

BM BARRETT MAHONY
CONSULTING ENGINEERS
CIVIL & STRUCTURAL



CONSTRUCTION MANAGEMENT PLAN FOR
PROPOSED STRATEGIC HOUSING DEVELOPMENT AT,
FRASCATI CENTRE, FRASCATI ROAD, BLACKROCK, CO.
DUBLIN

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**DOCUMENT
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OF
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**PROJECT: RESIDENTIAL DEVELOPMENT AT FRASCATI SHOPPING
CENTRE, BLACKROCK, CO. DUBLIN**

PROJECT NO. 19.248

DOCUMENT TITLE: CONSTRUCTION MANAGEMENT PLAN

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CONSTRUCTION MANAGEMENT PLAN FOR
PROPOSED STRATEGIC HOUSING DEVELOPMENT AT,
THE FRASCATI CENTRE, FRASCATI ROAD, BLACKROCK, CO. DUBLIN
(FORMERLY KNOWN AS FRASCATI SHOPPING CENTRE).

barrett mahony

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1.0 INTRODUCTION

Barrett Mahony Consulting Engineers (BMCE) have been commissioned to prepare a Construction Management Plan (CMP) for the Proposed Strategic Housing Development (Alterations to Phase 1 Residential and Proposed Phase 2 Residential Development) at Frascati Centre, Frascati Road, Blackrock, Co. Dublin (formerly known as Frascati Shopping Centre).

The proposal relates to alterations to the Phase 1 permission for 45 no. apartments (Reg. Ref.: D17A/0950 & ABP Ref.: 300745-18), from second to fourth floor level of the rejuvenated Frascati Centre. The proposed development also includes the provision of 57 no. additional apartments, as an extension of the Phase 1 permission, located above the existing / permitted podium car park to the north west of the center, as a Phase 2 residential development. The subject application therefore relates to a total of 102 no. residential units. The proposed additional residential development will be built on top of the existing car park building.

The construction has already begun on site for the Phase 1 development and the alterations to the planning application (Reg. Ref.: D17A/0950 & ABP Ref.: 300745-18), are purely related to non-structural items (apartment layout, external wall finishes etc.)

Refer to Appendix 1 for architectural site layout.



Figure 1.1 – Site Location

2.0 PURPOSE OF THE REPORT

This report has been prepared a part of the Planning Application for a Proposed Strategic Housing Development (Alterations to Phase 1 Residential and Proposed Phase 2 Residential Development. The purpose of this report is to ensure that best construction management practices are applied to the site by the main contractor and that measures are in place during construction to reduce as much as possible the impact of the works on people, property and the environment. This report should be read in conjunction with the Construction and Demolition Waste Management Plan (CDWMP) report prepared by AWN for the project which has been submitted as part of this application.

This CMP report is a live document that details the extensive construction planning carried out in preparation of this application for planning. The appointed contractor is required to develop this report further to be in line with their detailed requirements and maintain the live document. The contractor is required to submit the report to DLRCC for review prior to works commencing on site.

As mentioned above, the alterations to the 45no. apartments (Reg. Ref.: D17A/0950 & ABP Ref.: 300745-18) are non-structural and the construction process for these apartments have begun. The Construction Management Plan has been submitted by the contractor (Collen Construction), this is included in appendix 3.

2.1 KEY INTERFACES

2.1.1 Public Roads

The site is bounded by to the front by Frascati Road, a busy National Primary Route (N31). There are public footpaths along the road edge.

2.1.2 Adjacent properties

The sides and rear of the site are bounded by the rear gardens of Frascati Park and the Lisalea Apartments. North east of the site, on the opposite side of Frascati Road, there is Blackrock Shopping Centre and Blackrock village. Blackrock Park is located to the north of the site. Residential properties form the remainder of the adjacent properties on all other sides.

2.1.3 Priory Stream

There is a watercourse, the Priory Stream, which flows from Frascati Park into a 2500mm wide rectangular box culvert (built in 2017 as part of the Frascati Shopping Centre Rejuvenation Project) which passes under the existing two-level car park building. The watercourse then re-surfaces at the Lisalea Apartment Complex before crossing under the N31 and continuing into Blackrock Park, where it discharges to the sea. The watercourse is tidal in the park.

3.0 SITE TOPOGRAPHY

The existing site topography will not be changed or affected during the construction of the residential development above the Frascati Centre. The existing site is fully developed with a shopping centre and surface car parking. Phase 1 residential apartments are currently being constructed over the centre.

4.0 GROUND CONDITIONS

The existing ground conditions will not be changed or affected during the construction of the residential development above the Frascati Centre.

The site stratigraphy consists of a thin layer of made ground on glacial till (boulder clay) on granite bedrock at anticipated depths of 7.0m to 8.0m below ground level.

5.0 PROPOSED DEVELOPMENT

The proposed development will consist of the following principal elements.

- Strengthening works of existing foundations and columns in the car park buildings.
- Construction of a new steel frame for the apartments on top of existing buildings.
- Construction of concrete stair and lift cores.
- Pouring of metal deck floor slabs.
- Mechanical & electrical installations.
- External Walls, Cladding & Glazing.
- Architectural finishes, non-loadbearing walls, ceilings etc. associated with the above.
- Fit-out works.
- External podium landscaping & green roof finishes.

6.0 EARTHWORKS

The new residential development will require minor earthworks in the form of foundations some buried service runs to tie in with existing.

7.0 CONSTRUCTION MANAGEMENT

7.1 Construction Programme & Phasing

The construction stage of the Phase 1 project has commenced and will take c. 18 months to complete (the alterations proposed under this application will be included subject to a grant of permission) and the construction of the Phase 2 residential proposals, and associated development, will take c. 18 months to complete, and will happen concurrently with Phase 1, subject to a grant of permission

7.2 Hoarding & Site Security

The work areas are on top of the existing building and will not be accessible to the public. These areas will not typically need to be hoarded off, except at entrances. A 2.4m minimum high plywood painted timber hoarding will be provided around ground level work areas, site compounds and delivery areas. Heras type fencing will be used on short term site boundaries where appropriate to suit the works. The hoarding alignment and specification are to be confirmed by the appointed Contractor prior to commencement.

Controlled access points to the construction site areas, in the form of gates or doors/turnstiles, will be kept locked for any time that these areas are not monitored (e.g. outside working hours).

During working hours, a gateman will control traffic movements and deliveries to ensure safe access and egress to site. All personnel working on site must have a valid Safe Pass card and be inducted by the Main Contractor regarding site specific information.



Figure 7.1 – Typical Site Hoarding Arrangement

7.3 Cranes

A number of tower cranes will be required on site for construction of the works.

All materials being lifted by crane will be controlled by guide ropes and will only be completed under the strict supervision of appropriately qualified and experienced banksmen.

Mobile cranes and hoist will likely also be required for construction works. Any works outside of the site hoarding will be each subject to a method statement agreed with the client's team.

7.4 Site Accommodation & Site Parking

On site accommodation will consist of:

- Staff welfare facilities (toilets, canteen, offices/meeting rooms).
- Materials storage areas and drop off.

It is envisaged that the existing site offices and welfare areas at the rear of the site will be re-used for the new development. Limited parking for construction personnel will be provided within the site for the period of construction. It is noted the site is readily accessible by Dublin Bus services and DART services. The contractor parking areas are to be confirmed by the appointment Contractor prior to commencement.

7.5 Hours of Working / Delivery Times

Unless required otherwise by the Local Authority, it is proposed that standard construction working hours will apply, i.e.:

- 8am - 6pm Monday to Friday
- 8am to 2pm on Saturdays.

Any works proposed outside of these periods shall be strictly by agreement with the Local Authority in advance.

7.6 Traffic Management

7.6.1 General

The works associated with the new development will result in additional traffic on the road network with the removal of excess material, small quantities of excavated material, demolition waste, the delivery of new materials, concrete trucks etc.

Construction traffic to the site will use the existing shopping centre entrances on the Frascati Road (N31).

It is proposed that unloading bays should be provided for deliveries to the site within a hoarded area. They should be accessible by tower crane and fork lifts. Appropriately demarcated storage zones will be used to separate and segregate materials.

All deliveries to site will be scheduled to ensure their timely arrival and avoid need for storing large quantities of materials on site. Deliveries will be scheduled outside of rush traffic hours to avoid disturbance to pedestrian and vehicular traffic in vicinity of the site and to the shopping centre customers. It is anticipated that there will be a maximum of 3no. truck movements to the site per day. The storage area is to be located at least 50m from the site access to allow for the possibility of traffic queueing inside the site without any interference with the public road.

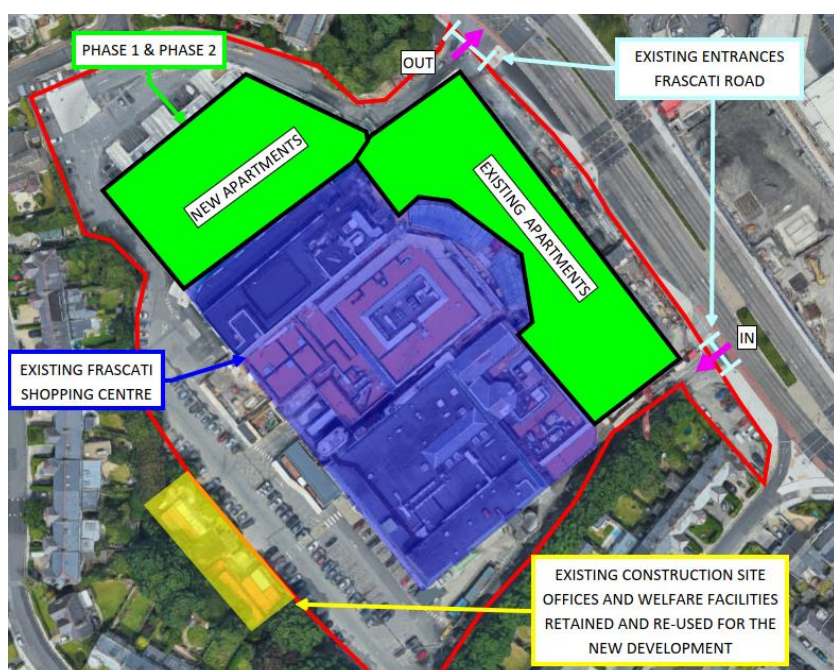


Figure 7.2 – Aerial View Showing Proposed and Existing Access.



Photo 7.1 – Existing Site Access onto Frascati Road, looking north.

7.6.2 Contractor's Traffic Management Plan

A Traffic Management Plan will be prepared by the contractor and agreed with Dun Laoghaire Rathdown County Council's Transportation Department, to mitigate any impact of construction on the

surrounding road network. The Traffic Management Plan will provide for the following where required:

1. The contractor shall be responsible for and make good any damage to existing roads or footpaths caused by his own contractor's or suppliers transport to and from the site.
2. The contractor shall at all times keep all public and private roads, footpaths entirely free of excavated materials, debris, rubbish, provide vehicle wheel wash and thoroughly clean all wheels and arches of all vehicles as they leave the site.
3. The contractor shall confine his activities to the area of the site occupied by the works and the builders' compound, as far as practicably possible, during any particular phase of the development.
4. Haul routes to and from the site will be defined and agreed with the Local Authority.
5. Properly designed and designated entrance and egress points to the construction site area for construction traffic will be used to minimize impact on shopping centre traffic and N31 traffic.
6. Flagmen shall be used to control the exit of construction vehicles from the site onto the public road, if required.
7. Existing fire hydrants are to remain accessible as required.

Suggested headings for the Contractor's Traffic Management Plan (not exhaustive)

- Construction Traffic Management – General Requirements
- Traffic Safety and Control
- Temporary Traffic Diversions & one-way systems
- Emergency Contact Numbers and Personnel
- Emergency Plan
- Access Arrangements
- Compound and Staff Parking

7.6.3 Public Traffic

The management of the Public traffic, both pedestrian & vehicular, is a key part of this development due to the proximity of the N31, public footpaths and the location of the site within a live shopping centre.

7.6.4 Construction Traffic

The vehicles associated with the construction activities are as follows: -

- Delivery trucks – flatbed & containers
- Mobile cranes
- Mobile hoists

7.6.5 Measures to Minimise Construction Vehicle Movements

Construction vehicle movements will be minimised through:

- Consolidation of delivery loads to/from the site and manage large deliveries on site to occur outside of peak periods;
- Use of precast/prefabricated materials where possible in the new construction;
- 'Cut' material generated by the construction works will be re-used on site where possible, through various accommodation works.
- Adequate storage space on site will be provided;
- Construction staff vehicle movements will also be minimised by promoting the use of public transport.
- Car sharing among the construction staff will be encouraged, especially from areas where homes of staff may be clustered. Such a measure offers a significant opportunity to reduce the proportion of construction staff driving to the off-site car parking facility and will minimise the potential traffic impact on the road network surrounding this facility.

- Public Transport: An information leaflet to all staff as part of their induction on site highlighting the location of the various public transport services in the vicinity of the construction site.

7.7 Site Safety

The Contractor will be responsible for the security of the site. The Contractor will be required to:

- Operate a site induction process for all site staff.
- Ensure all site staff shall have current 'safe pass' cards.
- Install adequate site hoarding to the site boundary.
- Maintain site security staff at all times.
- Separate pedestrian access from construction at the site entrance off Frascati Road and provide a safe walkway for pedestrians along the main access road in to the site.
- Ensure restricted access is maintained to the works.

7.8 COVID-19

The Contractor is to follow the latest CIF safety protocols for COVID-19 in relations to all activities on site, in relation to travel to & from home to site for all staff, in relation to site visitors and in relation to any other relevant activities connected with the construction of the development.

7.9 Water Supply

A water supply will be required for various activities on site.

The main contractor will require a water source for the duration of the works. Water will be required for:

- Main contractor's welfare facilities.
- Wheel wash and vehicle wash-down (use recycled water where feasible).
- Dust suppression (as required).
- Curing of concrete in warm weather.
- General construction cleaning materials/equipment etc.

7.10 Public Relations/Community Liaison

The site is located in an existing live shopping centre. The shopping centre site backs onto a residential area. The Main Contractor will be required to ensure that all agents, sub-contractors and suppliers act in a manner to minimise disruption to the locality, in particular the operation of business in the locality. Construction staff will be encouraged to remove all Personal Protective Equipment (PPE) and use wash down facilities before leaving the site.

A senior member of the construction staff should be appointed as a Liaison Manager. He/she will be responsible for the following:

- Participation and distribution of a local information leaflet on site activities as required.
- Briefing as necessary with neighbours on progress and issues.
- Liaison with Dun Laoghaire Rathdown County Council and emergency services as appropriate.
- Liaison with An Garda Siochana, particularly in relation to traffic movements and permits.
- Preparation of reports for the site meetings on neighbourhood issues, as required.

Efficient signage, maintenance and cleanliness of services and temporary facilities will be given high priority.

Due to the nature of construction works, it is essential to operate Good Neighbour Policies wherever possible. The key aspects of the Projects Team's good neighbour policy include:

- Early implementation
- Good client, staff and neighbourhood liaison.

- Reduction of nuisance factors.
- Clear access for neighbouring premises to be maintained.
- Clear and concise information to neighbours in response to queries.
- Designated liaison officer.
- Working within the prescribed hours

It is essential that the Good Neighbour Policy and any necessary procedures be in place before any works are commenced on site.

