

Project

Residential Development, Sandford Road, Dublin 6

Report Title

Preliminary Construction Management Plan

Client

Sandford Living Limited

INFRASTRUCTURE



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1. WORKS PROPOSAL

This Preliminary Construction Management Plan (PCMP) is for the works associated with the construction of 671 residential dwellings and other ancillary residential amenities on a c. 4.26 Ha site (developable area).

The subject site is situated at the corner of Sandford Road and Milltown Road, Dublin 6. Sandford Road is located along the site's north-eastern boundary and Milltown Road is located along the site's south-eastern boundary. Existing residential development is located to the north-west and west of the site while lands in the ownership of the Jesuit Order are located to the south-west and south of the site.

The development will also include the following associated engineering infrastructure:

- Provision of surface water drainage, foul drainage and water supply infrastructure and connections.
- Construction of a surface water outfall which exits the site along its south-eastern boundary, continues along Milltown Road, through the junction of Milltown Road / Sandford Road prior to discharging to the existing public surface water drainage network in Eglinton Road. The surface water outfall extends approximately 300m from the developable site boundary to the outfall location.
- Retain existing entrance on Sandford Road (facilitates pedestrian and cycle access as well as limited vehicle access to the plaza at the northern end of the site). Improvements to pedestrian facilities adjacent to the entrance off Sandford Road are also proposed.
- Provision of a new vehicle access off Milltown Road (primary vehicle access to the proposed development facilitating access to the basement carpark as well as serving pedestrians and cyclists). This new site access shall be a priority junction.
- Provision of an additional access point for pedestrians and cyclists adjacent to the junction of Sandford Road / Milltown Road.

The site is currently occupied by institutional buildings comprising Milltown Park House with 5 No. extensions attached to the original structure, two of whom are to be retained within the proposed development (The Chapel and Tabor House).

The development will also include demolition of existing structures on site including Milltown Park House, the rear extension/linking block between Tabor House and Milltown Park House, the Finlay Wing, the Archive, the link building between Tabor House and Milltown Park House, rear extension to the front of the Chapel and part of the 'red brick link building' (single storey over basement) towards the south-western boundary.

This project is currently at planning stage and as such input from the contractor has not been incorporated into this document.

On appointment of a contractor a detailed CMP shall be prepared. This PCMP will form the basis of the detailed CMP. The detailed CMP shall incorporate the requirements of the Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects (DoEHLG, 2006).



Figure 1.1, Site Location

The construction management issues addressed within this plan include the following:

- Health and Safety
- Working Hours
- Demolition
- Traffic Management
- Stripping of Topsoil
- Excavation of Subsoil
- Importation of fill
- Erosion and Sediment Control
- Accidental Spills and Leaks
- Ecology
- Waste Management
- Noise and Vibration
- Air Quality and Dust Control
- Landscape and Visual Impact
- Material Assets – Site Services
- Site Compound Facilities and Parking

This Preliminary Construction Management Plan shall be referenced in all tender and contract documentation for the proposed works and is to be read in conjunction with all relevant Engineering and Architectural documentation.

All works must be carried out in accordance with the mitigation measures as outlined in the individual chapters of the Environmental Impact Assessment Report enclosed with the subject planning application.

The following legislation, regulations and guidelines are referenced in this Preliminary Construction Management Plan;

- 2005 Safety Health and Welfare at Work Act
- Construction Regulations (SI 291 of 2013)
- Safety, Health and Welfare at Work (General Application) Regulations 2007
- Department of Transport Traffic Signs Manual 2010 – Chapter 8 Temporary Traffic Measures and Signs for Roadworks
- Department of Transport Guidance for the Control and Management of Traffic at Road Works (2010)
- Design Manual for Roads and Bridges (DMRB)
- Design Manual for Urban Roads & Streets (DMURS)
- Article 27(1) of the European Communities (Waste Directive) Regulations, 2011
- Waste Management Act 1996
- Department of the Environment, Heritage and Local Government's 2006 Publication – Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects
- Safety, Health and Welfare at Work (General Application) Regulations 2007, Part 5 Noise and Vibration
- National Roads Authority (NRA) Guidelines for Treatment of Noise and Vibration in National Roads Schemes
- BS 5228-1:2009+A1:2014 (Code of Practice for Noise Control on Construction and Open Sites)
- BS 5228-2:2009+A1:2014 (Code of Practice for Vibration Control on Construction and Open Sites)
- BS 7385: 1993 (Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration)
- BS 5837:2012 "Trees in Relation to Design, Demolition and Construction - Recommendations"

2. CONSTRUCTION PHASING

Proposed phasing of the works is summarised below.

- Phase 1 – Site Set Up, Enabling Works and Demolitions
- Phase 2 – Basement Box
- Phase 3 – Block D, Block E, Block F and works at Tabor House and The Chapel
- Block A1, Block A2, Block B and Block C

3. COMPLIANCE WITH GENERAL SAFETY REQUIREMENTS

The Contractor shall be responsible for overall management of the site for the duration of the proposed works and must progress their works with reasonable skill, care, diligence and to proactively manage the works in a manner most likely to ensure the safety and welfare of those carrying out construction works.

The Contractor shall comply with all relevant Statutory requirements such as the 2005 Safety Health and Welfare at Work Act, The Construction Regulations (SI 291 of 2013), the General Application Regulations (SI 299 of 2007), etc. (and any amendments thereof).

