

Appendix 4.1

Outline Construction and Environmental Management Plan

A4.1.1 Introduction

This section provides an outline of the general activities and issues associated with the construction of the Proposed Project. Ultimately, a Construction Management Plan for the works will be prepared by the Contractor on appointment, in advance of any works commencing. This will be updated at each stage of the project as it progresses and will deal with health and safety, security, access to and within the site, entrance and fencing treatment and parking.

The Construction Management Plan will be subject to the restrictions imposed by the Employer's Works Requirements. These restrictions will include:

- 1) The need to maintain access to premises through the Works area;
- 2) The need to maintain servicing to premises through the Works area;
- 3) The need to maintain adequate width pedestrian / cycle routes through the Works area;
- 4) The need to maintain utilities and services;
- 5) The need to maintain emergency access.

This section also includes an indicative outline of the construction programme, phasing and the typical construction activities required for the construction of the Proposed Project. Mitigation measures relating to minimising potential negative impacts arising from construction activities are described in relevant chapters, for example, Chapters 7 and Chapter 8, '*Air Quality and Climate Factors*' and '*Noise and Vibration*' respectively. Proposed construction management measures are also described.

The main construction works are associated with the development of the civic plaza area. The construction works associated with this phase of the development are described and assessed in this strategy. Other works that relate to road realignments and marking on Dame Street, Trinity Street, Andrew's Street, Church Lane and Grafton Street are considered minor and on that basis the measures outlined in this strategy do not apply. Standard Dublin City Council requirements, control procedures and permits will apply to those works.

A4.1.2 Indicative Construction Programme

An indicative construction sequence is described below. It should be noted that this construction sequence is just an overview, and the actual construction sequence will be confirmed when a Contractor is appointed.

The construction phase of the proposed project is likely to take 12 – 18 months, and is expected to commence in early 2018. The main stages of construction will proceed in a general sequence as follows:

- Enabling works- including the set-up of site construction facilities, hoarding, signage etc.

- Excavation and site clearance- including the excavation of roads and paved surfaces, and clearance of study area including careful removal of trees, street furniture, historic features etc.
- Provision of services- including the implementation of Sustainable Urban Drainage System (SuDS), localised diversion to local power supplies, and localised diversion of telecommunication services. A new public lighting regime is proposed for College Green, and new ducting and mini pillars will be provided to cater for same. In addition, an underground control chamber will be provided for the fountains, along with associated water supply, power supply and drainage connections.
- Construction of the civic plaza including relaying the setts at Foster Place, laying granite setts in the civic plaza area, paving works to trafficked plaza area at western end, construction of turning circle and works to existing footpaths.
- Replacement of statues and fountain, and planting of trees. This stage of construction will also involve the placement of street furniture, bicycle facilities, lighting, signage etc.

Main Stages of Construction

Enabling Works

Enabling works are generally undertaken in advance of the main works. Enabling works will be carried out to ensure that:

- Site construction facilities are established in advance of commencement of significant elements of work.
- Adequate work areas and access for the permanent works and or construction is provided.

The timing of enabling works depends on the programmed start of the phase of main works that they are designed to enable. Some may start significantly in advance of the main construction activities.

The initial phase of enabling works will include the provision of construction facilities located at the works area. The initial works area is expected to include the northern side of the site, with pedestrian and cyclist access being retained along the southern side of the site. Once this main section of works is complete, the works area will move to the southern side of the site, with pedestrians and cyclist access to be provided on the northern side of the site. A works area will provide secure and safe refuge space for Contractor facilities and equipment.

Construction site hoardings are used to provide a secure site boundary to what can be a dangerous environment for people who have not received the proper training and are unfamiliar with construction operations. Site hoarding also performs an important function in relation to minimising some of the potential environmental impacts associated with construction, namely noise, visual impact, and dust deposition.

Hoarding will be established around the site construction area before any significant construction activity takes place. Hoarding will be established such that maximum pedestrian access will be maintained around the works area. Hoardings works will be of the same nature as that carried out for similar operations at most urban construction and building sites.

Construction lighting will be powered by mains supplies or diesel generators where an electrical supply is not available and will be positioned and angled downwards to minimise spillage of light from the site. Weather and vandal resistant fluorescent fitting will be installed on hoardings around the construction area to illuminate public walkways.

Construction vehicles will gain access to the site using designated routes and access points such as Dame Street. Further detail on construction traffic and access is provided in Chapter 6 '*Traffic and Transportation*.'

