17 SCHEDULE OF MITIGATION MEASURES

17.1 Introduction

This chapter presents a schedule of the key mitigation measures identified within **Chapters 6 to 15** of this EIAR. Mitigation measures have been proposed, where required, in order to avoid, reduce and where practicable remedy significant adverse effects.

Mitigation measures have been incorporated into the design of the proposed Scheme and will be applied during the construction and operation of the proposed development. All mitigation measures are based on the proposed scheme as described in **Chapter 5**, **"*Description of the Proposed Works*"**. A summary of measures is presented in the tables below with reference made to the page numbers of the chapters where mitigation measures is discussed. The mitigation measures for both the construction and operational phases are detailed as appropriate. Individual chapters of the EIAR should be referred to for context and detail of the specific mitigation measures.

The appointed Contractor for the Scheme will be required to prepare and agree a detailed Construction Environmental Management Plan (CEMP), in line with ISO 14001 to address all construction activities to be carried out as part of this development prior to construction works commencing on site. The CEMP will include all measures as identified in the EIAR, NIS and associated environmental reports and will include all conditions attached to any planning approval granted for the Project. It will be a contractual obligation that the appointed Contractor implements **all** site management measures and all planning requirements and conditions.

17.2 Schedule of Mitigation Measures

Table 17-1: Population & Human Health Mitigation Measures (Chapter 6, Page 6-8)

No.	Description
6.1	Impacts associated with construction – such as noise, dust, the passage of heavy works vehicles *etc*., will be short-term effects that will end once the project is operational. The appropriate management of construction activities and traffic will mitigate against significant impacts, as set out in various sections of the EIAR.
6.2	Techniques to minimise the generation of dust before during and after the works and to protect receptors from dust and noise during construction and construction traffic have been dealt with in the following sections.

Table 17-2: Biodiversity Mitigation Measures (Chapter 7, Pages 7-35 – 7-38)

No.	Description
7.1	The contractor will employ an Ecological Clerk of Works (ECoW) to oversee the implementation of the mitigation measures outlined below. The ECoW will be required to provide reports and written correspondence to the Employers' Representative as requested, in order to demonstrate compliance with the measures outlined in this report.

No.	Description
7.2	The contractor will be required to employ an Environmental Manager and ECoW to assist with preparing a detailed CEMP and its implementation, and to advise on all works in close proximity to the river.
7.3	All work within 50m of the river corridor will be planned in accordance with the contractor's ECoW and recorded in a method statement. The ECoW will give a toolbox talk in advance of works, and all working areas will be marked out clearly in advance of work.
7.4	Pollution prevention measures will be adhered to as follows: • Silt-management measures will be implemented for all groundworks in order to prevent the release of suspended solids into the watercourse; • The main site compound at Tymon Park will include a bunded area for the storage of pollutants, with additional areas for the stockpiling of materials, and drainage control for the washing area; • Hazardous materials (e.g. fuel, cement, etc.) will be stored at least 50m from the river; • Vehicles will be refuelled over drip trays; • Spill kits will be kept in the site compound and all mobile vehicles; and • Any concrete required for construction work will be ordered ready-mixed. Vehicles will be cleaned off site.
7.5	All in-stream works will comply with current best practice, notable the Inland Fisheries Ireland *Guidelines on protection of fisheries during construction works in and adjacent to waters* (IFI, 2016) and Transport Infrastructure Ireland's *Guidelines for the crossing of watercourses during the construction of national road schemes* (TII 2008).
7.6	Impacts on habitat will be compensated by re-instating disturbed areas with an equivalent habitat type, *e.g*. species-rich dry meadow or a treeline. The majority of new tree and shrub planting will be of native species, complemented by some common ornamental species, *e.g*. beech, chestnut, walnut, cherries and limes.
7.8	Species-rich dry meadow will be re-instated on the surface of new embankments in Tymon Park, and in the footprint of the temporary construction compound.
7.9	New specimen trees will be planted in Tymon Park, Ravensdale and St Martins Drive, accounting for twice the number of trees that will be removed.
7.10	To ensure the protection of the recorded rare plant species, the following mitigation measures will be adhered to: • At the outset of construction works, the contractor's ECoW will survey the affected areas in order to map all individual plants of flowering rush and broad-leaved helleborine. The survey should be carried out during the growing season for these species (May to September, inclusive) • The ECoW will review the proposed working areas with the contractor, in order to determine whether the rare plants will be disturbed • Where possible, plants will be left in-situ and protected during construction works. Robust measures will be taken to protect the plants, including the use of temporary fences or other similar measures • Where such impacts are unavoidable, the plants will be translocated to a similar habitat nearby (*e.g*. shallow flowing water for flowering rush, or broadleaf woodland for broad-leaved helleborine). The ECoW should liaise with a landscape contractor regarding suitable techniques for translocation, in order to maximise chances of survival. The

