

## **13.0 EFFECTS ON THE ENVIRONMENT: Noise and Vibration.**

### **13.1 Introduction.**

13.1.1 This chapter discusses the existing noise levels and receptors in the Draft Planning Scheme Area and identifies and assesses the potential impacts of the Draft Planning Scheme on the existing ambient noise environment and receptors. It also identifies potential impact on future occupiers and lists the mitigation measures that will be employed to reduce/ eliminate the impact both on future occupiers and existing sensitive receptors.

### **13.2 Assessment Methodology.**

#### *13.2.1 Desk-based Review.*

13.2.1.1 A literature review of EISs completed for other developments on the Peninsula has been carried out as part of this assessment. In addition the traffic noise mapping prepared by Dublin City Council (predicted from available traffic counts) was reviewed for the Draft Planning Scheme and surrounding areas.

#### *13.2.2 Baseline Noise Monitoring.*

13.2.2.1 A comprehensive baseline noise monitoring survey was carried out within the Planning Scheme Area. The primary aim of the survey was to determine noise levels associated with all existing industries on the peninsula although in particular, the aim was to establish noise impact associated with the WWTP, Poolbeg ESB and Synergen installations which could affect future occupiers once the Scheme is fully complete. A further aim of the survey was to establish/verify noise levels at existing sensitive receptors. Traffic noise measurements were also carried out both within and outside the Draft Scheme Area.

13.2.2.2 Baseline noise monitoring was conducted on the following dates within the Planning Scheme Area.

	<b>Day time</b>	<b>Night time</b>
•	12 Dec 07	20 Dec 07
•	13 Dec 07	14 Feb 08
•	16 Jan 08	19 Mar 08
•	13 Feb 08	20 Aug 08
•	20 Aug 08	

13.2.2.3 Weather conditions were ideal for noise assessment on the days of monitoring.

13.2.2.4 The methodology followed was in accordance with the recommendation of the International Standards Organisation Document: ISO 1996 Parts 1, 2 and 3 (1982), the EPA Guidance Note on Noise in Relation to Scheduled Activities, 2006 and the EPA Environmental Noise Survey Guidance Document, 2003.

13.2.2.5 Noise measurements were carried out using a BRÜEL & KJÆR 2250 Hand Held Analyser equipped with Enhanced Logging Software BZ7225. The monitoring equipment was calibrated before measurements were recorded using a BRÜEL & KJÆR sound level calibrator type 4231. The noise levels were measured using the A-weighted network, and a fast sampling interval. At all sample locations the noise meter was positioned at a minimum of 3.5 meters away from any reflecting surfaces, and mounted on a tripod 1.5 meters over ground level.

13.2.2.6 The parameters measured were as follows:

**L<sub>AEQ</sub>** is the A – weighted equivalent continuous sound level – the sound level of a steady sound having the same energy as a fluctuating sound over a specified measurement period.

**L<sub>A10</sub>** is the A – weighted noise level which is exceeded for 10% of the specified measurement period. This gives an indication of the upper limit of fluctuating noise such as that from road traffic.

**L<sub>A90</sub>** is the A – weighted noise level exceeded for 90% of the measurement period and is useful in providing an indication of the background noise level experienced over the measurement period.

13.2.2.7 All measurements were as dBA; i.e. decibels measured using the A-Weighted network, which corresponds to the frequency at which humans perceive noise.

13.2.2.8 Noise monitoring locations were chosen to specifically take account of the need to identify noise levels at existing receptors and also to establish likely noise levels affecting future receptors whilst also respecting access constraints to the existing premises. Day and night time monitoring was also carried out in the River Liffey which forms the northern boundary of the peninsula. Monitoring locations and associated sound pressure levels (SPLs) are shown in Table 13.3.2.1 (day time) and Table 13.3.2.2 (night time). Mapping of noise levels on the peninsula associated with the main utility plants and the South Port activities has been carried out.

### *13.2.3 Construction Phase – Noise Prediction Modelling.*

13.2.3.1 Prediction of construction noise has been conducted as described in BS 5228: Part 1: 1997, Noise and Vibration Control on Construction and Open Sites. According to this standard, it is difficult to provide detailed guidance on what noise levels will constitute a problem in a particular situation. However, a number of factors such as site location, existing ambient noise levels, duration of site operations, hours of work and attitude of the site operator are likely to affect considerations of acceptability of site noise.

### *13.2.4 Operational Phase – Noise Prediction Modelling.*

13.2.4.1 In the long term, the main impact associated with the proposed development on existing noise sensitive receptors will be associated with potential increased traffic. Traffic flows have been reviewed and it has been concluded that the need for detailed modelling is not required.

## **13.3. The Receiving Environment.**

### *13.3.1 Baseline Noise Monitoring on the Peninsula.*

13.3.1.1 Poolbeg Peninsula is historically an industrial area located along the south of the River Liffey as it enters Dublin Bay. The following industries are currently present on the main landbank:

#### Utilities

- Poolbeg Electricity Station operated by ESB
- Synergen Electricity Station operated by ESB
- Wastewater Treatment Plant Ringsend
- Dublin Port.

#### Non-Utility Operations

- Roadstone Ringsend
- Kilsaran Concrete
- Hammond Lane Metal Recycling
- Cement Manufacturing Facilities x 2
- Gary Keville Transport and other miscellaneous small businesses around the site.

13.3.1.2 During the day time period the peninsula is primarily a very busy industrial zone with much HGV and lighter traffic accessing the site. Traffic noise from the surrounding road network is also predominant and noise from the non-utility industries on the peninsula, such as the concrete facilities and the metal recycling yard, are dominant in many parts of the Draft Planning Scheme Area.

13.3.1.3 At night the non-utility facilities are not in operation and monitoring at this time aided in isolating the continuous noise sources associated with the utility plants and the port.

#### *13.3.2 Noise Monitoring Locations.*

13.3.2.1 Baseline noise monitoring was undertaken at 48 locations in total. Monitoring was carried out at 37 of these locations during the day time and at 36 of these locations during the night time periods. Day time noise monitoring locations are shown on Figure 13.3.2.1 while night time monitoring locations are shown on Figure 13.3.2.2.

#### *13.3.3 Noise Monitoring Results.*

13.3.3.1 Table 13.3.3.1 overleaf contains the noise levels recorded during the day time period and the associated predominant noise sources at each location. Table 13.3.5.2 overleaf contains the corresponding night time noise monitoring results and associated noise sources audible during the night time monitoring events.

**Table 13.3.3.1 Day time Noise Levels dB(A).**

<b>Monitoring Point</b>	<b>L<sub>Aeq, T</sub></b>	<b>L<sub>A10, T</sub></b>	<b>L<sub>A90, T</sub></b>	<b>Frequency of Dominant Tone (Hz)</b>	<b>Predominant Noise Source</b>
NM1	60	58	54	-	Whirring and humming noises from ESB were the predominant noise sources.
NM2	62	64	59	-	Vents and fans within the ESB approximately 20-30m above ground level were the predominant noise source. Passing traffic was also audible.
NM3	68	68	68	-	Water gushing at WWTP, audible in local environment only. Pipe-work also audible carrying water/ gas within the WWTP.
NM4	54	54	52	-	High pitched noise from the WWTP predominant with tonal and equipment noises also audible from the WWTP. Port and ESB also audible in background.
NM5	64	66	57	63	Fans and vents from WWTP at this monitoring location are the predominant noise source. Trucks on site also audible.
NM6	68	68	61	1600	Activities at Kilsaran concrete predominant such as truck movements and alarms sounding.
NM7	63	63	60	16	Operations within WWTP predominant such as humming tonal noise and screeching high pitched noise. Some noise from Hammond Lane also audible.
NM8	55	56	53	-	Hammond Lane noise predominant. Hum from Synergen facility only audible when scrap metal noise ceases.
NM9	62	63	61	125	ESB predominant with welding in former electricity station and some Port activity also audible.
NM10	53	54	51	-	Hammond Lane noise predominant with some tonal noise audible from the ESB facility.
NM11	53	54	50	-	Wave noise predominant. No audible noise source from the site.
NM12	70	73	60	16	Hammond Lane noise predominant such as truck movements, loader scraping metal, metal hitting metal and related traffic noise.
NM13	68	71	61	-	Humming tonal noise from Synergen predominant with Hammond Lane and traffic also audible.
NM14	65	69	57	-	Traffic noise from HGVs on Southbank Road is the predominant noise source with some activities at Roadstone also audible.

