

PLANT USED IN MANUFACTURE OF TETRYL.

Charge House.

Sulphuric Acid Storage Tank.

1.

This is a cylindrical vessel made of 20 lb. lead. 4 ft. int. diam. and 3 ft. 6 in. deep. The capacity is approximately 260 gals.

The inlet is the lead C.O.V. pipe from the acid factory, the outlet a 2" lead pipe to the Sulphuric Gauge Tank controlled by an earthenware cock.

Sulphuric Acid Gauge Tank.

2.

This is a cylindrical vessel made of 20 lb. lead. 2 ft. 7" diam. and 3 ft. 5" to 3 ft. 6" deep i.e. it has a sloping base. A faucet is provided for a level show glass.

Sulphuric Acid Eggs (2).

Horizontal mild steel all welded egg to drawing D.D.(W) 205. Capacity approx. 160 gals.

Nitric Acid Storage Tanks (2)

4.

These are 1/4" mild steel cylindrical tanks, lined with 20 lb. lead. Diam. 3'9" depth 2' 10.1/2" - 2' 9.1/2", sloping base. They have earthenware fume pipes and narki metal cocks.

Nitric Acid Gauge Tank (2).

5.

1/8 in. Aluminium cylindrical tanks. Diam. 2' 5" depth

2' 4.1/2" to 2' 6.1/2" sloping base.
They have earthenware fume pipes.
A faucet is provided 4" from the
bottom for a level show glass.

Nitric Acid Eggs (2)
6.

Horizontal mild steel egg to drawing
D.D.(W) 19. Lined with 30 lb. lead.
Capacity 100 gals.

All the vessels are interconnected with lead pipe. All the
cocks are earthenware except the two on the nitric acid
storage tanks.

Nitrating House.

Tar Oil Gauge Tank.
7.

This vessel is made of 12 lb. lead
to drawing

Sulphator
8.

A cylindrical vessel of 20 lb. lead
body and a domed cover of 12 lb. lead.
It measures 3' 5" in diameter, 3' 1"
in height on the side remote from
the run-off and 3' 4" in height on
the side of the run-off. The overall
height is 5'.

The sulphator is fitted with:-

1. A lead coil of gauge 26 lbs/yard for
cooling which has 13 turns.
2. A mercury in steel recording thermometer
and a glass thermometer.
3. A lead pipe dipping below the surface
of the sulphuric acid for injecting
the D.M.A.
4. A coil of 7 lb. lead with holes at
9" intervals for air agitation.
5. A run off pipe to the D.M.A.S.
solution egg.

D.M.A.S. solution egg.
9.

This is of exactly the same type as the sulphuric acid egg item 3.

D.M.A.S. solution feed tank.
10.

This tank is cylindrical 3' 4" in diameter with a sloping base, the depth being 3' 0" at the side remote from the outlet and 3' 3" at the outlet. It has a domed top and the overall height is 4' 9". The dome has an inspection manhole and the inlet pipe an anti-splash box. The tank is made of 20 lb. lead.

Hot Water Storage Tank.
11.

This is a cylindrical tank mild steel 4' 0" in diameter and 4' 0" in height with a flat lid bolted on. It is made from 1/8 in. Mild Steel. The bottom and sides have a 1/8" mild steel jacket. The 1" cavity between the inner and outer vessels being packed with wool asbestos. Heating is done by blowing in naked steam at the bottom. The hot water outlet to the nitrator is at the bottom of the tank and the water return is at the top. The circulation is maintained by means of a steam injector in the return pipe.

Nitrator
12.

The nitrator is a cylindrical vessel made of 30 lb. lead, 3' 9" in diameter with a sloping bottom the height being 3' 4" at the side

remote from the run off and 4' 0" at the run off. There is also a slope of 2" from each side of the nitrator to the diameter passing through the run off. The overall height is 5' 1". The cover is domed and made of 16 lb. lead. It carries connections for the following.

