



PROJECT: Proposed River Poddle Flood Alleviation Scheme

Noise Impact Assessment.

Response to An Bord Pleanála

RFI no. 12

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1 Introduction

1.1 Background

A planning application has been submitted to An Bord Pleanála for the proposed River Poddle Flood Alleviation Scheme (ABP Ref. 306725-20). The Scheme is proposed to provide flood protection from the River Poddle and consists of upstream storage with raised defences in South Dublin and Dublin City Council areas.

Mervyn Keegan of AONA Environmental Consulting Ltd. undertook the noise and vibration impact assessment which is contained in Chapter 12 of the EIAR for the proposed River Poddle Flood Alleviation Scheme (February 2020).

An Bord Pleanála issued a Request for Further Information (RFI) in respect of the planning application, dated 17 July 2020. Further information is sought in relation to Environmental Impact Assessment in respect of noise.

1.2 Purpose of this document

AONA Environmental Consulting Ltd. were instructed by Nicholas O'Dwyer Ltd. to provide a response to items in the RFI as follows:

RFI 12. It is considered that the information relating to construction noise should be supplemented by the inclusion of:

- *a map showing the location of the noise sensitive receptors*
- *a table showing the selected noise criteria for daytime, evening and night*
- *clarification of the locations and circumstances which might warrant construction outside of daytime hours and the likely duration of such events*
- *a table showing the predicted noise levels (LAeq,T and LAmax) for each noise sensitive receptors and confirming adherence to adopted criteria*
- *the above table may include proposals for mitigation and residual noise levels*
- *an assessment of the significance of noise effects in accordance with the EPA Draft Guidelines of August 2017.*

1.3 Statement of Authority

This response to a Request for Further Information in respect of the Noise Impact Assessment for the proposed River Poddle Flood Alleviation Scheme has been by Mervyn Keegan, Director of the environmental consultancy, AONA Environmental Consulting Ltd. AONA Environmental Consulting Ltd. is an independent consultancy specialising in Environmental Impact Assessment and Licensing.

Mervyn Keegan's areas of professional expertise includes Noise and Vibration & Air Quality and Climate impact assessment and mitigation design. Mervyn has over 20 years of environmental consultancy experience. He is a full member of the Institute of Acoustics, with a Bachelor of Science Degree (Applied Sciences), a Master of Science Degree (Environmental Science) and a Diploma in Acoustics in Noise Control.

Mervyn has produced Noise and Vibration Impact Assessment reports to assess the impacts of a range of development types including roads, residential developments, industrial developments, quarries and mines and wind energy developments among others for projects in the Republic of Ireland, Northern Ireland and the UK in the last 15 years.

He has appeared as an Expert Witness at oral hearings, public inquiries and legal proceedings.

2 Duration of construction

Before responding to RFI no. 12, it is important to confirm the duration of construction at each of the works areas as queried by An Bord Pleanála in RFI no. 11. As outlined in the EIAR Chapter 12, and further described in response to Request for Further Information (RFI) no. 11, it is most likely that construction activities will take place separately throughout periods of construction at each works location.

The proposed construction works over the entire scheme are programmed over 24 months. Works will not be continuous over the 24-month period at any one location. The nature and duration of the proposed works will mean that noise sensitive receptors will not be exposed to continuous construction noise impact during this 24-month period. By its nature, construction phases of such a proposed development are transient in terms of locations of precise activities on site from time to time. Therefore, the predicted $L_{Aeq,1 \text{ hour}}$ noise levels at specific locations have been outlined to present a worst-case range of noise levels that have the potential to occur at various stages throughout the 24-month construction period. Therefore, any change to construction programme as shown in Table 2-1 does not affect the findings of the noise impact assessment contained in Chapter EIAR and further clarified in this response.

There will be five main construction works areas, namely Tymon North and Tymon Park; Whitehall Park and Wainsfort Manor Crescent; Fortfield Road and Ravensdale Park; St. Martin's Drive and Mount Argus; and at St. Teresa's Gardens. The expected construction duration for each area is provided in Table 2-1 below. This supersedes the table provided in EIAR Chapter 12, Table 12-7. Please also refer to response to Request for Further Information no. 11.

