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Graythwaite, 20 Edward Street North Sydney
Construction Management Plan
Sydney Church of England Grammar School (Shore)

Date: September 2011

QUALITY MANAGEMENT

Issue/revision	Issue 1	Revision 1	Revision 2	Revision 3
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1 INTRODUCTION

This Construction Management Plan (**CMP**) has been prepared by WSP Fitzwalter on behalf of Sydney Church of England Grammar School North Sydney (**Shore**) and relates to a Part 3A Concept Plan Application including a Stage 1 Project Application to conserve and restore existing heritage buildings and develop new educational facilities on the Graythwaite site at 20 Edward Street, North Sydney and part of the existing Shore site (the **site**). Figure 1 shows the Site Location and Figure 2 shows the proposed Concept Plan Application Site Plan.

This CMP specifically addresses the Stage 1 Project Application works. The principles and approaches within this CMP will typically apply to the later stages of the proposed works and specific CMPs for those stages will be subsequently prepared as part of the later Detailed Design and Approval processes. A short discussion of some of the issues that will arise in later stages is included at the end of this CMP.

The Stage 1 Project Application Works (which can be identified in Figure 2) include:

- Conservation and refurbishment of the Graythwaite House (the House), Coach House, Tom O'Neill Centre and associated garden area
- Drainage and Stormwater improvements, site levelling and landscaping of the site (particularly on the middle and lower terraces)
- Transport, traffic, parking and access improvements to the Graythwaite and Shore sites
- Miscellaneous works including site fencing

Specific details of the noted works are included in the Environmental Assessment (EA) associated with the 3A Application.

Future stages include inter alia construction of the North and East buildings (Stage 2) and the West Buildings (Stage 3).

1.1 PURPOSE

The purpose of this CMP is to provide supporting documentation to accompany the Part 3A Application for the site and guidance for future construction contractors on what must be done to commence and implement construction.

The CMP addresses the following issues:

- Site Management and Public Safety
- Operating Hours and Construction Staging
- Demolition and Excavation Work Methods
- Archaeological Issues
- Geotechnical
- Groundwater and Water Extraction
- Noise and Vibration Management
- Air and Water Quality
- Waste Management
- Construction Traffic Management

Figure 1: Site Location

Figure 2 – Concept Plan Application Site Plan (Mayoh Plan A.003 Rev G)

2 SITE AND LOCALITY

Location	20 Edward Street, North Sydney (**Figures 1 and 2**).
Real property description	Lot 2 DP 539853 and part of Lot 1 DP 120268.
Site area	2.7 ha (approximately)
Frontages	Union Street and Edward Street

3 SITE MANAGEMENT & PUBLIC SAFETY

3.1 SITE MANAGEMENT

Until a Principal Contractor is appointed to undertake the works, Shore has appointed the following person to be responsible for compliance with this Construction Management Plan.

- Name Mrs Kathy Dickson (BURSAR)
- Contact Number 02 9956 1111
- After Hours Contact Number 0413 484 303

When a Principal Contractor is appointed they will take responsibility for the preparation and implementation of their own plan which will fully address all the issues encompassed in this CMP.

3.2 PUBLIC SAFETY

Safety of the Shore School students and staff, contractors and the general public will be treated with the utmost priority. All entrances to the site (Edward and Union Streets) will be secured by fencing and locked gates. Fences around the site will be maintained. Site personnel and visitors in relation to the buildings work will gain access to the site via the entrance off Edward Street as shown in **Figure 3**, and will be required to be inducted into the site by the Principal Contractor, and sign in during each visit before entry is permitted. Separate arrangements will be made for landscaping and drainage work taking place on the middle and lower terraces where access will be managed from Union Street.

Vehicular access to the site will be limited, and traffic movements are discussed in **Section 12**.

A detailed site management plan will be required to be prepared by the Principal Contractor to ensure the site is secure at all times and to prevent unauthorised access to the site during the works, thereby protecting the public from activities occurring on the site.

