

Outline Construction, Demolition and Environmental Waste Management Plan

Proposed Residential Development Site at Cross Guns Bridge,
Phibsborough, Dublin 7

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1. Introduction

- 1.1. Waterman Moylan in conjunction with the applicant have prepared the following Outline Construction, Demolition and Environmental Waste Management Plan.

Bindford Ltd. intend to apply to An Bord Pleanála for permission for a strategic housing development at this c. 0.73 ha site at Cross Guns Bridge, Phibsborough, Dublin 7.

The proposal is for a Strategic Housing Development for Build -To-Rent apartments and will comprise the demolition of all derelict buildings on site and the construction of a new residential development comprising 3 no. blocks ranging in height up to 12 storeys consisting of 205 no. dwellings and associated residential amenities, basement and surface carparking with vehicular and pedestrian access from the eastern end of the site off Phibsborough Road. Additional pedestrian only accesses to the north of the site off the Royal Canal Way. A new café/ retail area will be located at ground floor level of block C along with a new public open space to the east of the site. All associated site development works, landscaping and boundary treatment, children's play area, cycle parking, bin stores, substation, and services provision. A full description is set out in the statutory notices.

- 1.2. The plan sets out typical arrangements and measures which may be undertaken during the demolition & construction phases of the project in order to mitigate and minimise disruption / disturbance to the area around the site. The purpose of this report is to summarise the possible impacts and measures to be implemented and to guide the Contractor who will be required to develop and implement the Construction Management Plan on site.

- 1.3. This Outline Construction, Demolition and Environmental Waste Management Plan is indicative only and should not be construed as representing the exact method or sequence in which the demolition & construction works shall be carried out.

As is normal practice, the Main Contractor for the project is responsible for the method in which the demolition and construction works are carried out and to ensure that best practices and all legal obligations including Local Authority requirements and Health and Safety legislation are complied with. The main contractor is also responsible for the design and installation of all temporary works required to complete the permanent works. The plan can be used by the Main Contractor to develop their final construction, demolition and environmental waste management plan. The Applicant reserves the right to deviate from the contents of this Report, while still complying with all relevant Local Authority requirements and legislation.

2. The Site and Surrounding Environs

- 2.1. The site is located in Phibsborough, Dublin 7, bounded to the north by the Royal Canal, to the east by the R108/Phibsborough Road and to the south and west by existing residential developments. The exact site location is shown on Waterman Moylan Drawing No. 20-011-P010.
- 2.2. The existing uses adjoining / adjacent the site include:-
- Commercial and residential buildings

3. The Proposed Development

The development will principally consist of the demolition of the existing derelict industrial structures on site and the provision of a Build-to-Rent residential development comprising 205 No. apartments. The site is approximately 0.73 hectares.

The proposed development includes landscaping (hard and soft), and all associated and ancillary works.

4. The Existing Buildings/Structures

The site comprises of multiple industrial buildings, which were part of a former bakery, and is located adjacent to residential buildings.

The existing buildings/structures on site appear to consist of masonry structures. The existing buildings are disused.

5. General Site Set Up and Pre-Commencement Measures

- 5.1.** Detailed condition surveys (including photographs) may be carried out on certain adjacent / adjoining third party buildings prior to any work being carried out on the site. This will especially apply to the existing residential units immediately adjacent to the site. The purpose of the survey would be to record the condition of the properties before the works commence. Copies of these survey reports would be provided to the third-party owners.
- 5.2.** A detailed condition survey (including photographs) may be carried out on the roads and footpaths surrounding the site. The purpose of the survey would be to record the condition of the streets and footpaths around the site prior to the works commencing.
- 5.3.** A site compound(s) including offices and welfare facilities will be set up by the main contractor in locations to be decided. Initial works will involve erecting an exclusion zone around the perimeter of the working area, this will be complete with heras fencing/hoarding with appropriate signage. All fencing/hoarding will be secured into position and inspected on a regular basis. No access will be permitted into this excluded area unless authorised and accompanied with the Site manager
- 5.4.** Prior to any site/demolition works commencing, the main contractor will investigate / identify the exact location of and tag all existing services and utilities around and through the site with the assistance of the relevant DCC technical divisions and utility companies.
- 5.5.** Typical working hours for the site would be 07.00 to 19.00 Monday to Friday and 07.00 to 14.00 Saturday. No Sunday work will generally be permitted. The above working hours are typical; however, special construction operations may need to be carried out outside these hours in order to minimise disruption to the surrounding area.
- 5.8.** Internally soft strip will be carried out to remove any fixed and not fixed elements such as timber/steel, furniture, free-standing non-load bearing partitions, finishes, fixtures and fittings, and M&E services. Wastes will be categorised, removed and segregated on site for removal to licensed waste facilities.
- 5.9.** An intrusive asbestos survey to identify the presence of any carcinogenic materials will be undertaken. Asbestos Removal will be carried out and completed in accordance with the Safety, Health & welfare at work "Construction Regs" "Working with Asbestos" and HSA Guidelines in asbestos removal.