<b>Monitoring Point</b>	<b>L<sub>Aeq, T</sub></b>	<b>L<sub>A10, T</sub></b>	<b>L<sub>A90, T</sub></b>	<b>Frequency of Dominant Tone (Hz)</b>	<b>Predominant Noise Source</b>
NM15	70	72	65	-	Activities within Roadstone are the predominant noise source such as truck movements and alarms sounding.
NM19	60	63	52	-	Trucks moving within the Port predominant.
NM20	62	64	57	-	Truck and crane movements with the Port predominant.
NM22	51	53	48	-	Traffic noise from Beach Road predominant. Activity at Roadstone also audible.
NM23	71	74	65	-	Traffic on Beach Road predominant. No noise audible from site.
NM24	72	76	59	-	Traffic on Sean Moore Road predominant. No noise audible from site.
NM25	49	51	45	-	Traffic on Sean Moore Road and activity at Roadstone are the predominant noise sources.
NM26	50	51	48	-	Traffic on Sean Moore Road predominant. No audible noise source from the site.
NM27	59	61	55	-	Traffic on Sean Moore Road predominant. No audible noise source from the site.
NM28	43	44	41	-	Roadstone activities predominant. Hum also audible from the direction of Synergen or WWTP.
NM29	62	66	51	-	Traffic on South Bank Road predominant. No audible noise source from the site.
NM30	54	56	52	100, 160	Tonal noise at ESB predominant.
NM31	60	61	58	-	Water gushing and vent/ fan noise at ESB predominant. Forklift activity in ESB also audible.
NM32	56	58	55	50	Noise from Northern Port predominant. No audible noise source from the site.
NM33	64	66	62	50	Loading of ship at Port predominant; cranes working and reverse bleeping from Northern Port also audible.
NM41	64	68	49	-	Traffic on Beach Road predominant.
NM42	74	77	63	-	Traffic on Beach Road predominant.
NM43	75	79	64	-	Traffic on Sean Moore Road predominant.
NM44	66	68	57	-	Traffic on Sean Moore Road predominant.
NM45	67	70	56	-	Mainly traffic on Sean Moore Road and Beach Road. Some noise from the

<b>Monitoring Point</b>	<b>L<sub>Aeq, T</sub></b>	<b>L<sub>A10, T</sub></b>	<b>L<sub>A90, T</sub></b>	<b>Frequency of Dominant Tone (Hz)</b>	<b>Predominant Noise Source</b>
					close by petrol station was also audible
NM46	48	51	42	-	Mainly traffic on Beach Road. Domestic metal cutting activities could also be heard.
NM47	66	70	58	-	Traffic on York Road (to toll bridge) and on Pigeon House Road (local road) predominant.
NM48	63	65	56	-	Mainly activities taking place at Dublin port. Traffic on Pigeon House Road could also be heard.

**Table 13.3.3.2 Night time Noise Levels dB(A).**

<b>Monitoring Point</b>	<b>L<sub>Aeq, T</sub></b>	<b>L<sub>A10, T</sub></b>	<b>L<sub>A90, T</sub></b>	<b>Frequency of Dominant Tone(s) (Hz)</b>	<b>Predominant Noise Source</b>
NM1	46	46	45	-	Waves lapping against shoreline are the predominant noise source. A buzzing noise is barely audible from ESB.
NM2	47	48	47	-	Humming tonal noise from the ESB is the predominant noise source. Water gushing noise is also audible from the WWTP.
NM5	55	55	54	-	Fixed noise source such as a pump from within the WWTP predominant. Other whirring noise is also audible from the WWTP. Operational noise of vehicles moving from northern boundary of the plant also audible.
NM7	58	59	57	80	Trucks reversing and humming noise within WWTP are the predominant noise sources. Forklift activity within the plant also audible.
NM9	47	48	46	100, 200	Tonal noise from a transformer/ generator within the ESB is the predominant noise source. Other ventilation type noise from within the ESB is also audible.
NM10	51	54	46	-	Port activity is the predominant noise source while activity at the northern Port is also audible.
NM11	48	49	46	-	Activity at the Port is the predominant noise source. Tonal noise from the ESB is also audible.
NM13	61	62	60	50, 200, 315	Synergen fan noise is predominant. Forklift activity from the WWTP is audible in the background.
NM16	48	49	48	-	Water gushing from within the WWTP is the predominant noise source at this location. Port activities and tonal noise from within the ESB are also audible.
NM17	73	59	58	125	Tonal noise from with the WWTP is predominant. Vent/ fan noise from the same facility is also audible.
NM18	66	67	66	-	Water gushing within cooling race predominant but only in local environment.
NM19	53	55	51	-	Truck and crane movements within the Port are the predominant noise source. Some activity from the WWTP is also audible.
NM20	55	57	50	-	Truck and crane movements within the Port predominant.
NM21	55	56	55	-	Noise from pipe-work within WWTP is the predominant noise source. Forklift and associated activity within the WWTP and some Port activities are also audible.



Monitoring Point	L <sub>Aeq, T</sub>	L <sub>A10, T</sub>	L <sub>A90, T</sub>	Frequency of Dominant Tone(s) (Hz)	Predominant Noise Source
NM22	50	52	47	80	Activities at the Port are the predominant noise source. Intermittent mechanical noise and high pitched noise from the WWTP also audible.
NM23	51	53	48	-	Loading and unloading activities at the Port are predominant. Refrigerated containers on ship are also audible.
NM25	49	51	47	80	Northern Port activity is the predominant noise source. Alarm sounding at berth of ship on northern quay intermittent.
NM26	51	53	50	80	Port activity predominant, particularly the noise from refrigerated containers on ship. Other activities at Port and some intermittent traffic also audible.
NM27	53	55	50	125	Cranes loading ship at the Port are the predominant noise source. No audible noise source from the utilities on site.
NM29	49	50	48	125	Loading and unloading activities at the Port are predominant. Trucks within the Port also audible. Whirring noise from the WWTP also audible.
NM31	54	55	53	-	Water gushing at ESB is the predominant noise source.
NM33	66	66	57	-	Loading ship at the Port is the predominant noise source. Wrapping and securing containers in place is also audible.
NM34	53	54	52	-	Vents and fans at ESB are the predominant noise source.
NM35	67	69	63	-	Refrigerated containers on ship at Port are the predominant noise source. Crane working on ship also audible.
NM36	50	51	50	-	Water gushing within the WWTP is the predominant noise source. This is audible in the local environment only.
NM37	49	50	48	-	Vents and fans at the WWTP are the predominant noise sources while generator noise was audible in the distance from the Synergen facility.
NM38	49	50	48	-	Generator and fan noise at Synergen are the predominant noise sources. Traffic was also audible on Beach Road in the distance.
NM39	47	47	45	-	Traffic on Beach Road and Sean Moore Road were the predominant noise sources.
NM40	47	48	44	-	Traffic on Beach Road was the only audible noise source.
NM42	68	71	41	-	Mainly traffic on Beach Road. Also tonal noise from overhead lighting lines.
NM43	68	71	40	-	Traffic on Sean Moore Road predominant.
NM44	57	62	36	-	Traffic on Sean Moore Road predominant.

