

**ENVIRONMENTAL SERVICES GROUP
REPORT NO. 2130/95/2**

**REPORT ON THE
REMEDIATION OF BUILDINGS**

VOLUME 1

**FORMER RARDE SITE
WALTHAM ABBEY (NORTH)**



**BRITISH AEROSPACE
DEFENCE
ROYAL ORDNANCE**

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REMEDiation OF BUILDINGS**

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REPORT NO. ESG 2130/95/2

Subject: Report on the Remediation of Buildings

Client: DEFENCE ESTATES ORGANISATION (LANDS)

ORIGINATOR:  G G VINCENT 14 June 1996
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CHECKED BY:  P MAYELL 14/6/96
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VOLUMES II TO VI

BUILDING DATA PACKS

VOLUME II	-	BLDG. NOS	A200 - A292, E2 - E15, H1 - H72
VOLUME III	-	BLDG. NOS.	L100 - L150
VOLUME IV	-	BLDG. NOS.	L151 - L199
VOLUME V	-	BLDG. NOS.	S1 -S90A, U1 - U9
VOLUME VI	-	BLDG. NOS.	1 - 259

1. INTRODUCTION

The former RARDE Waltham Abbey Site contains a number of buildings which in the past were used for the storage, manufacture, processing and testing of explosive materials. As a consequence, many of these buildings are possibly contaminated by such materials.

During the site remediation works carried out over the period 1992-1995, a number of buildings were remediated or partially remediated. All buildings have been assessed to evaluate their potential for contamination by explosive substances and the risks presented by such contamination.

This document comprises this introductory volume, plus Volumes II - VI which contain three data sheets for each building or floor slab present on the site (other than for buildings demolished during preparation for the Powdermill Lane Housing development, detailed separately in ESG40/93).

The first sheet records any remedial works carried out on buildings, categorises explosive hazard and makes recommendations on usage restrictions. Explosive hazard is rated low risk or high risk, according to information relating to the past use of the building. Note that buildings never used for explosives purposes (to the best knowledge of Royal Ordnance) and hence likely to present no explosive risk are categorised "low risk".

The second sheet contains any formal statement which Royal Ordnance Environmental Services Group (ESG) is able to make about the explosive or explosive toxic risk presented by the building.

The third sheet is a building drawing which also depicts a location for the building within its immediate locality. Refer to Report E5275/WA600 RW/WW Volume 2¹⁴ which contains the definitive site survey plans. These plans will show the location of buildings in relation to the site as a whole.

It should be noted that only one building (Bldg L157) on the site has been remediated non-destructively during the project to the point that ESG is satisfied that no risk of explosion exists. The majority of remaining explosives buildings on the site present explosive or toxic hazards, and should not be worked on, demolished or used without taking advice from a competent person.

All remedial work carried out on buildings has been in accordance with written procedures, referenced in the following section.

Work on drain remediation is reported separately in ESG 2129/95¹.

2. RECOMMENDED RESTRICTIONS CATEGORY

The building data sheets which appear in volumes II to VI incl. contain a category box entitled "Recommended Restrictions" within which there are four designations which are explained below.

2.1 NONE

The building has EITHER been remediated such that in ESG's opinion no explosive or explosive toxic risk remains OR has not to ESG's knowledge been used for explosive processing or storage.

2.2 NOT SUITABLE FOR OCCUPATION

The building does not in ESG's opinion present a risk of explosion, but may have explosive toxic hazards. The building can be entered by anyone or used for storage but should not be occupied or worked on until the potential toxic issues have been addressed. Smoking, spark and flame emitting devices should be prohibited.

2.3 NOT SUITABLE FOR PUBLIC ACCESS

Although some decontamination work has been carried out, the building has not been fully remediated such that the risk of explosion has been removed. The building may be entered by 'Trust' employees or used for storage, but should not be worked on without seeking competent advice. The building is not considered suitable for public access. Smoking, spark and flame emitting devices should be prohibited.

