

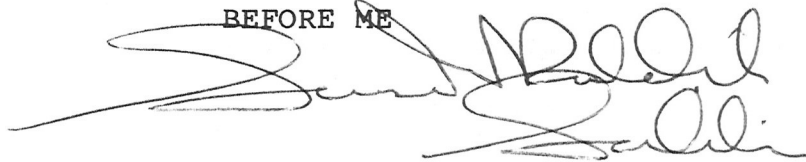
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E. A. Baker S. Site  
Building Lists / Declaration



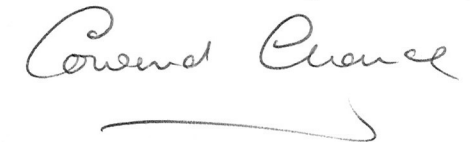
THIS IS THE EXHIBIT MARKED EAB2  
REFERRED TO IN THE  
STATUTORY DECLARATION OF  
ERIC ARTHUR BAKER

DECLARED THIS <sup>cm</sup> 14<sup>th</sup> DAY OF March 1986  
BEFORE ME



WE CERTIFY THAT THIS IS  
A TRUE COPY OF THE  
DOCUMENT OF WHICH IT  
PURPORTS TO BE A COPY.

DATED 18<sup>th</sup> March 1986





Building Ref	Map Ref	Activity Area	Map Area	Broad Description	Former Use	Date of Change
G400	29-G	1	1	Store	Gun Cotton Power Station	1954
G401	29-G	1	1	Water Softening Tank		
G402	29-G	1	1	Water Treatment Plant		
G403	29-G	1	1	Machine Shop		
G404	29-G	1	1	Oil Tank Compound		
G405	29-G	1	1	Boiler House		
G406	29-G	1	1	Compressor House		
G407	28-H	1	1	M.I. Servicing		
G408	29-H	1	1	Services Shop		
G409	29-H	1	1	Cement & Plant Store, Hardening Shop & Shift House	Welding Shop Engineers Facilities Shop	1984 1980
G411	28-H	1	1	High Pressure Test House	Chem. Plumbers Shift House	1975
G412	29-G	1	1	Carpenters & BWD Shop		
G413	29-H	1	1	BWD Offices & Stores		
G414	29-G & F	1	1	Timber Rack & Aggregate Bins		
G415	29-H	1	1	Offices		
G416	29-G	1	1	Inspection & QA Workshop		
G417	29-I	2	2	Acid Store		
G418	29-H	2	2	Process Building		
G419	29-I	2	2	Store		
G420	28-H	1	1	Store	Gun Cotton Factory	1944
G421	28-I	2	2	Store		
G422	28-I	2	2	Store		
G423	28-I	2	2	Store		
G424	29-I	2	2	Shift House		
G425	28-I	2	2	Solvent Store		
G426	28-I	2	2	Solvent Store		
G427	28-I	2	2	Solvent Store		
G428	28-I	2	2	Solvent Store		
G429	29-I	1	2	Sub Station	Nitrating House	1958
G430	29-I	6	2	Process Building		
G431	28-I	1	1	Offices & Central Stores		
G432	28-J	2	2	Offices & Laboratories		
G433	28-J	2	2	Explosives Storage		



Building Ref	Map Ref	Activity Area	Map Area	Broad Description	Former Use	Date of Change
G434	29-H	1	1	Store	Welding Shop	1978
G435	28-H	1	1	Store		
G436	29-G	1	1	Stand By Generator		
G437	29-F	1	1	Riggers Shop		
G440	28-J	2	1	Electronics Offices & Workshop		
G441	29-J	1	1	Administration Offices		
G442	29-G	2	1	Store		
G443	29-I	2	2	Offices (PortaKabin)		
G444	28-K	1	1	Engineers Offices		
G445	28-K	1	1	Design Office		
G446	28-K	2	1	Stores		
G447	28-I	2	2	Stores		
G448	28-H	2	2	Process Building		
G449	28-H	1	2	Sub Station 'E'		
G451	28-M	1	1	Sewage Ejector		
G452	29-J	2	2	Solvent Store/bins		
G454	28-M	1	1	Police Lodge		
G456	28-J	1	1	Solvent Store		
G457	28-J	1	1	Acid Store		
G458	28-J	2	1	Offices & Shift House		
G459	28-J	1	1	Laundry		
G460	29-J	2	2	Portastore (Chemicals)		



Building Ref	Map Ref	Activity Area	Map Area	Broad Description	Former Use	Date of Change
M315	29-E	1	1	Police Search Room	Pump House	1958
M316	29-E	1	1	Police Room		
M317	29-E	1	1	Pump House		
M319	29-E	1	1	Incinerator		
M320	30-E	2	2	Control Room		
M321	30-F	2	2	Store		
M322	30-E	2	2	Firing Point		
M323	30-E	2	2	Observation Post		
M325	31-H	6	2	Explosive Store		
M326	30-F	2	2	Explosive Store		
M327	30-H	1	1	Tractor and Mower Shed		
M328	30-H	1	1	Scrap Metal Bins		
M329	29-G	1	1	Office		
M330	30-G	1	1	Store		
M331	30-G	1	1	Electricians Workshop		
M332	29-H	2	2	Store		
M333	30-G	1	1	Electricians Office and Store		
M334	30-H	2	2	Store		
M335	30-H	2	2	Store		
M338	30-H	2	2	Explosives Facility	Blending House Process Building	1977 1977
M339	30-H	2	2	Control Room		
M340	31-G	1	2	Store		
M342	31-E	6 & 3	2	Charge Machining		
M343	31-H	3	2	Laboratories and Process Building		
M344	31-H	6	2	Explosives Facility	Drying House	1977
M345	31-H	6	2	Control Room		
M346	31-H	3	2	Store	Drying House	1977
M348	32-H	3	4	Explosives Store and Laboratory		
M349	32-H	3	2	Store		



Building Ref	Map Ref	Activity Area	Map Area	Broad Description	Former Use	Date of Change
M350	32-G	2	2	Explosives Facility		
M351	32-F	1	2	3 lb Firing Facility		
M352	32-E	1	2	Metal Store		
M353	32-E	6	2	Explosive Store		
M354	24-II	1	1	Sewage Pump House		
M355	29-II	2	2	Explosive Store		
M356	31-II	3	2	Store		
M357	31-II	3	2	Store		
M358	32-G	2	2	Control Room		
M359	31-II	3	2	Solvent Store		
M360	31-II	3	2	Store		
M361	31-II	3	2	Solvent Store		
M363	31-II	3	2	Process Building		