- 5.10.** Demolition of the building will be accomplished using demolition excavators. Works to commence at roof level and progressively work down through the building in a safe and appropriate manner ensuring that overall building stability is maintained at all times throughout the works.
- 5.11.** All debris will be separated on site and stored in skips for removal to licenced tips or exported where suitable facilities are not available locally. Recycling of materials, such as crushed concrete and steel reinforcement, will be undertaken where appropriate /applicable.
- 5.12.** All demolition works shall be in accordance with the BS Code of Practice for Demolition BS 6187. The design, materials and workmanship of structures incidental to the demolition, and basement excavation, shall be in accordance with the relevant Irish and British Standards. The following standards shall be complied with:
- IS 444 The Use of Structural Timber in Buildings
 - IS 325 Code of Practice for Use of Masonry
 - BS 5228 Code of Practice for Noise Control on Construction and Demolition Sites.
 - BS 5268 Structural Use of Timber.
 - BS 5628 Structural Use of Masonry.
 - BS 5950 Structural Use of Steelwork in Buildings.
 - BS 8004 Foundations.
 - BS 8007 Retaining Structures.
 - BS 8110 Structural Use of Concrete;
- 5.13.** All demolition works, and excavations, shall conform to all relevant legislation, and in particular the legislation dealing with health and safety, safe access, safe places of work and hazardous substances;

6. Construction methodology proposed in order to obviate potential impacts on the integrity of the Royal Canal

The works have been planned in a specific order and is also subject to a certain construction methodology that will ensure potential impacts on the integrity of the Royal Canal is obviated. We would not expect there to be any structural impact to the canal or tow path during or after construction due to this development.

Allowance has been made for the underpinning of the existing retained wall adjacent the canal to prevent undermining the wall foundations during construction and excavation. Requirements and depth of underpinning shall be determined once a site investigation has been undertaken and the depth of the footing to the wall has been surveyed. If underpinning is required, the works will comprise of the following methodology:

- Underpinning will comprise of mass concrete maximum 1m width and cast in a hit-miss alternate sequence to ensure minimum ground movement to the base of the wall.
- During the pit excavation the contractor will use a suitable retention system to prevent any material collapsing into the pit.
- Once the underpin has achieved full strength, any gaps under the wall footing shall be dry-packed. Backing of the workspace shall then occur before the next section of underpin is commenced.

The foundations are to be piled to depths below the canal and designed to ensure there will be no impact to adjacent structures. The piles will be installed using the CFA method to minimise vibration during construction to the surrounding infrastructure and canal.

The contractor shall employ suitable temporary works and retention systems during excavations to minimise the potential for ground movement.

Note the attenuation tank is approx. 10m away from canal edge (8m from the tow-path edge) and the basement approx. 12.5m away from canal edge (10.5m from the tow-path edge).

The proposed sequence of construction for works is as follows:

Block A & C

- Piling: Piles are to be installed at regular centre and expected to reach depth of c. 9m. All new vertical and lateral loads from proposed buildings on site will be directed to lower depths via piles, the Canal and Tow Path will not be subjected to new loads.
- Capping beam: Capping/Ground beam to be constructed in line above piles with starters placed to extend into load bearing walls above
- Ground floor construction: Ground floor slabs to be constructed as part of overall structure procedure

Block B

- Piling: Secant Pile wall to be installed around basement perimeter. Wall is formed by constructing alternative primary and secondary overlapping piles forming a continuous

impervious structure expected to reach depths of c. 12m. All new vertical and lateral loads from proposed buildings on site will be directed to lower depths via piles, the Canal and Tow Path will not be subjected to new loads. The construction of the secant pile wall and capping beam will omit any need for temporary works for the basement excavation.

- Capping beam: Capping beam to be constructed. The construction of the secant pile wall and capping beam will omit any need for temporary works for the basement excavation.
- Excavation (specific to basement): Basement to be excavated to required level
- Internal piling: Internal Piles to be bored and installed with pile caps and edge ground beams formed
- Basement construction: Basement slab to be constructed as part of overall structure procedure with slab spanning between ground beams and pile caps. Columns and Load bearing walls are to be constructed from basement to underside of ground floor slab
- Ground floor construction: Ground floor slabs to be constructed.

