



ARCHAEOLOGICAL STRATEGY FOR METRO NORTH

RPAMNACHr:01

DOCUMENT HISTORY LOG

Revision	Report Status	Issue Date	Description	Prepared	Reviewed	Approved
01	Draft	7 th March 2008	Archaeological Strategy for Metro North	Margaret Gowen Ltd	Maria FitzGerald, Geoff Featherstone RPA	Maria FitzGerald, RPA Archaeologist
02	Draft	14 th May 2008	Archaeological Strategy for Metro North	Maria FitzGerald, RPA Archaeologist	Anne Lillis, Geoff Featherstone RPA	Geoff Featherstone, RPA
03	Draft	13 th June 2008	Archaeological Strategy for Metro North	Maria FitzGerald RPA Archaeologist		

RPA DISCLAIMER

© 2008 All rights reserved. This document must not be loaned, altered, copied or otherwise reproduced in whole or in part or used for any purpose without the prior written permission of RPA.

The information contained herein does not purport to be comprehensive or final. It is subject to being altered and/or superseded.

Table of Contents

1	Introduction.....	1
2	Project Summary - from an archaeological perspective	2
3	Archaeological and historical background – scene-setting summary	3
3.1	Historical context and template for construction	3
3.1.1	The 18th-century city	3
3.1.2	The 19 th -century suburbs	4
3.1.3	Rural areas (from prehistory).....	4
4	Archaeological implications and approach for the development.....	6
4.1	Summary of construction environment.....	6
4.2	Specific recommendations	6
4.2.1	Greenfield locations	6
4.2.2	Archaeology (nature and presentation).....	7
4.2.3	Timing.....	7
4.2.4	Geophysical survey	7
4.2.5	Test trenching.....	7
4.2.6	Modern road median/ verge	8
4.2.7	Modern suburban	8
4.2.8	Mixed and historic suburban.....	9
4.2.9	Historic centre city	9
4.3	Advance Works.....	9
4.3.1	Mater Stop.....	9
4.3.2	Utilities Diversion.....	9
5	Construction Areas.....	11
5.1	Area MN101 – Belinstown Depot to South of Swords Stop	11
5.1.1	Depot.....	11
5.1.2	Belinstown Stop and Park and Ride.....	11
5.1.3	Lissenhall Stop.....	12
5.1.4	Lissenhall Stop to Lissenhall Bridge	12
5.1.5	Lissenhall Bridge (Broad Meadow River) and Balheary Bridge (Ward River)	13
5.1.6	From Balheary Bridge to Estuary Roundabout.....	13
5.1.7	Estuary Roundabout through to Swords Stop and including Seatown Stop and Swords Stop	14
5.2	Area MN102 South of Swords Stop to Dublin Airport north portal.....	14
5.2.1	Pinnock Hill Viaduct– Fosterstown Stop.....	14
5.2.2	Fosterstown Stop.....	15
5.2.3	Fosterstown Underpass	15
5.2.4	Fosterstown Underpass to Dublin Airport North Portal	16
5.3	Area MN103 – Dublin Airport Boundary (North) to Dublin Airport Boundary (South) portal	16
5.4	Area MN104 - Dublin Airport South Portal to Santry Demesne.....	18
5.4.1	Airport South portal to M50 Bridge (including) Dardistown Stop.....	18
5.4.2	M50 Bridge	18
5.4.3	M50 Bridge to Northwood Stop	20
5.4.4	South of Northwood stop to Santry Avenue	20
5.5	Area MN105 Santry Avenue to Albert College Park	21
5.6	Area MN106 – DCU to south of Mater Hospital.....	22
5.6.1	Historical Setting	22

5.6.2	Cut and cover through Albert College Park (incl TBM portal)	22
5.6.3	Griffith Avenue Stop.....	23
5.6.4	Tunnelling to Drumcondra.....	24
5.6.5	Intervention Shaft – St Patrick’s College.....	24
5.6.6	Drumcondra Stop	24
5.6.7	Mater Stop.....	26
5.7	Area 7 – South of Mater to St. Stephen’s Green.....	28
5.7.1	Tunnelling from Mater Stop to Parnell Stop.....	28
5.7.2	Parnell Square Stop.....	28
5.7.3	O’Connell Bridge Stop	29
5.7.4	St Stephen’s Green Stop	32

1 INTRODUCTION

This document has been prepared to inform and assist in the design of an approach to the evaluation and management of archaeological heritage and the mitigation of construction impacts on archaeology during the Metro North development project.

It addresses the twin concerns of the project with regard to archaeological heritage (in line with the principles set out in the RPA Code of Practice 2007), namely: the appropriate protection measures and recording of archaeological heritage and the efficient and timely delivery of the project

The strategy will be developed, as final design is being prepared, with reference to all development works associated with the construction of the Metro North project and the strategy is devised to supplement the provisions outlined in the EIS for the mitigation of impacts on archaeological heritage arising from the project. The strategy is a live document and it will continue to evolve on a phased basis to ensure that it remains appropriate and effective in managing archaeological risk throughout the project up to construction commencement. An updated archaeological strategy will be provided to the InfraCo in advance of construction commencement.

It is designed in order that the project can securely provide a timely and appropriate level of provision for archaeological works without undue impact on the development programme. In this regard the strategy addresses the nature, sequence, location and extent of the archaeological investigations required and suggests methods of interfacing with construction operations, where necessary, that are designed to ensure the integration of archaeological works with associated civil works, and to ensure the rapid, efficient progression of the archaeological works and construction programme side by side wherever this is possible.

The Metro North project has an ambitious construction programme and cannot, therefore, cater for the resolution of all archaeological issues and considerations in advance of the construction contract. There are a number of locations where archaeological interventions should be achievable prior to commencement, notably on greenfield sites, while there will be a number of key locations and construction environments where the InfraCo will be required to integrate archaeological works with construction works to ensure that the programme, as devised, can progress as rapidly as possible whilst ensuring that appropriate archaeological mitigation strategies are implemented.

This strategy sets out the requirements and the necessary provisions for the following:

- archaeological site investigation and evaluation methods to be adopted along the chosen route in greenfield, suburban and urban areas;
- risk assessment parameters requiring definition in relation to the archaeological heritage resource and the project;
- methods of ensuring confident impact assessment in relation to the archaeological resource and the proposed construction methodologies with reference to the sequence and progression of the contract;
- suggestions for amelioration where possible; and a scoping and operational approach to the mitigation measures required to resolve archaeological issues, in sequence, prior to and during the project's development programme along the Metro North route.

2 PROJECT SUMMARY - FROM AN ARCHAEOLOGICAL PERSPECTIVE

Metro North will be a combined underground and surface light rail service development, segregated from traffic using tunnel, road median and green-field construction environments.

The Metro North route will run along a proposed 18km corridor, from Lissenhall in North County Dublin, through Dublin Airport, to the City Centre at St. Stephen's Green. It will have stops at Belinstown (where its Depot will be located), Lissenhall (provisional), Estuary, (provisional), Seatown, Swords, Fosterstown, Dublin Airport, Dardistown, Northwood, Ballymun, Dublin City University, Griffith Avenue, Drumcondra, Mater Hospital, Parnell Square, O' Connell Bridge and St. Stephen's Green.

Track construction will occur on a generally, relatively narrow development corridor, through outer city suburbs and green-field locations except at the Depot site in Belinstown, the park-and ride facilities, the tunnel portal locations at Dublin Airport and at Albert College Park and the stops, while the city centre section will be tunnelled and associated with a series of stop-specific and shaft-specific construction locations.

The large development sites along the route will include: the depot and its associated construction compound; the stops above ground; the tunnel portals to below-ground sections and their associated compounds; the stops below-ground; vents and emergency access stairways to these; and the park-and ride facilities.

At present, it is understood that access for archaeological surveys and investigations will be achieved with landowner consent in advance of the grant of a Railway Order.

3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND – SCENE-SETTING SUMMARY

3.1 Historical context and template for construction

The city-centre underground section, from St. Stephen's Green to Parnell Square, passes through the designated Zone of Archaeological Constraint for Recorded Monument DU018-020. The city centre portion of the route does not pass through the medieval walled city and lies to the east of the important medieval suburb of Oxmantown that developed on the north side of the River Liffey, following the Anglo-Norman invasion in the 12th and early 13th century. It also lies to the east of the precinct of the important and large land-holding or the 12th-century St. Mary's Abbey.

Lying outside the walled medieval city, the material archaeology along the city centre route is not overly complex and is not composed of deep stratigraphic sequences of archaeological occupation deposits. However, the route from St. Stephen's Green to Parnell Square and some distance north of Parnell Square toward the Mater does cross through the footprint of the developed 18th-century city, the most potent graphic evocation of which is Rocque's map of 1756. 18th-century suburban expansion reached North Circular Road and Phibsborough with later north city expansion taking place rapidly after the 1830's.