In addition, the Contractor shall comply with all the reasonable safety requirements of the Client, the Project Supervisor for the Design Process and the Project Supervisor for the Construction Stage as well as providing all staff with a site specific safety induction and appointment of a safety officer.

4. WORKING HOURS

For the duration of the proposed infrastructure works, typical working hours shall be 07:00 to 19:00 Monday to Friday (excluding bank holidays) and 09:00 to 13:00 Saturdays, subject to the restrictions imposed by the local authority.

No working will be allowed on Sundays and Public Holidays.

Subject to the agreement of the local authority, out of hours working may be required for water main connections, foul drainage connections etc.

5. DEMOLITION

The development includes demolition of existing structures on site including Milltown Park House, the rear extension/linking block between Tabor House and Milltown Park House, the Finlay Wing, the Archive, the link building between Tabor House and Milltown Park House, rear extension to the front of the Chapel and part of the 'red brick link building' (single storey over basement) towards the south-western boundary.

Two buildings are to be retained within the proposed development (The Chapel and Tabor House). The careful management of the demolition process including design of temporary protection measures is required to ensure that retained buildings are protected from damage. Also refer to mitigation requirements outlined in Chapter 7 of the EIAR (Architectural Heritage).

6. OUTLINE TRAFFIC AND TRANSPORTATION PLAN

A Traffic Management Plan (TMP) will be prepared for the works in accordance with the principles outlined below;

Outline TMP

Comply at all times with the requirements of:

- Department of Transport Traffic Signs Manual 2010 – Chapter 8 Temporary Traffic Measures and Signs for Roadworks
- Department of Transport Guidance for the Control and Management of Traffic at Road Works (2010)
- Any additional requirements detailed in the Design Manual for Roads and Bridges (DMRB) & Design Manual for Urban Roads & Streets (DMURS)

The main construction access will be off Milltown Road at the location of the proposed primary vehicle access for the development. A secondary construction access is proposed at the existing entrance from Sandford Road. The location of the primary and secondary access points noted above is identified on DBFL Drawing 190226-DBFL-RD-SP-DR-C-1001 (Roads Layout). Also refer to Figure 6.1.

The use of both / either entrance will be coordinated with the phasing of the development (refer to Section 2 above).

Traffic impact from the construction period will be temporary in nature.

Construction Traffic will consist of the following categories:

- Private vehicles owned and driven by site staff and management
- Construction vehicles e.g. excavation plant, dump trucks
- Materials delivery vehicles involved in site development works

It should be noted that a large proportion of construction workers will arrive via public transport. The site is ideally located to avail of multiple bus routes on Milltown road, Sandford Road and the Stillorgan Road. The Beechwood Luas stop is approximately 1.0km walking distance from the site.

