

**THE ROYAL GUNPOWDER FACTORY,
WALTHAM ABBEY, ESSEX
AN RCHME SURVEY, 1993**

L126-L149





THE ROYAL GUNPOWDER FACTORY - WALTHAM ABBEY

NUMBER L126	OLD SERIES	RCHME NUMBER	N.G.R. TL 37634 01378
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NAME/FUNCTION Sewer pump house	START DATE 1951-2	END DATE
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NO PHOTOGRAPHY
AVAILABLE

<p>CARTOGRAPHIC DEPICTION</p> <p>c1960 WASC 900/94 ; L126 c1963 WASC 900/97 ; L126 1972 WASC 900/102 ; L126 1972 WASC 900/104 ; L126 1976 WASC 900/113 ; L126</p>	<p>DOCUMENTARY REFERENCES</p> <p>Plans; L126 B01-B04 ; Plans and ELevaltions 1951-52</p> <p>1972 ERDE List ; Sewer Pump House 1991 Mott McDonald survey 1992 RARDE List ; Sewer Pump House</p>
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<p>PHOTOGRAPHY HISTORIC</p>	<p>PHOTOGRAPHY RCHME 1) 206/F/32 Pump House from South East</p>
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RELATIONSHIPS WITH OTHER MONUMENTS
ASSOCIATED WITH: L170, H17, H31

CONDITION Good

DESCRIPTION

- 1) CONSTRUCTIONAL MATERIAL
Brick
- 2) ROOF MATERIALS AND STRUCTURE
Flat concrete slab
- 3) POWER SOURCE
Electricity
- 4) DIMENSIONS i) L 4.3m ii) W 3.37m iii) HT 2.8m
- 5) The pump house is a single storey brick building, it has a rectangular plan. It is entered through a single door on the west side and is lit by a window on the north wall. Internally are two electric pumps.

THE ROYAL GUNPOWDER FACTORY - WALTHAM ABBEY

NUMBER L127	OLD SERIES	RCHME NUMBER	N.G.R. TL 37850 01138
NAME/FUNCTION Car Hoist		START DATE 1959	END DATE
NO PHOTOGRAPHY AVAILABLE			
CARTOGRAPHIC DEPICTION c1960 WASC 900/94 ; L127 c1963 WASC 900/97 ; L127 1972 WASC 900/102 ; L127 1972 WASC 900/104 ; L127 1976 WASC 900/113 ; L127		DOCUMENTARY REFERENCES Plans; L127 B01 - B08 ; Plans and Elevations 1959 1972 ERDE List ; Car Hoist 1991 Mott McDonald survey 1992 RARDE List ; Car Hoist	
PHOTOGRAPHY HISTORIC		PHOTOGRAPHY RCHME	
RELATIONSHIPS WITH OTHER MONUMENTS ASSOCIATED WITH: L162			
CONDITION			
DESCRIPTION 5) Site unavailable for inspection beneath dump.			

THE ROYAL GUNPOWDER FACTORY - WALTHAM ABBEY

NUMBER L130	OLD SERIES 123	RCHME NUMBER	N.G.R. TL 37700 01476
NAME/FUNCTION Moulding House No2 Cordite Hydraulic Press House Magazine		START DATE 186?? 1898	END DATE 1898?
NO PHOTOGRAPHY AVAILABLE			
<p>CARTOGRAPHIC DEPICTION</p> <p>1865 WASC 900/38 + SUPP5 975 ; Moulding House No.2</p> <p>1865 WASC 900/41A ; Moulding House No.2</p> <p>1865 WASC 900/42</p> <p>1897 WASC 900/53C</p> <p>c1910? WASC 900/65 ; Moulding House No.2</p> <p>c1910? WASC 900/79 ; Moulding House No.2</p> <p>1917 WASC 900/72 ; 123</p> <p>1919 WASC 900/74 ; 123</p> <p>c1920 WASC 900/80 ; 123</p> <p>> 1940 WASC 900/91A ; L130</p> <p>1954 A - B.34 ; L130</p> <p>c1960 WASC 900/94 ; L130</p> <p>c1963 WASC 900/97 ; L130</p> <p>1972 WASC 900/102 ; L130</p> <p>1972 WASC 900/104 ; L130</p> <p>1976 WASC 900/113 ; L130</p>		<p>DOCUMENTARY REFERENCES</p> <p>Plans;</p> <p>L130 B01,B02 ; Plans and Elevations 1892-94</p> <p>1888 Maj.Gen W.H.Wardell <u>Handbook of Gunpowder & Guncotton</u> 1888 Chp V111 p.61-9 Plate X111 p.80</p> <p>1908 RGPF Ledger WASC 1509 + WASC 1764 ; Press House built 1882 p13</p> <p>c1925 RGPF Ledger WASC 1680 ; Press House</p> <p>c1945 RGPF Ledger WASC 1508 ; Press House</p> <p>1972 ERDE List ; Pyrotechnics Store and Workroom</p> <p>1991 Mott McDonald survey</p> <p>1992 RARDE List ; Ruin</p>	
<p>PHOTOGRAPHY HISTORIC</p>		<p>PHOTOGRAPHY RCHME</p> <p>1)206/D/33 View from East</p> <p>206/D/34 View from South East</p> <p>206/D/35 View from West</p>	
<p>RELATIONSHIPS WITH OTHER MONUMENTS</p> <p>ASSOCIATED WITH: L110, L136? <i>RCHME 181</i></p>			
<p>CONDITION Fair</p>			

DESCRIPTION

1) CONSTRUCTIONAL MATERIAL
Brick and earthwork

2) ROOF MATERIALS AND STRUCTURE
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3) POWER SOURCE
Hydraulic? Electricity

4) DIMENSIONS i) L 17.5m ii) W 15.5m iii) HT 5.5m

5) The moulding house sat at the centre of an L shaped traverse the inner face revetted in brick. At the northern edge of the traverse is the remains of a small room two narrow slots in the wall may have formerly housed connections to the machinery within the traverse. The moulding house has been demolished. A concrete floor slab 8.65m x 7.4m covered by asphalt remains this may represent the floor of the later magazine. This magazine was served by the canal to the north, a rotten landing stage remains.

A broken pottery insulator dated 1897 found lying within the traverse may indicate the introduction of electric lighting around this date when the structure was converted into a magazine.

A small store L110 has been cut into the southern side of the traverse.

THE ROYAL GUNPOWDER FACTORY - WALTHAM ABBEY

NUMBER L131	OLD SERIES	RCHME NUMBER	N.G.R. TL 37695 01447
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NAME/FUNCTION Solvent Store	START DATE 1953	END DATE
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NO PHOTOGRAPHY
AVAILABLE

CARTOGRAPHIC DEPICTION

> 1940 WASC 900/91A ; L131
 1954 A - B.34 ; L131
 c1960 WASC 900/94 ; L131
 c1963 WASC 900/97 ; L131
 1972 WASC 900/102 ; L131
 1972 WASC 900/104 ; L131
 1976 WASC 900/113 ; L131

DOCUMENTARY REFERENCES

Plans;
 L131 B01 - B03 ; Plans and Elevations 1953 to 1955
 1972 ERDE List ; Solvent Store
 1991 Mott McDonald survey
 1992 RARDE List ; Solvent Store

PHOTOGRAPHY
HISTORIC

PHOTOGRAPHY
RCHME

RELATIONSHIPS WITH OTHER MONUMENTS

ASSOCIATED WITH: L134? L137?

CONDITION: Demolished

DESCRIPTION

- 1) CONSTRUCTIONAL MATERIAL
- 2) ROOF MATERIALS AND STRUCTURE
- 3) POWER SOURCE
- 4) DIMENSIONS i) L ii) W iii) HT 7 m²
- 5) Demolished, concrete floor slab remains.

THE ROYAL GUNPOWDER FACTORY - WALTHAM ABBEY

NUMBER L132	OLD SERIES 128A	RCHME NUMBER	N.G.R. TL 37666 01452
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NAME/FUNCTION Pump House Physical Test House/Climatic Control Building	START DATE 1914? Post 1945	END DATE 1945
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NO PHOTOGRAPHY
AVAILABLE

CARTOGRAPHIC DEPICTION

1917	WASC 900/70 ; Pump House
1917	WASC 900/72 ; 128a
1919	WASC 900/74 ; 128a
c1920	WASC 900/80 ; 128a
1923	WASC 900/84 ; 128a Pump House
> 1940	WASC 900/91A ; L132
1954	A - B.34 ; L132
c1960	WASC 900/94 ; L132
c1963	WASC 900/97 ; L132
1972	WASC 900/102 ; L132
1972	WASC 900/104 ; L132
1976	WASC 900/113 ; L132

DOCUMENTARY REFERENCES

Plans;	
L132	B01,B02 ; Plans and Elevations 1914 to 1958
c1925	RGPF Ledger WASC 1680 ; Pump House
c1945	RGPF Ledger WASC 1508 ; Pump House
1972	ERDE List ; Physical Test House
1991	Mott McDonald survey
1992	RARDE List ; Physical Test House/ Climate Control Building

PHOTOGRAPHY
HISTORIC
WASC 1543/14 Gen View

PHOTOGRAPHY
RCHME
1)206/B/3 View from top floor of L136 ie from West 206/C/15 From South West
2) BB92/26162 Detail of roof structure from West

RELATIONSHIPS WITH OTHER MONUMENTS

ASSOCIATED WITH: L134

CONDITION Good

DESCRIPTION

- 1) **CONSTRUCTIONAL MATERIAL**
Brick in Flemish Bond
- 2) **ROOF MATERIALS AND STRUCTURE**
Felt over timber boards in a hipped pyramid form
- 3) **POWER SOURCE**
Steam Electricity
- 4) **DIMENSIONS** i) L 5.83 ii) W 5.39 iii) HT Eave 4.3
- 5) The building is a single storey with an almost square plan, it has pyramidal shaped roof. The building is entered through modern double doors on the western side. On the eastern elevation is an original window with a stone sill a metal window has been inserted into the north wall. Across the top of the interior are two RSJs with wheeled runners, the interior has latterly been partitioned.

THE ROYAL GUNPOWDER FACTORY - WALTHAM ABBEY

NUMBER L133	OLD SERIES 128	RCHME NUMBER	N.G.R. TL 37648 01442
NAME/FUNCTION Magazine Paste Store Rework Magazine Propellant Store		START DATE 1879	END DATE
NO PHOTOGRAPHY AVAILABLE			
<p>CARTOGRAPHIC DEPICTION</p> <p>1897 WASC 900/53C c1910 WASC 900/65 ; Paste Store c1910 WASC 900/79 ; 128 1917 WASC 900/70 ; 128 1917 WASC 900/72 ; 128 1919 WASC 900/74 ; 128 c1920 WASC 900/80 ; 128 1923 WASC 900/84 ; 128 > 1940 WASC 900/91A ; L133 1954 A - B.34 ; L133 c1960 WASC 900/94 ; L133 c1963 WASC 900/97 ; L133 1972 WASC 900/102 ; L133 1972 WASC 900/104 ; L133 1976 WASC 900/113 ; L133</p>		<p>DOCUMENTARY REFERENCES</p> <p>Plans; L133 B01 -B03 ; Plans and Elevations</p> <p>1908 RGPF Ledger WASC 1509 + WASC 1764 ; Paste Store built 1879 p13 c1925 RGPF Ledger WASC 1680 ; Paste Store c1945 RGPF Ledger WASC 1508 ; Paste Store</p> <p>1972 ERDE List ; Propellant Store 1991 Mott McDonald survey 1992 RARDE List ; Propellant Store</p> <p>1992 FBRC ; Class 3 Explosives Magazine</p>	
PHOTOGRAPHY HISTORIC		PHOTOGRAPHY RCHME 1) 206/C/17 From West <i>Site Photo</i>	
RELATIONSHIPS WITH OTHER MONUMENTS			
ASSOCIATED WITH:RCHM 179			
CONDITION Fair			

DESCRIPTION

1) **CONSTRUCTIONAL MATERIAL**

Brick in English Bond and two Red Brick bands

2) **ROOF MATERIALS AND STRUCTURE**

Felt over Slate covers a brick vault with suspended ceiling.

3) **POWER SOURCE**

Steam Electricity

4) **DIMENSIONS** i) L 9.3 ii) W 4.77 iii) HT Eave 2.55

5) The magazine is a single storey building, rectangular in plan, with gable ends. It is entered from the western side through modern double doors. Disturbance to the brick work around the entrance may indicate that a small brick porch has been removed. On the north and south elevations are small blocked segmental headed windows. The eastern wall is supported by two brick buttresses. The building is protected by a lightning conductor.

The building was formerly served by the now filled canal RCHM179.