No.	Description
	ECoW will also consider options for the collection and dispersal of seed if any plants are in flower
7.11	To control the spread of Nuttall's waterweed, a third schedule invasive species, the following mitigation measures will be adhered to: • Prior to the commencement of construction, the contractor's ECoW will survey the affected section of channel to map the distribution of Nuttall's waterweed. • If any waterweed is observed in the footprint of works, the ECoW will prepare an Invasive Species Management Plan, which will set out the contractor's strategy to ensure compliance with the law during construction works. The plan should include measures to avoid the accidental spread of waterweed plants during construction works, and to manually remove (and dispose of) any plants within or adjacent to the proposed working area. A derogation licence will be required from the Department of Culture, Heritage and the Gaeltacht.
7.12	Tree and shrub removal will be ideally carried out between September and February (inclusive). If this is not possible, an ecologist will survey relevant vegetation in advance in order to determine whether any protected fauna are present. If any are encountered, the vegetation clearance will be delayed until the protected fauna have moved away from the area, *e.g*. when chicks have fledged and a nest has been abandoned.
7.13	Tree protection zones will be marked out for all retained trees and hedgerows in the vicinity of working areas.
7.14	In recognition of the risk to nesting birds in Tymon Lake (which will be used for flood storage), two floating nest platforms will be installed on the Lake. It is intended that the nesting platforms will be approximately 1m x 1m in size and surfaced with sods of grass or reeds. They will be constructed on stable, floating platforms, but anchored to the ground to prevent them from drifting. Advice will be sought from specialists in the design of the rafts in order to maximise the likelihood of their success.
7.15	The optional provision of artificial nesting sites for sand martins and kingfisher as a measure for ecological enhancement is recommended. The following sites would be suitable: • The western edge of Tymon Lake, on the steep section of bank between the two streams • The southern bank of the river downstream of Tymon Lake, immediately opposite the ICW • The north bank of the realigned section of watercourse at Whitehall Park.
7.16	Artificial nesting banks can be created from concrete and clay / polyethylene pipes, or purchased as pre-fabricated wooden boxes. Nesting sites should be located on or beside the river bank, with a minimum height of 1.5m above water level, and a length of at least 5m.
7.17	All working areas will be surveyed in the year following construction in order to assess the re-establishment of vegetation. If any areas are found not to be revegetating or are found to be susceptible to localised bank erosion, additional landscaping work will be carried out. If any replanted trees or shrubs fail to establish, they will be replaced with a suitable alternative.

No.	Description
7.18	If Nuttall's waterweed or any other invasive species is found to have spread during construction works, the contractor will be required to eradicate any new growth.
7.19	Populations of rare flora will be monitored for the first three years after construction. If any populations are observed to be declining or in poor health, an ecologist will liaise with a landscape contractor regarding suitable methods to assist the plants.
7.20	The status of nesting birds in Tymon Lake will be assessed for three years following construction, including during any periods of high rainfall in the nesting season. If nests are being affected by inundation on an annual basis, then additional measures will be implemented, such as the provision of additional nesting rafts or modifications to the rafts.

Table 17-3: Hydrology and Hydromorphology Mitigation Measures (Chapter 8, Pages 8-16 – 8-20)

No.	Description
8.1	In general, all works on the riverbank will be subject to a specific method statement agreed in advance with the statutory authorities. The method statement will incorporate the following points: • To avoid excessive silt runoff, site clearance is not to be undertaken during wet conditions, when rainfall of more than 0.5 mm/hour is forecast within the next 24 hours; • To avoid contamination of the river water during an extreme flood event, no works likely to generate soiled water are to be carried out when rainfall of more than 3 mm/hour is forecast within the next five days in the River Poddle catchment; • At the riverbank works locations, eroded sediments are to be retained with silt fences; • Soil cleared from the site and all materials associated with the building process are to be stored outside the flood zone in designated storage areas; • Works adjacent to the riverbank will have catch-nets and silt traps to prevent debris from falling into the river; • Raw or uncured waste concrete is not to be disposed of within 30m of the river; • Fuels, lubricants and hydraulic fluids for equipment used on the construction site, as well as any solvents and oils *etc.*, is to be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment; • Fuelling and lubrication of equipment is not to be carried out close to the riverbank or lake shore; • Any spillage of fuels, lubricants of hydraulic oils is to be immediately contained and the contaminated soil removed from the site and properly disposed of; • Waste oils and hydraulic fluids is to be collected in leak-proof containers and removed from the site for disposal or re-cycling; • Hydrocarbon/grit interceptors of suitable size are to be placed on the runoff discharge from the car park at the abstraction point and must be maintained by a person or persons designated to carry out this maintenance;
8.2	Best practice mitigation measures will be employed for this Scheme as contained in the following guidance documents and best practice UK CIRIA guidance which includes but not limited to the following:

