



Car Parking Facility at Turnapin Great, Swords Road, Co. Dublin

Preliminary Construction Management Plan

September 2018

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Client Name: Mr. Gerard Gannon
Document Reference: 15.194r.007
Project Number: 15-194

Quality Assurance – Approval Status

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2008, BS EN ISO 14001: 2004 and BS OHSAS 18001:2007)

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1. Introduction

1.1 Background of Report

This report has been prepared by Waterman Moylan as part of the documentation in support of a planning application seeking permanent approval for the continuation of use of the 16.9 Ha Quickpark long stay airport car park at Turnapin Great, Swords Road, Co. Dublin. This document has been set up to be a 'living document' which will be updated by the developer and contractor as the project progresses.

The existing Quickpark facility is one of three authorised long-term car parks that together provide a total of 25,420 parking spaces, all of which have been previously approved under the Strategic Infrastructure Development procedure. The Quickpark facility currently provides 6,240 long term car parking spaces, while the DAA currently operates approximately 19,180 spaces.

Permission is also sought for a new entrance building and entrance layout to the car park. The new entrance building will provide for office space and facilities associated with the car park. Total net floor area of the proposed entrance building is c.1,043m². A new entrance layout is proposed to facilitate this building which results in a loss of 118 car parking spaces providing for a total of 6,122 spaces. The new entrance layout will facilitate additional SuDS and landscaping features along either side of the entrance layout.

The Preliminary Construction Management Plan deals with the proposed new building works, at the car park entrance and sets out typical arrangements and measures which may be undertaken during the construction phase of these works in order to mitigate and minimise disruption/disturbance to the area around the site. The purpose of this report is to summarise the possible impacts and measures to be implemented and to guide the Contractor who will be required to develop and implement the Construction Management Plan on site during the course of the construction period.

As is normal practice, the Main Contractor for the project is responsible for the method in which the construction works are carried out and to ensure that best practices and all legal obligations including Local Authority requirements and Health and Safety legislation are complied with. The main contractor is also responsible for the design and installation of all temporary works required to complete the permanent works. The plan should be used by the Main Contractor to develop their construction management plan.

1.2 Site Location

The car park is located approximately 1km south of Dublin Airport and is accessed from the R132, Swords Road. The site is located to the north of the M50 Northern Cross Route. The site is easily accessible from the M50 motorway via the Ballymun interchange along Collinstown Road, and also from the M1 motorway via the Airport interchange along the R132 Swords Road.

The site location is indicated in Figure 1, below.