THE ROYAL GUNPOWDER FACTORY - WALTHAM ABBEY

NUMBER L134	OLD SERIES 129A	RCHME NUMBER	N.G.R. TL 37682 01430
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NAME/FUNCTION Press House No. 2 Laboratories	START DATE 1914-1917? 1951	END DATE 1945
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NO PHOTOGRAPHY
AVAILABLE

CARTOGRAPHIC DEPICTION

1917 WASC 900/70 ; Press House No.2
 1917 WASC 900/72 ; 129a
 1919 WASC 900/74 ; 129a
 c1920 WASC 900/80 ; 129a
 1923 WASC 900/84 ; 129a
 > 1940 WASC 900/91A ; L134
 1954 A - B.34 ; L134
 c1960 WASC 900/94 ; L134
 c1963 WASC 900/97 ; L134
 1972 WASC 900/102 ; L134
 1972 WASC 900/104 ; L134
 1976 WASC 900/113 ; L134

DOCUMENTARY REFERENCES

Plans;
 L134 B01 - B36 ; Plans and Elevations 1952 to 1986

 c1925 RGPF Ledger WASC 1680 ; Press House No.2
 1938 Text Book of Explosives 1938 Chp XV
 p99-111 Figs 15.2-9
 c1945 RGPF Ledger WASC 1508 ; Press House No.2
 Not Dated WASC 901/101 Materials Research
 Laboratories "Preliminary"
 1972 ERDE List ; Laboratories
 1991 Mott McDonald survey
 1992 RARDE List ; Laboratories

 1992 FBRC Workshops, Mess, Rm3 Flammable

**PHOTOGRAPHY
HISTORIC**

PRO Supply 5/860 79 1893 Hydraulic Press
 PRO Supply 5/860 81 1893 Large vertical Press. In raised
 letters on the side RGP W ^ D
 PRO Supply 5/861 309-10 Ignition in bay 3 5-aug-1916

**PHOTOGRAPHY
RCHME**

1) 206/U/18 From south
 206/U/19 From south east
 206/U/20 From west
 2) BB92/26367 Documents of Gunpowder Works
 Elevations & Plans

RELATIONSHIPS WITH OTHER MONUMENTS

ASSOCIATED WITH: L143, L146, L151, L155, L159, L187 *RCHME 181*

CONDITION Fair

DESCRIPTION

- 1) CONSTRUCTIONAL MATERIAL
Brick in English Bond
- 2) ROOF MATERIALS AND STRUCTURE
Felt with vents, roof lights to the East
- 3) POWER SOURCE
Hydraulic?, Steam, Electricity
- 4) DIMENSIONS i) L 65.95 ii) W 10.36 iii) HT Eave 3.55
- 5) The building is single storeyed with a rectangular plan the original walls are laid in English bond. The original structure consists of the west wall and the internal brick partition walls creating eight bays. An additional room has been added to the north and south ends and a timber leanto corridor along the eastern side. 10 bays formed by partitions. At the centre of each bay is a metal roof truss. All the interior partition walls are plastered thereby masking any evidence for the transmission of power within the building.

Subject

**REMEDICATION OF UNLISTED
AND UNSCHEDULED BUILDINGS**

To

GRAHAM VINCENTDate **11TH JULY 1994**

From

BOB WATTS

Ref

E5275/53/1/01**Graham,**

Please proceed with organising the stripout by Morris labour of the following buildings, L134, L137, L143, L146, L151, L155 and L160. Please note:-

- 1) L134. Recover Fire Alarm equipment and switchgear, notice boards, and any other items spray marked by Adam Ford. The steel trusses will require eventual grit blasting etc., but this can be undertaken after preliminary strip out.
- 2) L137. The link appears in good condition and should remain undisturbed as L134.
- 3) L143. Timber roof but remainder as L134. Condition not good.
- 4) L146. Ditto L143.
- 5) L151. Ditto L143. Asbestos clad gables.
- 6) L155. Repair leaking. Recover library steps.
- 7) L160. Strip out by M. Thomas. Wire up broken windows to exclude pigeons.
- 8) We should walk these buildings together.

Regards,

BOB WATTS**c.c. Adam Ford - Please mark items for retention.**

Subject **REMEDICATION OF UNLISTED
AND UNSCHEDULED BUILDINGS**

To **Graham Vincent**

Date **11th July 1994**

From **BOB WATTS**
Ref **E5275/53/1/01**

AMENDED

Graham,

Please proceed with organising the stripout by Morris labour of the following buildings, L134, L137, L143, L146, L151, L155 and L160. Please note:-

- 1) L134. Recover Fire Alarm equipment and switchgear, notice boards, and any other items spray marked by Adam Ford. The steel trusses will require eventual grit blasting etc., but this can be undertaken after preliminary strip out.
- 2) L137. The link appears in good condition and should remain undisturbed, otherwise as L134.
- 3) L143. Timber roof but remainder as L134. Condition not good.
- 4) L146. Ditto L143.
- 5) L151. Ditto L143. Asbestos clad gables.
- 6) L155. Repair to leaking roof required. Recover library steps.
- 7) L160. Strip out by M. Thomas. Wire up broken windows to exclude pigeons.
- 8) We should walk these buildings together.

Regards,

BOB WATTS

c.c. Adam Ford - Please mark items for retention.

THE ROYAL GUNPOWDER FACTORY - WALTHAM ABBEY

NUMBER L135	OLD SERIES	RCHME NUMBER 129	N.G.R. TL 37666 01440
NAME/FUNCTION Tray Magazine Workshop		START DATE 1882 195?	END DATE 195?
NO PHOTOGRAPHY AVAILABLE			
<p>CARTOGRAPHIC DEPICTION</p> <p>1865 WASC 900/38 + SUPP5 975 1865 WASC 900/41A 1865 WASC 900/42 1897 WASC 900/53C c1910 WASC 900/65 ; Tray Magazine c1910 WASC 900/79 ; Tray Magazine 1917 WASC 900/70 ; Tray Magazine 1917 WASC 900/72 ; 129 1919 WASC 900/74 ; 129 c1920 WASC 900/80 ; 129 1923 WASC 900/84 ; 129 > 1940 WASC 900/91A ; L135 1954 A - B.34 ; L135 c1960 WASC 900/94 ; L135 c1963 WASC 900/97 ; L135 1972 WASC 900/102 ; L135 1972 WASC 900/104 ; L135 1976 WASC 900/113 ; L135</p>		<p>DOCUMENTARY REFERENCES</p> <p>Plan; L135 B02 - 1894 ; Plan,Section and Elevation 1908 RGPF Ledger WASC 1509 + WASC 1764 1 ; Tray Magazine built 1882 p14 c1925 RGPF Ledger WASC 1680 ; Tray Magazine c1945 RGPF Ledger WASC 1508 ; Tray Magazine 1972 ERDE List ; Workshop 1991 Mott McDonald survey 1992 RARDE List ; Workshop 1992 FBRC ; Stores</p>	
<p>PHOTOGRAPHY HISTORIC WASC 1543/14 Gen View</p>		<p>PHOTOGRAPHY RCHME 1) 206/B/2 View from top of L136 from West 206/C/14 From South West 2) BB92/26266 From South West (Colour) <i>Site Photog.</i></p>	
<p>RELATIONSHIPS WITH OTHER MONUMENTS</p> <p>ASSOCIATED WITH: L107,L135,L137,L138</p>			
CONDITION	Good		

DESCRIPTION

- 1) **CONSTRUCTIONAL MATERIAL**
Brick in English Bond with red brick bands
- 2) **ROOF MATERIALS AND STRUCTURE**
Slate over brick vault
- 3) **POWER SOURCE**
Steam Electricity
- 4) **DIMENSIONS** i) L 9.35 ii) W 3.94 iii) HT 4.6
- 5) The magazine is a single storey building, rectangular in plan, with gabled ends north and south. It was formerly served by a canal on the west side. Entry to the building was under a cover porch, the step of which retains a hide floor covering fixed by copper nails. The doors to the magazine are modern. On the northern elevation is a small segmental headed window with a stone sill and on the eastern wall two brick buttresses. The magazine has subsequently been converted into a workshop, in addition to the insertion of the modern doors a metal window has been inserted into the south window. The workshop was heated by steam pipes.

THE ROYAL GUNPOWDER FACTORY - WALTHAM ABBEY

NUMBER L136	OLD SERIES	RCHME NUMBER 130	N.G.R. TL 37647 01429
NAME/FUNCTION Remote Accumulator Tower Offices		START DATE 1878 1948	END DATE 1945
NO PHOTOGRAPHY AVAILABLE			
<p>CARTOGRAPHIC DEPICTION</p> <p>1865 WASC 900/38 + SUPP5 975 ; Accumulator House</p> <p>1865 WASC 900/41A ; Accumulator House</p> <p>1865 WASC 900/42 ; Accumulator House</p> <p>1897 WASC 900/53C</p> <p>c1910 WASC 900/65 ; Accumulator House</p> <p>c1910 WASC 900/79 ; Accumulator House</p> <p>1917 WASC 900/70 ; Accumulator House</p> <p>1917 WASC 900/72 ; 130</p> <p>1919 WASC 900/74 ; 130</p> <p>c1920 WASC 900/80 ; 130</p> <p>1923 WASC 900/84 ; 130</p> <p>> 1940 WASC 900/91A ; L136</p> <p>1954 A - B.34 ; L136</p> <p>c1960 WASC 900/94 ; L136</p> <p>c1963 WASC 900/97 ; L136</p> <p>1972 WASC 900/102 ; L136</p> <p>1972 WASC 900/104 ; L136</p> <p>1976 WASC 900/113 ; L136</p>		<p>DOCUMENTARY REFERENCES</p> <p>Plans; L136 B01 -B03 ; Plans and Elevations 1878 to 1970</p> <p>1908 RGPF Ledger WASC 1509 + WASC 1764 ; Accumulator House built 1879 p14</p> <p>c1925 RGPF Ledger WASC 1680 ; Accumulator House</p> <p>c1945 RGPF Ledger WASC 1508 ; Accumulator House</p> <p>1972 ERDE List ; TR Tower</p> <p>1991 Mott McDonald survey</p> <p>1992 RARDE List ; TR Tower</p>	
<p>PHOTOGRAPHY HISTORIC</p>		<p>PHOTOGRAPHY RCHME</p> <p>1) 206/B/1 View looking South 206/C/10 From South West 206/D/37 Gen view South from L136</p> <p>2) BB92/26097 Remote Accumulator Tower built 1878 From South East BB92/26115 View from South West</p> <p><i>Site Photo.</i></p>	
<p>RELATIONSHIPS WITH OTHER MONUMENTS</p> <p>ASSOCIATED WITH: L149, L130, L137, L132?, S31?, 107?, 108?</p>			
<p>CONDITION</p> <p>Good</p>			

DESCRIPTION

- 1) CONSTRUCTIONAL MATERIAL
Brick in English Bond
- 2) ROOF MATERIALS AND STRUCTURE
Flat Concrete slab over RSJ
- 3) POWER SOURCE
i) Water ii) Electricity
- 4) DIMENSIONS i) L 6.4 ii) W 6.39
- 5) The present structure has three storeys and is square in plan. All the elevations of the building have a single blind panel and the remains of two narrow blocked windows are visible on each elevation. Subsequent to its conversion to office accomodation two floors and a staircase have been inserted along with larger windows. On the southern elevation a stone plaque has the following inscription 'RGPF VR 1879'.

This tower acted as a remote accumulator for L149.

THE ROYAL GUNPOWDER FACTORY - WALTHAM ABBEY

NUMBER L137	OLD SERIES	RCHME NUMBER 134	N.G.R. TL 37725 01418
NAME/FUNCTION Gun Cotton Press House Hydraulic Press House & Experimental House Press House No. 3 Hydraulic Press House Group H Laboratory		START DATE pre 1886 1947	END DATE 1945

NO PHOTOGRAPHY
AVAILABLE

CARTOGRAPHIC DEPICTION	DOCUMENTARY REFERENCES
<p>1865 WASC 900/41A ; Guncotton Press House & Experimental House</p> <p>1865 WASC 900/42</p> <p>1897 WASC 900/53C</p> <p>c1910 WASC 900/65 ; Hydraulic Press House, Group H</p> <p>c1910 WASC 900/79 ; Hydraulic Press House, Group H</p> <p>1917 WASC 900/70 ; Press House No.3</p> <p>1917 WASC 900/72 ; 134</p> <p>1919 WASC 900/74 ; 134</p> <p>c1920 WASC 900/80 ; 134</p> <p>1923 WASC 900/84 ; 134</p> <p>> 1940 WASC 900/91A ; L137</p> <p>1954 A - B.34 ; L137</p> <p>c1960 WASC 900/94 ; L137</p> <p>c1963 WASC 900/97 ; L137</p> <p>1972 WASC 900/102 ; L137</p> <p>1972 WASC 900/104 ; L137</p> <p>1976 WASC 900/113 ; L137</p>	<p>Plans;</p> <p>L137 B01 - B53 ; Plans and Elevations 1947 to 1983</p> <p>1908 RGPF Ledger WASC 1509 + WASC 1764 ; Hydraulic Press House Group H built 1902/3/4 p14</p> <p>c1925 RGPF Ledger WASC 1680 ; Hydraulic Press House Group H</p> <p>c1945 RGPF Ledger WASC 1508 ; Hydraulic Press House Group H</p> <p>1972 ERDE List ; Lab. Press House No.2</p> <p>1991 Mott McDonald survey</p> <p>1992 RARDE List ; Lab. Press House No.2</p> <p>1992 FBRC ; Lab. Offices Laser Hazard</p>

<p>PHOTOGRAPHY HISTORIC</p> <p>WASC 741 Old Guncotton & Cordite conv to labs 1968</p> <p>WASC 742 Old Guncotton & Cordite conv to labs 1968</p> <p>WASC 1524/26 Dr D Sims test of plastics breaking point</p> <p>PRO Supply 5/861 213 10-May-1905 Cordite Press bay 2</p> <p>PRO Supply 5/861 214 10-May-1905 Lift with cylinder bay 2</p> <p>PRO Supply 5/861 215 10-May-1905 Front elevation showing toe boards and railway at north end</p> <p>PRO Supply 5/861 10-May-1905 Rear elevation showing pipes, (?hydraulic or ?heating)</p> <p>PRO Supply 5/861 238-243 Damage to cordite press bay 1</p> <p>2-Dec-1907</p> <p>PRO Supply 5/861 265-9, 271 Cordite press explosion, no date</p>	<p>PHOTOGRAPHY RCHME</p> <p>1) 206/G/36 From South</p> <p>206/T/28 From South East</p> <p>2) BB92/25356 No3 Press House Sections Plans & Elevations</p> <p>BB92/26377 Extension of Press House Group H</p> <p>BB92/26383 Extension of Press House Group H</p> <p>BB92/26384 Extension of Press House Group H</p> <p><i>Site Photog.</i></p>
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RELATIONSHIPS WITH OTHER MONUMENTS

ASSOCIATED WITH: Expense Magazines L107,L135 L138 Secondary L136, L131, L149 *ACTIVE 181*

CONDITION Good

DESCRIPTION

- 1) CONSTRUCTIONAL MATERIAL
 Brick
- 2) ROOF MATERIALS AND STRUCTURE
 Felt
- 3) POWER SOURCE
 Electricity
- 4) DIMENSIONS i) L 53.1 ii) W 8.6
- 5) This building is single storeyed and is rectangular in plan. It is divided into seven bays by five internal partition walls. All the internal walls were plastered. The north and south bays are later additions as is the brick corridor along the eastern side. The bays partly lit by glass roof lights.

