Operational Stage

During the operational stage, the buildings and public realm will be an urban environment, largely covered in roof and hard standing. Some areas with permeable paving, tree pits and green planting will allow for some surface water to permeate the soil. These SuDS devices treat and improve water quality by trapping suspended solids and filtering pollutants before they enter the soil.

No likely significant adverse impacts are predicted on soils or geology.

Worst Case Impact

The worst case scenario would be for contaminated soils to be encountered during the works. As noted above, any contaminated soils encountered will be excavated and disposed of off-site in accordance with the Waste Management Acts, 1998 – 2006, and associated regulations and guidance provided in Guidelines for the Management of Waste from National Road Construction Projects published by the National Roads Authority in 2008.

In the worst case scenario, subsoil may be exposed to inclement weather during construction and may result in the erosion of soils. However, with the proposed mitigation measures the quantity of soils exposed and the duration of that exposure will be minimised.

20.2.3.2 Proposed Development – Site 3, 4 & 5

Construction Stage

The residual impacts for the Proposed Development (Sites 3, 4 and 5) are the same as the residual impacts described for the Dublin Central Masterplan described in Section 7.7.1.1.

Operational Stage

The residual impacts for the Proposed Development (Sites 3, 4 and 5) are the same as the residual impacts described for the Dublin Central Masterplan described in Section 7.7.1.2.

Worst Case Impact

The worst case impact for the Proposed Development (Sites 3, 4 and 5) are the same as the worst case impact described for the Dublin Central Masterplan described in Section 7.7.1.3.

20.2.4 Water (Chapter 8)

20.2.4.1 Dublin Central Masterplan

Water Supply

Construction Stage

Due to the proposed remedial measures outlined above no significant adverse impacts are expected to arise during the construction stage of the implementation of the Dublin Central Masterplan on the water supply network.

Operational Stage

There will be a water demand for the implementation of the Dublin Central Masterplan of approximately 800m^3 per day. Irish Water will confirm whether the existing network has sufficient capacity, or alternatively will outline any upgrades required to facilitate the development.

Foul Water Drainage

Construction Stage

During the construction stage of implementation of the Dublin Central Masterplan some short term negative impacts as identified above may result. However, if the proposed remedial and reductive measures are implemented, the impact of the implementation of the Dublin Central Masterplan during the construction stage will be minimised and **no significant long term impacts** will result from the construction works.

Operational Stage

By removing surface water flows from the combined network, the implementation of the Dublin Central Masterplan will result in a net decrease in the wastewater flows discharging to the existing combined drainage system.

Surface Water Drainage

Construction Stage

During the construction stage of implementation of the Dublin Central Masterplan some short term negative impacts as identified above may result. However, if the proposed remedial and reductive measures are implemented, the impact of the implementation of the Dublin Central Masterplan during the construction stage will be minimised and **no significant long term impacts** will result from the construction works.

Operational Stage

With the implementation of the SuDS treatment train, attenuation and flow control, there will be a net improvement in the quality and a net reduction in the quantity of surface water discharging from the individual site within the Dublin Central Masterplan. The proposal to discharge Site 5 to the existing surface water network, rather than the combined network, will result in a significant decrease in flows to the combined network and a net increase in flows to the surface water network.

No significant adverse impacts are envisaged.

Worst Case Impact

In the worst case scenario, there could be some surface water ingress into the foul water drainage system due to poor workmanship. Leakage from sewers and drains could result in local contamination of soil and ground waters in the area. The runoff from the roads and hardstanding areas will discharge contaminants, including oils and silts, to the surface water system which might result in polluting of the surface water network. However, with the mitigation measures set out above, the likelihood of these impacts will be minimised, and **no significant long term impacts** will result from the development.

20.2.4.2 Proposed Development – Site 3, 4 & 5

Water Supply

The potential impacts on water supply of the Proposed Development (Sites 3, 4 and 5) are the same as the potential impacts of the Dublin Central Masterplan described in Section 8.7.1.1.

Foul Water Drainage

The potential impacts on foul water drainage of the Proposed Development (Sites 3, 4 and 5) are the same as the potential impacts of the Dublin Central Masterplan described in Section 8.7.1.2.

Surface Water Drainage

The potential impacts on surface water drainage of the Proposed Development (Sites 3, 4 and 5) are the same as the potential impacts of the Dublin Central Masterplan described in Section 8.7.1.3.

Worst Case Impact

The worst case impact of the Proposed Development (Sites 3, 4 and 5) is the same as the do noting impact of the Dublin Central Masterplan described in Section 8.5.1.4.

20.2.5 Climate (Air Quality and Climate Change) (Chapter 9)

20.2.5.1 Dublin Central Masterplan

Construction Stage

Air Quality

In order to minimise dust emissions during construction, a series of mitigation measures have been prepared in the form of a dust minimisation plan which will be incorporated into the construction environmental management plan (CEMP) for the site. Provided the dust minimisation measures outlined in the plan (see Appendix 9.2 and Section 9.6.1.1) are adhered to, the air quality impacts during the construction phase will be short-term, negative, localised and imperceptible.

Construction traffic emissions will have a **long-term, localised, negative** and **imperceptible** impact on air quality.

Climate

According to the IAQM guidance (2014) site traffic and plant are unlikely to make a significant impact on climate during the construction phase. Therefore, the potential impact on climate is considered to be **imperceptible** and **short-term**.

Human Health

Best practice mitigation measures are proposed for the construction phase of the proposed development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health (see Table 9.1). Therefore, the impact of construction of the proposed development is likely to be **negative, short-term** and **imperceptible** with respect to human health.

Operational Stage

Air Quality

As the traffic generated by the proposed development does not meet the criteria detailed in Section 9.2.2.1, for requiring a detailed air quality assessment the impact to air quality from traffic emissions during the operational stage is **neutral, long-term** and **imperceptible**.

Climate

The traffic associated with the operational phase of the proposed development is below the criteria requiring a detailed climate assessment. The impact to climate as a result of traffic emissions is predicted to be **long-term, neutral** and **imperceptible**.

In addition, the proposed development has been designed to reduce the impact to climate where possible through incorporated design measures. Full details of all measures included are outlined within the Energy & Sustainability Statement submitted as part of this planning application.

Human Health

Emissions of air pollutants are predicted to be significantly below the ambient air quality standards which are based on the protection of human health, impacts to human health are **long-term, neutral** and **imperceptible**.

Worst Case Impact

In terms of construction phase impacts, worst-case assumptions regarding volumes of excavation materials and number of vehicle movements have been used in order to determine the highest level of mitigation required in relation to potential dust impacts (see Section 9.5.1.1). The Masterplan development is the worst-case scenario in terms of dust emissions, emissions from each individual phase will be lower than the cumulative masterplan development.

Worst-case traffic data was used in the assessment of construction and operational phase impacts. In addition, conservative background concentrations were used in order to ensure a robust assessment. Thus, the predicted results of the construction and operational stage assessment are worst-case and the significance of effects is most likely overestimated.

20.2.5.2 Proposed Development – Site 3, 4 & 5

Construction Stage

Air Quality

Once the dust minimisation measures outlined in Section 9.6.1.1 and Appendix 9.2 are adhered to, the air quality impacts during the construction phase will be **short-term, negative, localised** and **imperceptible**.

Climate

According to the IAQM guidance (2014) site traffic and plant are unlikely to make a significant impact on climate during the construction phase. Therefore, the potential impact on climate is considered to be **imperceptible** and **short-term**.

Human Health

Best practice mitigation measures are proposed for the construction phase of the proposed development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health (see Table 9.1). Therefore, the impact of construction of the proposed development is likely to be **negative, short-term** and **imperceptible** with respect to human health.

Operational Stage

Air Quality

As the traffic generated by the proposed development does not meet the criteria detailed in Section 9.2.2.1 for requiring a detailed air quality assessment the impact to air quality from traffic emissions during the operational stage is **neutral, long-term** and **imperceptible**.

Climate

The traffic associated with the operational phase of the proposed development is below the criteria requiring a detailed climate assessment. The impact to climate as a result of traffic emissions is predicted to be **long-term, neutral** and **imperceptible**.

In addition, the proposed development has been designed to reduce the impact to climate where possible through incorporated design measures. Full details of all measures included are outlined within the Energy & Sustainability Statement submitted as part of this planning application.

Human Health

Emissions of air pollutants are predicted to be significantly below the ambient air quality standards which are based on the protection of human health, impacts to human health are **long-term, neutral** and **imperceptible**.

Worst Case Impact

The worst case impact described in Section 9.7.1.3 for the development of the Dublin Central Masterplan is also applicable to the proposed development.

20.2.5.3 Cumulative

Construction Stage

The proposed masterplan development will be constructed in a number of phases sites (Site 1 – 5), the construction stage for the individual phases will overlap with each other thus leading to cumulative construction dust emissions. However, a high level of dust control will be implemented across the full masterplan site which will control dust emissions from each phase of the development. Therefore, cumulative dust emissions associated with the full masterplan development will be short-term, localised, negative and imperceptible.