1. Nitric acid inlet pipe.
2. A stainless steel injector for the D.M.A.S. solution to drawing D.D.(W) 305.
3. Concentric cooling coils of 1/16" stainless steel with 7 laps inside and 9 outside to drawing R.G.P.F. 3109. The coils have 3 cradles, each in a footstep on the bottom of the nitrator. There are three inlets to the cooling coils, one for hot water, one for cold water and one for compressed air for testing the coils and clearing air locks. There are two outlets from the cooling coils, one to the drain and one return to the hot water storage tank.
4. Two agitation coils made from lead pipe 10 lb./yd. with holes spaced 9". The air supply to each coil can be controlled separately and there is a master cock supplying both.
5. A mercury in steel recording thermometer and a glass thermometer to drawing R.G.P.F. 2327.
6. An 8" lead fume main connecting to the main 9" earthenware fume line.

(7) A drencher connected to water supply operated by a lever outside the house.

(8) The cover has two 15 in. inspection manholes with stainless steel covers.

The nitrator run off divides into two $2\frac{1}{2}$ in. arms, one going to each filter and each arm carrying a $2\frac{1}{2}$ in. earthenware cock. For details of nitrator see drawing
The cooling coils are tested every 1000 nitrations with compressed air (80 lbs./sq.in.)

Filters (2)
13.

The filters are made with 20 lbs. lead and the cover with 12 lbs. lead to drawing
The filtering medium is a 2 in. layer of quartz held between two sets of perforated quadrant plates. The filter covers carry a 4 in. earthenware fume run connected to a set of 2 ft. 3 in. absorption towers.

Waste Acid Egg.
14.

Horizontal mild steel egg to drawing D.D.(W) 205. Capacity approx. 160 galls.

All acid lines between the vessels are lead pipe. All water is supplied in mild steel pipes. Compressed air lines are mild steel. Cocks on the acid lines are all earthenware.

The general arrangement of a nitrating house with levels etc. is shown on drawing No.

Woolf Bottles (11)
15.

Woolf bottles to Drawing No. R.G.P.F. 532B. are fitted to the exhaust pipes of all eggs as catch pots. The two nitrating house egg exhaust pipes deliver into separate bottles in order to avoid fire risks. All the charge house eggs deliver into the same bottle.

DISPOSAL OF NITROUS FUMES.

16. Fume Coolers (2). Each cooler consists of two vertical aluminium pipes open at the bottom and with the fume inlet on one pipe 3 ft. 3 ins. from the top. The pipes are 6 inches in diameter and 5 ft. 6 ins. long. Between the two pipes and connecting them run 15 horizontal aluminium pipes $2\frac{1}{2}$ inches in diameter and 3 ft. $8\frac{1}{2}$ ins. long. A half inch water pipe with $\frac{1}{8}$ inch holes 6 inches apart is situated over the top horizontal pipe to supply cooling water.
17. Woolf Bottles (4) Made from earthenware to drawing No. R.G.P.F. 532 B.
18. Strong Nitric Acid Collector. Cylindrical vessel made from stainless steel 2 ft. $2\frac{1}{2}$ ins. in diameter and 2 ft. deep with the top welded on. A side arm $3\frac{1}{2}$ ins. from the bottom carries a showglass.
19. Strong Nitric Egg. Horizontal mild steel egg to drawing No. D.D.(W) 19, lined with 30 lbs. lead.
20. Fume Mains. The fume main from the nitrators is constructed from the following earthenware pipes, 9 ins. in diameter.

Drawing No.

Straight pipe, 2 ft. long	R.G.P.F. 3045
90° Bend	R.G.P.F. 3042
Tee (9 in. arm)	R.G.P.F. 3043
Reducing Pipe, 9" to 6" diameter	D.D.(W). 296

Also used in fume mains between towers

Drawing No.

45° Bend R.G.P.F. 3041.

Double bend, i.e.
through 180° R.G.P.F. 3044.

Between the reducing pipe and the nitrator is a short 6 ins. earthenware run constructed from straight pipes, drawing No. R.G.P.F. 578. The 6 ins. fume run contains a stainless steel butterfly valve.

The fume main from the filters to the 2 ft. 3 ins. absorption towers is constructed from the following earthenware pipes 4 ins. in int. diameter.

Drawing No.

Straight pipe 4 ft. 6 ins.
long R.G.P.F. 746.

Tee pipe (4 in. arm) R.G.P.F. 748.

Bend - 90° R.G.P.F. 750.

The following 5 in. pipes are used in the connections between the 2 ft. 3 ins. towers.

Bend - 45° R.G.P.F. 3090.

Straight pipe, 3 ft. 3 ins.
long R.G.P.F. 579.

Double bend (i.e. 180°) .. R.G.P.F. 3088.