THE ROYAL GUNPOWDER FACTORY - WALTHAM ABBEY

NUMBER L138	OLD SERIES	RCHME NUMBER 133/139	N.G.R. TL 37678 01410
NAME/FUNCTION Dough Store No. 7 Store House		START DATE 1870	END DATE
NO PHOTOGRAPHY AVAILABLE			
<p>CARTOGRAPHIC DEPICTION</p> <p>1917 WASC 900/70 ; Dough Store No.7 1917 WASC 900/72 ; 139 1919 WASC 900/74 ; 133 c1920 WASC 900/80 1923 WASC 900/84 ; 133 > 1940 WASC 900/91A ; L138 1954 A - B.34 ; L138 c1960 WASC 900/94 ; L138 c1963 WASC 900/97 ; L138 1972 WASC 900/102 ; L138 1972 WASC 900/104 ; L138 1976 WASC 900/113 ; L138</p>		<p>DOCUMENTARY REFERENCES</p> <p>1908 RGPF Ledger WASC 1509 + WASC 1764 ; Dough Store built 1870 p14 c1925 RGPF Ledger WASC 1680 ; Dough Store c1945 RGPF Ledger WASC 1508 ; Dough Store 1972 ERDE List ; Store House 1991 Mott McDonald survey 1992 RARDE List ; Store House</p>	
<p>PHOTOGRAPHY HISTORIC</p>		<p>PHOTOGRAPHY RCHME</p> <p>1) 206/C/11 From South West</p>	
<p>RELATIONSHIPS WITH OTHER MONUMENTS</p> <p>ASSOCIATED WITH L107,L135, L137</p>			
<p>CONDITION</p>		<p>Fair</p>	

DESCRIPTION

- 1) CONSTRUCTIONAL MATERIAL
Brick in English Bond
- 2) ROOF MATERIALS AND STRUCTURE
Slate over brick vault
- 3) POWER SOURCE
Steam Electricity
- 4) DIMENSIONS i) L 4.01 ii) W 3.94 iii) HT Gable 3.7
- 5) The store is a single storey building, it has an almost square plan. The store was served by the adjacent canal to the west. The entrance is protected by a covered timber porch. At the threshold of the door is a removable shoe board to delimit a dirty and clean area. Windows have been inserted into the north and south walls. The interior has centrally suspended steam pipes. The building is earthed.

THE ROYAL GUNPOWDER FACTORY - WALTHAM ABBEY

NUMBER L139	OLD SERIES	RCHME NUMBER	N.G.R. TL 37706 01354
NAME/FUNCTION Magazine		START DATE 1958?	END DATE
NO PHOTOGRAPHY AVAILABLE			
CARTOGRAPHIC DEPICTION		DOCUMENTARY REFERENCES	
c1960	WASC 900/94 ; L139	Plans;	
c1963	WASC 900/97 ; L139	L139	B01,B02 ; Plans and Elevations 1957 to 1961
1972	WASC 900/102 ; L139		
1972	WASC 900/104 ; L139	1972	ERDE List ; Magazine
1976	WASC 900/113 ; L139	1991	Mott McDonald survey
		1992	RARDE List ; Magazine
PHOTOGRAPHY HISTORIC		PHOTOGRAPHY RCHME	
		1) 206/P/12 From South 206/P/13 From South doors open	
		2) BB92/26095 View from South West BB92/26096 View from South West BB92/26115 View from South West	
RELATIONSHIPS WITH OTHER MONUMENTS			
ASSOCIATED WITH: L143, L146			
CONDITION	Good		
DESCRIPTION			
1)	CONSTRUCTIONAL MATERIAL Brick in Stretcher bond		
2)	ROOF MATERIALS AND STRUCTURE Corrugated Asbestos		
3)	POWER SOURCE Steam Electricity		
4)	DIMENSIONS i) L 4.35 ii) W 2.9 iii) HT Gable 2.9		
5)	The building is a single storey building with a rectangular plan with gables elevations east and west. The building is divided into two self contained rooms by a central wall. The southern room is entered through double doors on the south wall, internally the room is shelved and heated with steam pipes. The northern room is also entered through double doors, with a red shoe board at the threshold. Internally there is a single shelf, it is heated by steam pipes. The building is earthed and connected to a lightning pole 7.0m in height attached to the east wall.		

THE ROYAL GUNPOWDER FACTORY - WALTHAM ABBEY

NUMBER L140	OLD SERIES	RCHME NUMBER	N.G.R. TL 37672 01365
NAME/FUNCTION Locker Magazine		START DATE 1955?	END DATE
NO PHOTOGRAPHY AVAILABLE			
CARTOGRAPHIC DEPICTION c1960 WASC 900/94 ; L140 c1963 WASC 900/97 ; L140 1972 WASC 900/102 ; L140 1972 WASC 900/104 ; L140 1976 WASC 900/113 ; L140		DOCUMENTARY REFERENCES Plan; L140 B01 - 10/4/1961 ; Extention to Magazine 1972 ERDE List ; Locker Magazine 1991 Mott McDonald survey 1992 RARDE List ; Locker Magazine 1992 FBRC ; Class 1 Explosives	
PHOTOGRAPHY HISTORIC		PHOTOGRAPHY RCHME 1) 206/C/13 From South West	
RELATIONSHIPS WITH OTHER MONUMENTS ASSOCIATED WITH: L145			
CONDITION Good			
DESCRIPTION 1) CONSTRUCTIONAL MATERIAL Brick in English bond 2) ROOF MATERIALS AND STRUCTURE Corrugated asbestos 3) POWER SOURCE Electricity 4) DIMENSIONS i) L 5.5m ii) W 2.6m ii) HT gable 2.6m 5) The magazine is a single storey building, it has a rectangular plan and is laid in English bond. roof. The building is protected by a copper strip lightning conductor. Internally are metal locker magazines.			

THE ROYAL GUNPOWDER FACTORY - WALTHAM ABBEY

NUMBER L141	OLD SERIES 143	RCHME NUMBER	N.G.R. TL 37652 01376
NAME/FUNCTION Expense Magazine Sorting house no. 1 Sorting house no. 2 Solvent extraction room	START DATE 1899 ?1959	END DATE 1959?	
NO PHOTOGRAPHY AVAILABLE			
CARTOGRAPHIC DEPICTION		DOCUMENTARY REFERENCES	
<p>1897 WASC 900/53C c1910 WASC 900/65 ; Sorting House No.1 c1910 WASC 900/79 ; Sorting House No.1 1917 WASC 900/70 ; Sorting House No.1 1917 WASC 900/72 ; 143 1919 WASC 900/74 ; 143 c1920 WASC 900/80 ; 143 1923 WASC 900/84 ; 143 > 1940 WASC 900/91A ; L141 1954 A - B.34 ; L141 c1960 WASC 900/94 ; L141 c1963 WASC 900/97 ; L141 1972 WASC 900/102 ; L141 1972 WASC 900/104 ; L141 1976 WASC 900/113 ; L141</p>		<p>Plans; L141 B01,B02 ; Plans and Elevations 1958,1982 1908 RGPF Ledger WASC 1509 + WASC 1764 ; Sorting House built 1889 p15 c1925 RGPF Ledger WASC 1680 ; Sorting House c1945 RGPF Ledger WASC 1508 ; Sorting House 1972 ERDE List ; Solvent Extraction Room 1991 Mott McDonald survey 1992 RARDE List ; Solvent Extraction Room</p>	
PHOTOGRAPHY HISTORIC		PHOTOGRAPHY RCHME 1) 206/F/33 From South West 2) BB92/26094 From North West	
RELATIONSHIPS WITH OTHER MONUMENTS ASSOCIATED WITH: L145			
CONDITION		Good	

DESCRIPTION

1) CONSTRUCTIONAL MATERIAL
Brick in English bond

2) ROOF MATERIALS AND STRUCTURE
Slate with tile ridges over brick vault

3) POWER SOURCE
Electricity and steam heating

4) DIMENSIONS i) L 5.8m ii) W 4m iii) HT gable 5.2m

5) The expense magazine is a single storey building, rectangular in plan with gabled ends. It is constructed of buff bricks laid in English bond, with red brick details. The magazine is roofed in slate with ridge tiles over a brick vault. It is lit by a small windows on the north and south walls. A leanto was formerly attached the eastern elevation. The magazine was entered through a raised door on the western side. This was formerly served by a narrow guage railway on trestles. The following is painted on the side of the building '143 3-34'.

THE ROYAL GUNPOWDER FACTORY - WALTHAM ABBEY

NUMBER L142	OLD SERIES	RCHME NUMBER	N.G.R. TL 37767 01276
NAME/FUNCTION Toilet		START DATE 1952	END DATE
NO PHOTOGRAPHY AVAILABLE			
CARTOGRAPHIC DEPICTION c1960 WASC 900/94 ; L142 c1963 WASC 900/97 ; L142 1972 WASC 900/102 ; L142 1972 WASC 900/104 ; L142 1976 WASC 900/113 ; L142		DOCUMENTARY REFERENCES 1972 ERDE List ; Toilet 1991 Mott McDonald survey 1992 RARDE List ; Toilet	
PHOTOGRAPHY HISTORIC		PHOTOGRAPHY RCHME 1)206/G/31 From South West <i>Site Photo</i>	
RELATIONSHIPS WITH OTHER MONUMENTS ASSOCIATED WITH: L149, L151			
CONDITION Good			
DESCRIPTION 1) CONSTRUCTIONAL MATERIAL Brick in stretcher bond 2) ROOF MATERIALS AND STRUCTURE Corrugated Asbestos 3) POWER SOURCE Electricity 4) DIMENSIONS i) L 4.14 ii) W 3.37 iii) HT Gable 3.53 5) The building is a single storey it has a rectangular plan. The gentlemen's toilet has a single door on the south elevation and a single window on the north elevation.			

THE ROYAL GUNPOWDER FACTORY - WALTHAM ABBEY

NUMBER L143	OLD SERIES	RCHME NUMBER 143A	N.G.R. TL 37719 01348
NAME/FUNCTION Cordite Incorporating house Laboratory/Electrode Boiler		START DATE 1914-17? 1946	END DATE 1945
NO PHOTOGRAPHY AVAILABLE			
<p>CARTOGRAPHIC DEPICTION</p> <p>1917 WASC 900/70 ; Incorporating House No.1 1917 WASC 900/72 ; 143a 1919 WASC 900/74 ; 143a c1920 WASC 900/80 ; 143a 1923 WASC 900/84 ; 143a > 1940 WASC 900/91A ; L143 1954 A - B.34 ; L143 c1960 WASC 900/94 ; L143 c1963 WASC 900/97 ; L143 1972 WASC 900/102 ; L143 1972 WASC 900/104 ; L143 1976 WASC 900/113 ; L143</p>		<p>DOCUMENTARY REFERENCES</p> <p>Plans; L143 B01 - B33 ; Plans and Elevations 1954 to 1973</p> <p>c1925 RGPF Ledger WASC 1680 ; Incorporating House No.1 c1945 RGPF Ledger WASC 1508 ; Incorporating House No.1</p> <p>1972 ERDE List ; Labs. and Plastic Moulding 1991 Mott McDonald survey 1992 RARDE List ; Electrode Boiler House/Incorporating Mill</p> <p>1992 FBRC ; Decontamination Ovens</p>	
<p>PHOTOGRAPHY HISTORIC</p>		<p>PHOTOGRAPHY RCHME 2) BB92/26092 Cordite incorp house steam pipe over canal from South West 4) 4788/7 06.05.1993</p>	
<p>RELATIONSHIPS WITH OTHER MONUMENTS</p> <p>ASSOCIATED WITH: L134, L146, L151, L155, L159</p>			
<p>CONDITION Fair</p>			

DESCRIPTION

1) CONSTRUCTIONAL MATERIAL
Brick in part English bond

2) ROOF MATERIALS AND STRUCTURE
Felt over flat roof

3) POWER SOURCE
Electricity

4) DIMENSIONS i) L 27.5 ii) W 14.7 iii) HT Eave 3.1

5) The building is a single storey, it has a rectangular plan the original parts of the building are laid in English bond. The building has gable walls at the north and south end. In the northern wall a small blocked feature high on the wall probably marks the position of a bearing box. The building is divided into six bays by four internal partition walls in English bond. A modern flat roof extension has been added to the eastern side. Along the west side a brick and timber corridor has been added.

THE ROYAL GUNPOWDER FACTORY - WALTHAM ABBEY

NUMBER L144	OLD SERIES	RCHME NUMBER	N.G.R. TL 37709 01270
NAME/FUNCTION Solvent & Waste Store		START DATE 1960?	END DATE
NO PHOTOGRAPHY AVAILABLE			
CARTOGRAPHIC DEPICTION c1960 WASC 900/94 ; L144 c1963 WASC 900/97 ; L144 1972 WASC 900/102 ; L144 1972 WASC 900/104 ; L144 1976 WASC 900/113 ; L144		DOCUMENTARY REFERENCES Plan; L144 B01 - 31/5/59 ; Proposed New Solvent Store 1972 ERDE List ; Solvent and Waste Store 1991 Mott McDonald survey 1992 RARDE List ; Solvent and Waste Store	
PHOTOGRAPHY HISTORIC		PHOTOGRAPHY RCHME 1)206/M/1 From South East	
RELATIONSHIPS WITH OTHER MONUMENTS ASSOCIATED WITH: L153, L148, L164, L150			
CONDITION Good			
DESCRIPTION 1) CONSTRUCTIONAL MATERIAL Brick 2) ROOF MATERIALS AND STRUCTURE Corrugated Asbestos 3) POWER SOURCE Electricity 4) DIMENSIONS i) L 4.8 ii) W 2.29 iii) HT 2.63 5) The store is a single storey building, rectangular in plan with a gabled roof. The store is divided into two by a central partition wall. On the south elevation is a double door the northern room was entered through a grilled door. Attached to the north wall is a veranda, a notice reads 'ACETONE CLEAN TRICHLORETHYLENE RECOVERED TRICHLORETHYLENE'. Also attached to the north wall is a small yellow glass fronted cabinet.			