8.0 ENVIRONMENTAL CONSIDERATIONS

The main contractor will be required to be accredited with ISO14001 Environmental Management Systems. The main contractor will be required to mitigate the impact of the construction works on the environment. Proposed measures in relation to several items are set out in the following sections.

8.1 Noise

Some impact of noise is likely to occur as a result of the construction activity. Construction work is of a temporary nature and the resulting noise levels are usually acceptable, subject to typical management and time control procedures which are common to most urban based development projects.

Construction plant used on site will comply with the relevant Irish regulations in relation to noise and vibration requirements.

Noise will be minimized as far as possible, by limiting the use of compressors and other plant to stated hours and by fitting and use of silencing devices wherever practicable. Attention should be paid to the recommendations given in the latest versions of BS 5228. 'Noise Control on construction & Open Sites' & BS 6187 Code of Practice for Demolition.

Measures employed to reduce noise should include

- Noise monitoring stations, which will be monitored daily, will be located on site and at recommended locations in the vicinity of the site to record background and construction noise activity.
- Proper maintenance of all operating plant to ensure noise emission compliance. Operating plant will be selected on the basis of incorporating noise reducing systems, and at a minimum be fitted with effective exhaust silencers.
- Compressors will be fitted with acoustically lined covers, which will remain closed while the machines are in operation.
- Plant such as pumps and generators which are required to work outside of normal working hours will be enclosed with acoustic enclosures.

8.2 Dust

The Contractor's proposals are to include dust control measures in accordance with best practice and with reference to the following:

- Air Pollution Act 1987
- BS 6187: Code of Practice for Demolition

Measures are to include the following:

- Ensuring construction vehicles have a clean surface to travel on within the site (i.e. haul road).
- Truck spraying and hosing down will be carried out during dry periods and as necessary to control dust.
- A road sweeper operating during excavation stage as required.
- Wheel washing facility to be provided if required.
- For operations resulting in significant dust generation, including some demolition works, the work areas will be sheeted off to control the spread of dust.

The site is already fully developed with buildings and car parking, so dust issues should be not significant. However, if deemed to be a possible problem then a dust minimisation plan will be formulated for the construction phase of the project. The Contactor will put in place a regime for monitoring dust levels in the vicinity of the site during the works using the Bergerhoff Method. Then minimum criteria to be maintained shall be the limit specified by the Environmental Protection Agency (EPA) for licensed facilities in Ireland which is 350mg/m²/day as a 30-day average.

8.3 Pollution Control

Prior to the commencement of construction, the appointed contractor will be required to obtain formal agreement from the Local Authority on pollution prevention measures as well the overall approach and emergency procedures for all construction stages.

Contractors will have regard to the following best practice guidelines to ensure that water bodies are adequately protected from construction work:

- Construction Industry Research and Information Association (CIRIA) C649: *Control of water pollution from linear construction projects: Technical guidance* (Murnane et al. 2006)
- *CIRIA C649: Control of water pollution from linear construction projects: Site guide* (Murnane et al. 2006)

This plan will provide precise details on methods to prevent sediment or pollutants from leaving the construction site:

8.3.1 General

- In order to prevent the accidental release of hazardous materials (fuels, paints, cleaning agents, etc.) during site activity, all hazardous materials should be stored within secondary containment designed to retain at least 110% of the storage contents. Temporary bunds for oil/diesel storage tanks should be used on the site during the construction phase of the project. Safe materials handling of all potentially hazardous materials should be emphasised to all construction personnel employed during this phase of the project.
- Prior to the commencement of construction, details will be provided for locations and safeguards for refuelling of machinery, machine servicing, concrete-mixing, etc.
- Comprehensive traffic management procedures, including the provision of access to all roads, and access/egress points should be prepared and agreed with the Local Authority. These traffic management measures should be implemented at times when traffic disruption may be experienced.
- Road sweeping and/or wheel wash facilities should be provided, as required.
- All oils/diesel stored on site for construction equipment are to be located in appropriately bunded areas.
- The location and size of stockpile areas for sands and gravel will be specified and identified on the maps.
- Sediment runoff will be minimised by standard engineering measures including sediment skirts around soil stockpiles, sediment retention barriers in surface water drains and the use of adequate construction roads.

8.3.2 Water / De-Watering

- A method statement for all works to be carried out will be prepared by the contractor and agreed with the Local County Council prior to commencement of works to outline what measures are to be taken to ensure there is no loss of service during the works.
- Dewatering measures should only be employed where necessary.
- In the event of groundwater being encountered during the demolition or construction phase, mitigation measures will include;
 - Dewatering by pumping to an appropriate treatment facility or settlement tanks in order to allow sediment to settle from solution prior to discharge.
 - Excluding contaminating materials such as fuels and hydrocarbons from sensitive parts of the site i.e. highly vulnerable groundwater areas.
- If concrete mixing is carried out on site, the mixing plant should be sited in a designated area with an impervious surface.
- Existing drains within the site that serve adjacent lands should be retained where possible to prevent causing increased flooding impacts.
- All surface water sewer connections should be made under the supervision of the Local Authority and checked prior to commissioning.
- All new onsite surface water drains should be tested and surveyed prior to connection to the public sewer to prevent any possibility of ingress of ground water.
- All surface water manholes and drains will be inspected and where necessary sealed to ensure that uncontrolled ground water inflow does not occur.
- Filters and silt traps will be used to prevent rain washing silts and other materials into the surface water network and creating blockages.
- Adjacent watercourses/groundwater need to be protected from sedimentation and erosion due to direct surface water runoff generated onsite during the demolition and construction phase. To prevent this from occurring surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete. Cut off land drains should be provided where there is a risk of uncontrolled runoff from the site.
- Regular inspections of settlement tanks are to be carried out and additional treatment used if settlement is not adequate.
- Bunded areas will be created for the storage or use of any fuels, oils, greases, cement, etc.
- Emergency spill kits will be kept close to works.

It is envisaged that any water to be discharged will be clean groundwater or rainwater falling into the works area. Clean rainwater should be discharged to the site surface water drainage systems. Frequent monitoring will be adopted to ensure that the water is of sufficient quality to discharge to the drainage systems. The use of slit traps will be adopted if the monitoring indicates the requirements for the same with no silt or contaminated water permitted to discharge to the sewer.

8.3.3 Harmful Materials

Harmful materials shall be stored on site for use in connection with the construction works only. These materials shall be stored in a controlled manner. Where on site fuelling facilities are used there shall be bunded filling area using a double bunded steel tank at a minimum.

8.4 Reinstatement / Road Cleaning

8.4.1 Construction Stage

Prior to the works commencing, detailed photograph surveys (condition schedules) of adjoining walls, roads, footpaths, grass verges etc. is to be prepared as required. Copies of the relevant parts are to be made available to adjoining owners and Dun Laoghaire Rathdown County Council. This record will form the basis of assessing repairs to adjoining areas in the future should a dispute arise as to their

cause. Roadways are to be kept clean of muck and other debris. A road sweeping truck is to be provided if necessary, to ensure that this is so.

8.4.2 On Completion

Reinstatement at completion of the works will involve:

- The cleaning of the existing drains and sewers in the vicinity of the development as required.
- Testing and cleaning of all watermains in the development to the requirements of Irish Water prior to connection to the public watermain. This will reduce the risk of contamination to the public water supply when the new network is connected to the system.
- Testing & cleaning of all new drains on site. CCTV surveys.
- Repair of any damage to any adjacent public roadways, kerbs, grass verges etc. in accordance with Dun Laoghaire Rathdown County Council requirements.
- Leaving the area in a neat and clean condition, removing all deleterious materials that may have been deposited during construction works.

9.0 MONITORING & PROTECTION OF NEIGHBOURING PROPERTIES

A monitoring regime will be put in place to protect neighbours & neighbouring properties with a full and detailed noise monitoring regime put in place for the duration of the works.

9.1 Monitoring Works Specialist:

If necessary, the Contractor will appoint a competent person to be referred to as the Surveying, Instrumentation and Monitoring Subcontractor (**MSC**) and together with them will prepare and maintain the noise, (and dust monitoring if required) monitoring plan, for the agreement/approval of the Client, Employers Representative and the Technical Advisors.

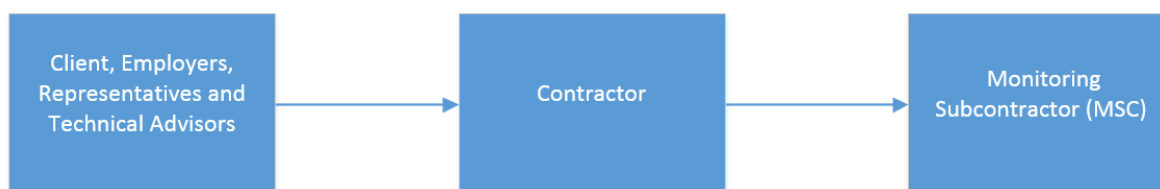


Figure 9.1 – Flowchart for the MSC

9.2 Condition Schedules:

The MSC will be responsible for preparing or organising the preparation of condition surveys of surrounding walls and hardstanding area etc. prior to the carrying out of any works on site. Extent of surveys to be agreed.

The condition surveys shall be carried out to a level of detail, suitable to the nature and extent of conditions encountered in order to obtain an understanding of the general structural condition of any relevant property/structure and/or external environments.

9.3 Movement Monitoring

As the new buildings are to be built on top of the existing buildings, designed to cater for the additional loads, it is not envisaged that there will be any need for movement monitoring. There are no existing buildings in third party ownership proximate to the new works.

9.4 Noise & Dust Monitoring / Control:

Refer to Section 8.1 & 8.2 of this report for details.

9.5 Groundwater:

It is not anticipated that there will be any groundwater to be discharged off-site as a result of the proposed works.

9.6 Recording:

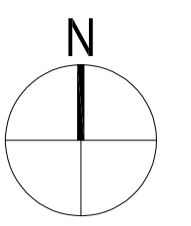
The MSC will monitor, collate and report, noise and dust measurements, on a weekly basis during critical activities. The report format is to be agreed.

APPENDIX
1
SITE
LOCATION



DO NOT SCALE FROM THIS DRAWING. USE FIGURED DIMENSIONS IN ALL CASES. VERIFY DIMENSIONS ON SITE AND REPORT ANY DISCREPANCIES TO THE ARCHITECTS IMMEDIATELY. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE ARCHITECTS SPECIFICATION. © THIS DRAWING IS COPYRIGHT AND MAY ONLY BE REPRODUCED WITH THE ARCHITECTS PERMISSION.

NOTES



Level Datum
 Malin Head Poolbeg Assumed

LEGEND

OUTLINE OF SITE TO WHICH APPLICATION RELATES
 Area - 2.67 Ha ———

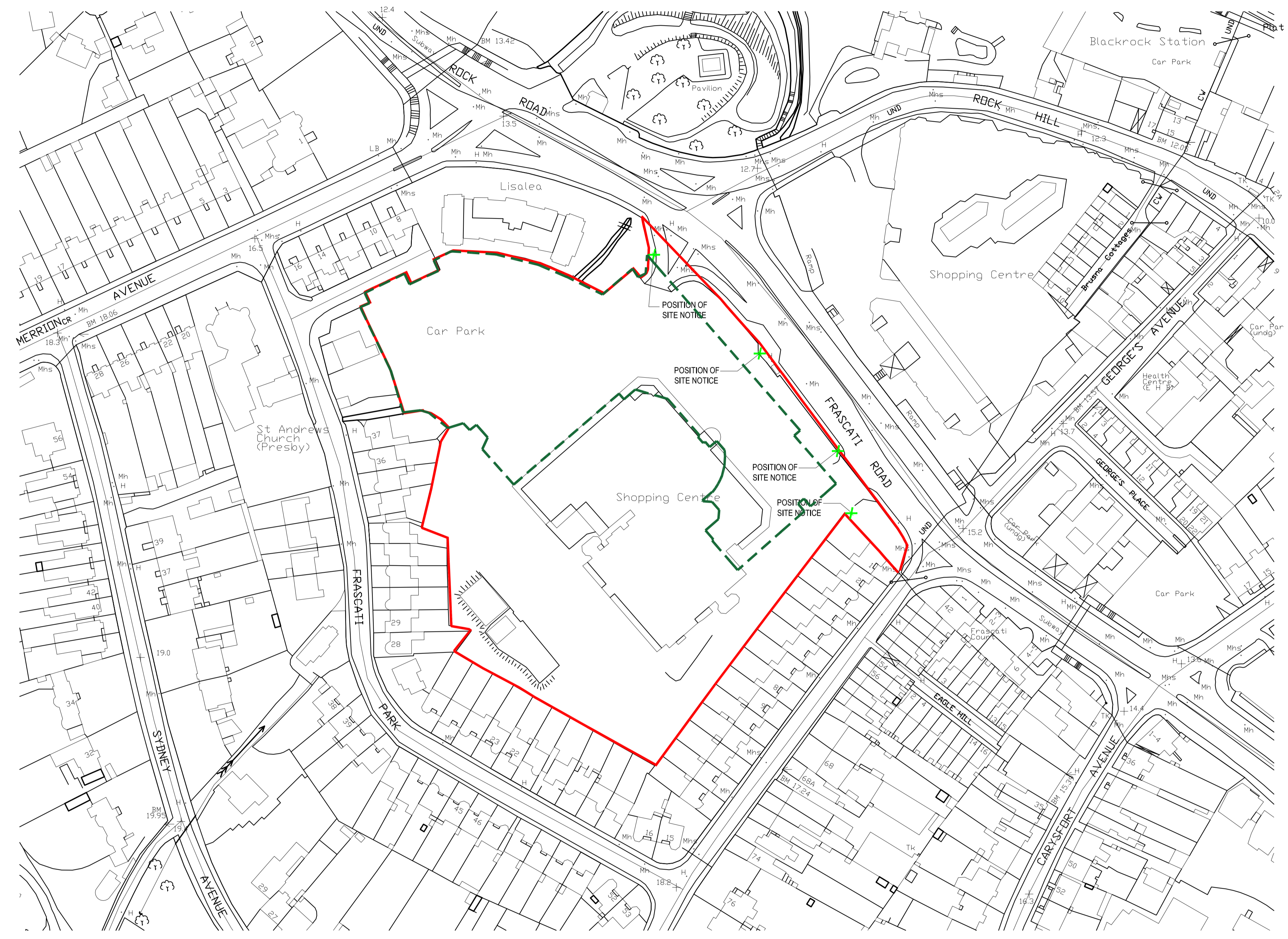
EXTENT OF PROPOSED PHASE 1 & PHASE 2 DEVELOPMENT - - - - -

POSITION OF SITE NOTICE X

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 © Ordnance Survey of Ireland & Government of Ireland

ORDNANCE SURVEY REFERENCE:
 3300-17 3300-22
 3300-23 3300-24
 3300-25

NOTE:
 REFER TO FLOOR PLANS, ELEVATIONS AND SECTIONS FOR DETAILS OF THE PROPOSED MODIFICATIONS TO PHASE 1 AND PHASE 2 PROPOSALS.