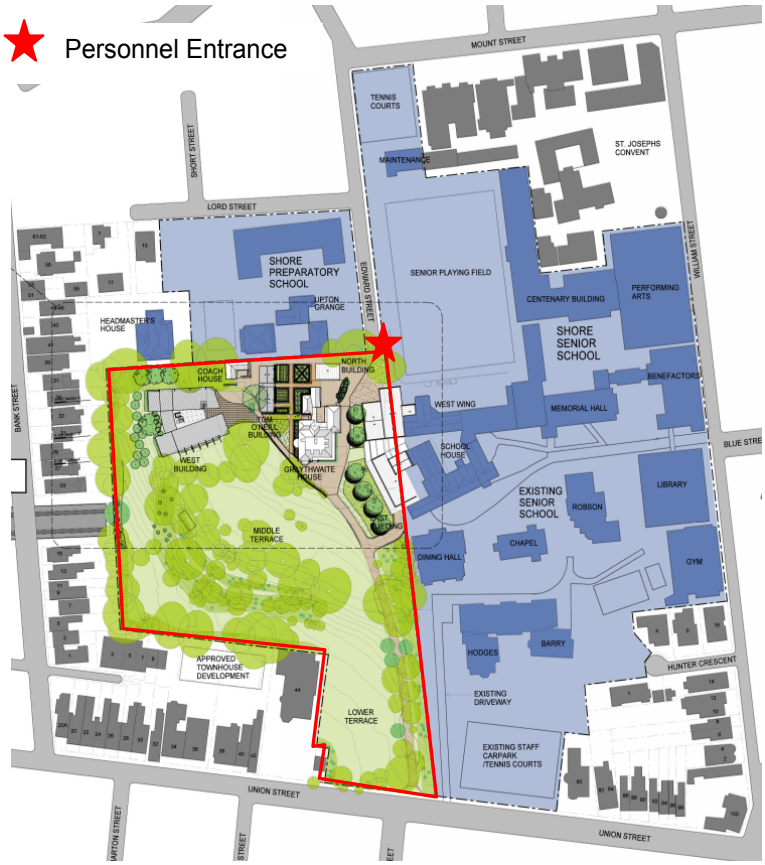

Figure 3: Site Access (Mayoh Plan A.003 Rev G)

4 OPERATING HOURS & CONSTRUCTION STAGING

4.1 OPERATING HOURS

To minimise the impact on the immediate neighbourhood, the following operating hours as stipulated by North Sydney Council's Permitted Hours of Work on Construction Sites will be adhered to:

- Monday to Friday 7:00AM to 5:00PM
- Saturday 8:00AM to 1:00PM
- Sunday / Public Holiday No work permitted

Should works be required to be undertaken outside of these hours, an application will be made to North Sydney Council.

4.2 CONSTRUCTION STAGING

The Concept Plan Application as discussed in **Section 1** seeks approval of a Master Plan that will be developed in three stages over a period of 10-15 years.

As discussed in **Section 1**, the Project Application is the focus of this document and details the work to be undertaken for Stage 1 (notionally to be complete within two years of receiving approval with the actual main construction typically taking in the order of 12 months). Therefore, the construction sequencing of Stage 1 only is addressed in this document.

There are two significant activities in this application, the restoration of the existing buildings, and the landscaping and drainage. Given the site conditions, the two activities can be run simultaneously with only a minor amount of cross coordination needed. Once the site is established and environmental controls are in place, both tasks can be executed at once. The following is a simplified sequence of works proposed for Stage 1:

1. Site Establishment
2. Installation of Environmental controls
3. Minor demolition & site clearing
4. Restoration of buildings, drainage & landscaping
5. Landscaping (hardscape) & gardens
6. Site demobilisation

It is important to note that this CMP will form part of any tender process to obtain a preferred Principal Contractor.

5 DEMOLITION & EXCAVATION WORK METHODS

5.1 DEMOLITION

As a heritage project, a delicate approach to demolition is needed, to ensure the significant building fabrics needed for the restoration are carefully managed, and those identified for removal can be accessed in a safe and efficient manner.

The demolition described will also be applicable to Stages 2 and 3, although future management plans will provide details of task and delivery methods applicable to those project applications:

House

- Removal and appropriate off site disposal of any hazardous materials as described in Hazardous Materials Report by HIBBS June 2009) and later by WSP ES (September 2010) – (this applies for all buildings)
- Removal of the roof lining and roof drainage system (unless completed earlier under a temporary works approval)
- Removal of selected external façade elements
- Removal of selected internal floor, wall, and ceiling fabrics
- Removal of selected unwanted built-in joinery, doors, loose furniture, fittings and fixtures
- Removal of deteriorated sandstone elements

Coach House

- Removal of damaged and deteriorated roof linings and roof drainage
- Removal of selected internal floor, wall, and ceiling fabrics
- Removal of selected unwanted built-in joinery, doors, loose furniture, fittings and fixtures

Tom O'Neill Centre

- Removal of damaged and deteriorated roof linings and roof drainage
- Removal of selected internal floor, wall, and ceiling fabrics
- Removal of selected unwanted built-in joinery, doors, loose furniture, fittings and fixtures

Ward Building

- Removal of the connections to House and all associated services to allow an appropriate clearance between House and Ward Building (east of House) in the period between Stage 1 and Stage 2, when the Ward Building will be removed.