THE ROYAL GUNPOWDER FACTORY - WALTHAM ABBEY

NUMBER L145	OLD SERIES	RCHME NUMBER 152	N.G.R. TL 37674 01340
NAME/FUNCTION Gunpowder Incorporating Mills Group F Cordite Incorporating House 6 Group F/Spare Gear Room No1 Laboratory		START DATE 1879 1898 1946	END DATE 1898 1945
NO PHOTOGRAPHY AVAILABLE			
<p>CARTOGRAPHIC DEPICTION</p> <p>1865 WASC 900/38 + SUPP5 975 ; Group F Incorp. Mills , Engine House , Boiler House/Coal Yard</p> <p>1865 WASC 900/41A ; Group F Incorp. Mills , Engine House , Boiler House/Coal Yard</p> <p>1865 WASC 900/42 ; Group F Incorp. Mills , Engine House , Boiler House/Coal Yard</p> <p>1897 WASC 900/53C</p> <p>c1910 WASC 900/65 ; Incorp House Group F</p> <p>c1910 WASC 900/79 ; Incorp House Group F</p> <p>1917 WASC 900/70 ; Incorp. House No. 6/ Spare Gear Room No. 1</p> <p>1917 WASC 900/72 ; 152</p> <p>1919 WASC 900/74 ; 152</p> <p>c1920 WASC 900/80 ; 152</p> <p>1923 WASC 900/84 ; 152</p> <p>> 1940 WASC 900/91A ; L145</p> <p>1954 A - B.34 ; L145</p> <p>c1960 WASC 900/94 ; L145</p> <p>c1963 WASC 900/97 ; L145</p> <p>1972 WASC 900/102 ; L145</p> <p>1972 WASC 900/104 ; L145</p> <p>1976 WASC 900/113 ; L145</p>		<p>DOCUMENTARY REFERENCES</p> <p>Plans; L145 B01 - B95 ; Plans and Elevations 1946 to 1963</p> <p>1908 RGPF Ledger WASC 1509 + WASC 1764 ; Incorp House Group F built 1879 p17</p> <p>c1925 RGPF Ledger WASC 1680 ; Incorp House Group F</p> <p>c1945 RGPF Ledger WASC 1508 ; Incorp House Group F</p> <p>Not Dated WASC 901/137 Group F Mills Alterations at porch to magazine & additions to platform</p> <p>1972 ERDE List ; Analytical House</p> <p>1991 Mott McDonald survey</p> <p>1992 RARDE List ; Lab/Incorp House No.6</p> <p>1993 RCHME NBR No. 91459</p>	
<p>PHOTOGRAPHY HISTORIC</p> <p>WASC 1524/22-25 Production of Ethyl cellulose tube for Giant Viper</p>		<p>PHOTOGRAPHY RCHME</p> <p>1) 206/P/2 From South West 206/P/3 Group F mills 1878</p> <p>2) BB92/26100 View from North West BB92/26177 View from North West (Colour)</p> <p>3) 225/A/12-14 Underground piping</p> <p>4) 4788/7 06.05.1993 4788/8 06.05.1993</p> <p style="color: red; font-style: italic;">Site Photog.</p>	

RELATIONSHIPS WITH OTHER MONUMENTS

ASSOCIATED WITH: L140, L141, L148, L149, L153, L157

CONDITION Good

DESCRIPTION

- 1) CONSTRUCTIONAL MATERIAL
Brick
 - 2) ROOF MATERIALS AND STRUCTURE
Felt on timber boards over iron tension rod trusses
 - 3) POWER SOURCE
Formerly steam latterly steam heating and electric lighting
 - 4) DIMENSIONS i) L 50.6m ii) W 9.6m iii) HT gable estimate 5.7m
 - 5) Plaque on front of engine house tower reads 'Group F Mills 1878'.
- See attached RCHME Threatened Buildings Section Report.

Boiler house had roof (flat later) removed with intention of replacing with part EH funded original lookalike. Removal complete, resources unavailable to complete reinstatement. Issue raised with EH Threatened Buildings Section: A. Derrick. No action taken. Tops of walls protected by polythene - will not last 1 yr.

ROYAL COMMISSION ON THE HISTORICAL MONUMENTS OF ENGLAND

MOD Building No. L145
Group F Incorporating Mills
The Royal Gunpowder Factory
Waltham Abbey
Essex

NBR No: 91459
NGR: TL 37674 01340

Built in 1878, the Group F Incorporating Mills building has a T-shaped plan which comprises a central Engine House, with a Boiler House at its east end, and three-bay cross wings on its north and south sides for six gunpowder incorporating mills. There was an open verandah along the west front. On the south side of the Boiler House was a coal yard containing a tall chimney.

The Engine House, Boiler House and partition walls separating the bays in the incorporating mills are constructed of yellow brick laid in English bond. The roofs and side walls were less substantial, being of wood and canvas or felt, with a slight iron framework.

The original gearing for the machinery of the mills was in a chamber below the ground.

-oo0oo-

The Group F Incorporating Mills building was constructed in 1878.¹ Its design is similar to the other incorporating mills in this area of the site and was almost identical to the adjacent Group G Incorporating Mills building of 1888-9, for which it was a model.

Its T-shaped plan comprises a central Engine House, with a Boiler House at its east end, and cross wings on its north and south sides which are each of three bays and contained a total of six gunpowder incorporating mills.² There was an open verandah along the west front. On the south side of the Boiler House was a coal yard containing a chimney at the centre of its west wall.

Both the Engine House and the Boiler House are constructed of yellow brick laid in English bond, with a chamfered brick plinth and brick dentil cornice. Each had a hipped roof with a board and lead covering.

The Engine House has a rectangular plan, with internal dimensions of approximately 30' by 13'6" (9.15 x 4.1 m).³ It is entered through a doorway from the open verandah on the west side and through a doorway reached by stairs rising up from the Boiler House on the east side. On the upper part of the east and west elevations of the Engine House there are a pair of window with a semi-circular heads of rubbed red brick. The north and south elevations had no fenestration originally. The Engine House carried a steam engine to drive the edge runners of the incorporating mills in the cross wings.

On the east side of the Engine House is the Boiler House which has a rectangular plan of approximately 21'2" by 53'4 1/4" (6.45 x 16.3 m).⁴ Brick pilasters separate the exterior elevations into four bays by one bay. The north bays each contained a window with a cambered head. There was a doorway in the east elevation bay which had a semi-circular head with a keystone. The Boiler House carried two boilers which were aligned east to west.⁵ The roof contained nine trusses which had round wrought

A datestone below the two windows on the western side of the Engine House bears the inscription "Group F Mills 1878".

Although the building faces west-south-west and the cross wings are aligned north-north-west to south-south-east, for clarity in this report the building is described as if it faced west.

Drawing of plan and sections of "Waltham Abbey, Extension of Factory, New Incorporating Mills - Group F", dated 12/1877, ?no cat. no. (L145/2), (MOD Central Disposals Unit, Chessington).

Drawing of plan and sections of "Waltham Abbey, Extension of Factory, New Incorporating Mills - Group F", dated 12/1877, ?no cat. no. (L145/2), (MOD Central Disposals Unit, Chessington).

Drawing of "Waltham Abbey, Extension of Factory, New Incorporating Mills Group F", dated 12/1877, ?no cat. no. (L145/2) (MOD Central Disposals Unit, Chessington).

iron tension rods, king rods, decorative cast iron compression members and cast iron ventilators. The roof had tongued boarding and lead coverings.

Serving the Boiler House, on its south side was the coal yard with a brick wall and an octagonal chimney which was 75' (22.86 m) in height and constructed of brick.⁶

The cross wings, originally containing the gunpowder incorporating mills, are of three bays each. They are single-storeyed and had a gabled roof which rose to just below the eaves of the Engine House. The bays are separated by partition walls, aligned east to west, which are constructed of brick laid in English bond. The front and back walls would have been of wood and canvas or felt, with shutters in an iron framing. The outer side of the verandah on the west side of the cross wings and Engine House originally had slender columns of cast iron. There were timber cabins at the north and south ends. The roof was of iron framing with a board and lead covering.⁷ The relatively insubstantial fabric for the sides and roof of the cross wings could be easily replaced in the event of an explosion.⁸ Drenching apparatus would have been erected over each pair of runners. In the event of an explosion, a wooden shutter would have been lifted automatically to release 40 gallons (182 l) of water from a cistern in the drenching apparatus of all of the mills in the building.⁹

The procedure for combining the ingredients of saltpetre, sulphur and charcoal to form gunpowder in each of the mills in the cross wing appears to have been essentially the same as it had been since 1857 when the first of the incorporating mills buildings (Group A; Building L169, now gone) was built.¹⁰ The following is an extract from the Handbook of Gunpowder and Guncotton, 1888, which describes both the machinery and the process of Incorporating or Milling as carried out in this type of incorporating mill building at the Royal Gunpowder Factory at Waltham Abbey:

The incorporating mill consists of a circular iron or stone bed, about 7 feet in diameter (fixed very firmly in the floor of the building), whereon the iron or stone cylindrical edge runners revolve The runners have a common axle, resting in gun-metal bouches in a solid cross-head attached to a vertical shaft, which, passing through a bearing in the centre of the bed, is in gear with the machinery, which is ... beneath it in cast iron tanks in the new steam mills. ...

The bed has a sloping rim on the outside, called the "curb," and on the inside, an edge formed by the "cheese," or bearing through which the vertical shaft passes. The runners are not equidistant from the centre of the shaft; one works the part of the charge nearest the centre of the bed, the other the outer part, but their paths overlap; two "ploughs" of wood, covered with leather, attached to the cross-head by arms or brackets (one working next the vertical shaft, the other to the rim), throw the composition under the runners, as it works away from them.

The green charge to brought in its bag, and put on the bed of the mill, being spread evenly by means of a wooden rake; it is then "liquored," or moistened with distilled water, and is worked for 4 hours under iron runners for R.F.G. powder, which time was formerly considered sufficient to render the incorporation complete in every respect; but R.F.G2 powder is incorporated about 8 hours under iron runners. MG1, for Nordenfelt guns, is kept 7 hours under iron runners. The granulated cannon powders now made (RLG2 and RLG4) are incorporated for 3 hours under iron runners, an additional hour being allowed if worked under stone runners. All "dust" and "re-work" charges are milled for 40 minutes.

Ledger c1908, cat. WASC 1509 (MOD Central Disposals Unit, Chessington).

Drawing of "Waltham Abbey, Extension of Incorporating Mills Group F", dated 12/1877, ?no cat. no., L145/2 (MOD Central Disposals Unit, Chessington).

"A Handbook of the Manufacture and Proof of Gunpowder, as carried on at the Royal Gunpowder Factory, Waltham Abbey," by Captain F M Smith, Royal Artillery, Assistant Superintendent. London, 1870, p43.

"A Handbook of the Manufacture and Proof of Gunpowder, as carried on at the Royal Gunpowder Factory, Waltham Abbey," by Captain F M Smith, Royal Artillery, Assistant Superintendent, 1870. Printed by Order of the Secretary of State for War, London.

The same procedure is outlined in both "A Handbook of the Manufacture and Proof of Gunpowder, as carried on at the Royal Gunpowder Factory, Waltham Abbey," by Captain F.M. Smith, Royal Artillery, Assistant Superintendent, 1870 and "Handbook of Gunpowder and Guncotton," by W.H. Wardell, 1888.

... During the time of working the millman enters the mill occasionally, takes a wooden "shover," and pushes the outside of the charge into the middle of the path of the runners, so that every portion may be regularly incorporated.

... The action of the runners is a combination of rolling and twisting, and has, on a large scale, somewhat the effect of a pestle and mortar, crushing, rubbing, and mixing, thus giving the charge a most intimate union.

.. When the charge, which in this state is called "mill-cake," is ready to be taken off the bed, it should be uniform in appearance, not having any specks of either saltpetre or sulphur visible to the eye, and of a greyish or brownish colour, according to the charcoal used.

Finally the mill cake would have been taken from the incorporating mill to a detached expense magazine. It would then have been taken in covered trucks to a "breaking down" house¹¹.

The underground chamber, which contained the independent gearing for each of the six mills, appears to have been flat-roofed, like that in the chamber of the adjacent Group G Incorporating Mills.¹² Almost all of the machinery of the gunpowder incorporating mills has been removed. The intermediate pinion wheel beams survive in the chamber.

Like most of the other gunpowder incorporating mills buildings on the site, this building was probably converted to take cordite incorporating mills in the late nineteenth century or early twentieth century.¹³ It would have been then that the gunpowder incorporating mills were removed from the building. The cross wing partition walls have "I" girders and blocked openings in the gables which are likely to belong to shafting for machinery associated with cordite manufacture.

The timber cabins at the north and south ends of the cross wings were demolished in December of 1905.¹⁴ The chimney was demolished in c1908-9.¹⁵

The building was extensively altered in the mid twentieth century for use as laboratories. In c1955 the gable roofs and partition walls of the cross wings were lowered, and probably at this time the Boiler House roof was replaced by a flat roof.¹⁶ A drawing of 1956 shows that by this date the Boiler House was used as a propellant laboratory, with a balance room and solvent laboratory at its west end, the Engine House had a floor inserted to create an optical laboratory on the ground floor and an office above, and the bays, from north to south, were: initiator's laboratory, HE and compatibility laboratory, micro-analysis laboratory, oven room and H&S laboratory, store and physical laboratory, and preparation room.¹⁷ It was probably with this conversion that new windows were inserted in the bays on the north and south sides of the Boiler House and on the south elevation of the Engine House, and possibly then that the cast iron columns of the verandah were removed. A link block, of

"How Explosives are Made" by William G. Fitzgerald, The Strand Magazine, Vol IX Jan-June 1895.

Drawing of "Waltham Abbey, Extension of Factory, New Incorporating Mills Group F", dated 12/1877, ?no cat. no, L145/2 (MOD Central Disposals Unit, Chessington).

The building is labelled as Incorporating Houses Group F in the OS County Series 1:2500 maps, 2nd ed. 1897 (surveyed 1865-9, revised 1895), sheet refs XLIX.14, XLI.8.12, XLII.5.9.

