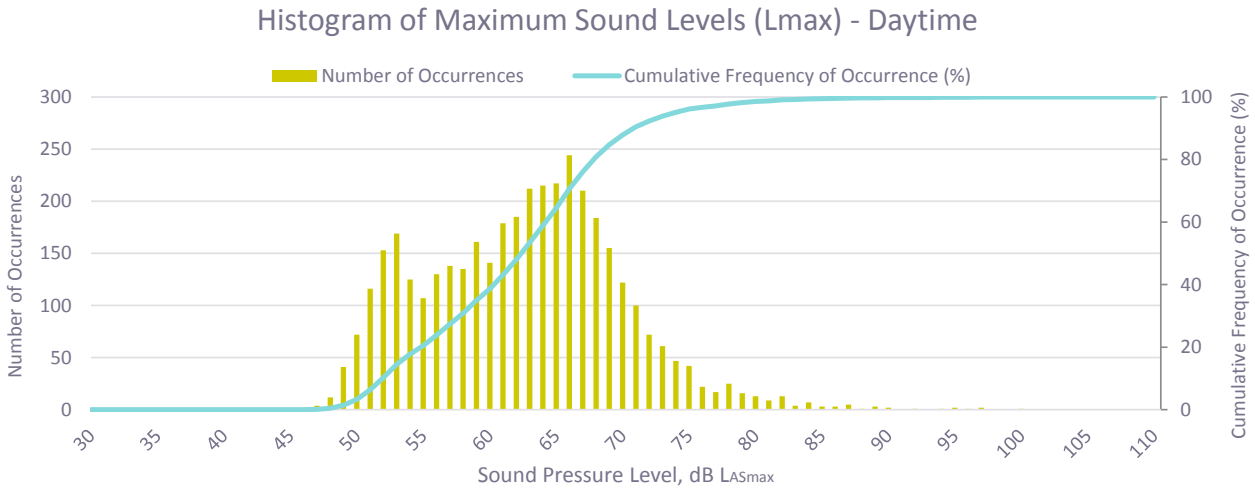

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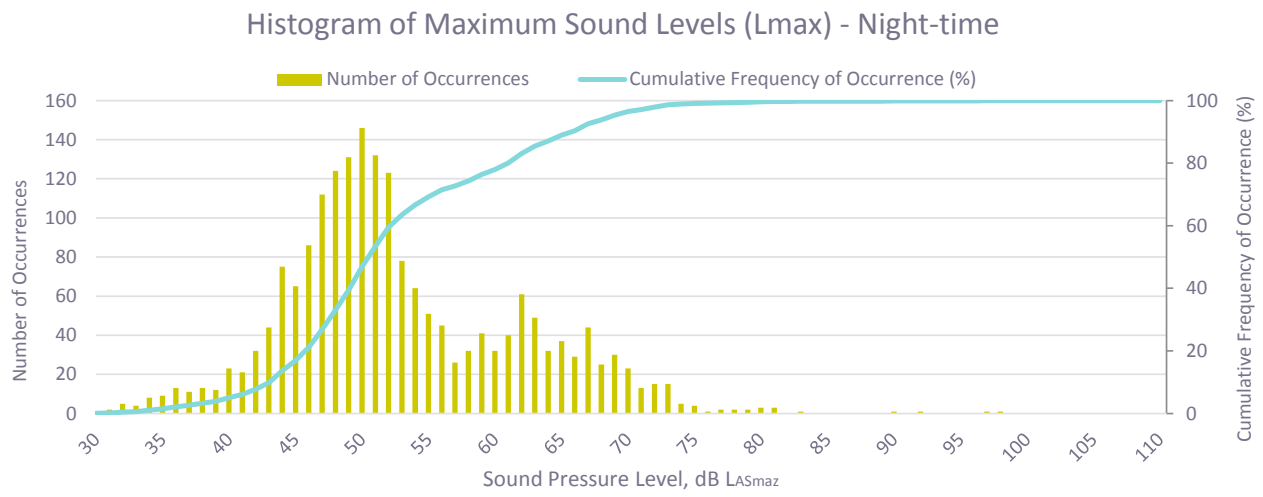