<b>Monitoring Point</b>	<b>L<sub>Aeq, T</sub></b>	<b>L<sub>A10, T</sub></b>	<b>L<sub>A90, T</sub></b>	<b>Frequency of Dominant Tone(s) (Hz)</b>	<b>Predominant Noise Source</b>
NM45	63	61	41	-	Mainly traffic on Sean Moore Road and Beach Road.
NM46	44	47	32	-	Traffic on Beach Road predominant.
NM47	58	58	50	-	Mainly activities taking place at Dublin port. Traffic on Pigeon House Road could also be heard at times.
NM48	57	61	47	-	Traffic on York Road (to toll bridge) predominant.

Figure 13.3.2.1 Daytime Noise Levels and Monitoring Points.

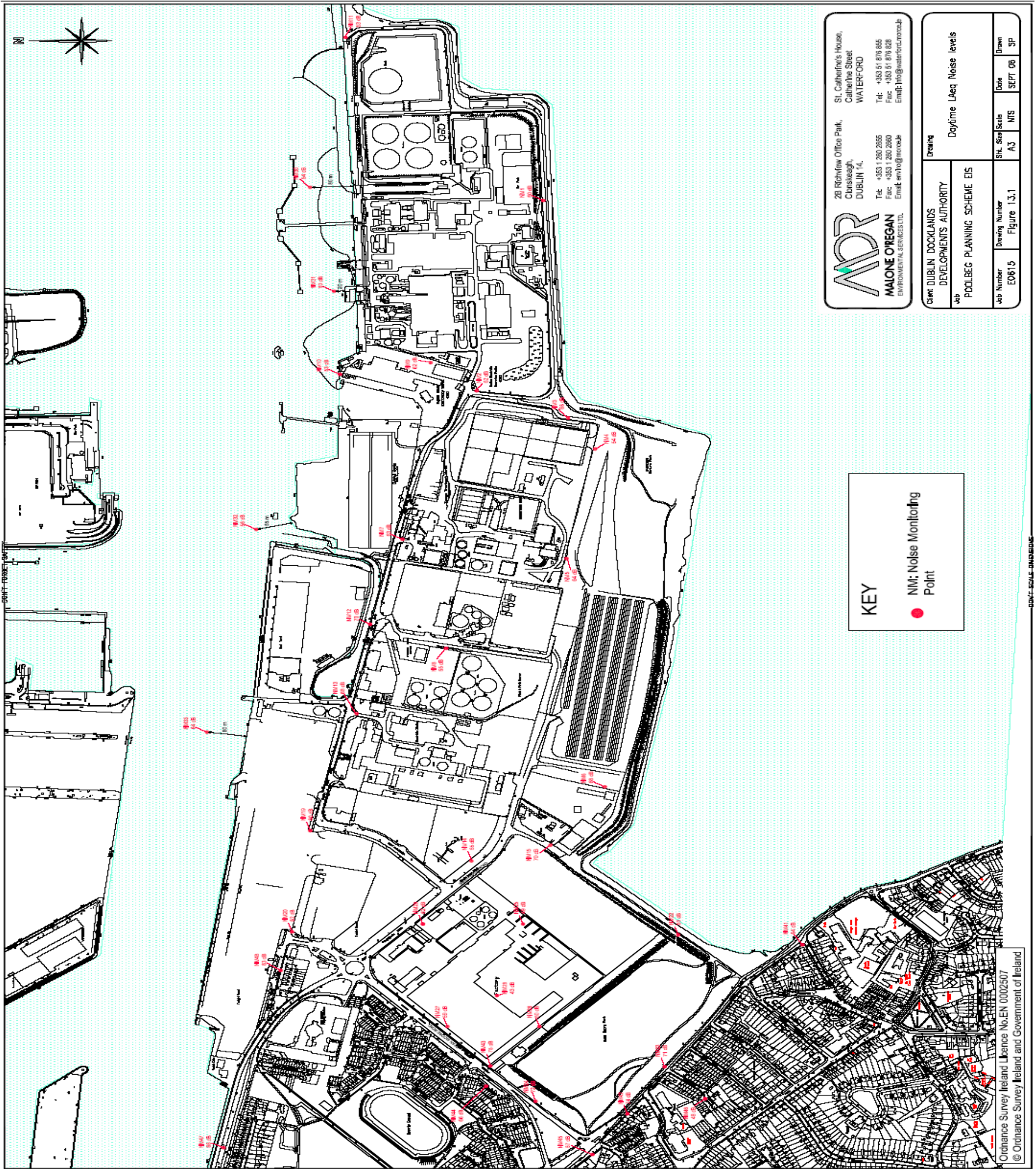
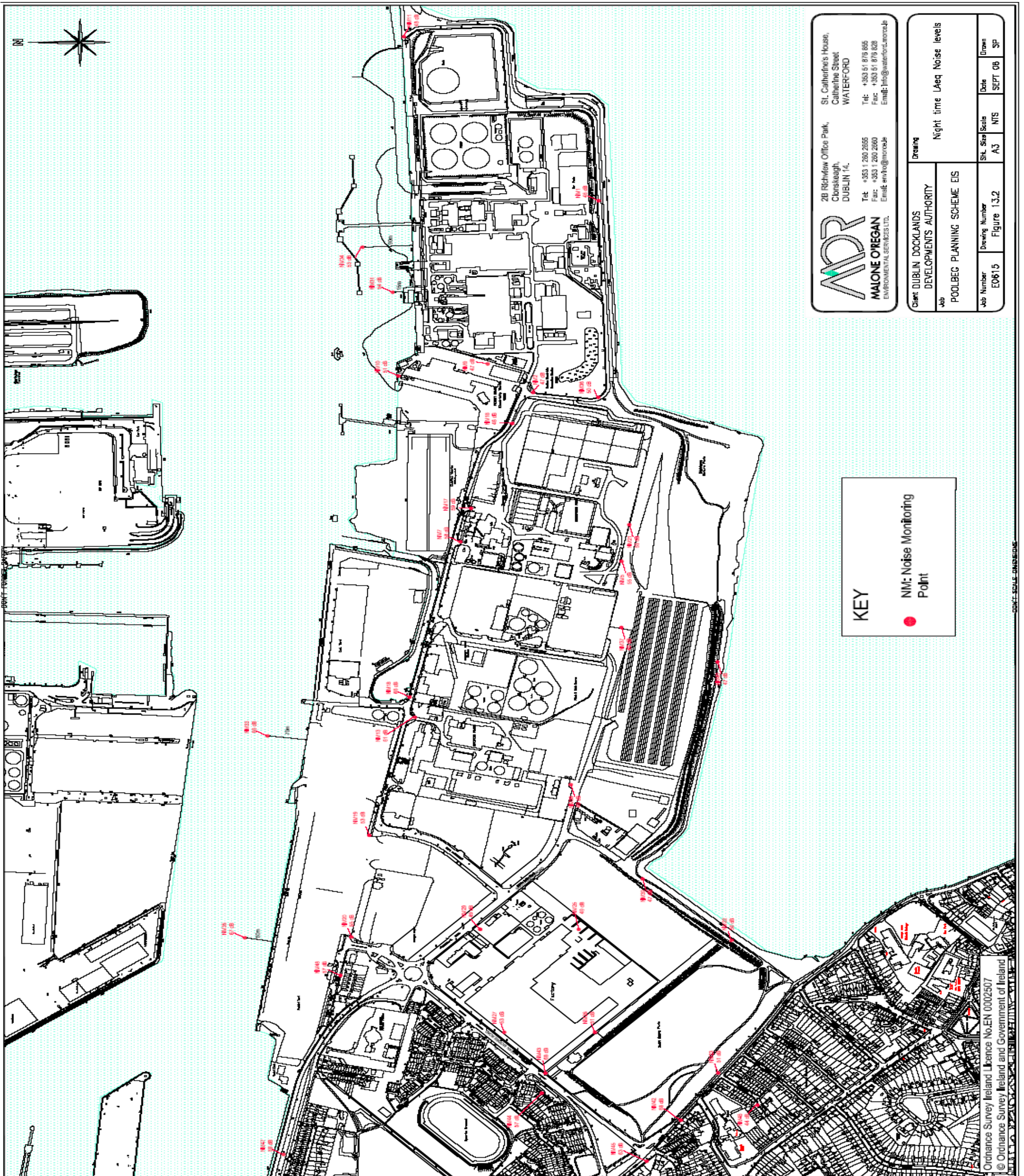