Another building, Group G Incorporating Mills, were converted from black gunpowder incorporating mills to cordite incorporating mills in 1898-9 and it is probable that most of the gunpowder incorporating mills were dismantled and converted in this way at around the same time.

Ledger c1908, cat. WASC 1509 (PRO, Hayes Repository).

Ledger c1908, cat. WASC 1509 (PRO, Hayes Repository).

Drawing showing specifications for conversion of building L145 to analytical laboratories, dated 9/1955, cat. L145.B.15 (MOD Central Disposals Unit, Chessington).

Drawing of "LPHW Heating and Layout of Plant Room", dated 10/7/1956, cat. L145.B.68 (MOD Central Disposals Unit, Chessington).

brick with a flat roof, joining the south cross wing with the north cross wing of the adjacent building no. L148 is also likely to be of this date.

The building was last used as laboratories in 1991. Stripping out began in early 1993.

Surveyed March 1993
Report R L Burgess

THE ROYAL GUNPOWDER FACTORY - WALTHAM ABBEY

NUMBER L146	OLD SERIES 152A	RCHME NUMBER	N.G.R. TL 37719 01348
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NAME/FUNCTION Cordite Incorporating house No.2 Crystallograph	START DATE 1914-17? 1946	END DATE 1945
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NO PHOTOGRAPHY
AVAILABLE

CARTOGRAPHIC DEPICTION

1917 WASC 900/70 ; Incorporating House No. 2
 1917 WASC 900/72 ; 152a
 1919 WASC 900/74 ; 152a
 c1920 WASC 900/80 ; 152a
 1923 WASC 900/84 ; 152a
 > 1940 WASC 900/91A ; L146
 1954 A - B.34 ; L146
 c1960 WASC 900/94 ; L146
 c1963 WASC 900/97 ; L146
 1972 WASC 900/102 ; L146
 1972 WASC 900/104 ; L146
 1976 WASC 900/113 ; L146

DOCUMENTARY REFERENCES

Plans;
 L146 B01 - B04 ; Plans and Elevations 1949 to 1956
 c1925 RGPF Ledger WASC 1680 ; Incorp House No.2
 c1945 RGPF Ledger WASC 1508 ; Incorp House No.2
 1972 ERDE List ; Crystallograph Lab/Incorp House No.2
 1991 Mott McDonald survey
 1992 RARDE List ; Crystallograph Lab/Incorp House No.2
 1992 FBRC left hand site Radiation, Right hand site Workshop

**PHOTOGRAPHY
HISTORIC**

**PHOTOGRAPHY
RCHME**
 1) 206/D/31 From East
 206/D/32 From North East
 206/T/29 From South West
 2) BB92/26099 From North West
 4) 4788/7 06.05.1993
 4788/8 06.05.1993

RELATIONSHIPS WITH OTHER MONUMENTS

ASSOCIATED WITH: L134, L143, L146, L151, L155, L159

CONDITION Fair

DESCRIPTION

- 1) CONSTRUCTIONAL MATERIAL
Brick
- 2) ROOF MATERIALS AND STRUCTURE
Felt with timber boards over purlins
- 3) POWER SOURCE
Steam Electricity
- 4) DIMENSIONS i) L 31.9 ii) W 8.8 iii) HT Eave 3.1
- 5) The building is a single storey with a rectangular plan. It has gabled ends to the north and south. It is divided into seven bays by five internal partition walls laid in English bond. On a number of the dividing walls the positions of bearing boxes could be discerned and cut off I girders formerly used to support a belt drive system. A lean to corridor has been added along the west side. the timber frame infill along the eastern side is modern. To the West is a leanto forming a corridor. An addition has been made to the north end in brick.

THE ROYAL GUNPOWDER FACTORY - WALTHAM ABBEY

NUMBER L147	OLD SERIES 151	RCHME NUMBER	N.G.R. 37752 01343
NAME/FUNCTION Fire Engine Shed Friction Test Room		START DATE 1865-1877	END DATE
NO PHOTOGRAPHY AVAILABLE			
CARTOGRAPHIC DEPICTION		DOCUMENTARY REFERENCES	
1865 WASC 900/38 + SUPP5 975 ; Fire Engine Shed 1865 WASC 900/41A ; Fire Engine Shed 1865 WASC 900/42 ; Fire Engine Shed 1897 WASC 900/53C c1910 WASC 900/65 ; Fire Engine House c1910 WASC 900/79 ; Fire Engine House 1917 WASC 900/70 ; Fire Engine House 1917 WASC 900/72 ; 151 1919 WASC 900/74 ; 151 c1920 WASC 900/80 ; 151 1923 WASC 900/84 ; 151 > 1940 WASC 900/91A ; L147 1954 A - B.34 ; L147 c1960 WASC 900/94 ; L147 c1963 WASC 900/97 ; L147 1972 WASC 900/102 ; L147 1972 WASC 900/104 ; L147 1976 WASC 900/113 ; L147		1908 RGPF Ledger WASC 1509 + WASC 1764 Fire Engine House built pre 1877 p16 1972 ERDE List ; Friction Test Room 1991 Mott McDonald survey 1992 RARDE List ; Friction Test Room/ Fire Engine Shed 1992 FBRC ; Stores	
PHOTOGRAPHY HISTORIC		PHOTOGRAPHY RCHME 1) 206/G/35 From North	
RELATIONSHIPS WITH OTHER MONUMENTS			
ASSOCIATED WITH:			
CONDITION	Good		

DESCRIPTION

- 1) CONSTRUCTIONAL MATERIAL
Brick with Red brick banding
- 2) ROOF MATERIALS AND STRUCTURE
Corrugated Asbestos
- 3) POWER SOURCE
Steam Electricity
- 4) DIMENSIONS i) L 5.06 ii) W 3.85 iii) HT 4.2
- 5) The building is a single storey with gabled ends and a rectangular ground plan. On the south elevation is a single blind panel with an inserted window, the west and east elevations have two blind panels. A modern double door has been inserted into the north wall.

THE ROYAL GUNPOWDER FACTORY - WALTHAM ABBEY

NUMBER L148	OLD SERIES	RCHME NUMBER 156	N.G.R. TL 37700 01292
NAME/FUNCTION Incorporating Mills Group G Gunpowder Incorporating Mills Group G Cordite Lab/Store/Incorp House No7		START DATE 1889 1898 1946	END DATE 1898 1945 1991

NO PHOTOGRAPHY
AVAILABLE

CARTOGRAPHIC DEPICTION	DOCUMENTARY REFERENCES
1897 WASC 900/53C	Plans;
c1910 WASC 900/65 ; Incorp House Group G	1904 WASC 901/160 10 Oct 1904 Traverses to Group "G"
c1910 WASC 900/79 ; Incorp House Group G	WASC 901/160A no date Traverses to Group "G"
1917 WASC 900/70 ; Incorp House Group G	WASC 901/162 no date No7 Incorporating Mill N? of No6 Mill
1917 WASC 900/72 ; 156	L148 B01 - B34 ; Plans and Elevations 1888 to 1972
1919 WASC 900/74 ; 156	
c1920 WASC 900/80 ; 156	1908 RGPF Ledger WASC 1509 + WASC 1764 ; Incorp House Group G built 1889 p17
1923 WASC 900/84 ; 156	c1925 RGPF Ledger WASC 1680 ; Incorp House Group G
> 1940 WASC 900/91A ; L148	c1945 RGPF Ledger WASC 1508 ; Incorp House Group G
1954 A - B.34 ; L148	
c1960 WASC 900/94 ; L148	1972 ERDE List ; Plastics Manufacture
c1963 WASC 900/97 ; L148	1991 Mott McDonald survey
1972 WASC 900/102 ; L148	1992 RARDE List ; Lab and Store Rooms/Incorp House No.7
1972 WASC 900/104 ; L148	
1976 WASC 900/113 ; L148	1993 RCHME NBR No. 91458
	WASC 353 Nathan F.L. Proceedings of a court of Enquiry re circumstances attending explosion at Waltham Abbey on 15 December 1902
	WASC 353 Nathan F.L Drawing of Group G mills for manufacture of Cordite No 914
	WASC 353 Nathan F.L Drawing of Incorporating machine for Cordite factory No 917

<p>PHOTOGRAPHY HISTORIC WASC 73 Explosion 11.3.1892 WASC 74 Explosion 11.3.? (x2) WASC 76 Explosion 11.3.1892 WASC 102 Explosion WASC 104 Explosion 15.12.1902 WASC 353 Nathan F.L Bay 3 & Engine House Group G photograph No.1 WASC 353 Nathan F.L Engine House & Bays 3,2,1 Group G photograph No.2 WASC 1543/47 Gunpowder mills Group G 1888-9 WASC 1655/13-15 Exlosion 15.12.1902 57lb MD Cordite paste in No 3 bay Supply 5/860 (Photo No.139),(Neg No.B25) RCHME Neg No. BB92/16738 ; Group G exploded 15/12/1902 Supply 5/860 (Photo No.145),(Neg No. B30) RCHME Neg No. BB92/16727 ; Group G exploded 15/12/1902 Supply 5/860 (Photo No.142),(Neg No.B28) RCHME Neg No. BB92/16728 ; Group G exploded 15/12/1902 PRO Supply 5/860 139-145, 147 Group G exploded 57lbs Cordite MD</p>	<p>PHOTOGRAPHY RCHME 1) 206/P/4 Group G mills 1888-9 206/P/14 Boiler & Engine house from South 2) BB92/16727 Explosion 15.12.1902 BB92/16728 Explosion Group G 15.12.1902 BB92/16738 Explosion Group G 15.12.1902 BB92/26089 From North East BB92/26090 From South East BB92/26191 From North East BB92/26192 Roof Trusses from North West BB92/26193 East room from West BB92/26352 Elevations, Plans & Sections 4) 4788/4 06.05.1993 4788/7 06.05.1993 4788/8 06.05.1993</p>
<p>RELATIONSHIPS WITH OTHER MONUMENTS</p> <p>ASSOCIATED WITH: L145, L149, L153, L157</p>	
<p>CONDITION GOOD</p>	
<p>DESCRIPTION</p> <p>5) See attached RCHME Threatened buildings Section report</p>	

ROYAL COMMISSION ON THE HISTORICAL MONUMENTS OF ENGLAND

MOD Building No. L148
Group G Incorporating Mills
The Royal Gunpowder Factory
Waltham Abbey
Essex

NBR No: 91458
NGR: TL 37700 01292

Built in 1888-9, the Group G Incorporating Mills building has a T-shaped plan which comprises a central Engine House, with a Boiler House at its east end, and three-bay cross wings on its north and south sides, for six black-gunpowder incorporating mills. There was an open verandah along the west front. On the south side of the Boiler House was a coal yard containing a tall chimney.

The Engine House, Boiler House and partition walls separating the bays in the incorporating mills are constructed of yellow brick laid in English bond. The roofs and side walls of the cross wings were less substantial, being of wood and felt with a slight iron framework. The gearing for the machinery of the mills was in a chamber below the ground.

In 1898-9 the machinery of the gunpowder incorporating mills was dismantled and the whole group was converted to take cordite incorporating mills. The building was partially rebuilt after an explosion in one of its bays in December 1902.

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The Group G Incorporating Mills building was constructed in 1888-9.¹⁸ The latest of the group of incorporating mills on this part of the site, the building was an infill between Group D and Group F Incorporating Mills.

Its T-shaped plan comprises a central Engine House, with a Boiler House at its east end, and cross wings, each of three bays, for the incorporating mills on its north and south sides.¹⁹ There was an open verandah along the west front. On the south side of the Boiler House was a coal yard containing a chimney at the centre of its west wall.

Both the Engine House and the Boiler House are constructed of yellow brick laid in English bond, with a chamfered brick plinth and brick dentil cornice. Each has a hipped roof which was originally covered with board and slate.

The Engine House has a rectangular plan of approximately 20'6" x 34'²⁰ (6.3 x 10.4 m) and rises to a height of approximately 30'8" (9.4 m).²¹ It is entered through a doorway from the open verandah on the west side and through a doorway reached by stairs rising up from the Boiler House on the east side. On the upper part of the east and west elevations of the Engine House there are a pair of window with a semi-circular heads of rubbed red-brick. The north and south elevations had no fenestration originally. The Engine House carried a steam engine to drive the edge runners in the incorporating mills in the cross wings.

On the east side of the Engine House is the Boiler House which has a rectangular plan of 23' x 50' (7 x 15.24 m).²² Brick pilasters separate the exterior elevations into four bays by one bay. The north bays each contained a window with a cambered head. There was a doorway in the east elevation bay which had a semi-circular head with a keystone. The Boiler House carried

A datestone below the windows the western side of the Engine House bears the inscription "Group G Mills 1888-9".

Although the building faces west-south-west and the cross wings are aligned north-north-west to south-south-east, for clarity in this report the building is described as if it faced west.

Drawing of "Waltham Abbey Incorporating Mills", dated ?July 1888, ?no cat. no (L148/X369) (MOD Central Disposals Unit, Chessington).

Ledger c1908, cat. WASC 1509 (PRO Hayes Repository).

Drawing of "Waltham Abbey Incorporating Mills", dated ?July 1888, ?no cat. no. (L148/X369) (MOD Central Disposals Unit, Chessington).

two Lancashire²³ boilers which were aligned east to west.²⁴ The roof contains trusses which have round wrought iron tension rods, king rods, and decorative cast iron compression members. The roof had cast iron ventilators, tongued boarding and zinc-galvanised metal coverings.