1 SITE LOCATION MAP
 001 1:1000

REV	DTE	DRN	ISSUE

Reddy Architecture + Urbanism
 Dublin Office
 Darryl Mall, Darryl Road, Dublin 6.
 T: +353 (0)1 4987000
 W: www.reddyarchitecture.com
 E: info@reddyarchitecture.com

PLANNING APPLICATION

JOB FRASCATI CENTRE BLACKROCK, CO. DUBLIN SHD RESIDENTIAL PROPOSAL			
CLIENT IMRF II FRASCATI LIMITED PARTNERSHIP / DAVY IMRF II GP LIMITED			
DRAWING SITE LOCATION MAP			
DATE	AUG 2020	SCALE	1:1000@A1
DRN.	CC	CHECKED	GA
JOB NO.	DWGS NO.	REVISION	
P19-202D	001-8		

APPENDIX

2

GEOTECHNICAL
SITE SUMMARY





**GROUND
INVESTIGATIONS
IRELAND**

Ground Investigations Ireland Ltd.,
Catherinstown House,
Hazelhatch Road,
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GROUND INVESTIGATIONS IRELAND LTD

FRASCATTI SHOPPING CENTRE

GROUND INVESTIGATION REPORT

DOCUMENT CONTROL SHEET

Engineer	Waterman Moylan
Project Title	Frascatti Shopping Centre
Project No	5464-11-15
Document Title	Ground Investigation Report

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Frascatti Shopping Centre - Ground Investigation Report

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1.0 Preamble

On the instructions of Barrett Mahony Consulting Engineers, a site investigation was carried out by Ground Investigations Ireland Ltd., in November 2015 at the site of the proposed extension to the Frascatti Shopping Centre in Blackrock Co. Dublin.

2.0 Overview

2.1 Background

It is proposed to construct a new extension with basement and associated access roads and car parking at the proposed site. The site is currently occupied by the existing shopping centre and a car park.

2.2 Purpose and Scope

The purpose of the site investigation was to investigate subsurface soil conditions by means of window sample boreholes and environmental laboratory testing. The scope of the work undertaken for this project included the following:

- Visit project site to observe existing conditions
- Carry out 4 No. Window Sample boreholes to a maximum depth of 3.1m BGL
- Environmental Laboratory testing
- Report with recommendations

3.0 Subsurface Exploration

3.1 General

During the ground investigation in November 2015 a programme of window sampling was undertaken to determine the sub surface conditions at the proposed site. Regular sampling and in-situ testing was undertaken in the exploratory holes to facilitate the geotechnical descriptions and to enable laboratory testing to be carried out on the soil samples recovered during drilling.

3.2 Window Sample Boreholes

The window sampling was carried out by mechanically driving a steel tube with a cutting edge and a plastic liner with a 50kg weight in 1.0m intervals to recover environmental soil samples for laboratory testing. Each location was sampled and logged by an Engineering Geologist and the window sample records are provided in Appendix 5 of this Report.

The above notes outline the procedures used in this site investigation and are in accordance with Eurocode 7 Part 2: Ground Investigation and testing (ISEN 1997 – 2:2007) and B.S. 5930:1999 + A2:2010.

3.3 Laboratory Testing

Waste Acceptance Criteria (WAC) test samples were selected and sent to Jones Environmental laboratory in the UK for the Rialta Suite.

The results of the laboratory testing are included in Appendix 7 of this Report.

4.0 Findings

4.1 Ground Conditions

The ground conditions encountered during the investigation are summarised below with reference to insitu and laboratory test results. The full details of the strata encountered during the ground investigation are provided in the trial pit and borehole logs included in the appendices of this report.

The sequence of strata encountered were variable across the site and are generally consisted of;

- Made Ground
- Cohesive Deposits

Made Ground: Made Ground was encountered in the majority of exploratory holes and was present to a depth of between 1.1m and 3.0m BGL. The Made Ground deposits were described as *brown/grey mottled red and white slightly sandy Gravel with brick fragments* or as *brown sandy gravelly Clay with fragments of plastic and wood*.

Cohesive Deposits: Cohesive Deposits were encountered below the Made Ground to a maximum depth of at 3.0m BGL. The cohesive deposits were described as *Stiff brown slightly sandy gravelly CLAY with occasional cobbles* however it should be noted that no insitu testing was carried out to confirm the strength of these deposits.

4.2 Groundwater

No groundwater strikes were noted during the investigation however we would point out that these exploratory holes did not remain open for sufficiently long periods of time to establish the hydrogeological regime and groundwater levels would be expected to vary with the time of year, rainfall nearby construction and other factors.

5.0 Recommendations and Conclusions

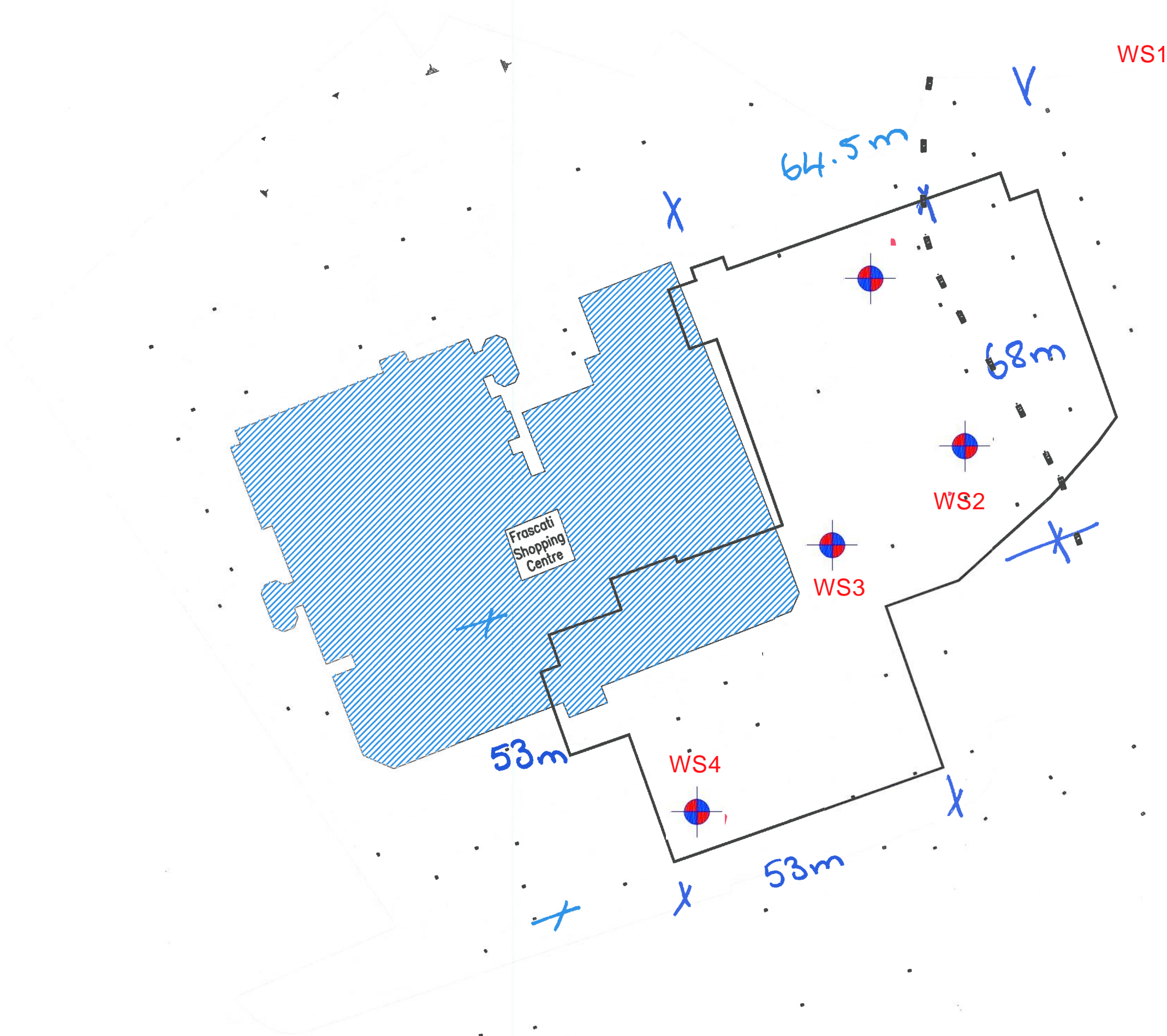
5.1 General

The recommendations given and opinions expressed in this report are based on the findings as detailed in the exploratory hole records. Where an opinion is expressed on the material between exploratory hole locations, this is for guidance only and no liability can be accepted for its accuracy. No responsibility can be accepted for conditions which have not been revealed by the exploratory holes.

The results of the Rialta Suite analysis are presented with the individual parameter limits for “Inert” “Non Hazardous” and “Hazardous” as outlined within European Council Directive 1999 131/EC Article 16 Annex II, “Criteria and procedures for the acceptance of waste at landfills”. This testing indicates the samples are inert, any spoil disposed of offsite should be sent to a licenced landfill.

Appendix 1: Site Location Plan

Ground Investigation Location Plan Frascatti Shopping Centre



- ① Depth of Dg
1.13m
- ② 1.09m
- ③ 2.085m
- ④ 2.385m



Appendix 2: Window Sample Records

WINDOW SAMPLE RECORD

Project Name: Frascati Centre Blackrock

Hole ID: WS1

Client:
 Consultant: Barrett Mahony
 Location: Blackrock
 Date: 10/11/2015
 Rig used: Window Sampler

Co-ordinates: -
 Elevation: -
 Project no. 5464-11-15
 Logged by: S. Connolly

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
MADE GROUND consisting of black Tarmacadam	[Cross-hatch pattern]	0.10						
MADE GROUND consisting of brown/grey mottled red and white slightly sandy Gravel with fragments of brick	[Dotted pattern]	1.10						
Stiff brown slightly sandy slightly gravelly CLAY with rootlets	[Stippled pattern]	2.60						
Dark brown/black slightly sandy gravelly CLAY	[Stippled pattern]	3.00						
End of Window sample at 3.00 m		4.00						

Remarks:



WINDOW SAMPLE RECORD

Project Name: Frascati Centre Blackrock

Hole ID: WS2

Client:
 Consultant: Barrett Mahony
 Location: Blackrock
 Date: 10/11/2015
 Rig used: Window Sampler

Co-ordinates: -
 Elevation: -
 Project no. 5464-11-15
 Logged by: S. Connolly

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
MADE GROUND consisting of black Tarmacadam MADE GROUND consisting of brown/grey mottled red and white slightly sandy Gravel with brick fragments Poor recovery between 0.70-1.0m BGL		0.10						
MADE GROUND consisting of brown sandy gravelly Clay with fragments of plastic and wood Poor recovery between 1.60-2.0m BGL and 2.6-3.0m BGL		1.10						
End of Window sample at 3.00 m		3.00						

Remarks:



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WINDOW SAMPLE RECORD

Project Name: Frascati Centre Blackrock

Hole ID: WS2A

Client:
 Consultant: Barrett Mahony
 Location: Blackrock
 Date: 10/11/2015
 Rig used: Window Sampler

Co-ordinates: -
 Elevation: -
 Project no. 5464-11-15
 Logged by: S. Connolly

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
MADE GROUND consisting of brown/grey mottled red and white slightly sandy Gravel Poor recovery between 0.60-1.0m BGL <hr style="border: 0.5px solid black;"/> End of Window sample at 1.00 m	[Hatched Pattern]	0.60 1 2 3 4						

Remarks:



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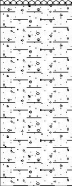
WINDOW SAMPLE RECORD

Project Name: Frascati Centre Blackrock

Hole ID: WS3

Client:
 Consultant: Barrett Mahony
 Location: Blackrock
 Date: 10/11/2015
 Rig used: Window Sampler

Co-ordinates: -
 Elevation: -
 Project no. 5464-11-15
 Logged by: S. Connolly

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
MADE GROUND consisting of black Tarmacadam			0.22					
MADE GROUND consisting of brown/grey mottled red and white slightly sandy gravelly Clay with fragments of brick and cement Poor recovery between 0.55-1.0m BGL and 1.3-2.0m BGL			1					
MADE GROUND consisting of brown slightly sandy gravelly Clay with fragments of cement and brick			2.16					
Stiff dark brown/black slightly sandy gravelly CLAY			2.40					
End of Window sample at 3.00 m			3.00					
			4					

Remarks:



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WINDOW SAMPLE RECORD

Project Name: Frascati Centre Blackrock

Hole ID: WS4

Client:
 Consultant: Barrett Mahony
 Location: Blackrock
 Date: 10/11/2015
 Rig used: Window Sampler

Co-ordinates: -
 Elevation: -
 Project no. 5464-11-15
 Logged by: S. Connolly

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
MADE GROUND consisting of black Tarmacadam	[Cross-hatch pattern]							
MADE GROUND consisting of brown slightly sandy slightly gravelly Clay with fragments of cement and brick	[Dotted pattern]	0.30						
MADE GROUND consisting of brown/grey mottled white and red slightly sandy Gravel with fragments of brick and cement	[Dotted pattern]	1.20						
End of Window sample at 2.51 m	[Dotted pattern]	2.51						
		3						
		4						

Remarks:



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Frascati Centre Blackrock – Window Sample Photos



WS1



WS2



WS2A



WS3



WS4

Appendix 3: Laboratory Test Records



Jones Environmental Laboratory

Registered Address : Unit 3 Deeside Point, Zone 3, Deeside Industrial Park, Deeside, CH5 2UA. UK

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland

Tel: +44 (0) 1244 833780

Fax: +44 (0) 1244 833781



Attention : Conor Finnerty
Date : 10th December, 2015
Your reference : 15/11/5464
Our reference : Test Report 15/16171 Batch 1
Location : Frascati Centre Blackrock
Date samples received : 12th November, 2015
Status : Final report
Issue : 2

Six samples were received for analysis on 12th November, 2015 of which six were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Where Waste Acceptance Criteria Suite (EC Decision of 19 December 2002 (2003/33/EC)) has been requested, all analyses have been performed using the relevant EN methods where they exist.