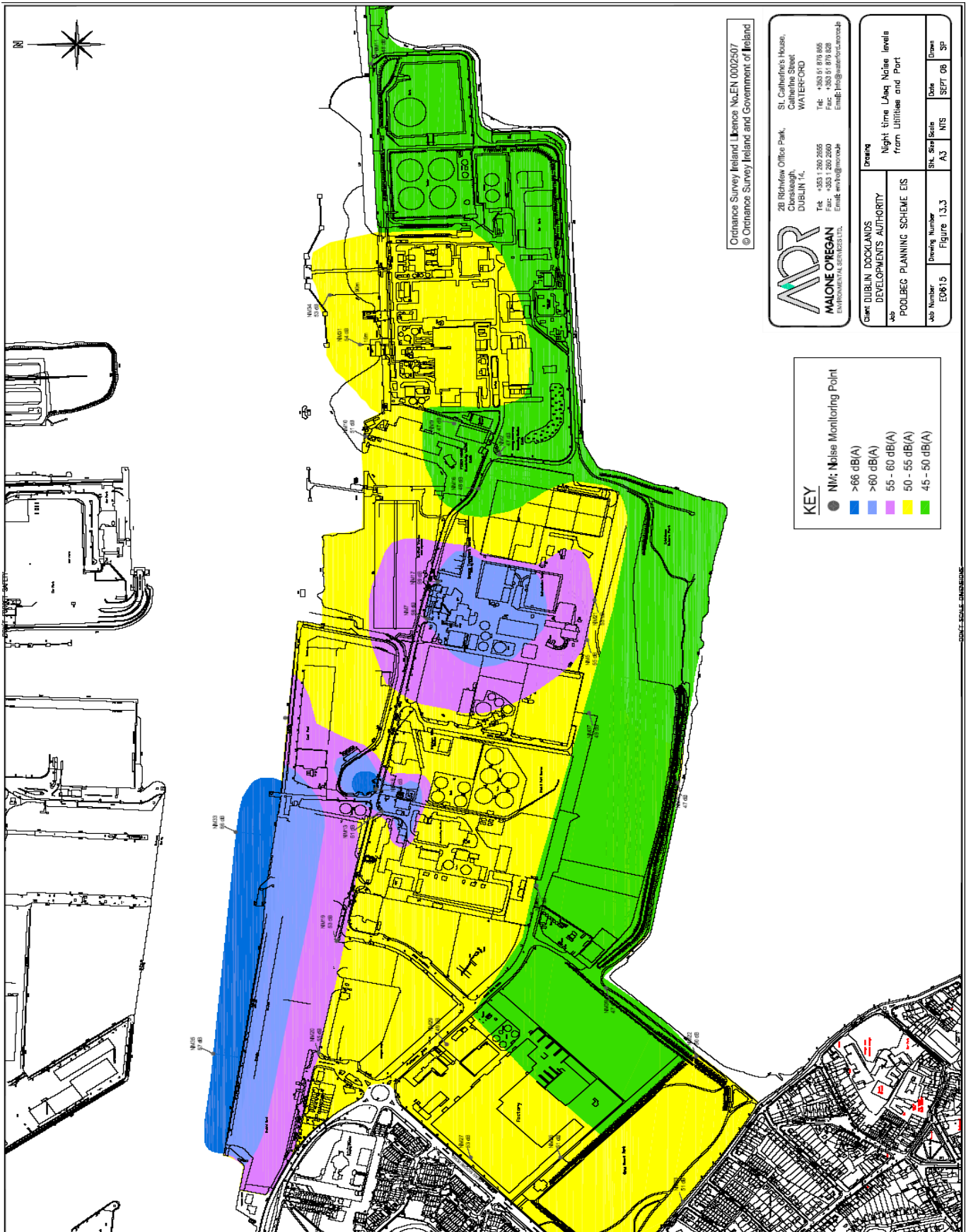
Figure 13.3.2.2 Night-time Noise Levels and Monitoring Points.



- 13.3.3.2 Figures 13.3.2.1 and 13.3.2.2 also show the noise monitoring results during both the day and night time period respectively.
- 13.3.3.3 During the daytime, the ambient noise environment is influenced by a large number of sources: predominantly traffic, scrap metal handling, port activities and activities associated with the cement plants.
- 13.3.3.4 During the night time, the predominant noise sources are the utilities and port activities both on the peninsula and on the northern bank at Alexandra Basin. In summary, the noise levels associated with the utility and port activities are described as follows:
- The highest noise levels of  $L_{Aeq,T}$  66 and 67 dB were experienced along the northern boundary of the Port while ships were being loaded and unloaded respectively. This is the main noise source across the west of the peninsula at night time.
  - A continuous noise source from pumps/ fans at Synergen is dominant on the northern boundary of the facility with an  $L_{Aeq,T}$  above 60dB. However due to screening from nearby buildings this noise is less dominant in areas surrounding the facility.
  - The noise generated within the Wastewater Treatment Plant dominates the noise environment in the centre of the peninsula at night time. The main building within the plant screens some of the noise from spreading eastward. However the site of the future Waste to Energy facility is dominated by this noise.
  - While there are individual noise sources within the Poolbeg Electricity Station, the levels recorded at the boundaries were below 50 dB(A). The exception to this is on the northern boundary where gushing water and fans were audible up to 54 dB(A) at night time, although noise levels reduced on moving westwards.
- 13.3.3.5 Figure 13.3.5.1 overleaf maps the noise monitoring results and illustrates the predominant night time sources of noise as the utilities and port activities.



Figure 13.3.5.1 – Estimated Night Time Noise Levels from Utilities and Port.