Building Ref	Map Ref	Activity Area	Map Area	Broad Description	Former Use	Date of Change
N500	30-I	4	4	Explosive Store	Store and Offices	1978
N505	29-I	1 & 2	2	Typing Pool and Offices		
N506	29-1	6	2	Laboratory and Offices		
N509	29-I	1	2	Canteen		
N513	29-J	2	2	Laboratory & Workshop	BWD Wood Machine Shop	1970
N514	30-J	2	2	Process Building		
N515	31-J	3	3	Truck Shed		
N516	32-I	3	3	Store		
N517	32-J	3	3	Store		
N518	32-K	3	3	Store		
N519	29-L	2	2	Solvent Store		
N520	31-L	3	3	Solvent Store		
N522	28-L	2	2	Acid Store		
N523	28-L	2	2	Acid Store		
N524	28-M	1	1	Meter House		
N525	28-L	2	2	Bund		
N526	28-L	2	2	Bund		
N527	28-K	2	2	Store		
N529	29-L	2	2	Store		
N530	29-L	2	2	Process Building		
N531	29-K	2	2	Process Building		
N532	29-K	2	2	Explosive Store		
N533	29-L	2	2	Control Room		



Building Ref	Map Ref	Activity Area	Map Area	Broad Description	Former Use	Date of Change
N534	29-L	2	2	Process Building	Truck Charging Station	1982
N535	30-L	2	2	Process Building		
N536	30-K	2	2	Process Building		
N537	30-L	2	2	Process Building		
N538	30-L	2	2	Process Building		
N539	30-L	2	2	Process Building		
N540	30-L	2	2	Process Building		
N542	30-K	1	2	Reservoir		
N544	31-K	1	3	Derelict		
N545	31-L	3	3	Explosive Store		
N546	32-I	3	3	Transit Shelter		
N547	31-J	3	3	Explosive Storage		
N548	31-J	3	3	Process Building		
N549	31-J	3	3	Process Building		
N550	31-L	3	3	Process Building		
N551	30-K	1	2	Reservoir		
N552	32-M	1	1	Pump House		
N553	31-L	3	3	Curing Ovens Building		
N554	31-M	3	3	Process Building		
N555	31-J	3	3	Calorifier Room		
N556	31-K	3	3	Process Building		
N557	31-K	3	3	Process Building		
N558	31-K	3	3	Compressor House		
N559	31-L	3	3	Store		
N560	31-L	3	3	Store		
N561	31-L	3	3	Store		
N562	32-L	3	3	Offices and Laboratories		
N564	32-L	3	3	Photographic Office and Laboratories & Process Bldg		
N565	32-L	3	3	Compressor House		
N566	32-L	1	3	Toilets		
N567	32-L	3	3	Process and Laboratory Building		

Building Ref	Map Ref	Activity Area	Map Area	Broad Description	Former Use	Date of Change
N568	32-L	3	3	Process Building	Process Building	1958
N569	32-K	3	3	X-Ray and Process Building		
N570	32-K	3	3	Curing Ovens Building		
N571	31-L	3	3	Control Room		
N572	32-K	3	3	Process Building	Air-raid Shelter	1959
N573	32-J	3	3	Not in use		
N574	32-K	3	3	Settling House		
N577	32-K	3	3	Store	Air-raid Shelter	1960
N579	32-I	3	3	Explosives Store		
N580	32-J	1	3	Toilets		
N581	32-I	3	3	Waste Store		
N582	32-L	1	3	Sub-Station		
N583	30-K	2	3	Process Building		
N584	32-L	3	3	Not in use		
N585	31-K	2	3	Refrigerator House		
N586	32-I	3	3	Waste Store		
N587	31-K	3	3	Calorifier House		
N588	31-K	3	3	Plant Room		
N589	31-L	3	3	Store		
N590	32-K	3	3	Calorifier House		
N591	32-M	1	1	Offices and Store		
N592	30-L	2	2	Store)		
N593	30-L	2	2	Store) Potakabin		
N594	30-L	2	2	Store) type stores		
N595	30-L	2	2	Store)		



Building Ref	Map Ref	Activity Area	Map Area	Broad Description	Former Use	Date of Change
P700	32-M	3	1	Womens Changing Room	Box House	1953
P701	32-M	3	3	Mens Mess Room and Changing Room		
P702	33-K	6	3	Explosives Store		
P703	33-L	3	3	Process Building		
P704	33-K	6	3	Process Building and Laboratory		
P705	33-K	3	3	Process Building		
P706	33-K	3	3	Process Building		
P707	33-K	1	3	Pump House (Sewage)		
P708	33-J	3	3	Store, M/c Shop and Exhibition Room		
P709	34-H	1	3	Toilet		
P710	33-I	3	3	Process Building	Store	1952
P712	34-H	3	3	Process Building		
P713	34-H	3	3	Process Building		
P714	34-I	3	3	Process Building		
P715	33-J	3	3	Process Building		
P716	34-J	3	3	Process Building		
P717	34-K	3	3	Process Building		
P718	34-L	3	3	Process Building		
P719	35-M	3	3	Laboratory & Lecture Room & Offices		
P720	34-M	3	3	Process Building	Offices	1951
P721	34-L	3	3	Offices, Laboratory Building		
P722	36-H	1	3	Police Post		
P723	35-K	3	3	Process Building		
P724	35-J	3	3	Process Building		
P725	35-L	3	3	Proof Stand		
P726	35-L	3	3	Motor Room		
P727	35-L	3	3	Temperature Chambers		
P728	35-J	3	3	Oven Building		
P729	35-J	3	3	Process Building		
P730	33-J	3	3	Offices		
P731	33-K	3	3	Office		
P732	33-K	3	3	Process Building		
P733	34-K	3	3	Process Building		

Building Ref	Map Ref	Activity Area	Map Area	Broad Description	Former Use	Date of Change
P734	34-K	3	3	Process Building	Female Mess House	1978
P735	34-K	3	3	Explosive Store		
P736	34-J	3	3	Stove		
P737	34-J	3	3	Process Building		
P738	34-J	3	3	Process Building		
P739	34-K	3	3	Explosive Store		
P740	34-J	3	3	Process Building		
P741	35-I	3	3	Explosive Store		
P742	33-M	6	3	Offices and Laboratories		
P743	33-M	1	3	Offices		
P744	33-M	1	3	Pump House (Sewage)		
P745	34-L	3	3	Solvent Store		
P746	33-M	1	1	Police Lodge		
P747	33-M	1	1	Search Hut		
P748	33-M	1	1	Surgey	Clock Station	1980
P749	33-M	3	3	Battery Charging		
P750	34-L	3	3	Mess House		
P751	34-K	1	3	Electric Sub-Station		
P752	35-H	1	3	Electric Sub-Station		
P753	34-L	3	3	Proof Stand		
P754	33-M	1	1	Fire Station		
P755	35-K	3	3	Explosive Store		
P756	35-M	3	3	Explosive Store		
P757	34-M	3	3	Office and Laboratories		
P758	35-M	3	3	Process Building		
P759	34-M	3	3	Solvent Store		
P760	35-J	3	3	Explosive Store		
P761	35-L	3	3	Explosive Store		
P762	33-M	6	3	Explosive Store		
P763	34-K	3	3	Process Building		
P764	35-M	3	3	Solvent Store		
P765	35-M	3	3	Explosive Store		
P766	34-L	3	3	Explosive Store		