No.	Description
	• C532 Control of water pollution from construction sites: guidance for consultants and contractors; • C648 Control of water pollution from linear construction projects; • SP156 Control of water pollution from construction sites – guide to good practice • NRA's 'Guidelines for the Crossing of Watercourses during Construction of National Road Schemes (NRA, 2005); • the Eastern Regional Fisheries Board guidance document 'Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites' (Murphy, 2004); and • the Southern Regional Fisheries Board guidance document 'Maintenance and protection of the inland fisheries resource during road construction and improvement works' (Kilfeather, 2007).
8.3	For in-river works the following mitigation measures are recommended: • Measures to minimise the suspension and mobilisation of sediment downstream of the working area should consider silt barriers and cofferdamming to create dry working areas; • Works should allow the river to recover for at least 14 hours on a daily basis meaning that the period of in river work should be about 10 hours maximum; • A dry working area should be created for pouring of concrete; • In areas of the river where there are alien species, all plant and machinery should be thoroughly washed before moving to another section of the river; • All vehicles should be regularly checked for oil leaks, and ruptured hose pipes.
8.4	Best practice measures will be adhered to during in stream works and any diversions of the river during construction should follow the NRA's 'Guidelines for the Crossing of Watercourses during Construction of National Road Schemes (NRA, 2005).
8.4	Best practice methods should be employed at all stages during the construction. It is recommended that the contractor's compound is situated as far as is practicable from the river.
8.5	Fuel, lubricants, hydraulic oil, repair equipment used on the construction site should be carefully handled to avoid spillage.
8.6	All tanks, barrels or containers containing hazardous materials (oils, lubricants, sealants *etc.*) must be stored in a sufficiently sized bunded area.
8.7	Spill kits will be made available in site compound and in site machinery. In the event that a spillage does occur, adsorbent material should be placed on the material to adsorb it. The contaminated adsorbent should be correctly disposed of as a hazardous waste and brought to a licenced waste handing site by a licenced waste contractor. The site manager must retain a copy of any waste transport and disposal documentation. In the event of a larger spillage of oil/hydraulic oil then South Dublin County Council and/or Dublin City Council Environment Sections should be contacted immediately. The Emergency Procedures for the site should have a procedure for dealing with large spillages.
8.8	All empty diesel/oil/hydraulic oil containers should be drained to a single labelled container. The empty oil containers should be stored in a dedicated labelled totally sealed skip. Waste skips should be collected by a licenced waste carrier and brought to a licenced facility for disposal. All disposal records must be retained at the site offices.

No.	Description
8.9	The waste from the chemical toilets should be collected by a licenced waste carrier and brought to a licenced treatment facility.
8.10	A supply of oil booms and soak pads must be maintained within the contractor's area.
8.11	A robust programme of maintenance will ensure that culvert screens and channels are kept clear of debris to ensure the flood alleviation scheme functions correctly during a storm event. This includes carrying out repair works on existing walls and instituting a robust maintenance programme to ensure that debris that has accumulated in the channel is removed and vegetation cleared in order to prevent blockages in the future. These measures will be undertaken by each Council (South Dublin County Council and Dublin City Council) as part of a regular maintenance programme. The existing culverts and screens at Wainsfort Manor, Lakelands and Gandon Close have CCTV cameras and level alarms and are currently checked and cleared by the responsible local authority in advance of forecast rainfalls.
8.12	In addition to the above maintenance an asset register of the flood defences for the River Poddle will be prepared for SDCC/DCC to be incorporated into the Development Plans for both authorities to ensure that defences that are erected will not be removed as part of any future development either by a local resident or as part of a planning submission.
8.13	The embankment structures will be kept clear of tree planting to maintain structural integrity and the flow control structure and embankment at Tymon Lake will undergo periodic checks by an All Panel Reservoir Engineer to ensure that the structural condition of the embankment is in order and there is no change or obstruction to the operation of the emergency overflow spillway that would inhibit the secure overflow of embankment for events greater than 1% AEP.