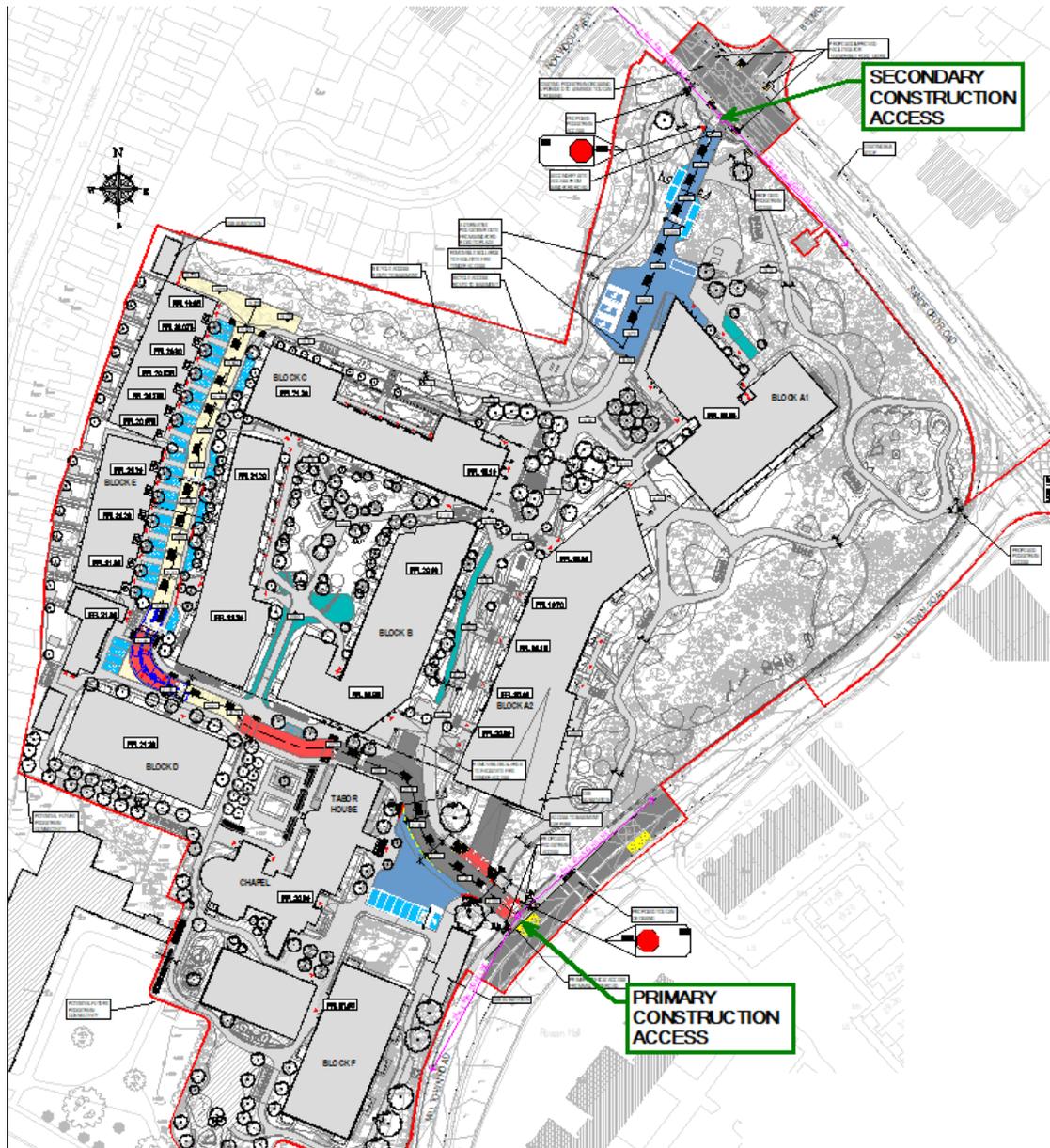


Figure 6.1, Construction Access

The following initiatives will be implemented to avoid, minimise and/or mitigate against traffic issues:

- During the pre-construction phase, the site will be securely fenced off/hoarded off from adjacent properties, public footpaths and roads;
- Appropriate on-site parking (temporary parking for the duration of construction works) and compound area will be provided to prevent overflow onto the local network;
- A large proportion of construction workers are anticipated to arrive in shared transport. It is likely that some numbers of the construction team will be brought to/from the site in vans/minibuses, which will serve to reduce the trip generation potential;
- Delivery vehicles to and from the site will be spread across the course of the working day, therefore, the number of HGVs travelling during the peak hours will be relatively low. Queuing of material delivery vehicles will not be permitted on the public roads adjacent to the site;
- Truck wheel washes will be installed at construction entrances and adjacent public roads swept as required.;
- Any specific recommendations with regard to construction traffic management made by Dublin City Council will be adhered to;
- Potential localised traffic disruptions during the construction phase will be mitigated through the implementation of industry standard traffic management measures such as the use of traffic signage. These traffic management measures shall be designed and implemented in accordance with the Department of Transport's Traffic Signs Manual "Chapter 8 Temporary Traffic Measures and Signs for Roadworks" and "Guidance for the Control and Management of Traffic at Roads Works – 2nd Edition" (2010); and
- Site entrance point/s from the public road will be constructed with a bound, durable surface capable of withstanding heavy loads and with a sealed joint between the access and public highway. This durable bound surface will be constructed for a distance of 10m from the public road.
- Material storage zones will be established in the compound area and will include material recycling areas and facilities;
- 'Way finding' signage will be provided to route staff / deliveries into the site and to designated compound / construction areas;
- Dedicated construction haul routes will be identified and agreed with Dublin City Council prior to commencement of activities on-site; and
- On completion of the works, all construction materials, debris, temporary hardstands etc. from the site compound will be removed off-site and the site compound area reinstated in full on completion of the works.

7. SOILS AND GEOLOGY

Site development works will include stripping of topsoil and excavation of subsoil layers. These activities have potential to expose the soils and geological environment to pollution.

The contractor shall obtain approval of their proposed erosion and sediment control measures from Dublin City Council's Environment Section prior to commencing works on site.

The following measures are to be implemented in order to mitigate against such risks.

Stripping of Topsoil

- Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development
- At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas
- Topsoil stockpiles will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains
- Topsoil stockpiles will also be located so as not to necessitate double handling

Excavation of Subsoil Layers

- The duration that subsoil layers are exposed to the effects of weather will be minimized
- Disturbed subsoil layers will be stabilized as soon as practicable (e.g. backfill of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping)
- Stockpiles of excavated subsoil material will be protected for the duration of the works, stockpiles of subsoil material will be located separately from topsoil stockpiles

Weather Conditions

- Typical seasonal weather variations will also be taken account of when planning stripping of topsoil and excavations with an objective of minimizing soil erosion

Dust Control

- Dust suppression practices are to be implemented during stripping of topsoil layers and excavation of subsoil layers as outlined in Section 9 of this Preliminary Construction Management Plan

Importation of Fill

- Materials imported to site will be natural stones sourced from locally available quarries or materials that have been approved as by-products by the EPA in accordance with the EPA's criteria for determining a material is a by-product, per the provisions of article 27(1) of the European Communities (Waste Directive) Regulations, 2011.
- The majority of imported fill materials will be granular in nature and used in the construction of ground slab formations, basement backfill, road pavement foundations, drainage and utility bedding and surrounds.
- Materials will be brought to site and placed in their final position in the shortest possible time. Any imported material will be kept separate from material excavated from the site. All excavation to accommodate imported material will be precisely coordinated to ensure no surplus material is brought to site beyond the engineering requirement.
- No large or long-term stockpiles of imported fill material will be held on the site. At any time, the extent of fill material held on site will be limited to that needed in the immediate vicinity of the active work area.
- Smaller stockpiles of fill where required, will be suitably protected to ensure no sediment laden runoff enters existing surface water drains. Such stockpiles are to be located in order to avoid double handling.