Building Ref	Map Ref	Activity Area	Map Area	Broad Description	Former Use	Date of Change
R633	35-F	3	4	Process Building (Derelict)	Climatic Trials Building	1978
R634	35-F	6	4	Process Building		
R635	35-E	3	4	Stoves		
R636	35-E	4	4	Magazine		
R637	33-G	3	4	Control Room		
R638	35-F	6	4	Control Room		
R639	38-E	2	2	Store		
R640	38-E	2	2	Solvent Store		
R641	39-F	2	2	Explosive Store		
R642	39-G	2	2	Explosive Store		
R643	38-F	2	2	Solvent Store		
R644	35-E	4	4	Magazine		
R645	35-F	1	4	Climatic Trials		
R646	35-F	2	4	Process Building		
R647	35-G	2	4	Process Building		
R648	35-G	2	4	Process Building		
R649	36-G	4	4	Magazine		
R650	36-G	4	4	Magazine		
R651	36-F	4	4	Magazine		
R652	38-G	2	2	Process Building/Laboratory		
R653	38-G	2	2	Store		
R654	36-F	4	4	Magazine		
R655	36-E	4	4	Magazine		
R656	37-E	6	6	Laboratory and Office		
R657	37-F	6	6	Explosive Store		
R658	37-F	6	6	Explosive Store		
R659	37-G	6	6	Explosive Store		
R660	37-G	6	6	Explosive Store		
R661	37-H	1	6	Shelter		
R662	37-H	1	2	Offices		
R663	37-G	6	6	Offices		
R664	38-G	6	6	Store		
R665	37-F	6	6	Laboratory	Store	1954
R666	37-E	6	6	Laboratory	Store	1953

Building Ref	Map Ref	Activity Area	Map Area	Broad Description	Former Use	Date of Change
R667	38-D	1	6	Laboratory	Store	1951
R668	38-D	1	6	Laboratory	Store	1951
R669	39-D	6	6	Laboratory	Store	1953
R670A	38-E	6	2	Store		
R670B	38-E	6	2	Store		
R671	38-E	2	2	Process Building	Store	1958
R672	38-F	2	2	Process Building/Laboratory	Store	1956
R673	38-G	2	2	Office and Laboratory	Store	1954
R675	38-F	2	6	Solvent Store		
R676	38-H	3	2	Store		
R677	38-F	1	2	Pump House (Sewage)		
R678	37-F	6	6	Explosive Store		
R679	37-F	6	6	Store		
R680	37-D	6	6	Explosive Store		
R681	35-F	6	4	Control Building		
R682	38-D	6	6	Explosive Store		
R683	40-F	6	6	Firing Point		
R684	40-F	6	6	Control Building		
R685	35-F	3	4	Control Building		
R686	33-H	1	4	Pump House (Sewage)		
R687	40-G	6	6	Test House		
R688	37E	2	6	Explosive Store		
R689	40-G	6	6	Control Building		
R690	38-F	2	2	Explosive Store		
R691	37-E	2	6	Explosive Store		
R692	37-E	2	6	Compressor House		
R693	38-H	3	2	Store		
R694	38-H	3	2	Store		
R695	38-H	3	2	Store		
R696	38-H	1	2	Chemical Disposal Point		
R697	37-G	6	4	Store		
R698	37-G	6	6	Toilet		
R699	38-F	2	2	Store		

Building Ref	Map Ref	Activity Area	Map Area	Broad Description	Former Use	Date of Change
R801	37-E	6	6	Compressor House		
R802	38-F	1	6	Sub Station 'F'		
R803	36-H	3	6	Store		
	39/40-H	1	1	Burning Ground		
A	005-377	5	5	Sport Club Store		
B	005-378	5	5	Store and Police Dog Kennels		



EAB/3

WE CERTIFY THAT THIS IS  
A TRUE COPY OF THE  
DOCUMENT OF WHICH IT  
PURPORTS TO BE A COPY.

DATED 18<sup>th</sup> March 1986

I, ERIC ARTHUR BAKER, of Royal Ordnance, Explosives  
Division, Research and Development Centre, Sewardstone  
Road, Waltham Abbey, Essex, do solemnly and sincerely  
declare as follows:-

*Covered  
Checked*

- (I) I am a senior scientist and have been employed continuously at the Research Centre at Waltham Abbey (the Factory) for the past thirty years. For the purpose of this declaration I have where possible relied on my own observations and recollections but where necessary I have referred to the records relating to the development which has taken place at the Factory, which records are kept in the Engineering Branch Drawing Office, which is building reference number G445 shown on the plan which I produce and exhibit hereto marked EAB1 and listed on the Schedule which I produce and exhibit hereto marked EAB2.
- (II) The Factory is situated in an urban setting to the south east of the town of Waltham Abbey, Essex with two main entrances in Sewardstone Road, Waltham Abbey (eastern boundary) and third (restricted use) entrance to Highbridge Street, Waltham Abbey. It is surrounded by a security fence (except for a dormant area sublet for agricultural purposes) and there is no residential property. The nearest railway station is Waltham Cross (London terminus is Liverpool Street) situated 1½ miles from the site centre.

The Factory is shown on EAB1 lying within the boundary coloured purple on this plan. This boundary line also marks the limit of the land which is within the Factory's ownership.

(III) The Factory covers an area of about 300 acres and is made up of approximately 355 buildings, comprising approximately 500,000 square feet of floor space, together with a number of firing sites. It has its own infrastructure comprised of the road system, electrical distribution, mains water, gas distribution, effluent and sewage systems, telephone system and steam mains distribution system.

(IV) Upon consultation of the Factory records referred to in paragraph 1 above I am able to say that the building of the Factory on this site commenced in 1885 when the land was acquired by the Crown as an extension to the Royal Gunpowder Factory which was and is located two miles to the north of the Factory. This is now known as the Royal Armaments Research and Development Establishment and is under the control of the Ministry of Defence. EAB1 shows all the buildings which make up the Factory coloured so as to indicate the period during which they were built. Thus the original buildings constructed between 1885 and July 1948 have been coloured blue, except for those constructed between September 1939 and March 1946 ("the war period") which have been coloured red. Construction which was carried out after July 1948 but before the end of 1963 is coloured yellow and the subsequent development is coloured green.