Please refer to Waterman Moylan Drawing No. 20-011-WMS-ZZ-ZZ-DR-S-21001 for further details, attached as Appendix A.

7. Site Security and Hoarding Lines

- 7.1.** Hoarding lines and site security will be set up within the development site as required.

Hoarding and security fencing will be required on the public roads during the demolition & construction works and for construction of the new entrance to the site. A detailed traffic management plan will be prepared by the Contractor and agreed with Dublin City Council as the Road Authority prior to commencing works on the public road.

The traffic management plan will identify staging areas, delivery of materials, strategy for large concrete pours, removal of demolition waste, traffic routes etc.

- 7.2.** Access gates will be operated by a flagman who will divert incoming / outgoing vehicles / pedestrians and general traffic, as necessary.

8. Construction Waste Management

8.1. These preliminary Construction Waste Management guidelines will be incorporated into the requirements for the Contractor and the Plan will be developed by the Contractor as the construction progresses.

8.2. Policy and Legislation

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

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

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

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

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

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

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

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

8.4. On site Waste Management

An estimate of the quantities of surplus construction waste and materials which will arise during the course of the construction phase is not confirmed at the time of writing. Construction waste will be categorised as outlined in Table 8.1 below.

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

Table 8.1: Estimated C&D Waste Arising on Site

C & D Waste Material	Quantity (tonnes)
Clay and stones	<i>TBC</i>
Concrete	<i>TBC</i>
Masonry	<i>TBC</i>
Wood	<i>TBC</i>
Packaging	<i>TBC</i>
Hazardous Materials	<i>TBC</i>
Other Waste Materials	<i>TBC</i>
TOTAL ARISING	<i>TBC</i>

8.5. Off Site Waste Management Licensing/Permitting

All waste materials (where necessary, after in-situ reuse and recycling options have been fully considered) shall be disposed of offsite, under the appropriate Duty of Care and subject to approvals/consents from the relevant statutory bodies. It is the responsibility of the Main Contractor to ensure that any company to whom waste is transferred is legally permitted to do so and that the facility they bring the waste to is licensed to handle that type of waste as outlined in the Waste Management Acts 1996-2005. The Waste Collection Permit Register, in accordance with the Waste Management (Collection Permit) (Amendment) Regulations 2016 will be consulted to ensure that waste carriers hold the appropriate permit.

It is anticipated that there is the possibility that waste materials will have to be moved off site due to the proposed demolition works. It is the intention to engage specialist waste service contractors, who will possess the requisite authorisations, for the collection and movement of waste off-site, and to transport the material to a facility which currently holds a Waste Licence, Waste Permit, or Certificate of Registration. Details of waste service contractors and demolitions are not confirmed at the time of writing. The following waste authorisations will be arranged specifically for the project:

Table 8.2.: Specific Waste Authorisations Necessary for the Scheme

Authorisation Type	Specific Need for Project (Yes / No?)
Waste Licence	Yes
Waste Permit	Yes
Waste Collection Permit	Yes
Transfrontier Shipment Notification	No
Movement of Hazardous Waste Form	No

Any wastes that have to be disposed/recycled off site will be transported to the nearest appropriate facility in order to comply with the proximity principle, and reduce the associated emissions from the transportation of waste. The Environmental Protection Agency holds details of waste facilities; which will be consulted where necessary.

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

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

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

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

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

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

In respect of any liquid Disposal including underground water, The Contractor shall carry out appropriate environmental chemistry testing in order to determine whether the liquid

is contaminated or not. The test regime shall be agreed with the receiving disposal facility and the testing shall be carried out by an accredited laboratory.

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

8.6. Appointment of Construction Waste Manager

A Construction Waste Manager shall be appointed from the Contractor's Staff and have overall responsibility for the implementation of the project Waste Management Plan (WMP) during the construction phase. The Construction Waste Manager will be appropriately trained, and assigned the authority to instruct all site personnel to comply with the specific provisions of the WMP. At the operational level, a designated person from the main contractor and from each sub-contractor on the site shall be assigned the direct responsibility to ensure that the operations stated in the WMP are performed on an on-going basis.

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

8.7. Construction Record Keeping

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

It is the duty of the Construction Waste Manager to ensure that necessary licenses have been obtained as needed. Each consignment of construction waste taken from the site will be subject to documentation which will conform with Table 8.3 along with Transportation Dockets to ensure full traceability of the material to its final destination.