8. WATER AND HYDROGEOLOGY

The following measures are to be implemented during the construction phase in order to mitigate risks to the water and hydrogeological environment.

Accidental Spills and Leaks

- All oils, fuels and other chemicals will be stored in a secure bunded hardstand area (within the construction compound)
- Refueling and servicing of construction machinery will take place in a designated hardstand area (within the construction compound) which is also remote from any surface water inlets (when not possible carry out such activities off site)
- A response procedure will be put in place to deal with any accidental pollution events, spillage kits will be available and construction staff will be inducted with regard to the emergency procedures / use of spill kits

Concrete

- Concrete batching will take place off site, wash down and wash out of concrete trucks will take place off site and any excess concrete is not to be disposed of on site
- Pumped concrete will be monitored to ensure there is no accidental discharge
- Mixer washings are not to be discharged into surface water drains

Wheel Wash Areas

- Debris and sediment captured by vehicle wheel washes are to be disposed off-site at a licensed facility

9. FOUNDATION DESIGN & CONSTRUCTION

Standard Pad & Strip Footings

The selection of the current foundation proposal of standard strip and pad footings is based on results of the site investigations, the structural modelling, loading calculations and site constraints. If during excavation of the foundations and basement unexpected ground conditions arise that vary from the site investigations results, it may be necessary to amend the indicative foundation solutions proposed at this juncture.

The standard strip and pad foundations and basement excavation/construction shall be executed as follows :-

- Excavate to foundation/basement formation level forming slope batters as necessary
- Cast the reinforced concrete pad and strip footings, rising walls and ground floor slabs
- Cast the basement to ground level reinforced concrete retaining walls, columns and lift, stair, shear walls
- Cast the reinforced concrete ground slabs
- Backfill to ground level the surrounding slope batters using granular material as appropriate.

Please refer to the Figures 9.1 and 9.2 in respect of the basement and strip foundations construction.

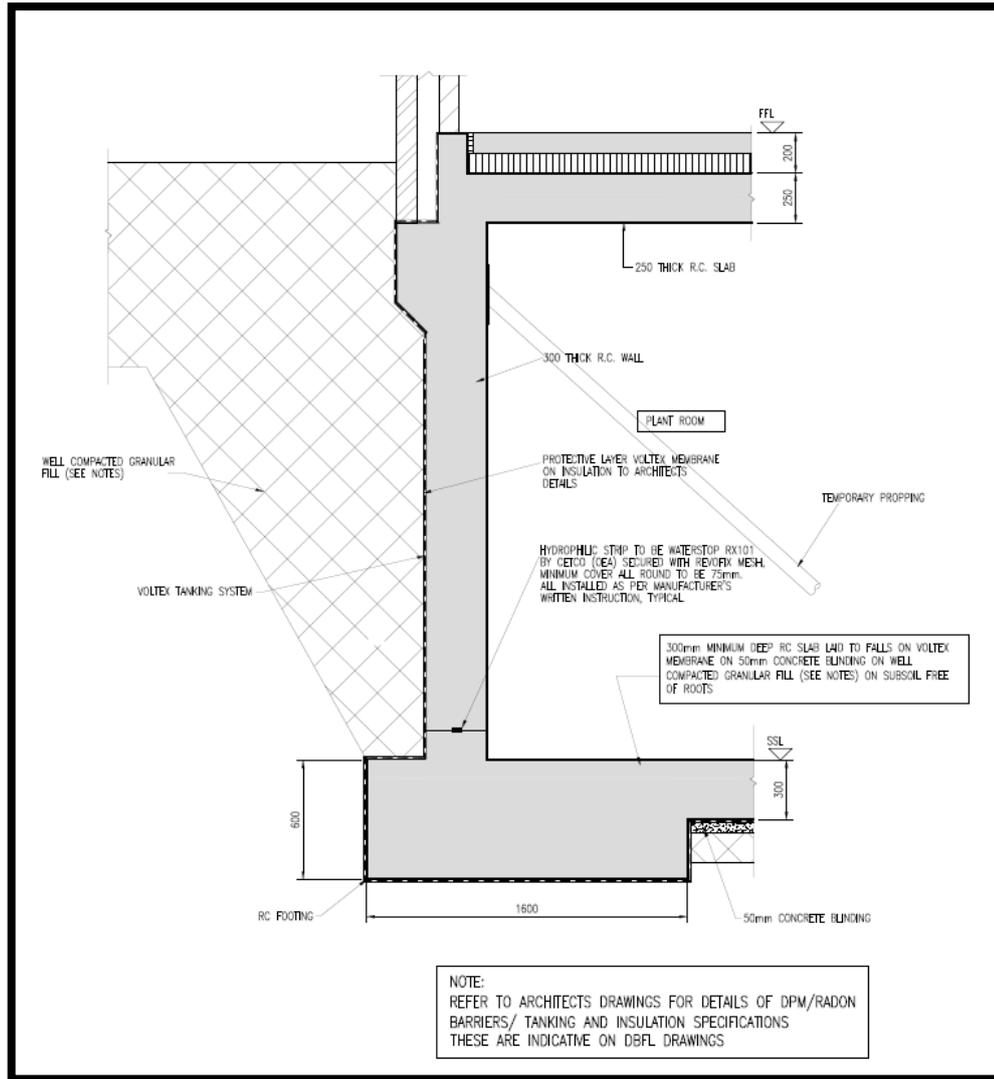


Figure 9.1 – Full context sample section through basement external ground boundary in future/permanent condition.