Table 2-1. Estimated construction programme

Location	Main Flood Alleviation Scheme works	Estimated maximum construction period (cumulative months)
Tymon North and Tymon Park	Establish & maintain main contractor's compound for Scheme duration	24 months
	Tree removal, excavations, demolition of flow control structure, stockpiling earth material, removal and import of earth material, formation of embankments, removal and replacement of flow control structure incorporating footbridge, ICW, site restoration, landscape mitigation/replacement tree planting, and biodiversity enhancements	6 months
Whitehall Park / Wainsfort Manor Crescent	Establish temporary works/set down area, excavations, removal and import of earth material, channel re-alignment and re-grading, construction/installation of flood protection walls, channel naturalisation, site restoration, biodiversity enhancements and replacement tree planting	5 months

Location	Main Flood Alleviation Scheme works	Estimated maximum construction period (cumulative months)
Fortfield Road & Ravensdale Park	Establish temporary works / set down area, tree removal, demolition and replacement of footbridge, construction/installation of flood protection walls, site restoration, landscape mitigation/public realm improvements and replacement tree planting.	7 months
St. Martin's Drive & Mount Argus	Establish temporary works / set down area, tree removal, construction/installation of flood protection walls, channel naturalisation, replacement tree planting and landscaping	4 months
Poddle Park / St Teresa's Gardens / Donore Avenue / National Stadium	Establishing temporary works area, traffic management, road works to rehabilitate or replace existing manholes	2 months

3 Map of Noise Sensitive Receptors

Maps illustrating the locations of nearest noise sensitive receptors (NSR) to the proposed works, as identified in EIAR Chapter 12, Table 12-8 are provided with this response to the RFI. Enclosed find **Figure 1** which is an index map, **Figure 2** which shows the NSR in SDDC area, and **Figure 3** which shows the NSR in DCC area.

4 Provide a table showing the selected noise criteria for daytime, evening and night-time

There are no national construction noise limit guidelines.

The Transport Infrastructure Ireland (TII) "*Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes*" (March 2014) outlines the following indicative levels of acceptability for construction noise as presented in EIAR Chapter 12, Table 12-1 and in Table 12-2, and reproduced in Table 4-1 and 4-2 below.

The levels of acceptability for construction noise quoted by the TII refers to a maximum permissible 1-hour noise level from Monday to Friday 07.00 to 19.00 of 70 dB $L_{Aeq, 1-Hour}$ and 80 dB L_{Amax} . Maximum permissible noise levels for evening, night-time and weekends are also outlined by the TII.

Table 4-1. Maximum permissible noise levels at the façade of dwellings during construction based on the TII guidelines

Days & Times	L _{Aeq} (1hr) dB	L _{AMax} dB
Monday to Friday - 07.00 to 19.00	70	80*
Monday to Friday - 19.00 to 22.00	60*	65*
Saturday - 08.00 to 16.30	65	75
Sundays and Bank Holidays - 08.00 to 16.30	60*	65*

* 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 (Ref. TII Guidelines)

As stated in the EIAR Chapter 12, Section 12.3.2, Annex E of BS5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*, provides guidance on assessing the potential significance of noise effects from construction activities. In relation to construction noise threshold levels, BS5228-1:2009+A1: 2014 *Noise and Vibration Control on Construction and Open Sites Part 1: Noise* details the 'ABC method', which recommends a construction noise threshold level based on the existing ambient noise level.

In accordance with the BS5228-1:2009+A1: 2014 *Noise and Vibration Control on Construction and Open Sites Part 1: Noise 'ABC method'*, the ambient noise levels (rounded to the nearest 5 dB) in the area of the proposed construction works are approximately 55 - 60 dB L_{Aeq,T} during daytime. As a result, the noise sensitive receptors fall into Category A of the 'ABC' assessment methodology. The construction noise threshold level referred to in BS5228 outlines a 12-hour noise threshold level from Monday to Friday 07.00 to 19.00 of 65 dB L_{Aeq, 12Hour} and 80 dB L_{AMax}. Evening, night-time and weekend noise threshold levels are also outlined in BS5228.