2.4 NOT SUITABLE FOR ENTRY

No remediation work has been carried out other than a sweep out. Both a risk of explosion and an explosive toxic risk remain. These risks are considered significant and the building should not be entered (other than by competent persons for inspection purposes), used or worked on without seeking competent advice. Smoking, spark and flame emitting devices should be prohibited.

3. EXPLOSIVE HAZARD CATEGORY

The building data sheets which appear in the building data packs volumes II to VI incl. contain a category box entitled "Explosive Hazard Category" within which there are two designations, 'high risk' and 'low risk' which are explained below.

3.1 HIGH RISK

The building has been used in the past for explosive processes likely to have resulted in explosive contamination of the building fabric, other than by gunpowder (which deteriorates when wet and is hence unlikely to present a

hazard having been subjected to a number of years in varying degrees of moisture change within unheated old buildings). Unless remediated, the building may present explosive or explosive toxic hazards to persons.

3.2 LOW RISK

The building has not been used (to the knowledge of ESG) for explosive processes likely to have resulted in explosive contamination of the building fabric.

4. WARNING

ESG2130 does not address the major hazards presented by the physical dilapidation of some buildings, although occasionally gross damage or obvious instability is commented upon on the Building Remediation Status sheets. It is recommended that no building on the site should be approached or entered in the absence of a physical condition appraisal.

ESG2130 does not address the hazards that may be presented by non-explosive chemical contamination, although occasionally known chemical contamination is commented upon on the Building Remediation Status sheets. It is recommended that a full appraisal of potential chemical hazards is made prior to the commencement of works upon or use of any building.

5. BUILDING REMEDIATION WORK SUMMARY

At the beginning of the project, in 1992, most buildings were subjected to investigatory sampling for explosives contamination by swab and/or core drilling. This is reported in ESG 5/93².

Initial procedures used for remedial works are contained in ESG39/92³ and ESG21/93⁴.

Explosives buildings within the areas of the site being prepared for residential housing developments were destructively decontaminated (by firing) prior to demolition.

Prior to demolition, Buildings A230-A234 were sampled for explosives. This activity is reported in ESG 54/93⁵.

Following demolition of buildings in the Powdermill Lane Housing plot, building data packs were produced for the demolished buildings. These are contained in ESG 40/93⁶ (Part). This document represents the extension of this task to all other buildings on the site.

The Incorporator Mills (Buildings L157, L153, L148, L145 and L149) were subjected to a programme of non-destructive decontamination which was not completed.

Phase 1 works (which were completed) are detailed in ESG/1004/93⁷. Phase 2 works

(completed for L157, some work carried out in the others) are described in ESG 83/93⁸ and ESG 2014/94⁹. The exact stage reached for each building is reported in Volumes II - VI of this report. A minor incident which occurred during remediation of building L157 is reported in ESG 77/93¹⁰. The remediation of building L157 is reported in detail in ESG 2112/95¹¹.

Nitroglycerine (NG) in timber roofs has been identified as a potential source of toxic vapour. ESG 2095/95¹² reports on a study to investigate the problem. The report recommends sealing roof timbers with a paint system prior to re-use of any building with NG contaminated roof timbers. **To date, no roofs have been treated in this way.**

All buildings on site have been searched for fibrous asbestos products, and any identified removed. Some cement-bonded asbestos has also been removed. This activity is detailed in ESG2056/94¹³. It should be noted that asbestos or asbestos based products could be present within buildings, in positions currently inaccessible.

6. CONCLUSIONS AND RECOMMENDATIONS

Remedial work has been completed as follows:

- All buildings have been searched, and all identified explosive or chemical products, plant, apparatus and containers have been removed. All identified fibrous asbestos products have been removed.
- All buildings have been emptied of rubbish, and swept.
- Any pits, chambers or sumps identified have been emptied and cleaned.
- A number of explosively contaminated buildings have been decontaminated by firing, demolished and arisings removed from site, to licensed landfill.
- Building L157 has been completely remediated, other than application of a roof sealant.
- Buildings L153, L148, L145 and L149 have been partially remediated.