Table 17-4: Soils, Geology & Hydrogeology Mitigation Measures (Chapter 9, Pages 9-5 – 9-7)

No.	Description
9.1	Any soil imported to site will be subject to assessment to identify any invasive alien species present by a suitably qualified Ecologist. Any soils stored on site will be seeded and periodically topped. Such stores will be subject to on-going monitoring.
9.2	If invasive plant species are present at any of the sites, machinery and equipment including footwear and tools will be cleaned appropriately (as per species requirements) between infested sites.
9.3	An estimated 5,000m^3 of material is to be excavated and reused elsewhere on site or locally. The excess material from the excavation works will be used as bulk fill, embankments or landscaping where possible. It is estimated that 50% of the material will be required for the embankments and landscaping and the remainder will be taken off site for disposal at an agreed licensed area. All material removed from site will be disposed of in accordance with relevant waste management legislation. Where material cannot be reused on site, it will be exported to co-ordinate deliveries of imported fill with a load of unsuitable material requiring removal from site in order to minimise traffic movements.

No.	Description
9.4	The top layer of soil (approximately 200m depth) contains valuable ecological material that will be saved separately from subsoils and will be used to reinstate the parks and green areas and allow for natural restoration and establishment of plants. Stockpiles of this material are to be stored in banks no more than 1m high.
9.5	All materials excavated from the works areas will be stockpiled as close to the area where they are to be re used in landscape restoration in order to minimise on-site haulage and double handling. Areas for material storage have been assigned in consideration of sensitive habitats and ecological features and use of the parks and green spaces in the Scheme. Stockpiles of other material will be formed no more than 2m in height and will be sealed using the back of an excavator bucket or tracked upon by a tracked excavator to ensure the stockpile does not become saturated and therefore difficult to handle when being reinstated into the works. All stockpiles will be clearly defined, fenced and signed to ensure no cross contamination of other materials to be stockpiled.
9.6	The contractor shall be obliged to ensure no deleterious discharges are released from the sites to the River Poddle during excavation de-watering, testing or washing activities. Throughout the period of works the contractor shall also take account of relevant legislation and best practice guidance including but not limited to the following: • C532 Control of water pollution from construction sites: guidance for consultants and contractors; • C648 Control of water pollution from linear construction projects; • SP156 Control of water pollution from construction sites – guide to good practice.
9.7	The contractor's construction method statements shall also indicate how management, monitoring, interception, removal and/or treatment of silt run-off will prevent contamination of ground or surface waters by mobilisation of soil particles.
9.8	The contractor's methodology statement should be reviewed and approved by a suitably qualified geotechnical engineer prior to site operations.
9.9	Excavations will be backfilled as soon as possible to prevent any infiltration of potentially polluting compounds to the subsurface and the aquifer.
9.10	Prior to the storage of any potentially polluting material on site, the site manager will be responsible for ensuring that a material safety data sheet for each product is available for inspection. A copy of all relevant material safety data sheets will be available at storage locations as well as the site office.
9.11	The majority of new material brought to site will be used immediately or will be stored within the site boundary. Other materials such as asphalt or concrete will be brought directly to the construction site when required and immediately placed.
9.12	All potentially polluting materials will be stored in bunded areas, the capacity of which will be 110% of the total volume of liquid to be stored. Any machinery refuelling that takes place on site will be carried out by competent personnel at a single designated location within the site boundaries, close to the site entrance.

No.	Description
9.13	Spill kits will be stored at the machinery refuelling area. The spill kits will comprise suitable absorbent material, refuse bags, *etc*. to allow for the appropriate clean-up and storage of contaminated material in the event of a spillage or leak occurring.
9.14	The washing of any plant equipment will be carried out in designated areas to prevent potentially polluting material from contaminating aquifers and soils/subsoils.
9.15	There will be no discharge of effluent to groundwater during the construction phase. All wastewater from the construction facilities will be stored for removal off site for disposal and treatment.
9.16	Any potentially contaminated groundwater that may be pumped from excavations will be tested and discharged appropriately.
9.17	All machinery will be inspected at the start of each work shift for signs of leaking hydrocarbons. Parking areas will be inspected on a daily basis for evidence of hydrocarbons leaking from machinery.
9.18	All materials required for the maintenance of the sites will be stored according to good practice and in areas either off-site or in bunded areas with impermeable floors. A programme of inspection and maintenance of the site drainage will ensure that any damage, blockages, *etc*. are identified and remedied.