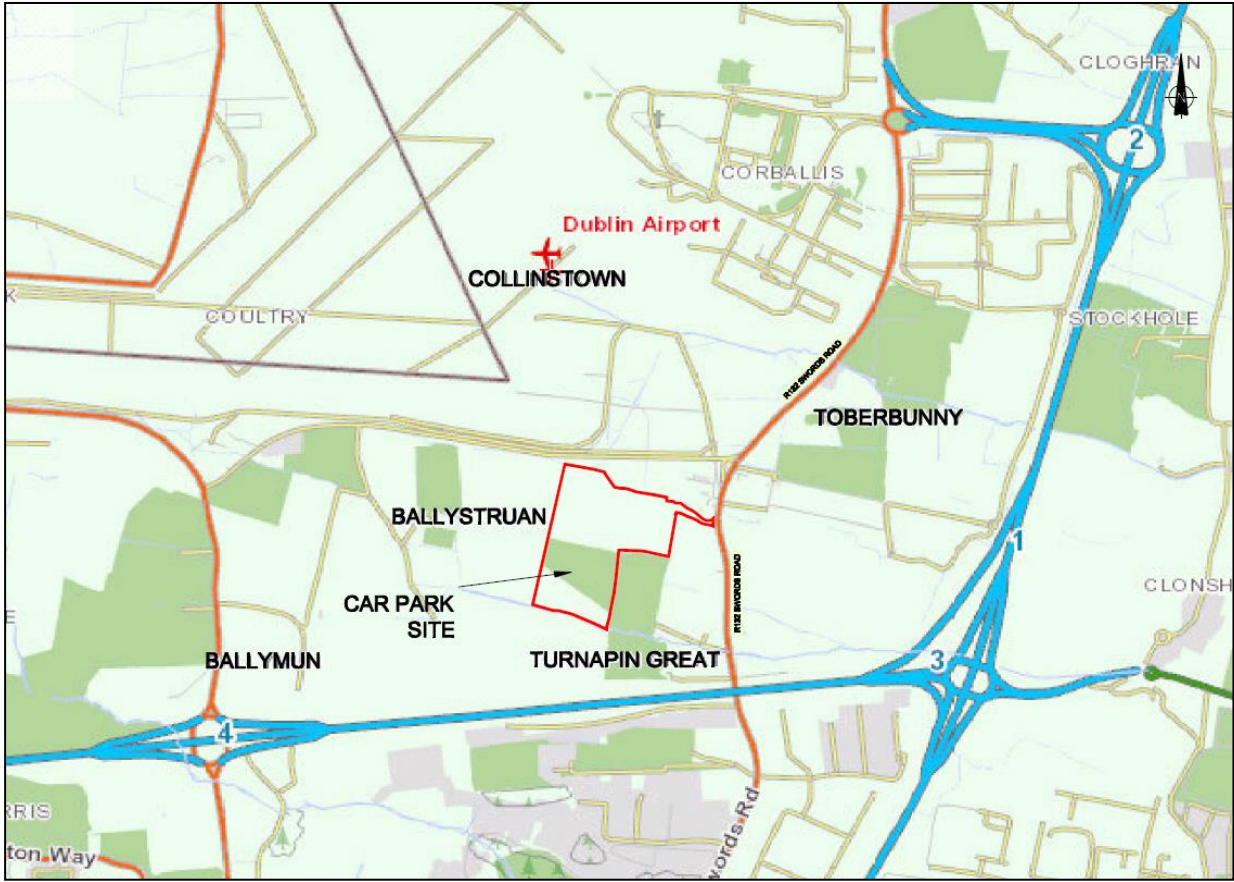


Figure 1 | Site Location Map

2. The Site and the Surrounding Environs

2.1 Site Description

The subject lands consist of approximately 16.9 hectares of car parking. The car park is located approximately 1km south of Dublin Airport and is accessed from the R132 Swords Road.

The existing car park in these subject lands was originally constructed in 2 phases, with phase 1 (3,500 spaces) having been in operation for approximately 17 years and phase 2 (an additional 2,740 spaces) having been in operation for almost 12 years.

Prior to construction of the car park, the lands were relatively flat greenfield lands, with a level of between 56m and 59m OD Malin Head. The car park was constructed at grade, keeping construction levels very close to its previously existing greenfield levels.

The site is in close proximity to the airport via the R132 Swords Road. The R132 Swords Road is a regional road that links Dublin City (via Santry) with Dublin Airport, and Swords to the North. The R132 Swords Road is a commuter route which serves local traffic. It is a 4 lane carriageway, with bus lanes in either direction, and is approximately 12m wide where it fronts the site.

2.2 Proposed Development

The proposal is for the continuation of use of the existing car park facility complete with the associated exit/entry control facilities, roads, drainage and bus shelters. The proposed development includes the relocation of the existing maintenance shed, demolition of the existing single-storey office and control building and canopy entrance structure, and the construction of a new three-storey car park entrance building with new car park barriers and ticket machines together with premium car parking offer, elevational signage to new entrance building, green roof, landscaping and revisions to the entrance layout to accommodate the new building.

The revised entrance layout results in a net reduction of 118 parking spaces, from the current 6,240 spaces to a proposed 6,122 spaces.

3. General Site Set-Up, Pre-Commencement Measures and Site Access

The following measures will be carried out by the Contractor:

- A general condition survey of the roads and infrastructure in the area prior to any work being carried out on the site.
- A site compound including offices and welfare facilities will be set up by the main contractor and is intended to be located in the vicinity of the existing office at the site entrance.
- Prior to any site works commencing, the main contractor will investigate/identify the exact location of and tag all existing services and utilities around and through the site.
- Typical working hours for the site will be 08.00 to 19.00 Monday to Friday and 08.00 to 14.00 Saturday. No Sunday work will generally be permitted. The above working hours are typical; however, special construction operations may need to be carried out outside these hours in order to minimise disruption to the surrounding area.
- Hoarding lines and site security will be set up within the development site as required.

Access gates will be provided at all site and compound access points. The main construction access will be from Swords Road.

The Contractor will prepare and implement a traffic management plan to ensure continued safe access and egress to and from the car park during the construction phase. This will require the segregation of construction traffic from the main Quickpark car park traffic along the car park entrance road. The contractor will also provide safe pedestrian access / egress to the car park and along the Swords Road at the car park entrance junction.

A detailed traffic management plan will be prepared by the Contractor and agreed with Fingal County Council, the Road Authority, prior to commencing works on the public road.

4. Construction Waste Management

This Preliminary Construction Waste Management guideline will be incorporated into the requirements for the Contractor and the Plan will be developed by the Contractor as the construction progresses.

In the event that contaminated soil is encountered, this soil will be removed by an appropriately accredited contractor and disposed of at an appropriately accredited facility.

4.1 Policy and Legislation

The principles and objectives to deliver sustainable waste management for this project have been incorporated in the preparation of this report and are based on the following strategic objectives:-

- National Policy: The Waste Management Acts 1996 to 2005
- Local Policy: Waste Management Plan for the Dublin Region 2005 – 2010, November 2005.

This Waste Management Plan is also in accordance with the following guidance note published by the Department of the Environment, Heritage and Local Government in July 2006:-

- Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition (C&D) Projects.

The hierarchy of waste management sets out the guiding principles in order of importance as follows:-

1. Reduction of the amount of waste generated by the construction process.
2. Segregation of waste is a key concept that will be implemented during the course of the construction phase of the development to enable ease in re-use and recycling, wherever appropriate.
3. Recycle waste material where feasible, including the use of excess excavations as fill material, recycling of various waste fractions such as metals, packaging etc.

4.2 Typical Construction Waste

Typical construction waste which will be generated by the development is as follows:-

- General site clearance waste
- Excavated material
- Surface water runoff
- Packaging and waste construction materials generated during the course of the construction activities

4.3 On-Site Construction Waste Management

It is estimated that all cut and fill operations and any other excavation will be balanced in terms of quantities. Therefore, it is envisaged that no significant amounts of excavated materials shall be disposed of off-site.

Skips will be provided for the disposal of wood from the site. It is envisaged that the majority of the wood for disposal will come from pallets used for the transport of construction materials.