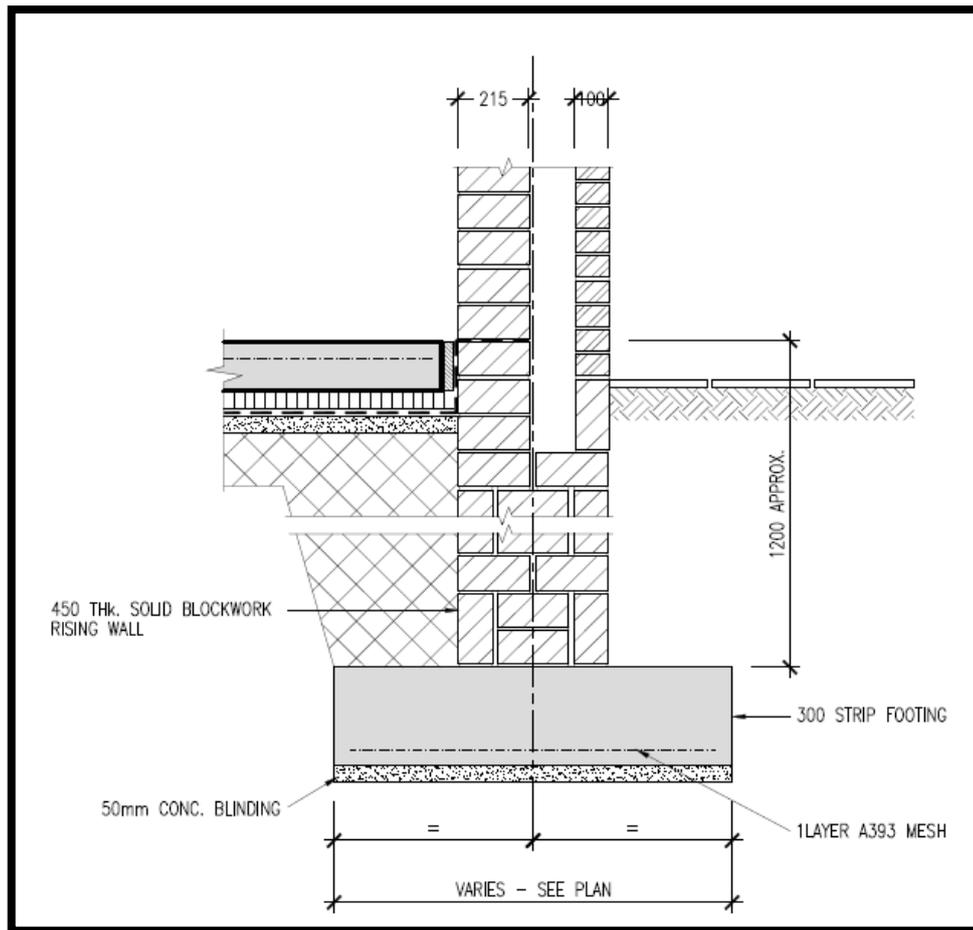


Figure 9.2 – Sample section through strip foundation external ground boundary in future/permanent condition.

Temporary Ground Retention Works

Whilst not required as a permanent foundation solution, the proximity of protected tree roots and structures such as the Chapel Building and Tabor House may necessitate some element of temporary sheet piling on site in discrete areas where the space for slope battering is not available. Steel sheet piles are driven into the ground using a piling hammer to facilitate vertical excavation on one side. The steel sheet piles are extracted and reused once the permanent works are complete and backfilled.

Other Solutions

Alternative foundation solutions under consideration for this project are noted below:

Augered Bored Piles

- Bored piles are cylindrical shaped shafts formed in the ground by extracting soil and replacing it with concrete and steel reinforcement cages. Augered bored piles are formed using a rotary boring method to produce uncased, partially / fully cased or slurry-supported bored piles. The soil is excavated by a drilling tool mounted at the tip of a telescopic Kelly bar. Alternatively, Continuous Flight Auger (CFA) method may be implemented which is a rotary drilling technique which permits high drilling performance but to a limited diameter and depth. This method employs a continuous flight auger which is a helical screw with hollow stem as the drilling tool that bores into the ground. When the final depth is reached, concrete is pumped from bottom to top through the hollow stem auger as it is extracted back up the shaft. The reinforcement is installed subsequently, assisted by a cage vibrator where required. Whichever way these cast insitu reinforced concrete piles are formed they will transmit large structural loads to lower loadbearing soils such as the very stiff clay encountered during the site investigation works. The length, diameter, material, geometry, and layout of the piles are determined by the detailed design process to suit the intended use and engineering parameters. Pile arisings are brought to the surface during drilling and concreting phase and must be disposed of.
- Because the depth to a suitable bearing stratum beneath Blocks D and Block F is 2.5m below ground level, bulk excavation is required with foundations extending to the required depth. For the foundation design of these blocks, augered piles may be considered as a more appropriate foundation solution than standard deep strip and pads. When considering the use of augered piles the contractor will have to address specific concerns regarding noise, vibration, disposal of pile uprisings and the use of very heavy plant on site requiring the design and installation of piling mats as set out in sections 11 and 12 below. In the case of augered piles the building will be supported on a system of ground beams, pile caps and suspended slabs supported on the piles. The piles themselves will be augered approximately 6-10m into the very stiff clays to gain capacity through a combination of end bearing and friction along the pile shaft.
- In the case of the basement under Block A, Block B and Block C piles are not required to reach the very stiff clay layer as the excavation is at sufficient depth.