(V) The Factory is one of five which comprise the Explosives Division of Royal Ordnance plc, which division was formed in the Spring of 1984 as part of the restructuring of the Royal Ordnance Factories organisation, prior to the formation of the public limited company in January 1985. The overall use of the Factory is to carry out research, exploratory development, project development, production and testing in the course of which primary, secondary, high explosives and ingredients are developed together with solid propellants for use in guns, rocket motors and power cartridges. The use of rubbers and plastics in conjunction with propellants and other related environments is also researched and developed. All stages of development from the initial research in the laboratories through to pilot schemes and the developing or production processes for the manufacture of explosives and propellants, ancilliary equipment and the assessment of the sensitivity and hazards of all explosives and propellants, is undertaken. The work is performed in support of Royal Ordnance factories in general and under contract to the Ministry of Defence and customers from private industry.

(VI) The site of the Factory may conveniently be divided into six main activity areas which are shown on EAB1 and numbered. All the buildings comprising the Factory have been listed on the schedule which forms exhibit EAB2. On EAB2 the building reference (also marked on each building on EAB1) is given, as is the grid reference on EAB1, a description of the use the building and an indication of the former use and when the use changed, if appropriate. Also indicated on EAB2

is the activity area to which the building belongs and, because not all the buildings are physically situated within the activity area of which they form part, that reference is also given.

(VII) The activity areas are as follows:-

#### 1. Services

The services comprise buildings such as the main offices, general workshops, canteen, boiler house, the surgery and the safety section. They are generally situated in four areas of the site; that is in the north east corner the north west corner, the south east corner (on which there are no buildings) and an area half way down the eastern boundary. The area in the north east corner has a main entrance and is where the principal administration offices are grouped. The area half way down the eastern boundary has a second main entrance and is where the emergency services are grouped. This second entrance is for use outside of working hours.

#### 2. Explosives Research

This activity is carried out on a large area at the northern end of the Factory on which are situated well scattered laboratories, firing sites and test facilities for the process development and production of explosives and related chemicals and non-metallic components. These processes are also carried out on a small parcel of land in the south west of the site.

#### 3. Propellants Research

This activity is carried out on an area of land at the centre of the site on which are situated several larger buildings many of which are of more recent construction. These buildings are laboratories, firing sites and facilities for pilot scale production of propellants, armaments, guided weapons and rocket motors.

#### 4. Magazines

In the centre of the site there are a series of evenly spaced mounded buildings, mostly of early construction, which are magazines used for the storage of explosives ingredients, part processed and finished, produced in other parts of the Factory including the process buildings in this area.

#### 5. Dormant

In the south-east of the site there is a large area of land outside of the perimeter (security) fence which has never had buildings constructed on it and is presently dormant and sub-let for agricultural purposes. It is held by the Factory in case it is needed for expansion at a later date.

#### 6. Royal Armament Research and Development Establishment Enclosure

There is a large area to the south west of the site which was leased to the Ministry of Defence (Procurement Executive) on 2 January 1985, together



with a number of isolated buildings throughout the site. The area and buildings concerned are used for explosives research and development and are listed on EAB2. The activity in the buildings/area did not change on leasing and it is not connected with the activities of the Factory or Royal Ordnance plc other than through commercial links. However, under the leasing arrangements the Factory provides all services, ie security, safety, medical, canteen, maintenance, utilities but the Ministry of Defence property is not administered from the Factory.

(VIII) On the 2nd January 1985, when Royal Ordnance plc was formed, there was no development being carried out at the Factory, nor has there been any development on the Factory site since that time.

AND I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the Statutory Declarations Act 1835.

Declared at *201 Highbridge Street*  
*Waltham Abbey*  
*Essex*

*E.A. Baker*

this *14th* day of *March* 1986



Before me

Solicitor

DATED

1986

STATUTORY DECLARATION

OF ERIC ARTHUR BAKER

---

Coward Chance  
Royex House  
Aldermanbury Square  
London EC2V 7LD.

Ref. MJM.4211/CAC

WE CERTIFY THAT THIS IS  
A TRUE COPY OF THE  
DOCUMENT OF WHICH IT  
PURPORTS TO BE A COPY.

DATED 18<sup>th</sup> March 1986

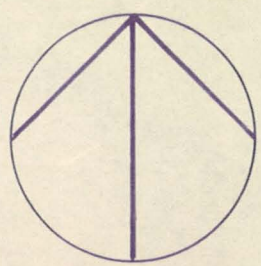
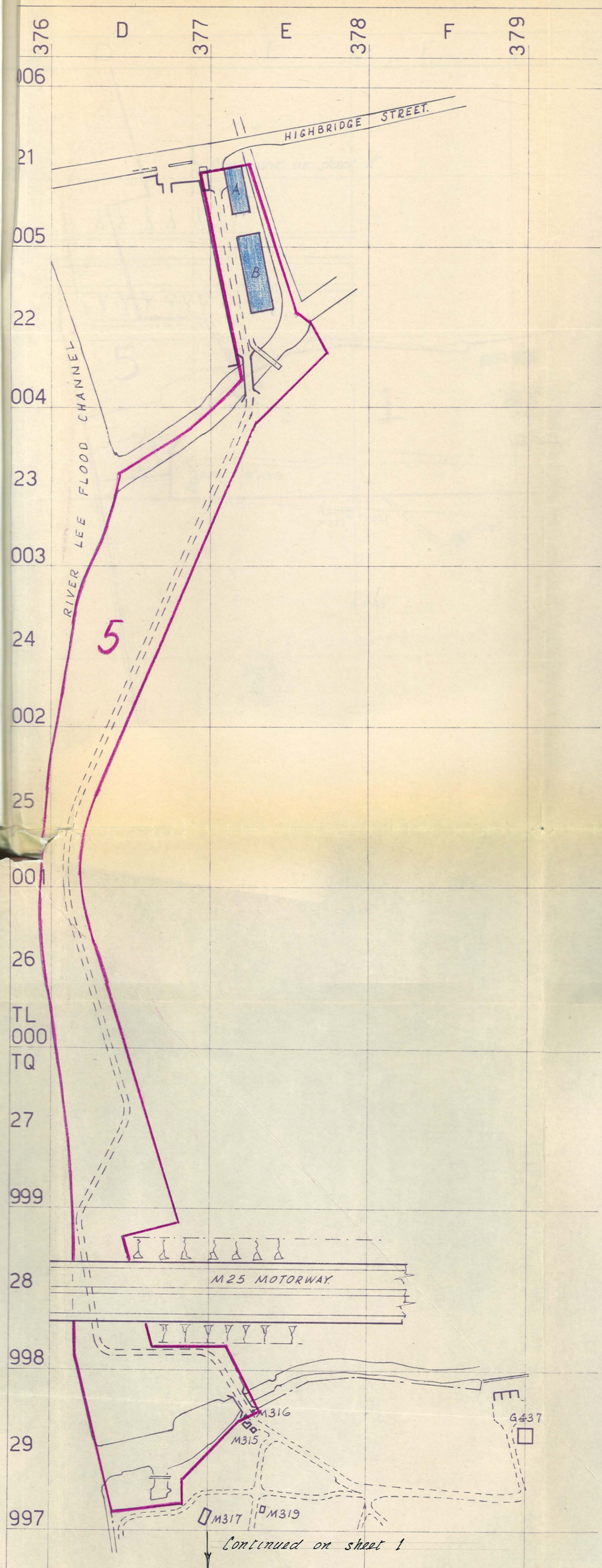
*Cornel Chane*