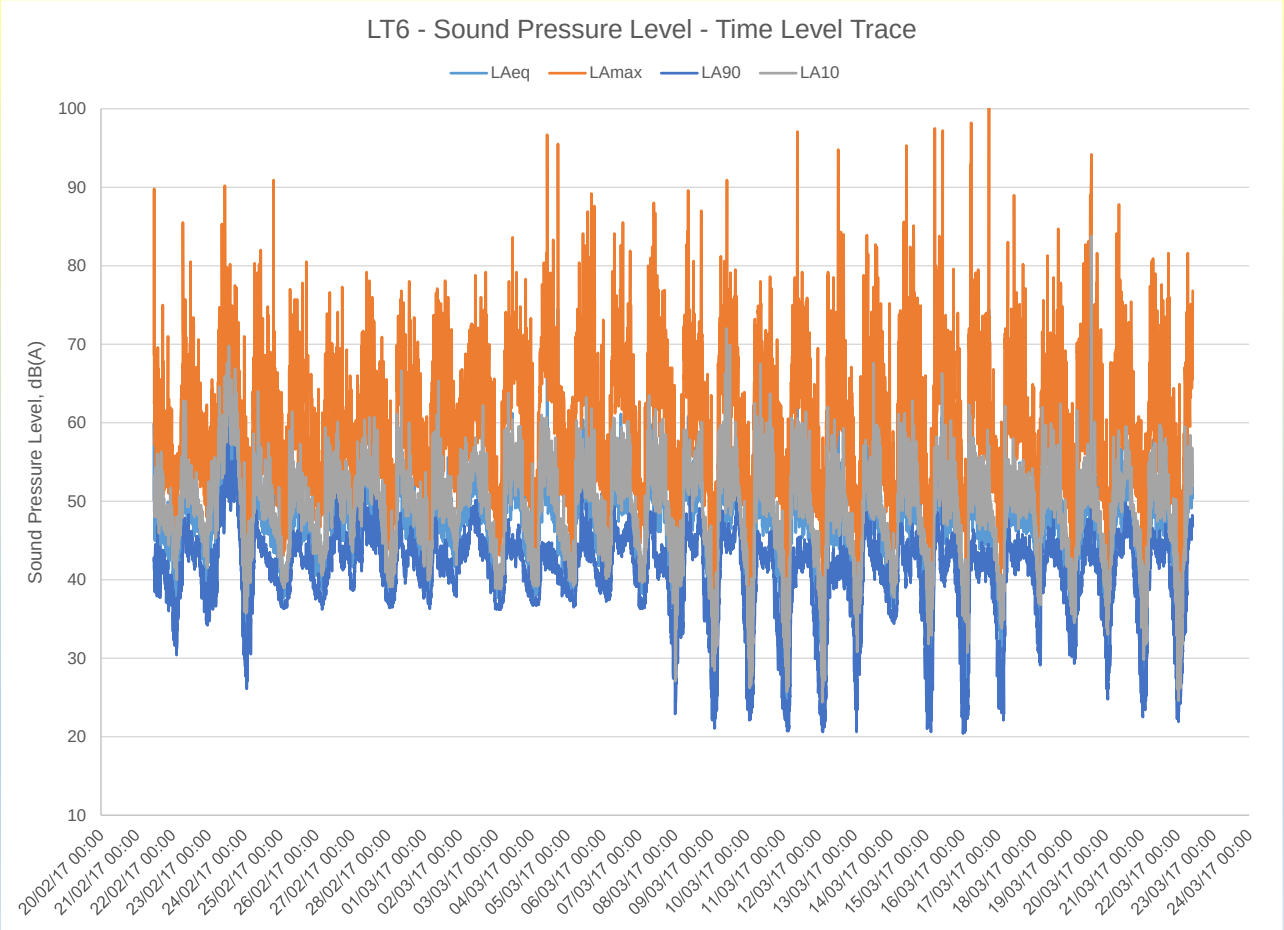

Position
LT7 – 68 Windermere Avenue

Location
Ramsgate

Period
10/10/2017 – 30/10/2017

Description of Monitoring Location

LT7 was located approximately 0.9 km east of the western side of the perimeter for the Proposed Development. The Sound Level Meter (SLM) was positioned in a free-field location in the rear garden of the property, approximately 16 m from the north-facing façade of the house. The acoustic environment at LT1 was considered representative of the background sound level within the area as comparisons with other measurements show that noise from the nearby railway does not cause considerable impact to background sound level. Error! Reference source not found. provides a summary of the measured baseline noise data at LT1

General Observations

The site was visited on two separate occasions and observations were made each time. The acoustic environment was observed to be dominated by distant road traffic noise from the B2050 (0.2 km to the northeast), the A299 (located 0.45 km to the southwest) and the A256 (located 0.7 km to the west). The A299 and A256 are both busy main roads into the town of Ramsgate and neighbouring Margate respectively. There is a train track approximately 26 m to the north of LT7 which becomes the dominant noise source during train pass-by events. A train pass-by event was observed during the first visit but not the second. The residents stated that not hearing a train pass-by during the second visit was 'unusual'.

A 'humming' sound was perceived to be emanating from the railway during the first visit but not the second. Distant sirens emanating from emergency vehicles on nearby main roads were clearly audible and were heard on both visits to the site and, according to the residents, are a common occurrence. Other sounds were noted during the site visits including a water feature, bird song and aircraft, but these sounds, when present, were not in any way dominating. It was also noted that the residents kept pets which may potentially contribute to the sound environment.

Night-time observations were also undertaken at LT7. The dominant noise source was a combination of both distant road traffic from the A299 and the A256 combined with the wind rustling leaves from the trees on Windermere Avenue.

Monitoring Location

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	$L_{A90,T}$ (dB) [modal average]	Total No. of 5 minute periods	Periods affected by rain %
Daytime	Monday to Sunday (0700-2300)	52	42	41	3844	2
Construction night-time	Monday to Sunday (2300-0700)	42	38	38	1932	3
Construction evenings & weekends	Monday to Friday (1900-2300), Saturday (1300-2300) and Sunday (0700-2300)	54	40	40	1608	3
Construction daytime	Monday to Friday (0700-1900) and Saturday (0700-1300)	50	42	41	2236	1
Operational night-time	Monday to Sunday (2300-0700)	42	38	38	1932	3
Operational daytime	Monday to Friday (0700-2300)	50	42	41	2692	0
	Saturday (0700-2300)	59	41	44	576	13
	Sunday (0700-2300)	47	41	39	576	0

Photographs

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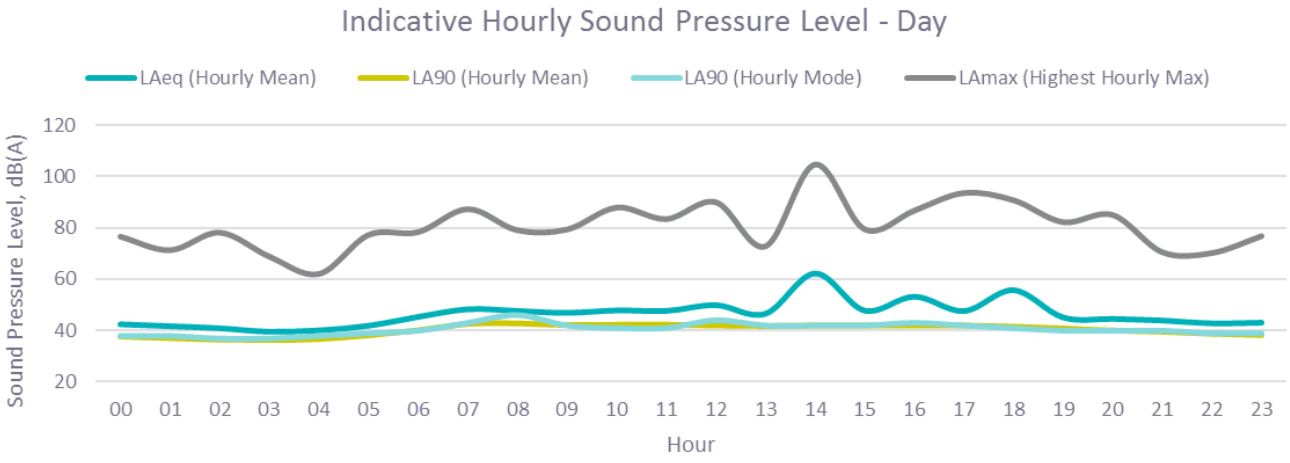