21. 3 ft. Towers (10)

Each tower is constructed from the following earthenware sections.

Drawing No.

1 Saucer D.D.(W) 287.

1 Bottom Section D.D.(W) 288.

4 Centre Sections D.D.(W) 291.

1 Distributing plate D.D.(W) 292.

1 Cover D.D.(W) 289.

Each centre section and the bottom section has lugs at a distance of from the bottom of the section to carry a perforated plate to drawing D.D.(W) 290.

These plates in turn carry the earthenware ring packing. The over-all height is 18 ft. Each tower has an air lift constructed from the following earthenware sections.

Drawing No.

- 1 Elevator bottle D.D.(W) 1098.
 - 3 two ins. earthenware pipes, spigot at one end, conical flange at the other, 3 ft. long D.D.(W) 1091.
 - 8 two ins. pipes, flanges both ends, 3 ft. long ... D.D.(W) 1090.
 - 1 two ins. bend, flange one end, socket at the other. D.D.(W) 1095.
- 10 metal couplings are required as shown on D.D.(W) 1090.

The air lifts are supported by mild steel tubes, 1.1/4 ins. in diameter. They are clipped to the tube by clips to drawing D.D.(W) 1100.

22. Aerex Fan.

Stainless steel fan by Messrs. Aerex capacity 400 cu. ft./min. to Specification R.G.P.F. 792.

23. Motor.

This motor is by the Lancs. Dynamo Co. 2 B.H.P. at 1440 - 1500 r.p.m.

24. Stainless Steel fume shaft.

This is made from stainless steel to Drawing No. R.G.P.F. 3348.

25. Butterfly Valves
(2)

In the fume pipes from the last tower to the fan and to the stainless steel fume shaft are two stainless butterfly valves.

26. Weak Nitric Acid Collector.

This is a stainless steel cylindrical vessel 6 ft. in diameter and 6 ft. deep. The capacity is 1000 gallons.

27. Weak Nitric Acid Egg.

Horizontal mild steel egg to drawing No. D.D.(W) 19 lined with 30 lbs. lead.

28. 2 ft. 3 in.
Towers (5).

Each tower is constructed from the following earthenware sections.

	Drawing No.
1 Bottom Section	R.G.P.F. 3089.
4 Centre Sections	R.G.P.F. 3087.
1 Distributing Plate	R.G.P.F. 3074.
1 Cover	R.G.P.F. 3073.

The overall height is 11 ft. 6 ins. Each centre section and the bottom section carry perforated plates to drawing No. R.G.P.F. 3091 on lugs at the top of the section. The plates themselves carry earthenware ring packing. Each tower has an air lift constructed from the following earthenware sections.

	Drawing No.
1 Elevator Bottle	D.D.(W) 1098.
3 two ins. earthenware pipes with spigot at one end and conical flange at the other, 3 ft. long	D.D.(W) 1091.
4 two ins. pipes with flanges at both ends, 3 ft. long ..	D.D.(W) 1090.
1 two ins. bend with flange at one end and socket at the other	D.D.(W) 1095.

6 metal couplings as shown on D.D.(W) 1090 are required per tower. The air lifts are supported by mild steel tubes 1.1/4 ins. in diameter. They are clipped to the tube by clips to drawing D.D.(W) 1100.

29. Aerex Fan.

As item to Specification R.G.P.F. 792.

30. Motor for Fan.

Motor is by Lancs. Dynamo Co. 2 B.H.P. at 1440 - 1500 r.p.m.

DISPOSAL OF WASTE ACID.

31. Building. The tanks are housed in a wooden framed building, 30 ft. long x 18 ft. 3 ins. with a corrugated iron span roof carrying louvres to assist ventilation. The building has no sides apart from wooden louvres extending 3 ft. 6 ins. downwards from the eaves. The floor is of blue brick.
32. Settling Tanks (4)
(Lead-lined). These are rectangular tanks 3 ft. x 5 ft. 10 ins. x 5 ft. 10 ins. deep (internally) made from $2\frac{1}{2}$ ins. timber and lined with 12 lbs. lead. The capacity is 1900 gallons so that each tank will accommodate the waste acid from six nitrations. There is a faucet in the middle of one of the long sides.
33. Settling Tanks (4)
Earthenware. These are cylindrical tanks 5 ft. 3 ins. in internal diameter and 4 ft. 6 ins. working depth. They are made from acid resisting stoneware 2 ins. thick with a 3 ins. lip at the top. The capacity is 1750 gallons. Each tank will accommodate the waste acid from $5\frac{1}{2}$ nitrations.
34. Waste Acid Pumps
(2). These are $\frac{1}{2}$ in. bore rotary faceplate type pump by Messrs. Douglas. They are belt driven.
35. Motor for Waste
Acid Pump. This is an E.C.C. motor, 5 H.P. at 1000 r.p.m.