3.1.1 *The 18th-century city*

The origins of this phase of the city's development are linked, in the St. Stephen's Green area to the acquisition, by lease, of lands to the east of the medieval city from the city's Council by Francis Aungier, 1st Earl of Longford, in the late 17th century. The City Assembly, or Council, was quite prescriptive in its requirements and was responsible for the location and setting out of St. Stephen's Green and set aside 27 acres of an existing common of over 60 acres for that purpose. By 1673 a map prepared by Sir Bernard de Gomme, largely for military purposes, reveals that St. Stephen's Green is in existence and building development has commenced on its northern and western sides. Parnell Square was similarly developed, but starting at the beginning of the 18th century. It was developed around the 4-acre gardens of the Rotunda Hospital (by Richard Castle and built in 1751-7), the brain-child of Dr. Bartholomew Mosse whose life ambition was the construction of a major 'lying in' hospital for the city's poor and who acquired the lease for the land some years earlier. By a function of economy over ambition on Luke Gardiner's part (he held the leases on the square's eastern side), a 30m wide strip of land in his ownership resulted in the current location of the hospital. The building could have had a splendid, axial position at the top of Sackville Street, now O'Connell Street Upper, which was laid by Gardiner in 1749 and its failure to achieve that was the subject of much comment at the time. The lower (southern) end of the street was not laid out until 1778, which involved the replacement of Drogheda Street, a late 17th century development archaeological remains of which have been demonstrated to exist. The River Liffey shoreline, similarly altered during the setting out of the street, with an extension of the quay wall southwards and the construction of the first bridge, designed by James Gandon, to cross the Liffey at the end of the street in 1791-5. Named Carlisle Bridge, it replaced Gandon's structure between 1876 and 1880, a development occasioned by a huge

increase in traffic and providing a 3-fold increase in the width of the crossing (drawn from Casey 2005).

The quays and what is now known as Lower O'Connell Street underwent almost continuous redesign and development from the time of the Amory Grant in 1675 to the present, a process reflected in the archaeology excavated on an ESB sub-station site at O'Connell Street - a Luas-related diversion. An ambitious land reclamation scheme initiated by the City Assembly in 1682 led to the gridded layout of what were called the North Lotts, parcels of land prepared for lease. Charles Brooking's Map (1728) depicts the intersection of Drogheda Street, Abbey Street and the North Lotts. Rocque's Map of 1756 is the first map to show the individual plots of land and structures associated with them. An overlay of the excavation site on this map depicts the location of the structural features in relation to the structures of 1756 one of which was the 18th-century quay wall, some 70m from the current quay wall, together with the remains of a possible masonry jetty extending into the river bed (Baker unpub. 2005). The archaeological excavation of the site of the ESB substation in O'Connell Street uncovered evidence for the extensive and rapid generation of an area of the north quays between the commencement of their development in 1675 and the widening of O'Connell Street in the 1790s.

3.1.2 The 19th-century suburbs

By 1798, when William Wilson's map of the city was published, expansion of the north city had reached Phibsborough and North Circular Road. Beyond that, north county Dublin was characterised by dispersed formal demesne properties, small village-type settlements, rural farmland and the development of housing along major routes out of the city. Expansion of the suburbs north of North Circular Road faltered somewhat after the Act of Union in 1800 as is evidenced in a map by Thomas Larcom 1837 but it continued rapidly into the Victorian era and is recorded in great detail from 1836 in the 1st and subsequent editions of the Ordnance Survey. The Mater Hospital was constructed between 1855-61 with the primary building constructed on a U-shaped plan and has seen continuous development on the site since that time. From the mid 19th-century onwards expansion continued along main routeways out of the city and within and around village-type nodal points, quickly followed by suburban residential development, around locations such as Drumcondra, for instance, which has 18th-century urban origins (depicted on Rocque's Map of 1756) linked to the site of Drumcondra Castle and associated settlement.

3.1.3 Rural areas (from prehistory)

Evidence for prehistoric activity in north county Dublin comes from the Record of Monuments, which includes prehistoric sites, previous development-led investigations and surveys and from stray finds. In the early historical period the area through which the route is aligned formed part of the geographical region of Brega with a range of sites of this period including ringforts, dispersed settlement sites and Early Christian ecclesiastical sites. There are relatively few surviving ringforts in north County Dublin due to the intensive cultivation and agricultural activity in this part of the county, which levelled many earthwork sites. These tend to survive as cropmarks, as illustrated in the archaeological desk study undertaken for the EIS.

After the conquest by Anglo-Normans in the twelfth century social structures, agrarian development and settlement centres of religious and secular origin followed. Throughout the medieval period monastic foundations and individual lordships held large tracts of lands in north Dublin. A period of great flux occasioned by warfare, confiscation and transfer of ownership occurred during the Tudor, Cromwellian and Jacobite wars and the development of demesne properties in subsequent years all influences the character and layout of rural north Dublin in their own ways, but as part of a continuum in a landscape that was influenced by and changed over time in equal measure by economic and associated agricultural development.

4 ARCHAEOLOGICAL IMPLICATIONS AND APPROACH FOR THE DEVELOPMENT

For the purposes of design and construction the route has been broken into 7 areas (MN101-MN107).

The approach to the management of archaeological investigation and arising resolution (archaeological excavation and recording works) has been devised and sequenced with a view to ensuring that, subject to land and site access, key sections of the route can be investigated and resolved at the earliest opportunity and, where possible, in advance of the construction contract.

4.1 Summary of construction environment

From an archaeological investigation perspective there are five very different archaeological heritage/working environments:

- 1) greenfield sites;
- 2) modern road median/verge;
- 3) modern suburban;
- 4) mixed and historic suburban; and
- 5) historic centre city.

Each of these working environments will be subject to a range of construction methodologies and associated civil works from diversion of utilities and surface track-bed construction works to the construction of larger facilities for the depot, park and ride facilities and there will be major construction works associated with the tunnel portals, stop construction especially below-ground and also for bridge and viaduct construction.

The archaeological strategy and approach is influenced by a number of factors and seeks to address the differing range of environments and construction processes as efficiently as possible.

4.2 Specific recommendations

4.2.1 Greenfield locations

The investigation, evaluation, construction impact assessment and resolution of archaeological issues in greenfield locations will be approached in the same way as archaeology is managed on road construction projects, with geophysical survey followed by test investigation where possible in advance on construction. Resolution of sites revealed by geophysics and test excavation will require hand excavation with dedicated teams of archaeologists under licence to the Department of Environment Heritage and Local Government (DoEHLG). Resolution of sites identified by geophysical survey and testing will, where possible, be carried out by RPA as Enabling Works in advance of the InfraCo's commencement date.

4.2.2 *Archaeology (nature and presentation)*

In greenfield locations along the route, all recorded and previously unrecorded archaeological remains occur below ground. In these environments in north County Dublin, archaeological remains are revealed beneath sod and cultivated soil at depths no greater than 400mm – 500mm below present ground level. Archaeological remains that are frequently revealed in such situations present as features cut into the underlying boulder clay and the primary surface of which rarely survives. Features that tend to occur include prehistoric, early medieval and later ditches enclosing burials, settlement activity or agricultural land use. Other traces of unenclosed settlement and burial activity are also common with the occasional discovery of the foundations of stone structures. Features of this nature can be identified during test trenching and can often be revealed in advance through non-invasive geophysical survey methods, which are used at project inception to identify particularly large sites.

4.2.3 *Timing*

In greenfield locations RPA will ensure that archaeological survey, geophysics and test investigation will be carried out prior to the grant of the Railway Order. These exploratory investigations will be undertaken with the prior agreement of landowners linked to an appropriate compensation scheme offered for the disruption occasioned. The archaeological remote surveys (geophysical surveys) involve no disruption while intensive linear test trenching can be reinstated. The follow-up excavations where required are unlikely to be achieved prior to the Grant of the Railway Order but it is anticipated that excavations will be carried out in advance of InfraCo construction commencement.

4.2.4 *Geophysical survey*

The use of scanning geophysical survey, incorporating intensive survey where required will be carried out by RPA as part of the EIS process. Magnetic gradiometry has yielded consistently good results in the drift geology of north County Dublin and in the north Leinster region. In sensitive construction locations detailed survey will be carried out e.g. at sites such as the Depot site at Belinstown which incorporates a Recorded Monument, and areas where the scanning survey results reveal anomalous data indicative of the presence of sub-surface sites or features of archaeological derivation.

4.2.5 *Test trenching*

All greenfield locations will be subject to intensive mechanical centreline and offset test trenching (subject to landowner access and agreement) by the RPA in advance of commencement. The test trenching methodology is that developed by the National Roads Authority and aims to establish the nature and extent of unknown archaeological deposits and features present below ground.

The methodology involves the mechanical excavation of a continuous 2m wide test trench (the width of a toothless ‘ditching’ bucket’ on a back-actor machine) through cultivated soils and topsoil to the subsoil surface with 15m alternative trench offsets extended from the centreline trench to the full width of the scheme land take. The trenching is designed to achieve an overall test sample of c.8-12% of the landtake and will ensure that all large

archaeological sites are identified in advance of construction. Trench layouts on the larger open areas (such as the Belinstown depot site, the portal sites and the park and ride areas) will be adapted to suit the terrain and the results of geophysical survey at each location.

The trenching will be carried out under archaeological supervision and potential features are investigated in order to assess their character, condition and extent. The report on the findings will include a summary of results as well as recommendations for appropriate mitigation, which usually involving excavation (*preservation by record*).

4.2.6 *Modern road median/ verge*

An examination of the route indicates that virtually all of these construction environments and locations occur along newly developed roadways.

In most of these locations, it is considered that there is negligible risk to the archaeological heritage resource. However, some road verge development extends into greenfield environments where archaeological remains may be located. The greenfield areas will be subject to geophysical survey and intensive test trenching and the results will inform the approach to any necessary investigations at road verge sites.