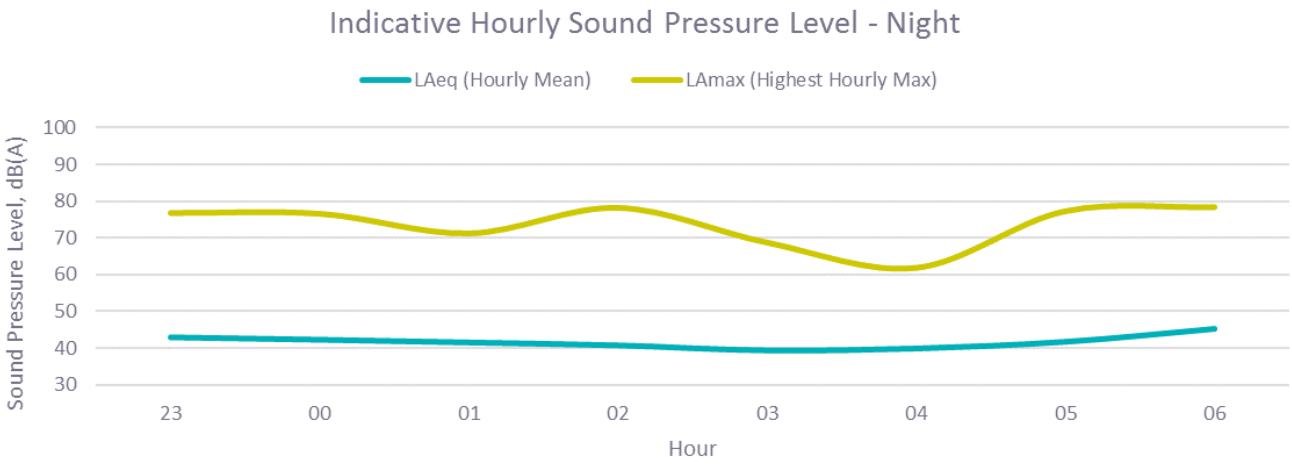

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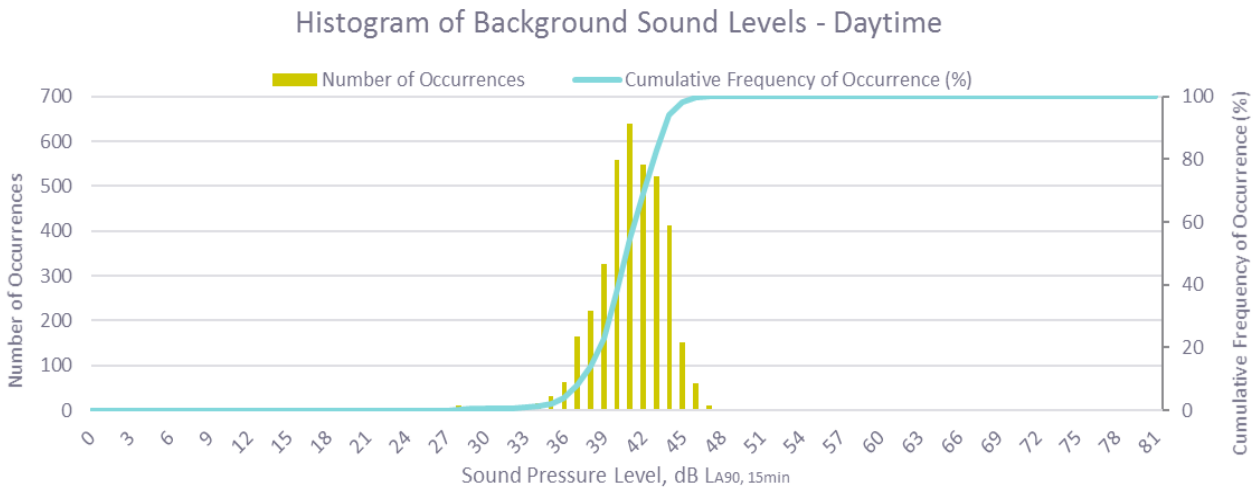