Waste masonry and other non-hazardous waste generated by the site (packaging and running of site offices) will be collected in separate roll-on skips.

There are no hazardous materials expected on this site. Any hazardous material encountered will be disposed of to a suitably licence tip.

The Purchasing Manager shall ensure that materials are ordered so that the quantity delivered, the timing of the delivery and the storage is not conducive to the creation of unnecessary waste.

C & D Waste Material	Quantity (tonnes)
Clay and stones	<i>To be Completed by C&D Waste Manager</i>
Concrete	<i>To be Completed by C&D Waste Manager</i>
Masonry	<i>To be Completed by C&D Waste Manager</i>
Wood	<i>To be Completed by C&D Waste Manager</i>
Packaging	<i>To be Completed by C&D Waste Manager</i>
Hazardous Materials	<i>None anticipated</i>
Other Waste Materials	<i>To be Completed by C&D Waste Manager</i>
Total Arisings	TBC

Table 1 | Estimated C&D Waste Arising On Site

4.4 Off Site Waste Management Licensing/Permitting

All waste materials (where necessary, after in-situ reuse and recycling options have been fully considered) shall be disposed of off-site, under the appropriate Duty of Care and subject to approvals/consents from the relevant statutory bodies. It is the responsibility of the Contractor to ensure that any company to whom waste is transferred is legally permitted to do so and that the facility they bring the waste to is licensed to handle that type of waste as outlined in the Waste Management Acts 1996-2005. The Waste Collection Permit Register, in accordance with the Waste Management (Collection Permit) Regulations 2001 will be consulted to ensure that waste carriers hold the appropriate permit.

The relevant waste collection permits and waste licences shall be provided by the Main Contractor and shall be appended to this report.

An inspection of the site shall be made by the Main Contractor for hazardous substances, gas cylinders and the like. If such substances are encountered during the course of construction, then works must be halted. The project supervisor for construction stage (PSCS) and the responsible Statutory Authority shall be informed immediately.

The Contractor shall prepare a detailed inventory of construction based hazardous waste generated, such as tars, adhesives, sealants and other dangerous substances, and these will be kept segregated from other non-hazardous waste to prevent possible contamination. Arrangements shall be made for such substances for disposal in a safe manner to an authorized disposal site or by means acceptable to the relevant Authority.

The Contractor shall ensure that the excavation works are carried out in accordance with best standard practice and excavation materials are well segregated to minimize any potential cross-contamination.

The Contractor shall carry out appropriate environmental chemistry testing in order to determine the waste classification of the soils that are to be excavated and that shall include Waste Acceptance Criteria testing. The test regime shall be agreed with the receiving landfill operator and the testing shall be carried out by an accredited laboratory.

Should excavation materials be assessed to be hazardous, the Contractor shall carry out pre-treatment of the waste soils to a methodology that is agreed with the receiving landfill operator and in accordance with Environmental Protection Agency guidance.

The Main Contractor is encouraged to reuse and recycle any waste materials as far as is reasonably practicable.

In respect of any liquid disposal including underground water, The Contractor shall carry out appropriate environmental chemistry testing in order to determine whether the liquid is contaminated or not. The test regime shall be agreed with the receiving disposal facility and the testing shall be carried out by an accredited laboratory.

The Main Contractor shall manage and carry out the works in accordance with best environmental practice and in accordance with the requirements of Local Authority, EPA and all requirements as specified in this document.

4.5 Appointment of C&D Waste Manager

The Main Contractor shall appoint a C&D Waste Manager. The C&D Waste Manager will have overall responsibility for the implementation of the project Waste Management Plan (WMP) during the construction phase.

Copies of the Waste Management Plan will be made available to all relevant personnel on site. All site personnel and sub-contractors will be instructed about the objectives of the Waste Management Plan and informed of the responsibilities which fall upon them as a consequence of its provisions. Where source segregation, selective demolition and material reuse techniques apply, each member of staff will be given instructions on how to comply with the Waste Management Plan. Posters will be designed to reinforce the key messages within the Waste Management Plan and will be displayed prominently for the benefit of site staff.

4.6 C&D Record Keeping

Details of all arisings, movement and treatment of construction waste shall be recorded as part of the Waste Auditing regime.

It is the duty of the Construction Waste Manager to ensure that necessary licenses have been obtained as needed. Each consignment of construction waste taken from the site will be subject to documentation which will conform with Table 3 along with Transportation Dockets to ensure full traceability of the material to its final destination.

Detail	Particulars
Project of Origin	<i>Quickpark Car Park, Swords</i>
Material being Transported	<i>Soil, construction waste, etc.</i>
Quantity of Material	<i>To be completed by C&D Waste Manager</i>
Date of Material Movement	<i>To be completed by C&D Waste Manager</i>
Name of Carrier	<i>To be completed by C&D Waste Manager</i>
Destination of Material	<i>To be completed by C&D Waste Manager</i>
Proposed Use	<i>To be completed by C&D Waste Manager</i>

Table 2 | Details of Materials Taken from Site

4.7 Topsoil

In the case of topsoil careful planning and on-site storage can ensure that this resource is reused on-site as much as possible. Any surplus of soil not reused on site can be sold. However, topsoil is quite sensitive and can be rendered useless if not stored and cared for properly.