Archaeological monitoring will be carried out on modern road median/verge by RPA during Enabling Works packages including utilities diversions on modern road median/verge locations e.g. Ballymun Road. Given the extent of the advance RPA Enabling Works, it is anticipated that limited intermittent archaeological monitoring of construction by the InfraCo will be required in these locations. The extent of this construction monitoring requirement will be agreed between the DoEHLG and RPA and notified to the InfraCo in advance of commencement.

A clearly set out document, with maps, indicating the precise locations for which intermittent archaeological monitoring is required will be issued to the InfraCo in advance of commencement.

4.2.7 *Modern suburban*

As above, many of these modern built environments have been comprehensively worked over and built upon, and are, therefore, unlikely to possess any significant archaeological heritage remains. Furthermore, much of the route alignment runs along major road medians through these modern suburbs. However, there are a small number of specific locations incorporating greenfield landscape that may retain undisturbed ground. These areas will need to be investigated, especially in areas where the scale of development will be considerable, for example at DCU, Dublin airport and Albert College Park.

Metro North will be tunnelled on its approach and exit from its Dublin Airport stop and the portal sites occur in greenfield locations. The proposed location for the Dublin Airport stop is within a general area that has already been subject to in depth archaeological evaluation for the purposes of the new DAA Terminal building development but

archaeological monitoring may be required during construction of the stop box. (Requirements will be agreed between DoEHLG and RPA in advance of commencement)

4.2.8 *Mixed and historic suburban*

Metro North will be tunnelled through these environments with stop boxes at Drumcondra and Mater. Tunnel construction will have no archaeological impact and with the exception of the stop boxes no surface interventions are anticipated in these areas.

The InfraCo will have archaeological requirements in relation to the construction of the stop box at Drumcondra as it is not anticipated that RPA will carry out any advance Enabling Works at Drumcondra. The archaeological requirements for Drumcondra are described below. The InfraCo will not have requirements in relation to Mater; the design and construction of the Mater stop box and therefore the resolution of any archaeological issues at this stop will be done as Enabling Works in advance of InfraCo commencement.

4.2.9 *Historic centre city*

Metro North will be tunnelled through the city centre and will pass beneath the, largely relatively well-preserved, fabric of the 18th-century and later city centre. Large footprint construction sites and smaller structural interventions such as vents and emergency stairwells will have archaeological requirements for the InfraCo during the construction phase. However, pre-construction diversion of services as Enabling Works and any further interventions in the historic city centre will be inspected and archaeologically monitored for assessment purposes.

The three stop locations: Parnell Street, O'Connell Street and St. Stephen's Green; each require individual and location-specific approaches to investigation, risk evaluation, and a dedicated site-specific approach to mitigating archaeological operations. It is anticipated that almost all of the archaeological issues at St Stephen's Green will be resolved by RPA as Enabling Works in advance of construction. The InfraCo will have archaeological requirements at Parnell and O'Connell and the proposed phasing and methodology for the works at Parnell and O'Connell Street stop boxes are set out below in Section 5.7.

4.3 Advance Works

4.3.1 *Mater Stop*

The Design and Build of the Mater Stop box will be procured separately by the RPA as an Enabling Works contract.

4.3.2 *Utilities Diversion*

A strategy has been developed by the RPA with Jacobs Engineering input, to deal with utilities along the metro alignment. A full set of drawings indicating the locations of the main utilities such as the below-ground ESB sub-station and water main on O'Connell Street as well as a detailed scope of Enabling Works utilities diversions will be available in the Data Room.

Different categories have been devised to assist in the determination of the timing scope and extent of the work to be carried out in advance of, and during the scheme. These include:

- *Permanent Diversions* – advanced works by the RPA immediately following the grant of the Railway Order;
- *Type (i) and (ii) Temporary diversions*: Type (i) as part of advanced works and Type (ii) as part of the contract.
- *Protection*: Works designed to protect services during construction
- *Replacement*: Where construction is in danger of damaging existing utilities and services, or where upgrading is clearly required.

All of these works involve ground disturbance of one form or another and all therefore have the potential to impact on archaeology.

Permanent Diversions will be undertaken as discrete Enabling Works contracts, in advance of construction. Utilities Diversions will be archaeologically monitored and the results from monitoring will be used for the purposes of archaeological assessment and risk assessment for the project in key sensitive locations, notably at the St. Stephen's Green, O'Connell Bridge, Parnell Sq. Drumcondra, DCU, Dublin Airport and Ballymun stops. The results will be used to further inform the archaeological strategy at construction stage and to agree archaeological requirements with the DoEHLG.

During the InfraCo construction phase, all utilities diversion investigations, enabling works and diversion works locations within the Designated Zone of Archaeological Potential for Dublin will be archaeologically assessed, investigated and intensively monitored, as appropriate. In each location the archaeological input will only reflect the nature and quality of archaeological deposits in the host sites for diverted services, otherwise monitoring of the diversion works will facilitate a scoping of the response required.

5 CONSTRUCTION AREAS

The following section examines the archaeological requirements in relation to each of the seven construction areas (MN101-MN107) of Metro North. A table setting out Enabling Works and InfraCo requirements is appended to this section (Table 1).

5.1 Area MN101 – Belinstown Depot to South of Swords Stop

5.1.1 Depot

Construction environment

This route begins at Belinstown Depot which is located north of Swords on land that is currently in agricultural use. The depot is aligned east – west and occupies an area of c.22 hectares.

Archaeology

This is the site of Belinstown Castle (HC1 – 7) and has very high potential for below-ground archaeological sites/ remains.

This is an area of known archaeological sensitivity. Priority will be given to its investigation by geophysical survey, followed by test excavation in advance of the grant of the Railway Order. Once the nature and extent of the archaeology is established an impact assessment will be prepared with a view to investigating the potential for the retention and preservation *in situ*, of the archaeological site and its associated features.

Approach

- Geophysical survey (subject to land access) to be carried out by RPA as part of the EIS
- Intensive centreline and offset test trenching, prior to (if possible) or immediately post Railway Order grant to be carried out by RPA.
- Impact assessment and assessment of potential for retention and preservation *in situ* of archaeological remains to be agreed between RPA and the DoEHLG.
- If required, pre-construction resolution to be carried out by RPA

5.1.2 Belinstown Stop and Park and Ride

Construction Environment

The northern terminus stop of the scheme at Belinstown lies immediately south west of the depot and a 2000 space park and ride facility is planned adjacent to the stop as well as an emergency crossover and a sub-station.

While the above ground stops are relatively simple structures, site preparation will involve removal of topsoil prior to the creation of the concrete foundation base on which the stop platform structures and ancillary structures will rest. The car park is likely to be an above ground structure (with one level below ground level) of prefabricated concrete

or steel frame construction. Site preparation will involve topsoil removal and excavation for the creation of the car parks structural foundations and ground floor slab.

Archaeology

Proximity to HC8 (a cropmark site noted on aerial photography).

Approach

- Geophysical survey (subject to land access) to be carried out by RPA as part of the EIS
- Intensive centreline and offset test trenching, prior to (if possible) or immediately post Railway Order grant to be carried out by RPA.
- If required, pre-construction resolution to be carried out by RPA

5.1.3 Lissenhall Stop

Construction environment:

From Belinstown, the proposed route passes southwards, across green fields at surface level to a provisional stop located at Lissenhall. This stop is located to the west of the junction of the M1 and N1 and adjacent to Balheary Golf Course.

Archaeology

Proximity to HC8, a cropmark site noted on aerial photography.

Approach

- Geophysical survey (subject to land access) to be carried out by RPA as part of the EIS
- Intensive centreline and offset test trenching, prior to (if possible) or immediately post Railway Order grant to be carried out by RPA.
- If required, pre-construction resolution to be carried out by RPA

5.1.4 Lissenhall Stop to Lissenhall Bridge

Construction Environment

This section of the route runs through the shallow flood plain of the Broad Meadow. It also includes an area for a compound to west of the alignment.

Archaeology

Proximity to HC10, two cropmark sites noted on aerial photography

Approach

- Geophysical survey (subject to land access) to be carried out by RPA as part of the EIS
- Intensive centreline and offset test trenching, prior to (if possible) or immediately post Railway Order grant to be carried out by RPA.
- If required, pre-construction resolution to be carried out by RPA

5.1.5 *Lissenhall Bridge (Broad Meadow River) and Balheary Bridge (Ward River)*

Construction environment

The route will use the existing Lissenhall and Balheary Bridges (for southbound only) which cross the Broad Meadow and Ward Rivers respectively. The northbound lane will cross the Ward River on a new bridge to be constructed in this location, immediately to the west of the existing Balheary Bridge façade.

Archaeology

The Lissenhall Bridge is a 5-span bridge that has a medieval origin, with much of the primary medieval fabric surviving. The structure is in good order. The Balheary Bridge is a 2-span bridge of later date.

Approach

- Inspection of the river along the approach to and site of Lissenhall Bridge by a suitably qualified archaeologist with underwater experience and preparation of an impact statement to be carried out as part of the EIS by RPA.
- Architectural survey of Lissenhall Bridge and Balheary Bridge (already undertaken) and assessment by a qualified conservation engineer. This may involve removal of vegetation and an assessment of the mortar bonding. To be carried out as RPA Enabling Works
- Impact assessment to be prepared in respect of proposed construction interventions at the two bridges by a conservation architect or engineer.
- If required pre-construction resolution
- Archaeological monitoring and detailed recording of all construction works and the impact of any interventions, to include the advice of a conservation engineer, at the Lissenhall and Balheary bridges to be carried out by the Infraco at construction stage.