A construction traffic management plan will be developed as required by the Contractor so as to ensure that routes around the works are maintained for pedestrians and vehicles for the duration of the construction works. Refer to Chapter 6 '*Traffic and Transportation*'.

Site Clearance and Excavation

Following erection of hoarding, street furniture, such as cycle features, traffic lights, bins and public lighting columns will be cleared where required from the excavation area and safely stored for reinstatement following the works. The statues of Thomas Davis and Henry Grattan, as well as the Four Angels Fountain will also be safely stored for reinstatement.

It is proposed to remove eight trees from the area of the traffic island at the Grattan and Davis Statues. It is proposed to retain the distinguished Plane trees in Foster Place South. Measures will be put in place to protect all retained trees.

Detailed surveys of existing underground utilities have been carried out by TST Engineering on behalf of DCC to determine if underground services are present in the area of the proposed works. In addition, areas to be excavated for utility trenches and the underground control chamber for the fountains will be scanned using a CAT scanner or similar utility scanning techniques to identify the location of any live cables prior to any excavation works commencing. All service diversions will be carried out in consultation with the relevant utility companies. The Contractor will as appropriate submit diversion proposals to the relevant utility company for their consideration prior to works being carried out.

Footpath and road surfacing will be broken by either manual or mechanical means and disposed of appropriately or stored for reuse. Trenches excavated for utility diversions will be supported to ensure that the sides of the excavation are secure. New utility ducts and pipes will be laid in an open cut trench with any existing utilities crossing the diversion trench protected and supported. Ducting, pipework, manholes, and chambers will be constructed to the utility owner specification and the trench then backfilled.

A significant proportion of the surplus excavation material from the project will consist of soil and stones which may be accepted for recovery or recycling at waste licenced and permitted facilities.

Excavation will be typically carried out using large tracked excavators where cut and re-profiling works are carried out on site. Material to be taken off site will be transferred to trucks for onward transportation to the disposal recovery site as soon as possible following excavation in order to minimise the amount of excavated material being stored on-site. In addition, materials required for the works will be delivered on a 'just in time basis' so as to minimise storage of materials on site.

Archaeological monitoring of earthmoving works for site preparation will be undertaken to ensure that any features of an archaeological nature that may be revealed are identified, recorded and fully resolved. Hoardings, additional support and temporary weathering will be provided, if required for protected structures on site.

Chapter 12, '*Soils, Geology, Hydrogeology and Hydrology*' provides detailed information on excavation material and mineralogy. Chapter 13, '*Resource and Waste Management*' contains more detailed information on Resource and Waste Management associated with the project.

Provision of Services

Following on from completion of site clearance and excavation, construction activities will focus on the installation/diversions of underground utilities to provide the infrastructure required for drainage, electricity and telecommunications.

Detailed surveys of existing underground utilities have been carried out on behalf of DCC. This survey information, together with information provided by the individual utility providers will be used to highlight the scope of early enabling works where service isolation or diversions may be required.

Installation of underground services within the civic plaza will be carried out including a new public lighting regime, as well as new traffic communications and electricity ducting, and the provision of the underground control chamber for fountains. Localised diversion of services will also be required.

A specific works installation plan and sequence will be developed by the Contractor in advance of commencement of these works. This plan will ensure that particular consideration is given to the sequence of excavations, consultation with utility providers and the phased completion of works in each area to ensure a sequenced handover of the completed installation.

While the existing drainage regime at College Green is being retained, it is intended to complement the existing system with the installation of a Sustainable Urban Drainage System (SuDS), where possible. These SuDS features will consist of new attenuation/infiltration areas filled with crushed stone or soil. These will predominately be located beneath the proposed trees. New gullies will be arranged such that overflow from these attenuation/ infiltration areas will discharge to the piped surface water drainage system. Some new gully connections will be required, and these will connect to the existing surface water infrastructure, either directly, or via small collector pipes to a single discharge point.

A drainage channel will be installed around the proposed fountain installation to harvest rainwater and to return water from the fountains to the water pumps in the proposed underground control chamber.

This channel will consist of precast drainage units covered by a continuous steel grating. Small connector pipes (c. 150mm) will connect the low points in the drainage channel to the control chamber.