Ground Improvement

- Ground improvement techniques have also been considered; however these are only appropriate for low rise lightly loaded structures of which only the Block E duplex houses are relevant. Currently the site investigation indicates a suitable bearing stratum can be reached by extending standard strip footings into the upper firm clays for the low-rise houses. However, should this situation change during the construction, the following ground improvement technique may also be considered:-

Lime stabilization is the mixing of quicklime with soft, fine grained soils to improve the shear strength and deformation characteristics of the soil. By a process of digging to a reduced level to reach a suitable bearing stratum and reinstating back to the existing ground levels using lime mixed with the soil which is then backfilled in well compacted in layers, providing a suitable bearing strata at a higher level for proposed foundations. This is carried out under controlled conditions under the supervision of a specialist. Where the characteristics of the ground are considered appropriate, cement is used as opposed to lime. Standard pad and strip footings can then be installed in the improved ground at shallower depth than might be necessary using bulk excavation and infilling.

10. BIODIVERSITY

Proposed mitigation measures with regard to biodiversity during the construction phase are detailed in Section 8.10.2 of the EIAR.

These mitigation measures are to be incorporated into the detailed Construction Management Plan.

11. CONSTRUCTION WASTE MANAGEMENT

The principle of 'Duty of Care' in Waste Management Act 1996 (as amended) states that the waste producer is responsible for waste from the time it is generated through to its legal disposal (including its method of disposal). Waste materials generated by earthworks, demolition and construction activities will be managed according to the Department of the Environment, Heritage and Local Government's 2006 Publication – Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects.

Proposed mitigation measures with regard to construction and demolition waste are detailed in Section 14.6.1 of the EIAR and are to be incorporated into the detailed Construction Management Plan.

The following measures are to be implemented during the construction phase in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle waste in such a manner as to minimise the effect on the environment:

- Copies of the final Construction and Demolition Waste Management Plan will be made available to all relevant personnel on site. All site personnel and sub-constructors will be instructed on the objectives of the Construction Waste Management Plan and informed of their responsibilities.
- The nominated Construction and Demolition Waste Manager responsible for implementation of this Construction Waste Management Plan will be identified prior to construction commencement and will arrange for a waste audit of the project once construction has fully commenced on site (and of any facilities to which waste from the project is delivered as required).
- Building materials will be chosen with an aim to 'design out waste'
- On-site segregation of non-hazardous waste materials into appropriate categories. All waste material will be stored in skips or other suitable receptacles in a designated area of the site.
- On-site segregation of hazardous waste materials into appropriate categories. Hazardous waste will be separately stored in appropriate lockable containers prior to removal from site by an appropriate waste collection licence holder.
- All wastes segregated at source where possible
- All waste material will be stored in skips or other suitable receptacles in a designated area of the site.
- Waste bins, containers, skip containers and storage areas will be clearly labelled with waste types which they should contain including photographs as appropriate.

- The site will be maintained to prevent litter and regular litter picking will take place throughout the site.
- Materials will be ordered on a 'just in time' basis to prevent over supply and site congestion (i.e. to minimise materials stored on site)
- Materials will be correctly stored and handled to minimise the generation of damaged materials
- Left over materials (e.g. timber off-cuts) shall be re-used on site where possible
- All waste leaving the site will be recycled, recovered or reused where possible
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities
- All waste leaving the site will be recorded and copies of relevant documentation maintained
- All site works shall also comply with the requirements of the Construction and Demolition Waste Management Plan prepared by AWN Consulting

12. NOISE AND VIBRATION

During the works the contractor shall comply with the requirements of BS 5228-1:2009+A1:2014 and BS 5228-2:2009+A1:2014 (Code of Practice for Noise and Vibration Control on Construction and Open Sites) as well as Safety, Health and Welfare at Work (General Application) Regulations 2007, Part 5 Noise and Vibration and all construction phase mitigation measures identified in EIAR Chapter 13 Noise and Vibration

In particular, the following practices will be implemented during the construction phase:

- Proposed mitigation measures with regard to noise and vibration are detailed in Section 13.6.1 of the EIAR and are to be incorporated into the detailed Construction Management Plan.
- Erection of a barrier (e.g. Standard 2.4m high construction hoarding) to remove direct line of sight between noise source and receiver when construction works are being carried out in proximity to noise sensitive receivers.
- Establishing channels of communication between the contractor, local authority and residents.
- Appointing a site representative responsible for matters relating to noise.
- A noise and vibration monitoring specialist will be appointed to periodically carry out independent monitoring of noise and vibration during random

intervals and at sensitive locations for comparison with limits and background levels.