### 13.3.6 *Predicted Noise Impact of Existing Utility Noise Sources.*

13.3.6.1 The Sound Pressure Levels (SPLs) associated with the utility plants and the Port have been determined or predicted from boundary monitoring as follows:

- The SPL associated with the ESB Poolbeg Power Station varies between day and night as some sources are switched off during the night time period. Noise levels at the boundary at night time reduced to between 45 – 50 dB(A) compared to >60 dB(A) during the daytime.
- The Synergen plant is relatively quiet compared to other activities on the peninsula. Noise levels along most of the boundary are predicted to be between 50 – 55 dB(A) except at the entrance where there is a significant noise source present within the facility.
- Noise levels along the boundary of the WWTP are predicted to vary from 50 – 55 dB(A) along the southern, eastern and western boundaries while noise levels increase to 55 – 60 dB(A) along the northern boundary. Noise sources are tonal along the immediate boundaries.

13.3.6.2 The noise predictions for the WtoE plant taken from Chapter 9 and Appendix 9 of the WtoE EIS indicate that noise breakout from this activity will be towards the east or the WWTP and are not likely to significantly influence existing non-industrial areas or future development envisaged to the west of the Draft Planning Scheme.

13.3.6.3 Within the remainder of the peninsula, noise levels during night time, and without non-utility day time sources in operation, are expected to vary between 50 – 55 dB(A) within the western portion, and between 45 – 50 dB(A) within the eastern and some southern portions.

13.3.6.4 Figure 13.3.9.1 indicates the noise levels associated with the utility plants and Port activities only.

### 13.3.7 *Traffic Noise.*

13.3.7.1 During the survey traffic noise was monitored at locations NM23, 24, 27 and 41-48 as shown on Figures 13.3.2.1 and 13.3.2.2 above. Day and night traffic noise mapping has been carried out by Dublin City Council and this was also reviewed to determine existing traffic noise influences. Also, monitoring was carried out at a number of locations for the Waste to Energy EIS (see below) which has been reviewed.

13.3.7.2 With regard to the Draft Planning Scheme Area and potential future receptors, generally daytime noise levels from traffic would be high immediately along the Sean Moore Road as expected and are typical of an urban environment. With regard to the remainder of the peninsula, traffic noise is likely to be in the region of 50 - 55 dB(A) during the daytime and 45 – 50 dB(A) during the night time period away from the immediate vicinity of the roads.

13.3.8 *Existing Sensitive Receptors.*

13.3.8.1 With regard to potential noise impact, existing sensitive receptors in the area are those located immediately west of Sean Moore Road (e.g. Bremen and Cymric Road), Coast Guard Cottages and those located on Pigeon House Road/York Road and Beach Road, Sandymount. Monitoring has been carried out at these locations as set out below. Traffic noise is the main existing noise source in these areas together with port noise. Also a review of the traffic noise mapping from DCC and monitoring data for these sites from other EISs has been carried out as set out in Table 13.3.8.1 below.



**Table 13.3.8.1 - Noise Levels Recorded at the Nearest Existing Noise Sensitive Receptors.**

Location	Source: DCC Traffic Mapping dB(A)		Source: Chapter 9 & Appendix 9, WtoE EIS dB(A)		Monitoring at sensitive receptors Aug 08 dB(A)	
	Day	Night	Day	Night	Day	Night
Coast Guard Cottages	60-65	50	-	-	63	58
St Luke's Road	65-70	55-60	64	60	-	-
Beach Road	60-65	60	-	-	74	68
York Road	60-65	60	-	-	66	57
Sean Moore Road	70-75	65-70	-	-	75	68
Beach Ave	55-60	50	-	-	48	44
Seafort Ave	60-65	55-60	61	57	64	-
Pigeon Hse Road/South Bank with Peninsula	55	50	-	-	-	-
Sean Moore Road façade of receptors (Bremen Road)	65	55-60			66	57

*Note: DCC traffic noise mapping is predictive from traffic counts only and is therefore not derived from monitoring. WtoE EIS noise monitoring would have taken account of other noise sources besides traffic in the area.*

## 13.4 Relevant Characteristics of the Draft Planning Scheme.

### 13.4.1 Construction Phase.

13.4.1.1 The construction phase will involve works such as site preparation, site development, construction of the main buildings, road surfacing and landscaping etc., all of which will result in the use of noisy machinery as well as the movement of HGVs on and off the site. With regard to existing sensitive receptors, the closest areas of construction work which could significantly affect existing receptors would be works providing the new transport network (DRT) adjacent to the East link road and potentially works to Sean Moore Road. Construction works within the IGB site could potentially affect the residents located across the Sean Moore Road.

13.4.1.2 The development of the peninsula will be phased. Accordingly, completed phases could be affected by construction noise arising from future development.

13.4.1.3 In terms of potential vibrational effects there are a number of listed or protected

buildings of significant importance, in the development area under review. These include, but not exclusively, the following architecturally assessed structures:

- Former Pigeon House Hotel,
- Pigeon House Power Station: former red brick electricity generating station,
- Remnants of Pigeon House Fort.
- Coast Guard Cottages

#### *13.4.2 Operational Phase.*

13.4.2.1 In the long term, the traffic generated as a result of the proposed scheme has the potential to impact on existing noise sensitive receptors.

13.4.2.2 Within the scheme itself, future occupiers may also be affected by traffic noise, plant equipment used for air handling, and impact from industrial noise and port activities.

### **13.5 Likely Impact of the Draft Planning Scheme.**

#### *13.5.1 Construction Phase.*

13.5.1.1 The construction phase has the potential to impact on the existing ambient noise environment by temporarily elevating noise levels through the use of plant equipment in proximity to the nearest sensitive receptors. At this stage of the Draft Scheme it is difficult to determine exactly what equipment will be used during construction. However Table 13.5.1.1 below details typical noise sources that may be in operation at different times during the construction phase. However, noise impact will effectively be controlled in a Construction Management Plan.

**Table 13.5.1.1 Likely Noise Levels Arising from the Construction Phase Predicted at Known Distances.**

Activity	Activity equivalent continuous sound pressure level $L_{Aeq,T}$ @ 10m	Predicted $L_{Aeq,t}$ @ 20m	Predicted $L_{Aeq,t}$ @ 50m	Predicted $L_{Aeq,t}$ @ 100m
<b>Site Preparation</b>				
<i>Likely Equipment to be Used for Demolition, Filling, Clearing, Ground Excavation, Trenching, Piling</i>				
Lump Hammer	69	63	55	49
Rock Breaker (ripping)	89	83	75	69
Tipper lorry/Placing of rock fill	85	79	71	65
Tracked loader	84	78	70	64
Tracked excavator and lorry	76	70	62	56
Piling	87	81	73	67
<i>Likely Equipment to be used for Tipping/Spreading and Levelling of Ground:</i>				
Dump Truck	82	76	68	62
Wheeled Excavator/loader	76	70	62	56
Dozer	81	75	67	61
Roller	78	72	64	58
Compactor	78	72	64	58
<b>Building Construction</b>				
<i>Likely Equipment to be Used:</i>				
Truck mixer (discharging)	84	78	70	64
Pumping concrete - truck mixer	81	75	67	61
Placing concrete and compaction – (combined truck mixer, tracked crane, poker vibrator)	86	80	72	66
<i>Other Likely Noise Sources in Operation at different times:</i>				
Diesel Driven Generator	82	76	68	62
Compressor	81	75	67	61
Poker vibrators (max likely)	94	88	80	74
Electric percussion drills	78	72	64	58
Hand-held petrol driven disc cutter	84	78	70	64
Scaffold Poles and Clips	80	74	66	60
Site Fork Lift Trucks (idling)	77	71	63	57
Diesel Hoist	76	70	62	56
Dumper	82	76	68	62
Tracked Crane	86	80	72	66
Lorry	85	79	71	65
<b>Paving Works/ Landscaping</b>				
Tipper lorry	85	79	71	65
Roller	80	74	66	60
Grader	84	78	70	64

*Noise Sources: BS5228: Noise and Vibration Control on Construction and Open Sites: Part 1: Code of Practice for basic information and procedures for noise and vibration control: 1997.*

13.5.1.2 The nearest existing receptors to construction are located at Coast Guard Cottages, Bremen Grove opposite Sean Moore Road, and along York Road/Pigeon House Road and adjacent to the East Link Road. Coast Guard Cottages are within the immediate vicinity of construction. Bremen Grove and residents along York Road, Pigeon House Road/ East Link Road are approximately 15 – 30m from the closest construction.