Table 4-2: Construction noise threshold levels based on the BS 5228 'ABC' method guidelines

Assessment Category and Threshold value period	Noise Threshold Level
Daytime (07.00 – 19.00) and Saturdays (07.00 - 13.00)	65 L _{Aeq,12 Hour} / 80 L _{AMax}
Evening and weekends (Note 1)	55 L _{Aeq,12 Hour} * / 75 L _{AMax}
Night time (Note 1)	45 L _{Aeq,8 Hour} * / 65 L _{AMax}

Note 1: 19.00–23.00 weekdays, 13.00–23.00 Saturdays and 07.00–23.00 Sundays.

Note 2: Threshold levels based on BS 5228 'ABC' method Threshold value, in decibels (dB) (Category A) and TII guidelines.

It is important to note that construction noise sources from the River Poddle Flood Alleviation Scheme will primarily be during daytime hours only and will be short-term and temporary at each area of construction works along the River Poddle. Not all construction noise sources will operate at once and construction noise levels will vary throughout the typical working day.

Construction works are planned for daytime hours only, but elements such as site security inspections, plant servicing and repair, cleaning of site offices and welfare facilities may occur outside normal working hours. Similarly, short term and temporary works including concrete pouring/finishing operations, over pumping operations, etc. may also extend outside normal hours.

Therefore, based on the TII maximum permissible noise levels and the BS5228 'ABC' assessment methodology, the contractor should aim to control daytime, evening and

night-time construction noise levels to within the noise threshold levels outlined in Table 4-3.

Table 4-3: Proposed project construction noise threshold levels

Assessment Category and Threshold value period	Noise Threshold Level (L_{Aeq} & L_{AMax})
Daytime ^(Note 1)	<ul style="list-style-type: none"> Daytime 12-hour level = 65 dB $L_{Aeq,12\text{ Hour}}$ Daytime 1-hour level = 70 dB $L_{Aeq,1\text{ Hour}}$ Daytime maximum level = 80 dB L_{AMax}
Evening ^(Note 2)	<ul style="list-style-type: none"> Evening 4-hour level = 55 dB $L_{Aeq,4\text{ Hour}}$ Evening 1-hour level = 60 dB $L_{Aeq,1\text{ Hour}}$ Evening maximum level = 75 dB L_{AMax}
Night time ^(Note 3)	<ul style="list-style-type: none"> Night-time level = 45 dB $L_{Aeq,8\text{ Hour}}$ Night-time maximum level = 65 dB L_{AMax}
Weekend ^(Note 4)	<ul style="list-style-type: none"> Weekend 8-hour level = 55 dB $L_{Aeq,8\text{ Hour}}$ Weekend 1-hour level = 60 dB $L_{Aeq,1\text{ Hour}}$ Weekend maximum level = 65 dB L_{AMax}

Note 1: 07.00–19.00 weekdays & 08.00–13.00 Saturday.

Note 2: 19.00–23.00 weekday evenings.

Note 3: 23.00 - 07.00 Night-time.

Note 4: 13.00–23.00 Saturdays and 07.00–23.00 Sundays.

Appropriate construction mitigation measures as outlined in EIAR Chapter 12, Section 12.6 will be implemented as part of the Construction Environmental Management Plan (CEMP) to ensure that the above construction noise threshold levels are achieved.

5 Clarifications of the locations and circumstances which might warrant construction outside of daytime hours and the likely duration of such events.

Construction activities will take place Monday to Friday, between 07:30 and 16:30, and as may be required on Saturdays from 08.00 hours to 13.00 hours. This excludes movement of construction traffic which may occur outside these hours. Evening and night-time work is not expected to take place, although it is possible that limited 24 hours working may be required on occasion. This shall only take place with the prior agreement of SDCC and DCC.

Works outside normal working hours stated above would include:

- Site security inspections, plant servicing and repair, cleaning of site offices and welfare facilities at the main contractor's compound at Tymon Park, and at the temporary works / set down areas at Wainsfort Manor Crescent, Ravensdale Park and St. Martin's Drive.
- Short term and temporary works including concrete pouring/finishing, and over pumping operations may also extend outside normal hours, potentially at all works locations.