According to the IAQM guidance (2014) should the construction phase of the proposed development or masterplan development coincide with the construction phase of any other development within 350m then there is the potential for cumulative construction dust impacts. However, as stated above a high level of dust control will be implemented across the full masterplan site which will avoid significant dust emissions. Provided these mitigation measures are in place for the duration of the demolition and construction phase cumulative dust related impacts to nearby sensitive receptors are not predicted to be significant. Cumulative impacts to air quality will be short-term, localised, negative and imperceptible.

Due to the short-term duration of the construction phase and the low potential for significant CO_2 and N_2O emissions cumulative impacts to climate are considered neutral.

There are no significant cumulative impacts to air quality or climate predicted for the construction phase.

Operational Stage

The traffic data reviewed for the operational stage impacts to air quality and climate included the cumulative traffic associated with other existing and permitted developments in the local area as well as traffic associated with the full masterplan development. Therefore, the cumulative impact is included within the operational stage impact for the proposed development. The impact is predicted to be long-term, neutral and imperceptible with regards to air quality and climate.

In addition, the proposed masterplan development will facilitate the development of the proposed MetroLink with a station located within the development. The development of the MetroLink, if permitted, will provide for an alternative, more sustainable method of transport in comparison to personal passenger cars. This will result in a positive impact to air quality and climate by reducing emissions associated with cars.

Worst Case Impact

The worst case impact described in Section 9.7.1.3 for the development of the Dublin Central Masterplan is also applicable to the cumulative development.

20.2.6 Climate (Sunlight & Daylight) (Chapter 10)

The scale of the development at Sites 3, 4 & 5 will have a minor impact on the shadow environment but the consequences of this will not be noticeable due to the site orientation and existing urban density of the area.

20.2.7 Air, Noise and Vibration (Chapter 11)

20.2.7.1 Dublin Central Masterplan

Construction Stage

Noise

All cumulative Dublin Central Masterplan construction activities are predicted to exceed the noise threshold value when they occur at the closest proximity to the residential, commercial and clinical receptors closest to the proposed site boundary. However, it should be noted that the assessment can be considered highly worst case and it is unlikely that all items of plant assessed will be in operational simultaneously, or that two adjoining sites of the development will be under construction simultaneously. Additionally, the predictions only indicate a potential significant effect (based on a worst-case scenario) when working at the closest location to the dwellings, with lesser impacts predicted at all other locations across site.

The implementation of the mitigation measures outlined in Section **Error! Reference source not found.**, and detailed in Appendix 11.2, will aim to minimise impact of construction noise experienced at nearby residential, commercial and clinical receivers.

Due to the nature of construction noise and the proximity of noise sensitive receivers, it is predicted the residual construction noise levels will be at or above the relevant noise criteria while works are within 15m of commercial receptors and less than 20m of residential receptors during initial site works. There will be a **negative, moderate to significant** and **short-term** residual noise impact during the initial site works activities at commercial and residential receptors within 10m and 15m respectively.

As the initial construction works move greater than 15m and 20m from commercial and residential receptors respectively, the predicted residual noise levels are at or below the relevant noise criteria but above the existing baseline noise levels, there will be a **negative, slight to moderate** and **short-term** noise impact. As the works move further away than 30m, the predicted noise levels are below the relevant noise criteria and existing baseline noise levels there will be a **neutral, not significant** and **short-term** noise impact.

All commercial receptors are predicted to have residual construction noise levels below the relevant noise criteria during utilities and structural construction works. The closest residential receptors are at 15m distance, which have residual noise levels below the relevant noise criteria during works but above the existing baseline noise level. There will be a **negative, slight to moderate** and **short-term** residual noise impact during the utilities and structural construction works at the commercial and residential receptors within 15m. As the works move further away than 20m from commercial and residential receptors, the predicted residual noise levels are below the relevant noise criteria and existing baseline noise levels there will be a **neutral, not significant** and **short-term** noise impact.

All commercial and residential receptors are predicted to have residual construction noise levels below the relevant noise criteria during general construction work activities and below the existing baseline noise levels. At all commercial and residential receptors there will be a **neutral, not significant** and **short-term** impact during general construction work activities.

The closest clinical receptor is at 20m distance with an existing baseline noise level above 70 dB $L_{Aeq,T}$, therefore there will be a **neutral, not significant** and **short-term** residual noise impact during all works activities at closest boundaries to the clinical receptors.

Vibration

No predicted significant adverse impact arising from vibration during construction provided works are carried out so as to fall under the relevant vibration criteria.

Worst Case Impact

In terms of potential noise and vibration impacts, the assessment has considered a range of worst case scenarios to determine the potential impacts of the proposed development.

During the construction phase, a range of worst case scenarios have been assessed assuming all plant items are operating along the closest noise sensitive boundaries. The assessment has determined impacts associated with these scenarios can be controlled through the best practice measures outlined in 11.6.

Operational Stage

Noise

Mechanical Plant Noise

Once cumulative plant noise emissions from the various sites of the Dublin Central Masterplan are designed to achieve the appropriate noise criteria the cumulative noise impact will be **neutral, imperceptible** and **permanent.**

Entertainment Noise

Once entertainment noise is designed and managed to achieve the criteria set out, i.e. inaudibility, the residual noise impact will be **neutral, imperceptible** and **permanent.**

Delivery and Servicing Traffic

Delivery activity has been considered in the context of the existing environment of a serviced, city centre location. The cumulative noise impact will be **neutral, not significant** and **permanent.**

Inward Noise Impact

With respect to inward noise impacts, the specification of noise mitigation has been recommended so that the internal noise criterion will be met. The residual noise impact will be **neutral, not significant** and **permanent.**

Vibration

There are no significant sources of vibration associated with the operational phases of the Dublin Central Masterplan. There is therefore a **neutral, imperceptible** and **permanent** cumulative impact associated.

20.2.7.2 Proposed Development – Site 3, 4 & 5

Construction Stage

Noise

The implementation of the mitigation measures outlined in Section **Error! Reference source not found.**, and detailed in Appendix 11.2, will aim to minimise impact of construction noise experienced at nearby residential, commercial and clinical receivers.

Due to the nature of construction noise and the proximity of noise sensitive receivers, it is predicted the residual construction noise levels will be at or above the relevant noise criteria while works are within 10m of commercial receptors and 15m of residential receptors during initial site works. There will be a **negative, moderate to significant** and **short-term** residual noise impact during the initial site works activities at commercial and residential receptors within 10m and 15m respectively. When the initial construction works are between 10m to 15m of the commercial receptors the residual noise levels are below the relevant noise criteria but above the existing baseline noise levels, there will be a **negative, slight to moderate** and **short-term** noise impact. As the works move more than 20m from commercial and residential receptors the predicted residual noise levels are below the relevant noise criteria and below the existing baseline noise levels, there will be a **neutral, not significant** and **short-term** noise impact.

All commercial and residential receptors are predicted to have residual construction noise levels below the relevant noise criteria during utilities and structural construction works. At commercial receptors within 10m of the works, the residual construction noise level is predicted above the existing baseline noise level. There will be a **negative, slight to moderate** and **short-term** residual noise impact during works at the commercial receptors within 10m. As the works move further away than 10m from commercial receptors and 15m from the closest residential receptors, the predicted residual noise levels are below the relevant noise criteria and existing baseline noise levels, therefore there will be a **neutral, not significant** and **short-term** noise impact.

All commercial and residential receptors are predicted to have residual construction noise levels below the relevant noise criteria during general construction work activities and below the existing baseline noise levels. At all commercial and residential receptors there will be a **neutral, not significant** and **short-term** impact during general construction work activities.

The closest clinical receptor is at 20m distance with an existing baseline noise level above 70 dB $L_{Aeq,T}$, therefore there will be a **neutral, not significant** and **short-term** residual noise impact during all works activities at closest boundaries to the clinical receptors.

Vibration

No predicted significant adverse impact arising from vibration during construction provided works are carried out so as to fall under the relevant vibration criteria.

Operational Stage

Noise

Mechanical Plant Noise

Once cumulative plant noise emissions from the various sites of the Dublin Central Masterplan are designed to achieve the appropriate noise criteria the cumulative noise impact will be **neutral, imperceptible** and **permanent.**

Entertainment Noise

Once entertainment noise is designed and managed to achieve the criteria set out, i.e. inaudibility, the residual noise impact will be **neutral, imperceptible** and **permanent.**

Delivery and Servicing Traffic

Delivery activity has been considered in the context of the existing environment of a serviced, city centre location. The cumulative noise impact will be **neutral, not significant** and **permanent.**

Inward Noise Impact

With respect to inward noise impacts, the specification of noise mitigation has been recommended so that the internal noise criterion will be met. The residual noise impact will be **neutral, not significant** and **permanent.**

Vibration

There are no significant sources of vibration associated with the operational phases of the Dublin Central Masterplan. There is therefore a **neutral, imperceptible** and **permanent** cumulative impact associated.

20.2.7.3 Cumulative

Construction Stage

The similar magnitude of residual noise and vibration impacts discussed in Section 11.7.1 for the Dublin Central Masterplan are relevant to the cumulative assessment of construction works external to the proposed site given it is anticipated that the same construction noise and vibration criteria would apply to these external construction sites.

