4.1.2 Objective 2

To minimise the overall number of single-occupant vehicles trips for journeys to work and work-related travel.

The reduction in vehicle use is a key objective of the WTP. Car use reduces air quality and local amenity while impacting on road safety, which in turn has social and economic disadvantages.

This objective is targeted specifically at the reduction of car use to and from the development. The objective is achievable through measures designed at reducing the need for travel and encouraging a modal shift away from the private car.

4.1.3 Objective 3

To integrate mobility management into the development decisions, policies and practices, and to work closely with governing bodies on means and use of transport services around the vicinity of the development site.

Mobility management and sustainable transport cannot be addressed in isolation, but as part of a more general approach towards the development of a sustainable organisation whose functions deliver significant benefits to the community and the environment, together with economic savings. Regular communication with the local authorities on further improving facilities in and around the vicinity of the development can establish good policies and practices when developing decisions within the WTP.

In addition, the Local Authorities require Travel Plans for developments which the planning authority may consider generate significant trip demand.

4.1.4 Objective 4

To provide information and have resources readily available to increase awareness and continue education on sustainable modes of travel for both development occupants and visitors to the development.

The WTP has a significant role to play in the provision of information and resources to people both within the development and the wider community. Information should be made readily available, and the benefits of sustainable travel should be widely promoted throughout the development when completed. Information positioned correctly can influence attitudes, which in turn can influence behaviour.

5.0 WORKPLACE TRAVEL PLAN TARGETS

5.1 Development Population

Journeys to and from the development shall be made primarily by two distinct population groups: development occupants (i.e. staff) and visitors (including hotel guests). The targets set under the Workplace Travel Plan shall be limited to development occupants, as this is the only group that is expected to make both frequent and regular trips to and from the site. While the travel habits of visitors are expected also to be influenced by measures adopted under the Plan, these are more difficult to monitor.

The proposed development comprises the following principal elements:

- offices with a total Net Internal Floor Area (NIFA) of 15,698m^2; and
- a 238-bedroom hotel.

To calculate the predicted number of employees within the development, the following average staff density figures have been sourced from the UK Homes & Community Agency's *Employment Density Guide (3rd Edition)*:

- General Offices (max. density) – 1 staff member per 10m^2 NIFA
- Hotels (mid-scale) – 1 staff member per 3 beds

Assuming an average of 1.2 beds per hotel bedroom (i.e. 1 staff member per 2.5 bedrooms), the development is predicted to have a total employee population of 1,665no. people, comprising:

- 1,570no. office staff
- 95no. hotel staff

5.2 Census Data

To establish indicative baseline modal splits for the development site, reference has been made to CSO data derived from the 2016 census.

These data are in the form of Workplace Zone (WPZ) statistics, which give modal splits for daytime occupants' trips to places of work or study.

Table 2 – CSO 2016 Census Data – Existing Modal Splits

Transport Mode	Workplace Zones	
	WPZ DC1007 only	WPZ DC1007 + adjacent
Driving a Car or Van	50%	50%
Passenger in a Car	1%	2%
Bicycle	8%	8%
Motorcycle	2%	1%
Bus	11%	12%
Train or Tram	18%	15%
Walking	8%	8%
Other / Work from Home	0%	1%
Not Stated	2%	3%

Figure 12 – Census Workplace Zones
(map data & imagery: NTA, OSi, CSO, OSM Contributors, Google)

The development site is located within Workplace Zone no. DC1007 (see Figure 12). The census modal splits for this WPZ, as well as for the adjacent zones, are given in Table 2.

5.3 Development Car Parking Provision

The proposed development shall include the following car parking provision:

- 30no. spaces for office staff
- 24no. spaces for the hotel (of which it is assumed that 4no. spaces shall be allocated to staff use)

Given this limited car parking provision and the predicted development population figures derived in sub-section 5.1, it is concluded that:

- at most 2% of office staff will be able to use a car as their primary mode of transport to work; and
- at most 4% of hotel staff will be able to use a car as their primary mode of transport to work.

5.4 Development Modal Splits

Table 3 gives the assumed starting modal splits for the proposed development, while Table 4 gives the suggested Workplace Travel Plan targets to be set in pursuance of the objectives defined in Section 6. The assumed starting modal splits have been informed primarily by CSO census data from the year 2016, as previously described, as well as by the proposed car parking provision within the subject development.

Once the development is completed and occupied, the true initial modal splits should be established by means of a travel survey and the initial WTP targets should be amended by the Mobility Management Coordinator, if

appropriate. These targets should be reappraised at regular intervals thereafter as part of the periodic Plan review process.

Table 3 – Assumed Initial Modal Splits for Development Occupants

Mode	Offices	Hotel	Overall Development
Driving a Car	2%	4%	2%
Passenger in a Car	3%	3%	3%
Bicycle	17%	16%	17%
Motorcycle	3%	3%	3%
Bus	25%	24%	25%
Train or Tram	33%	33%	33%
Walking	17%	17%	17%
TOTAL	100%	100%	100%

Table 4 – Target Modal Splits for Development Occupants

Mode	Offices	Hotel	Overall Development
Driving a Car	1%	2%	1%
Passenger in a Car	1%	2%	1%
Bicycle	18%	17%	18%
Motorcycle	3%	3%	3%
Bus	26%	25%	26%
Train or Tram	34%	34%	34%
Walking	17%	17%	17%
TOTAL	100%	100%	100%

5.5 Implementation Timeframe

The duration of the first phase of the Workplace Travel Plan, during which the initial target modal splits shall be pursued, will be decided by the Mobility Management Coordinator once the development is operational.

A phase duration of 2 years is suggested, after which time the first Plan review may be conducted and the initial targets revised, if appropriate.

5.6 Plan Monitoring and Review

As part of on-going monitoring and review, the percentage shares of individual modes such as walking, cycling and public transport will be monitored to understand how successful implementation of targeted programs have been.

The targets set will require ongoing work and commitment from the development as a whole, without which they will not be achieved. It is recognised that some people will be easier to convert to alternative modes of transport than others, and that the more that is done to facilitate the use of those alternatives, the more they will be used. As it has already been noted, a Workplace Travel Plan is an ongoing process and targets that are achieved should be replaced by further targets.

6.0 MOBILITY MANAGEMENT MEASURES

The measures identified are a mixture of policies and incentives designed to both encourage changes in travel behaviour and restrict the use of private cars. The measures are designed to be implemented over a period of time, allowing costs to be spread and ensuring policies and incentives are implemented together.

While little may be observed in terms of travel behaviour in the short term, as implementation gains momentum so will the impact in terms of travel behaviour.

The mobility management measures in the plan can be grouped under the following headings:

- Marketing and Communications
- Walking and Cycling
- Public Transport
- Implementation / Consultation / Monitoring

6.1 Marketing and Communications

The education of development occupants and visitors on the Travel Plan initiatives and the importance of contribution are extremely important. The services available must be communicated in a consistent and continuous manner to sustain behavioural change.

Communications will include promotional initiatives and activities aimed at informing occupants and visitors of the existing and proposed transport networks. Such initiatives and activities will include:

- Promoting the WTP through Internal Communication and external avenues.
- Developing an Access Map to show public transport facility locations and highlight safe walking and cycling routes. In addition to this, the

establishment of Travel Information Points at dedicated on-site locations to make occupants and visitors aware of the mode choices available in and around the development site. The Travel Information Points should be conspicuously located at the reception areas and provide travel and mobility information such as maps, public transport routes and timetables, leaflets, etc.

- Preparing a formalised Sustainable Travel Information Pack, which is to be provided to all new development occupants. The Pack will contain all the information relating to the Workplace Travel Plan, including the Mobility Access Map and the locations of cycle parking, etc.
- Developing a digital Travel Information Point for the development, to provide details of travel choices to the site, linking to appropriate external websites for visitors to the development.

6.2 Walking and Cycling

6.2.1 Safe Walking and Cycling Routes

All pertinent safe walking and cycling routes should be identified within a radius of at least 5km around the development site. These routes will be selected with regard to:

- Availability of footpaths and cycle paths
- Safety at crossings
- Signage
- Lighting

6.2.2 Bicycle Parking, Umbrellas, and Bicycle Maintenance Stations

- It should be ensured that bicycle parking for development occupants and visitors is secure, easily accessible, and sufficiently sheltered.
- Loan umbrellas should be provided at reception areas for visitors.

- Bicycle maintenance stations (containing tools, puncture repair equipment, pumps, etc.) should be maintained at reception areas and within bicycle storage areas, and made available to all bicycle users.

6.3 Public Transport

The proposed measures intend to promote the use of public transport.

6.3.1 Service Information

It must be ensured that the information supplied in the development Access Map, Sustainable Travel Pack and Travel Information Points includes the location of stops, routes, timetables, walking times to main public transport facilities, etc. Changes and improvements to public transport provision must be publicised as well.

6.3.2 Promotion of Tickets and Passes

Development occupants should be provided with information on advantageous public transport fare options, including the Taxsaver scheme and the Tfl Leap Card.

6.3.3 Multi-Modal Trip Support

Development users should be offered specific advice on combining public transport with other modes of transport, for instance travelling by bicycle between a bus stop or railway station and their home or workplace. In particular, information should be provided on the conditions under which standard or folding bicycles may be carried on bus and train services.

6.4 Implementation / Consultation / Monitoring

The Workplace Travel Plan is a document that evolves over time and depends upon ongoing implementation, management and monitoring. Its successful implementation requires organisational support, an internal Mobility Management Coordinator, and financial resourcing.

To implement the WTP, the following inputs are required:

- Management support and commitment;
- A Mobility Management Coordinator to oversee the Plan;
- A Steering Group to oversee the Plan;
- Working Groups on various related issues;
- Consultations with development users and external organisations.

To secure effective results from any initial sustainable travel investment, it is imperative to obtain the agreement of all the stakeholders and the support of external partners, such as the Local Authority, public transport operators, etc.

The WTP will be managed by a Mobility Management Coordinator with the clear mandate to implement and evolve the Plan. The Mobility Management Coordinator will also be best suited to monitor the results of the Plan. This role may for example be performed by a member of the development owner's management team.

Travel surveys of development occupants (and of visitors, if practicable) should be repeated annually, to monitor the initial success of the Plan and to gain a better understanding of travel habits. These survey results can also serve as a sustainable travel performance benchmark to indicate how the WTP is performing in comparison to previous years and against the sustainable travel targets initially outlined in the plan.

7.0 SUMMARY

The proposed development site is located at Heuston South Quarter, St. John's Road West, Kilmainham, Dublin 8. The proposed development site is located in proximity to existing high-quality bus, light rail and rail services that connect it to Dublin city centre. It is therefore an objective under this Workplace Travel Plan that a minimal proportion of the trips generated by this development be made by private car.

7.1 Mobility Management Measures

The following Mobility Management measures are suggested for implementation under the Workplace Travel Plan:

7.1.1 General

- Put in place a formal Workplace Travel Plan.
- Appoint a Mobility Management coordinator.
- Create an Access Map.
- Provide travel information to development occupants, in the form of Sustainable Travel Welcome Packs and a travel hub website.
- Monitor the operation of the plan by development occupants, by carrying out travel surveys; revise and update the plan as required.

7.1.2 Walking and Cycling

- Identify safe walking and cycling routes.
- Provide secure and attractive cycle parking and ancillary facilities for cyclists and pedestrians.

7.1.3 Public Transport

- Provide information on locations of stops, routes, timetables, walking times to main public transport facilities, etc.
- Provide specific advice on multi-modal trip planning.

Appendix A

Sample Baseline Workplace Travel Survey

Mobility Management Plan – Baseline Workplace Travel Survey

1. How do you usually travel TO work?

Select ONE mode only, for the longest part, by distance, of your usual journey to work.