Construction of Civic Plaza

Construction of the civic plaza will involve the construction of the hard landscape throughout the site. Light and dark granite setts will be laid in the central area. The original setts located at Foster Place will be removed, stored (on/off-site) and reinstated. A turning circle will be constructed opposite Foster Place which will act as a bus/car turning point.

The construction of the soft landscape will be integrated with completion works on elements of hard landscape.

Replacement of Street Furniture and Statues, and Replanting

The final phase of the construction works will involve the replacement /placement of street furniture including seating, litter bins, bollards, cycle stands, lighting planters and tree grilles.

The monuments of Henry Grattan and Thomas Davis will be repositioned to the locations.

The final phase of the construction works will also involve the planting of 22 new plane trees.

Water Management

Site drainage will be provided to collect surface runoff prior to discharge to the local drainage network – all in accordance with the necessary Dublin City Council approval.

Employment and Accommodation

The construction workforce numbers will vary depending on the construction stage of the project. However, it is anticipated that at the peak of construction there will be an average construction workforce of approximately 50 people employed on site.

Hours of Working

Normal working hours during the construction phase will be as follows:

Start	Finish	
0700	1800	Monday to Friday
0800	1400	Saturday

However, it may be necessary to work outside of these hours at night and at weekends during certain activities and stages of the development.

Community Liaison During Construction

During the construction phase, site management measures including proactive communication with business and public regarding phasing, extent and duration of works will be carried out by the Contractor. Access to all properties will be maintained during the construction phase. Signage and hoarding will be provided as necessary.

A4.1.3 Construction Health and Safety

Health and Safety

The Contractor will be required to ensure all Health & Safety requirements are agreed with Dublin City Council. This is to protect the public who will be accessing College Green during the construction phase of the works and will include all suitable temporary signage, barriers and hoarding as necessary.

All construction staff and operatives will be inducted into the security, health and safety and logistic requirements on site prior to commencing work.

All contractors will be required to progress their works with reasonable skill, care and diligence and to proactively manage the works in a manner most likely to ensure the safety, health and welfare of those carrying out construction works, all other persons accessing College Green and interacting stakeholders.

Contractors will also have to ensure that, as a minimum, all aspects of their works and project facilities comply with legislation, good industry practice and all necessary consents.

Particular cognisance will be taken by the contractor to managing the use of machinery in a public environment.

The requirements of the Safety, Health and Welfare at Work Act 2005, the Safety, Health and Welfare at Work (Construction) Regulations, 2006 and other relevant Irish and EU safety legislation will be complied with at all times.

As required by the Regulations, a Health and Safety Plan will be formulated which will address health and safety issues from the design stages through to completion of the construction and maintenance phases. This plan will be reviewed and updated as required, as the development progresses.

In accordance with the Regulations, a “Project Supervisor Construction Stage” will be appointed as appropriate. The Project Supervisor Construction Stage will assemble the Safety File as the project progresses.

Emergency Response Provision

The Contractor will maintain an emergency response action plan which will cover all foreseeable risks, i.e. fire, spill, flood, etc. Appropriate site personnel will be trained as first aiders and fire marshals. In addition, appropriate staff will be trained in environmental issues and spill response procedures.

Equipment and vehicles will be locked, have keys removed and be stored securely in the works area.

Site Management and Security

A Construction Management team will be established for the duration of the construction phase. The team will manage the construction of the Works including monitoring the Contractor's performance to ensure that the proposed construction phase mitigation measures are implemented and that construction impacts and nuisance are minimised.

A Construction Management Plan for the works will be prepared and submitted to the planning authority in advance of any works commencing. This will be updated at each stage of the development as it progresses and will deal with health and safety, security, access to and within the site, entrance and fencing treatment and parking.

The primary function of site security will be to ensure that no unauthorised entry to site occurs. There will be hoarding around the construction sites to minimise the risk of vandalism and unauthorised access.

Environmental Management

Environmental impacts during construction will be mitigated or reduced where possible (refer to the individual chapters in this EIS for specific mitigation measures).

In this regard, Contractors will be required to produce an environmental management plan for DCC approval prior to commencing any works on site. The Contractor's CEMP will be a development of this outline CEMP.

This plan will deal with issues such as noise and dust mitigation measures, hours of operation, traffic management, waste management, environmental management (including debris from construction traffic, noise, dust, air quality and the like), demolition, protection of trees, works to protected structures, etc.