Operational Stage

The different sites within the proposed development will be designed so that the cumulative noise emissions from processes and activities are within the relevant noise criteria set out. In the same way, proposed developments external to the proposed development will in turn be designed in order to comply with appropriate noise criteria.

Any major proposed development in close proximity to the proposed development will be required to prepare an EIAR wherein cumulative impacts will also be considered.

20.2.8 Landscape and Visual Impact Assessment (Chapter 12)

20.2.8.1 Dublin Central Masterplan

Not applicable as the Masterplan is still being refined and discussions with the Planning Authority are on-going. Notwithstanding this, as the Masterplan presents an integrated design for a new city quarter, no remedial or reductive measures are likely to be applicable.

20.2.8.2 Proposed Development – Site 3, 4 & 5

Since remedial and reductive measures do not apply, residual impacts will, initially, be as tabulated for potential impacts, above. Reduction in the visibility of the Proposed Development, resulting from the construction of other development, will gradually reduce its visibility and thereby its impacts, whether positive, negative or neutral in character.

Worst Case Impact

The effects considered above represent the 'worst case' scenario.

20.2.9 Material Assets (Transportation) (Chapter 13)

20.2.9.1 Dublin Central Masterplan

Construction Stage

Car Parking

During the Construction Stage, there will be a permanent loss of 160 car parking spaces on the subject site currently accessed from O'Rahilly Parade and Moore Lane. The reduction in car parking is predicted to be a **permanent long-term slight** impact which will be ameliorated by the high provision of public transport in the surrounding area.

Traffic Flow/Speed

The presence of construction traffic on the surrounding streets during the Construction Stage is not expected to lead to significant delays to vehicular traffic including public transport. Construction traffic is predicted to generate a temporary **slight negative, short term** impact during the construction site.

Diversion of Traffic

No traffic diversions are proposed on Parnell Street or O'Connell Street Upper. Local traffic diversions could occur on O'Rahilly Parade, Moore Lane and Henry Place which could lead to a temporary **slight negative, short term** impact during the Construction Stage.

Delays to Public Transport

No delays or disruption to bus or Luas services are predicted. Some delays may occur to bus or Luas services on Parnell Street and O'Connell Street Upper northbound due to construction traffic for Dublin Central using Parnell Street to access the development site. This impact is expected to be **temporary, short-term, slight,** and **negative.**

Capacity of Public Transport

Due to the proposed non-provision of car parking on-site, there is likely to be an increased demand for public transport from construction workers. The impact of the additional passenger demand is expected to be **temporary, short-term, slight,** and **negative.**

Cycle and Pedestrian

During construction works for the installation of underground services on the public streets, temporary facilities will be required to be provided by the main contractor to maintain cycle connectivity and pedestrian access. These facilities will be provided in accordance with the Construction Management & Waste Management Plan and the Construction Traffic Management Plan. The impact is predicted to be **temporary, short-term, slight,** and **negative**.

Overall

Overall, the impact of the Construction Stage on the transportation environment in the area of the subject site is predicted to be **temporary, short-term, slight,** and **negative.**

Operational Stage

Car Parking

The loss of 160 car parking spaces on Moore Lane will result in the permanent loss of car parking revenue to the operators together with an increased demand on other car parking in the surrounding area, primarily off-street. The loss of car parking is likely to be a **permanent, long-term, slight**, and **negative impact** which will be ameliorated by the high provision of public transport in the surrounding area.

Traffic Flow / Speed

No works are proposed to the carriageways or junctions on O'Connell Street Upper, Parnell Street or Moore Street. The results of the traffic modelling undertaken demonstrates that the surrounding street network will operate without any material or significant impact on the road infrastructure. As a result, the Proposed Development is predicted to have a **permanent, neutral, long term slight** and **impact** on traffic flows and speeds on O'Connell Street Upper and Parnell Street.

Diversion of Traffic

No traffic diversions are proposed on Parnell Street or O'Connell Street Upper. Permanent reversal of traffic flow from one-way southbound to one-way northbound is proposed on the northern section of Moore Lane. Pedestrianisation is proposed on Henry Place and on the southern section of Moore Lane. These changes are predicted to have a **permanent, long term, moderate** and **positive impact** on the transportation network.

Delays to Public Transport

No delays or disruption to bus or Luas services are predicted. The impact of the development is predicted to be **permanent, long term, imperceptible** and **neutral.**

Capacity of Public Transport

The commissioning of Metrolink and the high level of public transport usage by staff, guests, and residents at Dublin Central are predicted to **create a permanent, long term, significant** and **positive impact** on public transport in the City Centre.

Cycle and Pedestrian

The proposed pedestrian area on Moore Lane and Henry Place in conjunction with the extensive provision of cycle parking are predicted to create **a permanent, long term, significant** and **positive impact** on the pedestrian and cycle environment in the City Centre.

Overall

Overall, the impact of the Operational Stage on the transportation environment in the area of the subject site is predicted to be **permanent, long-term, slight**, and **positive.**

20.2.9.2 Cumulative Development

Construction Stage

The Residual Impact for the Cumulative Development arising from the Construction Stage will be the same as the Residual Impact for the Proposed Development described in Section 13.7.1.1

Operational Stage

The Residual Impact for the Cumulative Development arising from the Operational Stage will be the same as the Residual Impact for the Proposed Development described in Section 13.7.1.2.

Worst Case Impact

Where the various mitigation measures (ameliorative, remedial, reductive, and monitoring) described in Section 13.6 are not implemented correctly or fail, the proposal is likely to have to be a **negative short-term moderate impact** on the transportation environment during the Construction Stage and **a negative long term slight impact** on the transportation environment during the Operational Stage.

20.2.9.3 Proposed Development – Site 3, 4 & 5

Construction Stage

The Residual Impact for the Proposed Development arising from the Construction Stage of the Proposed Development (Sites 3, 4 and 5) will be the same as the Residual Impact for the Proposed Development (Dublin Central Masterplan) described in Section 13.7.1.1.

Operational Stage

The Residual Impact for the Cumulative Development arising from the Operational Stage of the Proposed Development (Sites 3, 4 and 5) will be the same as the Residual Impact for the Proposed Development (Dublin Central Masterplan) described in Section 13.7.1.2.

20.2.9.4 Cumulative Development

Construction Stage

The Residual Impact for the Cumulative Development arising from the Construction Stage of the Proposed Development (Sites 3, 4 and 5) will be the same as the Residual Impact for the Cumulative Development (Dublin Central Masterplan) described in Section 13.7.1.1.

Operational Stage

The Residual Impact for the Cumulative Development arising from the Operational Stage of the Proposed Development (Sites 3, 4 and 5) will be the same as the Residual Impact for the Proposed Development (Dublin Central Masterplan) described in Section 13.7.1.2.

Worst Case Impact

The Worst-Case Impact for the Cumulative Development arising from the Operational Stage of the Proposed Development (Sites 3, 4 and 5) will be the same as the Worst-Case Impact for the Proposed Development (Dublin Central Masterplan) described in Section 13.7.1.4.

20.2.10 Material Assets (Waste) (Chapter 14)

20.2.10.1 Dublin Central Masterplan

Construction Stage

A carefully planned approach to waste management as set out in Section 14.6 and adherence to the C&D WMP during the demolition, excavation and construction phase will ensure that the effect on the environment will be **short-term, imperceptible** and **neutral.**

Operational Stage

During the operational phase, a structured approach to waste management as set out in Section 14.6 and adherence to the OWMP will promote resource efficiency and waste minimisation. Provided the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted effect of the operational phase on the environment will be **long-term**, **imperceptible** and **neutral**.

Worst Case Impact

In a worst-case scenario, if no mitigation measures found in section 14.6 in chapter 14 are followed, poor onsite waste management, non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste offsite and result in negative environmental impacts or pollution as shown in section 14.5.

20.2.10.2 Proposed Development – Site 3, 4 & 5

Construction Stage

A carefully planned approach to waste management as set out in Section 14.6 and adherence to the C&D WMP during the demolition, excavation and construction phase will ensure that the effect on the environment will be **short-term, imperceptible** and **neutral.**

Operational Stage

During the operational phase, a structured approach to waste management as set out in Section 14.6 and adherence to the OWMP will promote resource efficiency and waste minimisation. Provided the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted effect of the operational phase on the environment will be **long-term, imperceptible** and **neutral.**

Worst Case Impact

In a worst-case scenario, if no mitigation measures found in section 14.6 are followed, poor onsite waste management, non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste offsite and result in negative environmental impacts or pollution as shown in section 14.5.

20.2.10.3 Cumulative

Construction Stage

During the demolition, excavation and construction phase waste management will be carefully managed as set out in Section 14.6 and the C&D WMP. Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise / mitigate any potential cumulative impacts associated with waste generation and waste management. As such it is considered that the cumulative effect relating to waste management will be short-term, imperceptible and neutral.