Table 8.3.: Details of materials taken from site

Detail	Particulars
Project of Origin	Cross Guns Bridge, Phibsborough, Dublin
Material being Transported	Demolition waste, Soil, Construction waste etc.
Quantity of Material	<i>TBC</i>
Date of Material Movement	<i>TBC</i>
Name of Carrier	<i>TBC</i>

Destination of Material	<i>TBC</i>
Proposed Use	<i>TBC</i>

8.8. Earthworks

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

- The quantity of excavated materials to be removed from or imported in to the site can be greatly reduced, by establishing levels of the proposed buildings which optimise the volume of cut and fill.
- Careful separation of builder's rubble packaging and contaminated waste from re-usable material will result in the minimisation of the disposal of material to landfill.
- Surplus subsoil excavated from the site will be reviewed for possible reuse as engineering fill on adjoining or other construction sites within the region.
- Surplus unsuitable sub-soils generated by excavations on site will be reviewed for reuse as general or non-engineering fills on adjoining or other construction sites within the region.

9. Deliveries and Access

- 9.1** Deliveries and access to the construction site will typically be made via Phibsborough Road subject to agreement with Dublin City Council.
- 9.2.** In the event that large concrete pours are required which may result in congestion at the entrance to the site, the deliveries will be organised such that concrete trucks will queue at a pre-determined staging point and will then be called in by radio as appropriate to the site, via a pre-determined route and to the required access gate.
- Set procedures and designated wash-out areas will be provided, or alternatively vehicle wash-out will be prohibited if a suitable wash-out area is not identified.
- 9.3** All delivery vehicles will be co-ordinated as required by a flagman on duty at the relevant access point.
- 9.4** All large pours will be carefully co-ordinated with the roads department at Dublin City Council.

10. Parking and Storage

- 10.1.** There is limited space to accommodate parking on site. The site is also well served by public transport including Dublin Bus and the Luas. Site management will organise on-site parking, off-site parking and shared car arrangements if required. Due to the proximity of the proposed site along well serviced bus routes, an adjacent Luas stop and also being well served by Dublin Bikes, and cycle lanes, no general car-parking will be provided for operatives on-site.

The development is within an 8-minute walk to the nearest Luas stop (Cabra Luas Stop) with the Luas line marked in yellow as shown in Figure 1 below:



Figure 1: Cabra Luas Stop

- 10.2.** The main contractor will be required to schedule delivery of materials daily. If necessary, the main contractor will be required to provide a secure material staging compound on the site.

11. Dust and Dirt Control

- 11.1.** Nuisance dust emissions from demolition & construction activities, especially demolition, are a common and well recognised problem. Fine particles from these sources are recognised as a potential significant cause of pollution.

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

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

- 11.3.** The following are techniques and methods which are widely used currently throughout the construction industry and which may be used in the proposed development.

- The roads around the site are all surfaced, and no dust is anticipated arising from unsealed surfaces.
- A regime of 'wet' road sweeping can be set up to ensure the roads around the immediate site are as clean and free from dirt / dust arising from the site, as is reasonably practicable. This cleaning will be carried out by approved mechanical sweepers.
- Footpaths immediately around the site can be cleaned by hand regularly, with damping as necessary.
- High level walkways and surfaces such as scaffolding can be cleaned regularly using safe 'wet' methods, as opposed to dry methods.
- Vehicle waiting areas or hard standings can be regularly inspected and kept clean by brushing or vacuum sweeping and will be regularly sprayed to keep moist, if necessary.
- Vehicle and wheel washing facilities can be provided at site exit(s) where practicable. If necessary, vehicles can be washed down before exiting the site.
- Netting can be provided to enclose scaffolding in order to mitigate escape of air borne dust from the existing and new buildings.
- Vehicles and equipment shall not emit black smoke from exhaust system, except during ignition at start up.
- Engines and exhaust systems should be maintained so that exhaust emissions do not breach stationary emission limits set for the vehicle / equipment type and mode of operation.
- Servicing of vehicles and plant should be carried out regularly, rather than just following breakdowns.
- Internal combustion plant should not be left running unnecessarily.
- Exhaust direction and heights should be such as not to disturb dust on the ground and to ensure adequate local dispersal of emissions.