It should be noted that the majority of explosives buildings on the site have not been remediated, and may present significant risks if they are altered or demolished without taking appropriate precautions. This includes drilling or breaking of floors or walls.

Buildings designated within the "High Risk" category will embody a potential for significant explosive and toxic risk in respect of unremediated drains, any proposed works to drains should therefore NOT proceed without appropriate procedures being in place.

Many buildings may also present explosive toxic hazards.

REFERENCES

- 1 Report ESG 2129/95 *"Former RARDE Site Waltham Abbey - Report on the Remediation of Drains"*
- 2 Preliminary Report ESG 5/93 *"Former RARDE Site Waltham Abbey - Survey for the Presence of Explosives Contamination - Buildings"*
- 3 Procedure ESG 39/92 *"Former RARDE Site Waltham Abbey - Decontamination of Buildings previously used for the Processing or Storage of Explosives"*
- 4 Procedure ESG 21/93 *"Former RARDE Site Waltham Abbey - Rehabilitation of Buildings Contaminated by Explosives"*
- 5 Report ESG 54/93 *"Former RARDE Site Waltham Abbey - Coring and Sampling in Buildings A230-A234"*
- 6 Report ESG 40/93 *"Former RARDE Site Waltham Abbey - Building Data Pack (Part)"*
- 7 Draft Procedure ESG/1004/93 *"Procedure for the Decontamination and Stripping Out above Floor Level and Veranda under Floor Areas in Buildings L145, L148, L149, L153 and L157 at Former RARDE Site Waltham Abbey North"*
- 8 Procedure ESG83/93 *"Procedure for the Decontamination of Incorporator Buildings, Final Phase, Former RARDE Site Waltham Abbey (North)"*
- 9 Report ESG2014/94 *"Proposal for the Further Remediation of Listed Buildings Nos. L157, L153, L148, L149, Former RARDE Site Waltham Abbey (North)"*
- 10 Report ESG77/93 *"Report on a Minor Occurrence Involving Energetic Materials During Decontamination of Building L157, Former RARDE Site Waltham Abbey (North)"*
- 11 Report ESG2112/95 *"Remediation of Building L157, Former RARDE Site Waltham Abbey (North)"*
- 12 Report ESG2095/95 *"Report on Experimental Trials Carried Out to Evaluate the Hazards of Explosively Contaminated Wooden Roofs"*
- 13 Report ESG2056/94 *"Former RARDE Site Waltham Abbey -Asbestos Clearance Testing of Buildings"*
- 14 Report E5275/WA600 RW/WW Volume 2 *"Canals, Buildings, Mounds and Wells. Waltham Abbey RARDE North Site. Remediation and Confirmatory Analysis"*