Operational Stage

During the Operational phase waste management will be carefully managed as set out in Section 14.6 and the OWMP. Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise / mitigate any potential cumulative impacts associated with waste generation and waste management. As such it is considered that the cumulative effect relating to waste management will be long-term, imperceptible and neutral.

Worst Case Impact

In a worst-case scenario, if no mitigation measures found in section 14.6 are followed, poor onsite waste management, non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste offsite and result in negative environmental impacts or pollution as shown in section 14.5.

20.2.11 Cultural Heritage (Architectural) (Chapter 15)

20.2.11.1 Dublin Central Masterplan

Construction Stage

A key residual impact is the possibility of accidental/ unforeseen permanent loss during the construction stage, of architectural heritage cited as having significance and intended to be retained as part of the proposed development.

A less tangible residual impact following the commencement of the development of the Masterplan is economic uncertainty or a continuing Covid pandemic-scenario arising in the temporary or prolonged cessation of works, leaving historic fabric more vulnerable than it is currently.

The proposed development has been designed so that on commencement of the Masterplan development, both risks are mitigated against in the certainty of funding and in the natural elimination of the pandemic.

Worst Case Impact

A worst-case scenario would be the permanent loss of architectural heritage of significance as a consequence of the development.

A further detriment for the delivery of the Masterplan would be for the works to permanently cease as a consequence of long-term economic impacts.

Operational Stage

The viability of the Masterplan development at operational stage is dependent on the prosperity of the community for which it is intended to be delivered. In the event of a recession, and piecemeal occupancy – the vitality of the scheme and long term securing of its architectural heritage would be impacted. A positive residual impact, even in the event of a future recession, would be the securing of that same architectural heritage at construction stage, overcoming the current status of incremental decline.

Worst Case Impact

A worst case impact for the Masterplan is partial, yet incomplete development, arising in further incremental erosion of the character of the ACA and its architecturally significant buildings.

20.2.11.2 Residual Impacts Envisaged for the Development of Site 3

Construction Stage

A final stage of recording the building ranges following clearance of each building is proposed. Residual impacts, following this second stage of recording is limited to the physical removal of fabric identified for demolition and disruption arising therefrom, which has been anticipated in the Construction Management Plan accompanying this submission prepared by Waterman Moylan Consulting Engineers Limited and Waterman Structures Limited with inputs by Ms. Lisa Edden, specialist conservation engineer of CORA.

As careful management of the demolition process will ensure the protection of the adjoining retained fabric, no further residual impacts are envisaged.

Worst Case Impact

No worst case residual impact is envisaged as arising at construction stage, if all mitigation measures proposed are adopted.

Operational Stage

The impact of an altered external urban context is offset against the benefit of a much needed renewal of this urban block.

It is possible that material impacts arising from the generation of infill fabric to the rear of retained facades might emerge over time, such as cracking of masonry or the build-up of condensation at interstitial layers, arising in efflorescence in masonry.

Worst Case Impact

A detailed analysis of the building fabric will be possible prior to construction, by which time a site specific design for the provision of new structures behind existing, provision of insulation and breather membranes can be resolved- all mitigating against the risk of a residual impact arising from the technical detailing of retained facades.

20.2.11.3 Residual Impacts Envisaged for the Development of Site 4

Construction Stage

The sensitivity of constructing this development will not easily tolerate residual impacts. As a consequence, it is hoped that additional future impacts for the National Monument and retained structures of heritage significance within Site 4 can be predicted at Ministerial Consent stage, or immediately following commencement of work, where carefully considered amendments to a future consent can be sought, if necessary. As a consequence of an avoidance of residual impacts, none are envisaged as arising.

Operational Stage

The terraced, multi-occupancy context of buildings north and south of the National Monument will inevitably arise in a possible residual risk of damage occurring from within properties adjacent. Every effort must be taken to secure the long term integrity of boundary conditions to mitigate against operational stage risks, by way of quality alarm systems and regular maintenance.

The same conditions will arise in respect of retained fabric, within Site 4, where buildings will be occupied by multiple tenants of differing profiles. It is essential that all properties within the development at Site 4 are subject to strictly observed and implemented monitoring, inspections and maintenance to ensure that all historic fabric within and adjoining the site is safeguarded.

Worst Case Impact

A worst case impact for fabric of heritage significance within and abounding the development site is the occurrence of damage spreading from one property to another. As cited for the Operational Stage of Site 4, above, it is imperative that an effective management plan for the future occupancy of the development is implemented, to mitigate risks of emergence of worst case impacts.

20.2.11.4 Residual Impacts Envisaged for the Development of Site 5

Construction Stage

No architectural heritage residual impacts are envisaged as arising from the construction stage development of Site 5.

Operational Stage

No architectural heritage residual impacts are envisaged as arising from the operational stage development of Site 5.

Worst Case Impact

No architectural heritage worst case residual impacts are envisaged as arising from the development of Site 5.

20.2.11.5 Cumulative

Construction Stage

At construction stage, existing streetscapes offered by the combined sites, that presently define the architectural setting of the site from within the public realm will be temporarily supplemented with hoarding to overcome possible environmental changes arising from the works. Methodologies for consolidation and repair of shared boundaries will be executed in order to maintain their integrity and mitigate risks arising from the works.

Operational Stage

On completion of the development, the cumulative impact of the combined development on the enclosing urban environs will be considerable. The Masterplan site has, since its origins, not known a period of decline as it has experienced since the early 1980s, particularly in the context of the rest of the city, which has, in the round, improved markedly over the intervening period. That same environment has withstood the perceived hostility of urban decay as now defining its urban character.

Notwithstanding the inevitable change in character, other large-scale schemes have been constructed in the vicinity of the Masterplan area, all contributing collectively to the increasingly 20th century character of the townscape which has proven that it can tolerate and indeed embrace structures of scale and contrasting design.

It follows that the site's redevelopment, whilst maintaining the urban character will seek to exploit its scale, street frontage and historical pattern of diverse and successive redevelopment, in the generation of a more ambitious scheme than presently exists.

The Masterplan site's changing chronology over time introduced, at each successive stage of development, buildings of scale, density and architectural treatment, radically contrasting with the smaller scale residential character of 18th and 19th century buildings in the vicinity. At each stage, the enclosing urban environs embraced an evolving character.

The cumulative impact of building on a tradition of ambitious development on this site is thus held to be lessened on account of the site's existing and past morphological character, and how that same character was accommodated by its enclosing environs on account of the proportions of the enclosing streets and internal laneways, and a passive interaction with same.

Worst Case Impact

A worst case impact for the development of Sites 3, 4 and 5 would be in prolonging their development further, which in time would create a challenge for the presentation of the heritage significance of Moore Street and its National Monument that might not be possible to overcome in isolation of the development of these sites.

20.2.12 Cultural Heritage (Archaeology) (Chapter 16)

20.2.12.1 Dublin Central Masterplan

Construction Stage

Following the implementation of an approved programme of mitigation, any impact on archaeological soils, finds or features identified within the Dublin Central Masterplan area lands will be resolved in consultation with the relevant authorities during the course of the project. There will therefore be no residual impacts on the archaeological resource. A beneficial residual impact will be the increased knowledge of the archaeology of this part of Dublin City.

A beneficial residual impact will be the increased knowledge of the archaeology of this part of Dublin City.

Operational Stage

There will be no residual impact on the archaeological heritage during the operational stage of the development.

Worst Case Impact

There is no worst case residual impact on the site.

20.2.12.2 Proposed Development – Site 3, 4 & 5

Construction Stage

Following the implementation of an approved programme of mitigation, any impact on archaeological soils, finds or features identified within Site 3, Site 4 or Site 5 will be resolved in consultation with the relevant authorities during the course of the project. There will therefore be negligible residual impacts on the archaeological resource.

A beneficial residual impact will be the increased knowledge of the archaeology of this part of Dublin City.

Operational Stage

There will be no residual impact on the archaeological heritage during the operational stage of the development.

Worst Case Impact

There is no worst case residual impact on the site.