THIS IS THE EXHIBIT MARKED EAB1  
REFERRED TO IN THE  
STATUTORY DECLARATION OF  
ERIC ARTHUR BAKER

DECLARED THIS 14<sup>th</sup> DAY OF March  
BEFORE ME

*[Signature]*  
*[Signature]*





R.O.S. (EXP. DIV  
WALTHAM ABBEY  
31 JAN 1986  
DESIGN OFFICE

FOR INFORMATION ONLY  
PRINTS WILL NOT BE  
AUTOMATICALLY UPDATED

RO F EXPLOSIVES DIVISION WALTHAM ABBEY.

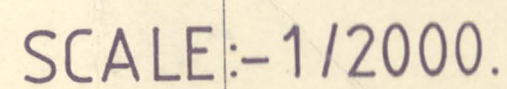
SCALE:-1 / 2000.

DRG REF. NO. 001 SHT 2.

J. Curson.  
G. E. D.

January 1986.







RETAINED BY RO (WA)

BUILDING NO

USAGE

*P708	SAMPLE STORE (EX EXHIBITION ROOM & M/C SHOP & STORE)
*P709	TOILETS
*P713	PROVING OVEN CONTROL ROOM (EX SIEVING HOUSE)
*P757	SAMPLE LAB & OFFICES
*P759	SOLVENT STORE
*P766	LOCKER MAGAZINE (EX MAGAZINE)