Compiled By:

Phil Sommerton BSc
Project Manager

Client Name: Ground Investigations Ireland
Reference: 15/11/5464
Location: Frascati Centre Blackrock
Contact: Conor Finnerty
JE Job No.: 15/16171

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18														
Sample ID	WS1	WS2	WS3	WS3	WS4	WS4														
Depth	0.00-1.00	1.00-2.00	1.00-2.00	2.00-3.00	1.00-2.00	2.00-3.00														
COC No / misc																				
Containers	V J T	V J T	V J T	V J T	V J T	V J T														
Sample Date	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015														
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil														
Batch Number	1	1	1	1	1	1														
Date of Receipt	12/11/2015	12/11/2015	12/11/2015	12/11/2015	12/11/2015	12/11/2015														
													LOD/LOR	Units	Method No.					
Natural Moisture Content	2.1	43.2	5.5	17.7	18.0	14.5							<0.1	%	PM4/PM0					
Moisture Content	2.1	30.2	5.2	15.0	15.2	12.7							<0.1	%	PM4/PM0					
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3							<0.3	mg/kg	TM38/PM20					
Sulphate as SO4 (2:1 Ext) #	-	-	-	-	-	-							<0.0015	g/l	TM38/PM20					
Chromium III	80.0	61.9	56.1	36.5	52.1	38.5							<0.5	mg/kg	NONE/NONE					
Sulphate as SO4 (2:1 Ext) #	0.0146	-	-	-	<0.0015	-							<0.0015	g/l	TM38/PM20					
Total Organic Carbon #	<0.02	2.46	0.22	1.09	0.69	0.56							<0.02	%	TM21/PM24					
pH #	9.15	8.15	9.13	9.95	8.86	9.17							<0.01	pH units	TM73/PM11					
Mass of raw test portion	0.0937	0.1249	0.1053	0.1034	0.104	0.1026								kg	NONE/PM17					
Mass of dried test portion	0.09	0.09	0.09	0.09	0.09	0.09								kg	NONE/PM17					

Please see attached notes for all abbreviations and acronyms

Jones Environmental Laboratory

Client Name: Ground Investigations Ireland
Reference: 15/11/5464
Location: Frascati Centre Blackrock
Contact: Conor Finnerty
JE Job No.: 15/16171

Report : MURPHY
Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18													
Sample ID	WS1	WS2	WS3	WS3	WS4	WS4													
Depth	0.00-1.00	1.00-2.00	1.00-2.00	2.00-3.00	1.00-2.00	2.00-3.00													
COC No / misc																			
Containers	V J T	V J T	V J T	V J T	V J T	V J T													
Sample Date	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015													
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil													
Batch Number	1	1	1	1	1	1													
Date of Receipt	12/11/2015	12/11/2015	12/11/2015	12/11/2015	12/11/2015	12/11/2015													
Please see attached notes for all abbreviations and acronyms																			
Solid Waste Analysis																			
Total Organic Carbon #	<0.02	2.46	0.22	1.09	0.69	0.56						3	5	6	<0.02	%			TM21/PM24
Sum of BTEX	0.080	<0.025	<0.025	0.096	<0.025	0.084						6	-	-	<0.025	mg/kg			TM31/PM12
Sum of 7 PCBs #	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035						1	-	-	<0.035	mg/kg			TM17/PM8
PAH Sum of 6 #	<0.22	5.94	0.42	<0.22	<0.22	<0.22						-	-	-	<0.22	mg/kg			TM4/PM8
PAH Sum of 17	<0.64	11.96	0.78	<0.64	<0.64	<0.64						100	-	-	<0.64	mg/kg			TM4/PM8
CEN 10:1 Leachate																			
Arsenic #	<0.025	<0.025	0.071	<0.025	0.049	0.027						0.5	2	25	<0.025	mg/kg			TM30/PM17
Barium #	<0.03	0.48	0.21	<0.03	<0.03	<0.03						20	100	300	<0.03	mg/kg			TM30/PM17
Cadmium #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005						0.04	1	5	<0.005	mg/kg			TM30/PM17
Chromium #	<0.015	<0.015	0.038	<0.015	<0.015	<0.015						0.5	10	70	<0.015	mg/kg			TM30/PM17
Copper #	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07						2	50	100	<0.07	mg/kg			TM30/PM17
Mercury #	<0.0001	<0.0001	0.0069	<0.0001	0.0009	0.0010						0.01	0.2	2	<0.0001	mg/kg			TM61/PM38
Molybdenum #	<0.02	<0.02	0.18	0.29	0.05	0.12						0.5	10	30	<0.02	mg/kg			TM30/PM17
Nickel #	<0.02	0.07	<0.02	<0.02	<0.02	<0.02						0.4	10	40	<0.02	mg/kg			TM30/PM17
Lead #	<0.05	<0.05	0.07	<0.05	<0.05	<0.05						0.5	10	50	<0.05	mg/kg			TM30/PM17
Antimony #	<0.02	<0.02	0.04	<0.02	<0.02	<0.02						0.06	0.7	5	<0.02	mg/kg			TM30/PM17
Selenium #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03						0.1	0.5	7	<0.03	mg/kg			TM30/PM17
Zinc #	<0.03	0.04	0.04	<0.03	0.03	0.04						4	50	200	<0.03	mg/kg			TM30/PM17
Chloride	<3	17	15	7	6	6						800	15000	25000	<3	mg/kg			TM27/PM0
Fluoride	<3	<3	<3	<3	4	5						10	150	500	<3	mg/kg			TM27/PM0
Sulphate as SO4	38.6	9.1	191.7	149.7	53.5	45.9						1000	20000	50000	<5	mg/kg			TM27/PM0
Total Dissolved Solids #	280	2080	850	590	780	550						4000	60000	100000	<100	mg/kg			TM20/PM0
Dissolved Organic Carbon	<20	220	50	<20	20	30						500	800	1000	<20	mg/kg			TM60/PM0
Mass of raw test portion	0.0937	0.1249	0.1053	0.1034	0.104	0.1026						-	-	-		kg			NONE/PM17
Dry Matter Content Ratio	95.8	72.0	85.2	86.9	86.2	87.5						-	-	-	<0.1	%			NONE/PM4
Leachant Volume	0.896	0.865	0.884	0.886	0.886	0.887						-	-	-		l			NONE/PM17
Elate Volume	0.86	0.8	0.88	0.72	0.85	0.89						-	-	-		l			NONE/PM17
Mineral Oil (C10-C40)	<30	<30	60	<30	<30	<30						-	-	-	<30	mg/kg			TM5/PM16
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1						-	-	-	<0.1	mg/kg			TM26/PM0

Client Name: Ground Investigations Ireland
Reference: 15/11/5464
Location: Frascati Centre Blackrock
Contact: Conor Finnerty

Note:

Analysis was carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Any questionable sample will automatically be assumed to have breached the Waste Limit and further testing may be required.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
 Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
15/16171	1	WS1	0.00-1.00	2	18/11/2015	Mass of Dry Sample	54.6 (g)
					20/11/2015	General Description (Bulk Analysis)	Soil/Stone
					20/11/2015	Asbestos Containing Material	None
					20/11/2015	Asbestos Containing Material (2)	None
					20/11/2015	Asbestos Screen	NAD
					20/11/2015	Asbestos Screen (2)	NAD
					20/11/2015	Asbestos Level	NAD
					20/11/2015	Waste Limit	<0.1%
15/16171	1	WS2	1.00-2.00	5	18/11/2015	Mass of Dry Sample	41.5 (g)
					20/11/2015	General Description (Bulk Analysis)	Soil/Stone
					20/11/2015	Asbestos Containing Material	None
					20/11/2015	Asbestos Containing Material (2)	None
					20/11/2015	Asbestos Screen	NAD
					20/11/2015	Asbestos Screen (2)	NAD
					20/11/2015	Asbestos Level	NAD
					20/11/2015	Waste Limit	<0.1%
15/16171	1	WS3	1.00-2.00	8	18/11/2015	Mass of Dry Sample	48.6 (g)
					20/11/2015	General Description (Bulk Analysis)	Soil/Stone
					20/11/2015	Asbestos Containing Material	None
					20/11/2015	Asbestos Containing Material (2)	None
					20/11/2015	Asbestos Screen	NAD
					20/11/2015	Asbestos Screen (2)	NAD
					20/11/2015	Asbestos Level	NAD
					20/11/2015	Waste Limit	<0.1%
15/16171	1	WS3	2.00-3.00	11	18/11/2015	Mass of Dry Sample	48.3 (g)
					20/11/2015	General Description (Bulk Analysis)	Soil-Silt/Sand/Brick/Stone
					20/11/2015	Asbestos Containing Material	None
					20/11/2015	Asbestos Containing Material (2)	None
					20/11/2015	Asbestos Screen	NAD
					20/11/2015	Asbestos Screen (2)	NAD
					20/11/2015	Asbestos Level	NAD
					20/11/2015	Waste Limit	<0.1%
15/16171	1	WS4	1.00-2.00	14	18/11/2015	Mass of Dry Sample	44.6 (g)
					20/11/2015	General Description (Bulk Analysis)	Soil-Silt/Sand/Brick/Stone
					20/11/2015	Asbestos Containing Material	None

Client Name: Ground Investigations Ireland
Reference: 15/11/5464
Location: Frascati Centre Blackrock
Contact: Conor Finnerty

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
15/16171	1	WS4	1.00-2.00	14	20/11/2015	Asbestos Containing Material (2)	None
					20/11/2015	Asbestos Screen	NAD
					20/11/2015	Asbestos Screen (2)	NAD
					20/11/2015	Asbestos Level	NAD
					20/11/2015	Waste Limit	<0.1%
15/16171	1	WS4	2.00-3.00	17	18/11/2015	Mass of Dry Sample	48.4 (g)
					20/11/2015	General Description (Bulk Analysis)	Soil-Silt/Sand/Brick/Stone
					20/11/2015	Asbestos Containing Material	None
					20/11/2015	Asbestos Containing Material (2)	None
					20/11/2015	Asbestos Screen	NAD
					20/11/2015	Asbestos Screen (2)	NAD
					20/11/2015	Asbestos Level	NAD
					20/11/2015	Waste Limit	<0.1%

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 15/16171

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 (UKAS) accreditation applies to surface water and groundwater and one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Please include all sections of this report if it is reproduced

All solid results are expressed on a dry weight basis unless stated otherwise.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS) accredited - UK.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 15/16171

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	
TM5/TM36	TM005: Modified USEPA 8015B. Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID.	PM12/PM16	CWG GC-FID			AR	Yes
TM17	Modified US EPA method 8270. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified USEPA 8163. Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes		AR	Yes

JE Job No: 15/16171

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM27	Modified US EPA method 9056. Determination of water soluble anions using Dionex (Ion-Chromatography).	PM0	No preparation is required.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7	PM17	Modified method EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.	Yes		AR	Yes
TM31	Modified USEPA 8015B. Determination of Methylterbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM31	Modified USEPA 8015B. Determination of Methylterbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes

JE Job No: 15/16171

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground samples with deionised water in a 2:1 water to solid ratio for anions. Extraction of as received samples with deionised water in a 2:1 water to solid ratio for ammoniacal nitrogen. Samples are extracted using an orbital shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground samples with deionised water in a 2:1 water to solid ratio for anions. Extraction of as received samples with deionised water in a 2:1 water to solid ratio for ammoniacal nitrogen. Samples are extracted using an orbital shaker.	Yes		AR	Yes
TM60	Modified USEPA 9060. Determination of TOC by calculation from Total Carbon and Inorganic Carbon using a TOC analyser, the carbon in the sample is converted to CO2 and then passed through a non-dispersive infrared gas analyser (NDIR).	PM0	No preparation is required.			AR	Yes
TM61	Modified US EPA methods 245.7 and 200.7. Determination of Mercury by Cold Vapour Atomic Fluorescence.	PM38	Samples are brominated to reduce all mercury compounds to Mercury (II) which is analysed using method TM061.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.			AR	
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	Yes
TM73	Modified US EPA methods 150.1 and 9045D. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
NONE	No Method Code	NONE	No Method Code			AR	Yes
NONE	No Method Code	PM17	Modified method EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.				

JE Job No: 15/16171

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	PM17	Modified method EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.			AR	
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.			AR	

Appendix - Methods used for WAC (2003/33/EC)

Leachate tests	
10l/kg; 4mm	I.S. EN 12457-2:2002 Specified particle size; water added to L/S ratio; capped; agitated for 24 ± 0.5 hours; eluate settled and filtered over 0.45 µm membrane filter.
Eluate analysis	
As	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Ba	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cd	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cr total	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cu	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Hg	I.S. EN 13370 rec. EN 1483 (CVAAS)
Mo	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Ni	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Pb	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Sb	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Se	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Zn	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Chloride	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Fluoride	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Sulphate	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Phenol index	I.S. EN 13370 rec. ISO 6439 (4-Aminoantipyrine spectrometric methods after distillation)* (BY HPLC - Jones Env)
DOC	I.S. EN 1484
TDS	I.S. EN 15216
Compositional analysis	
TOC	I.S. EN 13137 Method B: carbonates removed with acid; TOC by combustion.
BTEX	GC-FID
PCB7**	I.S. EN 15308 analysis by GC-ECD.
Mineral oil	I.S. EN 14039 C10 to C40 analysis by GC-FID.
PAH17***	I.S. EN 15527 PAH17 analysis by GC-MS
Metals	I.S. EN 13657 - Aqua regia digestion: EN ISO 11885 (ICP-OES)
Other	
Dry matter	I.S. EN 14346 sample is dried to a constant mass in an oven at 105 ± 3 °C; Method B Water content by direct Karl-Fischer-titration and either volumetric or coulometric detection.
LOI	I.S. EN 15169 Difference in mass after heating in a furnace up to 550 ± 25 °C.
ANC	CEN/TS 15364 Determined by amounts of acid or base needed to cover the pH range
Notes:	
*If not suitable due to LOD, precision, etc., any other suitable method can be used, e.g. AFS, ICP-MS	
**PCB-28, PCB-52, PCB-101, PCB-118, PCB-138, PCB-153 and PCB-180	
***Naphthalene, Acenaphthylene, Acenaphthene, Anthracene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)perylene, Benzo(a)pyrene, Chrysene, Coronene, Dibenzo(a,h)anthracene, Fluorene, Fluoranthene, Indeno(1,2,3-c,d)pyrene, Phenanthrene and Pyrene.	

APPENDIX

3

PHASE 1 CONTRACTORS CONSTRUCTION MANAGEMENT PLAN



Construction Management Plan



Project: A198 Frascati Apartments

Client: Invesco

Date: 14th August 2020

Revision: E

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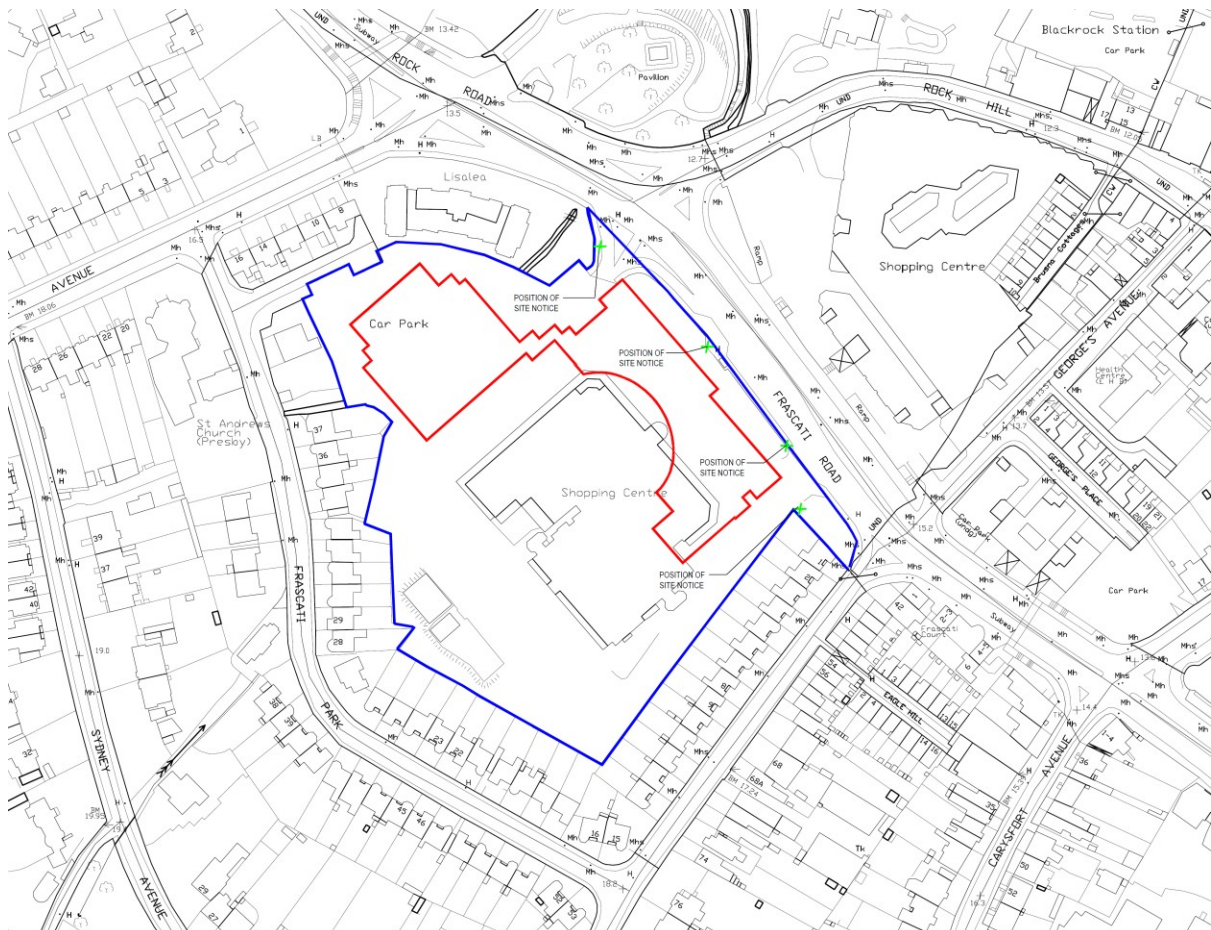
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1 Introduction

Colleen have prepared this Construction Management Plan (CMP) on behalf of SMP in support of the permitted works for the Residential Development at the Frascati Shopping Centre, Blackrock, Co. Dublin.