Landscape

- Removal of all nominated species as per Landscape Drawings (September/October 2011) and site preparation
- Removal of selected garden pathways
- Clearing of courtyard garden areas
- Removal of Union Street boundary gates and fence, including various fencing located within the property
- Removal and appropriate off site disposal of contaminated materials as described in the Contaminated Materials Report by WSP ES (September 2010)
- Removal of various inter-terrace fencing
- Removal of boundary inter-allotment boundary fencing

All demolition works will be executed in accordance with WorkCover NSW best practice, other statutory requirements, industry regulations, and applicable Australian Standards.

A demolition permit will be procured from Work Cover NSW, and the contractor carrying out the work will carry a valid demolition license.

Appropriate safe work method statements, and job safety analysis reviews will be produced to address the various activities needed to be undertaken. These will be described in the Principal Contractor's Safety Management Plan, which will be available prior to the commencement of any physical works.

Protective perimeter scaffolding, inclusive of shade cloth and mesh, will be an important component in the execution of the works. This will enable high and awkward building elements to be safely accessed.

Existing services such as power, water, sewer, and storm water, will be maintained and protected during the demolition works. Many of these will be utilised in the process to assist the delivery.

Noise and Vibration management is discussed in **Section 9** and will address the management of all demolition noise and vibration sources during the execution of the works.

Waste Management is discussed in **Section 11** and will address the management of all demolition waste, including sorting and segregation of individual elements.

Construction Traffic Management is discussed in **Section 12** and will discuss the vehicular movement of the trucks associated with the demolition works.

5.2 EXCAVATION WORK METHODS

The Project Application works has minor excavation components. These activities are predominantly drainage and trenching works and minor ground clearing and scraping. The majority of excavation will occur in later project applications where significant ground works will be required for the following new buildings:

- North, East, and West Building Foundations
- New Building foundations in the current location of the Tom O'Neill Centre and underground access to West Building
- East Building basement/car park

Excavation will be undertaken by a suitable method pending determination of ground conditions, which could involve execution via hand, bobcat, loader, or excavator. There will be no blasting on site. Excavation will need to address possible buried archaeological material as discussed in **Section 6**. Professional archaeological advice should be sought by the contractor's excavation team prior to commencing excavation works.

Noise and Vibration Management is discussed in **Section 9** and will address the management of all excavation noise and vibration sources during the execution of the works.

Waste Management is discussed in **Section 11** and will address the management of all unwanted excavation materials. Given the low volume of excavation proposed in Stage 1, the waste generated will be minimal.

Construction Traffic Management is discussed in **Section 12** and will discuss the vehicular movement of the trucks associated with the excavation works.

6 ARCHAEOLOGICAL ISSUES

The Graythwaite Site is included on the State Heritage Register (SHR), which is managed by the Heritage Council of NSW. As such, Graythwaite falls under the provisions of the Heritage Act 1977 (NSW). It is also included on Schedule 3 of the North Sydney Local Environmental Plan 2001 and forms part of the Graythwaite Character Area.

A *Conservation Management Plan* has been prepared for the site by Tanner Architects (endorsed by the Heritage council on 14 June 2011) to provide a guide to the management of the heritage significance of the site.

All works on the site are to be managed to avoid, minimise or mitigate impacts as much as possible, and be undertaken in accordance with the management practices detailed in the Conservation Management Plan, and in accordance with the Heritage Act 1977 (NSW).

6.1 HISTORICAL ARCHAEOLOGY

The Conservation Management Plan describes the historical archaeological resource of Graythwaite as consisting largely of sub-surface remains of outbuildings, ground surfaces, features, artefacts and pits associated with early occupation of the site in areas to the north, east and west of the Graythwaite House.

The conservation policies as outlined in Section 6.3.5 of the Conservation Management Plan are to be adhered to regarding Historical Archaeology.

