

Library Square Ringsend – Public Realm Improvement and Library Refurbishment and Extension

OUTLINE CONSTRUCTION MANAGEMENT PLAN



March 2023



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Outline Construction Management Plan

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1. INTRODUCTION

This Outline Construction Management Plan (CMP) has been prepared to address the procedures, sequencing and construction methodology anticipated by the Design Team engaged in the planning and design of the proposed Public Realm Development Works at Library Square, Ringsend. The plan outlines proposed traffic and environmental management measures to be adopted during construction. This document contains particular focus on avoiding or mitigating any potential adverse environmental effects that may arise from the construction process.

It is designed to be a live document which will eventually address how any planning conditions imposed on the project will be managed or discharged by the construction team. This report will inform the Contractor's Construction Management and Environmental Operating Plan for the construction stage. The Contractor will develop this plan further to outline the specific control measures that will be required to address the restrictions detailed herein.

The Outline CMP incorporates 3 main elements:

- (i) Description of the construction of the development and phasing thereof;
- (ii) Traffic management considerations; and
- (iii) Environmental management considerations.

2. DEVELOPMENT DESCRIPTION

2.1 Site location

The site is located in Ringsend, Dublin 4, as shown below in Figure 1 below. The site is bounded by existing development on all sides. Saint Patrick's Villas borders the R802 Bridge Street / Irishtown Road on the East and commercial premises to the north. The western border of Fitzwilliam Street is lined with apartment buildings with shops below such as Tesco Express.