20.2.13 Risk Management (Major Accidents & Disasters) (Chapter 17)

The risk of a major accident and / or disaster during the construction phase of the 'Masterplan' and the Proposed Development is considered **low.**

The risk of a major accident and / or disaster during the operational phase of the 'Masterplan' and the Proposed Development is considered **medium.**

21 BIBLIOGRAPHY

Population & Human Health (Chapter 5)

1. Architecture Ireland (2015) The Built Environment and Mental Health
2. Central Statistics Office Ireland (CSO) (2016) Census Results
3. Department of Communications, Climate Action & Environment (2017) Cleaning Our Air – Public Consultation to Inform the Development of a National Clean Air Strategy
4. Department of Health (2018) Health in Ireland, Key Trends.
5. Dublin City Council (2016) Dublin City Local Economic Plan and Community Plan 2016-2022
6. EPA (2017) Guidelines on Information to be Contained in Environmental Impact Assessment Reports (Draft).
7. EPA (2017) Air Quality in Ireland 2018
8. European Commission (2015) Noise Impacts on Health
9. Failte Ireland (2018) Future Supply of Tourist Accommodation in Cork, Galway & Kilkenny – Analysis of visitor accommodation in Cork. Galway & Kilkenny 2018-2022.
10. ISOVARP (2010) Urban Planning and Human Health in the European City – Report to the World Health Organisation
11. NHS (2017) "HUDU Planning for Health: Rapid Health Impact Assessment Tool, April 2017", Healthy Urban Development Unit.
12. The Institute of Public Health in Ireland (2006), Health Effects of the Built Environment: A Review
13. World Health Organisation (2016) Urban Green Spaces and Health – A Review of Evidence
14. World Health Organisation (2011) "Health in the Green Economy: Health C-Benefits of Climate Change Mitigation – Housing Sector".
15. World Health Organisation (2006) Health Effects and Risks of Transport Systems; the Hearths Project

Biodiversity (Chapter 6)

1. Atherton, I., Bosanquet, S. & Lawley, M. (2010) Mosses and Liverworts of Britain and Ireland: A Field Guide. Latimer Trend & Co., Plymouth.
2. CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland. Chartered Institute of Ecology and Environmental Management, Winchester, UK.
3. Collins, J. (ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1
4. Colhoun, K., and Cummins, S. (2013). Birds of Conservation Concern in Ireland 2014-2019. Irish Birds 9: 523-544 (2013).
5. Environmental Protection Agency. (2017) Guidelines on the information to be contained in Environmental Impact Assessment Reports.
6. Fossitt, J.A. (2000) A Guide to Habitats in Ireland. Heritage Council, Kilkenny.
7. Gilbert, G., Gibbons, D.W. & Evans, J. (1998) Bird Monitoring Methods - A Manual of Techniques for Key UK Species. RSPB: Sandy
8. Marnell, F., Looney, D. and Lawton, C. (2019) Ireland Red List No. 12: Terrestrial Mammals. National Parks and Wildlife Service, Department of the Culture, Heritage and the Gaeltacht, Dublin, Ireland

9. National Roads Authority (2009) Guidelines for Assessment of Ecological Impacts of National Road Schemes. National Roads Authority, Dublin.

10. Smith, G.F., O'Donoghue, P., O'Hora, K. & Delaney, E. (2011) Best Practice Guidance for Habitat Survey and Mapping. The Heritage Council Church Lane, Kilkenny, Ireland.

11. Stace, C. (2019) New Flora of the British Isles. 4th Edition. C&M Floristics

12. Sullivan, I. & Lusby, J. (2021). Wildlife in Buildings: Linking our built and natural heritage. BirdWatch Ireland

13. Transport Infrastructure Ireland (2020) The Management of Invasive Alien Plant Species on National Roads – Technical Guidance. Transport Infrastructure Ireland, GE-ENV-01105, December 2020.

14. Weekes, L.C. & FitzPatrick, Ú. (2010) The National Vegetation Database: Guidelines and Standards for the Collection and Storage of Vegetation Data in Ireland. Version 1.0. Irish Wildlife Manuals, No. 49. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Land, Soils and Geology (Chapter 7)

1. Geological Survey Ireland (GSI) Public Data Mapping

2. IGSL Site Investigation Report

3. EPA's Guidance on waste acceptance criteria at authorised soil recovery facilities

4. Waste Management Acts, 1998-2006

5. NRA's Guidelines for the Management of Waste from National Road Construction Projects

6. European Union (Waste Management (Environmental Impact Assessment) Regulations 2020 S.I. 130 of 2020

7. In addition to the sources listed above, design information from the other members of the project team was incorporated in Chapter 7 (Land, Soils and Geology).

Water (Chapter 8)

1. Irish Water's Code of Practice for Water Infrastructure

2. Irish Water's Water Infrastructure Standard Details

3. Irish Water's Code of Practice for Wastewater Infrastructure

4. Irish Water's Wastewater Infrastructure Standard Details

5. Building Regulations Technical Guidance Document H – Drainage and Waste Water Disposal

6. Building Control (Amendment) Regulations (BCAR)

7. Greater Dublin Regional Code of Practice for Drainage Works

8. CIRIA design manual C521

9. Ciria C753 SuDS Manual

10. DEHLG/OPW Guidelines on the Planning Process and Flood Risk Management

11. In addition to the sources listed above, design information from the other members of the project team was incorporated in Chapter 8 (Water).

Climate (Air Quality and Climate Change) (Chapter 9)

1. BRE (2003) Controlling Particles, Vapours & Noise Pollution From Construction Sites

2. Department of the Environment Heritage and Local Government (DEHLG) (2004) Quarries and Ancillary Activities, Guidelines for Planning Authorities

3. Dublin City Council (2018) Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition

4. Dublin City Council and Codema (2019) Dublin City Council Climate Change Action Plan 2019 - 2024

5. Environmental Protection Agency (2015) Advice Notes for Preparing Environmental Impact Statements – Draft

6. Environmental Protection Agency (2017) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports - Draft

7. Environmental Protection Agency (2020a) Air Quality Monitoring Report 2019 (& previous annual reports)

8. Environmental Protection Agency (2020b) Ireland's Provisional Greenhouse Gas Emissions 1990 – 2019

9. Environmental Protection Agency (2020c) GHG Emissions Projections Report - Ireland's Greenhouse Gas Emissions Projections 2019 - 2040

10. Environmental Protection Agency (2021) EPA website Available at: http://www.epa.ie/whatwedo/monitoring/air/

11. European Commission (2013) Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment

12. German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft

13. Government of Ireland (2015) Climate Action and Low Carbon Development Act

14. Government of Ireland (2019) Climate Action Plan 2019

15. Government of Ireland (2020) Draft General Scheme of the Climate Action (Amendment) Bill 2019

16. Government of Ireland (2021) Climate Action and Low Carbon Development (Amendment) Bill 2021

17. Institute of Air Quality Management (IAQM) (2016) Guidance on the Assessment of Dust from Demolition and Construction Version 1.1

18. Met Éireann (2021) Met Eireann website: https://www.met.ie/

19. The Scottish Office (1996) Planning Advice Note PAN50 Annex B: Controlling The Environmental Effects Of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings

20. Transport Infrastructure Ireland (2011) Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes

21. UK Highways Agency (2007) Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1 - HA207/07 (Document & Calculation Spreadsheet)

22. UK Highways Agency (2019a) UK Design Manual for Roads and Bridges (DMRB), Volume 11, Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 1 LA 105 Air quality

23. UK Highways Agency (2019b) UK Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 14 LA 114 Climate

24. UK Office of Deputy Prime Minister (2002) Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance

25. USEPA (1997) Fugitive Dust Technical Information Document for the Best Available Control Measures

26. World Health Organisation (2006) Air Quality Guidelines - Global Update 2005 (and previous Air Quality Guideline Reports 1999 & 2000)

Climate (Sunlight & Daylight) (Chapter 10)

1. P Littlefair, Site layout planning for daylight and sunlight: a guide to good practice (BRE 209), 12th September 2011, British Research Establishment.

2. British Standards Institute. BS 8206-2:2008 Lighting for Buildings – Code of Practice for Daylighting, 2008, London: BSI.

3. Environmental Protection Agency Ireland, Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, August 2017, EPA.

Air, Noise and Vibration (Chapter 11)

1. EPA Guidelines on the Information to be contained in Environmental Impact Statements, (EPA, 2002);

2. EPA Advice Notes on Current Practice (in the preparation of Environmental Impact Statements), (EPA, 2003);

3. EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports, (Draft August 2017);

4. EPA Advice Notes for Preparing Environmental Impact Statements, (Draft, September 2015);

5. BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise.

6. BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2 – Vibration.

7. BS 7385-2:1993 Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration;

8. British Standard BS 4142: 2014+A1:2019: Methods for Rating and Assessing Industrial and Commercial Sound.

9. Design Manual for Roads and Bridges, 2011;

10. ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise.

11. World Health Organisation Environmental Noise Guidelines for the European Region, 2018

12. BS 7385. Part 1: Guide for measurement of vibrations and evaluation of their effects on buildings (1990).

13. BS 4142: 2014+A1:2019: Methods for Rating and Assessing Industrial and Commercial Sound.

14. Good Practice Guide on the Control of Noise from Pubs and Clubs (Institute of Acoustics, March 2003).

15. BS ISO 4866: 2010: Mechanical vibration and shock – Vibration of fixed structures – Guidelines for the measurement of vibrations and evaluation of their effects on structures.