- Where possible fixed plant such as generators should be located away from residential areas.
- The number of handling operations for materials will be kept to a minimum in order to ensure that dusty material is not moved or handled unnecessarily.
- The transport of dusty materials and aggregates should be carried out using covered / sheeted lorries.
- Material handling areas should be clean, tidy and free from dust.
- Vehicle loading should be dampened down and drop heights for material to be kept to a minimum.
- Drop heights for chutes / skips should be kept to a minimum.
- Dust dispersal over the site boundary should be minimised using static sprinklers or other watering methods as necessary.
- Stockpiles of materials should be kept to a minimum and if necessary, they should be kept away from sensitive receptors such as residential areas etc.
- Stockpiles where necessary, should be sheeted or watered down.
- Methods and equipment should be in place for immediate clean-up of spillages of dusty material.
- No burning of materials will be permitted on site.
- Earthworks excavations should be kept damp where necessary and where reasonably practicable.
- Cutting on site should be avoided where possible by using pre-fabrication methods to facilitate any temporary works that may be required to enable the demolition.
- Equipment and techniques for cutting / grinding / drilling / sawing / sanding etc, which minimise dust emissions and which have the best available dust suppression measures, should be employed.
- Where scabbling is to be employed, tools should be fitted with dust bags, residual dust should be vacuumed up rather than swept away, and areas to be scabbled should be screened off.
- Wet processes should be used to clean building facades if possible. If dry grit blasting is unavoidable then ensure areas of work are sealed off and dust extraction systems used.
- Where possible pre-mixed plasters and masonry compounds should be used to minimise dust arising from onsite mixing.
- Prior to commencement, the main contractor should identify the demolition & construction operations which are likely to generate dust and to draw up action plans to minimise emissions, utilising the methods highlighted above. Furthermore, the main contractor should prepare environmental risk assessments for all dust generating processes, which are envisaged.
- The main contractor should allocate suitably qualified personnel to be responsible for ensuring the generation of dust is minimised and effectively controlled.
- Demolition works to incorporate water spray to reduce dust.

12. Water

- 12.1.** The excavations for the basement, drainage pipes, water supply, utilities and foundations are anticipated to impact on the ground water in the site.
- 12.2.** The contractor shall develop an appropriate dewatering scheme to keep the basement/excavations free from water.
- 12.3.** During any discharge of surface water from the basement/excavations, the quality of the water will be improved through the provision of settlement tanks and will be regularly monitored visually for hydrocarbon sheen and suspended solids. Periodic laboratory testing of discharge water samples will be carried out in accordance with the requirements of Dublin City Council before discharge to the surrounding drainage network.
- 12.4** Appropriate discharge licenses will be acquired from Dublin City Council in respect of discharges from dewatering operations.

13.Noise and Vibration Control

- 13.1.** The main contractor will deal with the immediate dangers to hearing etc. associated with high noise levels and the impact of same on demolition & construction operatives, by means of risk assessment and mitigation / precautionary measures and equipment, all pursuant to the current health and safety legislation.
- 13.2.** The main contractor should carry out a noise and vibration assessment in relation to the proposed works at the demolition and construction stage. This noise and vibration assessment should be carried out by a competent person (or specialist firm) with specialist training in this area.
- 13.3.** The noise assessment should include the following steps:-
- Identify and list all construction work activities where there is likely to be a significant noise hazard.
 - Determine the hazards / nuisance.
 - Identify all third parties likely to be exposed to the noise/vibration nuisance.
 - Measuring the risk: The level of noise in dBA.
 - Considering and Implementing Control Measures.
 - Control exposure to noise and vibration.
 - Record the findings of the noise assessment.
 - Review and revise.

14. Environmental Effects

14.1 Measures to Minimise Nuisance

The measures to be operational at this site will include:

- Use of properly designed access and egress points to minimise impact on both external traffic and amenity of residents.
- Check on each departing vehicle at exit from site to public road.
- Use of banksman and/or traffic lights to control exit of construction vehicles onto public road.
- Controlled off-site HGV holding area where deliveries are called up as required. No HGV's waiting outside site.
- Issue of instructions and maps on getting to site to each sub-contractor to avoid 'lost' HGV's disrupting traffic.
- Establishment and maintenance of HGV holding areas within the site.
- Ongoing assessment of the most appropriate routes for construction traffic to and from the site.
- Interface with operation of HGV traffic from adjacent railway and port terminals.
- Restriction of work hours to industry standard working hour

14.2 Site Control Measures

The designated and operational on-site control measures, which will be established and maintained at this site, will include:

- Designated hard routes through site.
- Each departing vehicle to be checked by banksman.
- Wheel wash facility at egress point.
- Provision and facilities to cover lorry contents as necessary.
- Controlled loading of excavated material to minimise risk of spillage of contents.
- Spraying/damping down of excavated material on site by dedicated crews.
- Use of known routes for lorries to monitor impact on local area.
- Facility to clean local roads if mud or spillage occurs.