Construction and Demolition Waste Management Plan

Resource and waste generation during construction will be mitigated and managed where possible. In this regard, Contractors will be required to produce a Construction and Demolition Waste Management Plan (CDWMP) for DCC approval prior to commencing any works on site. The CDWMP will address waste generation and arrangements made for prevention, reuse, recycling disposal and collection of recyclables and wastes.

The outline CDWMP was prepared in line with the DoEHLG Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects.

The following is an indicative list on the content of a CDWMP:

- Description of the Project;
- Wastes Arising Including Proposals for Minimisation/Reuse/Recycling;
- Procedures for prevention, reuse and recycling of wastes

- Estimated Cost of Waste Management;
- Roles including Training and Responsibilities for C&D Waste;
- Procedures for education of workforce and plan dissemination programme
- Record Keeping Procedures;
- Waste Collectors, Recycling and Disposal Sites Including Copies of Relevant Permits or Licences; and
- Waste auditing protocols.

Using the information identified in this section the Contractor will be required to develop, implement and maintain a CDWMP for the construction phase of the Proposed Project.

A4.1.4 Proposed Mitigation Measures

Traffic and Transportation

General Construction Traffic Strategy

Construction traffic will be limited to certain routes and times of day, with the aim of keeping disruption to existing traffic and public transport to a minimum. To minimise disruption to the local areas, construction traffic volumes will be managed through the following measures which include:

- During peak hours, ancillary, maintenance and other site vehicles movements will be discouraged.
- Daily construction programmes will be planned to minimise the number of disruptions to surrounding streets by staggering HGV movements to avoid site queues.
- No car parking will be provided on site for staff.
- The Contractor will be required to promote travel by sustainable modes of transport. A framework mobility management plan is presented later in this section.

Hours of Working

Construction operations on site will generally be between the hours of 07:00 and 19:00, Monday to Friday, and 08:00 to 14:00 on Saturdays. Similarly, deliveries of materials to site will generally be between the hours of 07:00 and 19:00, Monday to Friday, and 07:00 to 14:00 on Saturdays. However, it is acknowledged that works outside of these hours will be required on occasion. Any works proposed outside the core site hours

The construction shift times will ensure any staff travelling to the site by car will have limited impact on the peak periods of 08:00-09:00 in the morning and 17:00-18:00 in the evening as it is envisaged most construction staff will arrive to work before 08:00 in the morning and leave after 18:00 in the evening.

Construction Traffic Management Plan

As part of the construction works the appointed Contractor shall prepare a Construction Traffic Management Plan (CTMP) which will outline their approach to the Proposed Project and detail potential impacts for the public road system. This will include provision of transport facilities and encouragement of car sharing for staff. It will also include measures to mitigate any potential noise and air quality impacts resulting from construction activities, namely from traffic movements in and out of the site.

The CTMP will provide details of intended construction practice for the development, including:

- Location of the site and materials compound(s) including area(s) identified for the storage of construction refuse.
- Location of areas for construction site offices and staff facilities.
- Details of site security fencing and hoardings.
- Details of pedestrian routes through College Green.
- Details of the timing and routing of construction traffic to and from the construction site and associated directional signage, to include proposals to facilitate the delivery of abnormal loads to the site.
- Measures to obviate queuing of construction traffic on the adjoining road network.
- Measures to prevent the spillage or deposit of clay, rubble or other debris on the public road network.
- Alternative arrangements to be put in place for pedestrians and vehicles in the case of the closure of any public road or footpath during the course of site development works.
- Details of appropriate mitigation measures for noise, dust and vibration, and monitoring of such levels.
- Containment of all construction-related fuel and oil within specially constructed bunds to ensure that fuel spillages are fully contained. Such bunds shall be roofed to exclude rainwater.
- Off-site disposal of construction/demolition waste and details of how it is proposed to manage excavated soil.
- Means to ensure that surface water run-off is controlled such that no silt or other pollutants enter local surface water sewers or drains.
- The CTMP will be agreed with both Dublin City Council and An Garda Síochána, prior to commencement of works.

Mobility Management

The Contractor will be required as part of the contract to introduce a Mobility Management Plan (MMP) for its workforce to encourage access to the site by means other than by private car. The following section identifies some of the

measures the Contractor will provide as part of the MMP. The Mobility Management Plan will form part of the Construction Traffic Management Plan and will be agreed with KCC prior to works beginning on site.

Cycling: Cycle parking spaces will be provided on the site for construction staff, in addition lockers will be provided to allow cyclists store their cycling clothes.