6.2 ABORIGINAL HERITAGE

The *Graythwaite Site Aboriginal Heritage Assessment* prepared by the Australian Museum Business Services (August 2010), and included in the Conservation Management Plan, surmises that no evidence of Aboriginal occupation or activities remain on the site. The assessment also advises that it is not considered that there is any archaeological potential for intact or substantial heritage deposits on the site.

The conservation policies as outlined in Section 6.3.2 of the Conservation Management Plan are to be adhered to regarding Aboriginal Heritage. Of particular note is Policy 23 which is reproduced below -

Policy 23 *Should excavation, ground disturbance or vegetation removal within the less developed areas of the site, to the south and west of the House, be proposed, then the Metropolitan Local Aboriginal Land Council (MLALC) should be contacted and opportunities provided for a representative to monitor work.*

6.3 UNEXPECTED FINDS

In the event that unexpected Aboriginal objects are discovered during the course of the works, activities are to cease and the Cultural Heritage Division of DECCW contacted. Should unexpected archaeological relics be discovered, activities are likewise to cease and the Heritage Council of NSW notified.

7 GEOTECHNICAL

The main focus of this CMP is directed towards the works to be undertaken during the Project Application. As Stage 1 entails mostly restoration and landscaping works, the requirement for geotechnical analysis is not presently warranted. A geotechnical report will be produced for the later stages with an underlying focus on the construction of the East, North and West Buildings and their proximity to the North Shore line rail corridor located below to ensure compliance with RailCorp's requirements is achieved.

8 GROUNDWATER & SURFACE WATER

8.1 GROUNDWATER

The site is underlain by Sydney Sandstone, with natural groundwater running north-south beneath the site. This is evident in the damp affected walls in the Tom O'Neill Centre and Graythwaite House Buildings, and in the grassed terraces which are prone to water logging. There is a known natural spring to the west of the middle terrace with another thought to be present at the east end of the middle terrace.

To ensure that groundwater does not impact upon the buildings, Acor have prepared a Concept Stormwater Plan which provides a drainage channel that runs parallel to the northern boundary of the site before turning perpendicular past the Coach House and Tom O'Neill Centre buildings. This channel connects into the proposed stormwater drain that runs south through the site to Union Street. A network of drainage channels are also proposed across water logged areas of the site terraces. The design of these channels will be finalised in consultation with the Arborist and Landscape Architect to ensure that the site vegetation is able to be reliant on rainwater or spring water alone without recourse to an artificial watering system. The need for any possible future levelling of the middle and lower terraces will be determined after the success of the terrace drainage works has been assessed.

It is not intended to extract any groundwater from the site as part of the construction works, nor for use in the proposed development.

8.2 SURFACE WATER

The Stormwater Plan (Acor, October 2011) identifies a new stormwater drain line that can effectively manage stormwater capture, reuse and disposal for all stages of the works.

A Soil Erosion and Sediment Control Plan (SESCP) (Acor, October 2011) that was developed in conjunction with the Stormwater Plan for the Concept Plan Application is shown in Figure 4.

The main potential sources of sediment generation on the site during the Stage 1 works will occur in relation to the new drainage north of the House and on the terraces. These works will require local sediment control. The House renovations are unlikely to generate the need for the construction exits as shown on Figure 4 until Stages 2 & 3. The SESCP measures for stormwater control during construction are such that off-site impacts can be effectively managed during the construction works.

Surface Water quality control is discussed in **Section 10**.

9 NOISE & VIBRATION MANAGEMENT

The Stage 1 works are mostly confined to the near vicinity of the heritage buildings which are distant from nearby residences, thus reducing the potential for off-site noise impacts.

Notwithstanding, noise will emanate from the equipment onsite and from construction trucks, vehicles and personnel. All works are to be undertaken in accordance with Australian Standard *AS2436-1981: Guide to noise control on construction, maintenance and demolition sites*, and the DECCW Interim Construction Noise Guidelines. To minimise the impact of noise and vibration on the immediate neighbourhood, operating hours will be limited to those outlined in **Section 4.1**.

The following general controls and approaches are to be implemented to minimise noise impacts:

- Limitation of working hours;
- Mobile plant such as excavators, front-end loaders and other diesel-engine equipment may be fitted with residential class silencers or exhausts where necessary;
- Regular compliance checks on plant noise emissions and noise monitoring at receiver locations;
- Maintain a community liaison program during the works; and

- If noise activity has to take place that may affect neighbouring properties, the occupants will be warned in advance, particularly in regard to the duration and type of activity.