WASHING PROCESS FOR CRUDE TETRYL.

36. Vat House.

This is a wooden framed building 48 ft. x 14 ft. with a corrugated iron span roof and a blue brick floor. The building has open sides and ends. The vats are mounted on a wooden platform which is supported on blue brick piers. The platform is 2 ft. 6 ins. above the floor level. Nos. 1 and 2 vats are mounted on wood 1 ft. 4 ins. above the platform level and 3, 4 and 5 are 9 ins. above the platform.

37. Vats (5).

These are 700 gallon vats, 7 ft. in internal diameter and 3 ft. 8 ins. in height, made from 3 ins. oak to drawing No. D.D.(W) 121. A stainless steel plate 2 ft. 3 ins. x 2 ft. 5 ins. is fitted centrally on the bottom of the vat underneath the stirrer. A four inch lead faucet is fitted at the bottom and a 2½ inch at the top. Each vat has a cold water inlet, a hot water inlet, a steam inlet and a cold water pipe which ends just above the bottom faucet. All pipes which dip into the vat waters are stainless steel.

38. Stirrers (4).

These are made from stainless steel to Drawing No. D.D.(W) 272. The stirrers are directly driven by electric motors. The stirrers and motors are carried on 6 ins. x 3 ins. channel irons which extend over the vats. A special coupling to drawing No. R.G.P.F. 3029 permits easy removal of the stirrers.

39. Motors.

The stirrers are driven by 5 H.P. motors by Messrs. Vauxhall.

40. Labyrinths (3).

These are rectangular vessels made from 2 ins. wood 8 ft. 8 ins. long, 2 ft. 6 ins. wide and ft. ins. deep. They have a series of 4 baffle plates arranged in 2 pairs. The first of a pair extends from the bottom of the vessel to within 3 ins. of the top, the second extends from the top to within 3 ins. of the bottom. The first plate of the first pair is 2 ft. 6½ from the end of the tank, the first plate of the second pair is 4 ft. 7 ins. from the end. There is a space of 3 ins. between the plates of each pair.

The three labyrinths are arranged in series, connection between them is made by 4 ins. rubber tube between lead faucets. The second plate of the first pair in the first labyrinth is cut away to leave a gap of 9 ins. between the bottom of the plate and the bottom of the tank.

41. Wringing House No.1. This is a wooden framed building 27 ft. x 15 ft. with sheet asbestos sides and a wooden roof. The floor is concrete.

42. Hot Water Tank.

This is a galvanised iron tank 6 ft. ^{long} / x 6 ft. wide and 3 ft. deep. It has a cold water inlet operated by a ball valve, a steam inlet for heating and a hot water run off. It is situated ft. above ground level and supplies any hot water needed in the washing vats.

43. Wringers.

There are 3 machines (2 old and 1 new) by Manlove and Alliott. All are of the suspended basket over driven electric motor type. Baskets for the 2 old machines 36" x 14" perforated 3/16 ins. mild steel to drawing No. R.G.P.F. 3409. The basket for the new

machine is $33\frac{1}{2}$ ins. x 14 ins. perforated $\frac{3}{16}$ ins. stainless steel to drawing No. R.G.P.F. 3421.

The motors for the old machines are by the Lancs. Dynamo Co., 3.5 H.P. at 950 r.p.m. The new machine has a Lawrence Scott Ltd. motor, 3.5 H.P. at 950 r.p.m., fitted with an electro-magnetic brake.

44. Wringing House
No.2.

A wooden framed rectangular building 18 ft in length x 13 ft. in breadth with a wooden span roof.

45. Hot Water Tank.

A galvanised iron tank 4 ft. long, 3 ft. wide and 3 ft. deep. It has a cold water inlet, operated by a ball valve, a steam inlet for heating and a hot water run off.