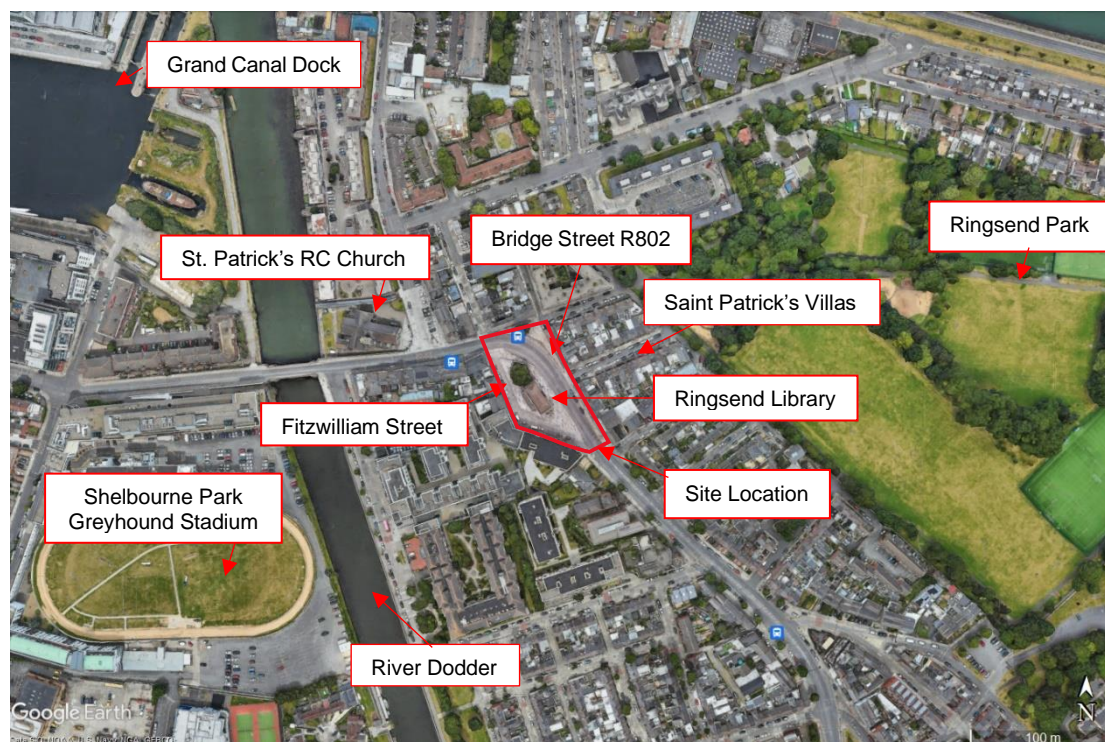


Figure 1 Site Location – Aerial map

2.2 Development Details

The proposed development comprises a public realm development for Library Square and a proposed extension of the Ringsend building itself. The development involves enhancements to the public realm including road realignment, the introduction of a raised table to control traffic flow speeds with controlled pedestrian crossing, cycle lane, shared surface plaza, defensive planting, communal seating and feature lighting. 5 car parking spaces will be provided along Bridge Street, and approximately 9 spaces along Fitzwilliam Street, outside of the loading bay hours, and 1 disabled persons' parking bay. 8 bicycle parking spaces will be provided on Fitzwilliam Street.

Surface water runoff during the operational stage has been accounted for within the drainage design. It is proposed to implement sustainable drainage systems (SUDs) through the incorporation of engineered attenuation features and controlled discharge at all outfalls will control storm runoff rates so as not to exacerbate flooding and flood risk in the receiving watercourses.

2.3 Programme

The project is expected to commence construction in mid-2024 and continue for 18-24 months.

2.4 Working Hours

Except where otherwise agreed with Dublin City Council, working hours will be 07:00 – 19:00 Monday to Friday and 08:00 – 18:00 Saturday and closed on Sundays.

3. CONSTRUCTION OF THE DEVELOPMENT

3.1 Pre-Start Survey

A pre-Start Survey of the site and surrounds will be carried out prior to construction works commencing. This will consist of a photographic aided report on the existing environment including; existing structures, boundaries, footpaths, roads, access points, fences lines, walls, hedge lines, kerb lines, lighting columns and road signs. The findings of the survey will be documented and recorded by the Contractor. The Contractor will also be required to undertake pre-construction condition surveys of nearby properties in consultation with the property owners.

3.2 Security

The Contractor will secure the site prior to any works commencing. Any parts of the site remaining in use by the public – e.g. for the continuance of operations at adjacent shops, will be securely cordoned off. The Contractor will be responsible for the ongoing maintenance and upkeep of security measures, and for controlling access onto the site.

3.3 Construction site compounds & accommodation, welfare & storage

The Contractor will provide temporary accommodation on the site, as required. The exact location of these facilities may be adjusted as required during the course of construction. Initially offices and storage containers will be transported to the site to provide accommodation and welfare facilities for workers in advance of the works commencing.

3.4 Existing Structures and Buildings

The existing lean-to extension at the rear of Ringsend Library is to be demolished. A detailed structural inspection will first be undertaken. The internal furnishings and fittings will then be removed and disposed of. The existing structure will then be carefully dismantled to ground level. The project includes the construction of a new, larger extension to the historic library building.

The levels of the public realm surrounding the library will also be reduced as part of the proposed works. This will require the felling of existing trees, the removal of features and fittings, including various sculptures. The latter will be removed for careful storage and re-use. Existing kerbs and paving stones will be salvaged for re-use, where practicable.

3.5 Excavation

The existing topography falls slightly from the north to south of the site, so the largest volumes of excavation will be to the north of the site. In 2006 a report on Ground Investigation was undertaken for a nearby development at Fitzwilliam Quay in Dublin for the construction of a multi storey residential/commercial units. The programme of investigation included a review of sub-soil conditions for the construction of five exploratory boreholes to establish stratification, the excavation of 6 trial pits, the installation of groundwater monitoring standpipes, geotechnical soil testing and environmental soil testing. The ground conditions were found to comprise approximately 4m of made ground, consisting of concrete, cobbles, steel, wire and red brick fill, a small section of sand, approximately 4m of fine to coarse gravel with sea shells, pockets of grey silt, cobbles and occasional boulders, and approximately 5m of sandy gravelly clay, with the water table at approximately 2.5-3m depth. The bedrock for the Ringsend area consists of dark limestone and shale.

The construction of the proposed development will require the reduction in existing ground levels across the site. Paving and overburden will be removed and exported from site in accordance with the Outline Construction and Demolition Waste Management Plan [CDWMP]. No rock-breaking is expected. Temporary sumps will be installed and maintained at each point during excavation to allow management of surface water.