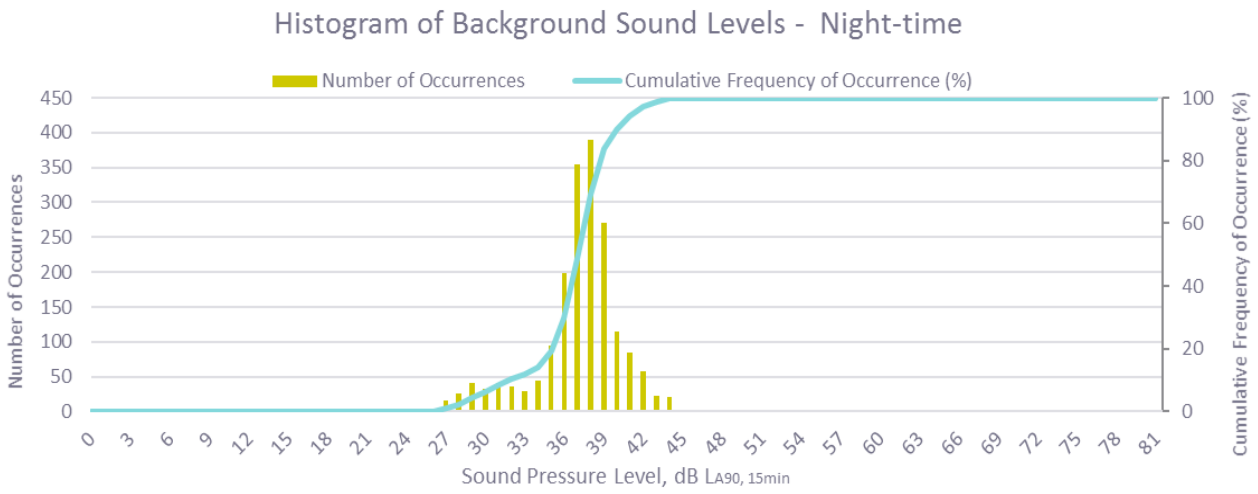

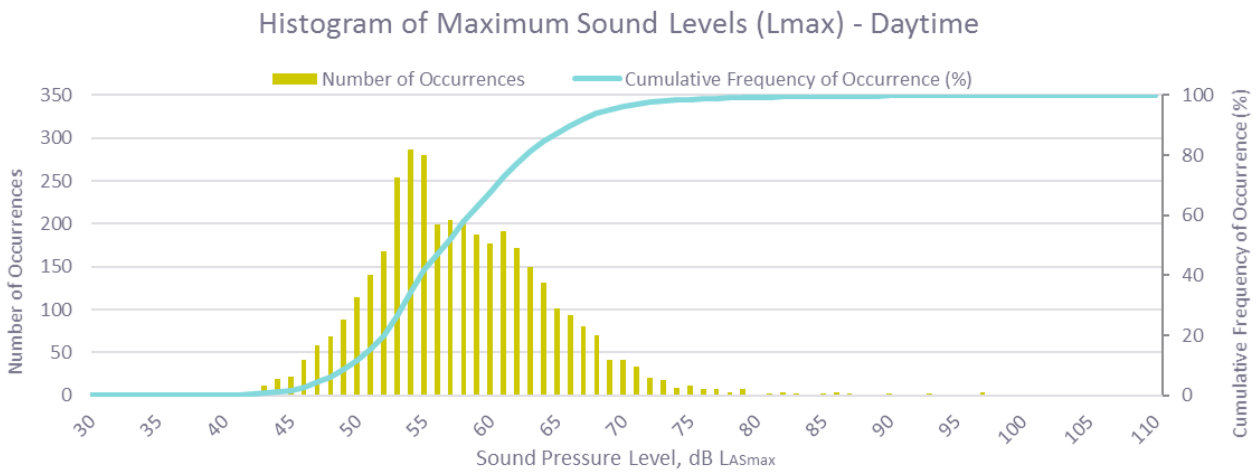

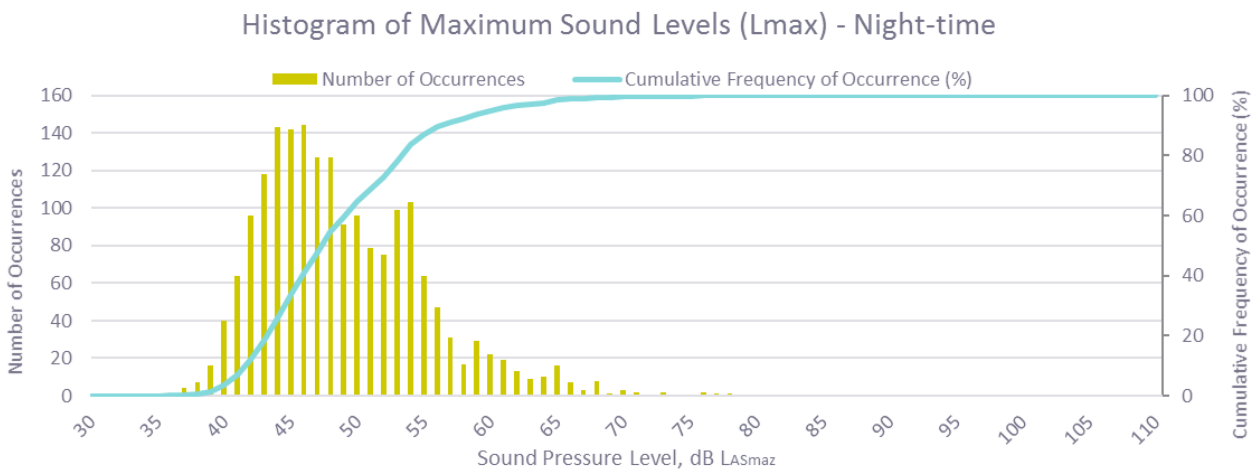

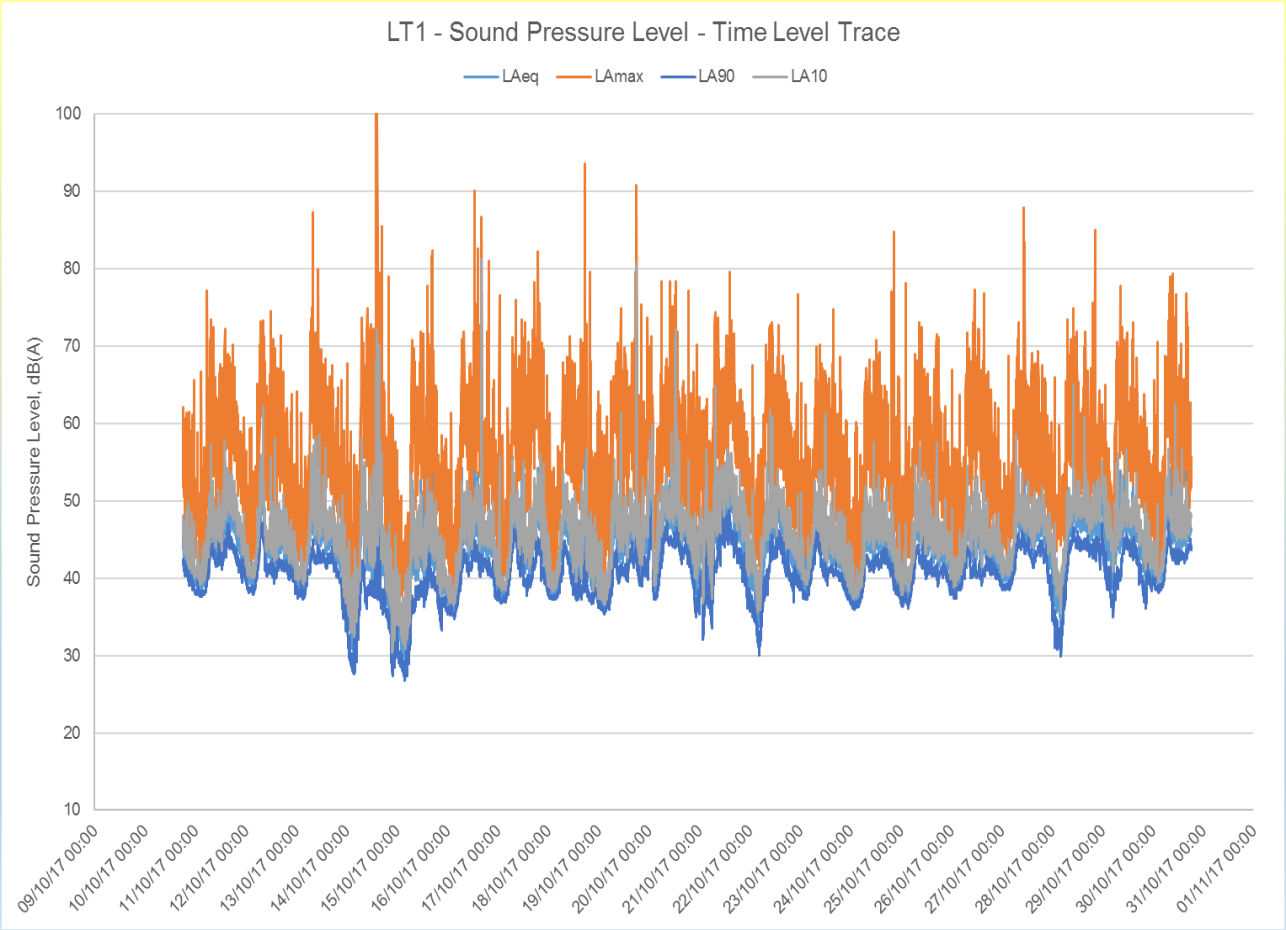

12.4.7 Site observations were undertaken in the wider environment to characterise baseline conditions under flightpaths away from the airport. Site visits were conducted on 22nd February and 6th, 7th and 21st March 2017.

12.4.8 The following sections describe the observations at each location.

Site observations

OBS 1 – St Nicholas-at-Wade

12.4.9 Daytime observations were made at the village of St. Nicholas-at-Wade on Wednesday 22nd February 2017 from 15:15 until 15:45. The village of St Nicholas-at-wade is a small residential village, situated approximately 5km north west of the Runway 10 threshold. During the observations, the ambient temperature was around 11°C, there was no rain and wind speeds were less than $5ms^{-1}$.

12.4.10 The acoustic climate within the village was observed to be dominated by the constant flow of road traffic noise from the A299, located 530 m to the north and sound levels measured in the western corner of the church graveyard were in the region of 55 to 60dB $L_{Aeq,5min}$. In addition, local roads within the village carried intermittent road traffic with a vehicle movement every 30 seconds. Furthermore, a railway event was observed from the Chatham Main Line, 2.2km to the north which contributed to the acoustic climate during the pass-by and constant bird song was audible alongside dogs barking intermittently.

12.4.11 Night-time observations were undertaken between Monday 6th March and Tuesday 7th March 2017 between 23:55 and 00:10. The dominant source of noise was road traffic on the A299 to the northwest and measured noise levels were in the region of 42 to 47dB $L_{Aeq,5min}$. During the observations the temperature was 5°C, there was no rain and wind speeds were less than $2ms^{-1}$.

OBS 2 – Beltinge

12.4.12 Daytime observations were made in the southern area of Beltinge on Wednesday 22nd February 2017 from 12:45 until 13:15. Beltinge is an area located to the east of Herne Bay along the A299. It is approximately 12.5km west of the Runway 10 threshold. The area is comprised mostly of residential housing with a few commercial units and a hotel close to the A299 junction. During the daytime observations, the ambient temperature was 13°C, with no rain and average wind speeds measuring less than $5ms^{-1}$.