Table 17-5: Landscape and Visual Mitigation Measures (Chapter 10, Pages 10-46 to 10-48)

No.	Description
10.1	Landscape Effects Mitigation Measures - General Landscape Effects range from Not Significant to Moderate/Significant, adverse effects. Landscape Mitigation plans are proposed for Ravensdale Park, as well as parts of Tymon Park. A tree planting plan is also included for St. Martin's Drive. Mitigation and avoidance measure were incorporated into the project design, and some of the measures taken and incorporated into the design are as follows: • One of the project aims is to minimise tree removal. Consideration of alternative construction methods in all locations where walls proposed to minimise vegetation loss, and to ensure retention of trees. Where this is deemed necessary as a result of the proposed works, replacement tree planting is proposed as required by the relevant Council's trees policies. Replacement tree planting is proposed where trees are to be removed. Information on the number of trees and tree groups to be removed is provided in Section 3 of the Tree Survey Report.
10.2	Landscape Effects Mitigation Measures -Ravensdale Park • Consideration of alternative design solutions in Ravensdale Park including retention of the current river alignment, and retention of path alignment from Kimmage Lower entrance to minimise disruption to trees.

No.	Description
	• Earlier design proposals would have necessitated extensive tree removal and the design was modified to greatly reduce tree removal with the result that very few trees will be removed. The river channel is not realigned, wall height was reduced through the design process, and high walls surrounding the park were modified, resulting in a lower wall height to the west of the park and a lower wall which doubles as a seating area, in the centre of the park adjacent to the path. It should be noted that a wall impounding the proposed attenuation area was the least impacting solution on the park. • It should be noted that 'soft' landscape measures which were considered, involved creating earth bunds which required a larger footprint, and ultimately would have resulted in extensive tree removal. The proposals for the park can be seen in the Landscape Mitigation Plan (19110-1-111) in Volume 3) • Regarding trees along Ravensdale Drive, the design was amended to avoid these trees. The existing retaining wall to the riverbank is retained and the new wall built in front of it. The "toe" of the retaining wall is beneath the channel rather than behind the wall. Construction access is generally from the streamside. • As stated in Chapter 5, Section 5.4 of the EIAR, replacement planting may not occur in the affected locations due to space constraints but will be planted as closely as possible in nearby green spaces to benefit the local communities. The locations for replacement tree and woodland planting will be agreed with SDCC and DCC at detailed design stage.
10.3	Landscape Effects Mitigation Measures - St. Martin's Drive • St. Martin's Drive: A tree planting plan (Drawing 19110-1-120 in Appendix 3) is proposed to reduce the effects of tree removal. Proposed replacement planting includes fast growing species and includes tree specification which ranging from 14-16 cm girth to 25-30cm girth. • Tymon Park: The design process for this area included consideration of alternative pathways in Tymon Park to maintain connectivity as a result of the re-grading of certain areas. Tree removal in Tymon Park was minimised. Proposed grass embankments and path re-grading are tied into the contours where possible. Embankments to be seeded with species rich grassland where necessary. Trees which are to be removed will be replaced. • An Integrated Constructed Wetland (ICW) is proposed as an enhancement measure for Tymon Park. This is located northeast of Tymon Lake and includes marginal planting and is expected to enhance the area and assist in improving water quality.
10.4	Visual Effects Mitigation Measures – General A number of mitigation measures were included in the scheme design and in the Landscape Mitigation Plans. Many of the landscape mitigation measures above are also relevant to visual effects - including those relative to tree removal and the change of character of an area. • Consideration of alternative construction methods in all locations where walls proposed to minimise vegetation loss, and to ensure retention of trees to reduce adverse visual effect.