Serving the Boiler House, on its south side was the coal yard with a brick wall and an octagonal chimney which was 75²⁵ (22.86 m) in height and constructed of brick.²⁸

The cross wings, originally containing six black-gunpowder incorporating mills, are of three bays each and are single-storeyed and have a gabled roof.²⁷ The bays are separated by partition walls, aligned east to west, which are constructed of yellow brick, laid in English bond. The front and back walls were lightly framed, comprising wood and non-inflammable felt, with movable sashes glazed with 15 oz (425 g) sheet glass.²⁸ On the west wall frames, on the inner side of the verandah, were lampframes constructed of lead, copper and sheet glass. The bottom of the lampframes were to hold ½' (0.15 m) of water constantly, as a fire precaution. Cast iron columns on the outer west side of the verandah are slender (2½" or .635 m diameter) and, having foliate-type design capitals, are more elaborate than the capitals of the verandah columns in the other incorporating mills. The roof was of angle and tee iron framing, with board and lead coverings. Drenching apparatus, constructed of iron and copper, was position on the tie of the truss.²⁹ The relatively insubstantial fabric of the sides and roof of the cross wings could be easily replaced should an explosion occur.³⁰ In the event of an explosion, a wooden shutter would have been lifted automatically to release 40 gallons (182 l) of water from a cistern in the drenching apparatus of all the mills in the building.

The procedure for combining the ingredients of saltpetre, sulphur and charcoal to form gunpowder in each of the mills in the cross wing appears to have been essentially the same as it had been since 1857 when the first of the incorporating mills buildings (Group A; Building L169, now gone) was built.³¹ The following is an extract from the Handbook of Gunpowder and Guncotton, 1888, which describes both the machinery and the process of Incorporating or Milling as carried out in this type of incorporating mill building at the Royal Gunpowder Factory at Waltham Abbey:

The incorporating mill consists of a circular iron or stone bed, about 7 feet in diameter (fixed very firmly in the floor of the building), whereon the iron or stone cylindrical edge runners revolve The runners have a common axle, resting in gun-metal bouches in a solid cross-head attached to a vertical shaft, which, passing through a bearing in the centre of the bed, is in gear with the machinery, which is ... beneath it in

"Proceedings of a Court of Enquiry and a Report ... on the Circumstances Attending an Explosion which occurred at the Royal Gunpowder Factory, Waltham Abbey, on the 15th December 1902", cat. WASC 353.

Drawing of "Waltham Abbey Incorporating Mills", signed J.W. Hale, 19/6/1888, (cat. no. ripped off, L148.B (MOD Central Disposals Unit, Chessington).

Drawing of plans and sections, "Waltham Abbey Incorporating Mills", signed J.W. Hale, 19/6/1888, (cat. no. ripped off), L148.B (MOD Central Disposals Unit, Chessington).

Ledger c1908, cat. WASC 1509 (PRO, Hayes Repository).

"Proceedings of a Court of Enquiry and a Report ... on the Circumstances Attending an Explosion which occurred at the Royal Gunpowder Factory, Waltham Abbey, on the 15th December 1092", cat. WASC 353.

Drawing of "Waltham Abbey Incorporating Mills", dated ?July 1888, ?no cat. no (L148/X369) (MOD Central Disposals Unit, Chessington).

Drawing showing enlarged cross section of "Waltham Abbey Incorporating Mills", dated 4/1888, cat. L148.B.20 (MOD Central Disposals Unit, Chessington).

"A Handbook of the Manufacture and Proof of Gunpowder, as carried on at the Royal Gunpowder Factory, Waltham Abbey," by the Captain F M Smith, Royal Artillery, Assistant Superintendent, 1870.

The same procedure is outlined in both "A Handbook of the Manufacture and Proof of Gunpowder, as carried on at the Royal Gunpowder Factory, Waltham Abbey," by Captain F.M. Smith, Royal Artillery, Assistant Superintendent, 1870 and "Handbook of Gunpowder and Guncotton," by W.H. Wardell, 1888.

cast iron tanks in the new steam mills. ...

The bed has a sloping rim on the outside, called the "curb," and on the inside, an edge formed by the "cheese," or bearing through which the vertical shaft passes. The runners are not equidistant from the centre of the shaft; one works the part of the charge nearest the centre of the bed, the other the outer part, but their paths overlap; two "ploughs" of wood, covered with leather, attached to the cross-head by arms or brackets (one working next the vertical shaft, the other to the rim), throw the composition under the runners, as it works away from them.

The green charge is brought in its bag, and put on the bed of the mill, being spread evenly by means of a wooden rake; it is then "liquored," or moistened with distilled water, and is worked for 4 hours under iron runners for R.F.G. powder, which time was formerly considered sufficient to render the incorporation complete in every respect; but R.F.G2 powder is incorporated about 8 hours under iron runners. MG1, for Nordenfelt guns, is kept 7 hours under iron runners. The granulated cannon powders now made (RLG2 and RLG4) are incorporated for 3 hours under iron runners, an additional hour being allowed if worked under stone runners. All "dust" and "re-work" charges are milled for 40 minutes.

... During the time of working the millman enters the mill occasionally, takes a wooden "shover," and pushes the outside of the charge into the middle of the path of the runners, so that every portion may be regularly incorporated.

... The action of the runners is a combination of rolling and twisting, and has, on a large scale, somewhat the effect of a pestle and mortar, crushing, rubbing, and mixing, thus giving the charge a most intimate union.

.. When the charge, which in this state is called "mill-cake," is ready to be taken off the bed, it should be uniform in appearance, not having any specks of either saltpetre or sulphur visible to the eye, and of a greyish or brownish colour, according to the charcoal used.

Finally the mill cake would have been taken from the incorporating mill to a detached expense magazine.³² It would then have been taken in covered trucks to a "breaking down" house³³.

Each mill contained in the bays had its own independent gearing in an underground chamber.³⁴ Unlike the barrel-vaulted chambers of the adjacent Group D and Group C Incorporating Mills, the chamber has a flat roof. It appears to have been approximately 3'6" wide and is positioned slightly off-centre to the east below the cross wing gable.³⁵

In 1898-9 and the gunpowder incorporating mills in the building were dismantled and new machinery was installed for cordite incorporating mills.³⁶ In effect, all the original machinery on the ground floor (circular bed, runners, etc) was removed and that in the chamber became redundant. A plan and sections of the building as it was used for the manufacture of cordite shows the Engine House with engine and hydraulic pumps, steam pipes, six sets of mills, and shaft alley.³⁷ The cross wing partition walls have "I" girders and blocked openings in the gables which are likely to belong to shafting for the cordite machinery. The

A drawing of "Waltham Abbey Incorporating Mills" dated 4/1888, shows plans and sections for a magazine to go with Group G Incorporating Mills: a single-storeyed building constructed of brick it had a rectangular plan of 10' x 16' internal dimensions and had a barrel-vaulted ceiling and a gable roof, cat. L148.B.20 (MOD Central Disposals Unit, Chessington).

"How Explosives are Made" by William G. Fitzgerald, The Strand Magazine, Vol IX Jan-June 1895.

The underground chamber was not investigated at the time of this survey in March 1993 owing to contamination in the building.

Drawing showing enlarged cross section of "Waltham Abbey Incorporating Mills", dated 4/1888, cat. L148.B.20 (MOD Central Disposals Unit, Chessington).

"Proceedings of a Court of Enquiry and a Report ... on the Circumstances Attending an Explosion which occurred at the Royal Gunpowder Factory, Waltham Abbey, on the 15th December 1902", cat. WASC 353.

"Proceedings of a Court of Enquiry and a Report ... on the Circumstances Attending an Explosion which occurred at the Royal Gunpowder Factory, Waltham Abbey, on the 15th December 1092", cat. WASC 353.

cordite incorporating mills were powered by an engine in the central Engine House, as the gunpowder incorporating mills had been powered, but the engine appears to be different in the two phases.³⁸

Cordite incorporating involved the "incorporating," or the conversion of "paste," a mixture of guncotton and nitroglycerine, to which mineral jelly was added after half the incorporation was completed, into "incorporated material" by means of the solvent acetone.³⁹

On 15 December 1902 there was an explosion in the bay immediately adjacent on the south side of the Engine House of this Group G Incorporating Mills building.⁴⁰ Three men were killed and the building was severely damaged. The building was then repaired shortly afterwards. Concrete and earth traverses, 12' (3.66 m) high, were built on the west and east sides of the cross wings in 1904-5.⁴¹

Some time after the explosion and before the chimney was demolished in c1908-9, the building ceased to be steam powered.⁴²

In the mid twentieth century, after 1945, the building was converted into laboratories. Large windows were inserted on the north and south elevations of Boiler House, the doorway at its east end was blocked and replaced by narrower doorway, windows were added on the north and south elevations of the Engine House, and the sides of the verandah were enclosed. A low flat-roofed extension was added on the north side of the Boiler House and a flat-roofed brick addition was built to link this building with buildings L153 and L145 on the south and north sides.

The laboratories were finally closed around 1991 and stripping out began in early 1993.

Surveyed March 1993
Report by R L Burgess

Cf the Engine House in plans and sections, "Waltham Abbey Incorporating Mills", signed J.W. Hale, 19/6/1888, (cat. no. ripped off), L148.B (MOD Central Disposals Unit, Chessington) with plan of "Group G Mills for Manufacture of Cordite, RGPF" in "Proceedings of a Court of Enquiry and a Report ... on the Circumstances Attending an Explosion which occurred at the Royal Gunpowder Factory, Waltham Abbey, on the 15th December 1902", cat. WASC 353.

"Proceedings of a Court of Enquiry and a Report ... on the Circumstances Attending an Explosion which occurred at the Royal Gunpowder Factory, Waltham Abbey, on the 15th December 1902", cat. WASC 353.

"Proceedings of a Court of Enquiry and a Report ... on the Circumstances Attending an Explosion which occurred at the Royal Gunpowder Factory, Waltham Abbey, on the 15th December 1902", cat. WASC 353.

Ledger c1908, cat. WASC 1509, and undated drawing RGPF Waltham Abbey showing traverses to Group "G", section of concrete traverse, 156/C261, (PRO, Hayes Repository)

Ledger c1908, cat. WASC 1509 (PRO, Hayes Repository). The replacement power may have come from a central hydraulic system at the Accumulator building A214 over 250 metres to the south-east of the building.

THE ROYAL GUNPOWDER FACTORY - WALTHAM ABBEY

NUMBER L149	OLD SERIES 154	RCHME NUMBER	N.G.R. TL 37750 01292
NAME/FUNCTION Hydraulic Accumulator House for Pellet Powder House Steam Gunpowder Incorporating House Group E Cordite Incorporating House Group G Cordite Incorporating House No3 Spare gear room No4 and Pump House Laboratory	START DATE 1867-8 1877 1898 by 1917 1947	END DATE 1877 1898 by 1917 1945	

NO PHOTOGRAPHY
AVAILABLE

CARTOGRAPHIC DEPICTION	DOCUMENTARY REFERENCES
1865 WASC 900/38 + SUPP5 975 ; Group E Accumulator (Incorp Mills), Engine, Boiler Houses / Coal Yard	Plans; L149 B01 - B51 ; Plans and Elevations 1867 to 1985 1877 WASC 901/129 13.Mar.1877 Plan & sections of platform & bridge (group E) New Mills
1865 WASC 900/41A ; Group E Accumulator (Incorp Mills), Engine, Boiler Houses / Coal Yard	1894 WASC 901/129A 30.Nov.1894 Incorporating Mills Group E
1865 WASC 900/42 ; Group E Incorp Mills , Boiler House /Coal Yard	
1897 WASC 900/53C	
c1910 WASC 900/65 ; Incorp House Group E	1908 RGPF Ledger WASC 1509 + WASC 1764 ; Incorp House Group E built 1867-8 p17
c1910 WASC 900/79 ; Incorp House Group E	c1925 RGPF Ledger WASC 1680 ; Incorp House Group E
1917 WASC 900/70 ; Incorp House No. 3/ Spare Gear Room No. 4 + Pump House	c1945 RGPF Ledger WASC 1508 ; Incorp House Group E
1917 WASC 900/72 ; 154	
1919 WASC 900/74 ; 154	
c1920 WASC 900/80 ; 154	
1923 WASC 900/84 ; 154	1972 ERDE List ; Initiation Solvent Store
> 1940 WASC 900/91A ; L149	1991 Mott McDonald survey
1954 A - B.34 ; L149	1992 RARDE List ; Lab/Incorp. House No.3
c1960 WASC 900/94 ; L149	
c1963 WASC 900/97 ; L149	1992 FBRC ; Explosives Testing/ Offices
1972 WASC 900/102 ; L149	
1972 WASC 900/104 ; L149	
1976 WASC 900/113 ; L149	1993 RCHME NBR No.91460

PHOTOGRAPHY
HISTORIC

WASC 1233/1 Looking North West 12.12.1978
WASC 1543/48 Group E mills 1877-8
WASC 1568 Rotter impact Machine
Supply 5/861 (Photo No.217),(Neg No.B95) RCHME Neg.
No.BB92/16726 ; View of Group E showing traverse
10/5/1904
Supply 5/860 17 1879 Exterior
Supply 5/860 146 Damage after explosion in group G 15-
dec-1902

PHOTOGRAPHY
RCHME

- 1) 206/D/27 From South East
206/D/28 Boiler House from South East
206/D/29 Boiler House from North East
206/D/30 From South East
206/Q/23 From North
- 2) BB92/26086 From South East
BB92/26087 From South West
BB92/26091 From North West
BB92/26098 From South West
BB92/26176 From South West (Colour)
BB92/26177 From North West (Colour)
BB92/26178 Steampipes from North West
BB92/26182 Detail pinnion wheel/Clutch
BB92/26183 Detail support beam & bearing
BB92/26184 Detail drive shaft/clutch
BB92/26185 Detail drive shaft/clutch
BB92/26186 Detail drive shat channel
BB92/26187 Detail of clutch/drive shaft
BB92/26190 Steam Incorporating mill & Accumulator
tower
BB92/26194 From North West
BB92/26195 Roof from East
BB92/26196 Detail of roof
BB92/26350 Plans Sections Elevations
BB92/26360 Plans Elevations Pellet Powder buildings
BB92/26361 Extension to new Incorporating Mills
Group F
- 3) 225/B/6-8 Corridor & Column details looking South
225/B/9-10 Baffle wall showing relieving arch for
underground chamber
225/B/11 Roof detail of mill
225/B/12-13 Roof detail Boiler house
225/B/14-15 Doorway West side of Accumulator tower
225/B/16 North Elevation
225/B/17 West side
225/B/18 South side
225/B/19 West Elevation
225/B/20 Boiler house South elevation
- 4) 4788/4 06.05.1993
4788/5 06.05.1993
4788/8 06.05.1993

RELATIONSHIPS WITH OTHER MONUMENTS

ASSOCIATED WITH: L145, L148, L149 1/2, L153, L157

CONDITION Good

DESCRIPTION

- 1) CONSTRUCTIONAL MATERIAL
Brick in English bond
- 2) ROOF MATERIALS AND STRUCTURE
Felt and slate
- 3) POWER SOURCE
Steam, Hydraulic, Electricity
- 4) DIMENSIONS i) L 47.2m ii) W 6.7m iii) HT iv)DIA
- 5) A plaque on the west side of the accumulator tower reads 'GROUP E MILLS 1877-8'

See attached RCHME Threatened Buildings Section report.