Car Sharing: Car sharing among the construction staff should be encouraged, especially from areas where construction staff may be clustered. The Contractor will aim to organise shifts in accordance to staff origins, hence enabling higher levels of car sharing. Such a measure offers a significant opportunity to reduce the proportion of construction staff driving to the off-site car parking facility, and will minimise the potential traffic impact on the road network surrounding this facility

Public Transport: The Contractor will issue an information leaflet to all staff as part of their induction on site highlighting the location of the numerous bus routes that operate in the vicinity of the site. The Contractor will also offer the “Travel to Work Scheme” to employees.

Air Quality and Climate

In order to ensure that no dust nuisance occurs, a series of measures will be implemented. In summary, the measures which will be implemented will include:

- Vehicles delivering material with dust potential (soil, aggregates) will be enclosed or covered with tarpaulin at all times to restrict the escape of dust.
- Public roads outside the site will be regularly inspected for cleanliness, and cleaned as necessary.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.
- Hoarding will be provided around the construction site.

At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

Construction vehicles, generators etc., may give rise to some CO₂ and N₂O emissions. However, due to short-term and temporary nature of these works the impact on climate will not be significant.

Noise and Vibration

The following section describes typical measures to minimise the potential for noise and vibration disturbance to the surrounding area which will be employed by the Contractor to ensure the construction noise and vibration criteria outlined in **Tables A.4.1** and **Table A.4.2** are not exceeded.

The Contractor will take specific noise abatement measures and comply with the recommendations of BS 5228 and the European Communities (*Noise Emission by Equipment for Use Outdoors*) Regulations, 2001.

BS 5228 includes guidance on several aspects of construction site practices, including, but not limited to:

- Selection of quiet plant and the control of noise sources – the use of proprietary acoustic enclosures and the quietest plant, where possible;
- Selection of the method of excavation to ensure there is no likelihood of structural or cosmetic damage to neighbouring buildings;
- Screening – the effectiveness of screening is based on the location, height and length of the barrier;
- Liaison with the public – a designated liaison officer will be appointed to deal with any complaints relating to noise.

Table A.4.1.1 - BS5228 (Part 1) ABC Assessment Categories and Thresholds (BSI, 2014)

Assessment Category and Threshold Value Period L_{Aeq}	Threshold Value in Decibels (dB)		
	A ^{A)}	B ^{B)}	C ^{C)}
Night (23:00-07:00hrs)	45	50	55
Evening ^{D)}	55	60	65
Day (07:00-19:00hrs)	65	70	75

A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values

B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values

C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category A

D) 19:00 – 23:00hrs weekdays, 13:00-23:00hrs Saturdays and 07:00-23:00hrs Sundays

Table A.4.1.2 - Noise Limits to be applied based on BS5228 Criteria

Assessment Category and Threshold Value Period L_{Aeq}	Threshold Value in Decibels (dB)
Night (23:00-07:00hrs) (L_{Aeq} , dB)	55
Evening (19:00-23:00hrs) (L_{Aeq} , dB)	65
Day (07:00-19:00hrs) (L_{Aeq} , dB)	75

Biodiversity

Construction management measures specifically related to the protection of surface water quality are listed below:

- Any stockpiles of construction material shall be stored on impermeable surfaces and covered using tarpaulin;

- Good housekeeping (daily site clean-ups, use of disposal bins, etc.) on the site during construction, and the proper use, storage and disposal of these substances and their containers will prevent groundwater contamination;
- For all activities involving the use of potential pollutants or hazardous materials, there will be a requirement to ensure that material such as concrete, fuels, lubricants and hydraulic fluids will be carefully handled and stored to avoid spillages. Potential pollutants shall also be adequately secured against vandalism and will be provided with proper containment according to codes of practice. Any spillages will be immediately contained and contaminated soil removed from the site and properly disposed of;
- The risk of water pollution will be minimised by the implementation of good construction practices. Such practices will include adequate bunding for silos, oil containers, wheel washers and dust suppression on site roads, and regular plant maintenance. The Construction Industry Research and Information Association (CIRIA) provides guidance on the control and management of water pollution from construction sites in their publication Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (Masters – Williams et al, 2001). A contingency plan for pollution emergencies will also be developed by the appointed Contractor prior to the commencement of the works and regularly updated, which will identify the actions to be taken in the event of a pollution incident;
- In accordance with recommendations in the CIRIA document, a contingency plan for pollution emergencies will be prepared which will address the following:
 - Containment measures;
 - Emergency discharge routes;
 - List of appropriate equipment and clean-up materials;
 - Maintenance schedule for equipment;
 - Details of trained staff, location and provision for 24-hour cover;
 - Details of staff responsibilities;
 - Notification procedures to inform the Environmental Protection Agency (EPA) or Environmental Department of the Dublin City Council;
 - Audit and review schedule;
 - Telephone numbers of statutory water consultees; and
 - List of specialist pollution clean-up companies and their telephone numbers.