No.	Description
	• Replacement tree planting is proposed where trees are to be removed. Information on the number of trees and tree groups to be removed is provided in Section 3 of the Tree Survey Report. Refer to section 10.7.1 above for comments regarding exact location of replacement trees. Ravensdale Park • Consideration of alternative design solutions in Ravensdale Park including retention of the current river alignment, and retention of path alignment from Kimmage Lower entrance to minimise disruption to trees. • Earlier design proposals would have necessitated extensive tree removal and would have resulted in considerable adverse visual effects in the park. Wall height and location was reduced through the design process, and high walls surrounding the park were modified. It should be noted that a wall impounding the proposed attenuation area was the least impacting solution on the park. • Regarding trees along Ravensdale Drive, the design was amended to avoid these trees. The existing retaining wall to the riverbank is retained and the new wall built in front of it. The "toe" of the retaining wall is beneath the channel rather than behind the wall. Construction access is generally from the streamside. • Walls vary in height, but are predominantly low enough to and allow for views into and out of the park, though these are restricted in some areas. The retaining wall to the west of the park reaches a to a maximum of 1.5 metres in the northwest corner, but reduces to the south of the park to a height of 1.1 metres. The wall in the centre of the park ranges from 1.35m metres in the north, to 0.7 metres. at the southern end. All heights are below 1.65 metres which is the average adult eye height. The proposals for the park can be seen in the Landscape Mitigation Plan (Drawing 19110-1-111 in Volume 3).
10.5	Visual Effects Mitigation Measures - St. Martin's Drive: • A tree planting plan is proposed to reduce the effects of tree removal, which would remove all trees to the south of the green space at St Martin's Drive, resulting in a change of character and visual quality. • Tymon Park: The design process for this area included minimising tree removal. Proposed grass embankments and path re-grading are tied into the contours where possible. Embankments to be seeded with species rich grassland where necessary. Trees which are to be removed will be replaced.
10.6	An Integrated Constructed Wetland (ICW) is proposed as an enhancement measure for Tymon Park. This is located northeast of Tymon Lake and includes marginal planting and is expected to enhance the visual amenity of the area.
10.7	Throughout the scheme, consideration was given to alternative wall materials and wall design including to allow visual permeability and passive surveillance

Table 17-6: Archaeological, Architectural and Cultural Heritage Mitigation Measures (Chapter 11, Page 11-26 – 11-27)

No.	Unique ID	Description	Proposed mitigation
11.1	DU022-007	Zone of notification for castle – tower house	Archaeological monitoring of any excavation works. If any features of archaeological potential are discovered during the course of the works, further archaeological mitigation may be required, such as preservation in-situ or by record, along with archaeological monitoring. Any further mitigation will require approval from the National Monuments Service of the DoCHG.
11.2	DU018-043003	Weir	Archaeological monitoring of any excavation works. If any features of archaeological potential are discovered during the course of the works, further archaeological mitigation may be required, such as preservation in-situ or by record, along with archaeological monitoring. Any further mitigation will require approval from the National Monuments Service of the DoCHG.
11.3	DU018-043004, DU022-003, and DU018-043002	Zone of notification for the City watercourse	Where it is proposed to divert the watercourse, a wade survey should be carried out along the existing stretch of the Poddle prior to commencement of construction activities. This should be carried out under licence from the National Monuments Service of the DoCHG. Archaeological monitoring of any excavation works along the course of the city watercourse should be carried out during construction. If any features of archaeological potential are discovered during the course of the works, further archaeological mitigation may be required, such as preservation in-situ or by record, along with archaeological monitoring. Any further mitigation will require approval from the National Monuments Service of the DoCHG.
11.4	DU022-078	Zone of notification for a windmill	Archaeological monitoring of any excavation works. If any features of archaeological potential are discovered during the course of the works, further archaeological mitigation may be required, such as preservation in-situ or by record, along with archaeological monitoring. Any further mitigation will require approval from the National Monuments Service of the DoCHG.

No.	Unique ID	Description	Proposed mitigation
11.5	DU018-047001	Zone of notification for the site of Donore Castle	Archaeological monitoring of any excavation works. If any features of archaeological potential are discovered during the course of the works, further archaeological mitigation may be required, such as preservation in-situ or by record, along with archaeological monitoring. Any further mitigation will require approval from the National Monuments Service of the DoCHG.
11.6	DU018-020	Zone of archaeological potential for Dublin City	Archaeological monitoring of any excavation works. If any features of archaeological potential are discovered during the course of the works, further archaeological mitigation may be required, such as preservation in-situ or by record, along with archaeological monitoring. Any further mitigation will require approval from the National Monuments Service of the DoCHG.
11.7	CH 01 and CH 06	Ravensdale Mills and its mill pond	Archaeological monitoring of any excavation works. If any features of archaeological potential are discovered during the course of the works, further archaeological mitigation may be required, such as preservation in-situ or by record, along with archaeological monitoring. Any further mitigation will require approval from the National Monuments Service of the DoCHG.
11.8	CH 03	Cutlers Mill	Archaeological testing in the first instance. This should be carried out by an archaeologist under licence from the DoCHG. If any features of archaeological potential are discovered during the course of the works, further archaeological mitigation may be required, such as preservation in-situ or by record, along with archaeological monitoring. Any further mitigation will require approval from the National Monuments Service of the DoCHG.
11.9	CH 04	Cutlers mill race	Archaeological testing in the first instance. This should be carried out by an archaeologist under licence from the DoCHG. If any features of archaeological potential are discovered during the course of the works, further archaeological mitigation may be required, such as preservation in-situ or by record, along with archaeological monitoring. Any further mitigation will require approval from the National Monuments Service of the DoCHG.