Excavation and construction works will be carefully managed to ensure no contamination of watercourses as a result of the construction work. This will involve ensuring that no dirty water from site enters the surface water sewerage network. The Contractor will be required to follow best practice in respect of the protection of watercourses during all stages of construction. Any surface water encountered during this phase will be pumped to the foul sewerage network during periods of low flow in agreement with the relevant authorities or pumped to tankers and removed from site.

3.6 Phasing of Works

The following is the indicative phasing of the works:

- 1) General Site Clearance;
- 2) Footpath works on north and east boundaries in conjunction with removal of existing library lean-to extension;
- 3) Lowering / realignment of services and utilities in conjunction with removal of paving and reduction of levels in Library Square;
- 4) Reduction in levels on Bridge Street / Irishtown Road under traffic management (stop-go likely to be required) and construction of revised road carriageway in conjunction with groundworks for proposed Library extension;
- 5) Construction of library extension structure in conjunction with paving and landscaping works to northern end of Library Square;
- 6) Paving and landscaping works to southern end of Library Square in conjunction with internal Library works and tree planting;
- 7) General finishes, street furniture and re-erection of sculptures;
- 8) Snagging and closeout.

In addition, at some point during the works, Fitzwilliam Street will have to close for c.12 weeks to allow the reduction in levels and repaving. These works will be timed for the summer to minimise the impacts on the businesses along Fitzwilliam Street.

The indicative phasing is subject to change in consultation with the Local Authority as environmental restrictions and economic circumstances may dictate.

The main works construction does not involve any unusual or exceptional construction techniques and will be constructed of in situ or precast elements constructed from the bottom up using scaffolding and temporary support structures as appropriate. Concrete pours will be managed so as to prevent the risk of any spillage outside the formwork. Wooden and steel elements will be assembled on or off site before careful transport and erection.

3.7 Protecting Existing Buildings in the Vicinity of the Site

There are a number of existing buildings in close proximity to the site including commercial premises along Fitzwilliam Street with apartments above, and further mixed two-storey commercial and residential properties along the northern and eastern frontage of Bridge Street / Irishtown Road. A number of measures will be taken throughout the construction stage of the proposed development in order to safeguard these structures against accidental damage. There will be strict limits on noise and

vibration so as to avoid the risk of any damage to the buildings. Construction methods will be adapted to reduce noise and vibration levels on site and working hour restrictions imposed by the planning permission will be respected in order to reduce disruption to neighbours. These will only be deviated from exceptionally with the agreement of Dublin City Council.

3.8 Site Compound

It is anticipated that the Site Compound will initially be installed within Library Square. The small compound will be adapted to suit the construction phases.

3.9 Site Security

The Contractor will be responsible for securing all parts of the site from public access, including works zones and the site compound. Sufficient safety zones will be required around any lift areas.

3.10 Logistics and Craneage

Deliveries and removals to and from the site will be managed along the R802. Temporary loading bays may be required on the public road, and these shall be agreed with Dublin City Council through the normal building control procedures.

4. TRAFFIC MANAGEMENT – ROAD NETWORK AND SITE TRAFFIC

4.1 Site Access and Road Safety

The existing vehicular access point to the site is via the R802 Bridge Road / Irishtown Road. A stop/go system will be in place for short durations. However, road connectivity will be generally maintained. A c.12 week closure of Fitzwilliam Street will be required to allow the reduction in levels and repaving. These works will be timed for the summer to minimise the impacts on the businesses along Fitzwilliam Street.

The use of minor roads by construction vehicles to access the site will not be permitted except to get from the site entrance to the regional road network.

All Traffic Management proposals will be agreed with Dublin City Council and An Garda Síochána prior to construction of the development. Significant traffic management installations or changes will be subject to Road Safety Audits, as required by the Local Authority. The Contractor's security arrangements will include protocols for managing all construction traffic movements to and from the site.

4.2 Constraints

There will be no major constraints to traffic on the surrounding roads during the construction works as road connectivity will be generally maintained. Foul and water supply connection will involve only short term and minor interference with the road network, and traffic conditions will generally not cause more than short-term inconvenience to residents.