Archaeology, Cultural Heritage and Architectural Heritage

Archaeology

All ground disturbances associated with the Proposed Project shall be subject to continuous archaeological monitoring. Monitoring will be carried out under licence to the DoAHRRGA in consultation with the National Museum and the Dublin City Archaeologist. Full provision will be made available for the resolution of any archaeological remains that may be discovered (i.e. preservation by record), should this be deemed an appropriate manner in which to proceed.

Furthermore, a suitably qualified archaeologist will be appointed as part of the detailed design team in order to advise on specific potential impacts as and when they may arise. This will result in continuous impact assessment of the detailed works, allowing mitigation measures to be agreed in advance, in full consultation with the statutory bodies.

Architecture

Historic footway to front of Bank of Ireland

During the works to extend the paving across to Grafton Street the adjacent granite paving of the footway to the front of the Bank of Ireland will be protected from damage.

Lamp standards in College Green

The lamp standards will be removed with care, in accordance with a conservation method statement, and put into storage for potential use elsewhere.

Henry Grattan statue

The statue will be moved by a heritage Contractor with experience in moving monuments of this type and in accordance with a conservation method statement.

Thomas Davis plaque

The Thomas Davis plaque will be lifted and reset in accordance with a conservation method statement and the work will be carried out by a heritage Contractor with experience in lifting stones of this type.

Thomas Davis sculpture

The Thomas Davis sculpture assemblage will be lifted and moved in accordance with a conservation method statement and the work will be carried out by a heritage Contractor with experience in working with monuments of this type.

Townscape and Visual

Given that the Proposed Project, once constructed, is considered to have a positive impact on the visual setting of College Green as well as its structure and function

within the context of the surrounding urban fabric, it is not warranted to provide any long term forms of mitigation.

Only during the construction phase is mitigation considered necessary in respect of townscape and visual issues. These relate to ensuring that College Green does not become a place that will be avoided by locals and visitors during the 12-18 month construction period. Effects that could give rise to this situation relate to perceived danger, congestion, way-finding confusion, scattering of dust and debris and overall visual clutter and disharmony. Mitigation to reduce these adverse construction related effects is principally the concern of the Construction and Environmental Management Plan. This will include the form of site hoarding, which in this instance should be solid and well constructed to reduce visibility of the on-going works and will also reduce the noise and dust emissions from the site. It is proposed that the solid hoardings will also include images of the future plaza as this can remind those affected of the long-term benefit of the temporary works. Pedestrian and cycle movement areas will be generous in dimension and clearly presented in terms of directional movement to avoid confusion. Areas outside of the site hoarding will also be kept clear of dust and debris.

Soils, Geology, Hydrogeology and Hydrology

A project-specific Construction Management Plan (CMP) will be prepared and submitted to the planning authority for approval. It will be maintained by the Contractor for the duration of the construction phase. The CMP will cover all potentially polluting activities and include an emergency response procedure. All personnel working on the site will be trained in the implementation of the procedures.

As a minimum, the CMP manual for the Proposed Project site will be formulated in consideration of the standard best practice. The CMP will include a range of site specific measures which will include:

- Earthworks operations shall be carried out such that surfaces shall be designed with adequate falls, profiling and drainage to promote safe run-off and prevent ponding and flooding.
- Run-off will be controlled to minimise the water effects in outfall areas.
- Good housekeeping (site clean-ups, use of disposal bins, etc.) on the site project.

In order to prevent the accidental release of hazardous materials (fuels, cleaning agents, etc.) during construction site activity, all hazardous materials will be stored within secondary containment designed to retain at least 110% of the storage contents. Temporary bunds for oil/diesel storage tanks will be used on the site during the construction phase of the Proposed Project. Safe materials handling of all potentially hazardous materials will be emphasised to all construction personnel employed during this phase of the Proposed Project.