13.5.1.3 These receptors are likely to experience noise nuisance during construction, depending on the activity being carried out. However mitigation measures will be implemented as set out in Section 13.6 to reduce the impact.

*13.5.2 Operational Phase.*

13.5.2.1 It is considered that there are several primary sources of noise in the operational context and the impact of each of these aspects is dealt with below. This main impact on existing receptors will be with regard to additional potential traffic noise.

*13.5.3 Long Term Traffic Related Noise.*

13.5.3.1 Chapter 16.0 Material Assets - Traffic, Transportation & Parking contains the details of the expected flows on the surrounding road network in 2020 when the Draft Planning Scheme is expected to be complete. Traffic flows have been predicted for Beach Road, Sean Moore Road, South Bank Road, East Link Road, Bridge Road, Londonbridge Road, Pearse St and North Wall Quay for the following two scenarios:

- 2020 without the Draft scheme in place and expected traffic growth, and
- 2020 with the scheme in place and expected growth and upgrades to Sean Moore Road.

13.5.3.2 Generally a doubling or halving of traffic on a route equates to an increase or decrease of up to 3 decibels which would be a perceptible change and which would be considered a minor noise impact. A comparison of the traffic predictions with and without the scheme in 2020 for the South Bank Road, Sean Moore Road and Beach Road indicates that the percentage increase as a result of the scheme on these roads will be 61%, 31% and 13% respectively. There are currently no sensitive receptors on the South Bank Road, although traffic related noise is likely to increase by 3-4 decibels on this road. The increased flows on Sean Moore Road are further outlined in Table 13.5.3.1. The impact of traffic noise associated with the Draft Planning

Scheme on existing sensitive receptors is considered negligible as the Draft Planning Scheme's additional traffic will only give rise to an increase of 1decibel.

**Table 13.5.3.1 Traffic Predictions for Sean Moore Road**

Scenario	Year	AM Peak Hour (Passenger Car Units) PCUs (both directions)	Annual Average Daily Traffic (AADT)
Existing Traffic Counts	2007	2,108	26,076
No Development	2020	2,309	28,562
With Development and upgrades to Sean Moore Road	2020	3,023	37,395
%Increase between No Development and Development in 2020	n/a	31%	31%

#### 13.5.4 Noise Emissions from Building Services Plant.

13.5.4.1 It is likely that a variety of electrical and mechanical plant will be required to service elements of the proposed Scheme. It is envisaged that plant and equipment will be housed at roof level or within enclosed internal plant rooms. It is also likely that a proportion of the plant and equipment will be operational on a 24-hour basis.

13.5.4.2 The designers of the plant and equipment will be required to ensure that the noise arising from plant and equipment will comply with the external noise criteria at the facades of the nearest receptors as outlined below:

- Day time (08:00hrs – 22:00hrs) = 55 dB(A)  $L_{eq, T}$
- Night time (22:00hrs – 08:00hrs) = 45 dB(A)  $L_{eq, T}$  (with no audible tonal or impulsive component).

13.5.4.3 Therefore, there will be no impact on existing sensitive receptors.

13.5.5 *Noise Emissions as a Result of Service Yard Activities.*

13.5.5.1 The proposed Planning Scheme allows for the development of retail/ commercial uses which would also require service yards at various locations on the site. Service yard/ loading bay areas will include such noise sources as vehicles manoeuvring, loading and unloading activities, air brakes and possibly refrigeration units. It is also envisaged that these activities could take place on a 24-hour basis, though it is likely, particularly in the case of the retail/ commercial units, that the majority of activities will take place first thing in the morning i.e. between 7 and 8am. In addition, civic amenity facilities for recycling which are positioned in service yards or other designated areas will also give rise to intermittent noise disturbances, though it is also likely that this will take place during normal day time hours.

13.5.5.2 Source data for typical service yard activities was derived from measurements conducted in a number of delivery areas for commercial activities such as retail. The values were measured at a distance of 10m and include the effect of reflection from building facades and service yard boundaries as presented in Table 13.5.2.1 below.

**Table 13.5.2.1 Source Noise Data for Typical Activities in a Service Yard.**

Activity	dB L <sub>Aeq, event</sub>			Overall Values	
	Arrival Departure	Unloading		dB L <sub>Aeq,</sub> 1hr	dB L <sub>Aeq,</sub> 5mins
Noise Level	69	66	75	64	68
Duration of Activity (mins)	2.5	30	0.5		

13.5.5.3 These values represent a ‘worst case’ scenario as they represent the noise impact at 10m from a busy supermarket service yard. In reality, the noise generated from service yards is expected to be less, and will decrease as one moves away from the service yard. A number of mitigation measures are outlined in section 13.6.0 below in order to further protect against the impact of service yard activities within the Draft Planning Scheme.

13.5.5.4 Therefore, there will be no impact on existing sensitive receptors.

13.5.6 *Noise Emissions Arising from Social Activities within the Development.*

13.5.6.1 Potential entertainment noise from some areas of the proposed Planning Scheme development may lead to significant noise breakout in addition to noise from people gathering on the street during night time hours. External space designated as smoking

areas can also influence the noise environment by attracting customers to gather in an external area which is neither designed to contain noise nor to prevent its breakout. Mitigation measures are listed below.

*'Do Nothing' Scenario.*

13.5.6.2 The 'Do Something' scenario may potentially result in the 'movement of some noisy activities out of the area compared to the 'Do Nothing' scenario. Albeit these are only likely to be daytime sources as long term utilities and the port will remain. Excluding the movement of some existing noise sources it can be stated that there is little to no difference between the 'Do Nothing' and 'Do Something' scenario in terms of noise impact. However receptors will now move closer to the existing licensed industrial sources which may have to mitigate as required by legislation or the conditions of their IPPC licenses if complaints occur. However this is unlikely to occur based in the mapping carried out which details shows noise levels from the existing utilities.

13.5.6.3 The 'Do Something' scenario has the potential to impact on listed structures in the construction phase. This would not occur for the 'Do Nothing' scenario. Mitigation measures are listed below.

13.5.7 *Operation of the DRT*

13.5.7.1 Elements of the proposed DRT will run close to existing residential receptors. A detailed assessment of the potential noise and vibrational effects on existing receptors would be required as part of an EIS for same where an EIS is deemed necessary.

13.5.8 *Impact on the Draft Planning Scheme arising from the Existing Industrial and Port Noise*

13.5.8.1 Generally the recommended external noise levels at the facade of noise sensitive receptors such as residential development are specified as 55 dB(A) during the daytime and 45 dB(A) during the night-time with no tonal content. The levels are generally set to ensure good internal living and sleeping conditions for *existing* dwellings. However as the Draft Planning Scheme is yet to be built, internal noise criteria achievable through measures such as noise insulation in the new buildings can be set. The internal criteria required to be complied with by developers are set out in Table 13.6.8 under mitigation.