14.3 Control of Mud and Dust

The main consideration will be to combat mud and dust at source so as not to let it adversely affect the surrounding areas. The objective will be to contain any mud or dust within the site, which is large enough for comprehensive control measures.

The main problems, which may arise during the early part of construction, will be controlled by the measures described above and by the following measures:

- The use of hardcore access route to work front

- Channelling of departing vehicles through the wheelwash.
- Sweeping of public road adjacent to egress from site.
- Ongoing monitoring during working hours.

14.4 Disposal of Material from Site

The construction phase of this development may require the excavation of material from the site.

It is proposed that as the material is excavated that a suitably qualified professional will be on site to sample and classify the material.

It is proposed that any Hazardous material will be disposed of to a suitably licenced waste facility in accordance with all the relevant codes of practice and environmental legislation.

The contractor will be required to provide all delivery and weight dockets reviewed at the end of the project to demonstrate to the Client that the material has been disposed of correctly.

Any inert and non-hazardous material will be retained on site and used to raise the levels of the site as required. Again, this material will be reviewed and classified as acceptable to re-use on site by a suitably qualified professional.

14.5 Impact on Surrounding Environment

The following mitigation measures will be implemented during the site preparation and construction stage of the development in order to minimise the impact on water quality and ecological receptors in the surrounding area:

- Site preparation and construction must be confined to the development site only and should adhere to all standard best practice measures and the measures outlined in the EclA and the NIS that accompany this application. Work areas should be kept to the minimum area required to carry out the proposed works and the area should be clearly marked out in advance of the proposed works.
- All construction waste must be removed from site by a registered contractor to a registered site. Evidence of the movement and safe disposal of the construction waste must be retained and presented to Local Authority upon request. The applicants and construction contractors will be responsible for the safe removal of any construction waste generated on site. Removal of the construction waste will occur as soon as possible after construction works.
- It is vital that there is no deterioration in water quality in the Royal Canal pNHA. This will protect both habitats and species that are sensitive to pollution, including downstream Natura 2000 sites. Therefore, strict controls of erosion, sediment generation and other pollutants associated with the construction process should be implemented. These measures should be installed prior to commencement of main construction site works. Prior to the removal of the existing wall that divides the site and the canal tow path, a silt fence installed on the outside the site boundary

and the canal tow path will be efficient to prevent the ingress of any pollutants into the canal.

- There should be no discharges of contaminated waters to ground or surface waters from these developments, either during the construction or operation of the development. The control and management of hydrocarbons on site will be vital to prevent deteriorations in surface and groundwater quality locally. The following measures must be employed on site:
 - On-site refuelling must be carried out at designated refuelling stations within the site. Only designated trained and competent operatives should be authorised to refuel plant on site. Drip trays must be used when refuelling all machinery. Absorbent material and pads should be available in the event of any accidental spillages.
 - Alternatively, mobile double skinned fuel bowzers may be used. Fuel bowzers should be parked on a level area in the site when not in use. They should be bunded at 110%.
 - There must be minimal maintenance of construction vehicles or plant on site.
 - On-site diesel tanks should be double skinned to 110% of their capacity.
 - Containment stores should be used for refuelling of small plant such as consaws etc.
 - Fuel volumes stored on site should be minimised. Any fuel storage areas should be bunded appropriately for the fuel storage volume for the time period of the construction.
 - Machines used should be regularly inspected for leaks and fitness for purpose.
 - Any hazardous materials should be stored in secure bunded areas.
 - An emergency plan for the construction phase to deal with accidental spillages should be contained within an Environmental Management Plan.
 - Waste oils and hydraulic fluids should be collected in leak-proof containers and removed from site for disposal and recycling
- Best practice concrete / aggregate management measures should be employed on site. These should include:
 - Best practice in bulk-liquid concrete management must be employed on site addressing pouring and handling, secure shuttering, adequate curing times etc.
 - Stockpile areas for sands and gravel should be kept to a minimum size, well away from the drains and watercourses (minimum 50m).
 - Where concrete shuttering is used, measures should be put in place to prevent against shutter failure and control storage, handling and disposal of shutter oils.
 - Wash down water from concrete trucks will be appropriately controlled on-site. Such controls may include collection to allow sediment to settle out