- It is important that topsoil is kept completely separate from all other construction waste as any cross-contamination of the topsoil can render it useless for reuse.
- It is important to ensure that topsoil is protected from all kinds of vehicle damage and kept away from site-track, delivery vehicle turning areas and site plant and vehicle storage areas.

If topsoil is stored in piles of greater than two metres in height the soil matrix (internal structure) can be damaged beyond repair. It should also be kept as dry as possible and used as soon as possible to reduce any deterioration through lengthy storage and excess moving around the site.

Records of topsoil storage, movements and transfer from site should be kept by the Construction Waste Manager.

4.8 Earthworks – Cut and Fill Policy

Earthworks for the entrance road and structure foundation forms part of the waste that will be generated by the construction phase of this project. In order to optimise the impact of the generation of surplus material due to excavation the following principles will be considered during the detail design and construction phase:-

- The quantity of excavated materials to be removed from or imported to the site will be minimised by establishing a level for the proposed building which optimises the volume of cut and fill.
- Careful separation of builder's rubble packaging and contaminated waste from re-usable material will result in the minimisation of the disposal of material to landfill.
- Surplus subsoil excavated from the site will be reviewed for possible reuse as engineering fill on adjoining or other construction sites within the region.

5. Deliveries

It is intended that deliveries to the construction site will typically be made to the main access which is off the Swords Road.

Deliveries will be managed on arrival and any queuing of delivery vehicles on to Swords Road will be avoided.

6. Parking and Storage

Parking will be provided on site. No on street parking or parking in the local residential areas will be permitted.

The main contractor will be required to schedule delivery of materials strictly on a daily basis. As there are adequate storage facilities available on site it is not envisaged that there will be any necessity to provide a secure materials staging compound remote from the site in which to temporarily store materials from suppliers until such time as these can be accommodated on site.

7. Dust and Dirt Control

Nuisance dust emissions from construction activities are a common and well recognised problem. Fine particles from these sources are recognised as a potential significant cause of pollution.

The main contractor will be required to demonstrate that both nuisance dust and fine particle emissions from the site are adequately controlled and are within acceptable limits.

Dust and fine particle generation from construction and demolition activities on the site can be substantially reduced through carefully selected mitigation techniques and effective management. Once particles are airborne it is very difficult to prevent them from dispersing into the surrounding area. The most effective technique is to control dust at source and prevent it from becoming air borne, since suppression is virtually impossible once it has become air borne.

7.1 Mitigation Measures

The following are techniques and methods which are widely used currently throughout the construction industry to control dust and dirt emitting from the site, and which may be used at the Quickpark development.

1. A regime of 'wet' road sweeping can be set up to ensure the roads around the immediate site are as clean and free from dirt / dust arising from the site, as is reasonably practicable. This cleaning will be carried out by approved mechanical sweepers.
2. Footpaths immediately around the site can be cleaned by hand regularly, with damping as necessary.
3. High level walkways and surfaces such as scaffolding can be cleaned regularly using safe 'wet' methods, as opposed to dry methods.
4. Vehicle waiting areas or hard standings can be regularly inspected and kept clean by brushing or vacuum sweeping and will be regularly sprayed to keep moist, if necessary.
5. Vehicle and wheel washing facilities can be provided at the site exit where practicable. If necessary vehicles can be washed down before exiting the site.
6. Netting can be provided to enclose scaffolding in order to mitigate escape of air borne dust from the existing and new building.
7. Vehicles and equipment shall not emit black smoke from exhaust system, except during ignition at start up.
8. Engines and exhaust systems should be maintained so that exhaust emissions do not breach stationary emission limits set for the vehicle / equipment type and mode of operation.
9. Servicing of vehicles and plant should be carried out regularly, rather than just following breakdowns.
10. Internal combustion plant should not be left running unnecessarily.
11. Where possible fixed plant such as generators should be located away from residential areas.
12. The number of handling operations for materials will be kept to a minimum in order to ensure that dusty material is not moved or handled unnecessarily.
13. The transport of dusty materials and aggregates should be carried out using covered / sheeted lorries.

14. Material handling areas should be clean, tidy and free from dust.
15. Vehicle loading should be dampened down and drop heights for material to be kept to a minimum.
16. Drop heights for chutes / skips should be kept to a minimum.
17. Dust dispersal over the site boundary should be minimised using static sprinklers or other watering methods as necessary.
18. Stockpiles of materials should be kept to a minimum and if necessary, they should be kept away from sensitive receptors such as residential areas etc.
19. Stockpiles where necessary, should be sheeted or watered down.
20. Methods and equipment should be in place for immediate clean-up of spillages of dusty material.
21. No burning of materials will be permitted on site.
22. Earthworks excavations should be kept damp where necessary and where reasonably practicable.
23. Cutting on site should be avoided where possible by using pre-fabrication methods.
24. Equipment and techniques for cutting / grinding / drilling / sawing / sanding etc., which minimise dust emissions and which have the best available dust suppression measures, should be employed.
25. Where scabbling is to be employed, tools should be fitted with dust bags, residual dust should be vacuumed up rather than swept away, and areas to be scabbled should be screened off.
26. Wet processes should be used to clean building facades if possible. If dry grit blasting is unavoidable then ensure areas of work are sealed off and dust extraction systems used.
27. Where possible pre-mixed plasters and masonry compounds should be used to minimise dust arising from on-site mixing.
28. Prior to commencement, the main contractor should identify the construction operations which are likely to generate dust and to draw up action plans to minimise emissions. Furthermore, the main contractor should prepare environmental risk assessments for all dust generating processes, which are envisaged.
29. The main contractor should allocate suitably qualified personnel to be responsible for ensuring the generation of dust is minimised and effectively controlled.