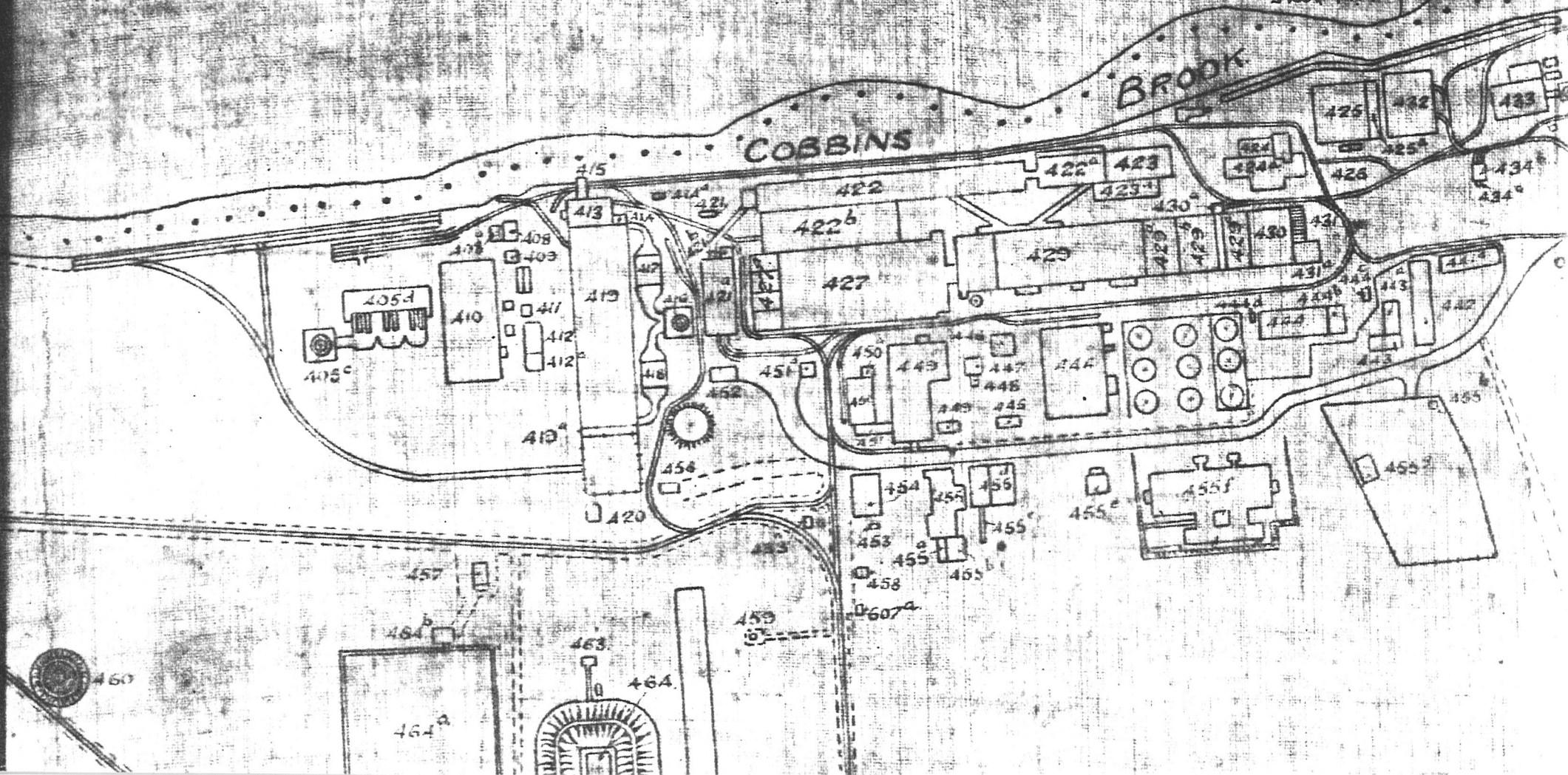
35 BUILDINGS ON LIST

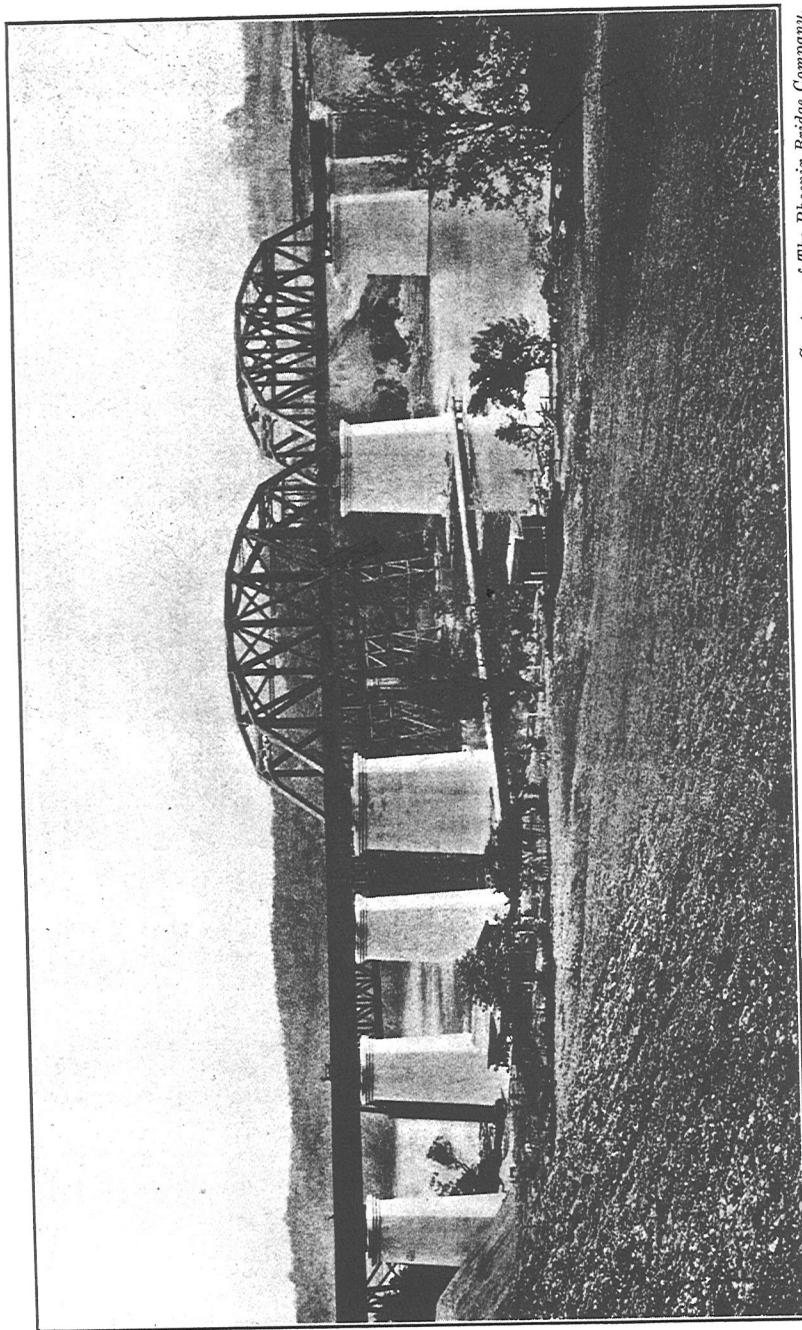
\* BUILDINGS RE-OPENED



# GUNCOTTON WORKS

Lyddite / Picric Acid  
Shell Filling





*Courtesy of The Phoenix Bridge Company.*

2—247'-11" Double Track Through Riveted Truss Spans.  
6—69'-10" Double Track Deck Plate Girder Spans.

OCCOQUAN CREEK BRIDGE—WASHINGTON SOUTHERN RAILWAY COMPANY.

# STRUCTURAL DESIGN IN STEEL

BY

THOMAS CLARK SHEDD

*Professor of Structural Engineering  
University of Illinois*

NEW YORK

JOHN WILEY & SONS, Inc.

LONDON: CHAPMAN & HALL, Limited

1934

**145. Design of Trusses.**—Some of the more common forms of roof trusses are shown in Fig. 11 which is reproduced here as Fig. 181 for

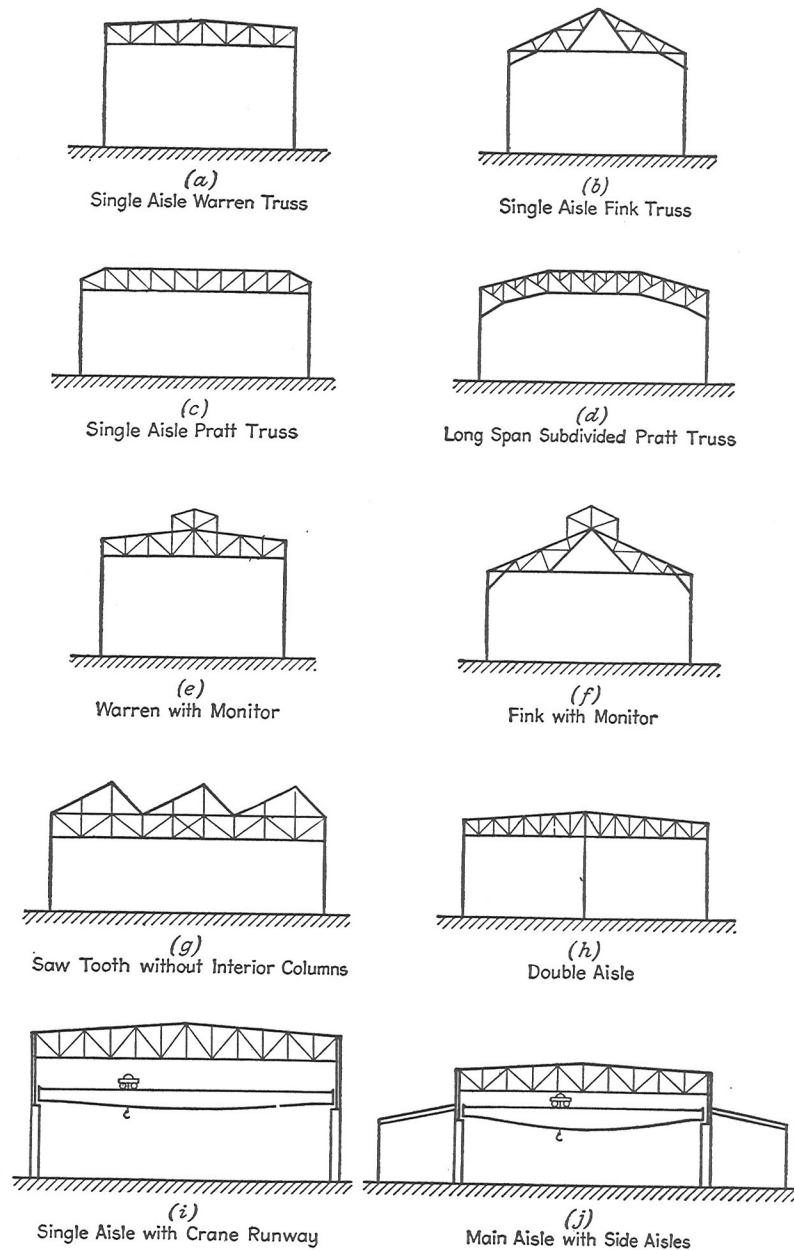


FIG. 181.

easy reference. Other types are shown in a previous volume,\* and in various texts having to do with building design and construction.