5.1.6 *From Balheary Bridge to Estuary Roundabout*

Construction environment

From Balheary Bridge, the route continues southwards and runs at surface level along the western verge of the R132 to the second provisional stop at Estuary. This also includes provision for two areas for Compounds.

Archaeology

No sites recorded.

Approach (road verge from Estuary Stop to Estuary Roundabout)

- Geophysical survey (subject to land access) to be carried out by RPA as part of the EIS
- Intensive centreline and offset test trenching, prior to (if possible) or immediately post Railway Order grant to be carried out by RPA.
- If required, pre-construction resolution to be carried out by RPA

5.1.7 Estuary Roundabout through to Swords Stop and including Seatown Stop and Swords Stop

Construction environment

The route rises up onto an elevated section of track and crosses over the Estuary roundabout, travels along the median of the R132 and over the Seatown roundabout before descending to reach the next surface stop at Seatown. The Seatown stop is located in the central median of the R132.

After Seatown stop, the route proceeds southwards on the surface along the central median of the R132 and then descends to pass under the Malahide roundabout. To the south of the roundabout the route emerges from the underpass and rises to the surface in the median of the R132 to the Swords stop which is located opposite the Pavilion's Shopping centre. Swords stop marks the end of Section MN101.

This entire section of the route is constructed on road median or road reservation with only the approach to the Chapel Lane footbridge, Malahide Underpass and Malahide South footbridge extending to a very minor degree into road verge/greenfield.

A section of the R132 between the Seatown and Malahide roundabouts will be widened and realigned by the InfraCo prior to construction. The road will be widened to accommodate the at grade alignment in the median with associated utilities diversions.

Archaeology

N/A

Approach (Estuary Roundabout – Swords Stop)

- Intermittent archaeological monitoring, if and as necessary by the InfraCo, during the road widening of the R132 and associated permanent utilities diversions between Seatown and Malahide. Monitoring requirements to be agreed in advance of construction between the DoEHLG and the RPA Project Archaeologist.

5.2 Area MN102 South of Swords Stop to Dublin Airport north portal

5.2.1 Pinnock Hill Viaduct– Fosterstown Stop

South of the Swords stop, the route rises up onto an elevated section of track to cross over Pinnock Hill roundabout and continues south to a surface stop at Fosterstown.

Construction environment

Road median for approaching section and for Pinnock Hill Viaduct. The section of the R132 between the Malahide and Pinnock Hill roundabouts will be widened and realigned with associated utilities diversions by the InfraCo prior to construction.

Archaeology

N/A

Approach

- During construction, intermittent archaeological monitoring of roadside/road median construction by the InfraCo, if and as necessary, at the footbridge and underpass locations to be agreed in advance of construction between the DoEHLG and the RPA Project Archaeologist.

5.2.2 Fosterstown Stop

While this stop is also on the road verge it is located in a modified greenfield environment and there is little unaltered ground at the stop site. A surface park and ride carpark (Compound 5) with 300 spaces is to be provided to the east of this stop. The combined site should therefore be approached like all other Greenfield locations.

Construction Environment

Road verge and partially modified greenfield environment

Archaeology

Proximity to HC13; cropmark site noted on aerial photography

Approach

- Geophysical survey (subject to land access) to be carried out by RPA as part of the EIS
- Intensive centreline and offset test trenching, prior to (if possible) or immediately post Railway Order grant to be carried out by RPA.
- If required, pre-construction resolution to be carried out by RPA

5.2.3 Fosterstown Underpass

From Fosterstown Stop, the route continues southwards along the east side of the R132 and then descends to cross the R132 by means of an underpass just south of the junction at Airside and Borimhe.

Construction Environment

Road verge and partially modified greenfield environment

Archaeology

N/A - Road median/reservation.

Approach

- Intermittent archaeological monitoring of roadside/road median construction by InfraCo, if and as necessary. Requirements to be agreed between the DoEHLG and the RPA Project Archaeologist.

5.2.4 Fosterstown Underpass to Dublin Airport North Portal

From the Fosterstown Underpass, the route passes under the proposed Fosterstown Accommodation Bridge to rise to the surface and onto embankments through open agricultural green fields to the tunnel portal. There is an agricultural underpass for access under the embankment. This section also includes areas for Compound 6 and 7. A turn-back facility is provided in this area to the north of the airport to allow some Metro services to reverse at the airport in the future. The turnback facility marks the end of section MN102.

A temporary compound area is located to immediate south of Fosterstown underpass.

Construction Environment

After the bridge this section towards the tunnel portal is all constructed in greenfield environment.

Archaeology

HC 14, a cropmark site noted on aerial photography.

Approach

- Geophysical survey (subject to land access) to be carried out by RPA as part of the EIS
- Intensive centreline and offset test trenching, prior to (if possible) or immediately post Railway Order grant to be carried out by RPA.
- If required, pre-construction resolution to be carried out by RPA

5.3 Area MN103 – Dublin Airport Boundary (North) to Dublin Airport Boundary (South) portal

This section of the route is tunnelled. The route enters two bored tunnels (one for northbound Metro services and one for southbound to the north of Dublin Airport, and traverses the airport in a southerly direction passing under the Airport South Perimeter Road (Collinstown Lane) which marks the end of Section MN103.

Construction environment

This section incorporates the Tunnel Portal sites, north and south, and their associated construction sites (Compounds 7 & 8) and also includes the Airport Stop within the airport complex.

Archaeology

Proximity to HC14, a cropmark site noted on aerial photography.

Approach

- Geophysical survey (subject to land access) to be carried out by RPA as part of the EIS
- Intensive centreline and offset test trenching, prior to (if possible) or immediately post Railway Order grant to be carried out by RPA.

- If required, pre-construction resolution to be carried out by RPA
- Archaeological monitoring of construction works by the InfraCo for the Airport Stop.

Note: DAA lands linked to the construction of the new Terminal 2 building and associated works have been archaeologically assessed. The results should inform the approach to be taken. .

5.4 Area MN104 - Dublin Airport South Portal to Santry Demesne

On exit from the Airport tunnel, the route returns to grade across agricultural land as far as the M50.

5.4.1 Airport South portal to M50 Bridge (including) Dardistown Stop

Construction environment

This is greenfield agricultural land south of Dublin Airport to the M50. The stop at Dardistown is located on a greenfield site to the north of the M50. A surface park and ride facility with 300 parking spaces is proposed for this location to the north of the stop. Space provision will be made at this stop for a future link with the proposed Metro West line. A high voltage sub-station is also located in this area. This site will be subject to extensive site preparation works for the Park and Ride development.

Archaeology

HC18 cropmark site noted on aerial photography deemed to be a 'moated site' lies close to the track alignment between the Dardistown Stop location and the M50.

Note: a moated site (HC18) could require several months to excavate. An attempt to locate the site securely using geophysics is a priority in this location.

Proximity to HC19, a pair of linear cropmarks running parallel for a distance of approximately 300m. The cropmarks run in an east-west direction across the field towards Ballymun House.

Approach

- Geophysical survey (subject to land access) to be carried out by RPA as part of the EIS
- Intensive centreline and offset test trenching, prior to (if possible) or immediately post Railway Order grant to be carried out by RPA.
- If required, pre-construction resolution to be carried out by RPA

5.4.2 M50 Bridge

The route crosses the M50 and associated slip roads on a new bridge structure.

Construction environment

Road margin/reservation for bridge. Greenfield agricultural land on approach from north (Compound 9) and modified greenfield on approach from south (Compound 10).

Archaeology

N/A

Approach

- Geophysical survey (subject to land access) to be carried out by RPA as part of the EIS
- Intensive centreline and offset test trenching, prior to (if possible) or immediately post Railway Order grant to be carried out by RPA.
- If required, pre-construction resolution to be carried out by RPA
- Derogation for road reservation areas on either side of the M50. Note: M50 upgrade corridor has been archaeologically assessed. No archaeological investigation will apply or be required to the works area associated with the M50 crossing/bridge within the M50 corridor boundary. This applies to the construction of the median pier foundation to be carried out as Enabling Works by RPA.

5.4.3 M50 Bridge to Northwood Stop

Immediately south of the M50, the route passes through the formally planted lands and avenue of Ballymun House over the culverted Santry River (Santry Lodge Bridge). This new bridge will cross a road that is not heavily used by traffic, and then proceeds south descending to surface level at the next stop, Northwood, located near Santry Demesne. The Stop location will be landscaped and approached from the current roadway by a curvilinear access route. The area to the east of the stop will be used as Compound 10a (Optional Area).

Construction Environment

Formally planted landscaped lands around Ballymun House and greenfield.

Archaeology

HC19: site of landscape features, also noted on aerial photography, that appear to be associated with Ballymun House.

Approach

- Geophysical survey (subject to land access) to be carried out by RPA as part of the EIS
- Intensive centreline and offset test trenching, prior to (if possible) or immediately post Railway Order grant to be carried out by RPA.
- If required, pre-construction resolution to be carried out by RPA
- Intermittent archaeological monitoring of bridge construction by InfraCo, as necessary to be agreed in advance of construction between the DoEHLG and the RPA Project Archaeologist.

5.4.4 South of Northwood stop to Santry Avenue

South of Northwood stop, the route descends into a cut and cover tunnel along the median of the R108 (Ballymun Road). This tunnel passes under Santry Avenue, which marks the end of Section MN104.

Construction Environment

Road median/road verge. These environments are likely to be radically altered and to have been largely modified as part of road verge and modern suburban residential development in the locality.