8. Water

The excavations for the drainage pipes, water supply, utilities and foundations are anticipated as being relatively shallow and will have minimal impact on the ground water in the site.

Following completion of any required initial dewatering, it is expected that flows of water into the excavation will be relatively small. These flows will be managed by sump pumping on an as-required basis.

During any discharge of surface water from the excavations, the quality of the water will be regularly monitored visually for hydrocarbon sheen and suspended solids. Periodic laboratory testing of discharge water samples will be carried out in accordance with the requirements of the discharge licence obtained from the Local Authority.

9. Noise Assessment and Control Measure

9.1 Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition

Prior to the commencement of work on the site a construction and demolition plan must be developed. When developing the construction and demolition plan reference must be made to the requirements of the Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition.

This Guide has been produced with reference to the London Good Practice Guide: Noise and Vibration Control for Demolition and Construction produced by the London Authorities Noise Action Forum, July 2016.

9.2 Environmental Noise Mitigation Measures

General Considerations:

1. All site staff shall be briefed on noise mitigation measures and the application of best practicable means to be employed to control noise.
2. Site hoarding should be erected to maximise the reduction in noise levels.
3. The contact details of the contractor and site manager shall be displayed to the public, together with the permitted operating hours, including any special permissions given for out of hours work.
4. In the event that The Contractor gets a complaint about noise from a neighbour he will act immediately to remedy the situation.
5. The site entrance shall be located to minimise disturbance to noise sensitive receptors.
6. Internal haul routes shall be maintained, and steep gradients shall be avoided.
7. Material and plant loading and unloading shall only take place during normal working hours unless the requirement for extended hours is for traffic management (i.e. road closure) or health and reasons(application must be made to local council a minimum of 4 days prior to proposed works).
8. Use rubber linings in chutes, dumpers and hoppers to reduce impact noise.
9. Minimise opening and shutting of gates through good coordination of deliveries and vehicle movements.

Plant:

1. Ensure that each item of plant and equipment complies with the noise limits quoted in the relevant European Commission Directive 2000/14/EC.
2. Fit all plant and equipment with appropriate mufflers or silencers of the type recommended by the manufacturer.
3. Use all plant and equipment only for the tasks for which it has been designed.
4. Shut down all plant and equipment in intermittent use in the intervening periods between work or throttle down to a minimum.
5. Power all plant by mains electricity where possible rather than generators.
6. Maximise screening from existing features or structures and employ the use of partial or full enclosures for fixed plant.

7. Locate movable plant away from noise sensitive receptors where possible
8. All plant operators to be qualified in their specific piece of plant.
9. Compressors and generators will be sited in areas least likely to give rise to nuisance where practicable.

Vehicle activity:

1. Ensure all vehicle movement (on site) occur within normal working hours. (other than where extension of work requiring such movements has been granted in cases of required road closures or for health and safety reasons).
2. Plan deliveries and vehicle movements so that vehicles are not waiting or queuing on the public highway, if unavoidable engines should be turned off.
3. Plan the site layout to ensure that reversing is kept to a minimum.
4. Where reversing is required use broadband reverse sirens or where it is safe to do so disengage all sirens and use banks-men.
5. Rubber/neoprene or similar non-metal lining material matting to line the inside of material transportation vehicles to avoid first drop high noise levels.
6. Wheel washing of vehicles prior to exiting the site shall take place to ensure that adjoining roads are kept clean of dirt and debris. Regular washing of adjoining streets should also take place as required by road sweepers.

Demolition Phase: (There are no demolition works anticipated on this development)

1. Employ the use of acoustic screening; this can include planning the demolition sequence to utilise screening afforded by buildings to be demolished.
2. If working out of hours for Health and Safety reasons (following approval by council) limit demolition activities to low level noise activity (unless absolutely unavoidable).
3. Use low impact demolition methods such as non-percussive plant where practicable.
4. Use rotary drills and 'burstors' activated by hydraulic or electrical power or chemically based expansion compounds to facilitate fragmentation and excavation of hard material.
5. Avoid the transfer of noise and vibration from demolition activities to adjoining occupied buildings through cutting any vibration transmission path or by structural separation of buildings.
6. Consider the removal of larger sections by lifting them out and breaking them down either in an area away from sensitive receptors or off site.

Ground Works and Piling Phase:

1. The following hierarchy of groundwork/piling methods should be used if ground conditions, design and safety allows;
 - Pressed in methods, e.g., hydraulic jacking
 - Auger/bored piling
 - Diaphragm walling
 - Vibratory piling or vibro-replacement
 - Driven Piling or dynamic consolidation

2. The location and layout of the piling plant should be designed to minimise potential noise impact of generators and motors.
3. Where impact piling is the only option utilise a non-metallic dolly between the hammer and driving helmet or enclose the hammer and helmet with an acoustic shroud.
4. Consider concrete pour sizes and pump locations. Plan the start of concrete pours as early as possible to avoid overruns.
5. Where obstructions are encountered, work should be stopped, and a review undertaken to ensure that work methods that minimise noise are used.
6. When using an auger piling rig do not dislodge material from the auger by rotating it back and forth. Use alternate methods where safe to do so.
7. Prepare pile caps using methods which minimise the use of breakers, e.g., use hydraulic splitters to crack the top of the pile.