The first step in the design of a roof truss is a decision as to general proportions.

The span, of course, is fixed by the dimensions of the area to be kept free of columns. The slope of the top chord will often be fixed within limits dictated by the type of roofing selected, and in some cases may be affected by requirements for ventilation, lighting, etc.

Shingles, slate, corrugated metal, and most forms of roofing tile

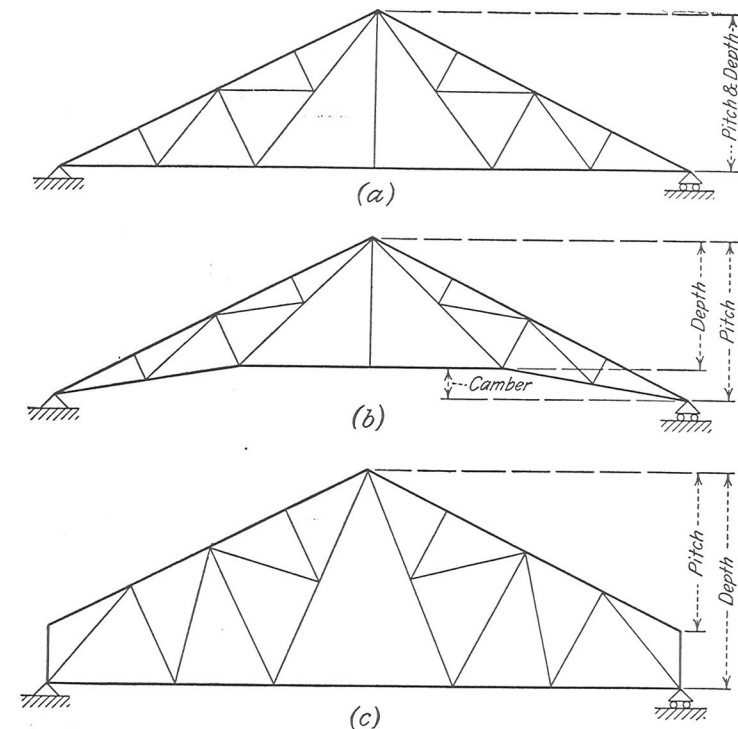


FIG. 182.

require a pitched roof,† while tar and gravel surfaces generally should be used on a flat roof or one having very little slope. The pitch for

\* "Theory of Simple Structures," Shedd and Vawter, John Wiley & Sons, New York.

† The pitch of a roof is defined as the ratio of the rise of the slope to the span length: i.e., a roof having a span of 80 ft. and a rise from eaves to center of 20 ft. is said to have a one-quarter pitch; if the rise from eaves to center is 16 ft. the pitch is one-fifth, and so on.



slate and shingle roofs should not be less than one-quarter and preferably should be from one-third to one-half; the pitch for corrugated metal roofs should not be less than one-fifth (unless the joints are soldered or cemented) and preferably should be one-quarter or more. The pitch for the various forms of tile roofs generally ranges from a minimum of about one-quarter to whatever amount the architect considers suitable. Roofs surfaced with tar and gravel or similar materials have slopes

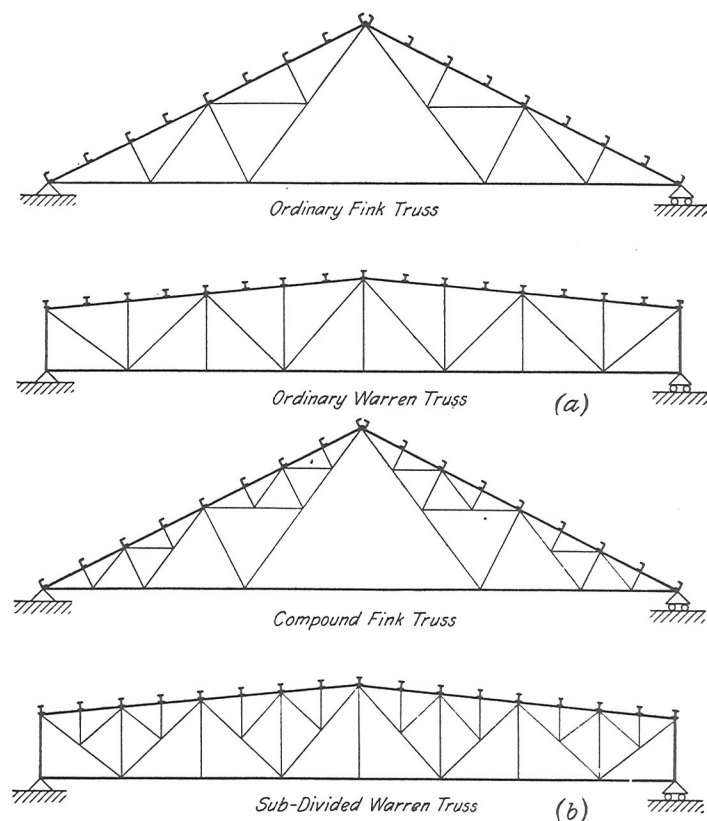


FIG. 183.

ranging from nothing at all to not more than 2 in. per ft.—from 1/4 to 3/4 in. per ft. being most common.

The depth of the truss for an ordinary pitched roof is generally fixed when the pitch is selected, as shown in Fig. 182 (a), but may be reduced by cambering as shown at (b) in the same figure, or increased as shown at (c). The depth of the truss for a so-called “flat” roof is a matter of choice by the designer; and the common range is from

1/12 to 1/8 of the span. In general the ratio,  $\frac{\text{truss depth}}{\text{span length}}$ , varies inversely as the span and directly as the load, and abnormal values of either span or load may result in the economic value of this ratio falling outside of the common range given.

The length of panels in a roof truss depends on two factors which may conflict: (1) on the spacing of purlins, which of course depends on the type of roofing or roof surface; and (2) on the slope for the truss diagonals, which should not be much less than 45° with the horizontal and not more than 60° with the horizontal. In trusses for “flat” roofs a common rule is to make the *average* slope of the diagonals about 45°.