Permanent utility diversions are to be carried out by RPA as Enabling Works in the area of the Ballymun cut and cover tunnel. All services in Ballymun Road to be diverted to narrow corridors to both sides of the road (predominantly to the west side) for the full length of Ballymun Road from north of Santry Avenue to Collins Avenue.

Archaeology

N/A. None recorded.

Approach

- Intermittent archaeological monitoring of permanent utility diversions in the area of the Ballymun cut and cover tunnel to be done as RPA Enabling Works in advance of construction
- If required, pre-construction resolution
- Intermittent archaeological monitoring of bridge construction by InfraCo, as necessary to be agreed in advance of construction between the DoEHLG and the RPA Project Archaeologist.

5.5 Area MN105 Santry Avenue to Albert College Park

The route continues southwards in a cut and cover tunnel beneath Ballymun Road to a shallow underground stop at Ballymun, adjacent to the new civic plaza. A compound (11A) will be located in a modified greenfield area to west of the alignment before Ballymun Stop. The stop in Ballymun will be constructed using cut and cover techniques. Continuing south in a cut and cover tunnel along the Ballymun Road, crossing under Collins Avenue, the next stop is DCU. This is a shallow underground stop on the east side of the Ballymun Road beside the Albert College housing estate. This stop will be constructed by cut and cover techniques. The stop is to be built on the strip of land between Ballymun Road and the houses to the east of DCU, which is presently a public lawn with trees. This section ends on the DCU access Road, just south of the DCU stop.

Construction Environment

Road median/road verge with the exception of the grounds of the church at the junction of Albert College Drive on the approach to the DCU Stop site. These environments are likely to be radically altered and to have been largely modified as part of road verge and modern suburban residential development in the locality, though the Stop location is currently presented as public lawn with trees.

Permanent utility diversions are to be carried out by RPA as Enabling Works in the area of the Ballymun cut and cover tunnel. All services in Ballymun Road to be diverted to narrow corridors to both sides of the road (predominantly to the west side) for the full length of Ballymun Road from north of Santry Avenue to Collins Avenue.

At the Ballymun Stop box, the water main and pumped sewers are to be diverted to the east around the proposed development. Permanent utilities will also be taking place in the DCU/Collins Avenue area including the diversions of public lighting and drainage at DCU and the diversion of an 800mm Water main, Wad Culvert and transverse services at the junction.

Archaeology

N/A. None recorded.

Approach

- Geophysical survey of Compound area to be carried out by RPA as part of EIS (subject to landowner access)

- Intensive centreline and offset test trenching of compound and DCU Stop, prior to or immediately post Railway Order grant to be carried out by RPA
- Intermittent archaeological monitoring of permanent utility diversions in the area of the Ballymun cut and cover tunnel to be carried out by RPA as Enabling Works in advance of construction
- If required, pre-construction resolution to be carried out by RPA
- Intermittent archaeological monitoring of roadside/road median construction, to be carried out by InfraCo as necessary. Requirements to be agreed between the DoEHLG and the RPA Project Archaeologist in advance of construction.

5.6 Area MN106 – DCU to south of Mater Hospital

The route remains in cut and cover across Albert College Park entering bored tunnel near the southern boundary of the Park. Large areas of Albert College Park will be used as Compound 12A and B. The route remains underground in the bored tunnel until its termination at St Stephen's Breen. All of the stops to the south of this location are underground stops to be constructed by cut and cover techniques except for the stop under O'Connell Bridge, which is to be part mined and part built by cut and cover techniques.

5.6.1 Historical Setting

The DCU stop and associated works site is located in the townland of Walnut Grove, a name that is not mentioned in the Civil Survey of 1654; the townland may therefore be of relatively modern derivation. The stop is located to the west of Dublin City University. The University was formerly the Albert Agricultural College which began life as the Glasnevin Model Farm in 1838 becoming the Albert National Agricultural Training Institution in 1853 after a visit by Prince Albert. The name Albert Agricultural College first appears in 1902. Its foundation was an important one for Irish education, linked to the provision of instruction for primary school teachers in order to meet the requirements set down by the then Board of National Education in Ireland. The Board, established in 1831, to create a nationwide system of primary education decided in 1837 (a noteworthy date in relation to the following decade of famine in Ireland) that agriculture should be taught in all its schools. In 1979 the Faculty of General Agriculture moved to the UCD campus at Belfield and the Albert Agricultural College was closed (cited in [tp://www.ucd.ie/archives/html/university/aaci.htm](http://www.ucd.ie/archives/html/university/aaci.htm)).

5.6.2 Cut and cover through Albert College Park (incl TBM portal)

The cut and cover tunnel section from south of DCU runs for approximately 500m to the tunnel portal.

Construction Environment

This large site containing sports pitches and other leisure amenities will be crossed by the cut and cover section towards the area known as Hampstead Park which will become the tunnel works site.

Archaeology

None recorded.

Approach

- Geophysical survey (subject to land access) to be carried out by RPA as part of the EIS
- Intensive centreline and offset test trenching, prior to (if possible) or immediately post Railway Order grant to be carried out by RPA.
- If required, pre-construction resolution to be carried out by RPA
- Intermittent archaeological monitoring of roadside/road median construction, if and as necessary by the InfraCo. Requirements to be agreed between the DoEHLG and the RPA Project Archaeologist in advance of construction.

The tunnelled section between Albert College Park and the Griffith Avenue stop will have no impact on archaeology.

5.6.3 Griffith Avenue Stop

The proposed Griffith Avenue Stop will be in a cut and cover box located immediately to the north of Griffith Avenue and construction access roads will be required leading off Griffith Avenue towards the Stop location. This stop will also have a compound (Compound 13) located to the east and west of the alignment.

Construction environment

The Griffith metro stop is located in the southwest corner of the agricultural lands on the north side of Griffith Avenue.

Note: Site investigations in the locality suggest that at least some portion of the proposed Stop site is Made Ground to a depth of 2.8m below present ground level. It is likely that suburban development and road development in this locality could have given rise to such modification of ground levels. Alternately, the borehole may have picked up a backfilled quarry pit – in which case the extent of the fill recorded could be quite limited. Archaeological testing in this area will establish the nature and extent of the Made Ground.

Archaeology

None recorded.

Approach

- Geophysical survey to be carried out by RPA as part of the EIS (subject to access but having regard for the BH 75 location).
- Intensive centreline and offset test trenching, prior to (if possible) or immediately post Railway Order grant to be carried out by RPA.
- If required, pre-construction resolution to be carried out by RPA

5.6.4 *Tunnelling to Drumcondra*

The tunnels continue from the Griffith Avenue Stop passing under St. Patrick's College playing fields where an emergency access and intervention shaft will be constructed.

5.6.5 *Intervention Shaft – St Patrick's College*

In advance of construction the site will be cleared and a construction compound established (Compound 13).

Construction environment

Shaft site is located in a greenfield environment currently set out as the playing fields of St. Patrick's College.

Archaeology

None recorded.

Approach

Due to the re-worked nature of the ground a playing fields, geophysical survey is not recommended in this instance.

- Intensive centreline and offset test trenching, prior to (if possible) or immediately post Railway Order grant to be carried out by RPA.
- If required, pre-construction resolution to be carried out by RPA

5.6.6 *Drumcondra Stop*

From St Patrick's, the route continues in tunnel under the Tolka River to the next stop, which is Drumcondra. The Drumcondra stop is located to the west of Drumcondra Road and adjacent to St Joseph's Avenue. An interchange with Iarnróid Éireann's suburban rail services to Maynooth will be provided at this stop

Historical setting

One of the first documented references to the Clonliffe/Drumcondra area is associated with the Battle of Clontarf which took place on Good Friday, 1014 and effectively routed Viking rule from Dublin. Westropp suggested that the Clonliffe/Drumcondra region saw the bulk of activity during the Battle of Clontarf (cited in <http://indigo.ie/~kfinlay/ball1-6/Ball6/ball6.9.htm>) as follows: 'The Irish marched from Kilmainham towards Drumcondra. They found the enemy drawn up on the northern bank of the Liffey, their line extending from the bridge they had build near the Castle to the mouth of the Tolka at Clontarf' (<http://indigo.ie/~kfinlay/Chart/history1.htm>).

Drumcondra was once an isolated village on the Great Northern Road. It now contains few vestiges of its original character. Brewer in his *beauties of Ireland* (1826), says "Drumcondra or Drumconrath, although not distant more than two miles from the metropolis, is marked by an air of pensive tranquillity, in some measure produced by a deep shade of numerous trees, which empower many parts of the village" (Joyce 1912). The first edition Ordnance Survey depicts the Metro stop location as the rear plots of

apparently domestic structures facing onto Drumcondra Road Lower. By the time the 25 inch map was published (c 1900) the area was significantly developed with the construction of additional roads and Victorian terraced houses and associated buildings.

Construction environment

The stop site is currently occupied by some residential properties and a school yard for the Catholic Institute of the Deaf. Development in this location is unlikely to encounter significant amounts of archaeology, though the potential for stray finds to be revealed must be catered for.

The Structure

The excavation for the stop 'box' will measure approximately 100m in length and 20m in width.

Archaeology

None recorded.