Given the constrained nature of the site, most deliveries will be on a "just-in-time" basis, since the scope to store materials on the site is extremely limited.

4.3 Maintenance of Public Roads

There will be potential for delivery vehicles and other site traffic to carry mud and silt onto the public roads when exiting the site. In order to prevent this, a wheelwash will be utilised on site at all egress points in use by construction traffic. This will be used as required to wash down vehicles prior to leaving the site. Dirty water from the wheelwash will be prevented from entering the municipal surface water drainage system.

The site layout during excavation works will be designed to ensure vehicles do not enter the works area unless necessary for the excavation and soil removal processes. All machinery leaving the works area will be thoroughly cleaned before being allowed on to public roads.

A road sweeper (including vacuum) will be in place (as required) to ensure cleanliness of nearby and haul roads (where necessary), particularly during enabling works. Roadside gullies will be maintained by the road sweeper contractor. Road line markings will be monitored and markings that require replacement throughout the duration of the project will be replaced by a specialist contractor.

4.4 Traffic Movements

There is approximately 1200m³ of material to be excavated from the site. Based on an average truck load of 20 tonnes (c. 8 m³), this equates to a total of c. 150 truck movements, assuming the worst-case scenario of no re-use of material on site. It is

anticipated that the excavation works will continue over c. 4 months (18 weeks), equating to 8 truck trips a week, or 1.33 a day. These will be spread over the course of the day due to the nature of the work. Allowing for periods of intense activity, peak truck activity might spike at five times this level – approximate 5 return truck trips a day.

Based on the anticipated site working hours, traffic movements by workers will generally be outside the road network peak periods, which are 0800 – 0900 and 1700 – 1800. Truck movements will generally be restricted at peak periods to avoid exacerbating rush-hour traffic, and to minimise interaction with vulnerable road users – especially cyclists - during these periods.

4.5 Parking

At all stages, parking for construction workers will be prohibited on site. Any construction workers requiring parking will have to use the public paid facilities in the neighbourhood (including on-street parking, County Council car parks).

Secure, covered bicycle parking will be provided, and the use of bicycles by construction workers will be encouraged. Workers will also be encouraged to use public transport services where possible.

5. ENVIRONMENTAL MANAGEMENT SYSTEM

5.1 Identification

Prior to commencement of site works, the Design Team and the Contractor will convene to identify the potential environmental issues which may arise throughout the duration of the Project. These will include off-site issues and cover the design, construction and commissioning phases of the Project, up to handover to operations staff. Each issue will be entered on a register of environmental risks.

5.2 Assessment

The Project Team will undertake an assessment of each of the identified environmental risks. This assessment will produce a clear definition of the risk, the potential impacts it may have and the consequences arising from the occurrence of the risk. The findings will be entered on the register of environmental risks.

5.3 Mitigation

Mitigation measures will be devised based upon the individually assessed risks. These could range from changes in design to remove the risk to on-site precautions to manage the risk and prevent the impact being realised. The agreed mitigation measures will be entered on the register of environmental risks. Any specific mitigation measures defined by planning conditions will also be addressed.

5.4 Monitoring, Recording & Reviewing

The register of environmental risks will act as the management tool for the control of environmental issues arising for the project. It will be reviewed on a regular basis to identify the efficacy of the mitigation measures employed based upon the monitoring data collected and records kept.

5.5 Minimising the Environmental Impacts

The Project Team and all its employees shall conduct their work in such a manner that unnecessary risks and disturbance to the environment are avoided. As part of the Environmental Management System, personnel are made aware of issues which may impact on the environment and are encouraged to act responsibly.

5.6 External Stakeholders

With respect to environmental impacts, consultations will be undertaken with the Local Authority (Dublin City Council) and relevant environmental stakeholders as required.

5.7 Noise & Vibration

Noise will be generated from excavation works, from delivery vehicles and from construction operations. Noise hoarding will be erected around noisy equipment/activities where necessary.