Monitoring:

1. Carry out regular on site observation monitoring and checks/audits to ensure that BPM is being used at all times. Such checks shall include;
 - Hours of work
 - Presence of mitigation measures
 - Number and type of plant
 - Construction methods
2. In the event that The Contractor get a complaint about noise from a neighbour he will act immediately to remedy the situation.
3. A sound level digital meter will be employed as necessary to monitor noise, with results recorded to inform the contractor of noise level.
4. Site reviews must be recorded and made available for inspection.
5. Appraise and review working methods, processes and procedures on a regular basis to ensure continuous development of BPM.

Communication and Liaison:

1. A Community Liaison Plan should be developed by the developer in consultation with local residents/businesses and a single point of contact nominated to engage with Dublin City Council and the residents/businesses and to handle complaints and communication of site information.
2. All site staff should be briefed on the complaints procedure and mitigation requirements and their responsibilities to register and escalate complaints received.

9.3 Risk Assessment & Mitigation

The Main Contractor shall deal with the immediate dangers to hearing etc. associated with high noise levels and the impact of same on construction operatives, by means of risk assessment and mitigation / precautionary measures and equipment, all pursuant to the current health and safety legislation.

Current legislation limits, assessment period of 8 hours of one week (noisiest 8 hours likely to experience):

- Lower Action Value (LAV) – 80 dBA $L_{EX,8}$, 135 dB Peak – Hearing Protection shall be made available and information shall be provided.

- Upper Action Value (UAV) – 85 dBA $L_{EX,8}$, 137 dB Peak – Use of Hearing Protection is mandatory, measures to eliminate the noise as much as possible shall be applied.
- Exposure Limit Value (ELV) – 87 dBA $L_{EX,8}$, 140 dB Peak – Not to be exceeded

Protection by ear plugs/muffs given by their Signal-to-Noise Ratio (SNR) or Noise Reduction Rating (NRR) is typically 20 – 30 dB.

- $Exposure = L_{EX,8} - (SNR - 10)$

As a guide, if it is difficult to hear a normal conversation at a distance of 2m or a workplace is consistently noisier than a busy street, it is likely that the noise levels in the area are above 80 dBA.

9.4 Potential Noise Sources

It is not envisaged that any excessively noisy activities to be carried out over extended periods of time during the construction stage. However, due to the nature of the construction works, exposure to noise levels in excess of 80 dBA (Safe Working Limit) may occur occasionally. The Main Contractor will carry out a noise assessment in relation to the proposed works at construction stage. The noise assessment shall identify, but not limited to, the following steps in its analysis:-

1. Potentially Hazardous Activities: Use of site machinery and power tools. For example, concrete saws, angle grinders, vibratory plate compactors etc.
2. Potential Hazards: Excessive noise
3. Persons at Risk: People in the vicinity of the work generating an excessive noise. These persons include employees, contractors and members of the public.
4. Risk of Exposure to the Potential Hazard: Temporary or permanent hearing loss.
5. Risk Assessment before the Implementation of Control Measures: Medium
6. Risk Assessment after the Implementation of Control Measures: Low
7. Control Measures Implemented by: Site Manager / Works Supervisor

9.5 Mitigation Measures

The following control measures are to be implemented:-

1. Site Manager shall monitor a likelihood of prolonged exposure to excessive noise and commission noise surveying/monitoring programme where necessary.
2. Works Supervisor shall assess risk arising from noise prior to each particular activity taking place and determine appropriate action. The aim shall be to minimise the exposure to excessive noise levels.
 - a. If it is likely that the noise exposure exceeds Lower Action Value then hearing protection must be made available.
 - b. If it is likely that the noise exposure exceeds Upper Action Value then hearing protection is mandatory to be used. Work Supervisor shall decide on the most suitable hearing protection to be used based on Exposure (see formula above) and worker's personal preference (earmuffs or earplugs).
3. Works Supervisor shall ensure proposed measures are put in place and that their effectiveness and suitability is evaluated on regular bases.

4. Site management shall minimise noise at work by looking for alternative processes and/or working methods, which would make the work quieter and/or exposure times shorter.
5. Site Manager shall liaise with all site contractors in order to effectively control noise exposure.
6. Number of people working near source of the noise shall be minimised.
7. Employees must use hearing protection where its use is made compulsory.
8. Hearing protection zones shall be identified where necessary.
9. Spot checks on appropriate use of hearing protection shall be carried out.
10. Operators of rock breaking machines and workers nearby must wear adequate ear protection.

9.6 Proper Use of Hearing Protection

- Earmuffs: Worker must make sure that they totally cover their ears, fit tightly and that there are no gaps around the seals. Hair, glasses, jewellery, hats etc. shall not interfere with the seal. Seals and insides of earmuffs shall be kept clean. Worker shall make sure that any headband keeps its tension.
- Earplugs: Workers shall make sure that they are wearing them properly. They shall practice fitting them and get help if they are having trouble. Hands shall be clean before fitting earplugs. Earplugs must not be shared with other workers.
- Semi-inserts/caps: Same applies as for earplugs. Worker shall make sure that any headband keeps its tension.