Approach

- Archaeological monitoring and intensive inspection of utilities diversions to be carried out by the InfraCo at Drumcondra Stop
- Test excavation of the stop site by the InfraCo prior to site clearance in order to assess the archaeological potential of the site
- Or
- Archaeological monitoring during InfraCo site clearance works undertaken to level the site to form a working platform in advance of piling.
- In the event that archaeological features are discovered during monitoring or testing at Drumcondra Stop, the InfraCo shall prevent the removal of or damage to any Archaeological Objects in accordance with the Archaeological Requirements. InfraCo shall immediately inform the Project Archaeologist and any Relevant Authorities who have an interest in such discovery of the discovery of any Archaeological Objects and without prejudice to InfraCo's obligation to comply with the Archaeological Requirements and to comply at all times with any Statutory Requirements and Necessary Consents, InfraCo shall carry out instructions from the Project Archaeologist in the time specified by the Project Archaeologist.
- Where archaeological excavation is recommended, the methodology must be agreed between the InfraCo's archaeological consultant and RPA Project Archaeologist and DoEHLG. The InfraCo must make the site available to and provide attendance to their archaeological team so that archaeological features and deposits can be investigated and recorded and all archaeological issues resolved in advance of further construction works at the site.

5.6.7 Mater Stop

The construction of the Mater Stop box will be done as a separate Design and Build Enabling Works contract for Metro North.

Initial site clearance, utilities diversions and ground reduction works will be carried out by the Mater (MCUH) as part of the proposed redevelopment of Mater Hospital. An independent archaeological assessment for the Mater was carried out by Margaret Gowen Ltd in August 2007 and recommended that all site clearance and ground reduction works associated with the Mater Hospital redevelopment will be archaeologically monitored by a licenced archaeologist.

The Design and Build of the Mater Stop box for Metro North will be carried out as a separate Enabling Works contract which will be procured by the RPA. The Detailed Design Brief for the design of the stop box includes provision for compliance with the Archaeological Strategy for the Mater Stop (set out below) at the Design phase of the project.

This stop is located within the grounds of the Mater Hospital on the northeast side of the property in an area that is currently used for car parking, a site store, housing and offices.

Historical setting

The Mater stop is located, within the hospital complex to the north of Eccles Street, considered to be one of the finest Georgian Streets on the north side of Dublin and reputedly built between the 1750s and 1820, though was not in existence when the survey for Rocque's map of 1756 was undertaken. The foundation stone for the Mater Misericordiae Hospital was laid in 1852 and it was opened to the public in September 1861. The hospital, designed by John Bourke, reflects Victorian fashion with its classical granite faced façade. The quadrangular structure was built in stages with the wings being added in 1868 and 1884. The hospital was founded and run by the Sisters of Mercy and had accommodation for forty patients. Five years later, during a cholera epidemic in 1866, it treated two hundred and forty eight patients in six weeks. The Mater received planning permission to demolish the entire north side of Eccles Street sometime post 1939 in order to build a large extension. It is now one of the largest teaching hospitals in the country. It has also developed to become the national centre for cardiac research and surgery. In 1977 William H. Byrne and Son were appointed to design a new ward for the hospital. Built in 1981-86, the L-shaped building is eight storeys high. It is accessed from the North Circular Road.

An archaeological assessment (licence number 02E0960) conducted in October 2002 revealed human remains in the northeast corner of the hospital grounds. The assessment established that the bones found during engineering site investigations were human and that some of them had clearly been used for dissection and anatomical study (as found in other sites at Trinity College, Dublin and Liffey Street Dublin) or the result of amputations. The latter may be deemed most likely, as nearly all of the bones (apart from one shoulder bone) were from limbs and digits. First Edition Ordnance Survey (1829-41) depicts the area of the proposed metro stop as mostly consisting fields. A road named Elizabeth Street ran east-west across the area of the proposed metro stop. Elizabeth Street

was removed for the construction of the Mater hospital but the area is shown as an open space on 25 Inch OS map (c.1900).

Construction environment

The stop site is currently occupied by a surface car park and is crossed by a large variety of services.

Utilities

These include gas, water and ESB in addition to surface water drains and power lines for lighting.

The structure

The stop box structure will measure approximately 150m by 25-40m.

Archaeology

None recorded, though the potential for the discovery of human remains is high. The stop location lies outside the designated constraint Zone of Archaeological Potential for Dublin and lies over 200m and 300m respectively from the nearest Recorded Monuments.

Approach

- Archaeological monitoring and intensive inspection of diversion of services and site clearance works to be done by Mater (MCUH) in compliance with their EIS for the proposed Mater Hospital redevelopment
- In the event that archaeological features are identified, archaeological excavation and resolution of issues by MCUH during this phase of site preparation works.
- Evaluation by archaeological test trenching of the stop site by the RPA procured Design and Build contractor in advance of commencement of construction of the Mater stop box.
- In the event that archaeological features are discovered during testing, the D & B contractor shall prevent the removal of or damage to any Archaeological Objects. They shall immediately inform the RPA Project Archaeologist and any Relevant Authorities who have an interest in such discovery of any Archaeological Objects and must comply at all times with any Statutory Requirements and Necessary Consents. The D & B contractor shall carry out instructions from the RPA Project Archaeologist in the time specified by the RPA Project Archaeologist.
- Where archaeological excavation is recommended, the methodology must be agreed between the D & B's archaeological consultant and RPA Project Archaeologist and DoEHLG. The D & B contractor must make the site available to and provide attendance to their archaeological team so that archaeological features and deposits can be investigated and recorded and all archaeological issues resolved in advance of further construction works at the site.

5.7 Area 7 – South of Mater to St. Stephen’s Green

5.7.1 Tunnelling from Mater Stop to Parnell Stop

On leaving the Mater Hospital the tunnels turn south easterly under the Dorset/Frederick Street junction and on to Parnell Square East where a cut and cover stop, Parnell Square will be constructed. There will be no surface intervention along this stretch of the line until Parnell Square. .

5.7.2 Parnell Square Stop

The proposed stop structure is located beneath Parnell Square East. On the eastern side of the stop box there is a 4-storey Georgian terrace with basement that extends outwards beneath the pavement.

Historical setting

Parnell Square was built between 1753 and 1785 and was the first of Dublin’s Georgian Squares and among the earliest formal spaces to be laid out in the city. The square was originally called Rutland Square and later renamed after the political leader Charles Stewart Parnell. Rutland Square evolved initially as an offshoot of the Lying-In Hospital (Now known as the Rotunda Hospital), located to the southwest of the proposed metro stop. The hospital was developed by Dr Bartholomew Mosse as the first charitable maternity hospital in Ireland. The foundation stone of the hospital was laid in 1751. The proposed metro stop is located on the earliest side of the square to be have been constructed, originally called Cavendish Street after the lord lieutenant, William Cavendish, 3rd Duke of Devonshire.

The Parnell stop is located within the Zone of Archaeological Potential of the historical core of the city of Dublin (DU018:020). It is also close to a possible Viking-period cemetery (DU 018:020-495). Evidence for this cemetery along with a sword and spear were recovered on Granby Row which runs between Dorset St and Parnell Square. In 1998 archaeological testing was carried out at number 29 Parnell Square (License 96E225). No archaeological features other than the foundations of the early Georgian Structures were revealed (www.excavations.ie).

The Parnell Stop structure

The stop box will measure approximately 130m in length and 30m wide.

Construction environment

The stop site is currently occupied by the road surface, pavements in the north-eastern sector of the square, incorporating the boundaries to the Garden of Remembrance, the Rotunda Hospital Grounds (which lie at a lower level than the street) leading to the Gate Theatre.

Utilities

A live sewer runs longitudinally through the stop site along with fibre-optic cable and other services. The diversions of this sewer and the relocation of an ESB substation at

Parnell Square and other utility diversions in Parnell Square East will be carried out by RPA as Enabling Works

Archaeology

None recorded, though the potential for the discovery of human remains dating to the Viking period, while slight, has to be considered. The site lies within the Zone of Archaeological Potential of the historical core of the city of Dublin (DU018:020).

Approach

- Archaeological monitoring and intensive inspection of diversion of services to be carried out as RPA Enabling Works in advance of construction
- Evaluation by archaeological test trenching of the stop site by the InfraCo's archaeological consultant after diversion of services in advance of construction commencement at this location.
- In the event that archaeological features are discovered during monitoring or testing at Parnell Square, the InfraCo shall prevent the removal of or damage to any Archaeological Objects in accordance with the Archaeological Requirements. InfraCo shall immediately inform the Project Archaeologist and any Relevant Authorities who have an interest in such discovery of the discovery of any Archaeological Objects and without prejudice to InfraCo's obligation to comply with the Archaeological Requirements and to comply at all times with any Statutory Requirements and Necessary Consents, InfraCo shall carry out instructions from the Project Archaeologist in the time specified by the Project Archaeologist.
- Where archaeological excavation is recommended, the methodology must be agreed between the InfraCo's archaeological consultant and RPA Project Archaeologist and DoEHLG. The InfraCo must make the site available to and provide attendance to their archaeological team so that archaeological features and deposits can be investigated and recorded and all archaeological issues resolved in advance of further construction works at the site.

5.7.3 O'Connell Bridge Stop

To the south of Parnell Square, the route proceeds in tunnel under O'Connell Street to O'Connell Bridge Stop. This stop will be located under the River Liffey and access will be provided to the north and the south of O'Connell Bridge with construction occurring in phases on both the East and West side of O'Connell Street North and construction in one location on Westmoreland Street (O'Connell Street South)..

Structure

The cut and cover boxes on O'Connell Street will be approximately 30m in width, 70m long and 33m in depth with the Westmoreland Street stop box measuring approximately 110m x 15m excavated to the same depth. O'Connell Street North and Westmoreland Street will be linked by a central concourse tunnel.