- 13.5.8.2 During the daytime, open spaces within the new built areas will generally be shielded from noise by the buildings proposed. However developers will be required to ensure that open spaces within development areas are effectively shielded and not subject to nuisance industrial noise.

### 13.6. Mitigation.

- 13.6.1 Noise and vibration criteria together with suitable mitigation measures are described and listed below.

#### 13.6.2 *Noise Criteria.*

- 13.6.2.1 There is no published Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project. The following limits, shown in Table 13.6.2.1, are considered suitable and are deemed acceptable for construction of motorways. However, the existing daytime ambient noise environment at the nearest receptors would deem that these criteria should be adhered to at a minimum and construction noise should be reduced as much as possible.

**Table 13.6.2.1 Maximum Permissible Noise Levels at the Façade of Dwellings During Construction.**

Days & Times	L <sub>Aeq</sub> (1hr) dB	L <sub>Amax</sub> dB
Monday to Friday 07:00 to 19:00hrs	70	80
Monday to Friday* 19:00 to 22:00hrs	60*	65
Saturday 08:00 to 16:30hrs	65	75
Sundays and Bank Holidays 08:00 to 16:30hrs	60	65

*Source: NRA Guidelines for the Treatment of Noise and Vibration in National Road Schemes, October 2004.*

\* Construction activity at these times, other than that required in respect of emergency works, will normally require the explicit permission of the relevant local authority.

#### 13.6.3 *Vibration Criteria.*

- 13.6.3.1 Vibration standards are concerned with those dealing with human comfort, and those dealing with structural or cosmetic damage to buildings.



### 13.6.4 *Effects on Buildings.*

13.6.4.1 Guidance relevant to acceptable vibration within buildings is contained in the following documents:

- British Standard BS 7385 (1993): *Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration;*
- British Standard BS 5228 (1997): *Noise control on construction and open sites Part 4: Code of practice for noise and vibration control during piling;* and
- Building Research Establishment (BRE) Digest 353 (1990): *Damage to Structures from ground borne vibration.*

13.6.4.2 BS 5228 recommends that for soundly constructed residential property and similar structures that are generally in good repair, a threshold for minor or cosmetic damage should be taken as a peak particle velocity of 10mm/s for intermittent vibration and 5mm/s for continuous vibration. Below these vibration magnitudes minor damage is unlikely although where there is existing damage these limits may be reduced by up to 50%. For light and flexible industrial and commercial structures threshold limits of 20mm/s for intermittent and 10mm/s for continuous are recommended, whilst for heavy and stiff buildings higher thresholds of 30mm/s for intermittent and 15mm/s for continuous are recommended.

13.6.4.3 In terms of limit values for older buildings or sites of architectural interest reference is made to the limit values in the BRE Digest and BS7385 which are as follows:

*"For structures that are of great intrinsic value and are particularly sensitive to vibration, transient vibration should not exceed 3 mm/s at low frequencies. Allowable levels increase to 8 mm/s at 50Hz and 10mm/s at 100Hz and above".*

13.6.4.4 BS7385 states that *"there should typically be no cosmetic damage if transient vibration does not exceed 15mm/s at low frequencies rising to 20 mm/s at 15 Hz and 50mm/s at 40Hz and above"*. These guidelines relate to relatively modern buildings and should be reduced to 50% or less for more critical buildings.

13.6.4.5 Therefore, from the preceding discussion, vibration criteria can be determined as follows for the construction phase which will ensure no adverse impact is experienced at the sensitive receptors as a result of the proposed development.

Residential Dwellings

Intermittent vibration limit: 10 mm/s

Continuous vibration limit: 5 mm/s.

Sensitive structures – Transient Vibration Limits

At low frequencies: 3mm/s

At frequency of 50-100Hz: 8mm/s

At frequency of >100Hz: 10mm/s

- 13.6.4.6 This vibration criteria was taken from BS5228:1997 and BS7385:1993 and is only suitable for use where a preliminary survey has confirmed that no significant structural defects are present within the structure.

13.6.5 *Effects on Occupiers.*

- 13.6.5.1 Vibration is perceptible to humans at around 0.5mm/s and may become disturbing or annoying at higher magnitudes. However, higher levels of vibration are typically tolerated for single events or events of short duration. For example, blasting and piling, two of the primary sources of vibration during construction, are typically tolerated at vibration level up to 12mm/s and 5mm/s respectively. This guidance applies to the day time only. It is unreasonable to expect people to be tolerant of such activities at night time.

13.6.6 *Construction Phase*

- 13.6.6.1 Suitable mitigation measures to reduce the impacts identified under 13.5 above will be put in place during the construction phase.

- 13.6.6.2 The predicted noise levels arising from the operation of individual items of equipment (particularly at the site boundaries) may be above the design criteria set for construction noise, therefore the following mitigation measures will be implemented to ensure that the levels specified under Table 13.6.2.1 are complied with:

- The operation of certain pieces of equipment will be managed through monitoring and timing of use in order to ensure that the 1 hour limits specified within Table 13.6.2.1 are complied with where possible. Screening of noisy equipment will also be implemented where necessary in order to achieve the design goals. It is

envisaged that screening/hoarding will automatically be placed where receptors are within 10m of the site boundary.

- During the construction phase any complaints received will be thoroughly investigated with suitable mitigation measures taken at the time such as restricting the use of noisy equipment during the early hours and late in the evening. With these measures, noise impact from the construction phase will be kept to a minimum and within acceptable levels to noise sensitive receptors.
- Noise control measures will be implemented to provide reductions in overall site noise levels. These include the use of sharp saws and drills and screws as opposed to nails where possible. In addition, good practice will be implemented when handling materials, for example lowering rather than dropping materials such as scaffolding poles.
- During the site development works and construction phases, for safety reasons, night time work may be required for areas such as entrance construction etc. However this will be carried out only when absolutely necessary and will be of short duration, therefore the impact is likely to be minimal.
- During the construction phase all equipment will be required to comply with EC Directives relating to noise emissions from construction, plant and equipment (S.I. 320/1988). These include compressors, welding generators, excavators, dozers, loaders and dump trucks. Account will also be taken of BS 5228: Part 1: 1997 - Noise Control on Construction and Open Sites. All equipment will be CE<sup>1</sup> marked.
- Construction work will be limited to hours agreed with planning authorities, the developers, contractors and residents especially where site works giving rise to high noise or vibration levels are envisaged.
- A site representative will be appointed for matters related to noise and vibration.
- Site excavation, site clearance, site development works and earthmoving operations will be temporary and short term in nature.
- Barriers will be erected around particularly noisy pieces of equipment where necessary and acoustic attenuators, enclosures etc employed where required.
- Noisy/ vibratory plant and equipment will be sited as far away as possible from sensitive properties and vibration isolated support structures will be used where necessary.

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<sup>1</sup> CE has no meaning as an abbreviation but it is thought that it is an acronym for Communaute Europeenne.