Vibration management consists mainly of maintaining suitable distances between works activities and receivers.

The application of the above measures and a proactive management approach for the demolition and construction will enable noise and vibration to be managed to acceptable levels.

10 AIR & WATER QUALITY

10.1 AIR QUALITY

Air quality (airborne dust and pollutants) in and around the site is to be maintained at acceptable levels throughout the works.

The activities on the site that have the potential for dust generation include demolition, earthmoving activities and excavation. It is noted that excavation for Stage 1 will be limited and mainly consist of the creation of new service trenches. Truck routes during the works will follow existing paved roadways and accordingly little dust is anticipated to be generated from truck movements.

The following controls and approaches should be implemented to minimise impacts from activities that may produce dust:

- If dust can not be adequately controlled, then activities generating dust are to cease until appropriate controls can be implemented;
- Areas are to be stabilised progressively during construction and wetted down where necessary;
- Trucks leaving the site must ensure that loads are covered; and
- All plant is to be maintained regularly to ensure its optimum operating levels and minimise pollutant emissions.

10.2 WATER QUALITY

Water quality in and around the site is to be maintained at acceptable levels throughout the works.

Surface Water controls are to be constructed in accordance with the Soil Erosion and Sediment Control Plan to be prepared for the works and will include the trapping of “dirty water” and eroded sediment from disturbed areas as close to the source of the sediment as practical.

As the majority of the Stage 1 works associated with this application are for the refurbishment of the existing buildings water quality is not expected to be an issue.

11 WASTE MANAGEMENT

Construction waste management will be carried out in accordance with Section 19 of North Sydney Council's Development Control Plan 2002. The objective is to ensure that all construction activities are carried out in a manner that will minimise landfill and maximise waste material avoidance, reuse and recycling.

All excavated material and construction waste generated will be placed in the onsite bins, in a location to be determined by the Principal Contractor and transported to the WSN Environmental Solutions facility at Artarmon for recycling and disposal.

WSN Environmental Solutions Facility Artarmon is located at Lanceley Place, Artarmon and combines bin storage, waste collection, waste recycling and waste transfer to service industrial, commercial, construction and domestic waste management needs in the Sydney metropolitan area. The Resource Recovery Facility is open seven days a week.

All material generated from the works will be recycled apart from selected soft demolition materials and hazardous materials such as asbestos. The following table sets out the materials likely to be encountered during the works and the general waste management principles that will be adopted through the contracting process.

Material	Source	Recyclable	End Usage - %
Asbestos and other hazardous waste	Pipe lagging, fire doors, light fittings	No	Landfill – 100%
Concrete	Suspended and ground slabs, beams and columns	Yes	Road base, pipe bedding, sub grade – 95%
Brick	External & internal walls	Yes	Road base, pipe bedding, sub grade – 95%
Steel heavy	Columns, beams, pipes	Yes	Scrap processing – 100%
Steel light	Reinforcement, panelling, studwork, doors, windows, ductwork	Yes	Scrap processing – 100%
Other metals non ferrous	Pipes, plumbing fittings, cables, stainless kitchens	Yes	Scrap processing – 100%
Carpet	Floor coverings	Yes in part	Reuse, resale, protection – 50%
Timber structural	Beams, studs, columns	Yes	Reuse, resale, furniture – 90%
Timber finishes	Doors, windows, kitchen finishes, floorboards, particle board	Yes in part	Reuse, resale – 40%
Plant	Chillers, motors, compressors, switchboards	Yes	Resale or scrap – 100%
Oils, fuels, paint solvents	Plant, tanks, capacitors, maintenance storage	Yes in part	Reuse, liquid waste facility – 30%
Furniture, rubbish	Chairs, tables, beds, trolleys	Yes in part	Resale or landfill – 30%

Domestic waste generated by the building contractors will be their responsibility separate from the School's activities.

12 CONSTRUCTION TRAFFIC MANAGEMENT

Construction Traffic Management will be carried out in accordance with Section 23 of North Sydney Council's Development Control Plan 2002 (**DCP**). A detailed Traffic report (Halcrow, October 2011) will be submitted as part of the 3A application which includes traffic estimates and assesses the impact of the 'staged' development on the surrounding arterial and local road network.