A noise and vibration control management plan shall be prepared by the contractor and shall be submitted in writing to Dublin City Council's air quality monitoring and noise control department for approval in advance of the works commencing. The restrictions of the noise and vibration control management plan will include:

- 1) Contractor to comply with all prevailing legislative requirements;

- 2) All plant to comply with all prevailing legislative requirements, CE marked, and maintained and tested accordingly;
- 3) All plant and machinery to be switched off when not in use;
- 4) Noise and vibration limits to be prescribed in construction contract, and monitoring to be implemented at sensitive receptors. Management plans to be prepared for addressing any exceedances;
- 5) Ensure plant and equipment have properly operating silencers / mufflers;
- 6) Consider the location of noisy plant in order to minimise nuisance to nearby houses, motorists, and wildlife;
- 7) Specific measures to be included to monitor noise and vibration during limestone and shale excavation works, and the same noise and vibration limits will apply.

More detail is included in Appendix B.

5.8 Air and Dust

Dust is a nuisance and can be damaging to humans, machinery, plants and animals. All workers on site are to consider the nuisance caused by the impacts of dust. The effects of dust will be minimised using the following techniques;

- Avoid creating unnecessary dust.
- Cover materials which could create dust when windy.
- Dampen down dust in operations which create dust.
- Ensure that vehicles leaving site do not leave mud on the road.

More detail on the specific restrictions is included in Appendix B.

5.9 Waste Management

The proper management and handling of waste on site is essential to ensure that pollution and increased levels of contamination are minimised. Effective management of waste on site will consist of the following measures;

- Closed skip containers.
- Non dumping/littering policy on site.
- Waste segregation.
- Regular clean up of the site.
- Careful handling and transportation to avoid damage to raw materials.
- Efficient ordering.

More detail is included in the Construction and Demolition Waste Management Plan included in **Appendix A**.

5.10 Water Pollution

Measures shall be taken to ensure that the groundwater related to the site does not come into contact with higher proportions of contaminants during the construction activity. Surface water in the vicinity ultimately discharges to Dublin Bay, which is an SPA, SAC and UNESCO Biosphere, and it is of paramount importance that these waterways are not affected during the construction works.

The following avoidance measures are proposed to prevent the occurrence of any pollution incidents:

- Throughout all stages of the construction phase of the project the contractor will ensure that good housekeeping is maintained at all times and that all site

personnel are made aware of the requirement to avoid water pollution of all types.

- Fuels, oils, greases and hydraulic fluids will be stored in bunded areas well away from any surface water gullies. Refuelling of machinery, etc., will be carried out in bunded areas.
- Runoff from machine service and concrete mixing areas will not enter any watercourse or groundwater.
- Areas for the stockpiling of materials will be kept to a minimum size, well away from any watercourse or permeable ground. It is noted that there is extremely limited scope for the stockpiling of materials on site.
- Any small short-term storage of excavated material shall be kept away from drains and shall be covered with high grade plastic in order to prevent runoff from entering groundwater.
- An emergency plan to deal with accidental spills within the confines of the site, and always at a safe distance from the surface water sewerage network, will be drafted with the inclusion of the relevant stakeholder contact details.
- Any water collected in excavations will be treated as contaminated material and pumped into the foul runoff system or removed from site in tankers until the surface water infrastructure is complete, flow controls installed and inspected. Desilting and petrochemical interception of all surface runoff/pumped water will take place for the length of the construction project, using standard techniques including silt buster/silt socks, local silt traps throughout the site, etc.
- A petrochemical interceptor will be placed on the surface water network prior to discharge.
- Bunds will be kept clean and spills within the bund area will be cleaned immediately to prevent groundwater contamination. Any water-filled excavations, including the attenuation tank during construction, that require pumping will not directly discharge to the surface water network. Prior to discharge of water from excavations adequate filtration and petrochemical interception will be provided to ensure no deterioration of water quality and ensure compliance with the Water Pollution Acts.
- Wastewater from the temporary staff facilities will be discharged to sealed contaminant systems, and disposed via licensed contractors.
- The pouring of concrete, sealing of joints, application of water-proofing paint or protective systems, curing agents, etc will be completed in the dry to avoid pollution of the freshwater environment. Method statements for these activities will be agreed prior to commencement.