No.	Unique ID	Description	Proposed mitigation
11.10	n/a	Greenfield areas	Archaeological monitoring of any excavation works. If any features of archaeological potential are discovered during the course of the works, further archaeological mitigation may be required, such as preservation in-situ or by record, along with archaeological monitoring. Any further mitigation will require approval from the National Monuments Service of the DoCHG.

Table 17-7: Noise and Vibration Mitigation Measures (Chapter 12, Page 12-20 – 12-21)

No.	Description
12.1	The contractor will be required to implement the control measures recommended in BS 5228 and apply the appropriate measures where applicable.
12.2	Working hours during site construction operations will be restricted to daytime hours from 07:30 hours to 16:30 hours (Monday to Friday) and, as may be required, from 08.00 hours to 13.00 hours (Saturdays). Evening and night-time work is not expected to take place although it is possible that limited 24 hours working may be required to take place on occasion. This will only take place with the prior agreement of SDCC and DCC.
12.3	An on-site speed limit will be enforced for all traffic. Drivers of vehicles will be advised of the speed limits through the erection of signs *i.e.* a typically recommended on site speed limit is 10 km/hr.
12.4	Where practicable, the use of quiet working methods and the most suitable plant will be selected for each activity having due regard to the need for noise control.
12.5	Best practicable means will be employed to minimise noise emissions and will comply with the general recommendations of BS 5228, 1997. To this end operators will use "*noise reduced"* plant and/or will modify their construction methods so that noisy plant is unnecessary.
12.6	By positioning potentially noisy plant as far as possible from noise sensitive receivers the transmission of sound can be minimised. Earth mounds and/or stockpiles of material or perimeter hoarding on site can be used as a physical barrier between the source and the receiver.
12.7	Mechanical plant used on site will be fitted with effective exhaust silencers. Vehicle reverse alarms will be silenced appropriately in order to minimise noise breakout from the site while still maintaining their effectiveness.
12.8	All plant will be maintained in good working order. Where practicable, machines will be operated at low speeds and will be shut down when not in use.
12.9	Compressors will be of the "noise reduced" variety and fitted with properly lined and sealed acoustic covers.
12.10	In all cases engine and/or machinery covers will be closed whenever the machines or engines are in use.
12.11	All pneumatic percussive tools will be fitted with mufflers or silencers as recommended by the equipment manufactures. Where practicable, all mechanical static plant will be enclosed by acoustic sheds or screens.

12.13	Employees working on the site will be informed about the requirement to minimise noise and will undergo training on the following aspects: • The proper use and maintenance of tools and equipment. • The positioning of machinery on-site to reduce the emission of noise to the noise sensitive receptors. • Avoidance of unnecessary noise when carrying out manual operations and when operating plant and equipment. • The use and maintenance of sound reduction equipment fitted to power pressure tools and machines.
12.14	Cognisance will also be taken of the *Environmental good practice site guide* 2005 compiled by CIRIA and the UK Environment Agency. This guide provides useful and practical information regarding the control of noise at construction sites.
12.15	Where excessive noise levels are recorded, further mitigation measures will be employed which may include temporary wooden hoarding / acoustic screening to be installed to a height of no less than 2m around areas of construction where loud noise levels occur.
12.16	The contractor will ensure that the TII Guidelines which identify limits for protection against cosmetic damage as a function of vibration frequency are not exceeded through the use of the selected low vibration piling method.
12.17	Responsible Person –The Contractor will appoint a responsible and trained person who will be present on site and who will be willing to answer and act upon complaints and queries from the local public.
12.18	Night-time Working - If there are items of plant (*e.g.* dewatering pumps and similar) in use during night-time hours they will be chosen, sited and enclosed such that levels at the nearest properties do not exceed the measured background noise levels.
12.19	Where deemed necessary due to excessive impact or complaints received, noise monitoring will be undertaken during construction works to determine noise levels at noise sensitive receivers. On the basis of the findings of such noise monitoring, appropriate noise mitigation measures will be implemented to reduce noise impacts.
12.20	The contractor will conduct continuous monitoring of vibration levels during any piling that may have the potential to result in a vibration impact at nearby properties.