APPENDIX 1

INDEX TO BUILDINGS CONSIDERED IN THIS STATUS REPORT

<u>VOLUME II</u>	<u>VOLUME III</u>	<u>VOLUME IV</u>	<u>VOLUME V</u>	<u>VOLUME VI</u>
<u>BUILDING REFERENCE NUMBER</u>				
A200	L100	L151	S1	1
A201/2a	L101	L152	S2	14
A201/2(b)	L102	L153	S3	16A
A203	L103	L154	S5	18
A210(a)	L105	L155	S6	18A
A210(d)	L107	L156	S9	22
A211	L108	L157	S10	22A
A212	L109	L158	S11	23
A214	L110	L159	S12	26
A219	L111	L160	S13	29
A220	L112	L161	S14	36
A222	L113	L162	S15	41
A291	L114	L163	S16	46A
A292	L115	L164	S17	46R
ARS 1	L116	L165	S19	62
ARS 2	L117	L166	S20	73
E2	L118	L167	S21	76
E3	L119	L168	S22	76A
E4	L120	L169	S23	83b
E5	L121	L170	S24	88A
E6	L122	L170A	S25	88B
E9	L123	L172	S26	92A
E10	L125	L173	S27	93A
E12	L126	L174	S28	93C
E13	L127	L175	S29	95A
E14	L128	L176	S30	96
E15	L130	L177	S31	96A
H1	L131	L178	S34	96B
H2	L132	L179	S36	102
H3	L133	L180	S37	103
H5	L134	L181	S38	104
H6	L135	L182	S43	107/108
H7	L136	L183	S46	108A
H8	L137	L185	S47	138/X25
H10	L138	L186	S48	139/X24
H11	L139	L187	S49	155
H12	L140	L188	S50	167/X1
H13	L141	L189	X3	171
H14	L142	L190	S90	178
H15	L143	L191	S90a	201
H16	L144	L192	U1	215
H17	L145	L193	U2	259
H21	L146	L194	U3	
H23	L147	L195	U4	
H24	L148	L196	U5	
H25	L149	L197	U6	
H25a	L149/2	L198	U7	
H26	L150	L199	U8	
H30			U9	
H31				
H32				
H37				
H38				
H65				
H66				
H67(a)-(c)				
H68				
H68a				
H69				
H70				
H71				
H72				

APPENDIX 2

KEY TO BUILDING REMEDIATION STATUS REPORT PAGE (refer vols. II to VI)
(HOW TO INTERPRET THE MEANING OF THE 'ITEMS' IN THE LEFT HAND COLUMN)

<i>ITEM</i>	<i>MEANING</i>
BUILDING DESCRIPTION	HISTORIC USE
BUILDING NUMBER	HISTORIC REF NO. (OR 'X' NUMBER FOR PREVIOUSLY UNIDENTIFIED REF)
EXPLOSIVE HAZARD CATEGORY	refer to Volume 1 of this report for a description
CONSTRUCTION	OUTLINE DETAILS OF THE STRUCTURE
BULK EXPLOSIVES & CHEMICALS CLEARED	PACKAGED AND LOOSE ITEMS REMOVED
SERVICES DISCONNECTED	UTILITY SERVICES ISOLATED
FOUL/CHEMICAL DRAINS	WHETHER REMEDIAL WORK EXECUTED ON BELOW GROUND DRAINS
RAIN WATER DRAINS	ditto
BUILDING CLEAN OUT	WHETHER ALL DEBRIS REMOVED AND BUILDING SWEEP
CEMENT BONDED ASBESTOS	WHETHER IDENTIFIED AND REMOVED OR WHAT REMAINS
FIBROUS ASBESTOS	ditto
STAGE 1 STRIP OUT	THE REMOVAL OF ALL INTERNAL FIXTURES AND FITTINGS LEAVING A BARE SHELL
WALL COATINGS	WHETHER INTERNAL WALL SURFACE PAINT FINISH REMOVED OR NOT
STEELWORK	WHETHER INTERNAL STRUCTURAL STEELWORK EXISTS AND IF SURFACE FINISH REQUIRES REMEDIAL TREATMENT OR WHAT TREATMENT CARRIED OUT
FLOOR COVERINGS	eg. LINOLEUM - WHETHER REMOVED OR LEFT IN PLACE
FLOOR SLAB/CONCRETE FLOORS	IF EXISTING - WHETHER REMOVED OR NOT
WOODEN FLOORS	ditto
ABOVE GROUND STRUCTURE	IF REMAINING, IT'S BASIC CONDITION
ROOF	ditto
TEMPORARY WORKS/SAFETY WORKS	TEMPORARY WORKS CARRIED OUT TO STABILISE/MAKE SAFE THE STRUCTURE
RECOMMENDED RESTRICTIONS	refer to Volume 1 of this report for a description