5.11 Light Pollution

Lighting shall be focussed and controlled during the construction phase to prevent light spill to the large treeline to the south of the development.

APPENDIX A CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT PLAN

APPENDIX B

SPECIFIC CONTRACTUAL RESTRICTIONS

CONTROL OF NOISE AND VIBRATION

1 Noise

1.1 General:

The Contractor shall implement specific noise abatement measures and comply with the recommendations of BS 5228: Parts 1 and 2 and the European Communities (Noise Emission by Equipment for Use Outdoors) Regulations, 2001, including:

- No Plant used on site will be permitted to cause an ongoing public nuisance;
- The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by site operations;
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order;
- Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers;
- Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use;
- Any plant, such as generators or pumps, that is required to operate at night will be surrounded by an acoustics enclosure or portable screen to the approval of the Employer's Representative, which shall restrict the noise level to not less than 5dB(A) below the levels quoted in Table 1/9/1.. "Night" is defined in Paragraph 1.3.
- During the completion of the works the Contractor shall ensure compliance with the limits detailed in Table 1/9/1 using methods outlined in British Standard BS 5228 – 1: 2009: Code of practice for noise and vibration control on construction and open sites - Noise

1.2 The normal working hours within the Site [excluding existing public roads], shall be Monday to Friday between 07.00 hours and 19.00 hours and Saturday between 08:00 and 18.00 hours, with no working on Sundays and Public Holidays.

1.3 "Night" is defined as 22:00 – 07:00 Monday to Friday and 22:00 – 08:00 Saturday, Sunday and Public Holidays.

1.4 The noise levels (see Note (i) below) in Schedule 1/9/1 for periods outside the normal working hours will only be permitted when consent has been given to exceptional working.

1.5 The ambient noise level, L_{Aeq} (see Note (ii) below), from all sources measured 2.0m above the ground at noise control stations (the Contractor shall provide for a minimum 8 No. Noise Monitoring Stations to be in operation at any one time) shall either not exceed the appropriate level given in the Schedule or not exceed by more than 3dB(A) the existing ambient noise level, L_{Aeq} at the control station measured over the same period, whichever level is greater. The maximum sound level at any noise control station shall not exceed the level given in the Schedule.

1.6 The Contractor shall employ the best practical means to minimise noise produced by his operations including plant maintenance and shall comply with the recommendations in BS 5228 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise.

1.7 All vehicles and mechanical plant used on the works shall be fitted with effective exhaust silencers and shall be maintained in good and efficient working order for the duration of the works in compliance with BS 5228. The Contractor shall remove from the works any item of plant, which in the opinion of the Employer's Representative is ineffectively silenced. All compressors shall be "sound reduced" models fitted with

properly lined and sealed acoustic covers and shall be kept closed whenever the machines are in use. Any ancillary pneumatic percussive tools shall be fitted with mufflers or silencers of the type recommended by the manufacturers. Pumps and mechanical static plant shall be enclosed by acoustic sheds or screens where directed by the Employer's Representative.

- 1.8 Any plant such as generators and pumps which is required to work outside the normal working hours shall be surrounded by an acoustic enclosure to the approval of the Employer's Representative which shall restrict the noise level to not less than 5dB(A) below the levels quoted in Table 1/9/1.
- 1.9 The Contractor shall organise his operations with regard to the positioning of plant and the location of haul routes etc. so that it minimises construction noise to adjacent properties.
- 1.10 The use of explosives is not permitted.

Table 1/9/1: Schedule of Noise Levels

Schedule	Hours	Total Noise Levels at Control Stations		
		Ambient Noise level, L_{Aeq} measured at Control Station dB(A)	Period of Hours over which L_{Aeq} is applicable	Maximum Sound Level (see Note (iv) below measured at Control Station: dB(A))
Monday to Friday	0700 – 1900	70	1	80
Monday to Friday	1900 – 2200	60	1	65
Saturdays	0800 – 1730	65	1	75
Sundays and Public Holidays (when permitted)	0900 – 1730	60	1	65
All unattended plant outside normal working hours	1900 – 2200	60	1	65
All other Times (when permitted)		50	1	55

Notes:

1. Noise levels relate to free field conditions. Where noise control stations are located 1 metre from façades of buildings, the permitted noise levels can be increased by 3dB(A).
2. The ambient noise level, L_{Aeq} , at a specific location is the total L_{Aeq} from all the noise sources in the vicinity over the specified period.
3. The existing ambient noise level, L_{Aeq} , at a specific location is the total L_{Aeq} from all the noise sources in the vicinity over the specified period prior to the commencement of the Works.
4. Maximum sound level is the highest value indicated on the sound level meter which meets the requirements of IS EN 61672.