As required, pumps will be installed in acoustic enclosures to ensure that the night-time noise threshold level of 45 dB $L_{Aeq, 8 \text{ Hour}}$ at the façade of the nearest residential properties will be achieved. Any out of hours working will only take place with prior agreement of SDCC and DCC.

6 A table showing the predicted noise levels ($L_{Aeq, T}$ & L_{Amax}) for each noise sensitive receiver and confirming adherence to adopted noise criteria. The above table may show proposals for mitigation and residual noise levels

The predicted worst-case construction noise levels at the nearest residential properties in proximity to future construction works areas are summarised in Table 6-1, which replaces EIAR Chapter 12, Table 12-8. It had been previously proposed that sheet piling would be used in the project to create the embankment at Tymon Lake. Following site investigations and review of the embankment design, this is no longer the case. This removes a potentially very noisy activity from the proposed construction works.

The noise level predictions using the BS5228 calculation methodology provide values based on the "Activity equivalent continuous sound pressure level L_{Aeq} at 10 m" and the "Maximum sound pressure levels at 10m distance from the drive-by of mobile plant" are also included. Therefore, the values presented are the worst-case noise level predictions. The values presented in Table 6-1 can be compared against the recommended construction noise threshold levels of 65 dB $L_{Aeq, 12 \text{ Hour}}$, 70 dB $L_{Aeq, 1 \text{ Hour}}$ and 80 dB L_{Amax} .

Table 6-1. Predicted worst-case construction noise levels at specific locations in proximity to potential future construction works

Location	Likely Construction Noise Sources	Worst-case Predicted Noise Level $L_{Aeq, 1 \text{ Hour}}$ (dB)
At St Angus' Crescent during Embankment Construction in Tymon North (near NML 2)	Tracked excavator, Track dumper, HGVs x 2 & Dozer	60 dB(A) (at 130m from works)
At St Angus' Grove during Embankment Construction in Tymon North (near NML 2)	Tracked excavator, Track dumper, HGVs x 2 & Dozer	56 dB(A) (at 190m from works)
At nearest receptors on Limekiln Road during Embankment Construction in Tymon Park (near NML 1)	Tracked excavator, Track dumper, HGVs x 2 & Dozer	63 dB(A) (at 100m from works)
At nearest receptors on Limekiln Road to Construction Compound in Tymon Park (near NML 1)	Excavator, HGVs, Lorry, Cement Mixer, Roller & 2 x Generators	70 dB(A) (at 25m from works)
At nearest receptors on Limekiln Road during Construction at Tymon Lake (near NML 1)	Tracked excavator, Track dumper, HGVs x 2 & Dozer	58 dB(A) (at 165m from works)
At nearest on Limekiln Road during Construction of ICW (near NML 1)	Tracked excavator, Track dumper, HGVs x 2 & Dozer	72 dB(A) (at 45m from works)