1.1 Site location and description

The residential development is to be constructed over the existing Frascati Shopping Centre on Frascati Road, Blackrock Co. Dublin. The development will consist of 45 no. apartments over three storeys including a first floor podium level car park located at the northwest of the site.



01 PROPOSED SITE LOCATION MAP
1:1000

2 Responsibilities

2.1 Key Contacts & Roles

The detailed CMP will need to confirm the following as a minimum.

	Organisation	Address	Name & Contact Details
Employer	Invesco C/O Burlington Real Estate	45 Fitzwilliam Place, Dublin 2, D02 KP46	Niall Kavanagh 01 905 8073 nkavanagh@burlealestate.com
Planning Consultant	John Spain Associates	39 Fitzwilliam Place, Dublin 2, D02 ND61	John Spain 01 662 5803 jspain@johnspainassociates.com
Contractor & PSCS	Collen	Riverhouse, East Wall Road Dublin 3, D03 P7Y5	Declan Lowry 01 874 5411 dlowry@collen.com
Contracts Manager	Collen	Riverhouse, East Wall Road Dublin 3, D03 P7Y5	David Cleary 01 874 5411 dcleary@collen.com
PSDP	SMP	62 Northumberland Road, Dublin 4 D04 KOT9	Des Kiernan des@smp.ie 01 614 4712
Project Manager & Liaison Officer	Collen	Riverhouse, East Wall Road Dublin 3, D03 P7Y5	Tom Reilly 01 874 5411 treilly@collen.com

The key responsibilities of those persons listed above:

	Key Responsibilities
Employer	To ensure all planning condition requirements are implemented.
Contractor / Contracts Manager	Will be responsible for development of the CMP in line with planning condition requirements.
PSCS	To manage and co-ordinate health and safety matters during the construction stage.
PSDP	Identify hazards arising from the design or from the technical, organisational, planning or time related aspects of the project. Where possible, eliminate the hazards or reduce the risks. Communicate necessary control measure, design assumptions or remaining risks to the PSCS so they can be dealt with in the safety and health plan. Ensure that the work of designers is coordinated to ensure safety. Organise co-operation between designers. Prepare a written safety and health plan.

Project Manager & Liaison Officer	Advise site personnel on requirements at the site and areas where improvements may be made on site. Issue weekly update on project progress and communications to shopping centre management and tenants.
-----------------------------------	--

Roles and responsibilities may be combined for an individual. The Contractor shall produce detailed method statements and risk assessments based on the outline method of works, procedures and the requirements set out in this CMP. The CMP forms part of the site induction and all contractors and employees shall be required to familiarise themselves with the contents.

Contractors shall identify all potential risks within the works or access areas, report these to the Site Manager and ensure that all employees working on site follow and strictly adhere to these procedures as absolute minimum requirements.

2.2 External Authorities

The development team will liaise regularly with external authorities as required. This may include:

Dun Laoghaire Rathdown County Council
Phone: (01) 205 4700
Email: planning@dlrcoco.ie

3 Relevant Legislation & Reference Documents

It is proposed that all works will be carried out using best practice and in conformance with the requirements of the relevant regulatory authorities and all relevant legislation. A non-exhaustive summary of key legislative documents and guidance is provided below.

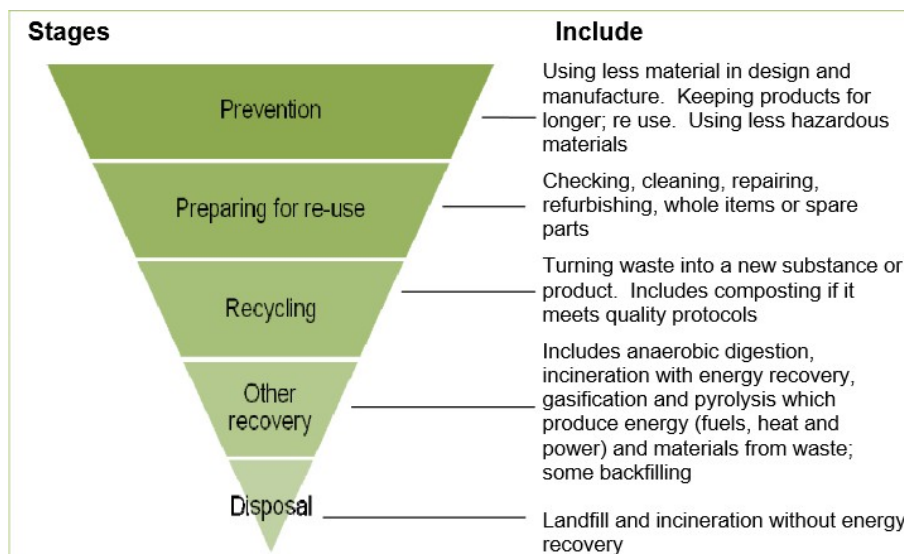
3.1 Legislation, Regulations and Orders

Current legislation as well as published guidance documents have been considered in the production of this CMP plan. In the case of the current proposed Development and associated potential impacts, all current legislation shall be adhered to along with codes of practice and guidelines.

3.2 EU Directives

Article 4 of Waste Framework Directive (Directive 2008/98/EC)

The Waste Framework Directive requires all member states to take the necessary measures to ensure waste is recovered or disposed of without endangering human health or causing harm to the environment and includes permitting, registration and inspection requirements. This sets out five steps for dealing with waste ranked according to environmental impact - the 'waste hierarchy' as demonstrated in the following Figure.



The Water Framework Directive (2000/60/EC)

The EU Water Framework Directive is an important piece of EU environmental legislation which aims at improving our water environment. It applies to rivers, lakes, groundwater, estuaries and coastal waters. Member States must aim to achieve good status in all waters and must ensure that status does not deteriorate in any waters.

3.3 Key Guidance

The Environmental Protection Agency has produced Pollution Prevention Guidelines. Some of these are of particular note with regard to the drafting of this CMP which include:

- 3.3.1 IPC Guidance Note - Guidance Note on Storage and Transfer of Materials for Scheduled Activities (EPA 2004).
- 3.3.2 National Hazardous Waste Management Plan 2008-2012 (EPA 2008). Key Guidance pertinent to this CMP from other bodies include:
 - Construction and Demolition Waste Management - A handbook for Contractors & Site Managers.
 - Best Practice Guidelines in the Preparation of Waste Management Plans for construction and demolition projects. Department of the Environment, Heritage & local Government. June 2006.
 - Guidance is available from the Health and Safety Authority with regard to legislation and construction safety.

3.4 Health and Safety Management

- 3.4.1 The Contractor shall be responsible for ensuring that a construction works Health and Safety plan is implemented and followed on site. All work will be carried out in accordance with the project specific Health & Safety Construction Stage Plan once it has been reviewed and approved by the PSDP.

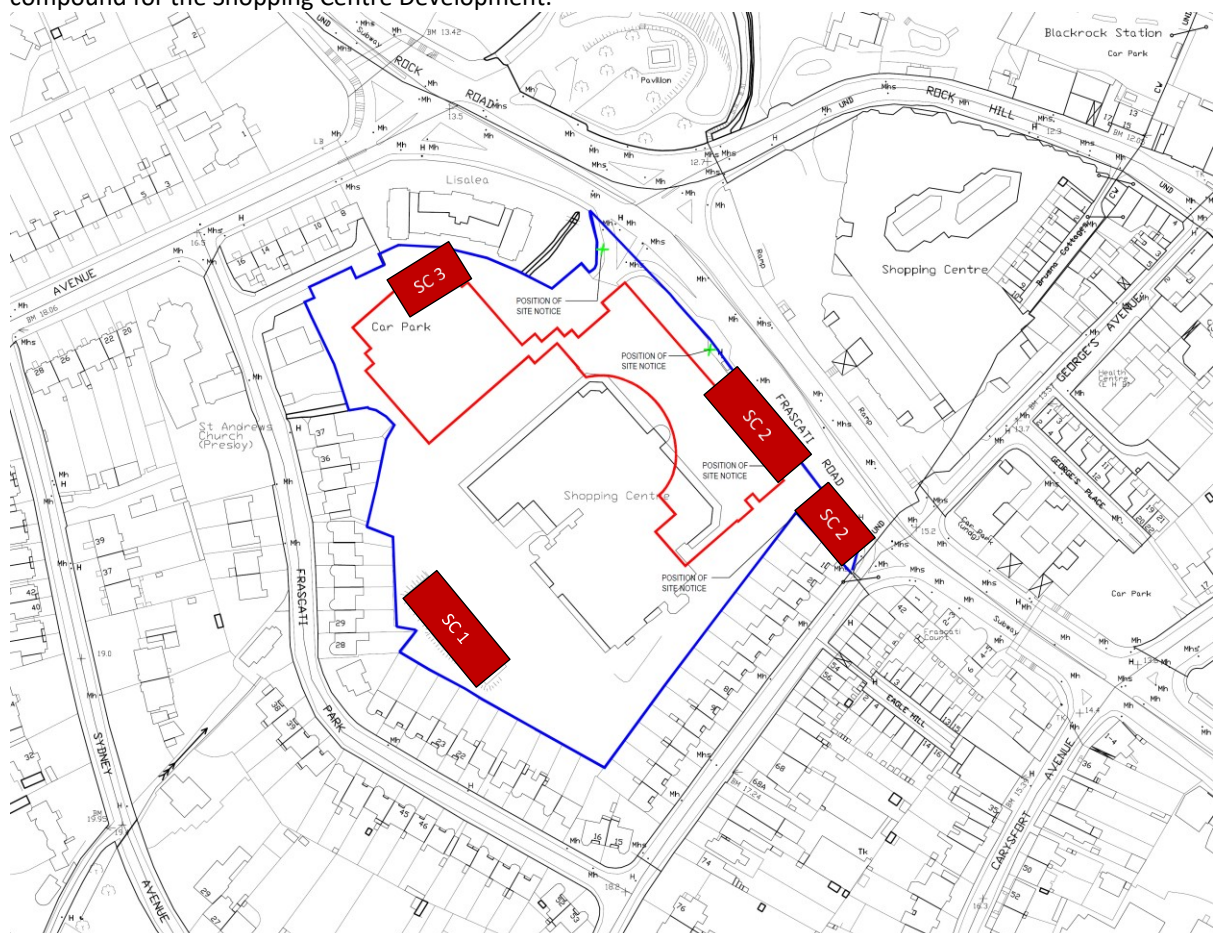
4 Construction Operations

4.1 Site Entrance, Deliveries and Primary Access Route

The site is up as per the Traffic Management Plan layout in Section 12 and also further detailed in the Traffic Management Plan.

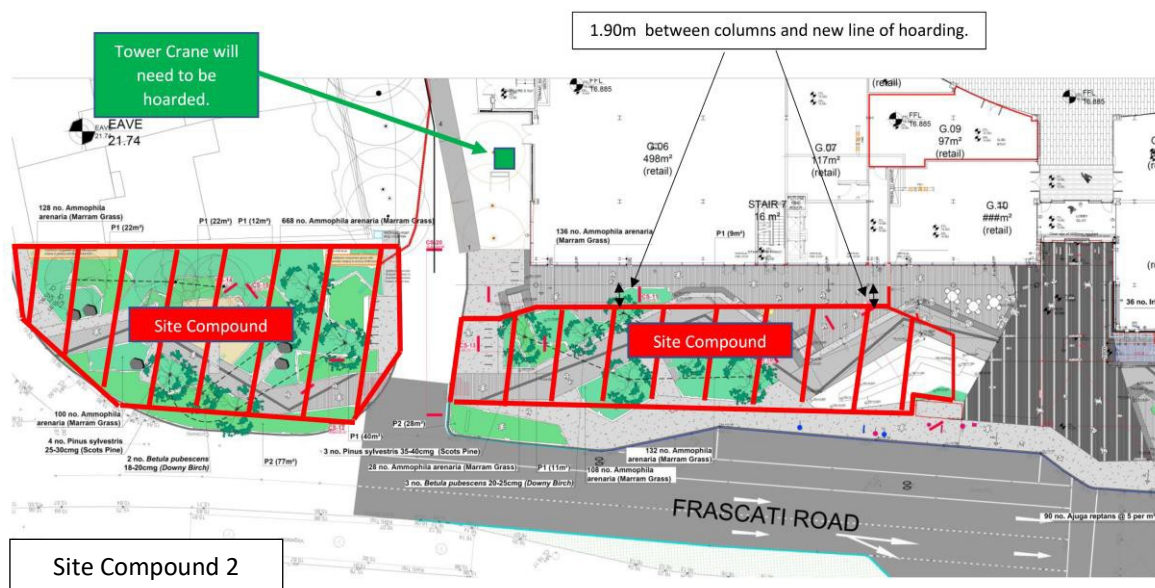
4.2 Site Compounds

Site Compound 1 (SC1) will be located as shown on the location map below. Located within this compound will be the Site Office, Site Meeting Room, Drying Room, Canteen & Welfare Facilities. This has been the site compound for the Shopping Centre Development.

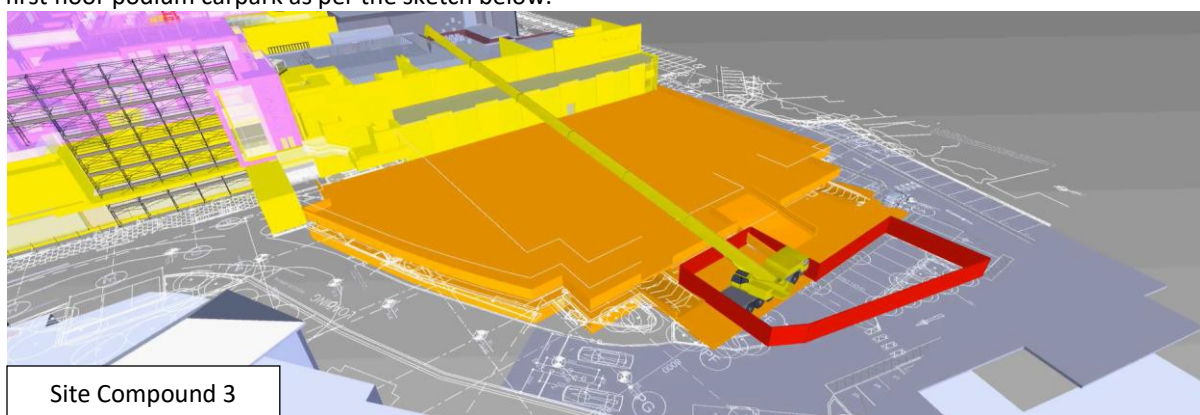


21 PROPOSED SITE LOCATION MAP
1:1000

Site Compound 2 (SC2) is required for the delivery and storage of materials for the development. This is where delivery vehicles will park and be off loaded throughout the construction of the project. The sketch below indicates this compound in greater detail.