- ☐ Walking
- ☐ Bicycle
- ☐ Bus, minibus or coach
- ☐ LUAS
- ☐ Train or DART
- ☐ Motorcycle or scooter
- ☐ Driving a car
- ☐ Taxi
- ☐ Passenger in a car with driver going to same destination
- ☐ Passenger in a car with driver going to different destination
- ☐ Lorry or van
- ☐ Work mainly at or from home
- ☐ Other means *(please specify below)*

2. What is your main reason for choosing that mode?

- ☐ Cheapest
- ☐ Quickest
- ☐ Environmentally friendly
- ☐ Lack of alternative
- ☐ Less stressful
- ☐ Habit
- ☐ Personal safety
- ☐ Other commitments
- ☐ Reliability
- ☐ Other *(please specify below)*

3. Which modes of travel do you use occasionally to travel to/from work?

Select ALL modes that apply.

- ☐ Walking
- ☐ Bicycle
- ☐ Bus, minibus or coach
- ☐ LUAS
- ☐ Train or DART
- ☐ Motorcycle or scooter
- ☐ Driving a car
- ☐ Taxi
- ☐ Passenger in a car with driver going to same destination
- ☐ Passenger in a car with driver going to different destination
- ☐ Lorry or van
- ☐ Work mainly at or from home
- ☐ Other means *(please specify below)*

4. Which of the following modes of travel would you consider using for your journey to/from work, if they were available (even for some days a week), more convenient, cheaper, or safer?

Select ALL modes that apply.

- ☐ Walking
- ☐ Bicycle
- ☐ Bus, minibus or coach
- ☐ LUAS
- ☐ Train or DART
- ☐ Motorcycle or scooter
- ☐ Driving a car
- ☐ Taxi
- ☐ Passenger in a car with driver going to same destination
- ☐ Passenger in a car with driver going to different destination
- ☐ Lorry or van
- ☐ Work mainly at or from home
- ☐ Other means *(please specify below)*

5. What specific factors constrain your choice of mode of transport and/or prevent you from using the mode(s) selected in Q4?

6. What time do you usually arrive to work?

7. What time do you usually leave work?

8. How far do you travel to work?

9. How long does it take you to get to work?

10. If you drive a car every day what could be done to encourage you to travel by another mode of transport to work (even for some days a week)?

Select all that apply.

- ☐ Tax free public transport tickets
- ☐ Personalised information about other transport options
- ☐ Improved cycle parking, showers and lockers at work
- ☐ Tax-free bike purchase scheme
- ☐ More storage facilities for walkers/cyclists
- ☐ Access to an organisational carshare scheme
- ☐ Priority parking for carsharers
- ☐ Access to a company vehicle for business travel
- ☐ Parking supply restrictions, parking permits or cost changes
- ☐ Other *(please specify below)*

11. Would you be encouraged to walk or cycle (even 1 or 2 days a week) if the following were undertaken in your organisation?

	Yes	No	Don't Know
Shower areas increased/ improved	☐	☐	☐
Lockers provided	☐	☐	☐
Drying room for gear provided	☐	☐	☐
Cycle parking increased	☐	☐	☐
Cycle parking moved closer to entrances	☐	☐	☐
Cycle parking covered and secure	☐	☐	☐
Increased security on site	☐	☐	☐

Other *(please specify)*:

12. Do you usually have a carparking space available to you at work?

- ☐ Always
- ☐ Sometimes
- ☐ Never
- ☐ Don't know

13. Would you be interested in any of the following initiatives to promote walking or cycling?

Select all that apply.

- ☐ Cycle to Work Tax Saver scheme
- ☐ Bicycle maintenance class
- ☐ Cycle training
- ☐ Fleet bikes to trial
- ☐ A cyclist's forum (Bicycle Users Group)
- ☐ Incentive scheme for sustainable commuters
- ☐ Walking route marked out in the local area or on site

14. How many people normally travel in your car TO work?

15. Do you need a car for doing your job through the day?

16. Do you have any other comments on travel to/from work?

Appendix B

Links to relevant Mobility Management guidance documents

Appendix 15 – Useful Links and Resources

Please note that the National Transport is not making recommendations for any of the suppliers listed below, and your organisation will find other suppliers beyond the list given below. The links listed are just to give a flavour of the type of products/ services that are available.

Workplace Travel Plans
- www.smartertravelworkplaces.ie
- www.ways2work.bitc.org.uk

Sustainable Travel
- www.smartertravel.ie
- www.sustrans.org.uk
- www.nationaltransport.ie
- www.dttas.ie
- www.eltis.org
- www.mobilityweek.eu

Getting Active
- www.getirelandactive.ie

Public Transport Information
- www.transportforireland.ie
- www.taxsaver.ie

Cycle to Work Scheme
- www.revenue.ie

Walking challenges
- www.pedometerchallenge.ie
- www.irishheart.ie

Cycling
- www.cyclechallenge.ie
- www.dublinbikes.ie
- www.irishcycling.com

Cycle to Work scheme
- www.revenue.ie
- www.bikescheme.ie

Designing and Planning for Cycling
- www.cyclemanual.ie
- Transport for London Workplace Cycle Parking Guide
- See p16 for technical guidance on space allocations for cycle parking
- http://www.tfl.gov.uk/assets/downloads/businessandpartners/Workplace-Cycle-Parking-Guide.pdf

Walking/ Cycling Routes
- www.mapmyride.com
- www.mapmyrun.com

Car Sharing
- www.carsharing.ie

Misc.
- Copenhagen Cycle Chic - Bikes, style and Copenhagen

APPENDIX 12A

IRISH WATER. CONFIRMATION OF FEASIBILITY

Pre-connection enquiry form

Business developments, mixed use developments, housing developments

This form is to be filled out by applicants enquiring about the feasibility of a water and/or wastewater connection to Irish Water infrastructure. If completing this form by hand, please use BLOCK CAPITALS and black ink.

Please refer to the **Guide to completing the pre-connection enquiry form** on page 13 of this document when completing the form.

*** Denotes mandatory/ required field. Please note, if mandatory fields are not completed the application will be returned.**

Section A | Applicant details

1 *Applicant details:

Registered company name (if applicable):

HPREF HSQ Investments Limited

Trading name (if applicable):

Company registration number (if applicable): 651714

If you are not a registered company/business, please provide the applicant's name:

*Contact name: Pierce O'Leary

*Postal address: 32, Molesworth Street

*Eircode:

*Telephone:

Mobile:

*Email: poleary@hendersonpark.com

2 Agent details (if applicable):

Contact name: OWEN SULLIVAN

Company name (if applicable): CS CONSULTING

Postal address: 19-22 DAME STREET, DUBLIN 2

EMAIL: OWEN.SULLIVAN@CSCONSULTING.IE

Eircode: D02E267

Telephone: 0154808 63

Email: SEE ABOVE

3 ***Please indicate whether it is the applicant or agent who should receive future correspondence in relation to the enquiry:**

Applicant [X] Agent [x]

Section B | Site details

4 ***Site address:** Heuston South Quarter,

Saint John's Road West,

Kilmainham, Dublin 8

5 ***Irish Grid co-ordinates of site:** Eastings (X) 313332 Northings (Y) 234041

Eg. co-ordinates of GPO, O'Connell St., Dublin: E(X) 315,878 N(Y) 234,619

6 ***Local Authority:**

Local Authority that granted planning permission (if applicable):

DUBLIN CITY COUNCIL

7 ***Has full planning permission been granted?** Yes [ ] No [X]

If 'Yes', please provide the current or previous planning reference number:

Section C | Development details

8 **Please outline the domestic and/or industry/business use proposed:**

Property type	Number of units	Property type	Number of units	Property type	Number of units
House		Apartments		Agricultural	
Office	15,128sqm	School		Retail unit	
Residential care home		Institution		Industrial unit	
Hotel	244 beds	Factory		Other	
Other (please specify type)					

9 ***Approximate start date of proposed development:** 0 1 / 0 6 / 2 0 2 2

10 ***Is the development multi-phased?** Yes [ ] No [X]

If 'Yes', application must include a master-plan identifying the development phases and the current phase number.

If 'Yes', please provide details of variations in water demand volumes and wastewater discharge loads due to phasing requirements.

11 ***Please indicate the type of connection required by ticking the appropriate box below:**

Water [ ] Please go to Section D

Wastewater [ ] Please go to Section E

Both [X] Please complete both Sections D and E

Section D | Water connection and demand details

12 ***Is there an existing connection to public water mains at the site?** Yes [X] No [ ]

12.1 If yes, is this enquiry for an additional connection to one already installed? Yes [ ] No [X]

12.2 If yes, is this enquiry to increase the size of an existing connection? Yes [ ] No [X]

13 **Approximate date water connection is required:** [0][1] / [0][6] / [2][0][2][2]

14 ***What diameter of water connection is required to service the development?** [1][5][0] mm

15 ***Is more than one connection required to the public infrastructure to service this development?** Yes [ ] No [X]

If 'Yes', how many? [ ]

16 **Please indicate the business water demand (shops, offices, schools, hotels, restaurants, etc.):**

Post-development peak hour water demand	2.630	**l/s**
Post-development average hour water demand	1.824	**l/s**

Please include calculations on the attached sheet provided. Where there will be a daily/weekly/seasonal variation in the water demand profile, please provide all such details.

17 **Please indicate the industrial water demand (industry-specific water requirements):**

Post-development peak hour water demand	N/A	**l/s**
Post-development average hour water demand	N/A	**l/s**

Please include calculations on the attached sheet provided. Where there will be a daily/weekly/seasonal varia. in the water demand profile, please provide all such details.

18 **What is the existing ground level at the property boundary at connection point (if known) above Malin Head Ordnance Datum?**

[8][.][0][9][ ] m

19 **What is the highest finished floor level of the proposed development above Malin Head Ordnance Datum?**

[5][2][.][0][0] m

20 **Is on-site water storage being provided?** Yes [X] No [ ]

Please include calculations on the attached sheet provided.

21 **Are there fire flow requirements?** Yes ☐ No ☐

Additional fire flow requirements over and above those identified in Q16-17		**l/s**

Please include calculations on the attached sheet provided, and include confirmation of requirements from the Fire Authority.

22 **Do you propose to supplement your potable water supply from other sources?** Yes ☐ No ☒

If 'Yes', please indicate how you propose to supplement your potable water supply from other sources (see **Guide to completing the application form** on page 12 of this document for further details):

Section E | Wastewater connection and discharge details

23 ***Is there an existing connection to a public sewer at the site?** Yes ☒ No ☐

23.1 If yes, is this enquiry for an additional connection to the one already installed? Yes ☐ No ☒

23.2 If yes, is this enquiry to increase the size of an existing connection? Yes ☐ No ☒

24 ***Approximate date that wastewater connection is required:** 0 1 / 0 6 / 2 0 2 2

25 ***What diameter of wastewater connection is required to service the development?** 2 2 5 mm

26 ***Is more than one connection required to the public infrastructure to service this development?** Yes ☐ No ☒

If 'Yes', how many? ☐☐

27 **Please indicate the commercial wastewater hydraulic load (shops, offices, schools, hotels, restaurants, etc.):**

Post-development peak discharge	10.5	**l/s**
Post-development average discharge	2.107	**l/s**

Please include calculations on the attached sheet provided.

28 **Please indicate the industrial wastewater hydraulic load (industry-specific discharge requirements):**

Post-development peak discharge	N/A	**l/s**
Post-development average discharge	N/A	**l/s**

Please include calculations on the attached sheet provided.

29 Wastewater organic load:

Characteristic	Max concentration (mg/l)	Average concentration (mg/l)	Maximum daily load (kg/day)
Biochemical oxygen demand (BOD)			
Chemical oxygen demand (COD)			
Suspended solids (SS)			
Total nitrogen (N)			
Total phosphorus (P)			
Other			

Temperature range	
pH range	

30 *Storm water run-off will only be accepted from brownfield sites that already have a storm/surface water connection to a combined sewer. In the case of such brownfield sites, please indicate if the development intends discharging surface water to the combined wastewater collection system:

Yes [ ] No [X]

If 'Yes', please give reason for discharge and comment on adequacy of SUDS/attenuation measures proposed.

31 *Do you propose to pump the wastewater? Yes [ ] No [ ]

If 'Yes', please include justification for your pumped solution with this application.