All workers are expected to:

- Co-operate: Help the Company to do what is needed to protect their hearing. Make sure that they use properly any noise control device and follow any working methods that are put in place.
- Wear any hearing protection they are given: Make sure that they are wearing it properly. They shall wear it all the time when they are exposed noisy environment (over UAV). Taking it off even for a short while means that the hearing could still be damaged.
- Look after their hearing protection.

Report any problems: Report any problems with the hearing protection or effectiveness of the measures to the work supervisor.

10. Erosion and Sediment Control

10.1 Run-Off to Ditches

Significant quantities of waste and potential pollutants can be generated during construction. Controls must be put in place to prevent these pollutants from washing into the local storm water system, which discharges to the Mayne Stream via storm water field drainage ditches which form the boundary of the site. The Mayne Stream ultimately feeds into the Mayne River.

Protection of the Mayne Stream is paramount during the construction stage of the subject development. Temporary measures will be put in place to remove sediments, oils and pollutants.

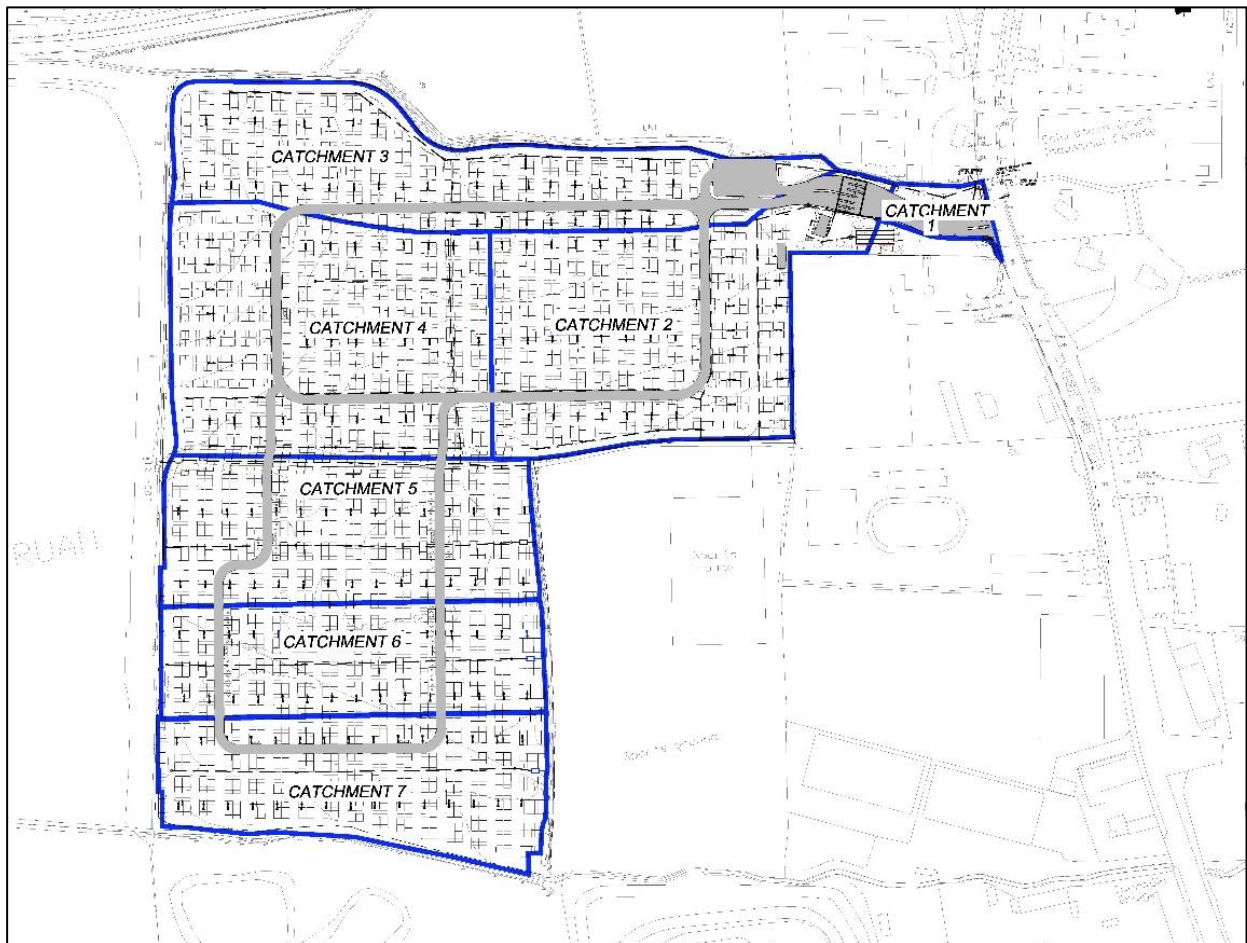


Figure 2 | Surface Water Catchments



Figure 3 | Mayne River Catchment Area and Surrounding Catchments

The recommendations as outlined in the Eastern Regional Fisheries Board document outline the following seven items to be considered for the protection of adjacent water courses during the construction stage:

1. Fuels, oils, greases and hydraulic fluids must be stored in bunded compounds well away from the watercourse. Refuelling of machinery, etc., should be carried out in bunded areas.
2. Runoff from machine service and concrete mixing areas must not enter the watercourse.
3. Stockpile areas for sands and gravel should be kept to minimum size, well away from the watercourse.
4. Runoff from the above should only be routed to the watercourse via suitably designed and sited settlement ponds/filter channels. Silt barriers are to be erected along the north of the site to protect attenuation ponds and ultimately the Broadmeadow River.
5. Settlement ponds should be inspected daily and maintained regularly.
6. Temporary crossings should be designed to the criteria laid down for permanent works.
7. Watercourse banks should be left intact if possible. If they have to be disturbed, all practicable measures should be taken to prevent soils from entering the watercourses.