When the roof surface is such that the purlin spacing must be relatively small and the depth of the truss is such that long panels are required for proper diagonal slopes it is necessary that the top chord of the roof truss support purlins between panel points (which of course

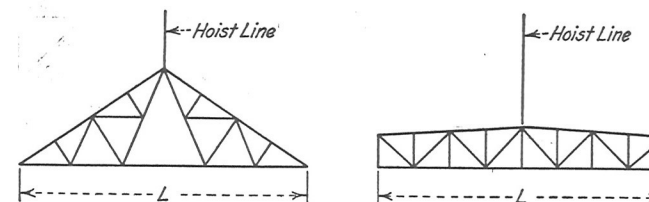


FIG. 184.

results in bending stress in addition to direct stress) as in Fig. 183 (a), or that some form of subdivided truss be used as in Fig. 183 (b).

Having estimated the loads which the truss is to support and established the general proportions such as slope of chords, depth, and panel dimensions, the designer is prepared to calculate the stresses in the various members and proceed to their proportioning.

*Proportioning.*—The fundamental principles to be observed in the design of tension and compression members were discussed in Chapter IV; the following comments are merely to emphasize those points particularly pertinent to roof-truss design, and to suggest some practical matters which should be considered.

When a truss is handled during fabrication or erection by lifting with the hoist line attached at one point, as indicated in Fig. 184, the bottom chord is in compression and of course has a tendency to sideways buckling. Experience has shown that to permit lifting safely with one point attachment (as is generally most convenient) the bottom



## THE ROYAL GUNPOWDER FACTORY - SOUTH SITE

<u>NUMBER</u> M327	<u>OLD SERIES</u>	<u>SS NUMBER</u>
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<u>NAME/FUNCTION</u> LABOUR POOL MONVERSHED	<u>CONDITION</u> Good <input type="checkbox"/> Fair <input type="checkbox"/> Demolished <input type="checkbox"/>	<u>NGR (10 figs)</u>
------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------	----------------------

RELATIONSHIP WITH OTHER MONUMENTS (Powered by. Protected by. Linked to.)

DESCRIPTION

- 1) CONSTRUCTIONAL MATERIAL
- 2) ROOF MATERIALS AND STRUCTURE
- 3) POWER SOURCE
- 4) DIMENSIONS i)L          m ii)W          m iii)HT          m
- 5)

Continue  
over?

PHOTOGRAPHY - WASSCS Film No. WASSCSB/W Film No. WASSBW

Date	Subject	Scale	Direct.	Exp.No.	Date	Subject	Scale	Direct.	Exp.No.

ARTEFACTS

Tools, Machinery-in situ?, Fittings and Furniture non-sparking.

Initial: 

JULY/AUG 1996

1. Dimensions:        L        m. W        m. HT        m.

2. Shape in Plan
3. No. of Stories
4. Building material and Bonding
5. Form of Roof and materials
6. Traverse or No Traverse
7. N.E.S.W. facades and detail
8. Internal description
  - i) Overall internal arrangement.  
Roof and floor materials
  - ii) Room by room (Use Ditto)
9. Interpretation of phasing
10. Any other. (Blackboards.  
machine lists. Telephone lists)

## THE ROYAL GUNPOWDER FACTORY - SOUTH SITE

NUMBEROLD SERIESSS NUMBERNAME/FUNCTIONCONDITIONNGR (10 figs)Good ☐Fair ☐Demolished ☐RELATIONSHIP WITH OTHER MONUMENTS (Powered by. Protected by. Linked to.)DESCRIPTION

1) CONSTRUCTIONAL MATERIAL

2) ROOF MATERIALS AND STRUCTURE

3) POWER SOURCE

4) DIMENSIONS i)L          m ii)W          m iii)HT          m

5)

Continue  
over ☐PHOTOGRAPHY - WASSB/W Film No. WASSBWCS Film No. WASSCS

Date	Subject	Scale	Direct.	Exp.No.	Date	Subject	Scale	Direct.	Exp.No.

ARTEFACTS

Tools, Machinery-in situ?, Fittings and Furniture non-sparking

Initial: 

JULY/AUG 1996

## THE ROYAL GUNPOWDER FACTORY - SOUTH SITE

<u>NUMBER</u> M328	<u>OLD SERIES</u>	<u>SS NUMBER</u>
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<u>NAME/FUNCTION</u> SCRAP METAL BINS	<u>CONDITION</u> Good <input type="checkbox"/> Fair <input type="checkbox"/> Demolished <input type="checkbox"/>	<u>NGR (10 figs)</u>
------------------------------------------	---------------------------------------------------------------------------------------------------------------------------	----------------------

RELATIONSHIP WITH OTHER MONUMENTS (Powered by. Protected by. Linked to.)

DESCRIPTION

- 1) CONSTRUCTIONAL MATERIAL
- 2) ROOF MATERIALS AND STRUCTURE
- 3) POWER SOURCE
- 4) DIMENSIONS i)L      m ii)W      m iii)HT      m
- 5)

Continue  
over?

☐
PHOTOGRAPHY - WASSB/W Film No. WASSBWCS Film No. WASSCS

Date	Subject	Scale	Direct.	Exp.No.	Date	Subject	Scale	Direct.	Exp.No.

ARTEFACTS

Tools, Machinery-in situ?, Fittings and Furniture non-sparking.

Initial: 

JULY/AUG 1996



## SS NO REGISTER.

- 200 - Concrete Plinth - P.640.
- 201 - Blast wall } TO N. OF R.616
- 202 - Blast wall } ~~R.620~~ TO S. OF R.623
- 203 Blast wall } ~~R.619~~ TO S. OF 622
- 204 Blast wall } - NE CORNER R.621
- 205 Blast wall } R.618
- 206 Blast wall }
- 207 Blast wall } R.617
- 208 Blast wall }

1.5m<sup>2</sup> ~~CONCRETE PLINTH~~ <sup>WOODEN</sup> ~~UNDER~~ & 4 COURSE RED BRICK,  
FLEMISH BOND WALL WITH WOODEN 'COVER'  
COVERING, LRG. SHAFT. - OVER-GROWN NOT ACCESSIBLE



SS Numbers				HR			
				Completed			
	Number	Location Description		Plans	Area Maps	Surveys	NGR
	SS 100						
	SS 101						
	SS 102						
	SS 103						
	SS 104						
	SS 105						
	SS 106						
	SS 107						
	SS 108						
	SS 109						
	SS 110						
	SS 111						
	SS 112						
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	SS 143						