Utilities

Permanent Utilities Diversions in the O'Connell Street and O'Connell Bridge area will be carried out by RPA as Enabling Works in advance of construction. This comprises the relocation of two substations serving the Luas and ESB (serving O'Connell Street Businesses), utility diversions between Abbey Street and O'Connell Bridge, and D'Olier and Westmoreland Streets.

Historical Setting

Eden Quay and the North Ward in which the bridge is situated are relatively late developments in the history of Dublin city, having been reclaimed from the tidal waters and mud flats of the River Liffey from the late 17th century. Prior to the reclamation activities undertaken with the eastward expansion of the city towards the end of the 17th century, the site was part of the river's shallow inter-tidal zone. O'Connell Street (to the north of the bridge) is a relatively late feature of the Dublin streetscape. The first cartographic reference to a street in this location is an unnamed road forming the eastern boundary of the lands of St Mary's Abbey (dissolved in the sixteenth century), shown on Bernard de Gomme's map of 1673. This part of the city, along the river to the north and east of the medieval city, was largely developed on reclaimed marshy mud flats.

Prior to the formal laying out of the quays in the early years of the 19th century, it was possible to pass along the northern river frontage along what was then Bachelor's Walk, to the present Abbey Theatre, behind a quay wall that was located 70m to the north of the present quay wall (revealed during the Luas project). To travel further east at that time it was necessary to go north onto Abbey Street and south again at Liberty Hall, owing to an intervening iron yard or Iron Quay, which had a river frontage of about 30 m. The first quay was created by the city from 1733 and is depicted on a map of the city by Rocque (1756) at what was then the east end of Bachelor's Walk (De Courcy 1996).

In 1777, the Wide Streets Commission was given a grant to extend Sackville (now O'Connell) Street to the quays, and, in 1782, it was given Parliamentary approval to build a bridge (to be called the Carlisle Bridge, now O'Connell Bridge over the Liffey. The bridge, designed by James Gandon, was opened in 1795, but the extension of Sackville Street was under construction until 1800. While the bridge and Sackville Street were under construction, plans for Eden Quay were being drawn, and the quay, involving the proper embankment of the river with stone walls, was laid after 1806. It was reported in 1814 that the wall and parapet needed to complete the extension of the quay had been built (De Courcy 1996). The new quay was named after the Right Honourable William Eden, Chief Secretary in Dublin Castle in c.1780.

Following the opening of Carlisle Bridge (O'Connell Bridge) in 1795, the quays to the west were no longer accessible by ships. They did, however, continue to berth at Eden Quay, along with Burgh Quay, with the result that the quay developed as a centre of commerce and shipping. It is recorded in 1850 that sixteen shipping and four emigration offices existed within the thirty-two buildings listed for Eden Quay.

Construction environment

The stop sites north and south of the river are currently occupied by the street surfaces, pavements and street furniture leading to O'Connell Bridge.

Archaeology

The site lies within the Zone of Archaeological Potential of the historical core of the city of Dublin (DU018:020).

Remnant structural remains of the primary Gandon Bridge are very likely to remain *in situ* while remains of the primary 18th century buildings on Sackville Street and the primary north quay wall (revealed during Luas works) will survive below-ground on the northern side of the site.

The archaeological horizon is estimated to be at a depth of 2.0 to 4.0m below ground level (as found during the preparation of the substation site for the Luas on O'Connell Street), though the archaeological deposits may be deeper towards the river.

On the southern side, evidence from adjacent development suggests, apart from the remains of 18th-century buildings along the street that were demolished by the Wide Streets Commission, that post-medieval wooden and possibly masonry quay front structures may be encountered in positions set back from the present southern quay front.

The stop site is also located close to, but to the north of the original confluence of the River Steine with the River Liffey and to the north of the original river bank which was identified under the Weston Hotel during its development to the south of Fleet Street (i.e. the site appears to lie within the primary river bed of the Liffey).

Approach

- Archaeological monitoring and intensive inspection of diversion of services will be carried out by RPA during Enabling Works at each of the three construction locations as along the routes of diversions relocated away from the stop box locations for archaeological evaluation and for recording purposes. Note: as with the Luas development, diversion of services to new locations may result in the discovery of *in situ* remains of archaeological significance.
- Archaeological monitoring of all ground disturbance and utilities diversions within the Zone of Archaeological Potential for Dublin (DU018:020) to be carried out by the InfraCo
- In the event that archaeological features are discovered during monitoring, the InfraCo shall prevent the removal of or damage to any Archaeological Objects in accordance with the Archaeological Requirements. InfraCo shall immediately inform the Project Archaeologist and any Relevant Authorities who have an interest in such discovery of the discovery of any Archaeological Objects and without prejudice to InfraCo's obligation to comply with the Archaeological Requirements and to comply at all times with any Statutory Requirements and Necessary Consents, InfraCo shall carry out instructions from the Project Archaeologist in the time specified by the Project Archaeologist.

O'Connell Bridge North

It is anticipated that the excavation and construction of O'Connell Bridge North will be carried out phases in order to facilitate traffic movement and pedestrian/business access in this location. As previously discussed, it is anticipated that archaeologically sensitive horizons are located approximately between 2m and 4m below ground level.

Approach

Initial ground reduction works to the top of the archaeological horizon (assumed to be 2m BGL) will be carried out by the InfraCo under archaeological supervision. On reaching the upper levels of the archaeological horizon, the site or part of the site should be made available to the InfraCo's archaeological team for excavation. The archaeological consultant will be required to excavate all archaeological features and deposits in plan from the surface downwards with suitable attendance provided by the contractor until all archaeological issues are resolved.

It is understood that archaeological excavation by the InfraCo's team may take place in multiple phases. However, it should be noted that a multi-phased excavation strategy will be less efficient from an archaeological perspective and the methodology may necessarily have to be revised in the event that important large intact archaeological objects or structures are identified which extend outside the excavation area into previously unexcavated sections of the stop box. .

It is recommended that archaeology issues are resolved in advance of the installation of the road deck. The archaeological issues are not complex and the deposits are not especially deep so the resolution of the archaeology in advance of the installation of the road deck is considered the most efficient approach.

The methodology for archaeological excavation at this location must be agreed in consultation with RPA and DoEHLG.

O'Connell Bridge South

The southern Stop box will be located fully within Westmoreland Street. This stop box will require a diaphragm wall. The same strategy for the resolution of archaeological issues at OCB North should be applied to OCB South. Initial ground reduction works should be monitored by the InfraCo's archaeological to the top of the archaeological horizon. In the event that archaeology is identified, the site or part of site must be made available to the InfraCo's archaeological consultant team and the InfraCo must provided attendance on them. Excavation through the archaeology must be carried out in plan from the surface.

5.7.4 St Stephen's Green Stop

From O'Connell Bridge the route proceeds beneath Westmoreland Street, along the front of Trinity College and under buildings between Clarendon Street and Grafton Street. The terminus St. Stephen's Green stop will be approached, by tunnel, along an alignment that largely runs west of Grafton Street and approaches the Green at its northwestern corner. The design of the stop location is currently being developed and designed jointly with Irish Rail as it is anticipated that the proposed Interconnector rail route will link to Metro North at St. Stephen's Green. The proposed Stop structure is located in the north west corner of St. Stephen's Green and the ticket hall will extend out into St. Stephen's Green

North and St. Stephen's Green West. Emergency escape and vent structures will also be located within the Park.

At present the design suggest that the stop box structure will be approximately 154m in length and 34m in width, with a ticket hall of irregular shape measuring generally 73m in width and 42m in length.

Historical and archaeological considerations (historical data drawn from Casey, 2005)

St. Stephen's Green is a National Monument (RMP DU018:02033; RPS 7927 (DCC); HC338; potential features and standing features are underlined and numbered below) The footprint and boundaries of St. Stephen's Green, as currently presented, are virtually unchanged since it was first set out, in the 17th-century to facilitate the lease of 96 plots for development around a green of 27 acres. In its earliest years the green was surrounded by a perimeter wall (1) constructed in 1669. In 1670 the city agent, Richard Lord, was instructed to enclose part of the Green with a hedge and to plant a lime-tree walk within it. The ground was quite marshy at this time and the green was drained by a perimeter ditch (2). By 1758 tree-lined walks (3) were established around the inner edge of the green and had fashionable names (Beaux Walk - N, Lesson Walk - S, Monk's Walk - E and French Walk - W). In the 19C landscaping works virtually removed all trace of the 18thC layout. In 1818 the Green was replanted, the perimeter wall was replaced by railings, and the short granite posts that still line the outer pavement were installed, linked originally with chains. The Green was transformed once again in the 1870s at the instigation of Arthur E. Guinness who engaged the architect J.E. Fuller and the landscape designer William Shepard and the firm of Pulham & Sons to produce the Green's current picturesque landscaping, including the pond, around a central parterre and gateways at each of the corners.

In the 18thC the principal entrance was placed in the middle of its western side. This entrance remained into the 19thC and the Green's early 19thC layout and planting scheme (4) is recorded in detail in the first edition of the Ordnance Survey (Pub. 1847) which indicates an additional three 'wicket gate' pedestrian entrances (5) on its northern side, the locations of which still remain in use. These entrance gates were matched by three similar entrances on the southern side and there were two on the east.