Location	Likely Construction Noise Sources	Worst-case Predicted Noise Level $L_{Aeq, 1 \text{ Hour}}$ (dB)
At Whitehall Park (near NML 3)	Tracked excavator, Wheeled Dumper, HGVs, Water Pump & Place and vibrate concrete cycle	78 dB(A) (at 20m from works)
At Wainsfort Manor Crescent (near NML 3)	Tracked excavator, Wheeled Dumper, HGV, Water Pump & Place and vibrate concrete cycle	78 dB(A) (at 20m from works)
	At receptors nearest to temporary works / set down area	72 dB(A) (at 20m from works)
At Rear gardens at terrace of houses on Fortfield Road (near NML 4)	Tracked excavator, Wheeled Dumper, HGV, Dump Truck, Water Pump & Place and vibrate concrete cycle	79 dB(A) (at 10m from works)
At Ravensdale Park & Poddle Park (near NML 4)	Tracked excavator, Wheeled Dumper, HGV, Water Pump & Place and vibrate concrete cycle	80 dB(A) (at 15m from works)
	At receptors nearest to temporary works / set down area	72 dB(A) (at 20m from works)
At St Martin's Drive & Mount Argus	Tracked excavator, Wheeled Dumper, HGV, Water Pump & Place and vibrate concrete cycle	79 dB(A) (at 10m from works)
Pedestrians and park users at Tymon North and in Tymon Park - @40m from works.	Tracked excavator, Wheeled Dumper, HGVs x 2 & Dozer	73 dB(A) (at 40m from works)
At Noise sensitive receptors @ 20m from manhole sealing and repair and stormwater upgrade works.	Tracked excavator, Wheeled Dumper, Dump Truck & Place and vibrate concrete cycle. Use of rock-breakers, concrete/steel cutting equipment for manhole sealing very likely to remove road surface.	76 dB(A) (at 20m from works)
At 20m from worst-case works when repairing flood defence walls	Tracked excavator, Dump Trucks, water pump & place and vibrate concrete cycle.	78 dB(A) (at 20m from works)
Recommended construction noise threshold levels	<ul style="list-style-type: none"> 12-hour noise threshold level = 65 dB $L_{Aeq, 12 \text{ Hour}}$ 1-hour noise threshold level = 70 dB $L_{Aeq, 1 \text{ Hour}}$ Maximum noise threshold level = 80 dB L_{AMax} 	

(Note: Calculations of the above worst-case construction noise levels are presented in **EIAR Volume 4, Appendix 12**)

Table 6-1 outlines the predicted worst-case construction noise levels ($L_{Aeq, T}$) at the nearest noise sensitive receptor to each area of proposed works. The predicted worst-case construction noise levels with all equipment operating concurrently confirms adherence to

the maximum noise threshold level of 80 dB $L_{A_{Max}}$. The 1-hour noise threshold level of 70 dB $L_{A_{eq,1\text{ Hour}}}$ and the 12-hour construction noise threshold level of 65 dB $L_{A_{eq,12\text{ Hour}}}$ will be adhered to as not all such construction noise sources will operate continuously and concurrently for 1 hour or 12 hours at any one location.

Throughout the course of the 24-month construction period, construction works will only take place intermittently and for short periods of time at any one location. The construction noise impact will occur primarily during daytime and will be of a short-term duration and temporary. EIAR Chapter 12, Section 12.6 identifies mitigation measures to ensure the construction phase target noise limits (Table 4-3) are not exceeded.

The residual noise construction effects which will occur after the proposed mitigation measures have been implemented will be negligible - slight adverse. A small number of noise sensitive receptors however may experience a moderate adverse residual impact, but this will be short-term during intermittent construction activities. Refer to Table 7-2 below for further details.

There will be no residual noise operational impacts from the proposed development as once construction works are complete in any given area, the existing ambient noise level will return as the proposed development will not have any operational noise impact.

7 An assessment of the significance of noise effects in accordance with the EPA Draft Guidelines of August 2017

The assessment of construction noise from the proposed development has indicated that the construction noise threshold levels may be exceeded intermittently at the nearest residential properties for short periods during the daytime. This is based on '*worst-case construction noise prediction*' assumption with various construction activities on-going continuously and concurrently and in closest proximity to the nearest residential properties to the proposed works.

Noise from construction works will fluctuate throughout the course of a typical working day as well as over the course of the construction works being undertaken in any one location. Therefore, the daytime construction noise threshold levels of 65 dB $L_{A_{eq,12\text{ Hour}}}$, 70 dB $L_{A_{eq,1\text{ Hour}}}$ and 80 dB $L_{A_{Max}}$ will be achieved at the nearest residential properties.



Also, while the overall construction activities for the River Poddle Flood Alleviation Scheme will occur over 24 months, the linear nature of the proposed works and the duration of works at each works area will mean that noise sensitive receptors will not be exposed to continuous construction noise impact during this 24-month period.

The Guidelines for Noise Impact Assessment (2014) produced by the Institute of Environmental Management and Assessment (IEMA) address the key principles of noise impact assessment and are applicable to development proposals where noise effects are likely to occur. These guidelines have been referred to as ABP has requested an assessment of significance in accordance with the EPA draft guidelines, 2017.