46. Wringer-Steam.

This is a 48 ins. x 18 ins. suspended basket under driven steam hydro extractor by Messrs. Broadbent. The steam supply is 1 in. at 75 - 80 lbs./sq.in., giving 4 H.P. at 900 r.p.m. (adjustable to 750 r.p.m.)

47. Wringer - Electric.

This is a 36 ins. x 18 ins. suspended basket over driven type by Potts Cassel. No motor details are available.

48. Table for hand-
sieving Crude
Tetryl.

This is a wooden table 3 ft. long, 2 ft. wide and 2 ft. 6 ins. high. The top of the table slopes downwards to a centrally placed hole 6 ins. in diameter. The edge of the hole is 5 ins. below the edge of the table. A $\frac{1}{4}$ ins. mesh copper sieve in a wooden frame over the top of the table. The edge of the hole in the table extends downwards for $2\frac{1}{2}$ ins. to provide a hopper on which rubber bags may be tied.

49. Scales.

Platform steelyard type scale weighing to 3 cwt.

50. Trucks for moving
buckets of Tetryl.

These are Slingsby Platform trucks.

Purification of Tetryl.

Purification House No.1.
51.

This is a steel framed building 47 ft. by 30 ft. with corrugated iron sides and roof. There is an annex 24 ft. by 9 ft. 2 ins. which houses the engine and the hot water pump and filter, and another annex 4 ft. 6 ins. by 9 ft. 2 ins. where the soda solution for the stills is prepared.

Services for Purification House.

The house is fitted with a cold water service at a pressure of 140 lbs./sq. inch, a steam service at a pressure of 10 lbs./sq. inch. There is also a line shafting driven by a steam engine.

Plant for Hot Water Service.

Water Tanks (2).
52.

Cylindrical tanks 9 ft. 0 ins. diameter, 3 ft. 9 inches deep made from 3/8 inch mild steel. The water is heated by steam blown through a 1 inch silent boiler, and is pumped through the house under pressure. The water return to the tank has a relief valve set at 10 lbs./sq. inch. Before going to the house the water is pumped through a filter press.

Pump.
53.

Horizontal, double acting direct driven steam pump (Worthington pattern) approx. 4" bore x 5" stroke by Manlove Alliot. Steam supply 1" at 80 lbs.

Filter Press.
54.

Mild steel jacketed cylinder 23 ins. in external diameter and 12 ins. deep with 2 ins. supply and delivery pipes. The internal diameter is 18 ins. The filter is an 18 inch circle of felt cloth support on an 8 mesh copper wire grid and a grooved plate. The felt is held in position on the grid by a one inch iron ring. For detail see drawing No. R.G.P.F. 2487.

Dissolving Vessels (2).
55.

These are dished, aluminium lined vessels 3 ft. 4 ins. in internal diameter, 3 ft. 7 ins. in external diameter and 2 ft. 4 ins. in maximum depth. They are made from 3/8 ins. Mild Steel and lined with 3/16 inch aluminium. The space between the lining and the outer vessel acts as a steam jacket. The outlet is a diameter pipe at the bottom, closed during dissolving by a wooden plug and a clipped rubber tube.

Solution Filters (4)
56.

These are rectangular vessels consisting of a top portion 4 ft. 1 inch by 2 ft. 1 inch and 1 ft. 8 ins. deep, bolted to a bottom portion 4 ft. 1 inch by 2 ft. 1 inch by 2 inches deep at the back and 4 inches deep at the front between the two parts is held at ~~stainless steel~~ perforated plate with a 1/4 inch circular hole. The vessels are

constructed from 1/8 inch aluminium strengthened at the top by a mild steel band 1 inch by 1/4 inch. The filters have aluminium covers made in two sections.

Precipitating Vessels (2).

57.

Cylindrical vessels, 3 ft. 9 inches in diameter and 3 ft. 7 inches in depth made from 1/8 inch aluminium sheet strengthened at the top with a mild steel band 1 inch by 1/4 inch. Each has an aluminium stirrer, rotating at 32 revs./minute, and a 2 inch outlet at the bottom. The stirrer is belt driven from a line shafting.

The vessel and stirrer are shown in Drawing No. R.G.P.F. 3519.

The water added for precipitation is sprayed in through brass sprays to drawing R.G.P.F. 3518. The vessels have aluminium covers made in two sections.