32 What is the existing ground level at the property boundary at connection point (if known) above Malin Head Ordnance Datum?

6.65 m

33 What is the lowest finished floor level on site above Malin Head Ordnance Datum? 2.42 m

34 What is the proposed invert level of the pipe exiting the property to the public road?

5.889 m

Section F | Supporting documentation

:ase provide the following additional information (all mandatory):

> Site location map: A site location map to a scale of 1:1000, which clearly identifies the land or structure to which the enquiry relates. The map shall include the following details: [X]

i. The scale shall be clearly indicated on the map.

ii. The boundaries shall be delineated in red.

iii. The site co-ordinates shall be marked on the site location map.

> Details of planning and development exemptions (if applicable). [ ]

> Calculations (calculation sheets provided below). [X]

> Site layout map to a scale of 1:500 showing layout of proposed development, water network and wastewater network layouts, additional water/wastewater infrastructure if proposed, connection points to Irish Water infrastructure. [ ]

> Conceptual design of the connection asset from the proposed development to the existing Irish Water infrastructure, including service conflicts, gradients, pipe sizes and invert levels. [ ]

> Any other information that might help Irish Water assess this pre-connection enquiry. [X]

Section G | Declaration

I/We hereby make this application to Irish Water for a water and/or wastewater connection as detailed on this form.

I/We understand that any alterations made to this application must be declared to Irish Water.

The details that I/we have given with this application are accurate.

I/We have enclosed all the necessary supporting documentation.

Any personal data you provide will be stored and processed by Irish Water and may be transferred to third parties for the purposes of the water and/or wastewater connection process. I hereby give consent to Irish Water to store and process my personal data and to transfer my personal data to third parties, if required, for the purposes of the connection process.

you wish to revoke consent at any time or wish to see Irish Water's full Data Protection Notice, please see **https://www.water.ie/privacy-notice/**

Signature: Verified by pdfFiller Owen Sullivan 10/28/2021

Date: 28 / 10 / 2021

Your full name (in BLOCK CAPITALS):

O	W	E	N		S	U	L	L	I	V	A	N																	

Irish Water will carry out a formal assessment based on the information provided on this form.
Any future connection offer made by Irish Water will be based on the information that has been provided here.

Please submit the completed form to **newconnections@water.ie** or alternatively, post to:

Irish Water
) Box 860
.uth City Delivery Office
Cork City

Please note that if you are sending us your application form and any associated documentation by email, the maximum file size that we can receive in any one email is 35MB.

Please note, if mandatory fields are not completed the application will be returned.

Irish Water is subject to the provisions of the Freedom of Information Act 2014 ("FOIA") and the codes of practice issued under FOIA as may be amended, updated or replaced from time to time. The FOIA enables members of the public to obtain access to records held by public bodies subject to certain exemptions such as where the requested records may not be released, for example to protect another individual's privacy rights or to protect commercially sensitive information. Please clearly label any document or part thereof which contains commercially sensitive information. Irish Water accepts no responsibility for any loss or damage arising as a result of its processing of freedom of information requests.

Calculations

Water demand

FOUL WASTEWATER DISCHARGE CALCULATIONS

IW-CDS-5030-03 (Revision 2 – 2020)

Flow Rate	60	l/person/day
Infiltration Rate	10%	
sq.m/person	7.5	
Peaking Factor (Average)	1.5	times
Peaking Factor (pipe network)	4.5	times
Office Space	**15128**	sq.m

Wastewater Discharge = Dwelling x Dry weather flows

No. Person	2017	unit
Dry weather flows	60	l/person/day
Wastewater Discharge	**121.02**	**m3/day**
Wastewater Discharge	**121024**	**l/day**

1 day	86400	s
Water Demand	1.401	l/s

Peak Discharge = Wastewater Discharge x Peaking Factor

Peak Discharge	**6.303**	**l/s**
Average Discharge	**1.401**	**l/s**

WATER DEMAND CALCULATIONS

According to Code of Practice for Water Infrastructure, Water Demand Calculations:

Consumption rate	150	l/person/day
Bedrooms		
Peaking Factor (Average)	1.25	times
Peaking Factor (pipe network)	5	times

Water Demand = Dwelling x Persons per Dwelling x Consumption Rate

Bedrooms	244	unit
Consumption Rate	150	l/person/day
Water Demand	**36.60**	**m3/day**
Water Demand	**36600**	**l/day**

1 day	86400	s
Water Demand	0.424	l/s

Peak Water Demand = Water Demand Average x Peaking Factor

Peak Water Demand	0.530	l/s
Peak Water Demand - Pipe Network	**2.118**	**l/s**
Average Water Demand	**0.424**	**l/s**

On-site storage

Hotel – 60,000litres based on 227litres/apt

Office – 64,000litres based on 40litres/person (current 11-storey scheme)

Fire flow requirements

FOUL WASTEWATER DISCHARGE CALCULATIONS
IW-CDS-5030-03 (Revision 2 – 2020)

Flow Rate	60	l/person/day
Infiltration Rate	10%	
sq.m/person	7.5	
Peaking Factor (Average)	1.5	times
Peaking Factor (pipe network)	4.5	times
Office Space	**15128**	sq.m

Wastewater Discharge = Dwelling x Dry weather flows

No. Person	2017	unit
Dry weather flows	60	l/person/day
Wastewater Discharge	**121.02**	**m3/day**
Wastewater Discharge	**121024**	**l/day**

1 day	86400	s
Water Demand	1.401	l/s

Peak Discharge = Wastewater Discharge x Peaking Factor

Peak Discharge	**6.303**	**l/s**
Average Discharge	**1.401**	**l/s**

FOUL WASTEWATER DISCHARGE CALCULATIONS
IW-CDS-5030-03 (Revision 2 – 2020)

Flow Rate	60	l/person/day
Ìnfiltration Rate	10%	
sq.m/person	7.5	
Peaking Factor (Average)	1.5	times
Peaking Factor (pipe network)	4.5	times
Office Space	**15128**	sq.m

Wastewater Discharge = Dwelling x Dry weather flows

No. Person	2017	unit
Dry weather flows	60	l/person/day
Wastewater Discharge	**121.02**	**m3/day**
Wastewater Discharge	**121024**	**l/day**

1 day	86400	s
Water Demand	1.401	l/s

Peak Discharge = Wastewater Discharge x Peaking Factor

Peak Discharge	**6.303**	**l/s**
Average Discharge	**1.401**	**l/s**

Guide to completing the pre-connection enquiry form

This form should be completed by applicants enquiring about the feasibility of a water and/or wastewater connection to Irish Water infrastructure.

The Irish Water Codes of Practice are available at **www.water.ie** for reference.

Section A | Applicant Details

Question 1: This question requires the applicant or company enquiring about the feasibility of a connection to identify themselves, their postal address, and to provide their contact details.

Question 2: If the applicant has employed a consulting engineer or an agent to manage the enquiry on their behalf, the agent's address and contact details should be recorded here.

Question 3: Please indicate whether it is the applicant or the agent who should receive future correspondence in relation to the enquiry.

Section B | Site details

Question 4: This is the address of the site requiring the water/wastewater service connection and for which this enquiry is being made.

Question 5: Please provide the Irish Grid co-ordinates of the proposed site. Irish grid positions on maps are expressed in two dimensions as Eastings (E or X) and Northings (N or Y) relative to an origin. You will find these coordinates on your Ordnance Survey map which is required to be submitted with an application.

Question 6: Please identify the Local Authority that is or will be dealing with your planning application, for example Cork City Council.

Question 7: Please indicate if planning permission has been granted for this application, and if so, please provide the planning permission reference number.

Section C | Development details

Question 8: Please specify the number of different property/premises types by filling in the tables provided.

Question 9: Please indicate the approximate commencement date of works on the development.

Question 10: Please indicate if a phased building approach is to be adopted when developing the site. If so, please provide details of the phase master-plan and the proposed variation in water demand/wastewater discharge as a result of the phasing of the development.

Question 11: Please indicate the type of connection required by ticking the appropriate box and proceed to complete the appropriate section or sections.

Section D | Water connection and demand details

Question 12: Please indicate if a water connection already exists for this site.

Question 12.1: Please indicate if this enquiry concerns an additional connection to one already installed on the site.

Question 12.2: Please indicate if you are proposing to upgrade the water connection to facilitate an increase in water demand. Irish Water will determine what impact this will have on our infrastructure.

Question 13: Please indicate the approximate date that the proposed connection to the water infrastructure will be required.

Question 14: Please indicate what diameter of water connection is required to service this development.

Question 15: Please indicate if more than one connection is required to service this development. Please note that the connection size provided may be used to determine the connection charge.

Question 16: If this connection enquiry concerns a business premises, please provide calculations for the water demand and include your calculations on the calculation sheet provided. Business premises include shops, offices, hotels, schools, etc. Demand rates (peak and average) are site specific. Average demand is the total daily volume divided by a 24-hour time period and expressed in litres per second (l/s). For design purposes, please refer to the Irish Water Codes of Practice for Water Infrastructure.

Question 17: If this connection enquiry is for an industrial premises, please calculate the water demand and include your calculations on the calculation sheet provided. Demand rates (peak and average) are site specific. Average demand is the total daily volume divided by a 24-hour time period and expressed in litres per second (l/s). The peak demand for sizing of the pipe network will be as per the specific business production requirements. For design purposes, please refer to the Irish Water Codes of Practice for Water Infrastructure.

Question 18: Please specify the ground level at the location where connection to the public water mains will be made. This is required in order to determine if there is sufficient pressure in the existing water infrastructure to serve your proposed development. Levels should be quoted in metres relative to Malin Head Ordnance Datum.

Question 19: Please specify the highest finished floor level on site. This is required in order to determine if there is sufficient pressure in the existing water infrastructure to serve your proposed development. Levels should be quoted in metres relative to Malin Head Ordnance Datum.

Question 20: If storage is required, water storage capacity of 24-hour water demand must usually be provided at the proposed site. In some cases, 24-hour storage capacity may not be required, for example 24-hour storage for a domestic house would be provided in an attic storage tank. Please calculate the 24-hour water storage requirements and include your calculations on the attached sheet provided. Please also confirm that on-site storage is being provided by ticking the appropriate box.

Question 21: The water supply system shall be designed and constructed to reliably convey the water flows that are required of the development including fire flow requirements by the Fire Authority. The Fire Authority will provide the requirement for fire flow rates that the water supply system will have to carry. Please note that while flows in excess of your required demand may be achieved in the Irish Water network and could be utilised in the event of a fire, Irish Water cannot guarantee a flow rate to meet your fire flow requirement. To guarantee a flow to meet the Fire Authority requirements, you should provide adequate fire storage capacity within your development. Please include your calculations on the attached sheet provided, and further provide confirmation of the Fire Authority requirements.

Question 22: Please identify proposed additional water supply sources, that is, do you intend to connect to the public water mains or the public mains and supplement from other sources? If supplementing public water supply with a supply from another source, please provide details as to how the potable water supply is to be protected from cross contamination at the premises.

Section E | Wastewater connection and discharge details

Question 23: Please indicate if a wastewater connection to a public sewer already exists for this site.

Question 23.1: Please indicate if this enquiry relates to an additional wastewater connection to one already installed.

Question 23.2: Please indicate if you are proposing to upgrade the wastewater connection to facilitate an increased discharge. Irish Water will determine what impact this will have on our infrastructure.

Question 24: Please specify the approximate date that the proposed connection to the wastewater infrastructure will be required.

Question 25: Please indicate what diameter of wastewater connection is required to service this development.

Question 26: Please indicate if more than one connection is required to service this development. Please indicate number required.

Question 27: If this enquiry relates to a business premises, please provide calculations for the wastewater discharge and include your calculations on the attached sheet provided. Business premises include shops, offices, hotels, schools, etc. Discharge rates (peak and average) are site specific. Average discharge is the total daily volume divided by a 24-hour time period and expressed in litres per second (l/s). For design purposes, please refer to the Irish Water Codes of Practice for Wastewater Infrastructure.