12.4.13 The acoustic climate was observed to be dominated by road traffic noise, especially HGV movements on the A299, located approximately 200m to the south of Beltinge. Sound measurements made at The Blvd were in the region of 60dB $L_{Aeq,5min}$. Furthermore, train pass-bys were audible along the Chatham Main Line 100m north of the measurement position. Commercial units were seen to be operating, however, it was observed that due to the dominance of the road traffic noise the units were not audible.

12.4.14 Further night-time observations were made in Beltinge on Wednesday 22nd March 2017 from 00:25 to 00:40. The dominant source of noise was again road traffic noise from the A299. Whilst moving around the area it was noted that sound from fixed plant could be heard when in the vicinity of the Premier Inn and near to Jaytee Biosciences Ltd. Sound levels measured within the graveyard were in the region of 45dB $L_{Aeq,5min}$. During the observations the ambient temperature was 4°C, there was no rain and wind speeds were less than $2ms^{-1}$.

OBS 3 – Avenue of Remembrance, Herne Bay

12.4.15 Daytime observations were made along the Avenue of Remembrance located within Memorial Park, Herne Bay on Wednesday 22nd February 2017 from 11:20 to 11:50. Memorial Park is located within the centre of Herne Bay, approximately 14.5km west along the extended Runway 10 centreline. The park is surrounded by commercial and residential properties. A children's nursery and play area is located within the park. Kings Road runs along the northern boundary and the A2990 and A299 are approximately 800 m south of the park. During the observations, the temperature was approximately 13°C, there was no rain and average wind speeds were less than $5ms^{-1}$.

12.4.16 The acoustic environment was observed to be dominated by road traffic noise on Kings Road, with road traffic noise from the A299/A2990 becoming more audible during lulls in traffic flows on Kings

Road. Furthermore, the nursery within the park was observed to be contributing to the overall acoustic climate.

12.4.17 Further night-time observations were made within Memorial Park on Tuesday 21st March 2017 from 23:35 to 23:50. Road traffic noise from the A299/A2990 was again the dominant source of sound, however, there was intermittent road traffic noise on Kings Road which would dominate whilst a car travelled past, and this occurred approximately once every two minutes. High flying aircraft noise was observed but was intermittent. Measured sound levels within the park were in the region of 46dB LAeq,5min. During the observations, the ambient temperature was 4°C, there was no rain and wind speeds were less than $2ms^{-1}$.