- Where practicable non-audible warning systems will be utilised. All audible warning systems will be designed where practicable to reduce noise.
- Monitoring of typical levels of noise and vibration will be conducted during critical periods at sensitive locations. Noise monitoring should generally be undertaken on a weekly basis to begin with, in order to establish the typical noise levels generated by the activities on site, then monthly thereafter. This should be undertaken at the sites where baseline monitoring was completed and in accordance with the methodology described.
- During the development the road surfaces to, from and on site will be maintained by the developer to ensure vibration from construction traffic travelling over uneven surfaces is minimised.
- A lower speed limit will be enforced during the construction phase to further minimise vibration and noise as a result of construction traffic.
- The construction noise associated with the DRT will be required to be fully assessed in a stand-alone EIS for same if deemed necessary, however at a minimum it can be stated that noise impacts will be minimised as much as is feasibly possible.

13.6.6.3 In addition to the above, the following will be specifically required with regard to vibration:

- Vibration monitoring will be required to be carried out at the protected structures on site, namely the Pigeon House. This will be used to ensure that levels do not exceed peak particle velocity (ppv) limits recommended in BS7385 and BS5228. In terms of vibration, all guidance limits outlined above will not be exceeded during the proposed development works.
- Any proposed DRT elements with potential to cause vibration impact will be subject to a separate EIS or assessment which will detail mitigation measures required to avoid or minimise potential vibration effects during construction.

13.6.6.4 All of the above will be required to be dealt with by the developer in a Construction Management Plan.

### 13.6.7 *Operational Phase.*

13.6.7.1 The proposed mitigation measures or guidance listed below relate to noise generated within the Draft Planning Scheme as there will be no significant impact on existing receptors during the operational phase.

### 13.6.8 *Criteria for Future Receptors*

Operational Phase – Design Criteria for Future Receptors.

13.6.8.1 Given the external urban ambient noise environment, it is necessary to specify how much sound may be permitted to transfer to the existing and potential future noise sensitive receptors, without causing adverse impact.

13.6.8.2 Appropriate guidance in relation to noise intrusion in residential and other buildings is contained within BS8233:1999 – *Sound Insulation and Noise Reduction for Buildings – Code of Practice*. This British standard sets out recommended noise limits for indoor ambient noise levels. A selection of the internal criteria taken from the standard are presented in Table 13.6.8.1 below.

**Table 13.6.8.1 Recommended Indoor Ambient Noise Levels.**

Criterion	Typical Situation	Design Range $L_{Aeq,T}$	
		Good	Reasonable
Reasonable resting/ sleeping conditions (residential)	Living Room	30	40
	Bedroom	30	35
Reasonable speech or telephone communications (offices)	Department store	50	55
	Restaurant	50	55
	Corridor	45	55
Reasonable conditions for study or work requiring concentration (offices)	Museum	40	50
	Meeting room, executive office	35	40
	Staff Room	35	45
Reasonable listening conditions	Classroom	35	40
	Cinema, church	30	35
	Concert hall, theatre	25	30

Source: BS8233:1999

- 13.6.8.3 All potential noise sensitive development which will proceed as part of the Draft Planning Scheme will have regard for existing noise sources within the Peninsula. In this regard developers will be required to provide adequate sound insulation within the building structures of potential future noise sensitive development to ensure that the recommended internal noise criteria set out above in Table 13.6.8.1 are met. The final location and design of potential future noise sensitive developments will also take due regard of prevailing noise sources within the proposed development area, reflective of different phases of development and changing circumstances especially if existing non-utilises operations relocate.
- 13.6.8.4 Developers will be required to ensure that open spaces within the Draft Planning Scheme area are not unduly affected by nuisance industrial noise.
- 13.6.8.5 Existing industrial activities will be expected to have due regard to the Planning Scheme if introducing new noise sources into the area which could potentially result in levels elevated over existing day and night time ambient noise levels.
- 13.6.8.6 All building services plant design will be required to meet the following specified external noise criteria at potential future noise sensitive development:
- Day time (08:00hrs – 22:00hrs) -  $L_{Aeq\ 15\ mins} = 55dB$ .  
Night time (22:00hrs – 08:00hrs) -  $L_{Aeq\ 15\ mins} = 45dB$  (with no audible tonal or impulsive component).
- 13.6.8.7 The use of screens, noise enclosures, duct mounted attenuators or acoustic louvers will be required to be employed, where appropriate, to achieve these guidance values.
- 13.6.8.8 With regard to the service yard areas the following mitigation and ‘good practice’ measures will require to be implemented:
- All service yards, including recycling areas will be located and orientated in so far as is practicable with suitable attenuation measures to ensure the recommended noise criteria are met. This includes for quieter smooth surfaces in delivery areas to prevent unnecessary vibration effects.
  - All mechanical items and equipment will be designed and regularly maintained to ensure the recommended noise criteria are met.

- Reverse beepers on vehicles within the service yard areas will not be operated at night time.
- Vehicle engines will not be left idling on site. Where practicable, refrigeration units if required will not be left running while on site.
- All radios and amplified music in truck cabs will be turned off while on site.
- No unnecessary soundings of horns will be permitted on site.
- Staff should not communicate with raised voices in the delivery yard, particularly at night time. Appropriate signage should be placed within the service yards in this regard. Furthermore, all truck drivers should be briefed, understand and adhere to the requirements of the site practice.
- Quieter plastic dollies should be used in preference to metal cages where practicable.
- Roll cages should be fitted with composite rubber and nylon wheels that reduce shock loads and consequent vibration and noise.

13.6.8.9 Control of noise from bars, restaurants and hotel function rooms during the operational phase will be in accordance with the publication - Institute of Acoustics – ‘Good Practice Guide on the Control of Noise from Pubs and Clubs’.

13.6.8.10 In August 2008, the Minister for the Environment issued a Noise Issues Consultation. It is understood that comprehensive legislation on nuisance noise may be published in the future and this will benefit all existing and future receptors which may be affected by noise. An integrated approach to noise pollution is proposed and measures include:

- Improved powers for local authorities to take steps to address noise sources
- To improve An Garda Síochána with powers similar to local authorities vis-à-vis noise pollution
- The drafting of codes of practice for industry, construction commerce and domestic situations for the reduction of noise
- A higher profile for noise issues through an annual reporting mechanism
- The creation of a website to provide information to affected persons on appropriate means for addressing complaints.

- 13.6.8.11 A Noise Action Plan will be prepared for Dublin City by DCC and this may also potentially benefit the Draft Planning Scheme in the future through the setting of objectives such as improving noise levels in the city.
- 13.6.8.12 The European Communities (Waste Water Treatment)(Prevention of Odours and Noise) Regulations 2005 will have to be complied with on the peninsula.
- 13.6.8.13 The long term noise and/or potential vibration associated with the operation of the DRT will be addressed in a separate EIS for same if deemed necessary.
- 13.6.8.14 It is envisaged that any future extensions to the WWTP will be subject to noise impact assessment and determination of mitigation measures if deemed necessary with regard to the nearest noise sensitive receptors.



### 13.7 References.

ISO 1996 Parts 1, 2 and 3 (1982), the EPA Guidance Note on Noise in Relation to Scheduled Activities, 2006

EPA Environmental Noise Survey Guidance Document, 2003.

BS5228: Noise and Vibration Control on Construction and Open Sites: Part 1: Code of Practice for basic information and procedures for noise and vibration control: 1997.

BS8233:1999 – *Sound Insulation and Noise Reduction for Buildings – Code of Practice.*

Dublin Waste to Energy Project, Ringsend, Dublin, EIS, Chapter 9 & Appendix 9, Elsam Engineering, June 2006.

Noise Maps, Report & Statistics, Dublin City Council, Noise Mapping Project, Roads and Traffic Department, November 2007.