- 1.11 Prior to commencement of any construction works on site, the Contractor shall ensure that an Environmental Operating Plan shall be drawn up for implementation on site. The Environmental Operating Plan shall provide, inter alia, for:
 - A. Definition of locations of noise and vibration monitoring equipment;

- B. The provision of appropriate acoustic barriers, where the Contractor deems they will be required to comply with these requirements.
- C. The use of best available technology (BAT) to eliminate and control tonal and impulsive noise components and to reduce the noise impact to as low as is reasonably practicable.
- D. A limit on the duration of construction hours for noise generating works in proximity to dwellings.
- E. A schedule of enhanced mitigation measures to be taken in the potential event of noise monitoring and vibration levels exceeding the permissible levels set out in Tables 1/9/1, 1/9/2 and 1/9/3.

2 Vibration

2.1 Vibration generated by the Contractor's activities shall not adversely affect the structural and serviceability performance of any building or structure outside the boundaries of the site. In addition, the maximum permitted peak particle velocity generated by the construction of the Works shall not exceed the peak particle velocities at locations described and for the frequencies given in Tables 1/9/2 and 1/9/3 below.

Table 1/9/2: Limits for Intermittent Vibration

Structure Type	Max PPV (mm/sec) – Intermittent Vibration		
	Frequency <10 Hz	Frequency 10 – 50 Hz	Frequency 50 – 100 Hz
Residential Properties and similar Structures adjacent masonry structures (unoccupied)	5	10	15
Residential Properties (occupied)	4	8.5	10
Steel and Reinforced Concrete Structures	15	30	40
Robust Underground service	15	30	60
Elderly & Dilapidated Services	10	20	40

Table 1/9/3: Limits for Continuous Vibration

Structure Type	Max PPV (mm/sec) – Continuous Vibration		
	Frequency <10 Hz	Frequency 10 – 50 Hz	Frequency 50 – 100 Hz
Residential Properties and similar Structures adjacent masonry structures (unoccupied)	2.5	5	7.5
Residential Properties (occupied)	2.0	4.5	5.0
Steel and Reinforced Concrete Structures	7.5	15	20
Robust Underground services	7.5	15	30
Elderly & Dilapidated Services	5.0	10	20

2.2 Groundborne vibrations shall not be permitted at sites of freshly placed concrete, i.e. concrete less than 48 hours old.

- 2.3** The Contractor shall employ the best practical means to minimise vibration produced by his operations, including plant maintenance, and shall comply with the recommendations in BS 5228 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration.
- 2.4** To ensure compliance with the specified vibration limit, monitoring shall be undertaken by the Contractor using digital seismographs as described in paragraph 2.6 of this Appendix. Such monitoring shall include locations outside the limits of the Site. The Contractor shall provide for at least 8 No. separate vibration monitoring stations to be in operation at any one time – see also Paragraph 1.11 above.
- 2.5** The Contractor shall monitor ground vibrations at the directed locations. Each vibrograph shall be certified as being in proper working order and shall unless otherwise approved, record vibrations in three directions simultaneously with a print-out showing the amplitude and frequency of the vibrations.
- 2.6** The digital seismographs shall meet the following minimum specification:
- (i) Minimum sampling rate 1000 samples/second/channel;
 - (ii) Capable of recording Peak Particle Velocity (Directly), Peak Acceleration (Calculated), Peak Displacement (Calculated), Frequency at the Peak Velocity (Calculated);
 - (iii) Dual Mode instrument having (a) Self Triggering Mode and (b) Continuous Monitoring Mode;
 - (iv) Transducer - 3 orthogonally mounted transducers on one mounting unit
 - (v) Frequency Range - 4.5 to 200Hz;
 - (vi) Minimum Resolution - 0.05mm/second, velocity;
 - (vii) Range - 0 to 100mm/second, velocity;
 - (viii) Record of Events - hard copy printout and storage on solid state memory or disc for subsequent printout; and
 - (ix) Power – 120 volts mains for continuous unattended operation on construction site plus internal battery with minimum of 24 hours capacity.