16. BS ISO 5348: 1998: Mechanical vibration and shock – Mechanical mounting of accelerometers.

17. Dublin City Council's "Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition".

Landscape and Visual Impact (Chapter 12)

1. Dublin City Council. Dublin City Development Plan 2016-2022.
2. Dublin City Council. O'Connell Street Integrated Area Plan 1998
3. Department of Housing, Planning and Local Government. 2018. Urban Development and Building Heights Guidelines for Planning Authorities. Dublin: Government Publications Office.
4. Department of Arts, Heritage and the Gaeltacht. 2011. Architectural Heritage Protection Guidelines for planning Authorities. Dublin: The Stationery Office.
5. Landscape Institute, Institute of Environment Management & Assessment. 2013. Guidelines for Landscape and Visual Impact Assessment, Third Edition. London and New York: Routledge Taylor & Francis Group.
6. Environmental Protection Agency. 2017. Guidelines on information to be contained in Environmental Impact Assessment Reports DRAFT. Wexford: Environmental Protection Agency.
7. Council Directive 2011/92/EU (on the assessment of the effects of certain public and private projects on the environment) (Official Journal No. L 26, 28.1.2012),
8. Council Directive 14/52/EU (amending Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment) (Official Journal No. L 124/1, 25.4.2014).
9. Environmental Protection Agency. 2002. Guidelines on the Information to be Contained in Environmental Impact Statements. Wexford: Environmental Protection Agency.
10. Environmental Protection Agency. 2003. Advice Notes on Current Practice. Wexford: Environmental Protection Agency.
11. Environmental Protection Agency. 2015. Advice note for Preparing Environmental Impact Statements DRAFT. Wexford: Environmental Protection Agency
12. Warburton, Whitelaw & Walsh. 1818. History of the City of Dublin. London : Printed for T. Cadell and W. Davies.
13. Joyce, Weston St John. 1912. The Neighbourhood of Dublin. Dublin: W.H. Gill & Son Ltd.
14. Irish Architectural Archive. Dictionary of Irish Architects 1720 – 1940.
15. Casey, C. 2005. The Buildings of Ireland: Dublin. New Haven and London: Yale University Press.
16. Abercrombie, S., Kelly, S. & Kelly, A. 1922. Dublin of the Future. Liverpool: University Press of Liverpool.
17. Killanin, Lord & Duignan, M. 1962. Shell Guide to Ireland. London: Ebury Press.
18. Peter, A. 1925. Dublin Fragments. Dublin: Hodges Figgis.
19. The Civics Institute of Ireland. 1925. The Dublin Civic Survey. Liverpool: The University Press of Liverpool.
20. Fleming, J. & J. H. 1803. The Post Chaise Companion Through Ireland. Dublin
21. Maxwell, C. 1936. Dublin under the Georges. London: George G. Harrap & Co Ltd

Material Assets (Transportation) (Chapter 13)

1. Dublin City Development Plan 2016 – 2022.
2. Directions for the Control and Management of Road Works, Dublin City Council, June 2010.
3. HGV Management Strategy, Dublin City Council.
4. Environmental Impact Statement for Dublin Central, October 2008.

5. Construction Methodology and Programme for Dublin Central, March 2008.
6. Traffic Impact Assessment for Dublin Central, October 2008.
7. Environmental Impact Statement for LUAS St Stephens Green – Broombridge (Line BXD), 2010.
8. Metrolink website, 2020.
9. Bus Connects website, 2020.
10. Traffic and Transport Assessment Guidelines, Transport Infrastructure Ireland, May 2014.
11. Preliminary Construction Traffic Management Plan, Dublin Central, Waterman Moylan, April 2021.
12. Preliminary Construction Traffic Management Plan – Sites 3, 4 and 5, Dublin Central, Waterman Moylan, April 2021.
13. Construction Management and Waste Management Plan, Dublin Central, Waterman Moylan, March 2021
14. Travel Plan, Dublin Central, Waterman Moylan, April 2021
15. Servicing Strategy for Dublin Central, Sweco, January 2021.
16. In addition to the sources listed above, a significant amount of design information from the other members of the project team was incorporated in Chapter 13.0 Material Assets (Transportation).

Material Assets (Waste) (Chapter 14)

1. Waste Management Act 1996 (No. 10 of 1996) as amended. Sub-ordinate and associated legislation include:
   - European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011) as amended.
   - Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007) as amended.
   - Waste Management (Facility Permit and Registration) Regulations 2007 (S.I No. 821 of 2007) as amended.
   - Waste Management (Licensing) Regulations 2000 (S.I No. 185 of 2000) as amended.
   - European Union (Packaging) Regulations 2014 (S.I. No. 282 of 2014) as amended.
   - Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997) as amended.
   - Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015).
   - European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014).
   - European Union (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended.
   - Waste Management (Food Waste) Regulations 2009 (S.I. No. 508 of 2009) as amended.
   - European Union (Household Food Waste and Bio-waste) Regulations 2015 (S.I. No. 430 of 2015).
   - Waste Management (Hazardous Waste) Regulations 1998 (S.I. No. 163 of 1998) as amended.
   - Waste Management (Shipments of Waste) Regulations 2007 (S.I. No. 419 of 2007) as amended.

- The European Communities (Transfrontier Shipment of Hazardous Waste) Regulations 1988 (S.I. No. 248 of 1988).
- European Communities (Shipments of Hazardous Waste exclusively within Ireland) Regulations 2011 (S.I. No. 324 of 2011).
- European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015) as amended.

2. Protection of the Environment Act 2003, (No. 27 of 2003) as amended.
3. Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended
4. Eastern-Midlands Region Waste Management Plan 2015 – 2021 (2015).
5. Department of Environment and Local Government (DoELG) Waste Management – Changing Our Ways, A Policy Statement (1998).
6. Forum for the Construction Industry – Recycling of Construction and Demolition Waste.
7. Department of Environment, Communities and Local Government (DoECLG), A Resource Opportunity - Waste Management Policy in Ireland (2012).
8. Department of Environment, Heritage and Local Government, Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (2006).
9. FÁS and the Construction Industry Federation (CIF), Construction and Demolition Waste Management – a handbook for Contractors and Site Managers (2002).
10. Dublin City Council (DCC), Dublin City Council Development Plan 2016-2022 (2015)
11. Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended
12. EPA, Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous (2015)
13. Council Decision 2003/33/EC, establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC.
14. Environmental Protection Agency (EPA), National Waste Database Reports 1998 – 2012.
15. EPA and Galway-Mayo Institute of Technology (GMIT), EPA Research Report 146 – A Review of Design and Construction Waste Management Practices in Selected Case Studies – Lessons Learned (2015).
16. BS 5906:2005 Waste Management in Buildings – Code of Practice.
17. DoEHLG, Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities (2018).
18. DCC, Dublin City Council (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws (2018)
19. Department of Communications, Climate Action and Environment (DCCAE), Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025 (2020).

Cultural Heritage (Architectural) (Chapter 15)

In addition to reports executed for the purposes of the Dublin Central Masterplan Area Conservation Plan; Architectural Heritage Impact Assessments for Sites 3,4 and 5, all their appendices and references to other documents, the following was also consulted: -

1. Bolger, Teresa, 2011 Defining the 'Pill: the contribution of excavations at Ormond Quay Upper to the interpretation of the original topography of the Liffey foreshore", in Medieval Dublin XI pp.161-169, Four Courts Press, Dublin.
2. Branagan, Michael, 2020, Dublin Moving East, 1708-1844, Wordwell.

3. Brady, Joseph, 2004, "Reconstructing Dublin City Centre in the Late 1920s", in Howard B Clarke, Jacinta Prunty and Mark Hennessy, Surveying Ireland's Past: Multidisciplinary Essays in Honour of Anngret Simms, Geography Publications.
4. Burke, John, 1830, A General and Heraldic Dictionary of the Peerage and Baronetage of the British Empire, London.
5. Campbell, Thomas, 1811, City of Dublin, surveyed by Mr Thomas Campbell under the Directions of Major Alexander Taylor.
6. Carey, Tim, 2016, Dublin Since 1922, Hatchette Books, Dublin.
7. Casey, Christine, 2005, The Buildings of Ireland – Dublin, Yale University Press.
8. Carman, John and Patricia, 2006 Bloody Meadows: Investigating Landscapes of Battle, Sutton.
9. Carman, John and Patricia, 2020 Battlefields from Event to Heritage, OUP.
10. Clark, Mary, 2016, The Dublin Civic Portrait Collection – patronage, politics and patriotism, 1603-2013, Four Courts Press.
11. Clarke, H B, 2002, Irish Historic Towns Atlas, Dublin part I, to 1610, Royal Irish Academy.
12. Connell, Joseph E A, 2009, Dublin in Rebellion – a directory 1913-1923, Lilliput Press, Dublin.
13. Coogan, Tim Pat and George Morrison, 1998, The Irish Civil War, Weidenfeld and Nicolson, London.
14. Craig, Maurice, 1980, Dublin 1660-1860, 2nd edition, Allen Figgis.
15. Crowley, John, Donal Ó Driosceoil and Mike Murphy, 2017, Atlas of the Irish Revolution, Cork University Press, Cork.
16. Daly, Mrs James F, 1957, "O'Connell Bridge and its Environs", in Dublin Historical Record, vol. xiv, no. 3.
17. de Courcy, J W, 1996. The Liffey in Dublin, Gill and Macmillan.
18. Dickson, David, 2014, Dublin – the making of a capital city, Profile Books.
19. Doherty, J E and D J Hickey, 1989, A Chronology of Irish History since 1500, Gill and Macmillan, Dublin.
20. Dorney, John, 2017, The Civil War in Dublin – the fight for the Irish capital, 1922-1924, Merrion Press, Newbridge.
21. Dublin Weekly Journal, 1726/7.
22. Dublin Reconstruction (Emergency Provisions) Bill., HC deb 17 August 1916 vol 85 cc2098-118.
23. Evelyn, John, 1661, Fumifugium: or The Inconvenience of the Aer and Smoak of London Dissipated.
24. Fairchild, Thomas, 1722, The City Gardener.
25. Fallon, Las, 2012, Dublin Fire Brigade and the Irish Revolution, South Dublin Libraries, Tallaght.
26. John Ferrar, 1796, A view of ancient and modern Dublin, with its improvements to the year 1796.
27. Ferriter, Diarmaid, 2015, A Nation and Not a Rabble – the Irish revolution 1913-1923, Profile Books, London.
28. Forrest, Mary, 2019, "Street tree planting in 19th and early 20th century Dublin" Irish Forestry, vol 76.
29. Fraser, Murray. 1985, "Public Building and Colonial Policy in Dublin, 1760-1800." Architectural History, vol. 28.