- and reach neutral pH before clarified water is released to the local watercourse or allowed to percolate into the ground.
 - Activities which result in the creation of cement dust should be controlled by dampening down the areas.
 - Raw and uncured waste concrete should be disposed of by removal from the site or by burial on the site in a location and manner which will not impact upon local watercourses.
 - Stockpile areas for sands and gravel should be kept to a minimum size, well away from the river.
- During construction, surface water on the site must be controlled and management to avoid any impacts upon local ground or surface water receptors. Construction water should not be discharged directly into any watercourse. Good construction practices such as wheel washers and dust suppression measures must be undertaken. There must be no discharges of silt laden surface water into the public sewer.
- Guidelines within The Construction Industry Research and Information Association (CIRIA) provides guidance on the control and management of water pollution from construction sites ('Control of Water Pollution from Construction Sites, guidance for consultants and contractors', CIRIA, 2001). Guidelines within this document must be followed.
- If swallows, swifts or house martins nest in the buildings, then demolition should only proceed once these nests are no longer being used.
- The recommendations in the accompanying bat report should be followed, including:
 - The Lighting Plan should be designed to avoid light spill in habitats adjacent to the site, particularly along the Royal Canal.
 - It will be important to maintain Dark Zones for foraging bats in areas where lighting is not necessary. However, where lighting is required, this lighting should be placed at a minimum height using the lowest lux levels permitted for health and safety reasons.
 - The lighting should be directional onto the buildings/pathways only with no spillage of light to adjoining habitats.
 - To reduce light spillage from luminaries, lights that are designed not to emit light at angles greater than 70 degrees from the vertical plane should be used. A flat glass protection is often used to reduce light spillage. Other methods could include shields, masking and louvers.
 - No white light or lighting with a UV component should be permitted as this has the greatest impacts on bats due to their attraction by insects. LED lights with a broad spectrum are also not permitted. Only lighting with a

narrow spectrum should be used, to avoid impacts on insects and subsequently bats.

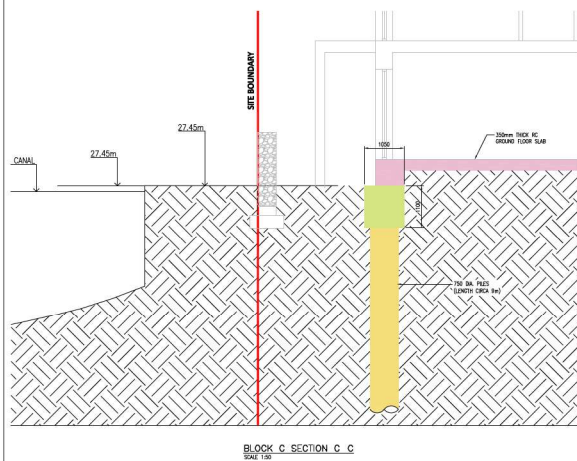
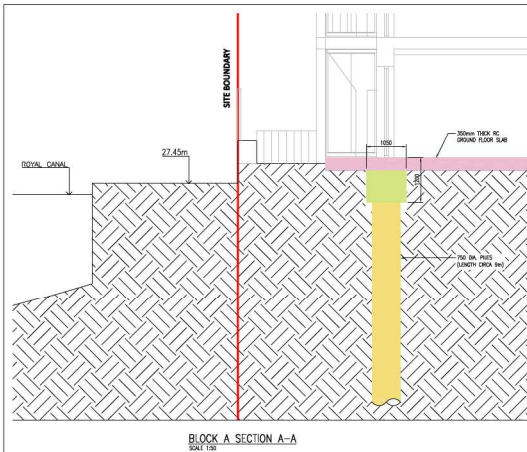
- The lighting plan should consider activity sensors.
- Minimum lux (luminosity) level should be used or as required by Health and Safety, especially around the perimeters.
- Light spillage from doors, windows etc should be kept to a minimum.
- No lighting should be permitted along the treeline boundaries, compensatory habitats and hedgerows.
- Two 2F and Two 1FF Schwegler bat boxes with built in timber panels should be distributed throughout the site. These should be placed on trees or posts, at least 3m high with a clear drop below (as bats need to drop to start their flight). They should be placed in a dark area of the site.
- To mitigate against the loss of food sources for local bat populations, native species should be used when landscaping with trees and shrubs.
- If bats are discovered at any stage of the development, building work should cease and a bat expert should be consulted immediately.