OBS 4 – Studd Hill, Herne Bay

12.4.18 Daytime observations were made around the Daimler Avenue area of Herne Bay from 12:00 to 12:30 on Wednesday 22nd February 2017. Daimler Avenue is a residential area located to the west of Herne Bay and approximately 16km west along the extended Runway 10 centreline. The location had direct line of sight onto the Chatham Main Line railway and onto the main western access route to the centre of Herne Bay (the B2205, Sea St.). During the observations the ambient temperature was 15°C, there was no rain and average wind speeds measured less than $5ms^{-1}$.

12.4.19 It was observed that road traffic noise on Sea St, located approximately 35m south of Daimler Avenue was the dominant source of noise. Monitored sound levels taken a from a monitoring position 30m north of Sea St were in the region of 60dB $L_{Aeq,5min}$. Furthermore, a train pass-by event lasting approximately 15-seconds was audible above the road traffic. Bird song was also audible throughout the observations.

12.4.20 Night-time observations were made around Daimler Avenue between Tuesday 21st March 23:55 and Wednesday 22nd March 00:15. Road traffic noise from the A2990 was the dominant source of noise, with infrequent vehicle pass-bys on Sea St audible when occurring. Measured sound levels were in the region of 49dB $L_{Aeq,5min}$. During the observations the ambient temperature was 4°C, there was no rain and average wind speeds were less than $2ms^{-1}$.

OBS 5 – Sarre

12.4.21 Daytime observations were made in Sarre on Monday 6th March 2017 from 14:30 until 15:00. The village of Sarre is a small residential village, situated approximately 6.2km west of the Runway 10 threshold. During the observations, the temperature was 10°C, there was no rain and wind was less than $5ms^{1}$.

12.4.22 The acoustic climate in the village was observed to be dominated by road traffic noise on the A28, which runs through the centre of the village. Sound measurements taken from a monitoring position on Old Road, and approximately 40m from the A28, were in the region of 60 dB $L_{Aeq,5min}$. It was noted that there was a road traffic pass-by approximately once every 10 seconds on the A28. High flying aircraft noise was audible and bird song was constant throughout the observations. Commercial units were present; however, no noise was audible whilst making observations.

12.4.23 Night-time observations were undertaken on Tuesday 7th March 2017 from 00:15 to 00:30. The dominant source of sound was constant road traffic on Thanet Way (A299) located 2.2km to the north, with intermittent traffic pass-bys on the A28 audible and occurring approximately once per minute. The measured sound levels were in the region of 50 dB $L_{Aeq,5min}$. Domestic animal noise including dogs and cats were occasionally audible during the observations and it was noted that the commercial units were still inaudible during the night. During the observations, the temperature was 5°C, there was no rain and wind speeds were less than $2ms^{-1}$.

OBS 6 - Stourmouth

12.4.24 Daytime observations were made at Stourmouth between 15:55 to 16:25 on 6th March 2017. Stourmouth is a civil parish located approximately 6.5km south west of the Runway 10 threshold. During the observations, the temperature was 8°C, there was no rain and wind speeds were less than $3ms^{-1}$.

12.4.25 The acoustic climate was dominated by road traffic noise from the A28, located 1.6km north west of Stourmouth. Spot measurements were made outside the Church in West Stourmouth on Church Lane and measured sound levels were in the region of 50dB $L_{Aeq,5min}$. In this location, there was direct line of site to the Ashford to Ramsgate railway located 1.5 km to the north. Train horns were audible during observations, however train pass-bys were not. Bird song was constant throughout the observations. Furthermore, intermittent construction noise from a site located south of the church.

12.4.26 Night-time observations were undertaken on Tuesday 7th March 2017 from 01:05 until 01:20. The dominant source of noise was road traffic on the A28. Wind rustling in the trees was also audible. The measured sound levels were in the region of 30-35dB $L_{Aeq,5min}$. During the observations, the temperature was 5°C, there was no rain and wind speeds were less than 5ms^{-1}.

OBS 7 – Grove Ferry, Upstreet

12.4.27 Daytime observations were made at the Grove Ferry area of Upstreet between 15:10 and 15:40 on Monday 6th March 2017. Upstreet is a small residential village, situated along the A28 and 8.7km west of the Runway 10 threshold. During the observations, the temperature was 10°C, there was no rain and wind was less than 5ms^{-1}.

12.4.28 The acoustic climate was dominated by road traffic noise from the A28, however, during a train pass-by rail noise was the dominant noise source. A train pass-by typically was audible for approximately 10 seconds. There was a level crossing on Grove Ferry Road which had a warning siren that was audible for approximately 15 seconds prior to a train pass-by and became the dominant source of noise. Bird song was also audible during observations. Spot measurements were undertaken from outside the Grove Ferry Inn and measured sound levels were in the region of 55 to 60dB $L_{Aeq,5min}$.

12.4.29 Night-time observations were undertaken on Tuesday 7th March 2017 from 00:40 to 00:55. The dominant source of noise was road traffic on the A28. It was noted that a train pass-by event did not occur whilst undertaking the night-time observations. However, intermittent animal sounds (for example pigs in the pub garden) were audible along with occasional bird song. Measured sound levels taken outside the Grove Ferry Inn were in the region of 35 dB $L_{Aeq,5min}$. During the observations, the temperature was 5°C, there was no rain and wind speeds were less than 2ms^{-1}.

OBS 8 – Reculver

12.4.30 Daytime observations were made at Reculver between 14:30 and 15:00 on Wednesday 22nd February 2017. Reculver is a seaside holiday destination located approximately 9km north west of Manston Airport. The area is comprised of static caravan holiday parks and a number of public houses. During the observations, the temperature was 12°C, there was no rain and wind speeds were less than 5ms^{-1}.

12.4.31 It was noted that during the observations, the holiday parks were not in use and therefore the acoustic climate was observed to be dominated by the sea crashing upon the shore and bird song, in particular from seagulls. Furthermore, intermittent residential noises, for example a tree being felled and the erection of a static caravan was observed.