30. Geraghty, Tom and Trevor Whitehead, 2004, The Dublin Fire Brigade – a history of the brigade, the fires & the emergencies, Dublin City Council, Dublin.

31. Gilbert, Sir John and Gilbert, Lady, 1889-1944, Calendar of Ancient Record of Dublin,19 vols., Dublin.

32. Gillis, Liz, 2011, The Fall of Dublin – 28 June to 5 July 1922, Mercier Press, Cork.

33. Gillis, Liz, 2013, Revolution in Dublin – a photographic history, 1913-1923, Mercier Press, Cork.

34. Goodbody, Rob, 2014, Irish Historic Towns Atlas, Dublin part III, 1756-1847, Royal Irish Academy.

35. HM Postmaster General, The Post Office Annual Directory and Calendar, 1843, 1858.

36. Jeffery, Keith, 2006, The GPO and the Easter Rising, Irish Academic Press.

37. Kennerk, Barry, 2003, Moore Street: The Story of Dublin's Market District, Mercier Press.

38. Kearns, George and Patrick Maguire, 2006, A to Z of All Old Dublin Cinemas, published by the authors, Dublin.

39. Kelly, Merlo, 2012, "'Give' and 'take': Luke Gardiner and the making of the north city", in Gillian O'Brien and Finola O'Kane, Portraits of the City – Dublin in the Wider World, Four Courts Press.

40. Kennerk, Barry, 2012, Moore Street – the story of Dublin's market district, Mercier Press, Cork.

41. Longstaffe-Gowan, Todd, 2001, The London Town Garden, Yale University Press

42. Lucey, Conor, 2012, "Building dialectics: negotiating urban scenography in late Georgian Dublin" in Portraits of the City ed Gillian O'Brien and Finola O'Kane, pp.91-109, (Four Courts Press, Dublin)

43. Lennon, Colm, 2008, Irish Historic Towns Atlas, Dublin part II, 1610-1756, Royal Irish Academy.

44. Mac Donncha, Mícheál, 2019, The Mansion House and the Irish Revolution, 1913-1923, Dublin City Council, Dublin.

45. McKellar, Elizabeth, 2013, Landscapes of London, Yale University Press.

46. McManus, Ruth, 2002, Dublin, 1910-1940 – shaping the city and suburbs, Four Courts Press, Dublin.

47. McManus, Ruth and Lisa-Marie Griffith, 2013, Leaders of the City – Dublin's first citizens, 1500-1950, Four Courts Press.

48. McCready, C T, 1892 (1987), Dublin Street Names dated and explained, Carraig Books.

49. McCullough, Niall, 2007, Dublin: An Urban History, 2nd edn., Associated Editions, Dublin.

50. McParland, Edward, 1972, "The Wide Street Commissioners: their importance for Dublin architecture in the late 18th-early 19th century' in Irish Georgian Society Bulliten, XV

51. Morrison, George – photographs in Coogan and Morrison, above.

52. Morrison, Kethryn A., 2003, English Shops and Shopping, Yale University Press.

53. Myles, Franc, Beating the Retreat: The final hours of the Easter Rising.

54. Ó Cionnaith, 2015, Exercise of Authority: Surveyor Thomas Owen and the paving, cleansing and lighting of Georgian Dublin, Dublin City Council/Four Courts Press.

55. O'Dwyer, Frederick, 1981, Lost Dublin, Gill and Macmillan.

56. O'Halpin, Eunan and Daithí Ó Corráin, 2020, The Dead of the Irish Revolution, Yale University Press.

57. Olley, John, 1992, "The Theatre of the City", in Irish Arts Review.

58. O'Neill, Marie, 1994, "Dublin Corporation in the Troubled Times 1914-1924", Dublin Historical Record, vol. 47, no. 1.

59. Ordnance Survey, six-inch map, Dublin sheet 18, 1843-1849.

60. Ordnance Survey, five-foot manuscript map, Dublin sheets 10 and 17, 1838-1843.

61. Ordnance Survey, five-foot map, Dublin sheets 8 and 14, 1847.

62. Ordnance Survey, five-foot map, Dublin sheets 8 and 14, 1864.

63. Ordnance Survey, five-foot map, Dublin sheet XVIII-47, 1891.

64. Ordnance Survey, 1:2500 map, Dublin sheet XVIII-7, 1907.

65. Ordnance Survey, six-inch map, Dublin sheet 18, 1936.

66. Pettigrew and Oulton, Dublin Almanac, various editions, 1834-1849.

67. Registry of Deeds, various deeds.

68. Rippon, Stephen, 2000 The Transformation of Coastal Wetlands Exploitation and management of marshland landscapes.

69. Rowley, Ellen (ed.), 2016, More than Concrete Blocks, Dublin city's twentieth-century buildings, volume 1, 1900-40, Dublin City Council.

70. Rowley, Ellen (ed.), 2019, More than Concrete Blocks, Dublin city's twentieth-century buildings, volume 2, 1940-72, Dublin City Council.

71. Ryan, Brenda, 2019, "The Monument Creamery Ltd (1918-1966) – 100 Year's Anniversary Appreciation", in Dublin Historical Record, vol. 72, no. 2.

72. Scalé, Bernard, 1773, An Accurate Survey of the City and Suburbs of Dublin by Mr. Rocque with Additions, and Improvements, sheet 2.

73. Shaffery Maura 'Sackville / O'Connell Street', GPA Irish Arts Review Yearbook, 1988, pp144-56.

74. Shaw, Henry, 1850, New City Pictorial Directory, 1850, Dublin.

75. Sheridan, Edel, 1993, Dublin and Berlin – a comparative geography of two eighteenth-century European capitals, unpublished PhD thesis, University College, Dublin.

76. Sheridan, Edel, 2001, "Designing the capital city: Dublin c.1660-1810", in Joseph Brady and Anngret Simms, Dublin Through Space and Time, Four Courts Press, Dublin.

77. Spencer Blackett, n.d., The Industries of Dublin, historical, statistical, biographical, London.

78. Stout, Geraldine, (2012) "The topography of St Mary's Cistercian abbey and precinct, Dublin", in Medieval Dublin XII, pp.138-160, Four Courts Press, Dublin.

79. Thick, Malcolm, 1998, The Neat House Gardens: Early Market Gardening Around London, Prospect Books.

80. Thom's Directory, various editions, 1847-2013.

81. Topham Bowden, Charles, 1791, A tour through Ireland.

82. Valuation Office cancelled books, North Dublin, 1855-1965.

83. Wilson, Peter, Dublin Directory, various editions, 1752-1832.

84. Warburton, J., J. Whitelaw and R. Walsh, 1818, History of the City of Dublin,

85. Willes, Margaret, 2014, The Gardens of the British Working Class, Yale University Press.

86. Yeates, Pádraig, 2015, A City in Civil War – Dublin 1921-24, Gill and Macmillan, Dublin.

87. Zimmerman, Mark, 2007, The History of Dublin Cinemas, Nonsuch Publishing, Dublin.

Periodicals

88. Belfast Newsletter Irish Press

89. Cork Examiner Irish Times
90. Drogheda Independent Kerry Weekly Reporter
91. Evening Echo Leinster Leader
92. Evening Herald Meath Chronicle
93. Freemans Journal Nenagh Guardian
94. Irish Builder Southern Star
95. Irish Daily Independent Sunday Independent
96. Irish Independent

Digital Sources

97. American Geological Society Royal Irish Academy
98. Archiseek Royal Society of Antiquaries of Ireland
99. Artic.edu/artworks RTE Archives
100. Britain From Above UCD Digital Library with permission OSi
101. British Library Warhistoryonline.com
102. Buildings of Ireland Wikimedia
103. Census
104. Dictionary of Irish Architects
105. Dublin City Archive & Library
106. Google/Google Earth
107. Harvard University Map Collection
108. Historic England
109. Historic Environments Scotland
110. Imperial War Museum
111. Irish Architectural Archive
112. Irish News Archive
113. Irish Newspaper Archives
114. Irish Times Archive
115. Kilmainham Gaol Archive
116. National Archives
117. National Gallery of Ireland
118. National Library of Ireland
119. National Maritime Museum
120. National Military Archives
121. National Museum of Ireland
122. Norton Group Limited

Cartographic Sources

123. John Rocque Maps: Harvard University, Harvard Map Collection.

124. Scalé Map & Ordinance Survey Maps: UCD Digital Library with permission of OSi.

125. Bernard de Gomme Map: National Maritime Museum, Greenwich London, accessed from Irish Historic Towns Atlas, Dublin part II, Royal Irish Academy.