Mitigation during the construction phase will include implementing best practice during excavation works to avoid sediment running into the drainage system which discharges to the River Liffey.

Resource and Waste Management

Construction and Demolition Waste Management Plan

An outline Construction and Demolition Waste Management Plan (CDWMP) is described in section 13.6.1.2. This outline CDWMP plan will be required to be developed into a detailed CDWMP by the Main Contractor(s) following appointment and prior to commencing works on site. The CDWMP addresses waste generation and arrangements made for prevention, reuse, recycling disposal and collection of recyclables and wastes.

The outline CDWMP was prepared in line with the *DoEHLG Best Practise Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects*.

The following is an indicative list on the content of a CDWMP:

- Description of the project;
- Wastes arising including proposals for minimisation/reuse/recycling;
- Procedures for prevention, reuse and recycling of wastes
- Estimated cost of waste management;
- Roles including training and responsibilities for C&D Waste;
- Procedures for education of workforce and plan dissemination programme
- Record keeping procedures;
- Waste collectors, recycling and disposal sites including copies of relevant permits or licences; and
- Waste auditing protocols.

Using the information identified in this section and the outline Construction Environmental Management Plan in Appendix 4.1 as a basis the Contractor will be required to develop, implement and maintain a CDWMP for the construction phase of the Proposed Project.

Construction- General

In addition to the inherent design measures during the construction phase the following mitigation measures are proposed:

- The Contractor will minimise waste disposal so far as is reasonably practicable.
- Waste from the Proposed Project will be transported by authorised waste collectors in accordance with the Waste Management (Collection Permit) Regulations, 2007 as amended.
- Waste from the Proposed Project will be delivered to authorised waste facilities in accordance with the Waste Management Acts 1996 as amended.
- Source Segregation: Where possible metal, timber, glass and other recyclable material will be segregated during construction works and removed off site to

a permitted/licensed facility for recycling. Waste stream colour coding, and photographs of wastes to be placed in each container as required, will be used to facilitate segregation. Where waste generation cannot be avoided this will maximise the quantity and quality of waste delivered for recycling and facilitate its movement up the waste hierarchy away from landfill disposal and reduce its environmental impact:

- Material Management: ‘Just-in-time’ delivery will be used so far as is reasonably practicable to minimise material wastage; and
- Supply Chain Partners: The Contractor will engage with the supply chain to supply products and materials that use minimal packaging, and segregate packaging for reuse.
- Waste Auditing: The Main Contractor will record the quantity in tonnes and types of waste and materials leaving site during the construction phase.
- Material assets – utilities.

The Contractor will be obliged to put measures in place to ensure that there are no interruptions to existing services and all services and utilities are maintained unless this has been agreed in advance with the relevant service provider and local authority.

All works in the vicinity of utilities apparatus will be carried out in ongoing consultation with the relevant utility company and/or local authority and will be in compliance with any requirements or guidelines they may have.

Where new services are required, the Contractor will apply to the relevant utility company for a connection permit where appropriate, and will adhere to their requirements.

Material assets – land use and property

During the construction phase, site management measures including the provision of high quality hoarding and proactive communication with business and public regarding phasing, extent and duration of works will be carried out. Access to all properties will be maintained during the construction phase. Signage will be provided as necessary.

Socio-economics

This assessment, has determined that the negative impact on businesses during the construction will be of slight to moderate negative significance. A broad range of mitigation measures will be implemented for the construction of College Green Plaza and the Proposed Project.

Mitigation measures for traffic/pedestrians relate primarily to maintaining access to businesses, which will minimise disruption during the construction phase. Changes to traffic, public transportation and access to the city core will be clearly communicated to the resident and visiting public.

The capacity for business to be serviced on street, and receive deliveries in limited periods in the day would mitigate the socioeconomic impact of the proposal.

Alternative access arrangements for private cars and buses will mitigate the impact of direct access through College Green.

Luas works will be completed before construction commences on the site to ensure that north-south access by bus and taxis is available. Taxi ranks will be re-located on adjoining streets with no net loss in parking spaces. Changes to operation of services will be clearly communicated to customers and visitors, including on-street signage.

References

Department of Environment Community and Local Government (2006). Best Practice Guidelines on the Preparation of Waste management Plans for Construction and Demolition Projects. DoECLG, Dublin, Ireland.

BS 5228 and the European Communities (*Noise Emission by Equipment for Use Outdoors*) Regulations, 2001.

Masters – Williams et al (2000) Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors