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STRUCTURAL ENGINEER'S REPORT

ON

THE DEMOLITION

OF

OLD MOLE HEAD BUILDING

CONTENTS Page

1.0 INTRODUCTION. 2
1.1 Scope of Works.
1.2 Location.
1.3 General Background Information & Construction

2.0 SURVEY RESULTS. 3
2.1 Visual Survey.

3.0 SURROUNDING AREAS AND BUILDINGS. 4

4.0 DEMOLITION METHODOLOGY. 5
4.1 Demolition Sequence.
4.2 Legislation.
4.3 Designer's Risk Assessments.

APPENDIX A – LOCATION PLAN
APPENDIX B – DEMOLITION PLAN
APPENDIX C – PLATES
APPENDIX D – RISK ASSESSMENTS
APPENDIX E – DEMOLITION PERMIT

1.0 INTRODUCTION.

1.1 Scope of Works.

In July 2013, JJ De La Paz Consulting Engineers Ltd. was commissioned by Construction & Maintenance Ltd to develop a methodology for the demolition of the ex-Refuse Collector's Mess Facility Building at Old Mole Head, Waterport Road. This would require an external survey to be undertaken of the building to establish the structural type and condition of the building and to assess the stability and integrity of parts of the structure during the demolition.

Part of the brief also includes undertaking a visual survey of the surrounding land, services and buildings that may be affected by the demolitions.

1.2 Location.

The site is located at the Old Mole Head. Waterport Road forms the boundary to the north of the site. The Refuse Collector's Depot and access road are situated to the west of the site, and Varyl Begg Residential Estate and access road sit to the east and south of the site. Refer to the Site Location Plan contained in Appendix A.

1.3 General Background Information.

The structure was built around the 1990's, becoming redundant in recent years. Refer to the Site Location Plan in Appendix A and the various Plate Elevations contained in Appendix C.

2.0 STRUCTURAL SURVEY.

2.1 Visual Survey.

The visual survey was limited to accessible areas of the building. The survey revealed that the building comprises a single storey masonry load bearing cellular wall structure supporting a reinforced concrete flat roof slab. Further to carrying out intrusive investigation works, the roof construction was found to consist of RC beams spanning across the masonry walls, with concrete hollow blocks acting as permanent formwork supporting 100mm deep solid concrete slab, and spanning across the beams.

The building has been constructed on top of the Old Mole Head, which is of heritage importance. The building appears to be in a sound structural condition.

3.0 SURROUNDING AREAS AND BUILDING.

Reference Site Plan contained in Appendix A.

The site is located at the Old Mole Head. Waterport Road forms the boundary to the north of the site. The Refuse Collector's Depot and access road are situated to the west of the site, and Varyl Begg Residential Estate and access road sit to the east and south of the site.

The surrounding buildings are deemed to be sufficiently remote, to be affected by the proposed hand method demolition of the building. However, consideration needs to be given to the close proximity of the access road to the Refuse Collector's Depot. This will require traffic management arrangements the details of which described later in this report.

Because of the site location it is imperative that measures are taken to suppress dust and mitigate noise.

4.0 DEMOLITION METHODOLOGY.

4.1 DEMOLITION SEQUENCE.

The Structural Engineer, J J De La Paz Consulting Engineers Ltd, will be present on site at key stages to ensure that the demolition procedure follows the methodology outlined below.

The methodology has been developed considering the Client's heritage requirements, site access constraints, size of plant and machinery, the proximity of adjacent structures and the public. As such, the structure will be demolished using hand tools, always working top to down and from scaffold platforms. The roof slab and walls are to be demolished in the sequence indicated in the Demolition Plans contained in Appendix D and as detailed below:

Pre-demolition Works.

a) Ensure all services are scanned, disconnected and protected;

b) Undertake a dilapidation survey of the surrounding area before works commence;

c) Check / erect security hoarding around the perimeter of the site and provide a banksman at the site entrance. Provide all necessary waning and traffic signs.

d) Provide / check the internal scaffold crash deck to protect the Old Mole Head structure.

e) Erect suitable independent scaffolding fully enclosed with debris netting around the perimeter of the building to be demolished as described in the stages below;

f) Erect a debris chute at the northern end of the building;

g) Remove all identified asbestos and contaminated materials by specialist contractor (not covered in this report);

h) Traffic and Pedestrian Management may need to be implemented along the Refuse Collector's Deport access road. This shall consist of Construction Warning Signs and No Parking Signs displayed at the site entrance. The main construction access route will be via Waterport Road. Traffic Management arrangements will require the approval of the Highway Authority;

i) Remove all obsolete services and soft strip materials, including windows, doors, plasterboard partitions, rain pipes, gutters, water tanks, etc..., using safe scaffolding access;

Stage 1 – Demolition of Flat RC Roof Slab.

a) Remove the top gravel layer, waterproofing felt and sand screed by hand.

b) Refer to the Demolition Plan Drawing in Appendix B. Erect a suitable internal scaffold and crash deck within the structure. The crash deck is to be placed immediately below the soffit of the concrete roof slab soffit and is to serve two purposes. Firstly, it will provide a safety platform for the operatives working above and demolishing the roof slab by hand. Secondly, the deck will act as a platform which can catch the demolition debris and thereby avoid the free fall of debris onto the Old Mole Head below which could potentially cause damage to this structure of heritage importance. The scaffolding will have to accommodate the installation of vertical supports described below.

c) Install a line of vertical acro-props to support the reinforced concrete beam running along the working edge of the demolition works, as shown in the Demolition Plan Drawing.

d) Start with the hand demolition of the concrete roof slab working in 500-1000mm wide strips, starting from the western edge and proceeding in an easterly direction. Use standard compressed air operated hand-held breakers. Demolish the concrete slab in such a way so as not to overload the crash deck with demolition rubble i.e. continually remove the rubble as the works proceed and do not allow to over accumulate.

e) Ensure that the acro props are continuously moved to the next working edge as the demolition proceeds in strips as indicated on the demolition plan drawing.

Stage 2 – Demolition of Walls.

a) Once the roof slab has been removed, lower the perimeter scaffolding and internal crash deck by approximately a meter. Then proceed to demolish by hand the outer perimeter and internal 450mm thick walls in horizontal layers not exceeding 1m in height. Care must be taken not to leave any unsupported walls and lintels during the demolition process.

b) Always ensure to break the walls such that they fall inwards and never outside of the building perimeter. Continue in this manner until the whole wall has been demolished.

c) Remove and cart away from site all demolition rubble by tipper trucks.

d) Make good the top of the Old Mole Head structure in accordance with the Client PM's requirements.

General.

a) At the end of each working day or shift, the Contractor is to ensure that all elements of the building that remain in place are adequately secured to prevent the collapse of free standing elements during silent hours.

b) It is envisaged that working hours will be 0800 to 1530, Monday to Friday. However, these hours are to be agreed with the Client PM, and will be strictly adhered to.

c) The Contractor will monitor weather conditions on a daily basis during the demolition works and no working at height shall take place when steady wind speeds are forecast to or actually exceed 20kph.

d) All demolition work shall be carried out in accordance with BS 6187.

e) In dry weather conditions, the site will be frequently hosed down to suppress any dust caused by the demolition works.

f) The demolition operatives will work with frequent breaks to avoid injury caused from prolonged use of hand held vibrating tools.

4.2 LEGISLATION.

The main contractor shall comply with the following building regulations and ensure that all subcontractors are made aware of their obligations for compliance:

- Institution of Civil Engineers Demolition Protocol;
- The Environmental Protection Act, 1990;
- The Control of Pollution Act, 1990;
- The Construction CDM Regulations, 1998;
- The Control of Asbestos at Work Regulations, 2006;
- The Asbestos (Licensing) Regulations, 1998;
- The Control of Lead at Work Regulations, 1998;
- Health and Safety at Work Regulations, 1999;
- The Noise at Work Regulations, 1989;
- The Provision of Work Equipment Regulations, 1992;
- The Health and Safety (First Aid) Regulations, 1981;
- The Manual Handling Operations Regulations, 1992.

4.3 RISK ASSESSMENTS.

The Contractor shall submit detailed written statements to indicate specifically how the risks are mitigated on site, in respect of the designer's risk assessments contained in Appendix D.

Main Risk Items:

- Live Services;
- Asbestos &/or Hazardous Material;
- Temporary Works;
- Work at Height;
- Roof Work;
- White Finger 'Vibrating' Syndrome;
- Hot Works;
- Demolition;
- Manual Handling;
- Working close to public areas, roads and buildings.

Plate C.01 – View of Old Mole Head from Waterport Road.

Plate C.02 – Old Mole head.

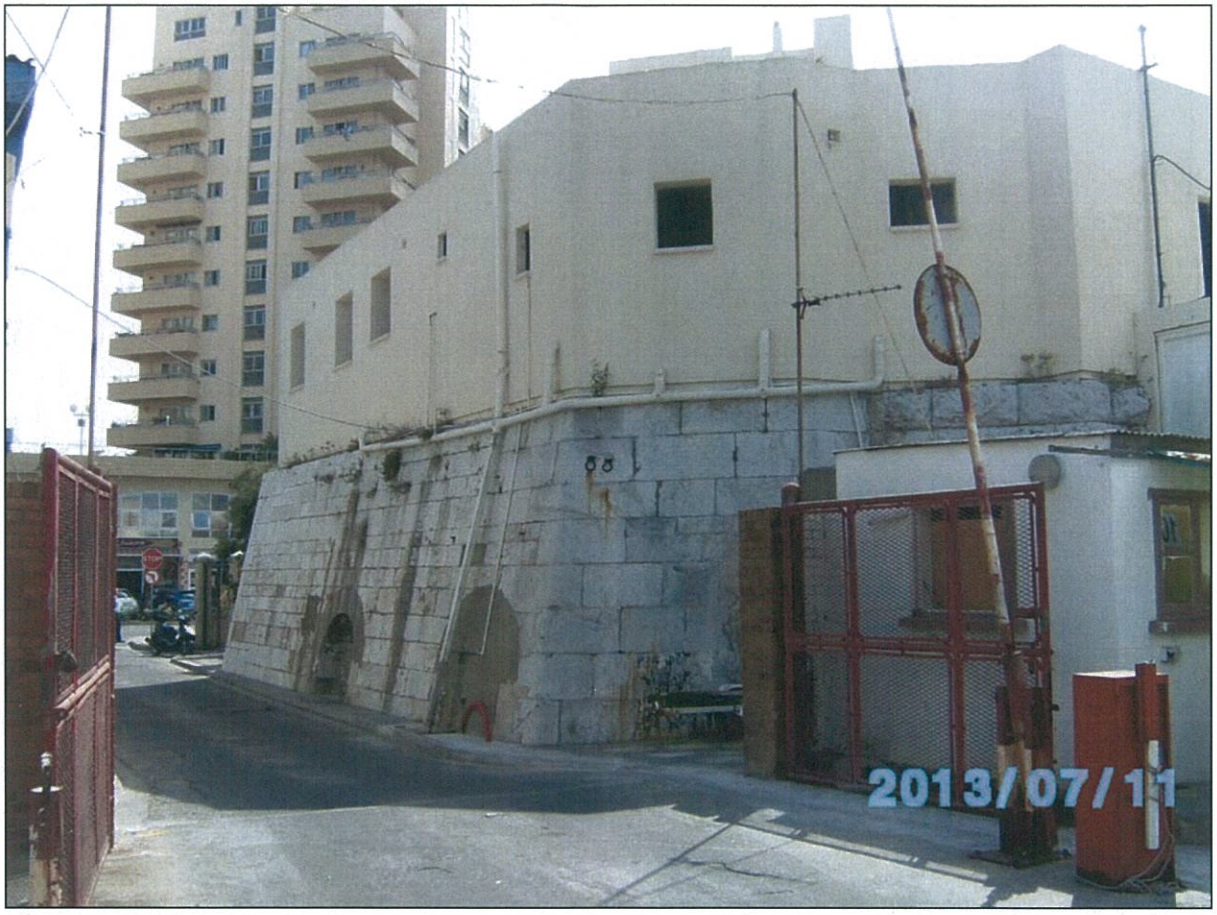

Plate C.03 – Old Mole Head view from Refuse Collector's Access Road.

Plate C.04 – Old Mole Head, south elevation.

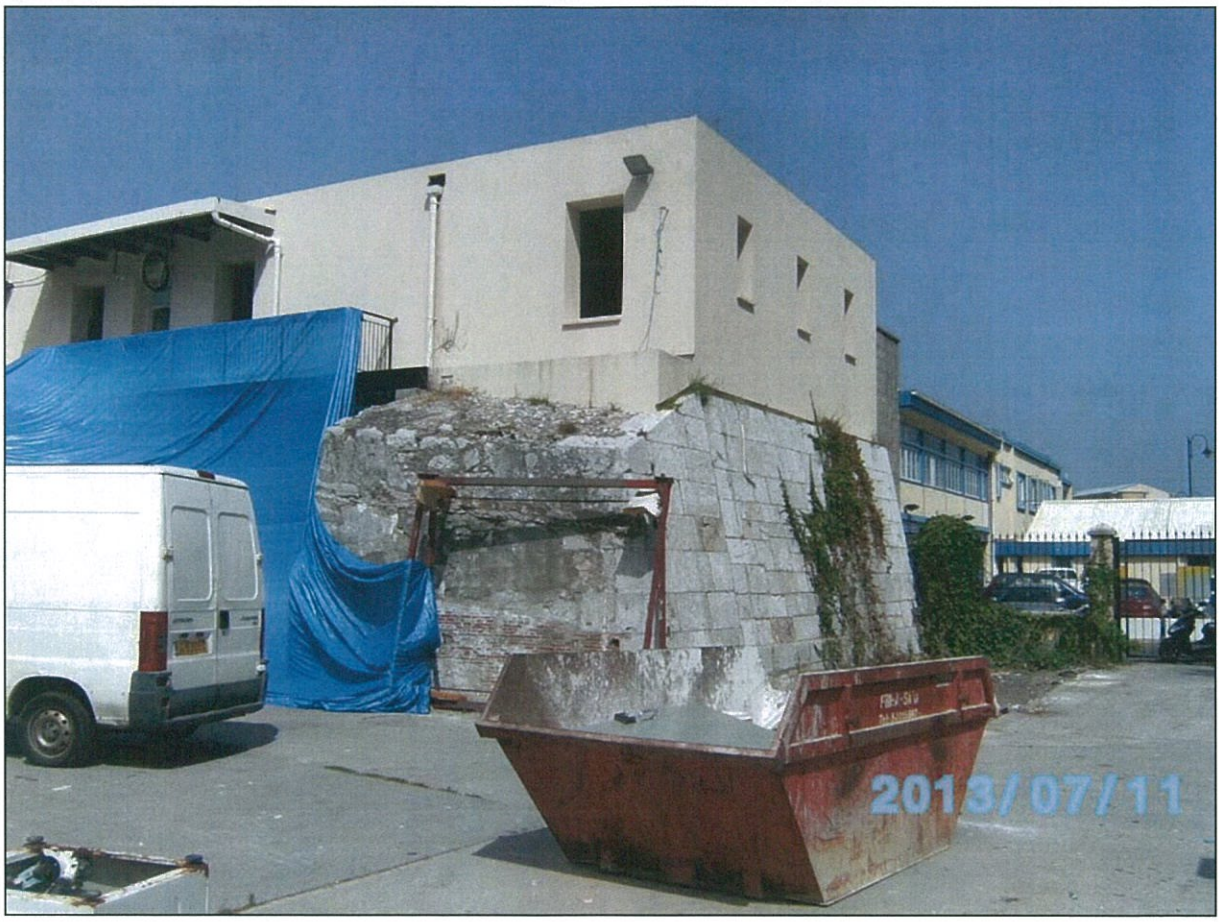

Plate C.05 – Old Mole Head, north & east elevation.

Plate C.06 – Old Mole Head

Plate C.07 – Old Mole Head

Plate C.08 – Old Mole Head, access stairs protected prior to works starting.

Plate C.09 – Old Mole Head

Plate C.10 – Old Mole Head.

Plate C.11 – Old Mole Head, intrusive investigation of rc flat roof.

C.12 – Old Mole Head, internal view within the building.

Floor of heritage value and to be protected during the demolition works.

C.13 – Old Mole Head, internal view within the building.
Floor of heritage value and to be protected during the demolition works.

Plate C.14 – Old Mole Head, access stairs to be protected during demolition works.

Plate C.15 – Old Mole Head – Refuse Collector's Depot, south of the site.

APPENDIX D

RISK ASSESSMENTS

J J DE LA PAZ
Consulting Engineers Ltd

Project Title **DEMOLITION OF THE OLD AIRPORT TERMINAL BUILDING.**					**HEALTH & SAFETY RISK ASSESSMENT / ACTION PLAN**				Sheet No. 1 Date: 20 March 2013
Designer: CIVIL & STRUCTURAL ENGINEERS									Prepared by: JJD
Activity / Element	Potential Hazard	People at Risk			Risk Rating			Control Measures Required During Site Work	Action Required at Design Stage
		Wkr	Vis	Pub	Sev	Freq	O/A		
Demolition / dismantling / stripping out / structural alterations - concrete frame; - steel frame; - masonry / random rubble load bearing walls; - steel beams; - timber floors;	Live Services	√			M	L	M	Adequate method statement. Mark out the services on on site and make services safe. Suitable equipment / training and safe system of work. Obtain Service Clearances.	Adequate survey. Provide adequate information noting any nature and location of known live services. '
	Uncontrolled Collapse / Over loading	√		√	M	L	L	Adequate method statement – comply with the Struct. Eng's report. Suitable sequences of work. Adequate protection /temporary support to retained structure and adjoining properties where necessary. Site fencing to cordon off site from public areas – including safety buffer zone.	Adequate survey. Provide structural report noting principles of structural stability, demolition methodology and any special hazards inherent in the existing construction or adjoining properties. Obtain demolition permit from Building Control.
	Falls from height	√			H	M	M	Adequate method statement. Suitable equipment/training and safe system of work including use of scaffolds, etc.. where possible.	Avoid unnecessary demolition and the specification of complex or hazardous demolition sequences.
	Hazardous Materials / Substances	√			M	L	L	Adequate method statement. Adequate inspection/testing. Suitable equipment/training and safe system of work.	Adequate survey/testing. Provide adequate information noting any hazardous material/substances.
	Work with Asbestos	√			L	L	L	No asbestos on site. However, should any asbestos be encountered Client to engage a Licensed contractor. Adequate method statement adopting safe systems of work and site controls complying with asbestos Regs. Statutory notification.	Client to provide adequate information at tender stage. Adequate investigation/ testing (by specialist engaged by Client.
	Dust	P	P		M	L	M	Adequate method statement. Adequate site controls.	Specify any special requirements.
	Noise / Vibrations	P	P		M	L	M	Adopt low noise techniques/plant where reasonably practicable. Adequate method statement / site controls.	Consider existing / surrounding premises and their occupants. Specify any noise or vibration restrictions.
	Fire / Explosion	P			L	L	L	Adequate method statement. Adequate site controls.	Identify any record presence of any live gas/pipes, fuel tanks/supplies etc. Provide adequate tender information.

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Project Title **DEMOLITION OF THE OLD AIRPORT TERMINAL BUILDING.**					**HEALTH & SAFETY RISK ASSESSMENT / ACTION PLAN**				Sheet No. 2 Date: 20 March 2013
Designer: CIVIL & STRUCTURAL ENGINEERS									Prepared by: JJD
Activity / Element	Potential Hazard	People at Risk			Risk Rating			Control Measures Required During Site Work	Action Required at Design Stage
		Wkr	Vis	Pub	Sev	Freq	O/A		
Debris falling onto public areas.	Hit by debris.	√	√	√	M	L	M	Provide debris netting and erect fencing around the perimeter of building to be demolished.	Consider scaffolding protection around the building in the method statement.
Construction traffic accessing the site.	Traffic accident / injury to pedestrians.		√	√	M	L	M	Provide traffic management arrangement – allow for congested pedestrian and vehicular traffic on the adjacent public highway, Winston Churchill Avenue.	Highlight to the contractor the hazards in the structural report.
Damage / Injury to public on adjacent highway and walkway.	General injury.		√	√	M	L	M	Implement exclusion zone and provide continuous and interrupted supervision. Consider traffic management arrangements during demolition works adjacent to the highway i.e. divert traffic and pedestrians during critical demolition works. Consider carrying out critical demolition works at night time when there is less traffic.	Highlight to the contractor the hazards in the structural report and recommend stringent implementation of the exclusion zones and traffic management arrangements.
Damage to adjacent structures.	Damage.	√	√	√	M	L	M	Protect and separate existing structures from the demolition works.	Carry out survey of surrounding area. Highlight adjacent structures in the structural demolition report and include means of separating existing structures from the demolition by manual methods.
Debris (FOD) blown onto airfield.	Aeronautical incident.	√	√	√	M	L	M	Adequate method statement. Adequate site controls. Install boundary fence before starting works. Carry our most of the soft strip works within the enclosed building. Avoid external works in high winds.	Specify any special requirements.