Question 28: If this enquiry relates to an industrial premises, please provide calculations for the wastewater discharge and include your calculations on the calculation sheet provided. Discharge rates (peak and average) are site specific. Average discharge is the total daily volume divided by a 24-hour time period and expressed in litres per second (l/s). The peak discharge for sizing of the pipe network will be as per the specific business production requirements. For design purposes, please refer to the Irish Water Codes of Practice for Wastewater Infrastructure.

Question 29: Please specify the maximum and average concentrations and the maximum daily load of each of the wastewater characteristics listed in the wastewater organic load table (if not domestic effluent), and also specify if any other significant concentrations are expected in the effluent. Please complete the table and provide additional supporting documentation if relevant. Note that the concentration shall be in mg/l and the load shall be in kg/day. Note that for business premises (shops, offices, schools, hotels, etc.) for which only domestic effluent will be discharged (excluding discharge from canteens/ restaurants which would require a Trade Effluent Discharge licence), there is no need to complete this question.

Question 30: In exceptional circumstances, such as brownfield sites, where the only practical outlet for storm/ surface water is to a combined sewer, Irish Water will consider permitting a restricted attenuated flow to the combined sewer. Storm/surface water will only be accepted from brownfield sites that already have a storm/surface water connection to a combined sewer and the applicant must demonstrate how the storm/surface water flow from the proposed site is minimised using sustainable urban drainage system (SUDS). This type of connection will only be considered on a case by case basis. Please advise if the proposed development intends discharging surface water to the combined wastewater collection system.

Question 31: Please specify if the development needs to pump its wastewater discharge to gain access to Irish Water infrastructure.

Question 32: Please specify the ground level at the location where connection to the public sewer will be made. This is required to determine if the development can be connected to the public sewer via gravity discharge. Levels should be quoted in metres relative to Malin Head Ordnance Datum.

Question 33: Please specify the lowest floor level of the proposed development. This is required in order to determine if the development can be connected to the public sewer via gravity discharge. Levels should be quoted in metres relative to Malin Head Ordnance Datum.

Question 34: Please specify the proposed invert level of the pipe exiting the property to the public road.

Section F | Supporting documentation

Please provide additional information as listed.

Section G | Declaration

Please review the declaration, sign, and return the completed application form to Irish Water by email or by post using the contact details provided in Section G.

LEGEND:

SITE BOUNDARY

SITE LOCATION.
SCALE 1:500

DCC PLAN NO: 4610/22
RECEIVED: 04/08/2022

H087

INFORMATION ONLY

THIS DRAWING HAS BEEN ISSUED FOR INFORMATION PURPOSES ONLY AND MUST NOT BE USED FOR CONSTRUCTION UNDER ANY CIRCUMSTANCES

NOTES
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2. This drawing to be read in conjunction with all other Architectural and Engineering drawings and all other relevant drawings and Specifications.
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Rev. No.	Date	REVISION NOTE	Dn. By	Chkd. By

Architect	Reddy Architecture
Project	HSQ COMMERCIAL SITE DEVELOPMENT.
Title	SITE LOCATION
Dwg. No	HSQ-CSC-XX-XX-SK-C-0012

Date	Drn by	Chkd by	Aprvd by	Scale	Revision
OCT 2021	JS	OS	OS	1:1000 @ A1	

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e: info@csconsulting.ie
w: www.csconsulting.ie

NSAI Certified
Quality I.S. EN ISO 9001:2008
Environment I.S. EN ISO 14001:2004
Energy I.S. EN ISO 50001:2011
Health & Safety OHSAS 18001:2007

Notes

Notes

Owen Sullivan

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Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448,
South City
Delivery Office,
Cork City.

www.water.ie

14 December 2021

Re: CDS21007755 pre-connection enquiry - Subject to contract | Contract denied

Connection for Multi/Mixed Use Development of 2 unit(s) at Heuston South Quarter, Saint Johns Road West, Co Dublin

Dear Sir/Madam,

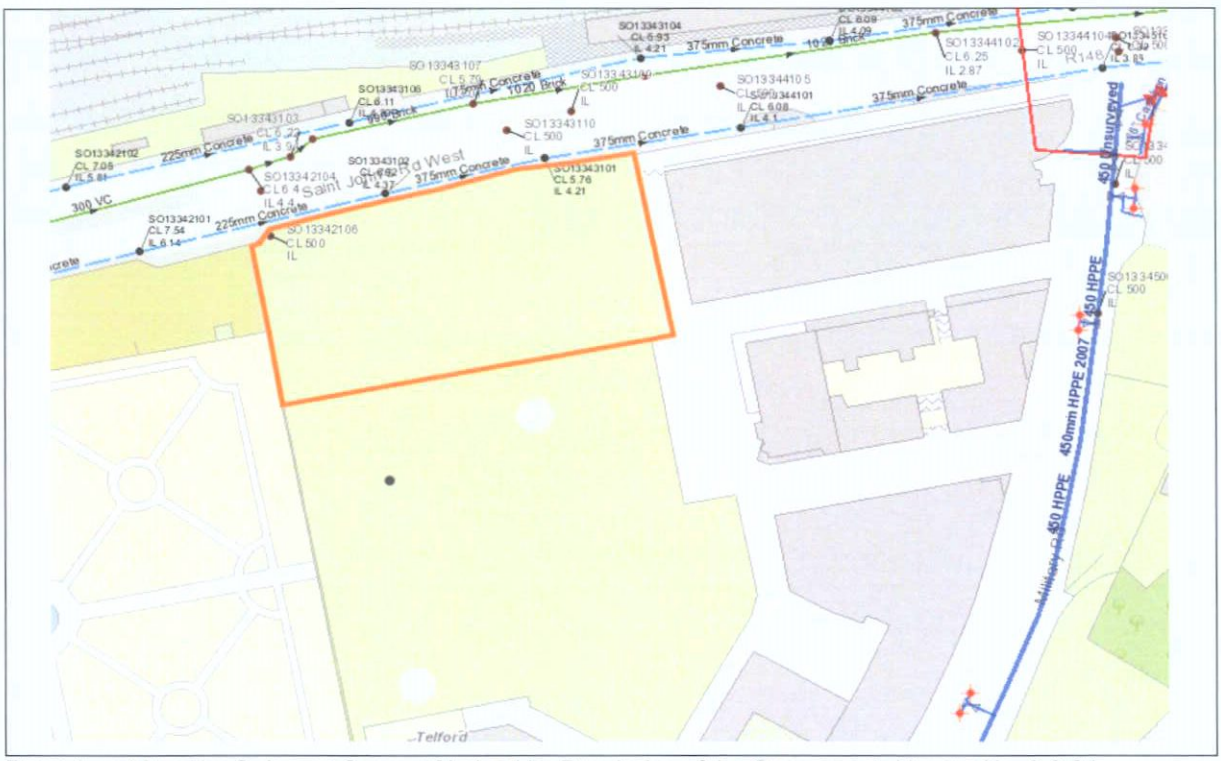
Irish Water has reviewed your pre-connection enquiry in relation to a Water & Wastewater connection at Heuston South Quarter, Saint Johns Road West, Co Dublin (the **Premises**). Based upon the details you have provided with your pre-connection enquiry and on our desk top analysis of the capacity currently available in the Irish Water network(s) as assessed by Irish Water, we wish to advise you that your proposed connection to the Irish Water network(s) can be facilitated at this moment in time.

SERVICE	OUTCOME OF PRE-CONNECTION ENQUIRY THIS IS NOT A CONNECTION OFFER. YOU MUST APPLY FOR A CONNECTION(S) TO THE IRISH WATER NETWORK(S) IF YOU WISH TO PROCEED.
Water Connection	Feasible without infrastructure upgrade by Irish Water
Wastewater Connection	Feasible without infrastructure upgrade by Irish Water
SITE SPECIFIC COMMENTS	
Water Connection	This Confirmation of Feasibility to connect to the Irish Water infrastructure also does not extend to your fire flow requirements. Please note that Irish Water can not guarantee a flow rate to meet fire flow requirements and in order to guarantee a flow to meet the Fire Authority requirements, you should provide adequate fire storage capacity within your development. Please be advised that at connection application stage you have to provide written confirmation from the owner of the private water infrastructure that you have received legal permission to connect to and that the infrastructure has capacity and integrity to cater for the additional load from the Development.

Wastewater Connection	Separate storm and foul water connection services have to be provided for the Development. The surface and storm water from the site must be discharged only into an existing storm water network that does not discharge to an IW combined/foul sewer. The connection arrangement should be agreed with the Local Authority Drainage Division.

The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this development shall comply with the Irish Water Connections and Developer Services Standard Details and Codes of Practice that are available on the Irish Water website. Irish Water reserves the right to supplement these requirements with Codes of Practice and these will be issued with the connection agreement.

The map included below outlines the current Irish Water infrastructure adjacent to your site:



Reproduced from the Ordnance Survey of Ireland by Permission of the Government. License No. 3-3-34

Whilst every care has been taken in its compilation Irish Water gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available information provided by each Local Authority in Ireland to Irish Water. Irish Water can assume no responsibility for and give no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided and does not accept any liability whatsoever arising from any errors or omissions. This information should not be relied upon in the event of excavations or any other works being carried out in the vicinity of the Irish Water underground network. The onus is on the parties carrying out excavations or any other works to ensure the exact location of the Irish Water underground network is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

General Notes:

1) The initial assessment referred to above is carried out taking into account water demand and wastewater discharge volumes and infrastructure details on the date of the assessment. **The availability of capacity may change at any date after this assessment.**
2) This feedback does not constitute a contract in whole or in part to provide a connection to any Irish Water infrastructure. All feasibility assessments are subject to the constraints of the Irish Water Capital Investment Plan.
3) The feedback provided is subject to a Connection Agreement/contract being signed at a later date.
4) A Connection Agreement will be required to commencing the connection works associated with the enquiry this can be applied for at https://www.water.ie/connections/get-connected/
5) A Connection Agreement cannot be issued until all statutory approvals are successfully in place.
6) Irish Water Connection Policy/ Charges can be found at https://www.water.ie/connections/information/connection-charges/
7) Please note the Confirmation of Feasibility does not extend to your fire flow requirements.
8) Irish Water is not responsible for the management or disposal of storm water or ground waters. You are advised to contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges
9) To access Irish Water Maps email datarequests@water.ie
10) All works to the Irish Water infrastructure, including works in the Public Space, shall have to be carried out by Irish Water.

If you have any further questions, please contact Kevin McManmon from the design team at kmcmanmon@water.ie For further information, visit **www.water.ie/connections.**

Yours sincerely,

Yvonne Harris

Yvonne Harris

Head of Customer Operations

APPENDIX 13A

EXCAVATION REPORT

APPENDIX 13.A. DETAILS OF PREVIOUS EXCAVATION AT THE SUBJECT SITE

Figure 13.1. Site location prior to redevelopment, 2000.