12.4.32 Further night-time observations were made at Reculver on Wednesday 22nd March from 00:50 to 01:05. During the observations, the temperature was 4°C, there was no rain and wind speeds were less than 2ms^{-1}. During the night, the dominant source of noise was road traffic on the A299 approximately 2km south of Reculver. High flying aircraft noise was also audible but infrequent. Furthermore, a ventilation system on a public house was audible, but only when the sound of waves crashing upon the shore subsided. Measured sound levels made in the public carpark on the coast were in the region of 34dB $L_{Aeq,5min}$.

OBS 9 - Birchington-on-Sea

12.4.33 Daytime observations were made at Birchington-on-Sea on Tuesday 7th March 2017 between 12:10 and 12:40. Birchington-on-Sea is a coastal village situated approximately 4km northwest of the Runway 10 threshold. The village is comprised mostly of residential properties. The A28 and the Chatham Mainline railway run through the centre of the village. During the observations, the temperature was 6°C, there was no rain and wind speeds varied up to 3.5ms^{-1}.

12.4.34 Daytime observations were made along the coast approximately 350 m north of the A28 and near to the Chatham mainline on Epple Road, approximately 150m north of the A28. During observations at the coast it was noted that road traffic noise from the A28 was dominant, whilst high flying aircraft noise was intermittent. At the coast, a single train pass-by from the Chatham mainline railway was audible and seagulls and other birdsong were constant throughout. During the rail pass-by, rail noise dominated the acoustic climate, however, the event was short lasting. Observations made at Epple Road noted that road traffic on local roads was dominant until there was a lull in road traffic noise and then road traffic on the A28 was dominant. Construction noise was audible intermittently during observations. The measured sound levels on Epple Road were in the region of 61dB $L_{Aeq,5min}$.

12.4.35 Further night-time observations were made in Epple Road area of Birchington-on-Sea on Tuesday 7th March 2017 from 23:40 to 23:55 and sound measurement were made on Epple Road. Road traffic noise from the A28 was dominant, however, high flying aircraft noise was audible but this was intermittent. Motorbikes were noted to be audible in the distance. The measured sound levels during the observations were in the region of 53 dB $L_{Aeq,5min}$. During the observations, the temperature was 5°C, there was no rain and wind speeds were less than 3ms^{-1}.

OBS 10 - Staner Court, Ramsgate

12.4.36 Daytime observations were made at Staner Court, Ramsgate on Tuesday 7th March 2017 between 13:10 and 13:40. Staner Court is situated approximately 1.8km east of the Runway 28 threshold and is a residential area comprising a high-rise residential tower block and a number of low-rise flats. Within the vicinity of Staner Court there are commercial units and a supermarket. During the observations, the temperature was 12°C, there was no rain and the wind was less than 2.5ms^{-1}.

12.4.37 The acoustic climate within the area was dominated by road traffic noise on the B2050. Road traffic noise was also audible from the A256 situated to the 550m to the west. There was an electricity transformer station which had a consistent tone, which was audible when within approximately 5m of the perimeter fencing, however this was not audible at the façade of Staner Court. Closer to the B2050, the petrol station at the supermarket became the dominant source of sound. A single helicopter flyover event was also audible during the observations. At Staner Court, the measured sound levels were in the region of 46 to 54dB $L_{Aeq,5min}$ with maximum sound levels of approximately 70dB L_{AFmax}.

12.4.38 Night-time observations were made at Staner Court on Wednesday 8th March 2017 between 00:05 and 00:20. During the observations sound from ventilation plant at the commercial unit was dominant, with intermittent road traffic noise on the B2050. Shouting from flats in Staner Court was noted as well as intermittent bird song. Similar to daytime, the electricity transformer was only audible when within a 5m radius of it. The measured sound levels within Staner Court were in the region of 49dB $L_{Aeq,5min}$ and similar to daytime maximum sound levels were approximately 70dB L_{AFmax}. During the observations, the temperature was 6°C, there was no rain and wind speeds were less than 2ms^{-1}.

OBS 11 - St Lawrence

12.4.39 Daytime observations were made at St. Lawrence in the vicinity of Ramsgate Railway Station on Tuesday 7th March 2017 between 13:50 and 14:20. St. Lawrence is an area of Ramsgate and situated along the runway centreline and approximately 2.6km from the Runway 28 threshold. The area is largely residential with shops, a railway station and a church. During observations, the temperature was 11°C, there was no rain and wind speeds were less than 2ms^{-1}.

12.4.40 Close to the train station the dominant source of noise was trains idling at the station, however elsewhere the dominant source was road traffic noise from Park Road and Newington Road. During a train pass-by, rail noise was the dominant noise source. A single high flying aircraft overflight event was audible, along with bird song and dogs barking intermittently.

12.4.41 Night-time observations were made at St. Lawrence between 00:25 and 00:40 on Wednesday 8th March 2017. At night, the railway station is used as a depot to store trains and therefore trains idling at the railway station were the dominant source of noise unless there was an active train movement. Road traffic noise from Newington Road was intermittent. Train whistles were observed as trains moved around the railway station. The measured sound levels were in the region of 45 to 50dB $L_{Aeq,5min}$, with maximum sound levels in excess of 60dB L_{AFmax}. During the observations, the temperature was 7°C, there was no rain and wind speeds were less than 2ms^{-1}.

OBS 12 – Ramsgate Harbour

12.4.42 Daytime observation were made in Albion Place Gardens on the 7th March 2017 between 15:30 and 16:00. Ramsgate centre is approximately 4.1km east along the extended Runway 28 centreline. During the observations, the temperature was 10°C, there was no rain and wind speeds were less than 1ms^{-1}.

12.4.43 Road traffic noise along the B2054 was dominant throughout. Bird song, including seagulls was intermittent along with a high-flying military fast jet aircraft event over sea. A fountain within Albion Place Gardens was only audible at a distance of less than 10m. Measured sound levels at the northern corner of the park were in the region of 50 to 55dB $L_{Aeq,5min}$.

12.4.44 Night-time observations were made on the 8th March 2017 between 01:05 and 01:20. The road traffic flow on the B2054 was much reduced and a pass-by occurred approximately every minute. Due to road traffic noise being reduced, the noise of the wind rustling the trees was considered the dominant source of noise, and it was noted that the fountain within the park was still active during the night. Measured sound levels in the northern corner of the park were in the region of 50dB $L_{Aeq,5min}$. During observations, the temperature was 7°C, there was no rain and wind speeds were less than 3ms^{-1}.