Site Compound 3 (SC3) is required for the delivery and storage of materials for the new carpark podium slab at first floor level. This is where delivery vehicles will park and be off loaded throughout the construction of the first floor podium carpark as per the sketch below.



4.3 Accommodation

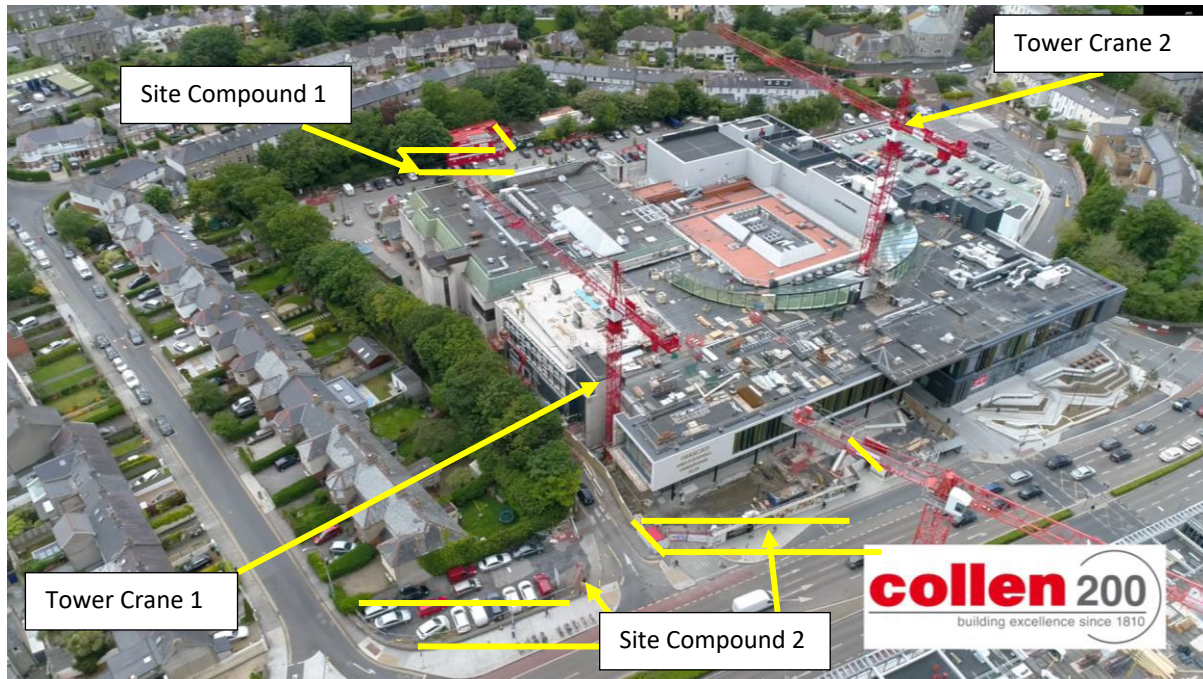
Site offices are constructed from modular anti-vandal containers and stacked two tiers high to reduce the overall footprint. The offices shall be provided with a power supply, internet access and water supply for welfare facilities.

4.4 Welfare Facilities

Welfare facilities are located within Site Compound 1.

4.5 Tower Crane Locations

The tower cranes that have been erected for the Shopping Centre development will be utilised for the construction of the residential phase and are highlighted on the photograph below. The offloading of materials will be completed in Site Compound 2. This compound is the same compound that is currently in use for the Shopping Centre development.



4.6 Substructure Construction

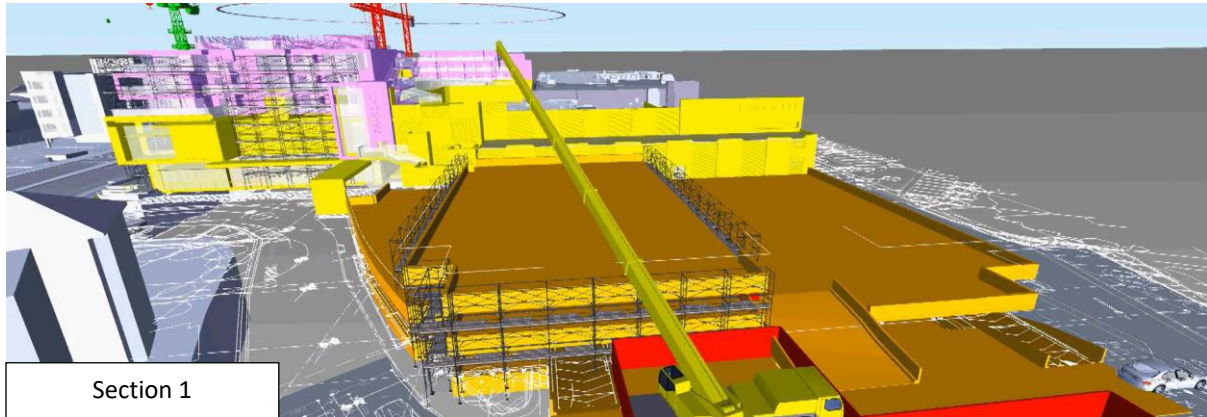
The only foundations associated with the entire project are for the new ramp that is to be formed for accessing the new podium carpark. These are isolated pad foundations and will be excavated within the hoarding of Site Compound 3. There are no substructure works associated with the new apartment building as it is being built directly over the existing shopping centre.

4.7 Superstructure Construction

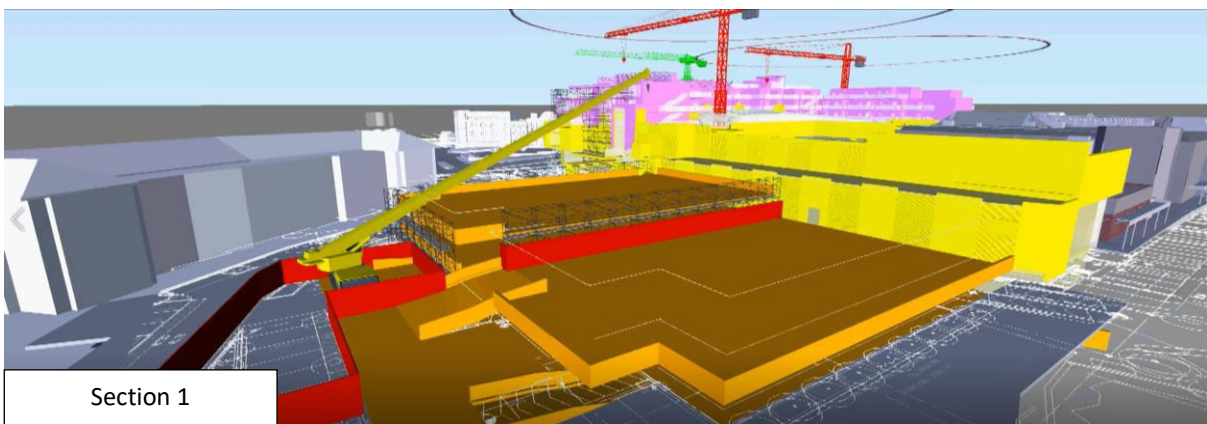
The new podium carpark is a reinforced concrete frame with precast slab infills and a reinforced concrete screed poured over the precast floor slabs and reinforced concrete frame. The super structure of the apartment building composes of reinforced concrete stair & lift cores, structural steel frame with precast concrete slabs and reinforced concrete screed.

4.7.1 Carpark podium slab

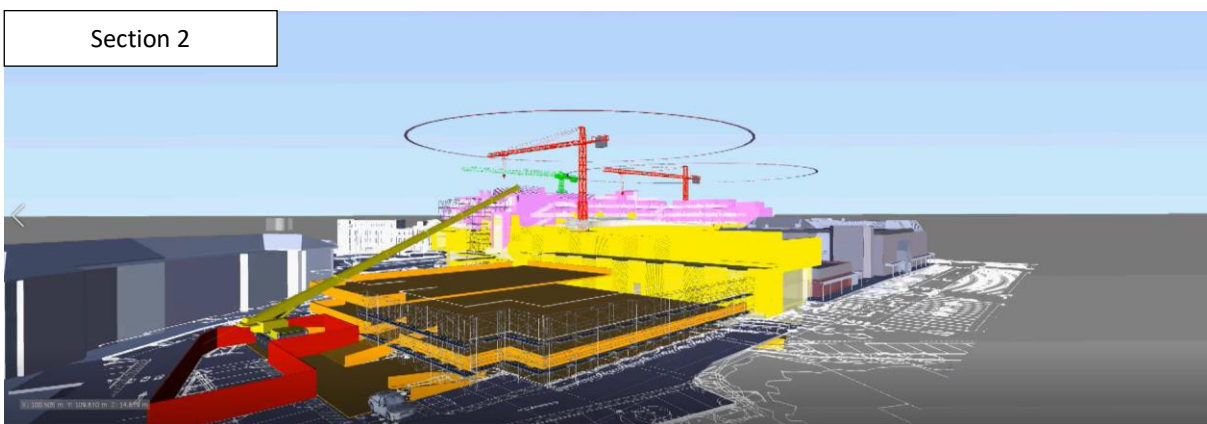
The carpark structure will be serviced by a mobile crane as shown on the Site Compound 3 sketch on the previous page. This crane will be located within the hoarding to ensure clear segregation between public vehicles and the works area. The podium carpark structure will be completed in three sections. The first section will be the reinforced concrete structure and precast slabs on the north side of the site, followed by the reinforced concrete structure and precast slabs on the south side of the site finishing with the new access ramps construction.



Scaffolding will be positioned around the perimeter of the work area and hoarded off.

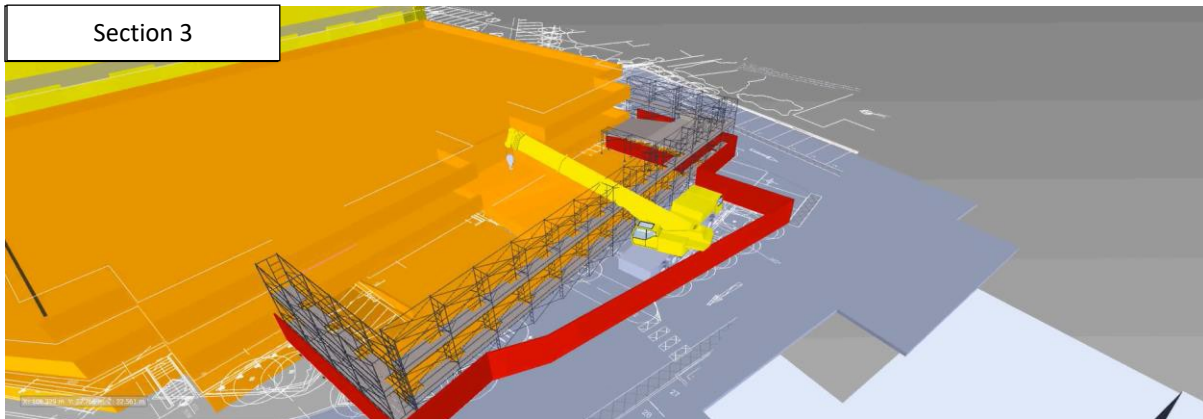


Once section 1 is completed then works will progress to the south side of the site. Again, scaffolding will be positioned around the perimeter of the work area and hoarded off.



Once section 1 is completed then works will progress to the south side of the site. Again, scaffolding will be positioned around the perimeter of the work area and hoarded off.

Once section 2 is complete the scaffolding and hoarding will be erected to the perimeter of section 3 as per the sketch below.

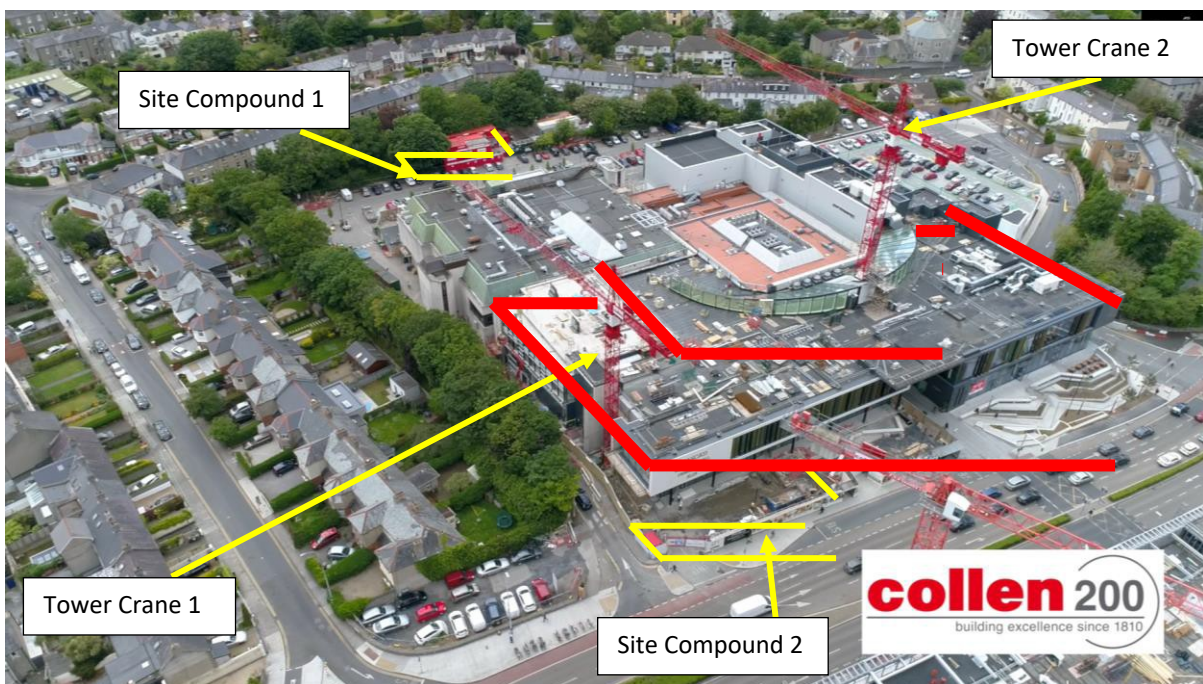


Upon completion of the structure for section 3 the new road markings and M&E installation will be completed prior to the removal of perimeter hoardings and handover to Shopping Centre Management.