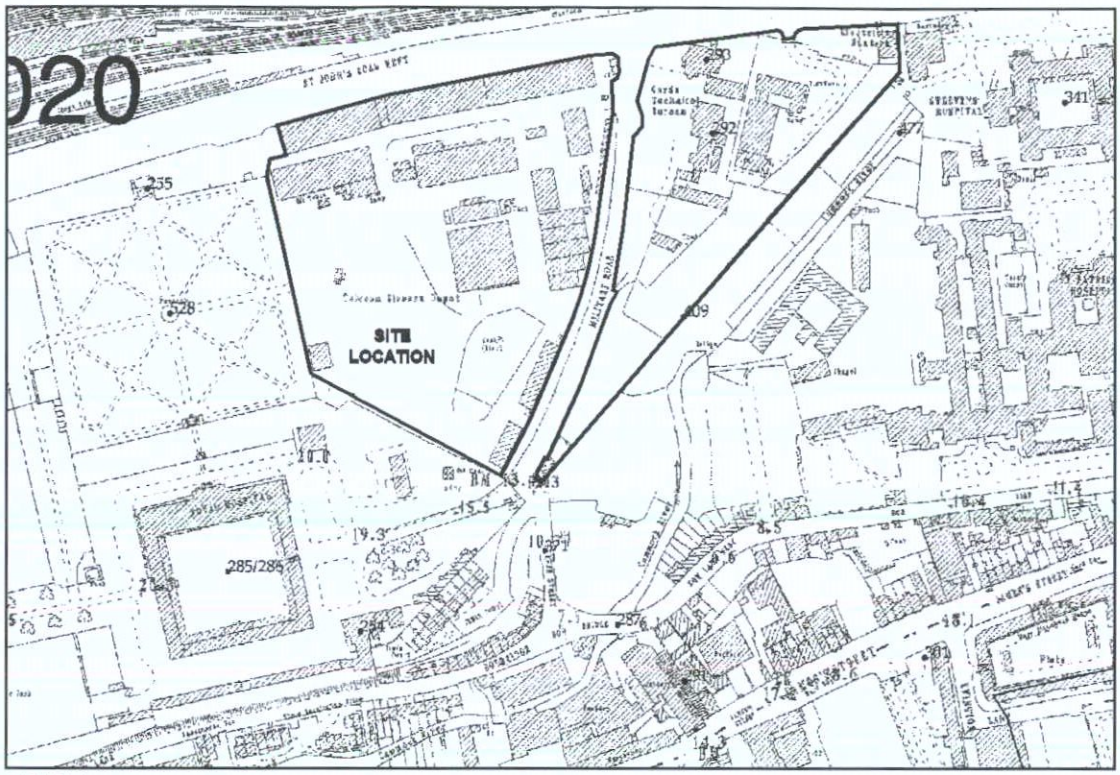


FIGURE 1

Figure 13.2. Main features uncovered, overlaid on Rocque 1756.

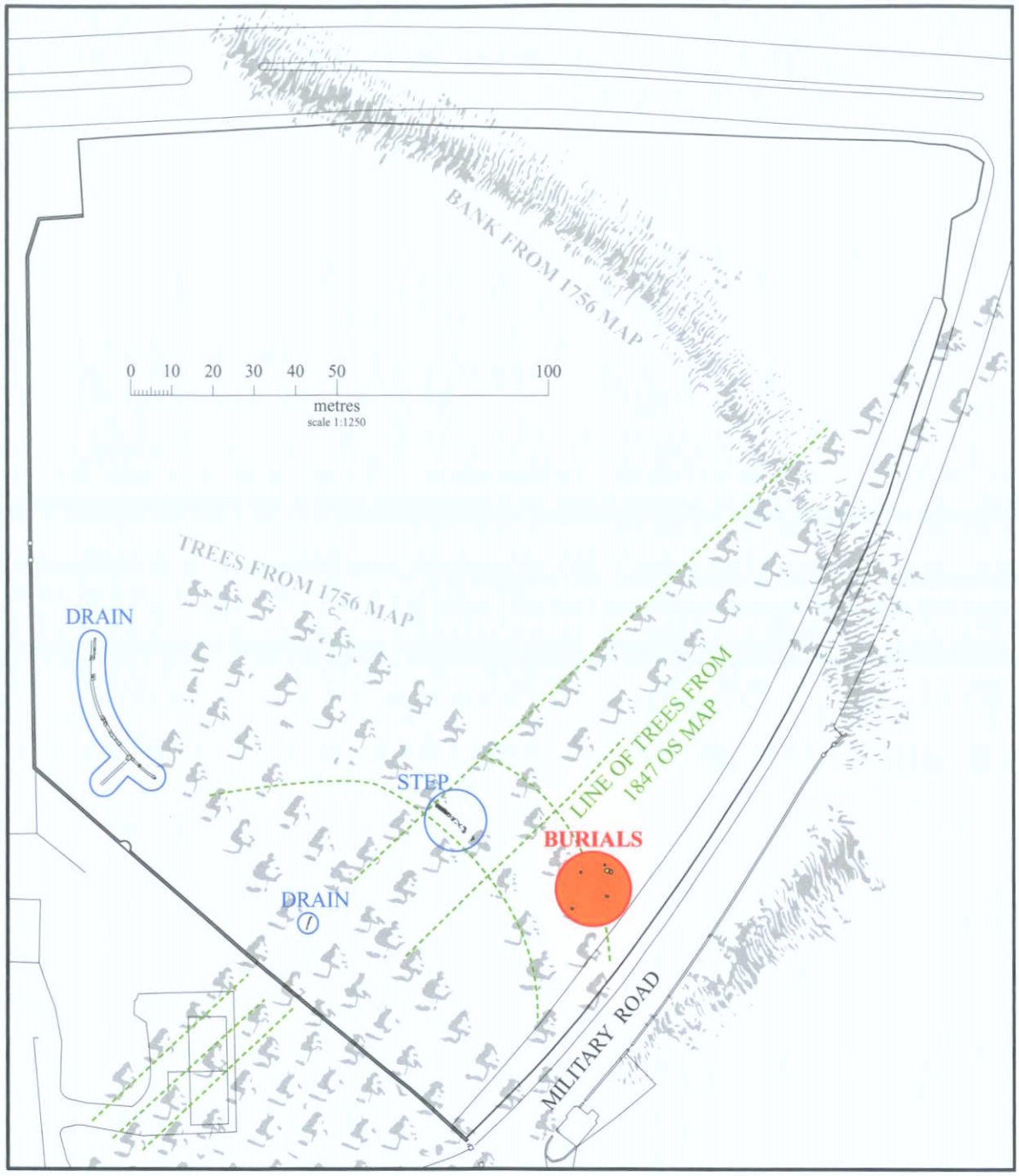


Figure 13.3. Food vessel.

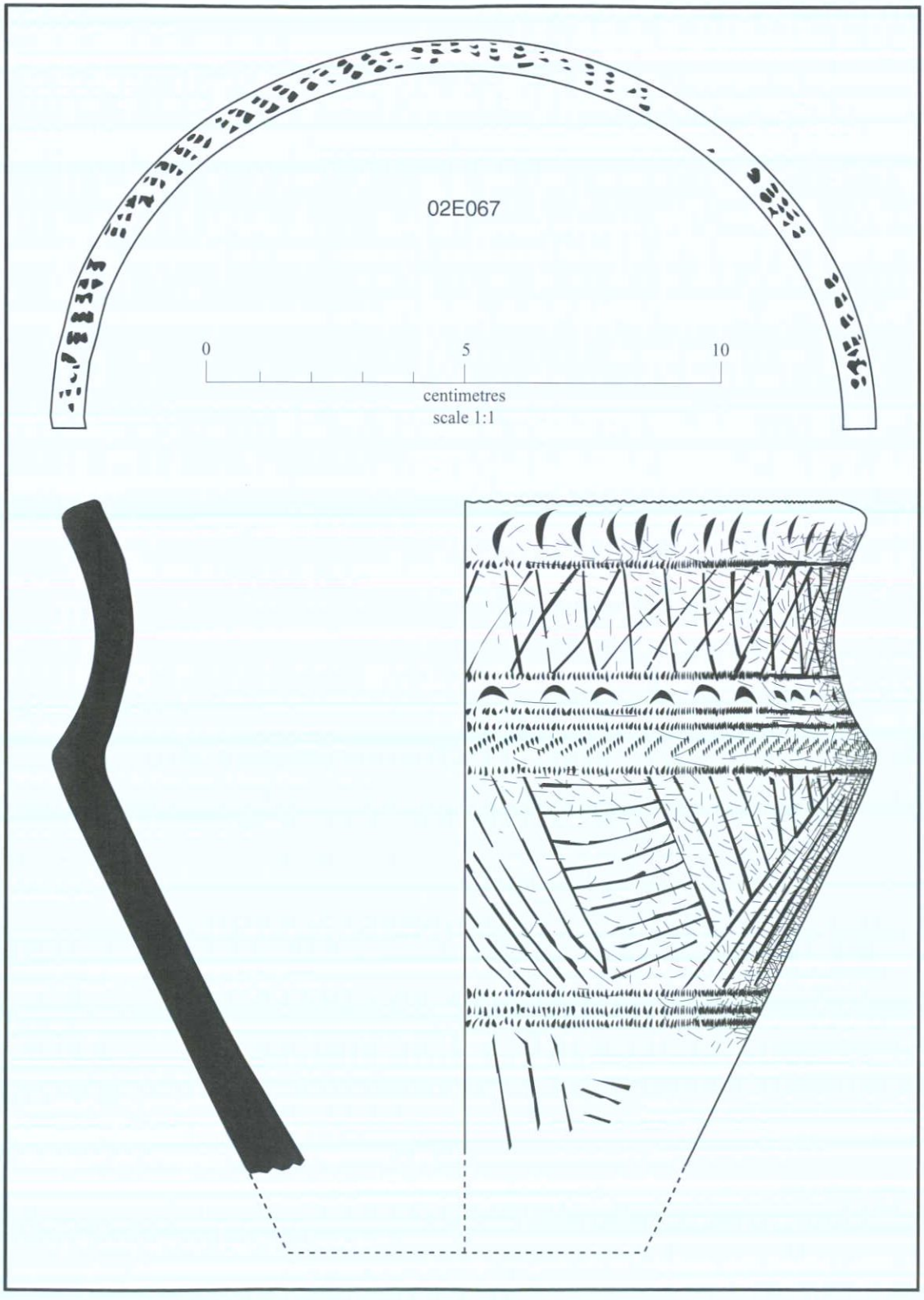


Figure 13.4. Pygmy cups and beads.

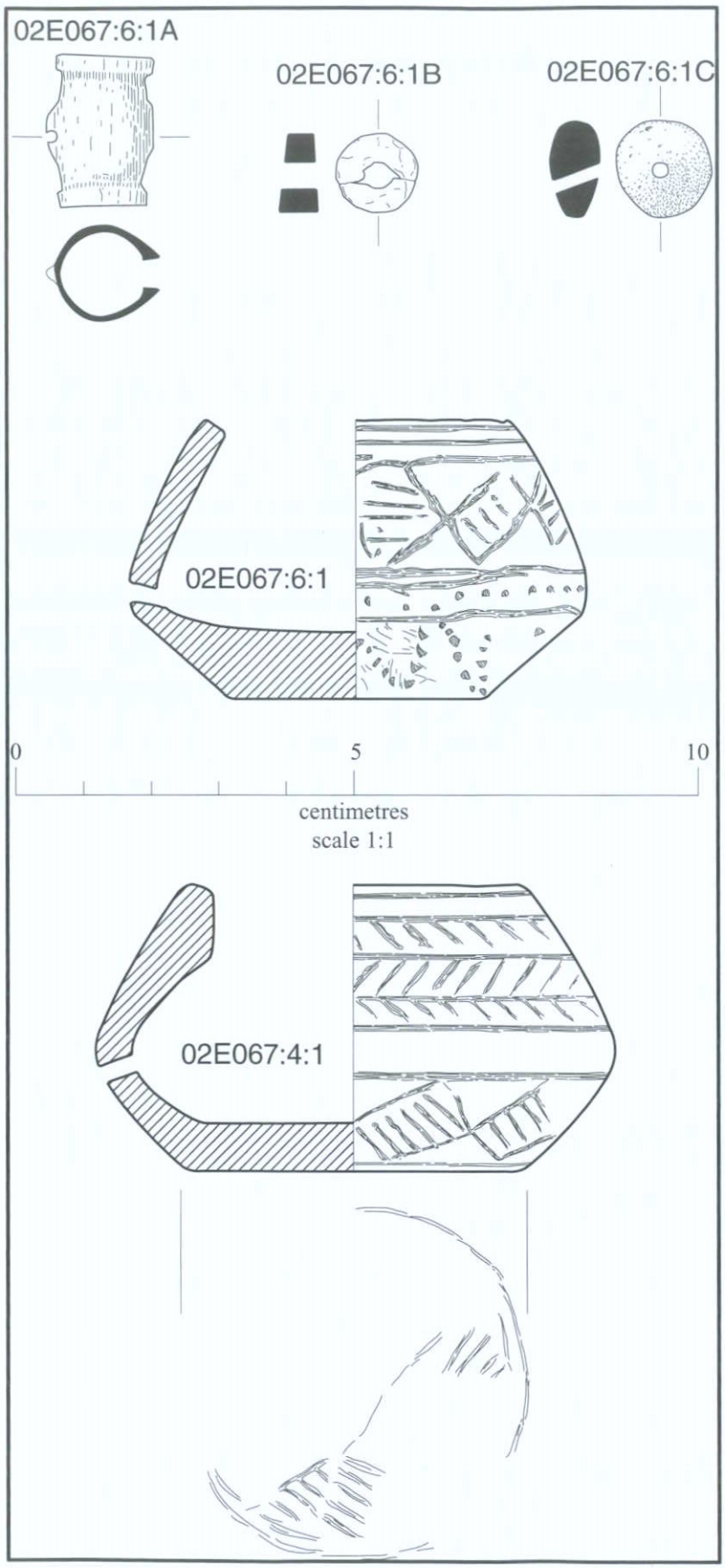


Plate 13.1. Food vessel in pit, test trenching 2002.

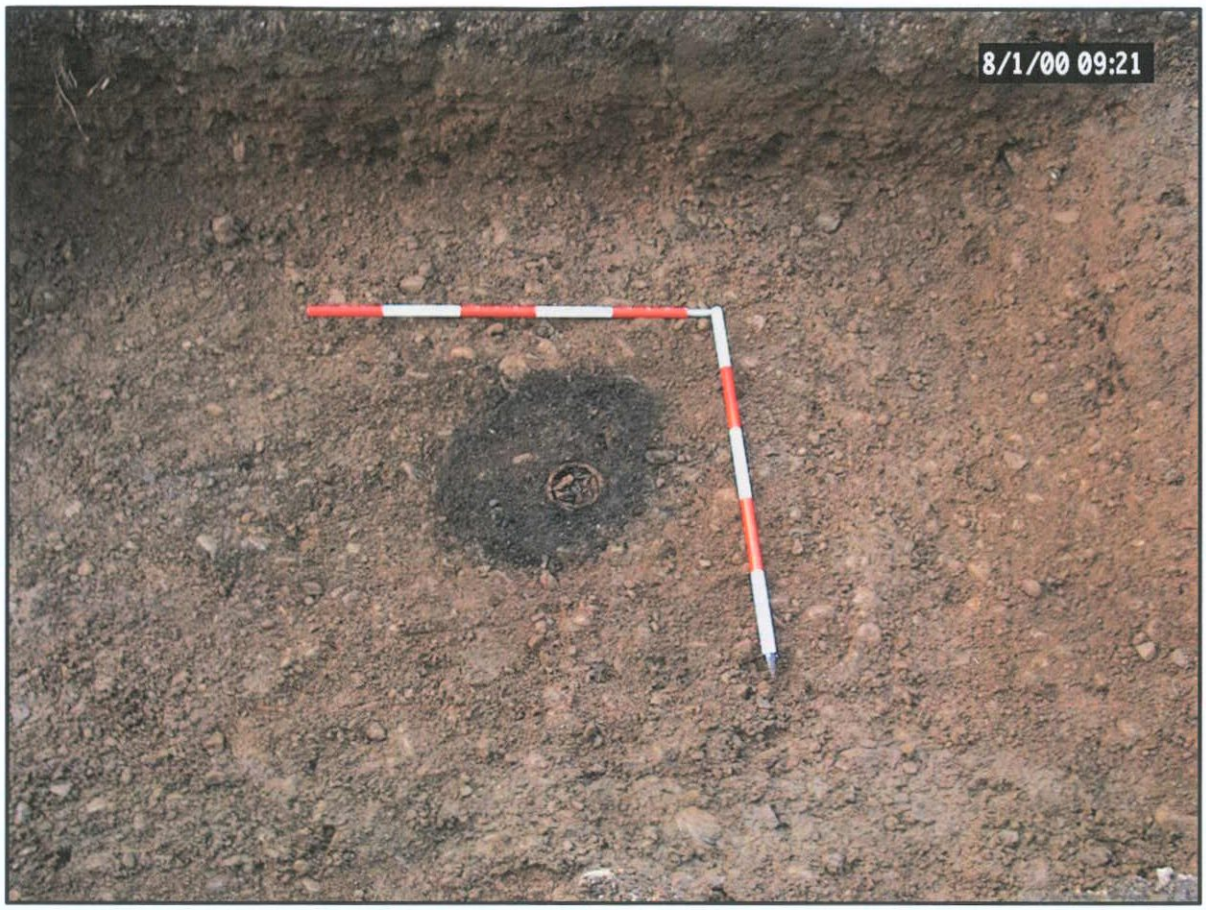
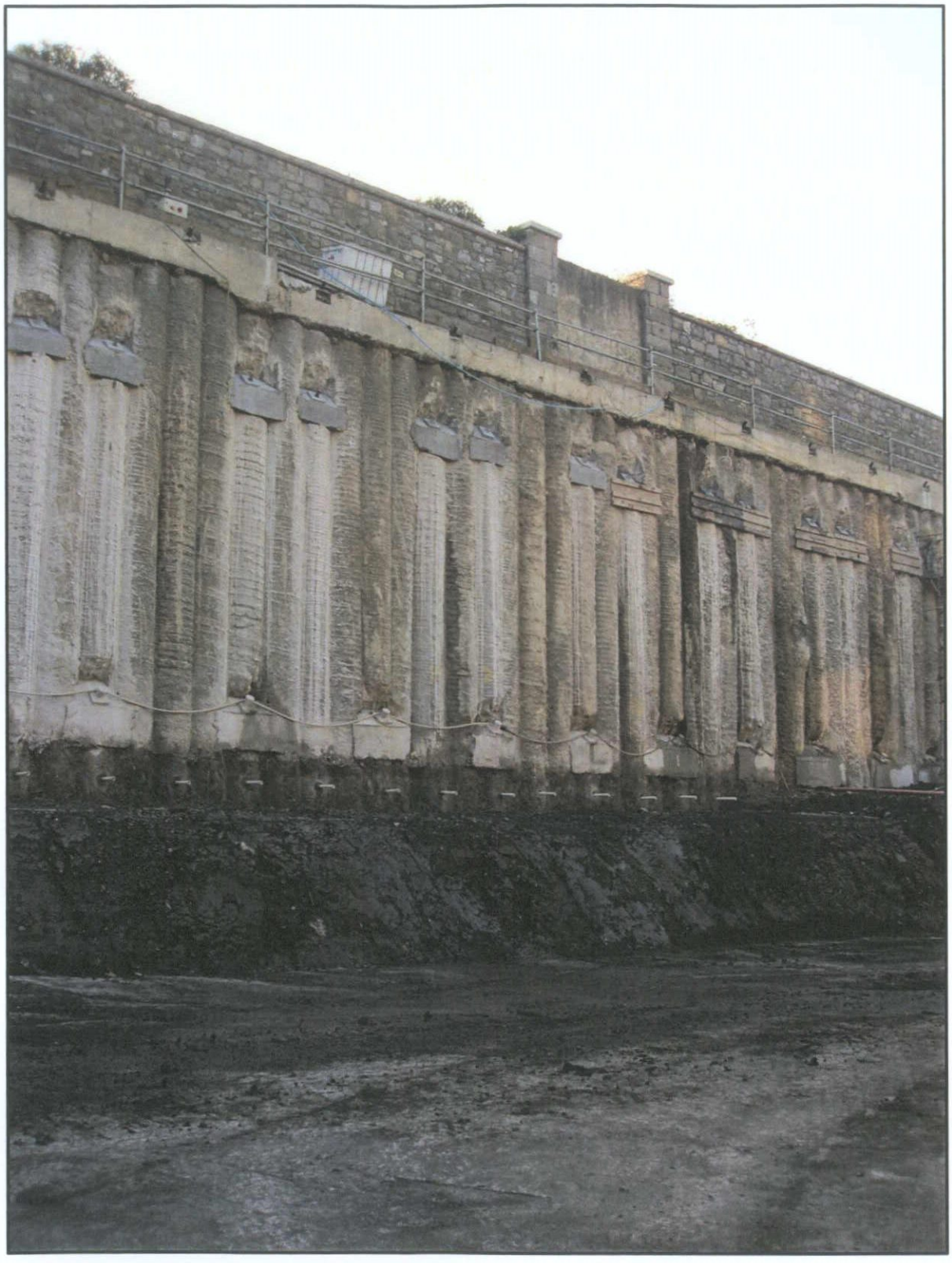


Plate 13.2. West boundary wall of secant piles, wall of garden, 2005.



13.A.1 Introduction

This report describes the results of archaeological excavation and monitoring of a large development site at St John's Road West/ Military Road, Kilmainham, Dublin 8. The report incorporates the outline specialist reports on the site.

The report has been updated from earlier reports to accompany an EIAR report for full redevelopment of sections of the larger site which currently remain undeveloped. These sections for redevelopment have a full basement and have been landscaped. The creation of the basement, following monitoring and excavation as required, has removed all earlier deposits on the site, including archaeological soils.

The writer was engaged by the initial site owners, Eircom and OPW, to prepare a Cultural Heritage Section of an EIS for development of the site in 2002. This was compiled, and associated test excavation was carried out under licence 02E067 from National Monuments service, Department of Arts, Heritage and the Gaeltacht. During the test excavation, a food vessel burial with cremated bone, of the early Bronze age was uncovered and excavated.

13.A.2 Layout of the report

The report consists of a description of the archaeological features on the site.

Specialist reports compiled by Laureen Buckley, Penny Johnson, and Lorna O' Donnell, are included, as is the Carbon 14 dating of human bone from the initial food vessel burial.

Acknowledgements: sincere thanks to conservator Susannah Kelly, who supervised the lifting of the food vessel, and undertook conservation on it and subsequent finds; the plans and drawings are the work of Conor McHale.

13.A.3 Site description

The site was until c. 2002 in use as an Eircom depot, and was then occupied by modern concrete industrial buildings at the northern end, and open fenced enclosures and metal fabricated structures. The site has frontage to Military Rd and St John's Road West, and bounds the walled garden of the early 18th century formal garden of the Royal Hospital, Kilmainham. The original ground level slopes quite steeply northwards and less so eastwards, reflecting the geological influences of the Liffey and Camac rivers.

13.A.4 Test trenches in 2002: the food vessel burial F6

Detailed results of the test excavation in 2002 are not included, as little or no archaeological finds were uncovered, apart from F6 food vessel burial uncovered in Trench 9. Hardcore/ gravel overlay c. 0.80m of mixed disturbed soil of recent date over the entire trench. At the north end of the trench, the vase burial was uncovered, in its' original pit dug into the subsoil.

Trench 9 also clipped the southern edge of a 19th century quarry pit where subsoil was reached at a depth of over 3.5m below present ground level. The fill of the quarry was fairly loose soil, with lenses of brick and mortar throughout. Excavation of Trench 10 which overlay the central part of the quarry was halted due to the excessive depth of deposits, coupled with the presence of services. The quarry fills also extended into the southern part of trench 11.

13.A.4B The vase burial

The location of the burial was at the northern end of trench 9. The vessel had been placed in an unprotected pit, F6, which measured 590mm east/ west by 500mm north/ south, and only c. 300mm deep. There was no remaining evidence for a covering cist or mound.

The vessel was set into the north- eastern part of the pit, and was slightly angled to the west. Large fragments of cremated bone were evident in the fill of the pit, but most were contained within the inverted vessel. The fill of the pit was a heavily charcoal stained silt. The top of the pit was a mere 1.08m below present ground level, which is at approximately 10.80MOD at this point, and the machine which was excavating the trial trench had extended c. 0.20m into subsoil.

The cremation pit was excavated on 5.2.02 in a manner which allowed the vessel to be removed in one piece by a conservator. It was encased in Plaster of Paris in situ, blocked lifted, and was cleaned and stabilised under laboratory conditions.

A full report on the pit contents has been prepared by osteologist Laureen Buckley. The cremation pit and vessel contained the remains of an adult male. No other artefacts were present. A sample of the bone, submitted to Q.U.B. for preparation and thence to Oxford for an accelerator date, returned a C14 date of cal BC 2034 (1928) 1785 @ two sigma.

Identification of the seed remains in the cremation material by paleobotanist Penny Johnson did not identify any anomalous material which could be said to be part of the burial ritual. However, identification of the charcoal remains within the pit by Lorna O' Donnell showed that the wood used in the pyre was primarily oak, a finding that is paralleled in many other cremation contents.

13.A.5A Monitoring and excavation, 2005

Construction and site clearance was constantly monitored by the writer and assistants under an extension to the original licence from National Monuments issued in 2002. There was no remaining topsoil over the site, and no medieval deposits were uncovered. The underlying soils are stiff gravels and clays, encountered when the upper level of modern contaminants were removed.

As cremation pits generally occur as cemeteries, the zone around the initial find was treated as highly sensitive. Initial overburden was removed by mechanical excavator fitted with a grading bucket, and proceeding under archaeological direction.

Modern intrusion in this area adjacent to Military Road was quite high, with dumps of asbestos piping, and some pits with iron bars and other debris. A 19th century gravel quarry located to the north of this area limited the northern part of the cemetery.

In the vicinity of the 2002 pit, a further five pits were located and archaeologically excavated over an area measuring approx. 12m by 10m. This was undertaken in four days with a crew of 4-5 archaeologists. Further work, such as removing the cremated bone, and conservation of the artefacts, was carried out off-site. Despite the fact that the pits were quite closely clustered, there was no surviving evidence for a cairn or covering mound.

The features excavated are as follows:

F1 was a shallow pit, measuring 720mm by 67-mm, with a depth of 180mm. It was square shaped with rounded corners. The pit was cut through on the northern side by a larger pit of modern date which contained iron bar fragments and asbestos pipe. The pit fill, also F1, was sampled in two parts, as the northern side is potentially contaminated. The pit fill was heavily charcoal stained, and contained calcined bone.

F2 was a triangular shaped pit, cut into very stoney subsoil. It measured 700mm by 420mm, with a depth of 140mm. A deposit of cremated bone and charcoal was present in the loamy fill.

The three pits F3, F4 and F5, were located very close to one another. F3 measured 620mm by 500mm with a depth of 260mm. The fill was charcoal and calcined bone. The subsoil into which the pit was cut was notably stoney, and resulted in the presence of several stones, up to 150mm in diameter in the fill, however there was no evidence that these formed part of a protective cover. A complete Pygmy cup, which contained three beads, was recovered from the central part of the pit fill.

F4 lay only c. 300mm west of F3. It measured 1,200mm by 1,200mm, with a depth of 450mm. The fill towards the base contained a lens of burnt clay, which may have been scraped up from the funeral pyre- the sides of the pit were not scorched. Calcined bone was widely dispersed through the fill, along with several sherds from a biconical Pygmy cup. The sides of the pit, where cut through coarse gravel and rounded stones, contained white flecking, which appears to be a soil fungus.

The upper level of pit F4 was sealed with a large flat slab, which measured 600mm by 600mm. This was the sole evidence for a protective structure over any of the cremation pits.

F5 lay a short distance north of pits F3 and F4. The pit was a well-defined circular shaped pit, measuring 450mm in diameter and 120mm in depth. The charcoal fill contained a small deposit of calcined bone.

13.A.5B Discussion

All of the pits contained calcined bone, identifiable as human. Three of the pits contained a small 'token' deposit of bone, and no further finds. One pit, F4, contained sherds of a decorated vessel, a so- called Pygmy cup, now more often referred to as miniature vessels, and much calcined bone. Towards the base, a thin layer of burnt clay was present- this may have been removed from the funeral pyre. The sherds of the little vessel were scattered throughout the fill of this rather large pit, having been broken in antiquity. The vessel is very fine, and has two perforations on one side, which appear to have been for suspension. This is classifiable as a biconical cup (Kavanagh 1977). Out of a then total of 31, 15 of the vessels in her corpus had perforations on the shoulder area.

The second pit of this group to return a vessel is F3. A complete Pygmy cup was recovered from this pit, and sent to a conservators lab for stabilisation and cleaning. In the course of this work, the conservator recovered three beads from the interior of the cup. One is ceramic, and two are bone- one is a particularly finely worked decorated cylindrical bead. The bone beads have been calcined. This cup too, is classifiable as biconical.

A group of finds such as these are rare occurrences. Associations of finds with pygmy cups are few; they consist of a faience bead from Knockboy, Co. Antrim, an amber bead from Dromara, Co. Down, a flint flake from a burial at Clogherny, Co. Tyrone, and a bronze awl from Annaghkeen, Co. Galway. A quartz pebble was found in this latter burial, while a cube of iron pyrites was recovered from Broughderg, Co. Tyrone

(Kavanagh 1977).

In a brief search of recent publications to hand, the NRA archaeological database, and excavations.ie, Kavanagh's 1977 table of Pygmy cups or miniature vessels can be expanded to include the following sites:

- Ballyoskill, Co. Kilkenny (Cahill and Sikora 2011, 239)
- Caltragh, Co. Silgo (NRA.ie)
- Castlehyde, Co. Cork (excavations.ie)
- Newtown Little, Co. Dublin (excavations.ie)
- Rathlin Island, Church Bay (excavations.ie)

This limited addition to Kavanagh's corpus serves to underline that these vessels are rare finds.

They are frequently found in association with food vessels, and many of the vessels are in fact miniature copies of this type. The vessels are found with both children and adult burials: while the analysis of the human bone from the pits was to be undertaken by osteologist Laureen Buckley, adult teeth and fragments of mature skull were present in the pits at Kilmainham.

This group of cremation pits constitutes an important find. A full analysis of the results could contribute significantly towards our understanding of the funerary ritual, of the practice of excarnation, and the individuals who received this ritual. In particular, the presence of paired perforations, which indicate a suspension cord, on the two pygmy cups, is of interest. The name incense cup, first used to describe these vessels in 1812, may be appropriate. The vessels may have contained some more pleasant-smelling substance in the funerary context (Kavanagh 1977, 73).

13.A.6A Finds: The food vessel

The bowl stands to a maximum height of 1300mm, with an estimated original height of 1450mm. The external diameter is 1600mm. The interior of the vessel is brown/ buff, while the exterior is burnished and pale brown. The fabric is oxidised unevenly, to a variable red/ pink colour, with a grey- black core. Large angular grits are present in the clay.

The vessel is classifiable as a tripartite vase, with three primary zones of decoration. None of the base is present. The flat rim is slightly everted, and the vase is shouldered.

The decoration on the body has been carried out with perhaps four different implements. One series of incised lines was done with a narrow- edged implement, while those grooves set diagonally were done with a broader, blunter implement which left a softer, less defined edge. The main encircling bands of decoration appear to have been done with a toothed implement- these impressions however are neither regular, and the marks suggest that two toothed implements were used. One series has consistently rectangular indentations, while the band towards the base of the vessel is narrower. Small indentations are present on the outside of the rim, while the top of the rim has a series of diagonally set toothed indentations. Inside the vessel, the neck is decorated with a series of lozenge shaped indentations, set in pairs of three, separated by either five or six horizontal lines. This zone of ornamentation is shallower in the impressed lines than those on the exterior.

The zone from rim to the slope of the shoulder has a simple lattice of incised lines, which is not regular, and in places has a sequence of four diagonally set lozenges, instead of one main lozenge, flanked by halves, which appears to have been the intended pattern. This is contained within a single band of the impressed toothed ornamentation.

The shoulder repeats use of the incised rounded implement under the rim, with wider spacing, and oriented differently. This is followed by two bands made with the indented implement, with a lower pattern of the same implement set at the same angle to those on the top of the rim. This is contained by a further band of the toothed implement.

From below the shoulder to approximately half-way to the base, the ornamentation was planned as a series of triangles, which are filled with widely spaced incised lines, set at an angle to the orientation of the triangle. The intention was to have two primary directions, and the pattern is consistent around the belly of most of the pot, however in much of the section illustrated, the pattern has fallen apart.

The large triangles are contained within three horizontal bands of impressed toothed implement. Below this zone, little remains of the vessel. Widely spaced incised lines indicate that the large triangular pattern may have been repeated.

The shape of the vessel is extremely regular, and it appears to have been well made. Much of the ornamentation is still sharp, and a slightly eroded section of the exterior appears due to an earlier exposure, perhaps when gravel quarrying took place nearby.

These vessels were built up by the coil method, and there is only one area visible where the potter has left an evident join. As mentioned above, this vase has a burnished exterior, and there are few areas where the large grits of the fabric protrude into the decorated surface of the vessel.

The form of the vessel is that termed a tripartite vase by O' Riordain and Waddell (1993, 25). These are characterised by 'an angular profile with an everted, nearly vertical or vertical neck above a sloping shoulder; the neck is invariably at least half or more than half the length of the shoulder...the interiors of necks are usually decorated...tripartite vases are in fact greater in rim diameter than in height'... Incised and impressed decoration is known. The motifs on the vase from Kilmainham are known on other tripartite vases, in particular, the filled triangles. Lattice occurs only occasionally.... The incidence of triangular patterns on tripartite bowls is greater than on the other forms.

Burial rite is known in thirty cases where these vessels have been found (data from O'Riordain and Waddell 1993, now outdated). The great majority have been found in cists. Seven are known from pit graves. The majority were placed mouth upwards, 'accompanying or even containing cremated bone'. The distribution map of tripartite vases produced by O' Riordain and Waddell shows a scatter with a cluster in south Dublin (1993, fig. 9). Few of the vases were known to contain cremated bone.

Vases are known from both flat cemeteries and cemetery mounds. Unburnt material is uncommon. Some have been found in association with a variety of vase forms, and a second vase is the most common find. Metal finds are particularly rare in these burials. Stone cists are more common than not. From the corpus of recorded sites, the vase tradition appears to have been quite distinct from the bowl.

A series of uncalibrated dates, generally for unburnt bone, has been published by O' Riordain and Waddell

(1993, 37). This series of samples agree on a date of between 3900BP and 3600BP. The date from the Kilmainham burial centering on 3877BP (calibrated at between BC 2034 (1928) 1785 is in good agreement with these dates. Bipartite and tripartite vases are broadly contemporary.

13.A.6B The miniature vessels and beads

02E0067:3:1 Intact miniature vessel, biconical. Height: 41.3mm. Diameter: 40.6mm at lip, 46.80mm at middle, 39.60mm at base. The vessel has two perforations at the shoulder 10.70mm apart.

The fabric is a smooth, micaceous buff- red, with charcoal staining on part of shoulder and within vessel. The exterior has four zones of ornamentation; the base and the interior are plain. The lower zone, from base to below shoulder, has a zig-zag of stabbed indentations, made with a sharpened implement. Several of the zig- zags cross over the first made patterns, and it can be seen that the impressions were made with the pot held first one way, and then the opposite way. Several of the lines of indentations are deeper. There is a light pattern of lines, possibly grass or other surface matter, on one part of the lower zone- this does not appear to be deliberate.

This zone of ornamentation consists of a horizontal band of dots, created by a sharp implement, and contained within incised lines which overlap on one side, and of differing depths. The third zone is an irregular, lighter incised pattern of lozenges, which contain incised lines; the lines vary in direction from lozenge to lozenge.

The upper zone around the lid consists of three irregular horizontal incised lines, carried out with a thin pointed implement. The lines cross over each other, and are not particularly well executed

Three beads were recovered by the conservator from within the vessel.

02E067:3:1A is a complete bone bead or toggle. The bone is calcined from the funeral pyre. The object is barrel shaped, and finely worked and hollowed lengthwise. There is a centrally placed circular perforation through one side of the bead. The opposing side has a transverse loop- like perforation through the wall of the bead, and the outer part of this loop appears to have broken off. Both ends of the bead are grooved and collared, with flat ends. A soil or pyre accretion remains on the outside of the bead close to the larger perforation.

The exterior is circular while the interior hollow is more squared. Length: 23.5mm, diameter: 15.5mm.