OBS 13 – Pegwell

12.4.45 Daytime observations were made at Pegwell on the 7th March 2017 between 14:30 and 15:00. Pegwell is a residential area in the south west of Ramsgate, situated 2.2km from the Runway 28 threshold. During the observations, the temperate was 11°C, there was no rain and wind speeds were less than 1ms^{-1}.

12.4.46 During observations, it was noted that road traffic noise from the local roads running through the area were the dominant source of noise. Road traffic noise was dominant, except whilst in the vicinity of a restaurant on the coast which had a ventilation system that became dominant when approximately 20m away and agricultural noise when in the west of the area and near the Coastguard Cottages. High flying aircraft noise, was audible throughout a single helicopter overflight was observed. Measured sound levels made at a field adjacent to Chilton Lane were in the region of 40 to 45dB $L_{Aeq,5min}$.

12.4.47 Night-time observations were made on the 8th March 2017 between 00:50 and 01:05. Road traffic noise was still the dominant source of noise, however, it was noticeably quieter than it was during the day and the fan from the restaurant was still only audible whilst in the vicinity of it. Bird song was audible in the distance, in particular seagulls. Measured sound levels were in the region of 40dB $L_{Aeq,5min}$. During night-time observations, the temperature was 7°C, there was no rain and wind speeds were less than 2ms^{-1}.

OBS 14 – Nethercourt Estate

12.4.48 Daytime observations (afternoon) on Nethercourt Estate found that the dominant noise source was distant road traffic noise from the A299 the A255. This noise was constant during the daytime observations. Traffic noise from A299 and A255 was more clearly audible closer to southern

section of the estate. Other constant noise sources (of equal dominance) included: rustling of vegetation (planted near roadside), and birdsong. Aircraft pass-by events were also audible but not dominant as these were not directly overhead. Traffic on Nethercourt Estate was infrequent but tended to be slightly busier to the south west corner of the estate. A railway pass-by event occurred during a second daytime (morning) observation and this was clearly audible but not dominating.

12.4.49 During evening observations, distant road traffic noise was still dominant but was more noticeable due to the use of sirens by emergency vehicles on the A256. Although not constant, the sound of sirens was frequent. Sounds from the railway pass-by events and from overhead aircraft were not observed during this visit.

12.4.50 Night-time observations were mostly consistent with the daytime observations i.e. distant road traffic and noises from nearby vegetation were constant and equally dominating. A low level 'hum' was audible from the direction of the railway and this sound was audible along the northern edge of the Nethercourt Estate but was inaudible the southern half of the estate. As with the daytime observations, the night-time observations found that road traffic noise from the A299 the A255 became more clearly audible on the southern end of the Nethercourt Estate.

Characterising the baseline

12.4.51 The observations above have been utilised alongside noise modelling of known traffic flows on roads in the wider area to infer an approximate sound level to be used to represent the noise environment at each observed location. The following table provides the chosen sound level value for each location and describes the rationale.

Table A12.4.8 Estimated baseline sound level and rationale

Location	Indicative Daytime 0700 to 2300 ($L_{Aeq,16hr}$)	Indicative Night-time 2300 to 0700 ($L_{Aeq,8hr}$)	Comments
LT1 - Orchard Cottage	51 dB	48 dB	Measured levels have been adopted as the long-term measurements are considered to be most valid
LT2 - 14 Beamont Close	51 dB	45 dB	Measured levels have been adopted as the long-term measurements are considered to be most valid
LT3 - Grove House	51 dB	45 dB	Measured levels have been adopted as the long-term measurements are considered to be most valid
LT4 - 23a St John's Avenue	51 dB	45 dB	Measured levels have been adopted as the long-term measurements are considered to be most valid
LT5 - 17a Cliff View Road	51 dB	45 dB	Measured levels have been adopted as the long-term measurements are considered to be most valid
LT6 - 45 Tothill Street	51 dB	48 dB	Measured levels have been adopted as the long-term measurements are considered to be most valid
LT7 - 68 Windermere Avenue	51 dB	42 dB	Measured levels have been adopted as the long-term measurements are considered to be most valid

OBS 1 - St Nicholas at Wade	57 dB	45 dB	Consistent with modelled and short-term measured level
OBS 2 - Beltinge - Road/Rail	60 dB	45 dB	Informed by location characterisation and short-term measurement
OBS 3 - Avenue of Remembrance Herne Bay	48 dB	45 dB	Daytime informed by Noise England mapping with 3 dB adjustment for Kings Road Night- time Informed by location characterisation and short-term measurement
OBS 4 - Studio Herne Bay - Road	54 dB	48 dB	Daytime informed by Noise England mapping Night-time informed by Noise England mapping with slight adjustment to higher band due to measured level
OBS 5 - Sarre - Road	57 dB	48 dB	Informed by Noise England mapping
OBS 6 - West Stourmouth	45 dB	33 dB	Daytime informed by Noise England mapping Night-time, Noise England adjusted to upper contour and informed by location characterisation and short-term measurement
OBS 7 - Upstreet / Grove - Road	51 dB	36 dB	Daytime informed by Noise England mapping Night- time Informed by location characterisation and short-term measurement
OBS 8 - Reculver	54 dB	33 dB	Daytime informed by Noise England mapping Night- time Informed by location characterisation and short-term measurement
OBS 9 - Birchington-on-Sea	60 dB	51 dB	Informed by Noise England mapping
OBS 10 - Staner Court	48 dB	48 dB	Informed by location characterisation and short-term measurement
OBS 11 - St Lawrence - Rail	54 dB	48 dB	Daytime informed by Noise England mapping Night- time Informed by location characterisation and short-term measurement
OBS 12 - Ramsgate	51 dB	51 dB	Informed by location characterisation and short-term measurement
OBS 13 - Pegwell	42 dB	42 dB	Informed by location characterisation and short-term measurement Night-time, Noise England adjusted to lower contour and informed by location characterisation and short-term measurement
OBS 14 – Nethercourt Estate	60 dB	54 dB	Informed by indicative noise modelling