In 1907 The Royal Dublin Fusilier's Arch (6) at the NW corner was erected on the site of the 19thC gateway to commemorate the casualties of the Boer War. It was designed by J. Howard Pentland of the OPW and consultant Sir Thomas Drew it is a granite triumphal arch flanked by four rusticated piers creating a shallow, curved forecourt at the northwestern entrance to the Green where it is approached from Grafton Street. It has inscribed panels in Sheephouse limestone.

During the 1916 Rising, St. Stephen's Green was the location for a fiercely contested, if short lived, position. At midday on 24th April around 100 men and women, principally from the Irish Citizen's Army under the command of Commdt. Michael Mallin, took control of St. Stephen's Green. Civilians were escorted from the park and any British servicemen taken prisoner. The gates were closed and the process of barricading key routes commenced. Either through lack of foresight, or troops, the tall buildings along the north side of the Green were not secured. These were rapidly occupied overnight by

British forces who set up machine-gun positions which they used in just a morning to force a retreat of the Irish fighters to the Royal College of Surgeons, where they managed to remain for a few days prior to surrender. This theatre of action has left its eloquent traces on the NE side of the Fusilier's Arch where damage occasioned by machine gun fire is still evident. It is also likely to have left less obvious archaeological remains.

The records of the event suggest that the Irish forces entrenched (7) within the Green, especially at the approaches to the entrances. Machine-gun fire, from the elevated positions across the street would have rained down on these positions at a rate of 550 rounds per minute leaving many bullets (8) deeply embedded in the ground. While the Irish forces may not have discharged many rounds, the cartridges (9) of their ammunition may also have been discarded at their positions.

The character and layout of the entrenched positions is recorded from eye-witness accounts which describe how the men were set to 'dig trenches; two trenches, one on either side of the gate' (in this description referring to Earlsfort Terrace and Lower Lesson Street on the southern side of the Green where the trenches were described as being 3ft deep and another account suggests the location of trenches at the northeastern corner). No descriptions explicitly mention the northwest corner, though the scars of machine-gun fire testify to action in that location.

Construction environment

This is a highly sensitive, designed historic park with associated planting, some of which has its historical origins in the 18th Century and earlier. It is also a designated National Monument 'the preservation of which is of national importance'.

It will be a legal requirement that Ministerial Consent will have to be granted for all proposed invasive works at St. Stephens Green by both RPA for the Enabling Works phase and by the InfraCo for the construction phase.

Archaeological investigation and mitigation approach

The main area of potential archaeology will be within the green itself, and the items for consideration are identified and numbered in the text above, namely: the primary enclosing perimeter wall (1); the enclosing drainage ditch (2); evidence for the primary tree-lined walks (3); and perimeter planting layout (4); the location of the 'wicket gates' on the northern side of the green (5); the scars of machine-gun fire on the NE elevation of the Fusilier's Arch (6) which should not be repaired/obscured in the event that the arch will be dismantled and re-constructed (item for the Environmental Management Plan); evidence for shallow fortifications (7) associated with the defence of the gateway position during the 1916 Easter uprising; bullets (8) lodged in soil that were fired from British elevated positions on the northern side of the Green and cartridges (9) discarded by the Irish forces in their positions close to the NW gate.

Programme - archaeology

Prior to RPA Enabling Works, the archaeology and cultural heritage section of the EIS will be reviewed, with particular reference to its historical background, historic map

search and field inspection in order to define the location of potential primary structural, horticultural and archaeological features.

An advance geophysical survey will be carried out by RPA as part of the EIS and in advance of Enabling Works. It may provide some indication on the location, nature and scale of the archaeological issues to be resolved prior to construction.

RPA will also undertake a detailed geodetic survey of the Green, its layout, planting scheme and structural features in advance of Enabling Works. A Conservation Architect will be appointed by RPA for Metro North and they will develop impact assessments and mitigation strategies for structures and statues within the Green (notably the Fusilier's Arch).

Utilities Diversion

Permanent utility diversions to the St Stephen's Green area including utility diversions to St Stephen's Green North and West will be carried out by RPA as Enabling Works under archaeological supervision.

During RPA Enabling Works, the Park area will be made available to the archaeological team. The scope of excavation depends on how the items identified present themselves. Each of the items mentioned could result in the discovery of material remains, albeit of a fragmentary nature in the case of the original planting scheme and tree-lined walks which were removed as part of the late 19th century and later modified planting schemes.

The archaeological work will commence, within an established survey grid, with the careful removal of sod, by hand where necessary, and hard surfaces across the development area. Note: careful consideration will need to be given to the location of haul routes, proposed soil stockpile locations, rapid removal of spoil off site, access and egress routes to the construction area, storage and site accommodation locations.

Metal-detection survey will be used on the topsoil, and all spoil, to ensure that any fragments of bullets or related militaria are retrieved. The exposed surface will be cleaned back, by hand, to establish what traces of the features described above survive within the construction area.

In the event that primary garden and landscape features survive, these will be isolated and fully documented with suitable sampling methods will be used to assist in the analysis of the evidence for the original planning scheme.

Any features and finds relating to the defense of positions on the Green in 1916 will also be fully archaeologically excavated, recorded and documented and all appropriate material retrieved for off-site analysis, curation and conservation.

If the Fusilier's Arch is to be dismantled or relocated it is recommended that the work is monitored intensively and that the structure is architecturally recorded, in detail, for the purposes of re-instatement and as a record. However, it is currently not anticipated that the foundations of the arch will be removed by RPA in advance of InfraCo

commencement and there will be a requirement for the InfraCo to monitor their removal and other topsoil reduction works in this area. The extent of the monitoring requirement will be indicated on plan in advance of construction.

It is anticipated that all archaeological issues with the exception of the monitoring of the arch foundations removal will be resolved by RPA as Enabling Works.

In summary the works required are as follows:

- Geophysical survey of Green as part of the EIS (subject to access)
- Detailed geodetic survey of the Green (As RPA Enabling Works)
- Detailed survey of Fuseliers Arch (specification to be agreed with architectural section of the DoEHLG) (As RPA Enabling Works)
- Detailed methodology for the removal, storage and reinstatement of Fuseliers Arch as RPA Enabling Works
- Archaeological testing (methodology to be agreed between DoEHLG and RPA Project Archaeologist) to be carried out as RPA Enabling Works
- Metal Detection as appropriate to be carried out as RPA Enabling Works
- If required methodology for any proposed archaeological excavation to be discussed and agreed with the DoEHLG and to be carried out as RPA Enabling Works.
- Monitoring of the removal of the foundations of Fuseliers's Arch and ground disturbance in this area will be carried out by the InfraCo's Archaeological Consultant.
- In the event that archaeological features are identified, the required methodology for any proposed archaeological excavation will be agreed with RPA and the DoEHLG.

St Stephens Green Loop

In parallel with the stop box excavation, the loop tunnel will be constructed from the south end of the stop. Traditional drill and blast methods will be employed for its construction or if the rock is suitable, it may be driven by excavators equipped with impact hammers.

Construction of the loop tunnel will have no impact on archaeology.

Table 1. Pre-Construction Archaeology and InfraCo Archaeological Requirements

METRO NORTH AREAS MN101-MN107	Receiving Environment	PRE-CONSTRUCTION ARCHAEOLOGICAL SURVEYS AND EXCAVATION						INFRACo ARCHAEOLOGICAL REQUIREMENTS		
		Geophysics	Testing	Underwater	Architectural	Monitoring	Excavation if Required	Monitoring	Testing	Excavation if Required
Area MN101 Belinstown Depot to Swords Stop Belinstown Depot to Lissenhall Bridge Lissenhall Bridge and Balheary Bridge Balheary Bridge to Estuary Roundabout Estuary Roundabout to Swords Stop (incl. Seatown Stop)	Green field Bridges Road Verge Road Median	*	*	*	*		*	*	*	
Area MN102 Swords Stop to Dublin Airport North portal Pinnock Hill to Fosterstown Stop Fosterstown Stop Fosterstown Underpass Fosterstown Underpass to Dublin Airport Nth Portal	Road Median Modified green field Road Median Green field		*				*	*	*	
Area MN103 Dublin Airport Dublin Airport Boundary (Nth) to Dublin Airport Boundary (South)) portal Dublin Airport Stop	Green field and tunnel Carpark							*	*	
Area MN104 Dublin Airport south portal to Santry Av. South portal to M50 (Incl. Dardistown Stop and P & R) M50 Bridge	Green field Road margin/median	*	*				*			
M50 to Northwood Stop South of Northwood Stop to Santry Avenue	Modified green field Road median/verge	*	*			*	*	*	*	

METRO NORTH AREAS (CONTINUED)	Receiving Environment	PRE-CONSTRUCTION ARCHAEOLOGICAL SURVEYS AND EXCAVATION						INFRACo ARCHAEOLOGICAL REQUIREMENTS		
		Geophysics	Testing	Underwater	Architectural	Monitoring	Excavation if Required	Monitoring	Testing	Excavation if Required
Area MN105 Santry Avenue to Albert College Park Santry Avenue to Albert College Park	Road median/verge					*	*	*		*
Area MN106 Albert College Park to Mater Stop DCU to Albert College Park Albert College Park Griffith Avenue Stop St Patrick's College Vent Drumcondra Stop Mater (Design and Build)	Road Verge Modified green field Modified green field Modified green field Properties/School yard Carpark		*			*	*	*	*	*
Area MN107 Mater Stop to St Stephen's Green Parnell Square O'Connell Bridge (North and South) Sub-stations St Stephen's Green	Street & footpaths Street Street Park		*	*	*	*	*	*	*	*