- Selection of plant with low inherent potential for generation of noise.
- Siting of noisy plant as far away from sensitive properties as permitted by site constraints and implementation of noise reduction measures such as acoustic enclosures.
- Avoid unnecessary revving of engines and switch off plant when idle.
- All vehicles and mechanical plant used for the purpose of the works shall be fitted with effective exhaust silencers and shall be maintained in good and efficient working order. In addition, all diesel engine powered plant shall be fitted with effective air intake silencers.
- All ancillary pneumatic percussive tools shall be fitted with mufflers or silences of the type recommended by the manufacturers, and where commercially available, dampened tools and accessories shall be used.

Noise Limits

Noise Limits to be applied for the duration of construction works are as set out in the National Roads Authority (NRA) Guidelines for Treatment of Noise and Vibration in National Roads Schemes (summarised below in Figure 12.1) and BS 5228-1:2009+A1:2014 (Code of Practice for Noise Control on Construction and Open Sites).

Date ^a	Noise Level (dB re 2x10 ⁻⁵ Pa) ^a	
	L _{Aeq} (1hr) ^a	L _{AFmax} ^a
Monday to Friday 07:00 to 19:00hrs ^a	70 ^a	80 ^a
Monday to Friday 19:00 to 22:00hrs ^a	60* ^a	65* ^a
Saturdays 08:00 to 16:30hrs ^a	65 ^a	75 ^a
Sundays & Bank Holidays 08:00 to 16:30hrs ^a	60* ^a	65* ^a

Figure 12.1, NRA Guidelines for Maximum Permissible Noise Levels at the Façade of Dwellings During Construction.

BS 5228 applies a noise limit of 70 dBA between 07:00 am and 19:00 pm outside the nearest window of the occupied room closest to the site boundary in suburban areas away from main road traffic and industrial noise.

For the duration of construction works, a daytime noise limit (07:00 am to 19:00 pm) of 70 dBA shall apply (in accordance with the requirements of BS 5228 and generally in agreement with the NRA guidelines).

Vibration Limits

Vibration Limits to be applied for the duration of construction works are as set out in BS 5228-2:2009+A1:2014 (Code of Practice for Vibration Control on Construction and Open Sites) and BS 7385: 1993 (Evaluation and

measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration). Allowable vibration during the construction phase is summarised below in Figure 12.2.

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of:-		
Less than 15Hz	15 to 40Hz	40Hz and above
12 mm/s	20 mm/s	50 mm/s

Figure 12.2, Allowable Vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration

13. AIR QUALITY AND CLIMATE

The primary air quality impact during the construction phase relates to nuisance dust emissions.

The following dust suppression practices are to be implemented during the construction phase as well as implementing all construction phase mitigation measures identified in EIAR Chapter 12, Air Quality and Climate.

- The Contractor shall prepare a dust minimisation plan (including a documented system for managing site practice with regard to dust and specification of effective measures to deal with any complaints received) which shall be communicated to all site staff
- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic
- Any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions
- Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly (on any un-surfaced site road, this will be 20 kph and on hard surfaced roads as site management dictates)
- Vehicles delivering material with dust potential (soil, aggregates etc.) will be enclosed or covered with tarpaulin at all times to restrict the escape of dust
- Public roads outside the site will be inspected on a daily basis for cleanliness and cleaned as necessary
- Debris, sediment, grit etc. captured by road sweeping vehicles is to be disposed off-site at a licensed facility

- Vehicles exiting the site shall make use of a wheel wash facility where appropriate prior to entering onto public roads
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods
- During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions

Monitoring of dust deposition levels (via the Bergerhoff method) shall take place at a number of locations at the site boundary of the proposed development to ensure that dust nuisance is not occurring at nearby sensitive receptors. This monitoring aims to ensure that the dust mitigation measures outlined above remain effective.

14. LANDSCAPE AND VISUAL IMPACT ASSESSMENT

Mitigation measures include (but are not limited to) those noted below.

- Site hoarding will be erected to restrict views of the Construction activity e.g. standard 2.4m high construction hoarding
- Establishment of tree protection measures as required (no-dig construction zones, tree protection fencing and existing hedgerow retention). Any trees which are not to be taken down shall remain undisturbed and undamaged. This includes the use of sheet piling as necessary to protect existing trees roots which would otherwise be encroached upon by the basement excavation.
- Tree protection fences are to be constructed in accordance with BS 5837:2012 "Trees in Relation to Design, Demolition and Construction - Recommendations"
- A 'Construction Exclusion Zone' notice shall be placed on tree protection fencing at regular intervals
- Tree Protection Zones are not to be used for car parking, storage of plant, equipment or materials
- A post construction re-assessment of any retained trees shall be carried out

Regarding visual impact, mitigation measures identified in the EIAR Chapter 9 (LVIA) are to be implemented, including but not limited to erection of site hoarding to restrict views of the construction activity.

15. LIGHTING

Light will be switched off during non-working hours where possible and directional lighting will be used during the construction phase. This will minimise spill to any other area forming part of the bats commute. The specification and colour temperature of light treatments is chosen based on their tolerability by bats. LED luminaires are ideal due to their sharp cut-off, lower intensity, and dimming capability. A warm white spectrum (2700 K – 3000 K) will be used to reduce the blue light component.