3 Property Condition Surveys

- 3.1** Structures and properties that require condition surveys (dilapidation surveys) are identified in the table below. Pre-construction surveys are to be completed and reports submitted to the Engineer 14 days prior to undertaking any Works within 20m of the properties in question. Post-execution condition surveys shall be undertaken in accordance with the requirements of Clause 136.7 of the NRA Specification for Roadworks.

Table 1/9/4 Condition Survey Requirements

Number	Description	Location
TBC	TBC	

ENVIRONMENTAL MANAGEMENT

1. The Contractor shall establish and implement, during the execution and completion of the Works, an Environmental Operating Plan consistent with and analogous to the NRA "Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan".
2. The Environmental Operating Plan shall be structured to differentiate between and address separately all of the following:
 - (1) short term impacts of construction activities
 - (2) required mitigation measures that relate to the execution and completion or operation of the Works
 - (3) any other commitments made in respect of the execution and completion of the Works procedures
 - (4) processes and resources provided in order to avoid wherever possible environmental accidents and pollution, to encourage reduced consumption of resources and
 - (5) processes and resources provided to restrict the production of waste and to promote good relationships with the relevant Authorities, and Statutory Undertakers.
3. The Environmental Operating Plan shall include site-specific method statements for all Works activities where there shall be or may be a risk of environmental damage, which:
 - (i) shall show how the proposed methods of construction shall reduce impacts and how contingency plans and emergency procedures shall limit damage caused by accidents, spillages or other unforeseen events and
 - (ii) shall ensure that such method statements and the like shall include notification procedures for the relevant Authorities and Statutory Undertakers.
4. The Contractor shall appoint a site Environmental Manager to develop, implement and maintain the Environmental Operating Plan. The Environmental Manager should possess sufficient training, experience and knowledge appropriate to the nature of the task to be undertaken for completion of the Works.
5. The Contractor shall submit to the Engineer details of the Environmental Operating Plan, method statements and a Waste Management Plan prior to the commencement of the Works.
6. All construction and operations shall be carried out in accordance with the Control of Water Pollution from Construction Sites; Guidance for Consultants and Contractors (SP156) (CIRIA, 2002).
7. Soil storage areas will be sited away from drains and appropriate measures put in place to ensure containment of run-off and leechate. The storage of oils, hydraulic fluids, etc shall be undertaken in accordance with current best practice for oil storage (Enterprise Ireland, BPGCS005).
8. Fuels, lubricants and hydraulic fluids for equipment used on the construction site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to codes of practice.

- 9.** Throughout all stages of the construction phase of the project, the contractor shall ensure that good housekeeping is maintained at all times and that all site personnel are made aware of the importance of the requirement to avoid pollution of all types.
- 10.** Foul drainage from site compound etc. will be discharged to the existing foul sewerage network, subject to the prior approval of Dublin City Council.

AIR AND DUST

Public health and environmental protection measures shall be put in place to mitigate the adverse impacts that construction operations may have due to the following:

- Air pollution through the emission of hazardous particulates, fibres and gases;
- Transfer of contaminants off-site due to inadequate vehicle decontamination or sheeting of vehicles;
- Odours.

1.1. The following is a non exhaustive list of measures shall be implemented by the Contractor during the works to mitigate the effects of the above impacts:

- The use of fine water sprays, wheel washing facilities, 'tumble' wheel cleaners and road sweepers
- Temporary containment of excavation, materials handling, and deposition area
- Monitoring
- Temporary covering of exposed surfaces
- Careful selection and operation of plant and equipment (e.g. sheeting of vehicles, control over vehicle speeds on-site)
- Site zoning
- Vehicle decontamination measures
- Temporary covers
- Dust control on operational areas