The IEMA guidelines state that the noise level threshold and significance should be determined based upon the specific evidence, likely subjective response to noise, and should reflect human perception of sound. A change of 3 dB(A) is generally considered to be the smallest change in environmental noise that is perceptible to the human ear under most normal conditions. A 10 dB(A) change represents a doubling or halving of the noise level. The Noise Effects Descriptors presented in Table 7-1 as reproduced from the IEMA guidelines, are used to assess the overall construction noise impact due to the short-term and temporary nature of the construction works at each location in the proposed River

Poddle Flood Alleviation Scheme, and the magnitude and sensitivity to changes in noise levels.

Table 7-1. IEMA Description of generic relationship between Noise Impact (magnitude) and Noise Effect (magnitude and sensitivity) including evaluation of Effect Significance

Magnitude (Nature of Impact)		Description of Effect (on a specific sensitive receptor)	Significance
Beneficial	Substantial	Receptor Perception = Marked Change Causes a material change in behaviour and/ or attitude, e.g. individuals begin to engage in activities previously avoided due to preceding environmental noise conditions. Quality of life enhanced due to change in character of the area.	More Likely to be Significant (Greater justification needed - based on impact magnitude and receptor sensitivities- to justify a non-significant effect)  (Greater justification needed- based on impact magnitude and receptor sensitivities- to justify a significant effect) Less Likely to be Significant
	Moderate	Receptor Perception = Noticeable Improvement Improved noise climate resulting in small change in behaviour and/or attitude, e.g. turning down volume of television; speaking more quietly; opening windows. Affects the character of the area such that there is a perceived change in the quality of life.	
	Slight	Receptor Perception = Just Noticeable Improvement Noise impact can be heard, but does not result in any change in behaviour or attitude. Can slightly affect character of the area but not such that there is a perceived change in quality of life.	
	Negligible	N/A = no discernible effect on receptor	Not Significant
Adverse	Slight	Receptor Perception = Non-intrusive Noise impact can be heard, but does not cause change in behaviour or attitude, e.g. turning up volume of television, speaking more loudly; closing windows. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life.	Less Likely to be Significant Greater justification needed- based on impact magnitude and receptor sensitivities- to justify a significant effect)  Greater justification needed- based on impact magnitude and receptor sensitivities- to justify a non-significant effect) More Likely to be Significant
	Moderate	Receptor Perception = Intrusive Noise impact can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows. Potential for non-awaking sleep disturbance. Affects the character of area such that there is a perceived change in the quality of life.	
	Substantial	Receptor perception = Disruptive Causes material change in behaviour and /or attitude, e.g. avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in getting to sleep, premature awakening, and difficulty in getting back to sleep. Quality of life diminished due to change in character of area.	
	Severe	Receptor Perception = Physically Harmful Significant Changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or psychological effects, e.g. regular sleep deprivation / awakening ; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	

An assessment of the significance of the construction impact from the proposed Scheme has been undertaken based on a comparison with the existing noise levels in the suburban area in which the works will take place in Table 7-2. In accordance with the BS5228-1:2009+A1: 2014 Noise and Vibration Control on Construction and Open Sites Part 1: Noise 'ABC method', the ambient noise levels (rounded to the nearest 5 dB) in the area of the proposed construction works are typically 55 - 60 dB LAeq,T during daytime. These existing noise levels are reflective of suburban areas and therefore, the predicted intermittent and temporary construction noise levels will not result in substantial or severe noise impacts.

Table 7-1 above has been reproduced and a significance rating has been applied for the predicted worst-affected receptor close to each location of construction works.