Table 17-8: Air Quality and Climate Mitigation Measures (Chapter 13, Page 13-12 – 13-15)

No.	Description
13.1	The site manager has the overall responsibility for ensuring that operations comply with the requirements of any planning authorisation.
13.2	The site will have at its disposal a suitable water bowser and associated water supply to allow for dampening down of areas of the site works when windblown dust arises. The occurrence of potential wind-blown dust is very much weather dependent but suitable facilities will be available to minimise windblown dust from the site surfaces.
13.3	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. Evening and night-time work is not expected to take place, although it is possible that limited 24 hours working may be required to take place on occasion. This will only take place with the prior agreement of SDCC and DCC.

13.4	Regular attention shall be paid to cleaning dust material from all roadways, hard surfaced areas and working areas of the construction site. Dust from clean-up will be re-incorporated into stockpiles within the construction compound and adjacent to working areas. This will be done at appropriate intervals during the day and at the end of each working period.
13.5	Roadways and other areas within the construction compound where vehicles are regularly moving shall be kept clean, by sweeping or by wetting.
13.6	When loading vehicles within the construction compound and overall construction site, the following procedures will be adhered to: • No overloading of vehicles or containers resulting in either peaks of cargo or overspill onto the working areas or roadways. • Keep fall heights of the material into the transport vehicles to a minimum.
13.7	Strictly applied, suitable on-site speed limits shall be set, displayed and observed for the movement of all vehicles (10 mph)
13.8	Mandatory use of the wheel wash provided.
13.9	Stockpiling shall be co-ordinated in such a way as to minimise the potential for double handling of material and carefully planned to ensure minimum exposure to winds, thereby reducing dust emission to air.
13.10	Stockpile areas will be clearly and physically delineated to deter vehicles from running over extracted material at the stock edge.
13.11	Stockpiles shall be managed to ensure that the profile of material will be no higher than 2m which will minimise wind whipping.
13.12	During embankment construction and any stockpiling, embankments and stockpiles shall be profiled and compacted by flattening out peaks and ridges and when partially worked, shall be re-contoured to prevent ridges or overhanging falls.
13.13	Whenever possible, embankments and stockpiles shall not be broken into when the wind is likely to lift newly exposed dry dust. When this is unavoidable, effective dust control methods shall be implemented.
13.14	Prior to carrying out any stockpile handling operations, the dust suppression equipment will be checked to ensure that it is working properly.
13.15	A high standard of housekeeping will be maintained on site.
13.16	Contingency plans shall be made to provide dust control in the event of equipment malfunction, whether by loan, hire or other arrangements.
13.17	Systems for monitoring processes, responding to and reporting pollution incidents shall be devised. This information shall be kept in a logbook, together with information regarding equipment failure, periods of significant dust emissions off-site and the inspection of roadways, together with any remedial action taken.
13.18	Any complaints received from neighbouring properties will be logged and appropriate actions taken to reduce the potential for further complaint.
13.19	The Dust Management Plan (as per **Table 13-4**, **Section 13.6.3, Chapter 13**) will be implemented by the contractors at all times and special importance will be placed on these actions on high wind days.

Table 17-9: Traffic and Transport Mitigation Measures (Chapter 14, Pages 14-20 to 14-22)

No.	Description
14.1	A Traffic Management Plan (TMP) will be agreed between the Contractor and the Clients Representative.
14.2	Minimise construction, maintenance and ancillary vehicle movements to site during peak times such as rush hour.
14.3	Ensure daily construction programs will be planned to minimise the number of disruptions to surrounding roads by staggering HGV movements to avoid site queues.
14.4	Provide wheel and vehicle body washing facilities, use water bowsers, dust suppression or similar apparatus and street sweepers in order to keep construction routes free from vehicle deposits and debris.
14.5	Provide appropriate information and signage along the construction routes and on approach roads to the site.
14.6	Mitigation measures may also be proposed following consultation with the local roads authority and public transport operators. It is recommended that the roads authority and public transport operators are consulted in order to address any concerns they may have regarding accidents and road safety along the proposed route.

Table 17-10: Material Assets Mitigation Measures (Chapter 15, Pages 15-11 to 15-12)

No.	Description
15.1	Information and signage will be provided at the car parks and access points from residential areas adjacent to the Parks to inform residents and Park users of closures or alternative access routes during the works at Tymon Park and Ravensdale Park.
15.2	All utilities and services will be recorded and incorporated to the detailed design for the Scheme, and the contractors will be informed of the locations of all services. Diversions will be undertaken under the supervision of the relevant utility provider. Advance notice will be given to local residents and businesses of any disruptions to services.
15.3	A CEMP and a project specific Waste Management Plan will be implemented for the project.