4.7.2 Residential Block

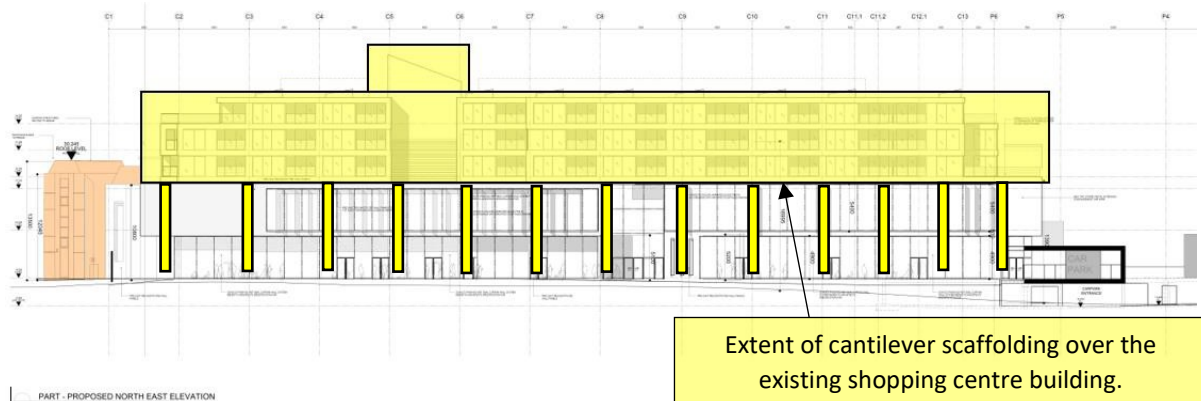
The location of the residential block is outlined in red below. This part of the development has been broken into two sections that will be serviced by the two tower cranes. This allows both sections to be built simultaneously.

The construction of the reinforced concrete stair and lift cores will be constructed prior to the arrival of the structural steel frame to site. These concrete cores will be shuttered using traditional formwork systems and poured utilising a concrete skip.



Scaffolding will surround the entire apartment building. The scaffolding will need to be erected from the ground with temporary scaffold towers located at 8m centres as per the sketch below. There will be no access to the work site from these towers. Access to the site will be via the existing stair core that provides access to the site.

Once enough of the steel structure has been erected then the scaffolding will cantilever over the perimeter of the building allowing the temporary scaffold towers at 8m centres to be removed until the majority of the new building has been completed. Localised scaffold towers will be required to complete the external façade.



Upon the completion of the steel structure the precast slab floor infills will commence. These slabs are to be covered with an insitu concrete screed. The volumes of concrete to be poured will be relatively consistent per level. Mobile concrete pumps with boom placers will be utilised for the placing of all the insitu concrete screeds. Pours can be supplemented using a crane mounted concrete placement skip during peak productivity periods.



The facades work will follow closely after the steel frame and concrete infill construction and protected throughout from the work occurring on the floors above. Sections of the facades will be left out to accommodate the delivery of materials and removal of waste from each floor level. These sections will be filled in later once the majority of materials have been completed for each floor level. The precast stone and glazed facades will be installed from the surrounding scaffolding utilising the tower cranes.

Internal finishes are typical of a residential development. A loading dock will be positioned at the rear of the development over the existing roof to allow access of materials to each individual floor.

5 Working Hours

Standard times adopted by the Council that apply to construction activity, and if work takes place outside of these hours, it can then be regarded as a source of noise nuisance and investigated by the Council's EHOs. The standard times for construction work in Dún Laoghaire/Rathdown are:

- Monday to Friday: 8 a.m. to 7 p.m.
- Saturdays: 8 a.m. to 2 p.m.
- Sundays & Bank Holidays: Works normally not permitted.

These are guideline times only and circumstances may arise that it may be necessary for building works to take place outside of these hours. Dun Laoghaire Rathdown County Council will be notified if work is proposed outside of standard working hours.

6 Noise, Dust and Vibration Management

6.1 Noise and Vibration

The potential noise impacts during the construction and during the operational phase are considered. Due to the scope of works no demolition is planned. During the construction phase, the main potential for noise impact is due to Construction Plant and Equipment and construction vehicle movements.

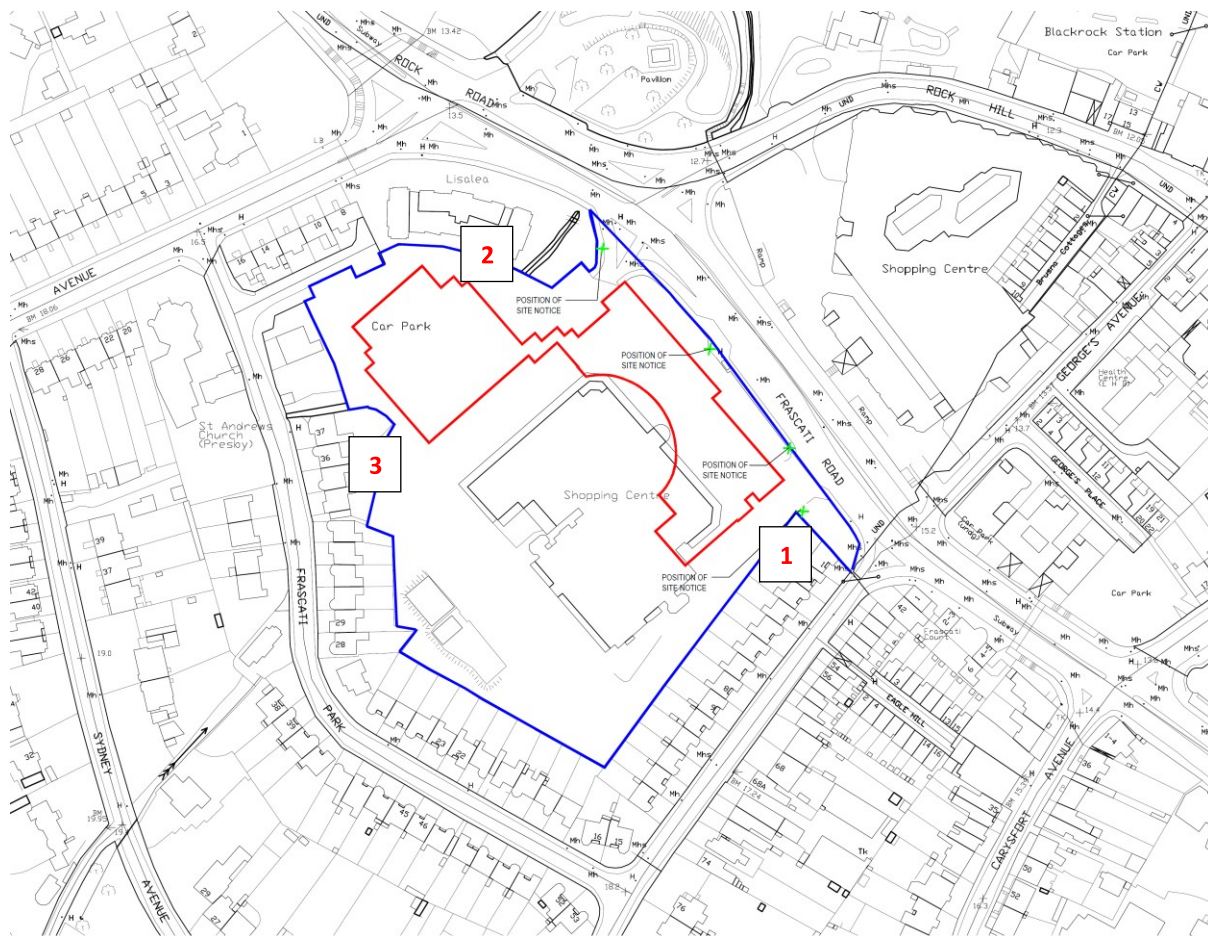
Construction noise will be kept to a minimum in accordance with **BS 5228-1:2009+A1:2014** *Code of practice for noise and vibration control on construction and open sites*. It is envisaged that the noise emanating from the site will cause negligible impact on neighbouring businesses during the above ground construction phase.

We will ensure the rated noise levels from the proposed development shall not constitute reasonable grounds for complaint as provided for in **4142:2004** *"Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas"* as far as is reasonably practicable.

The main points of the standard are as follows:

- make measurements of all noise at the assessment location, including the "problem" noise, in terms of LAeq - termed the "ambient" noise level
- a measurement is then made of all the noise excluding the "problem" noise in terms of both LAeq and LA90; these measurements are termed the "residual" and "background" noise levels respectively.
- the "residual" LAeq measurement is then subtracted (logarithmically) from the "ambient" LAeq measurement to produce the noise level produced by the "problem" noise alone - termed the "specific" noise level
- if the "problem" noise is tonal [containing a noticeable hiss, whine or hum] or if it is impulsive [contains bangs clatters, clicks or thumps] or if it is irregular enough to attract attention a correction of 5 dBA is added to the "specific" level to produce the "rating level"
- the "background" LA90 measurement is then compared against the "rating" level.
- If the "rating" level exceeds the "background" by around 10 dBA or more this "indicates that complaints are likely". A difference of around 5 dBA is of marginal significance; at a difference below 5 dBA, the lower the value, the less likely that complaints will occur; a difference of -10 dBA or more is "a positive indication that complaints are unlikely"

The above procedures will be a requirement of the contract documents and will be monitored by the Site Manager. The dust minimisation plan will also be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust nuisance through the use of best practice procedures.



21 PROPOSED SITE LOCATION MAP
 1:1000

Noise monitors are placed in the locations numbered above. Should excessive noise be encountered we will investigate and take any associated remedial actions required. All noise monitoring data shall be compiled into a monthly technical monitoring report which will include a full assessment of the noise impacts arising from site construction activities.

6.2 Construction Noise

The construction noise at the closest noise and vibration sensitive properties, defined in the EIAR as the residential receivers along Frascati Park, George’s Avenue and the Lisalea apartment complex which directly bound the site, shall be managed to remain below the threshold values of 65dB -70dB LAeq, 1hr at these locations as defined in Table 11.4 of the EIAR. Table 11.4 of the EIAR is summarised below:

Location	Threshold value, dB LAeq,1hr
Properties North West / South West	65
Properties South / North	70
Properties West	65

6.3 Mitigation Measures

Every practicable effort will be made to ensure that any environmental impacts will be minimised during the construction phase of this project. The construction planning will be geared towards keeping disruption and nuisance to a minimum.

Likewise, appropriate measures will be taken to ensure that the site and the surroundings are maintained to a high standard of cleanliness. The general nuisance of the construction activities on the surrounding area will be minimised as far as feasible. Mitigation measures to address construction traffic are described in the traffic management plan.

Objective	To appropriately manage noise during construction activities to minimise impact to workers, neighbours, and community members.		
Actions	Requirements	Responsibility	Timing
Performance Indicators	Reschedule particularly noisy operations to a more favourable time as far as is reasonably practicable	Site Manager	Throughout construction and demolition works
	Erect sound baffle screens where practical	Site Manager	When required
	Avoid leaving machinery running while not in use	Plant operators	Throughout construction and demolition works
	Ensure that plant and equipment are well maintained and in good working order	Site Manager	Throughout construction and demolition works
	Monitor complaints regarding noise from workers / neighbours / community members	Site Manager	Throughout construction and demolition works
Monitoring	Noise monitoring	Site Manager	Throughout construction and demolition works
Reporting	Complaints	All staff	
	Report to Site Manager	All staff	Throughout construction and demolition works
Corrective Actions	Review procedures and make changes were required	Site Manager	Throughout construction and demolition works

7 Dust Minimisation

Construction activities have the potential to generate some dust emissions. Frascati Shopping Centre Residential Apartments Project involves a very small amount of concrete breaking, this will be monitored daily and wetting down will be operational onsite.

The potential for dust to be emitted depends on the type of construction/demolition activities being carried out in conjunction with ambient conditions including rainfall, wind speed and wind direction. The potential for impact from dust depends on the distance to potentially sensitive locations and whether the wind can carry the dust to these locations.

Most of the dust will be deposited close to the potential source and any impacts from dust deposition will typically be within several hundred metres or so of the construction/demolition area. In order to minimise dust nuisance, a series of measures will be implemented as follows:

- 7.1 Site roads and the access onto the public road will be regularly cleaned and maintained as appropriate, and the site will be regularly dampened, if required, during dry and/or windy conditions.
- 7.2 Vehicles delivering and removing materials to site will be enclosed or covered with tarpaulins or closed skips.
- 7.3 The Principal Contractor or equivalent must monitor the contractors' performance to ensure that the proposed mitigation measures are implemented, and that dust impacts and nuisance are minimised;
- 7.4 During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions;
- 7.5 The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details;
- 7.6 It is recommended that community engagement be undertaken before works commence on site explaining the nature and duration of the works to local residents and businesses;
- 7.7 A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out;
- 7.8 It is the responsibility of the contractor at all times to demonstrate full compliance with the dust control conditions herein;
- 7.9 At all times, the procedures put in place will be strictly monitored and assessed.
- 7.10 Material handling systems and stockpiling of materials on site will be arranged to minimise exposure to wind, Water misting or sprays will be used during demolition and also as required when particularly dusty activities are being undertaken during dry or windy periods, and during movement of material both on and off-site, trucks will be covered with tarpaulins, if required.
- 7.11 Site Roads / Haulage Routes - A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles using unpaved site roads. Bowsers or suitable watering equipment will be available during periods of dry weather throughout the construction period. Any hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only.
- 7.12 Land Clearing/ Earth Moving – Not applicable as there are no significant sub structure works onsite.
- 7.13 Storage Piles - Not applicable as there are no significant sub structure works onsite.
- 7.14 Monitoring - Visual walks will be carried out daily by our Site Management Team. A complaints log shall be kept onsite should complaints arise.

8 Debris

The following are some of the measures that will be taken to ensure that the site and surroundings are maintained to a high standard of cleanliness, and that windborne debris will not be a nuisance:

- 8.1 Regular programme of site cleaning will be established to ensure a safe and orderly site; scaffolding will have debris netting attached to prevent materials and equipment being scattered by the wind.
- 8.2 Food waste will be strictly controlled on all parts of the site, and mud on the roads and footpaths outside the site will be cleaned regularly as required and will not be allowed to accumulate.

Objective	To manage construction activities with the potential to impact on air quality		
Actions	Requirements	Responsibility	Timing
	Use of wet cutting equipment when required	Site Manager	Throughout construction and demolition works
	Use of tools with vacuum attachments	All staff	Throughout construction and demolition works
	Ensuring items of plant are well maintained	Site Manager	Throughout construction and demolition works

	Trucks transporting aggregates or removing fill and all waste from site will be covered	Site Manager	Throughout construction and demolition works
	Good housekeeping practices	All staff	Throughout construction and demolition works
	Misters to be on all heavy plant onsite	Operators	
Performance Indicators	No complaints regarding dust from workers / neighbours / community members	Site Manager	Throughout construction and demolition works
Monitoring	Air quality monitoring	Site Manager	Throughout construction and demolition works
	Complaint based monitoring	Site Manager	Throughout construction and demolition works
Reporting	Site manager	All staff	Throughout construction and demolition works
Corrective Actions	Review procedures and changes required	Site Manager	Throughout construction and demolition works

9 Construction Noise and Vibration Induction

There are a number of commercial neighbours in close proximity to the works, where noise and vibration limits apply. To ensure limits are achieved, all staff are responsible for good noise and vibration management. The H&S Officer/Site Manager will communicate the following during induction processes:

- 9.1 When arriving at work, please drive slowly on site and keep revs to a minimum. Keep stereos off and do not slam doors.
- 9.2 No shouting or swearing on site. Either walk over and talk to somebody or use a radio/phone.
- 9.3 Be careful with tools and equipment. Place them down and do not drop them.
- 9.4 Do not drag materials on the ground. Place them down when you arrive at the work area.
- 9.5 Equipment and vehicles should not be left running when not in use.
- 9.6 When loading trucks try not to drop material from a height. Load softer material at the bottom.
- 9.7 Noise enclosures should always have all doors/hatches closed when the equipment is in use.
- 9.8 Stationary equipment such as pumps and generators should be located away from neighbours.
- 9.9 All equipment is to be well maintained.
- 9.10 If you see anything/anyone making unnecessary noise and vibration, then stop it/them. If the source cannot be stopped then report it to the Site Manager.
- 9.11 It is essential that good relationships are maintained with the local community. Any queries from members of the public should be responded to politely and referred to the site manager. Staff shall assist the public to contact this person. Staff shall not enter into debate or argue with members of the public.
- 9.12 No potentially noisy work is to be conducted until all staff involved in the task have read and signed the Construction Noise and Vibration Management Schedule for that task.