The main pollutants of site water are silt, fuel/oil, concrete and chemicals. See Table 3 for a list and brief description of pollution prevention measures.

Source	Action
Detergents	Use of detergents should be carried out in designated areas draining to the foul sewer.
Fuel/Oil	Fuel/oil stores must be located away from the site drainage system and the edge of watercourses. If this is
	Ensure adequate measures are identified to prevent or contain any spillage such as creating a fall away from any drainage grid or blocking drainage points.
	Prevent oil pollution by: <ul style="list-style-type: none"> • Suitable bunded storage of fuel/oil, and use of drip trays under plant, and • An oil separator, and/or • On-site spill-kit • Commercially available absorbent granules, pads or booms.
Material Storage	Store drums, oil and chemicals on an impervious base and within a secured bund.
	Ensure topsoil and/or spoil heaps are located at least 10m away from water courses. Consider seeding them or covering with a tarpaulin to prevent silty runoff and losses due to wind.
Leaks and Spills	Storage facilities are to be checked on a regular basis to ensure any leaks or drips are fixed to prevent loss and pollution.
	Ensure appropriate spill response equipment is located near to the material in case of containment failure or material spills, and ensure site staff know how to use it.
	Adequate stocks of absorbent materials, such as sand or commercially available spill kits and booms should be available at all times.
Litter	Provide waste bins on-site as appropriate.
Construction Vehicles	Provide vehicle wheel washing.
Concrete, Cement and Bentonite	Washout of these materials should be carried out in a designated, impermeable contained area. The washout water itself should be disposed of off-site, or discharged to the foul sewer if authorised.

Table 3 | Pollution Prevention Measures

10.2 Sediment Control

Construction runoff is heavily laden with silt which can block road gullies and reduce the hydraulic capacity in pipes and rivers, contributing to ponding and flooding. Continued development without appropriate controls will ultimately keep maintenance costs elevated, whether that be in cleaning gullies, jetting pipes or dredging. Sediment control plans can be implanted on site to mitigate these issues.

Sediment basins and traps should be installed before any major site grading takes place. Additional sediment traps and silt fences should be installed as grading takes place to keep sediment contained on site at appropriate locations.

Key runoff-control measures should be located in conjunction with sediment traps to divert water from planned undisturbed areas away from the traps and sediment-laden water into the traps. Diversions should be installed above the areas to be disturbed before any grading operations. Any perimeter drains should

be installed with stable outlets before opening major areas for development. Any additional facilities needed for runoff control should be installed as grading takes place.

During grading operations temporary diversions, slope drains, and inlet and outlet protection installed in a timely manner can be very effective in controlling erosion and sediment build up.

The main run-off conveyance system with inlet and outlet protection measures should be installed early and used to convey stormwater run-off through the development site without creating gullies or channels. Install inlet protection for storm drains as soon as the drain is functional to trap sediment on site in shallow pools and to allow the flood flows to enter the storm drainage system safely. Install outlet protection at the same time as the conveyance system to prevent damage to the Broadmeadow River.

10.3 Sediment Control Measures

Sediment entrapment facilities are necessary to reduce sediment discharges to downstream properties and receiving waters. All run-off leaving a disturbed area should pass through a sediment entrapment facility before it exits the site and flows downstream.

- **Straw Bales:** Straw bales can be placed at the base of a slope to act as a sediment barrier. These are not recommended for use within a swale or channel. Straw bales are temporary in nature and may perform for only a period of weeks or months. Proper installation and maintenance is necessary to ensure their performance.
- **Silt Fencing:** A silt fence is made of a woven synthetic material, geotextile, and acts to filter run-off. Silt fencing can be placed as a temporary barrier along the contour at the base of a disturbed area, but is not recommended for use in a channel or swale. The material is durable and will last for more than one season if properly installed and maintained. Silt fencing is not intended to be used as a perimeter fence or in area of concentrated flow. If concentrated flow conditions exist, a more robust filter should be considered.
- **Silt Barriers:** Silt barriers can also be temporarily installed in any road gullies of partially constructed roads to prevent sediment movement into downstream drainage systems or SUDS components. When the catchment area is greater than that allowed for straw bale barriers or silt fences, runoff should be collected in diversion drains and routed through temporary sediment basins.

Diversion Drains: Diversion drains are simple linear ditches, often with an earth bund, for channelling water to a desired location. If the drains are being eroded they can be lined with geotextile fabric or large stones or boulders.

11. Construction Phasing and Programme

11.1 Run-Off to Ditches

The proposed development includes the relocation of the existing maintenance shed, demolition of the existing single-storey office and control building and canopy entrance structure, and the construction of a new three-storey car park entrance building with new car park barriers and ticket machines together with premium car parking offer, elevational signage to new entrance building, green roof, landscaping and revisions to the entrance layout to accommodate the new building. All demolition and construction work will be completed in one phase. The construction programme is intended to be a 9-month programme.

UK and Ireland Office Locations