A similar object was recovered from a cist containing an urn at Lisadell, Co. Sligo in 1992 (Cahill and Sikora 2011, 437-438). That object had a similar placement of perforations, while it is uncertain whether the second perforation was incomplete or just a housing for a string. Cahill observed that the closest comparisons for the object are from urn burial contexts in Scotland. Comparanda from cremation burials with similar objects from Cumbria (Bewley et al 1992, cited by Cahill) 'draws particular attention to the numbers of bone beads and toggles of various types found with collared urns and emphasizes the links to Scottish burials of similar type'. Two dates were derived from this burial- one from charcoal which yielded a calibrated date of 1947-1751BC, however a sample from the cremation yielded a calibrated date of 1260-930BC. The urn is described as belonging to Stage 2 of the development of collared urns, which date to the period 1800-1700BC.

02E0067:3: 1B is a complete small disc bead with a central perforation, sawn from an antler tine. The bead

has been heavily calcined, causing several fissures. Both ends are flat, and the exterior has some slight ridges. The central perforation is fractured.

Diameter: 12.5mm. Thickness: 6mm.

02E0067:3:1C is a small fired ceramic bead, with a very small off-centre perforation, sent diagonally through the bead. The bead is not regular in shape and is of buff -coloured fabric. It appears as though small inclusions have been burnt out of the fabric, leaving a pitted surface.

Diameter: 13.8mm. Thickness: 8.2mm.

Vessel 02E0067: 4:1 is a fragmented biconical vase, recovered from pit F4. The vessel could be partly reconstructed for illustrative purposes. The fabric is quite fine, with many calcites. It is grey/ buff, with a grey to red core. The base is flat, and much of the outer face has delaminated, but it was clearly decorated. It appears to have been a pattern of triangles, which are infilled with incised lines. One or two incised horizontal lines delimit the base. The lower pattern on the walls is lightly incised slanting rectangular blocks, which are infilled with perpendicular incised lines. This is bordered on the upper line by a deeply incised horizontal band. Above this, there is a band which appears to have remained undecorated. The upper part of the vessel had three bands of opposing incised lines, each bordered by an incised horizontal line, and quite deep. The band at the rim was plain, except for a horizontally incised line. The vessel has two perforations, 24mm apart, located just below the shoulder.

13.A.7 Post medieval features

Part of a limestone mortared drain, associated with the gardens of the Royal Hospital, was recorded in advance of removal. The French drain extended from the site boundary wall to the south and continued northwards along the boundary with the formal garden of the hospital.

A small section of mortared limestone footing was located towards the centre of the site. This was later 18th century in date, and is probably connected with the steep bluff indicated on Rocque's (1756) map of Dublin. The location of the masonry coincides with the tree lined avenue which led from the hospital complex towards the Infirmary. It appears to have functioned as a step on the slope. The masonry was recorded prior to removal.

13.A.8 Site description

Boundary walls: The site is bounded to the west by the wall of the Royal Hospital Gardens, a protected structure, and to the south by a late 18th or early 19th century boundary wall to the grounds of the Royal Hospital. The wall of the Royal Hospital formal gardens has been underpinned at its base with concrete by OPW, probably when the gardens were reconstructed in the 1980s. This was revealed in the course of construction on the present site. This has ensured stability of the structure, and no intervention in relation to either the foundations or the wall itself was required by the present construction.

The later 18th or 19th century mortared limestone wall to the south of the site, however, was neglected in the past, and partial removal of the upper courses was undertaken for safety reasons. This was agreed with OPW. A condition survey was prepared by consultant engineers O'Connor Sutton Cronin, and

associated trial holes along the base of the wall indicated the lack of foundations to the construction.

The site was bounded with a series of Secant piles. Prior to landscaping works in 2014, these were still visible along the western site margin, and much of the northern line, where no building work has taken place. The boundary wall of the Royal Hospital garden sits higher than the secant piles, and set in from them. The boundary wall to the south is formed at ground level by masonry from the original wall, which clads a new reinforced concrete wall. The secant piles are set in to the north of the wall, and covered, where the southern wall of the underground car park is located.

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13.A.7A Cremated bone from F6. Author: Laureen Buckley

During excavations by Claire Walsh of Archaeological Projects Ltd., an urn containing cremated bone was recovered (F6). The bone within and around the pot was excavated by the conservator and then given to the osteoarchaeologist for analysis. The conservator had saved the recovered bone separately from three main layers from the pot: top, internal and bottom as well as the material from outside the pot.

13.A.7B Methods

Examination of cremated remains involves a description of colour and texture of the bone as this helps determine the efficiency of the cremation. Efficiently cremated bone is white in colour and usually has a chalky texture. Less well cremated bone, where the temperature of the fire was not high enough or where oxygen flow was restricted has a blue or a blue/black colour.

Each fragment of bone is then examined and identified if possible. The degree of identification of fragments is generally dependent on fragment size. Larger fragments are usually easier to identify although phalanges are often found intact among the smaller fragments. Successful identification depends on the number of distinguishing features present on the bone fragments as well as knowledge of the thickness and expected cross section of particular bones.

In this case each sample of bone from the various layers was examined separately in order to determine if there had been any attempt to differentiate the bones when they were being deposited in the pot. For example the skull may have been deliberately placed in the pot first, or may have been placed on the top of the pot.

The results for each layer are given in the report below followed by a summary of all the bone collected.

13.A.7C Layer 1: Top of pot

The bone from this layer was grey in colour although this colour came from the heavy deposits of charcoal surrounding the bone. The underlying colour appeared to be white. The bone was also highly fissured and warped. Only a few fragments were partially blue in colour where there was less efficient cremation and some fragments of skull were stained brown, probably due to leaching of minerals from the soil.

A total of 3,574 fragments of bone were collected, weighing 775g. The size and fragmentation of the bone is given in the table below with the largest fragment being 92mm in length.

Size (mm)	Number of fragments	Weight g)	Percentage by weight
<5	1,630	87	11
5-10	1,267	123	16
10-15	315	101	13

15-25	234	162	21
25-40	100	188	24
>40	28	114	15
TOTAL	3,574	775	100

It can be seen from the above table that there was a small proportion of very large fragments but there was not a high proportion of very small fragments either. Most of the sample consisted of moderate sized fragments between 10-40mm in length.

It was possible to identify 346g (45%) of the bone. The amount of the various bones identified is given in table 2 below:

Table 2: Proportion of Identified Bone

Bone	No. of fragments	Weight (g)	Percentage of identifiable bone
Skull/Mandible	88	120	34.7
Femur	18	88	25.4
Vertebrae	51	42	12.1
Tibia	8	30	8.7
Humerus	10	20	5.8
Scapulae/Clavicles	3	9	2.6
Ribs	26	9	2.6
Pelvis	10	9	2.6
Patella	1	5	1.4
Tarsals/MT/Phalanges	9	5	1.4
Carpals/MC/Phalanges	16	4	1.2
Fibula	3	3	0.9
Radius	1	2	0.6
Total	244	346	100

13.A.7d Layer 2: Just below rim

This sample was quite small and consisted of only 182 fragments of bone with a total weight of 123g. The fragmentation of the sample is given below:

Size (mm)	Number of fragments	Weight (g)	Percentage by weight
<5	0	0	0
5-10	41	6	4.9
10-15	87	28	22.8
15-25	34	30	24.4
25-40	18	43	34.9
>40	2	16	13.0
Total	182	123g	100

It can be seen from the above table that was a very low proportion of the smaller fragments and that most of the fragments were of medium size.

It was possible to identify 70g (57%) of the bone. The bones identified are given in the table below.

Layer 2: Proportion of Identified Bone

Bone	No. of Fragments	Weight (g)	Percentage of Identifiable Bone
Skull/Mandible	19	28	40.0
Femur	2	3	4.3
Vertebrae	3	9	12.9
Tibia	2	16	22.9
Humerus	4	7	10
Ribs	3	0	0
Pelvis	1	3	4.3
Tarsals/MT/Phalanges	2	1	1.4
Carpals/MC/Phalanges	2	1	1.4
Ulna	1	2	2.8

TOTAL	39	70	100

13.A.7E Layer 3: Internal Layer

This sample consisted of 41 fragments of bone with a total weight of 125g. The fragmentation of the sample is given below:

Size (mm)	Number of fragments	Weight (g)	Percentage by weight
<5	0	0	0
5-10	185	21	16.8
10-15	81	27	21.6
15-25	46	28	22.4
25-40	25	33	26.4
>40	4	16	12.8
Total	341	125g	100

Most of the fragments were of medium size with a low proportion of larger fragments.

It was possible to identify 55g (44%) of the bone. The bones identified are given in the table below.

Layer 3: Proportion of Identified Bone

Bone	No. of Fragments	Weight (g)	Percentage of Identifiable Bone
Skull/Mandible	18	19	34.6
Femur	2	8	14.5
Vertebrae	5	2	3.6
Tibia	1	2	3.6
Humerus	2	5	9.1
Ribs	14	3	5.4
Pelvis	2	4	7.3
Tarsals/MT/Phalanges	5	4	7.3

Carpals/MC/Phalanges	3	1	1.9
Ulna	2	5	9.1
Fibula	2	2	3.6
TOTAL	56	55	100

13.A.7F Layer 4 Bottom of pot

This sample consisted of 321 fragments of bone with a total weight of 408g. The fragmentation of the sample is given below:

Size (mm)	Number of fragments	Weight (g)	Percentage by weight
<5	0	0	0
5-10	52	4	1.0
10-15	90	29	7.1
15-25	77	63	15.4
25-40	73	147	36.0
>40	29	165	40.5
Total	321	408g	100

A high proportion of the sample consisted of very large fragments with most of the sample consisting of larger fragments more than 25mm in length. There seems to have been little crushing of the bone in the bottom of the pot, suggesting that large fragments were deliberately placed in the pot and that most of the crushing of the bone occurred after deposition.

It was possible to identify 281g (69%) of the bone. The bones identified are given in the table below.

Layer 4: Proportion of Identified Bone

Bone	No. of fragment	Weight (g)	Percentage of Identifiable Bone
Skull/Mandible	36	99	35.9
Femur	8	28	15.1
Vertebrae	15	22	0
Tibia	8	39	3.8
Humerus	6	36	9.4
Radius	2	18	15
Ribs	9	3	5.7
Ulna	6	12	1.9
Fibula	3	5	9.4
Scapulae	1	2	3.8
TOTAL	110	281	100

13.A.7G External bone

In addition to the layers in the pot, bone was recovered from around the pot. Most of this bone was very crushed. There were over 4,000 fragments of bone present with a total weight of 873g. The fragmentation of the bone is given in the table below:

Size (mm)	Number of fragments	Weight (g)	Percentage by weight
<5	2,720	215	24.6
5-10	547	88	10.1
10-15	486	158	18.1
15-25	213	162	18.6
25-40	78	165	18.9
>40	16	85	9.7
Total	4,060	873g	100

A high proportion of the bone was less than 10mm in length and there was a low proportion of larger fragments. Since the bone was so highly crushed, it was only possible to identify 257g (29%) of the bone. This is a very low amount compared to the other samples from the pot. The bones identified are given in the table below.

External: Proportion of Identified Bone

Bone	No. of fragment	Weight (g)	Percentage of Identifiable Bone
Skull/Mandible	50	92	35.9
Femur	7	40	15.6
Vertebrae	21	27	10.5
Tibia	8	26	10.1
Humerus	8	28	10.9
Ribs	9	3	1.2
Pelvis	3	2	0.7
Tarsals/MT/Phalanges	2	2	0.7
Carpals/MC/Phalanges	15	7	2.7
Ulna	5	8	3.1
Fibula	2	10	3.9
Radius	4	8	3.1
Scapulae	1	4	1.6
TOTAL	135	257	100

Summary

If the bone from all the layers is considered as a whole, then the sample consisted of 8,478 fragments with a total weight of 2,306g. The weight of a full adult cremation can vary from 1,600 to 3,600g (Mc Kinley, 1989) although in practice it is rare to get more than 1000g of bone from a single cremation.

The size and fragmentation of the bone is given in the table below with the largest fragment being 99mm in length.