15. Proposed Construction Phasing and Programme

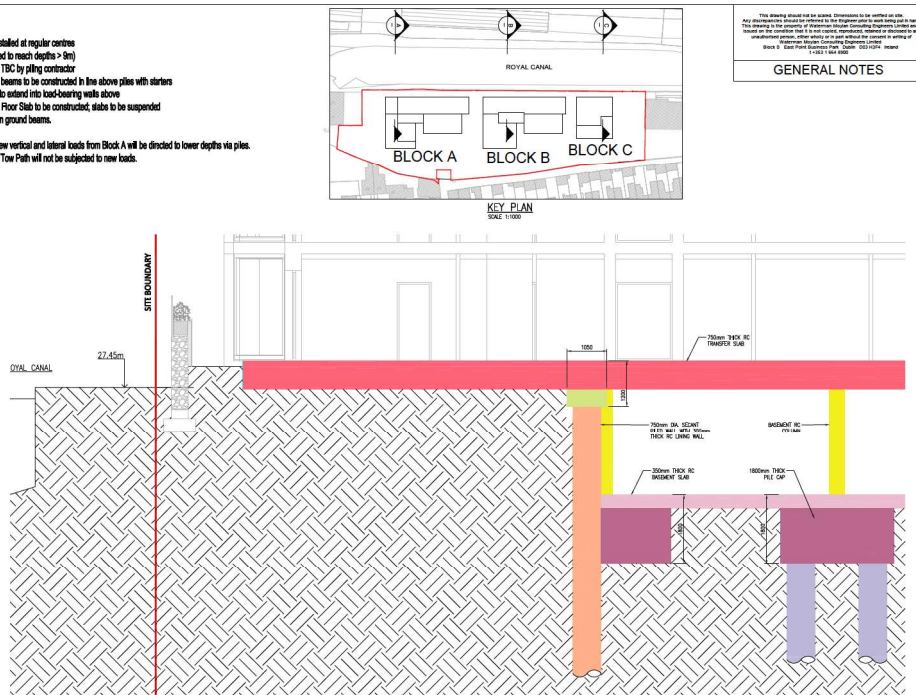
- 15.1.** The proposed development consists of 205 No. units which are to be provided by a combination of 3 apartment blocks.
- 15.2.** It is intended that the development will be constructed in a single phase.
- 15.3.** A detailed construction programme has not been developed at this stage. However, it is anticipated that the total construction period of the development will be approximately 24 months.

APPENDICES

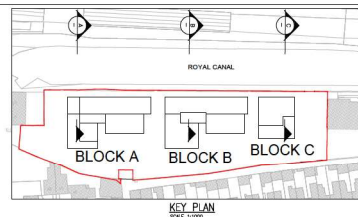
A. Waterman Moylan Drawing No. 20-011-WMS-ZZ-ZZ-DR-S-21001



- Block A:**
- A) Piles installed at regular centres (expected to reach depths > 9m)
 - Depths TBC by piling contractor
 - B) Ground beams to be constructed in line above piles with starters placed to extend into load-bearing walls above
 - C) Ground Floor Slab to be constructed, slabs to be suspended between ground beams
- Note:** All new vertical and lateral loads from Block A will be directed to lower depths via piles. Canal and Tow Path will not be subjected to new loads.



- Block B:**
- A) Secant Piled Wall is installed around basement perimeter. Wall is formed by constructing alternating primary and secondary overlapping piles forming a continuous impervious structure; (expected to reach depths > 12m)
 - Depths TBC by piling contractor
 - B) Capping Beams installed.
 - C) Basement Excavation down to bulk formation.
 - D) Internal Piles to be bored and installed with pile caps and edge ground beams formed.
 - E) Basement Slab is constructed, slabs to be suspended spanning between ground beam and pile caps.
 - F) Columns and Load bearing walls constructed from basement to underside of Ground Floor.
 - G) Ground Floor Transfer Slab is constructed.
- Note:** All new vertical and lateral loads from Block B will be directed to lower depths via piles. The Secant Pile Wall will be designed to resist any lateral and earth pressure from the Canal during excavation of the basement. Canal and Tow Path will not be undermined or subjected to new loads.



The drawings shown on the screen are for information only. They are not to be used for construction purposes. The drawings are for information only. They are not to be used for construction purposes. The drawings are for information only. They are not to be used for construction purposes.

GENERAL NOTES

Rev.	Date	Description	By
1		Issued for Construction	
Project: CROSS GUNS BRIDGE			
Title: TYPICAL CROSS SECTIONS			
Client: BINFORD LTD.			
Block B: Canal Pier Building Part 2: Design: 20-011 1:1000 Scale			
FOR PLANNING			
Drawn by: PK	Checked by: RD	Reviewed by: 20-011	
Date: 20-SEP-20	Scale: 1:100	Sheet: 21	
Project: 20-011-WMS-ZZ	Issue: 1	Rev: 1	Rev: 1
20-011-WMS-ZZ-ZZ-DR-S-21001			

UK and Ireland Office Locations