16. MATERIAL ASSETS: SITE SERVICES

Existing Underground Services

- The location of all existing underground services are to be confirmed by the contractor prior to commencing any works on site

Existing Overhead Services

- Existing LV overhead lines (public lighting) are located in the vicinity of the proposed site access off Milltown Road and along the site's eastern boundary.
- For works in the vicinity of existing overhead electrical lines refer to ESB's Code of Practice for Avoiding Danger from Overhead Electrical Lines

17. SITE COMPOUND FACILITIES AND PARKING

The exact location of the construction compound is to be confirmed in advance of commencement of the works (and agreed with Dublin City Council). An indicative compound location is shown in Figure 17.1. The location of the construction compound may be relocated during the course of the works.

- The construction compound will include adequate welfare facilities such as wash rooms, drying rooms, canteen and first aid room as well as foul drainage and potable water supply
- Foul drainage discharge from the construction compound will be tankered off site to a licensed facility until a connection to the public foul drainage network has been established
- The construction compound's potable water supply shall be protected from contamination by any construction activities or materials
- Access to the compound will be security controlled and all site visitors will be required to sign in on arrival and sign out on departure
- A permeable hardstand area will be provided for construction machinery and plant

- The construction compound will include a designated Construction material recycling area
- A series of way finding signage will be provided to direct staff, visitors and deliveries as required
- All construction materials, debris, temporary hardstands etc. in the vicinity of the site compound will be removed off-site on completion of the works
- Limited onsite parking will be provided during the construction phase as a large proportion of construction workers will arrive via public transport or shared transport (also refer to Section 6, Outline Traffic and Transportation Plan).

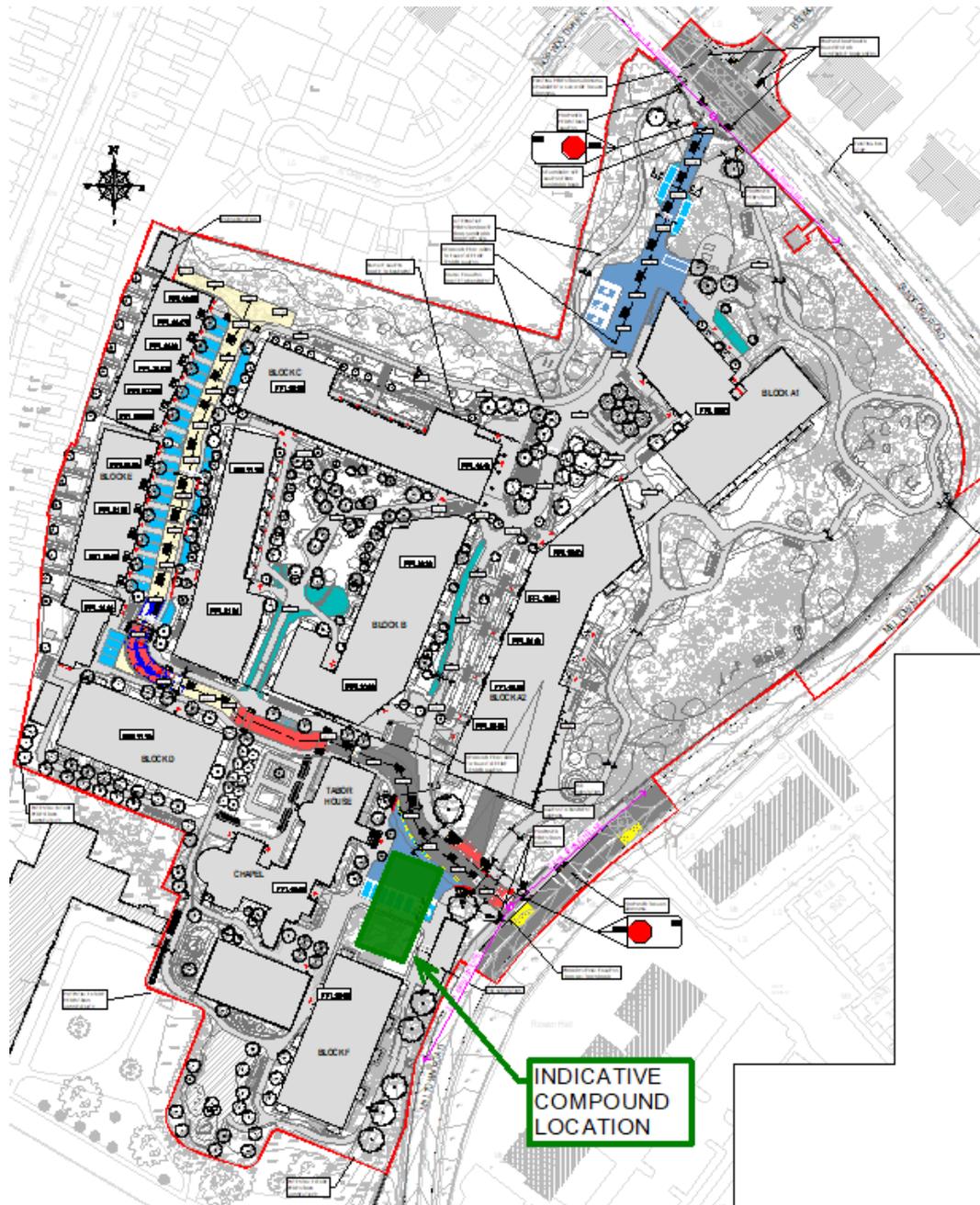


Figure 12.1, Indicative Compound Location