The Construction Traffic Management plan here details works to be undertaken in the Project Application Stage 1. Relevant plans, similar to the attached, will be produced in due course for the future stages.

The construction site will have temporary fencing to the perimeter for the duration of the works. Signage will be placed on the fences located in both Edward Street and Union Street with all relevant site safety information and the 24-hour contact number for the Site Manager.

All of the construction vehicles involved with the building renovations will gain entry to the site from the main arterial roads followed by travelling along Bay Road and into Edward Street. There will be no vehicular access to the site via Edward Street from 7:50am to 8:40am, and 2:40pm to 3:20pm to ensure the safety of students arriving and leaving the school premises. During these times construction vehicles will enter through the Union Street driveway. Construction vehicles involved in the drainage work south of the House will generally enter from Union Street.

Vehicular egress from the site will be from Union Street followed by travelling along Blues Point Road and onto Pacific Highway. All construction vehicles will enter and leave the site in a forwards direction, with turning bays to be available onsite. The construction work will be managed in stages to minimise any impact on the public's use of roads. Any damage caused to roads that result from work will be rectified according to the requirements of North Sydney Council.

It is anticipated that bogie tippers, semi-tippers and truck and trailer type heavy vehicles would be used in undertaking the works. All trucks will be loaded to their prescribed weight limits, within the site boundary and be covered with a tarp (rubbish loads only) prior to exiting the site.

Street parking will be restricted to essential vehicles only. Contractors will be encouraged to car pool and catch public transport to minimise the effects on local parking availability. All workers will be informed not to obstruct roadways or private driveways with their vehicles and will be required to stay on formed roads or designated access routes to minimise impact on vegetation. Access to all neighbouring properties will be maintained at all times. Areas available on site away from the existing student areas will be made available for the construction tradesmen.

Standing vehicles will only be allowed to do so in the proposed construction zone. Trucks required for construction will be scheduled and segmented in advance to ensure parking is available so as local traffic and pedestrians are not adversely affected. As there are sufficient standing and unloading areas in the proposed construction zone, all materials and equipment carried by construction vehicles will be unloaded onsite.

12.1 PEDESTRIAN MANAGEMENT

The construction site is located at the dead end of Edward Street so minimal disruption will be caused to pedestrians. Any pedestrians wishing to access this end of the street will be able to pass the construction site with controls in measure to warn of entering vehicles. Site gates will be locked at all times to prevent pedestrians gaining authorised access to the site. Appropriate controls will also be implemented at the exit point onto Union Street.

13 ISSUES FOR LATER PROJECT STAGES

Construction Staging and Traffic Management
At present, Stage 2 predominantly involves the North and East Buildings with the demolition of the Ward Building. These works can be undertaken using a similar traffic plan to the Stage 1 works.

Construction access to the West building construction site will be constrained after the Stage 2 North Building works are complete and in this event, it will be likely that temporary construction access at that time will be obtained via the Union Street entrance and the Middle Terrace. Because of this issue, later consideration will be given to delaying the North Building construction until the end of Stage 3 to facilitate construction access to the West Buildings.

The following identifies construction access and impacts that will form part of the Project Applications for the later stages.

Demolition and Excavation
The following are future demolition tasks that will be undertaken during Stages 2 and 3:

- Removal of existing building fabrics to existing buildings on west elevations of; West Wing, and School House
- Removal of the entire Ward Building and associated services
- Removal of nominated plant specimens around Ward building, West Wing, and School House in accordance with future arborist advice
- Pruning of nominated plant specimens to allow for the construction process in accordance with future arborist advice
- Removal of boundary inter-allotment boundary fencing

The majority of excavation will be required for the following new buildings:

- North, East, and West Building Foundations
- New Building foundations in the location of the existing Tom O'Neill Centre and underground access to West Building
- East Building basement/car park

Archaeological Issues
The greater degree of excavation and ground disturbance in the later stages will increase the possibility of unearthing previously unidentified archaeological artefacts.

Geotechnical Issues
The construction of new buildings on the site in later stages will require detailed geotechnical investigations, particularly in respect to the North Shore Rail line tunnel passing under the east west axis of the Graythwaite site.

Water and Air Quality Issues
The current data has identified what is required to address the ground and surface water issues in later stages.

Noise Issues
New noise impact assessments will be required in conjunction with the Project Applications and in particular for construction of the West building.