ROYAL COMMISSION ON THE HISTORICAL MONUMENTS OF ENGLAND

MOD Building No. L149
Group E Incorporating Mills
The Royal Gunpowder Factory
Waltham Abbey
Essex

NBR No: 91460
NGR: TL 37750 01292

The Building No. L149 has two main phases of construction. The core was built in c1869 as "Pellet Powder Buildings". As such it had an almost-square plan comprising an Accumulator House, Engine House and Boiler House, with a coal yard with chimney against the Boiler House.

In 1877-8 the building was converted to Group E Incorporating Mills. The Accumulator House, Engine House and chimney of the original building appear to have been retained but the Boiler House and coal yard walls were demolished. A new Boiler House was built at the rear of the Engine House and a new coal yard was formed which incorporated the earlier chimney. On the north and south sides of the Engine House three-bay cross wings were added to contain six gunpowder incorporating mills. There was an open verandah along the west front of the cross wings. A Pump House was subsequently added, in two phases, on the north side of the Boiler House.

The construction is of yellow brick, laid in English bond, with red brick details, except for the side walls of the cross wings which were of wood and canvas or felt on a slight iron framework. The gearing for the machinery of the mills survives in a chamber below the ground.

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This building has a t-shaped plan and is constructed of yellow brick, laid in English bond, with red brick detailing, and of timber with a slight iron framework.

It has two main phases of construction. The original structure was built in c1869 as "Pellet Powder Buildings". Project drawings for this show an almost-square building containing a Boiler House, on one side of which is an Accumulator House and Engine House, and on the other side is a coal yard with chimney.⁴³ As a Pellet Powder Building, the structure would have been used for the pressing of gunpowder.

Almost a decade later, in 1877-8, the building was significantly altered and converted into the fifth gunpowder incorporating mills building to be constructed on the Gunpowder Factory site, and was named Group E Incorporating Mills.⁴⁴ Proposal drawings for this new incorporating mills building outline and label the site of the original Boiler House and coal yard, which were still standing at that time in March 1877.⁴⁵ The structure then built in 1877-8 may have utilised the existing Accumulator House⁴⁶, Engine House and chimney. The original Boiler House and coal yard walls were demolished. A new Boiler House was built at the east end of the Engine House, reusing the iron roof trusses of the former Boiler House, and on its east side a new coal yard was created which incorporated the existing chimney at its south-west corner.⁴⁷ On the north and south sides of the Engine House, set back from the front of the Accumulator House, three-bay cross wings were added to contain six

Drawing of "Waltham Abbey, (Project), Plans, Sections & Elevations for Pellet Powder Buildings, signed I. Randall, Clerk of Works, 2/12/186(?9), cat. L149.B.15 and drawing of "Pellet Powder Buildings, Accumulator House", dated 1869, cat. L149.B.10 (MOD Central Disposals Unit, Chessington).

Drawings of "Waltham Abbey, Proposed New Incorporating Mills, Item I, AE 1877-8, dated 3/1877, cat. L149.B.05 (MOD Central Disposals Unit, Chessington).

Drawings of "Waltham Abbey, Proposed New Incorporating Mills, Item I, AE 1877-8", dated 3/1877, cat. L149.B.05 (MOD Central Disposals Unit, Chessington).

The Accumulator House may be partly rebuilt, however, because its style is slightly different from that shown in the proposal drawings for the "Pellet Powder Buildings" of 186(?9) and because its west front carries a datestone bearing the inscription "Group E Mills 1877-8".

Although the building faces west-south-west and the cross wings are aligned north-north-west to south-south-east, for clarity in this report the building is described as if it faced west.

gunpowder incorporating mills. There was an open verandah along the west front of the cross wings.

Probably as a result of combining parts of an earlier building as its core, the Group E Incorporating Mills building is more elaborate in plan and design than the other incorporating mills on this part of the site.

The Engine House has a rectangular plan of 16'6" x 30'6" (5.05 x 9.3 m), and rises to a height of 22'6" (6.9 m).⁴⁸ As such it is both narrower and lower than the Engine Houses in the other incorporating mill buildings on this part of the site. Constructed of yellow brick, laid in English bond, with red brick details, it had brick pilasters and windows on its north side, and a brick dentil cornice.⁴⁹ It has a hipped roof which is wood-framed. A large wooden transverse beam may have carried the engine itself.

The Accumulator House, at the west side of the Engine House, may be the Accumulator House of the earlier "Pellet Powder Buildings" of c1869. Although it differs slightly in appearance from the Accumulator House shown in the proposal drawings for the earlier building, the Accumulator House actually built for that earlier building may be that which survives.⁵⁰ Alternatively it may be a rebuild or partial rebuild. A datestone on its west elevation reads "Group E Mills 1887-8" but, rather than being incorporated into the brickwork, the plaque is adhered to it. Built of yellow brick with red brick details, with a 16'6" (5.05 m) square plan, it forms a tower 36' (11 m) in height.⁵¹ On the north and west elevations a kind of platband with dentils marks a point almost halfway up the tower, below which the tower is wider on these north and west sides only. The absence of this feature on the south elevation might support the theory that this is the Accumulator House from the earlier building which would have had the Boiler House abutting on the south side. Furthermore, the brickwork of the innermost walls of each of the cross wings does not appear to be bonded into the brickwork of the tower.

Below the datestone on the west front, the entrance doorway to the Accumulator House has a semi-circular head and brick label. At a higher level on the tower, each of its elevations has a pair of semi-circular headed windows with rubbed red-brick arches with a pair of brick drops at the springing on either side. The windows on the north and south elevations are blind. Above the windows, a series of five brick arches give the appearance of false machicolations, and this is echoed in an arrangement of bricks which corbel out as part of the cornice. It appears to have had a hipped roof originally.⁵²

The accumulator which would have been housed within the tower supplied a more remote accumulator on the site (Building No. L136). An internal pier would have held the guide rail of the accumulator itself.

Ledger c1908, cat. WASC 1509 (PRO, Hayes Repository).

Drawing of "Waltham Abbey, (Project), Plans, Sections & Elevations for Pellet Powder Buildings", signed I Randall, Clerk of Works, 2/12/186(?)9, cat. L149.B.15 (MOD Central Disposals Unit, Chessington).

The project drawings for the "Pellet Powder Buildings" of 2/12/186(?)9 for the front west elevation of the Accumulator House show, above the doorway, a rectangular panel with clipped corners, above a pair of semi-circular headed windows which have keystones and which span almost the entire width of the front, and a simple dentil cornice below the eaves. The present building has no such rectangular panel, narrower windows with no keystone and a more elaborate false-machicolation design above.

Ledger c1908, cat. WASC 1509 (PRO, Hayes Repository).

A hipped roof is shown on the tower in an elevation drawing of "Waltham Abbey, Proposed New Incorporating Mills, Item I. AE 1877-8", cat. L149.B.05 (MOD Central Disposals Unit, Chessington). However, in place of a hipped roof, the tower carried a water tank by 1902, as recorded in a photograph of December 1902, RCHME neg. no. BB92/16730, PRO Supply 5/860 (photo no. 146; neg. no. B32).

Serving the Boiler Houses in both phases of construction, was a chimney stack which had an octagonal plan, 75⁵³ (22.86 m) in height, and was constructed of brick.⁵⁴ A coal yard on the south side of the original Boiler House incorporated the chimney on its east wall, while a new coal yard created in 1877-8 on the south side of the new Boiler House incorporated the same chimney in the south-west corner.

The Boiler House which was constructed in the second phase of 1877-8 has a rectangular plan of 45' x 23'. (13.7 x 7 m)⁵⁵ Of a single storey and of the same height as the Engine House, it is also brick-built and has a dentil cornice as well as dentils at the top of recessed panels between pilasters which separate the exterior elevations into four bays by one bay. The three eastern bays on the north and south elevations each contained a pair of semi-circular headed windows with red brick heads and drops, in a style similar to that of the Accumulator House. There is a doorway in the east elevation bay which has a semi-circular head of rubbed red-brick. The Boiler House carried a pair of boilers which were aligned east to west. The roof is hipped and contains trusses which are probably reused from the earlier Boiler House, since the trusses match those in the drawings for the original building.⁵⁶ The trusses have wrought iron tension rods, decorative cast iron compression members, and cast iron ventilators. The hips have central roundels with five bridging arms on a horizontal plane and a king rod on a vertical plane. The roof had tongued boarding and lead coverings.

Cross wings, set back from the front of the Accumulator House, were added in 1877-8 on the north and south sides of the Engine House. The wings contained a total of six gunpowder incorporating mills. Each of three bays, the wings are single-storeyed and have a gabled roof. The bays are separated by partition walls, aligned east to west, which are constructed of brick laid in English bond. The front and back walls had a light iron framing filled in with moveable panels of non-inflammable felt on light deal frames.⁵⁷ On the west wall frames were lampframes constructed of iron, copper and sheet glass, the bottom of which were to hold 1/2' (0.15 m) of water constantly.⁵⁸ Cast iron columns on the outer west side of the cross wings originally formed part of an open verandah which had ends of corrugated iron.⁵⁹ The roof was of angle and tee iron framing (round rods with metal purlins and pin spokes), with board and lead coverings. Drenching apparatus, constructed of iron and copper, was positioned on the tie of the truss.⁶⁰ The relatively insubstantial fabric for the sides and roof could be easily replaced in the event

The chimney stack is labelled as being 75' in height in both the early project drawing for the "Pellet Powder Buildings", cat L149.B.15, and in the Group E Incorporating Mills, Ledger c1908, cat. WASC 1509 (PRO, Hayes Repository).

The date of 1877 given to the Chimney Shaft in the Ledger of c1908 appears to be incorrect, cat. WASC 1509 (PRO, Hayes Repository).

Ledger c1908, cat. WASC 1509 (PRO Hayes Repository).

Drawing of "Waltham Abbey, (Project), Plans, Sections & Elevations for Pellet Powder Buildings", signed I. Randall, Clerk of Works, 2/12/186(?), cat. L149.B.15.

A drawing of "Waltham Abbey, Proposed New Incorporating Mills, Enlarged Section, Item I, A.E. 1877-8", dated 13/3/1877, describes the side walls as such, ?no cat. no. (L149/6) (MOD Central Disposals Unit, Chessington). However, the an undated drawing (?c1908) describes the walls as being of wood and canvas, with shutters in an iron-framing, cat. WASC 901/129A, (PRO, Hayes Repository).

Drawing of "Waltham Abbey, Proposed New Incorporating Mills, Enlarged Section, Item I, A.E. 1877-8", dated 13/3/1877, ?no cat. no. (L149/6) (MOD Central Disposals Unit, Chessington).

A photograph taken in December 1902 shows the open verandah. RCHME Neg. No. BB92/16730 (PRO Supply 5/860; photo no. 146)

Although the drawing of "Waltham Abbey, Proposed new Incorporating mills, Enlarged Section, Item I, A.E. 1877-8", dated 13/3/1877, details this apparatus, an adjacent note states that "This drenching Apparatus will not be included in the Contract for the building".

of an explosion.⁶¹

The procedure for combining the ingredients of saltpetre, sulphur and charcoal to form gunpowder in each of the mills in the cross wing appears to have been essentially the same as it had been since 1857 when the first of the incorporating mills buildings (Group A; Building L169, now gone) was built.⁶² The following is an extract from Handbook of Gunpowder and Guncotton, which describes both the machinery and the process of Incorporating or Milling as carried out in this type of incorporating mill building at the Royal Gunpowder Factory at Waltham Abbey:

The incorporating mill consists of a circular iron or stone bed, about 7 feet in diameter (fixed very firmly in the floor of the building), whereon the iron or stone cylindrical edge runners revolve The runners have a common axle, resting in gun-metal bouches in a solid cross-head attached to a vertical shaft, which, passing through a bearing in the centre of the bed, is in gear with the machinery, which is ... beneath it in cast iron tanks in the new steam mills. ...

The bed has a sloping rim on the outside, called the "curb," and on the inside, an edge formed by the "cheese," or bearing through which the vertical shaft passes. The runners are not equidistant from the centre of the shaft; one works the part of the charge nearest the centre of the bed, the other the outer part, but their paths overlap; two "ploughs" of wood, covered with leather, attached to the cross-head by arms or brackets (one working next the vertical shaft, the other to the rim), throw the composition under the runners, as it works away from them.

The green charge is brought in its bag, and put on the bed of the mill, being spread evenly by means of a wooden rake; it is then "liquored," or moistened with distilled water, and is worked for 4 hours under iron runners for R.F.G. powder, which time was formerly considered sufficient to render the incorporation complete in every respect; but R.F.G2 powder is incorporated about 8 hours under iron runners. MG1, for Nordenfolt guns, is kept 7 hours under iron runners. The granulated cannon powders now made (RLG2 and RLG4) are incorporated for 3 hours under iron runners, an additional hour being allowed if worked under stone runners. All "dust" and "re-work" charges are milled for 40 minutes.

... During the time of working the millman enters the mill occasionally, takes a wooden "shover," and pushes the outside of the charge into the middle of the path of the runners, so that every portion may be regularly incorporated.

... The action of the runners is a combination of rolling and twisting, and has, on a large scale, somewhat the effect of a pestle and mortar, crushing, rubbing, and mixing, thus giving the charge a most intimate union.

.. When the charge, which in this state is called "mill-cake," is ready to be taken off the bed, it should be uniform in appearance, not having any specks of either saltpetre or sulphur visible to the eye, and of a greyish or brownish colour, according to the charcoal used.