126. Thomas Phillips Map: British Library, accessed from Irish Historic Towns Atlas, Dublin part II, Royal Irish Academy.

127. Charles Brooking Map: Royal Irish Academy.

128. Chas E Goad: Insurance Map, British Library.

Cultural Heritage (Archaeology) (Chapter 16)

1. Bailey, F. 2020. Archaeological monitoring at 17-19 Moore Lane, Dublin 1. Unpublished Report for IAC Ltd.

2. Bennett, D. 1991 *Encyclopaedia of Dublin,* Gill and Macmillan, Dublin.

3. Brady, J. and Simms, A. (eds) 2001 *Dublin: Through Space and Time,* Four Courts Press, Dublin.

4. Clarke, H. 2002 Dublin*, Part I to 1610*. No. 11. Irish Historic Towns Atlas, Royal Irish Academy, Dublin.

5. Craig, M. 1959 (re-printed1980) *Dublin 1660-1860,* Figgis, Dublin.

6. Courtney Deery Heritage Consultancy. 2011. Dublin Central: 14, 15, 16, 17 Moore street, National Monument, Moore Street, Dublin North City, Co Dublin – Archaeological Method Statement – Ministerial Consent Application. Unpublished report for Courtney Deery Heritage Consultancy Ltd.

7. Courtney Deery Heritage Consultancy. 2012. *13-19 Moore Street, Dublin* 1 Archaeological Heritage Environmental Impact Assessment Report. Unpublished report for Courtney Deery Heritage Consultancy Ltd.

8. De Courcy .1996. *The Liffey in Dublin* Gill & Macmillan Ltd

9. Duffy, P & Ní Cheallacháin, M .2019. Archaeological Assessment at Former Keeling's Site, Little Mary Street, Dublin 7. Unpublished report IAC Ltd.

10. Brady, J. and Simms, A. (eds) 2001.*Dublin: Through Space and Time*, Four Courts Press, Dublin.

11. Coogan T. P (2001) *1916: The Easter Rising*, United Kingdom

12. Royal Irish Academy .2008. Irish Historic Towns Atlas No. 19 Dublin, Part II, 1610 to 1756, RIA, Dublin.

13. Kostick, C. & Collins L . 2000.*The Easter Rising – A Guide to Dublin in 1916*. The O'Brien Press, Dublin.

14. Lennon C. .2008. Irish Historic Towns Atlas No. 19 Dublin Part 1 and II, 1756. Royal Irish Academy in association with Dublin City Council.

15. McCready, C. T. .1892. *Dublin Street Names Dated and Explained*, (Logainm)

16. McCullough, N. .2007. *Dublin: An Urban History*. Anne Street Press, Dublin.

17. McIlreavy, D. (2018). *Archaeological Assessment at 23-28 Parnell Square North, Dublin 1.* Licence no.: 15E0361. Unpublished Report for IAC

18. Myles, F. 2001. The Monument of Light, Nelson's Pillar, O'Connell Street, Dublin, 01E0871. www.excavations.ie

19. Myles, F. with Kerins, P. .2005. Stratigraphic Report O'Connell Street Sub-Station Excavation, Dublin 1, Licence No. 02E1825. Dublin: Unpublished Report by Margaret Gowen & Co. Ltd.

20. Myles, F. and Shaffrey G. 2012. *Application for a Ministerial Consent to carry out works at 14-17 Moore Street, Dublin 1, a National Monument*. Report submitted to the Departments of Arts, Heritage and the Gaeltacht in response to an Additional Information request.

21. O'Donovan, E. 2004.*The National Ballroom, 20-21 Parnell Square, Dublin 1, Excavation Licence 04E0035, Plan Ref: 1429/02*, unpublished archaeological report prepared for Margaret Gowen and Co. Ltd. for Gilroy McMahon Architects on behalf of Dublin City Council.

22. O'Donovan, E. .1999. *Archaeological test excavation of a site bounded by Parnell Street, Moore Street, Moore Lane and O'Rahilly Parade, Co. Dublin*. Unpublished report lodged with the Heritage Service, Department of Arts, Heritage, Gaeltacht and the Islands (February 1999).

23. Pearson, P.2000.The Heart of Dublin: Resurgence of an Historic City, The O'Brien Press, Dublin.

24. Roundtree, S.2007. Dublin Bricks & Brickmakers. Dublin Historical Record, 60(1), 61-70. Retrieved August 13, 2020, from www.jstor.org/stable/30101726

25. Seaver, M. & Kavanagh, L. .2017. *Archaeological excavation report, 14E0004 Utilities at O'Connell St, Marlborough St., County Dublin*, Digital Repository of Ireland [Distributor], Transport Infrastructure Ireland (TII) [Depositing Institution], https://doi.org/10.7486/DRI.9z90gd78z

26. O'Dowd, & Mitchell, N.2017. *Archaeological excavation report, 14E0006 Utilities at Parnell St., County Dublin,* Digital Repository of Ireland [Distributor], Transport Infrastructure Ireland (TII) [Depositing Institution], https://doi.org/10.7486/DRI.b564j646g

27. Myles, Franc and Shaffrey. 2012. Application for a Ministerial Consent to carry out works at 14-17 Moore Street, Dublin 1, a National Monument. Report submitted to the Departments of Arts, Heritage and the *Gaeltacht* in response to an Additional Information request.

28. Pearson, P. .2000. *The Heart of Dublin: Resurgence of an Historic City,* The O'Brien Press, Dublin.

29. Somerville-Large, P. 1979. Dublin. London. Hamilton

30. Simpson, L. 2009 'Archaeological monitoring of enabling works at 40-42 O'Connell Street, Dublin 1 (Licence Ref: 09 E118).

31. Simpson, L..2014a. 'Findings report: archaeological Assessment and supervision of Engineering test-pits at Nos 14-17 Moore Street/8-9 Moore Lane (National Monument and Nos 6-7 Moore Lane. Ministerial Consent C392. Courtney-Deery Heritage Consultancy Ltd.

32. Simpson, Linzi, 2014b., Archaeological assessment of cellars at Nos 8-9 Moore Lane (National Monument) and at Nos 6-7 Moore Lane, Dublin 1 Ministerial Consent No. C392 Courtney Deery Heritage Consultancy Ltd.

33. Simpson, Linzi, 2015a, Archaeology Strategy and Method Statement for construction works at Nos. 14-17 Moore Street (National Monument) Courtney Deery Heritage Consultancy Ltd.

34. Simpson, Linzi, 2015b. Archaeological monitoring during the Essential Works programme at Nos 14-17 Moore Street, Dublin 1 Courtney Deery Heritage Consultancy Ltd.

35. Walker, J. C. (1788) *Historical memoirs of the Irish bards: an historical essay on the dress of the ancient and modern Irish.*

36. Weadick, S. and Deery, S. 2018. *Archaeological Finds Retrieval during the Essential Works Programme at Nos 14-17 Moore Street, Dublin 1, Phase 1 – Report and Preliminary Finds Register*. Courtney Deery Heritage Consultancy Ltd.

Cartographic Sources

37. National Monuments Service (NMS) (2020). Archaeological Survey of Ireland Sites and Monuments Record Database [Online]. Available from https://webgis.archaeology.ie/historicenvironment/

38. Ordnance Survey Ireland (OSI) (2020). Historical maps and aerial imagery [Online]. Available from http://map.geohive.ie/mapviewer.html

39. Irish Historic Towns Atlas No. 19 Dublin, Part II, 1610 to 1756 (2008):

40. Speed's map of Dublin 1610

41. Bernard DeGomme, The City and Suburbs of Dublin, 1673

42. Thomas Philip's Map of Dublin, 1685

43. Charles Brooking's Map of Dublin Bay, 1728

44. John Rocque, Map of Dublin City and its Environs, 1756

45. Bernard Scalé, Map of Dublin City, 1773

46. First edition six inch Ordnance Survey Map (1838-1847)

Risk Management (Major Accidents & Disasters) (Chapter 17)

(1) Department of Defence (2017) A National Risk Assessment for Ireland 2017. Dublin, Ireland.

(2) DoEHLG (2010) A Guide to Risk Assessment in Major Emergency Management. Dublin Ireland.

(3) Directive 2014/52/EU of the European Parliament and the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment.

(4) Environmental Protection Agency. (2014). Guidance on Assessing and Costing Environmental Liabilities.

(5) Environmental Protection Agency. (2017). Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.

(6) European Commission (2017). Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report. Luxemburg.

(7) Government of Ireland (2006) A Framework for Major Emergency Management. Dublin, Ireland.

(8) Government of Ireland (2015) Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015