Table 7-2: Assessment of significance of residual construction effects at noise sensitive locations

Location	Likely Construction Noise Sources	Worst-case Predicted Noise Level $L_{Aeq, 1 \text{ Hour}}$ (dB)	Assessment of Significance (inclusive of mitigation) i.e. Residual Construction Effects
At St Angus' Crescent during Embankment Construction in Tymon North (near NML 2)	Tracked excavator, Track dumper, HGVs x 2 & Dozer	60 dB(A) (at 130m from works)	Negligible
At St Angus' Grove during Embankment Construction in Tymon North (near NML 2)	Tracked excavator, Track dumper, HGVs x 2 & Dozer	56 dB(A) (at 190m from works)	Negligible
At nearest receptors on Limekiln Road during Embankment Construction in Tymon Park (near NML 1)	Tracked excavator, Track dumper, HGVs x 2 & Dozer	63 dB(A) (at 100m from works)	Negligible
At nearest receptors on Limekiln Road to Construction Compound in Tymon Park (near NML 1)	Excavator, HGVs, Lorry, Cement Mixer, Roller & 2 x Generators	70 dB(A) (at 25m from works)	Slight
At nearest receptors on Limekiln Road during Construction at Tymon Lake (near NML 1)	Tracked excavator, Track dumper, HGVs x 2 & Dozer	58 dB(A) (at 165m from works)	Negligible
At nearest receptors on Limekiln Road during Construction of ICW (near NML 1)	Tracked excavator, Track dumper, HGVs x 2 & Dozer	72 dB(A) (at 45m from works)	Slight
At Whitehall Park (near NML 3)	Tracked excavator, Wheeled Dumper, HGVs, Water Pump & Place and vibrate concrete cycle	78 dB(A) (at 20m from works)	Slight Moderate during loudest construction works in closest proximity to receptors
At Wainsfort Manor Crescent (near NML 3)	Tracked excavator, Wheeled Dumper, HGV, Water Pump & Place and vibrate concrete cycle	78 dB(A) (at 20m from works)	Slight Moderate during loudest construction works in closest

Location	Likely Construction Noise Sources	Worst-case Predicted Noise Level $L_{Aeq, 1 \text{ Hour}}$ (dB)	Assessment of Significance (inclusive of mitigation) i.e. Residual Construction Effects
	At receptors nearest to temporary works / set down area	72 dB(A) (at 20m from works)	proximity to receptors
At Rear gardens at terrace of houses on Fortfield Road (near NML 4)	Tracked excavator, Wheeled Dumper, HGV, Dump Truck, Water Pump & Place and vibrate concrete cycle	79 dB(A) (at 10m from works)	Slight Moderate during loudest construction works in closest proximity to receptors
At Ravensdale Park & Poddle Park (near NML 4)	Tracked excavator, Wheeled Dumper, HGV, Water Pump & Place and vibrate concrete cycle	80 dB(A) (at 15m from works)	Slight Moderate during loudest construction works in closest proximity to receptors
	At receptors nearest to temporary works / set down area	72 dB(A) (at 20m from works)	
At St Martin's Drive & Mount Argus	Tracked excavator, Wheeled Dumper, HGV, Water Pump & Place and vibrate concrete cycle	79 dB(A) (at 10m from works)	Slight Moderate during loudest construction works in closest proximity to receptors
Pedestrians and park users at Tymon North and in Tymon Park - @40m from works.	Tracked excavator, Wheeled Dumper, HGVs x 2 & Dozer	73 dB(A) (at 40m from works)	Slight Moderate during loudest construction works in closest proximity to receptors
At Noise sensitive receptors @ 20m from manhole sealing and repair and stormwater upgrade works.	Tracked excavator, Wheeled Dumper, Dump Truck & Place and vibrate concrete cycle. Use of rock-breakers, concrete/steel cutting equipment for manhole sealing very likely to remove road surface.	76 dB(A) (at 20m from works)	Moderate during loudest construction works in closest proximity to receptors
At 20m from worst-case works when repairing flood defence walls	Tracked excavator, Dump Trucks, water pump & place and vibrate concrete cycle.	78 dB(A) (at 20m from works)	Moderate during loudest construction works in closest proximity to receptors

For the majority of the noise sensitive receptors in proximity to the construction works, the residual noise impact will be negligible - slight adverse. This will not affect the

character of the area or result in a perceived change in the quality of life. A small number of noise sensitive receptors however may experience a moderate adverse residual impact, but this will be short-term during intermittent construction activities.

Once construction is complete the proposed development will not have a noise impact.