Finally the mill cake would have been taken from the incorporating mill to a detached expense magazine which was probably situated north-west of the building.⁶³ It would then have been taken in covered trucks to a "breaking down" house⁶⁴.

Although all of the machinery on the ground floor has been removed, all of the machinery for the independent gearing of each of the six mills survives in the underground chamber.⁶⁵ This includes parts of the vertical shafting, pinions, friction clutch, and

"A Handbook of the Manufacture and Proof of Gunpowder, as carried on at the Royal Gunpowder Factory, Waltham Abbey, by Captain F M Smith, Royal Artillery, Assistant Superintendent, 1870, London, p43.

The same procedure is outlined in both A Handbook of the Manufacture and Proof of Gunpowder, as carried on at the Royal Gunpowder Factory, Waltham Abbey, by Captain F.M. Smith, Royal Artillery, Assistant Superintendent, 1870 and Handbook of Gunpowder and Guncotton by W.H. Wardell, 1888.

The drawing of "Waltham Abbey, Proposed New Incorporating Mills, Item I. AE 1877-8" includes a plan and sections of a magazine, with interior dimensions of 10' x 8', cat. L149.B.05 (MOD Central Disposals Unit, Chessington).

"How Explosives are Made" by William G. Fitzgerald, The Strand Magazine, Vol IX Jan-June 1895.

The relieving arches of the chamber are visible in the partition walls at the lower part of the ground floor.

wheel. Below the Engine House is a tunnel which contains cast iron members, possibly the spokes of a flywheel, and clutch to chambers from the Engine House end.

Some time after 1878, and before 1895, a Pump House was added at the centre of the north elevation of the Boiler House, cutting across the former windows in this position.⁶⁶ Of a single storey, approximately 16' (4.88 m) in height, it is of yellow brick laid in Flemish bond and has a gabled roof, aligned north to south. Originally it was one bay wide and housed Worthington and Tangye pumps.⁶⁷ In c1904 the Pump House was extended by another bay, giving it an almost-square plan, 22' x 23'9" (6.71 x 7.3 m).⁶⁸ The new bay housed a new hydraulic pump. It is lit by a pair of semi-circular headed windows on the north elevation and square windows on the east and west sides.

A timber cabin at the north end of the north cross wing was built in 1895 and demolished in 1905.⁶⁹

Around the turn of the century the building was altered for the manufacture of cordite. New line shafting, pulleys and individual driving wheels were installed. Blocked openings in each of the end gables of the cross wings are evidence of the existence of the line shafting. Concrete traverse were added on the west side in the early twentieth century; the traverse has since been demolished but a photograph of 10 May 1904 shows the traverse on the west side of the building.⁷⁰

Although the chimney stack was proposed to be demolished in c1908-9,⁷¹ it appears to have survived at least until the following decade, as it is shown in a block plan of 1923.⁷²

In c1947 the building was converted into laboratories.⁷³ The former Accumulator Tower was a room for an impact machine, the former Engine House was divided into a laboratory and a store, the former Boiler House was a laboratory, balance room and machine shop, the former Pump House was a dark room and a laboratory, and the bays of the cross wings were variously used for glass blowing, laboratories, dark room, drawing office, office and writing room. The verandah was probably filled in at this time and extended to form a covered way around the west side of the Accumulator House.

The building ceased to function as laboratories in c1991. Stripping out began in c1993.

Although the Ledger of c1908 dates the addition to 1877, it is in fact secondary to the Boiler House of that date and is therefore a later addition, cat. WASC 1509 (PRO, Hayes Repository). The addition is shown on the OS County Series 1:2500 maps, 2nd ed. 1897 (surveyed 1865-9, revised 1895), sheet refs XLIX.14, XLI.8.12, XLII.5.9.

This single-bay extension was drawn as a later addition to the plan of "Waltham Abbey, Proposed New Incorporating Mills, Item I. AE 1877-8", cat. L149.B.02 (MOD Central Disposals Unit, Chessington).

Drawing of "Extension of Pump House Group E", dated 16/4/1904, ?no cat. no. (L149/13) (MOD Central Disposals Unit, Chessington).

Drawing of "Extension of Pump House Group E", dated 16/4/1904, ?no cat. no. (L149/13) (MOD Central Disposals Unit, Chessington).

Ledger c1908, cat. WASC 1509 (PRO, Hayes Repository).

RCHME Neg. No. BB92/16726. A print from this negative appears in PRO. Supply 5/861 (photo no. 217, negative no. B.95), Group E Mills, 10 May 1904.

Ledger c1908, cat. WASC 1509 (PRO, Hayes Repository).

"Royal Gunpowder Factory, Waltham Abbey" site plan 1:2500, as named 13th September 1917, revised March 1919, and March 1923, cat. WASC 900/84.

Drawing of "Layout of New Laboratories in Building No. 154", dated 18/11/1947, cat. L149.B.28 (MOD Central Disposals Unit, Chessington).

Surveyed March 1993
Report by R L Burgess

THE ROYAL GUNPOWDER FACTORY - WALTHAM ABBEY

NUMBER L149 1/2	OLD SERIES	RCHME NUMBER	N.G.R. TL 37759 01281
NAME/FUNCTION Dehumidifier Plant & Hardstanding		START DATE 197?	END DATE
NO PHOTOGRAPHY AVAILABLE			
CARTOGRAPHIC DEPICTION 1972 WASC 900/102; L149 1/2 1972 WASC 900/104; L149 1/2 1976 WASC 900/113; L149 1/2		DOCUMENTARY REFERENCES 1991 Mott McDonald survey 1992 ION Poor	
PHOTOGRAPHY HISTORIC		PHOTOGRAPHY RCHME 1) 206/G/32 10.Feb.1993 From South West 206/P/11 09.Mar.1993 Floor slab from South East	
RELATIONSHIPS WITH OTHER MONUMENTS ASSOCIATED WITH: L149			
CONDITION Demolished			
DESCRIPTION 1) CONSTRUCTIONAL MATERIAL 2) ROOF MATERIALS AND STRUCTURE 3) POWER SOURCE 4) DIMENSIONS i) L ii) W iii) HT 5) Demolished concrete floor slab remains.			

Your ref Mr.R.Watts
Our ref c/o Royal Ordnance (South Site)
Sewardstone Road
Date Waltham Abbey
Essex EN9 1AY
Tel: 0992 651611
Fax: 0992 651611

Ext no

Mr.D.Bone
CIVIX
27 Old Street
London EC1V 9HL

15th July 1994

Our Ref: E5275/22/1/01

Dear Dan,

WALTHAM ABBEY RARDE NORTH SITE
REMEDICATION OF BUILDING L149

1) In your minutes of the Liaison Committee Meeting of 12th July 1994 you state in paragraph 3 that building L149 should be the subject of a Listed Building application.

2) Building L149 was notified in my letter to Paul Sutton of EFDC of 23rd March 1994 copied to Paul Edwards of English Heritage and yourself. The work is fully described in the accompanying documents and was agreed. English Heritage representatives did not make a specific inspection of building L149 and so I wrote to Paul Edwards on 13th July 1994, copy to Paul Sutton, identifying 2 areas for specific consideration and inviting observation, (copy enclosed).

3) My interpretation of the situation in respect of unlisted, unscheduled buildings which are however in a conservation area, is that approval to strip out and decontaminate buildings is not necessary as the external appearance is not affected. I enclose a copy of Paul Sutton's letter of 13th April 1994 on the subject. When it is deemed necessary to remove external features of buildings then consultation will be undertaken. I hope this letter is helpful in clarifying matters.

Yours sincerely,

P.P. W.R. Webb.

R.E.WATTS.

ENC.

Copy:- **Mr.Adam Ford** - Resident Archaeologist

Mr.Graham Vincent - Royal Ordnance

Directors: CJA Binnie R Collins JA Cuming RB Dean NE Dempster JL Doyle MT Foley RC French
DRS Harris CP Haylock BS Holmes KM Hounslow BC Hutt DS James RD Jarvis MME Jeffries S Kidd
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HC Symonds LR Wootton

Registered office: Woodcote Grove Ashley Road Epsom Surrey KT18 5BW England
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WS Atkins Environment

a division of WS Atkins Consultants Limited

Mr.R.Watts
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Telephone (0372) 726140
Telex 266701 (Atkins G)
Fax (0372) 740055

Ext no

Mr.P.Edwards
Anglia Team
English Heritage
Fortress House
23 Savile Row
London W1X 1AB

13th July 1994

Our Ref: E5275/53/1/01
E5275/49/1/01

Dear Paul,

WALTHAM ABBEY RARDE NORTH SITE
L149 Grade 2* Listed Building and Buildings in a Conservation Area
L134, L137, L143, L146, L151, L155, L160 and L166.

1) The strip out of Incorporating Mill L149 will commence 25th July 1994. Work will proceed as notified in my letter to Paul Sutton EFDC of 23rd March 1994 copied to yourself. There are two items for specific consideration.

- i) The retention or removal of the elevated steel walkway in the tower.
- ii) The removal of laboratory benching.

2) The unlisted buildings L134, 137, 143, 146, 151, 155, 160 and 166, which are outside the scheduled area but within a conservation area, will be subjected to an initial internal strip out commencing 25th July 1994. It is not intended to touch the façade of these buildings at this stage.

3) If you have any observations on this work please let me know.

Yours sincerely,



R.E.WATTS.

Copy:- Mr.O.Pearcey - English Heritage - for information

Mr.P.Sutton - EFDC

Mr.A.Ford - Resident Archaeologist

Directors: CJA Binnie R Collins JA Cuming RB Dean NE Dempster JL Doyle MP Foley RC French
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Registered in England Number 755613

23/4/01



Epping Forest District Council

Planning & Technical Services Department, Civic Offices, Epping, Essex. CM16 4BZ.
Telephone : Epping (0992) 564000
Head of Planning & Technical Services Department K. Sharman, C. Eng., M.I.C.E., M.I.H.T.

Your ref :

If telephoning please ask for

Mr. P. Sutton

Direct Dial: (0992) 564119

Our ref : PL/7000/PAS

13th April 1994

WS Atkins Environment,
c/o Royal Ordnance (South Site),
Sewardstone Road,
Waltham Abbey,
Essex EN9 1AY.

Rw 18/4
Dear Mr. Watts,

ROYAL GUNPOWDER FACTORY (RARDE) SITE
LISTED BUILDINGS - L145, L148, L149, L153 AND L157.

Thank you for your recent letter outlining the decontamination, repair and preservation works which are proposed in respect of the above buildings.

Under Circular 18/84 (Crown Land and Crown Development) Listed Building Consent is not needed to demolish, alter or extend a Listed Building owned by the Crown. Government Departments are required, however, to consult the local planning authority (the District Council in this case), about any proposal to demolish a Listed Building (or an unlisted building in a Conservation Area), or to alter or extend such a building in a way which would affect its character as a building of special architectural or historic interest. The local planning authority are required to advertise such proposals and to notify certain specified bodies in addition to relevant local amenity societies, in the same way as they would if application had been made for Listed Building Consent.

The decontamination works which are being carried out for building L157 have been agreed with English Heritage and will obviously form a useful basis for experience in carrying out similar works to L153, L148, L145 and L149. I have no further comment to make on this aspect of the decontamination works.

As regards the replacement of the flat roof to the boilerhouse of L145, I would prefer to see the pitched roof option implemented if any money is to be spent on the roof. If the pitched roof option is pursued, the works would be considered to affect the character of the building and the consultation procedure under Circular 18/84 would need to be followed. However, the replacement of the flat roof with another flat roof would be seen as essential repair and consultation would not be required.

The re-roofing and other works proposed for L157, as outlined on drawing L157/1, are also considered to be works of repair, provided identical materials are used, and accordingly formal consultation will not be required.

I hope that this letter clarifies the position in respect of the need to formally consult the Council as local planning authority, and I thank you for explaining the works which are proposed and for allowing me the opportunity to comment.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'P. Sutton', with a horizontal line underneath.

Paul Sutton BTP MRTPI Dip Urban Design
Principal Officer (Heritage and Environment)

DECONTAMINATION OF L149

GRAHAM VINCENT

BOB WATTS

11th July 1994

E5275/49/1/01

Graham,

- 1) Please proceed with decontamination procedures in L149. This work, together with work to buildings described in my memo of same date will necessitate an increase in Morris labour and plant.
- 2) We discussed and agreed a working ganger(s) would be necessary to ensure progress in the different locations. I would not object to an increase in the rate to £9.50 for a ganger(s). An additional wheeled excavator and dumper will be required and Morris is to be given the opportunity to supply with drivers. Any spare capacity can be taken up with tasks around the site.
- 3) the only controversial issues are retention or disposal of the steelwork in the tower (which would require grit blasting if retained) and a length of laboratory benching. Scaffold quotations are required for internal work, including the tower and boilerhouse and external for gutter removal, brickwork and roof repairs etc.
- 4) Please keep me informed of the labour and plant situation.

Regards,

BOB WATTS

c.c. Adam Ford

WS Atkins Environment

a division of WS Atkins Consultants Limited

Your ref Mr.R.Watts
Our ref c/o Royal Ordnance (South Site)
Date Sewardstone Road
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Tel: 0992 651611
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Ext no

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Anglia Team
English Heritage
Fortress House
23 Savile Row
London W1X 1AB

13th July 1994

Our Ref: E5275/53/1/01
E5275/49/1/01

Dear Paul,

WALTHAM ABBEY RARDE NORTH SITE
L149 Grade 2* Listed Building and Buildings in a Conservation Area
L134, L137, L143, L146, L151, L155, L160 and L166.

1) The strip out of Incorporating Mill L149 will commence 25th July 1994. Work will proceed as notified in my letter to Paul Sutton EFDC of 23rd March 1994 copied to yourself. There are two items for specific consideration.

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3) If you have any observations on this work please let me know.

Yours sincerely,



R.E.WATTS.

Copy:- Mr.O.Pearcey - English Heritage - for information
Mr.P.Sutton - EFDC

Mr.A.Ford - Resident Archaeologist

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