10 Environmental Controls

10.1 Road Sweeper

Colleen shall prevent any mud, dirt, debris or building material being carried onto or placed on the public road or adjoining property(s) as a result of the site construction works and repair any damage to the public road arising from carrying out the works in the interests of vehicular safety and road maintenance.

There is no requirement for a fulltime wheel wash onsite as there is no significant sub structure works onsite.

The development is being constructed directly over the existing shopping centre facility. A road sweeper will be engaged when required to ensure all roads and walkways are kept free of any mud, dirt or debris.

10.2 Stormwater Controls

All drains are covered by a filter mesh and also a drain cover to stop any sediment entering the storm water. They are checked weekly and in wet season checked daily.

As referred under section 7.1.1 there shall be no significant sub structure works onsite. While we do not foresee any reason to interfere with the existing stormwater drainage, DLRDCC will be contacted and a method statement agreed prior to works commencing should there be any reason to work in or around existing stormwater controls.

10.3 Dust Controls (in accordance with 14.36 Lands and Soils Frascati Centre- Residential Extension Environmental Impact Assessment Report, Chapter 14 – Summary of EIAR Mitigation & Monitoring Measures)

Sprinkling/Irrigation is to be used on dry/dusty days. Wind breaks are barriers in the form of Hoarding erected around the perimeter of the entire site. Stone will be used on the entrance road if required to minimise dust. Soil heaps or rubble – Not applicable as there are no significant sub structure works onsite.

10.4 Maintenance Considerations

Because dust controls are dependent on specific site and weather conditions, inspection and maintenance requirements will be monitored on a daily basis. If structural controls are used, we will inspect them regularly for deterioration to ensure that they are still achieving their intended purpose.

10.5 Hoarding

The entire perimeter of the site is protected by Hoarding that acts as a wind and dust barrier also. The use of Heras fencing may be used as a short-term site enclosure.

10.6 Storm Drain Inlets

We shall ensure all storm drains are covered with felt and then by a drain cover. To be checked weekly and also after heavy rainfall

10.7 Perimeter Protection

The entire perimeter of the site is protected by Hoarding that acts as a wind and dust barrier also.

10.8 Specific Sediment Basin Controls

All runoff from the site will be gathered in to lined sump bunds or sediment tanks. It is then filtered via settlement using drainage filters/covers. Any settlement bunds or tanks will be maintained to ensure they continue to operate properly.

10.9 Spill Prevention and Response

- 10.9.1 Ensure all employees are trained to use the Spill kits available onsite
- 10.9.2 Ensure all employees use drip trays when refuelling onsite
- 10.9.3 Where possible ensure all refuelling is done offsite
- 10.9.4 Ensure all operators are fully trained and competent to deal with a spill in an effective manner to ensure the least damage to the environment.

10.10 Storage of Fuels and Oils (in accordance with 14.36 Lands and Soils Frascati Centre- Residential Extension Environmental Impact Assessment Report, Chapter 14 – Summary of EIAR Mitigation & Monitoring Measures)

In line with best practice, all fuels, oils and chemicals on site must have secondary containment system of 110% capacity and be located more than 10m from any storm drain and more than 20m from any watercourse.

During enabling works and demolition, all fuels and oils shall be stored in designated areas only, including mobile bowzers, within the Construction Compound. If generators are used on site, these shall be bunded (the bund shall be capable of containing 110% of the fuel tank's capacity). The bund shall be kept empty of water.

Appropriate spill kits must be kept and maintained by the Contractor, at the Temporary Construction Compound on site to use in the event of a spillage. These must be made available at all times to all personnel.

10.11 Fuelling and Maintenance of Equipment or Vehicles

- 10.11.1 Shut the engine off
- 10.11.2 Ensure that the fuel is the proper type of fuel.
- 10.11.3 Absorbent spill clean-up materials and spill kits shall be available in fuelling areas and on mobile fuelling vehicles and shall be disposed of properly after use.
- 10.11.4 Nozzles used in vehicle and equipment fuelling shall be equipped with an automatic shut-off to prevent overfill.
- 10.11.5 Fuel tanks shall not be "topped off."
- 10.11.6 Mobile fuelling shall be minimized. Whenever practical, vehicles and equipment shall be transported to the designated fuelling area in the Facilities area.
- 10.11.7 Clearly post, in a prominent area of the facility, instructions for safe operation of fuelling equipment, and appropriate contact information for the person(s) responsible for spill response.

10.12 Hazardous Products

- 10.12.1 Ensure the (M) SDS for all chemicals and hazardous materials is provided to the NZEB/ Environmental coordinator based onsite and the H&S Officer prior to any materials being brought to the site.
- 10.12.2 Ensure all chemicals are used as per directed on the (M) SDS
- 10.12.3 Ensure all chemicals are stored in the chemical storage area onsite
- 10.12.4 Ensure all chemicals are disposed of correctly
- 10.12.5 Ensure products are kept in original containers unless they are not re-sealable.

10.13 Concrete Washout

Concrete trucks will be allowed to wash their chutes in designated areas on the site most likely to be bunded wash out zones. Surplus concrete and drum wash water will be disposed of at an approved off-site landfill and will not be allowed to be discharged at the site. No washout material will be allowed to run off site and wash out areas will be properly cleaned as necessary.

10.14 Maintenance and Inspection

- 10.14.1 Fuelling areas and storage tanks shall be inspected weekly.
- 10.14.2 Keep an ample supply of spill clean-up material on the site spill kits inspected weekly.
- 10.14.3 Any equipment, tanks, pumps, piping and fuel dispensing equipment found to be leaking or in disrepair must be repaired or replaced immediately.

10.15 Emergencies

In the event of a liquid spill occurring on a construction site, the Contractor shall cease work in the vicinity immediately and follow the lines of communication outlined in Appendix C of this report – emergency preparedness & response plan.

Contractor's trained personnel shall don appropriate PPE and do as follows:

- 10.15.1 Locate the source of the pollution and stop/contain any further flow if possible;

- 10.15.2 If spillage is flammable, extinguish all ignition sources;
- 10.15.3 Immediately deploy the spill kit in accordance with the manufacturer's instructions;
- 10.15.4 Clean up the spill; and,
- 10.15.5 All used spill kit materials should be disposed of in the proper manner as outlined in spill summary procedures.

10.16 Surface Water Construction Stage Measures (in accordance with 14.36 Lands and Soils Frascati Centre- Residential Extension Environmental Impact Assessment Report, Chapter 14 – Summary of EIAR Mitigation & Monitoring Measures)

- 10.16.1 A method statement for all works to be carried out will be prepared by the contractor and agreed with Dun Laoghaire Rathdown County Council prior to commencement of works to outline what measures are to be taken to ensure there is no loss of service during the works;
- 10.16.2 Dewatering measures should only be employed where necessary;
- 10.16.3 If concrete mixing is carried out on site, the mixing plant should be sited in a designated area with an impervious surface;
- 10.16.4 Existing surface drainage channels within the lands that serve adjacent lands should be retained where possible to prevent causing increased flooding impacts;
- 10.16.5 Construction methods used should be tailored to reduce, as much as possible, dust and noise pollution;
- 10.16.6 Comprehensive traffic management procedures, including the provision of access to all roads, and access/egress points should be prepared and agreed with the Local Authority. These traffic management measures should be implemented at times when traffic disruption may be experienced;
- 10.16.7 Road sweeping and/or wheel wash facilities should be provided, as required;
- 10.16.8 All oils/diesel stored on site for construction equipment are to be located in appropriately bunded areas;
- 10.16.9 Filters and silt traps will be used to prevent rain washing silts and other materials into the surface water network and creating blockages.
- 10.16.10 Adjacent watercourses/groundwater need to be protected from sedimentation and erosion due to direct surface water runoff generated onsite during the construction phase. To prevent this from occurring surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete. A temporary positive drainage system shall be installed prior to the commencement of the construction works to collect surface water runoff from the site during construction. A series of geotextile lined cascading, high level outfall, settling basins will be installed upstream of the agreed discharge point. This temporary surface water management facility will throttle runoff and allow suspended solids to be settled out and removed before being discharged in a control manner to the agreed outfall. Inlet to the cascading settling basins will be rippapped to prevent scour and erosion in the vicinity of the inlet.

11 Construction and Demolition Waste Management (condition 13)

Please see separate Construction and Demolition Waste Management Plan.

13 Liaison with Local Community, Businesses and Shopping Centre Management.

13.1 Liaison with Local Community and Shopping Centre Management

Thomas Reilly is the appointed Liaison Officer and is the single point of contact to engage with the community and businesses and respond to concerns. The Liaison Officer will be in a position to explain the planning of specific construction tasks, such as large concrete pours and material deliveries if required to do so.

The Liaison Officer issues a weekly communication on construction progress and updates to Shopping Centre Management and tenants as agreed. Shopping Centre Management shall advise the Liaison Officer of particular concerns raised by tenants to allow mitigation measures to be implemented to minimise any adverse impacts. Weekly meetings are held with Shopping Centre Management to discuss any upcoming works which may have potential to affect businesses within the Centre. Other meetings with businesses to be arranged/held as required in liaison with Shopping Centre Management. Leaflet drops will be issued to neighbours as and when required, in particular where planned works are required directly adjacent to neighbouring residents.

13.2 Complaints Procedure

A log shall be maintained on site of noise complaints detailing:

1. Name and address of complaint
2. Time & date complaint was made
3. Date time & duration of noise
4. Characteristics, such as rumble, clatters intermittent, etc.
5. Likely cause or source of noise
6. Weather conditions, such as wind speed and direction
7. Investigate and follow up actions.

All of the above points are captured in the complaint procedure that is outlined on the following pages.

14 Complaints & Inquires Procedure

CCL-Q-PR-018 Complaints & Inquires Procedure



I. Purpose

Communications received from stakeholders, including positive feedback, enquiries and complaints, must be handled effectively and efficiently. Complaints are an important source of feedback on the Company's operations/ services. Colleen personnel are encouraged to treat complainants with respect and listen carefully to their concerns to ensure the issue is resolved effectively.

II. Scope

This procedure applies to all Colleen employees and representatives.

III. Responsibilities

The Director is responsible for:

- Ensuring resources are allocated to effectively manage all complaints raised.

The Project Manager is responsible for:

- Ensuring resources are allocated to manage and close all complaints.
- Advising Contracts Manger of all complaints received.

Department Managers are responsible for:

- Reviewing and providing direction on complaints received where required.
- Submitting periodic reports on complaints to Senior Management.

Complaints receivers are responsible for:

- Consultation with the Project Manger to advise of complaint received.
- Consultation with Department Manger as required to close a complaint.
- Closing out of complaint where possible in a mannerly timeframe to ensure stakeholders do not escalate complaint due to lack of consultation and participation on Colleen's behalf.
- Communication of complaint to Subcontractors and/or Colleen employees to ensure no recurrence of complaint.

CCL-Q-PR-013 Complaints & Inquiries Procedure

IV. Procedure



Key Players

- Project management team
- Person making complaint



Key Deliverables

- A documented record of the enquiry and the response given
- Up-to-date complaints register



Indicators of Success

- Constructive feedback from stakeholders improves Colleen's operations and services
- Stakeholders consider they have been listened to and understand the reasons behind the resolution
- Enquiries are resolved in a timely manner

Step by Step



Key actions



Comments, hints, risks



Resources and tools

1. Record the enquiry

- A written or electronic record must be made of all enquiries/ complaints and stakeholder dealings
- A register of enquiries must be kept for each project
- Advise the client of the enquiry/ complaint, if required
- Include minutes from stakeholder meetings in project folder
- Details recorded should include: All complaints to be mailed to complaints@4projectsmail.com
- Name of person making the enquiry
- Date/ time of enquiry
- Details of the enquiry
- Resolution/ action taken
- An electronic database should be used to record enquiries/ complaints

QA Approved
 Review Date: 11/09/2019
 22.07.2019

CCL-Q-PR-013 Complaints & Inquiries Procedure

<p>2. Work with Project team to resolve any complaints/issues</p>	<ul style="list-style-type: none"> • Determine the responsible management team member (Site Mgr, Environment Mgr etc) and communicate the issue/ complaint by supplying them a copy of the enquiry/ complaint report so they can investigate further • Follow-up with delegated team member to ensure timely response is delivered to complainants/ stakeholders • Commitment to timeliness of response essential • Project expectations should be established in relation to response and resolution times. • Acknowledgements of the call would normally be given within 24 hours and ideally would include a response or timeframe relating to informing the stakeholder of a response.
<p>3. Communicate outcome and include in project report</p>	<ul style="list-style-type: none"> • Communicate findings and action/s taken to the person making the enquiry • Update the client, if required • Summarise all complaints/ enquiries for project team on a monthly basis to track issues
<p>4. Advise Company Secretary and Directors of issues that may impact on reputation</p>	<ul style="list-style-type: none"> • If the enquiry is likely to generate media interest or is from the media, then notify either: <ul style="list-style-type: none"> ○ Company Secretary ○ Project Director

A198 Frascati SC Residential Phase
Construction Management Plan



CCL-Q-PR-013 Complaints & Inquiries Procedure Log



Time & Date the complaint was made	Name & Address of complainant	Date & Time of incident and duration of noise	Complaint details: Characteristics of noise; - Banging, Rumbling, intermittent, constant etc	Likely cause or source of noise	Weather conditions, such as wind speed and direction	Follow up actions required and person whom received the complaints details
: hrs on __/__/20__		: hrs on __/__/20__ Duration:				Actions: Name of person receiving complaint:
: hrs on __/__/20__		: hrs on __/__/20__ Duration:				Actions: Name of person receiving complaint:
: hrs on __/__/20__		: hrs on __/__/20__ Duration:				Actions: Name of person receiving complaint:
: hrs on __/__/20__		: hrs on __/__/20__ Duration:				Actions: Name of person receiving complaint:
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: hrs on __/__/20__		: hrs on __/__/20__ Duration:				Actions: Name of person receiving complaint:
: hrs on __/__/20__		: hrs on __/__/20__ Duration:				Actions: Name of person receiving complaint:

15 Conclusion

This Construction Management plan identifies an indicative sequence of the works from the initial enabling works through to the completion of the construction phase. The project programme will have a more detailed breakdown of the sequence of work and timeframes.

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