Tetryl Filters (4)

58.

Rectangular vessels 4 ft. long by 3 ft. wide by 1 ft. 6 inches deep made from 1/8 inch aluminium sheet and strengthened and the top with a mild steel band 1 inch by 1/4 inch. On the bottom of the vessel is a framework constructed from 1 inch by 1/8 inch aluminium angle 3 ft. 7.1/2 ins. long 2 ft. 8 ins. wide and 2.1/2 ins. deep. This supports a 1/4 mesh perforated stainless steel plate 3 ft. 10 inches long by 2 ft. 10 inches which carries the coarse linen filter cloth. A 1 inch mesh perforated plate 3 ft. 10 inches long by 2 ft. 10 inches also made from stainless steel is placed over the cloth, to keep it in position while the tetryl is dug out.

Wringers (2).

59.

These are 48 inches by 18 inches suspended baskets under driven steam hydro extractors by Messrs. Broadbent. The steam supply is 1 inch at 75-80 lbs./sq. inch. This gives 4 H.P. at 900 r.p.m. The basket is made from mild steel perforated 1/4 inch at 1.1/4 inch pitch.

Acetone Pump.

60.

1.1/2" bore rotary faceplate type pump by Messrs. Douglas. It is belt driven from the line shafting. The pump has a priming inlet.

Scales.

61.

Platform Steelyard type scales to weigh to 3 cwts.

Recovery of Acetone.

Liquor Storage Vats.(2)

These are cylindrical vessels 7 ft. in diameter and 3 ft. 6 inches deep made from 3 inch oak. The outlet is a 2" lead faucet 6" from the bottom. Tetryl which may precipitate in the vat is removed from the liquor by a filter across the vat 2 ft. 2 inches from the outlet. The filter consists of reel cloth superimposed on 1/4 mesh copper wire sieve on a wooden framework. It is in three sections each 2 ft. 2 inches by 1 ft. 11 inches. The sections fit into slots and rest on a 6 inch wooden baffle on the bottom

of the vat. The vats have an aluminium cover made in two sections.

Primary Stills (5)
63.

Cylindrical vessels 3 ft. 4 inches in diameter and 2 ft. 1 inch deep with a domed top giving an overall depth of 3 ft. 4 inches made from 16 lb. lead. The vapour leaves the still through a vertical tube 9 inches in diameter and 5 ft. 6 inches in height. Above this is another vertical tube 2 ft. in length the diameter of which is 9 inches at the bottom reducing to 1.1/2 inches at the top. The 1.1/2 inch pipe is connected to a 1.1/2" lead coil immersed in a water tank. The continuation of this coil takes away the liquor condensed and is turned up at the bottom to allow the S.G. to be measured. The liquor overflows continuously from the turned up end of the pipe into a lead basin, the outlet of which leads to Y pipe to feed both secondary stills. The pipes from the five primary stills deliver into the same basin.

Secondary Stills (2)
64.

Cylindrical vessels 4 ft. 0 inches in diameter, 3 ft. 0 inches in height in vertical portion and 4 ft. 4 inches in height overall including domed top. The stills are made from 3/8 inch mild steel, to drawing No.2006. The vapour leaves the still through a 9 inch vertical lead pipe 4 ft. 6 inches long. Above this is another lead pipe 9 inches in diameter at the bottom and 1.1/2 inches at the top. The 1.1/2 inch pipe is connected to a condensing coil of lead pipe in a cold water tank and thence to a sampling tube in exactly the same way as in the primary stills except that the overflows are into separate basins, the outlets of which deliver into drums in which the recovered acetone is collected.

Filter for wash waters.
65.

This is a square vessel, 3 ft. square by 1 ft. deep made from 2 inch wood. 3 inch from the bottom is a perforated aluminium plate which carries the linen filter cloth.

Labyrinth on drain from Filters.
66.

This is a rectangular vessel 2 ft. wide by 6 ft. long made from 2 inch wood. It has 2 pairs of baffles 1/3 and 2/3 of the distance along the labyrinth. The two baffles in each pair are 3 inches apart.

Labyrinth on drain from wringers
67.

A rectangular vessel made from 2 inch wood 14 ft. long and 2 ft. 6 inches wide with 5 single baffles, the first 4 ft. from the inlet and the rest at 2 ft. intervals.

Vessel for boiling filter cloths.
68.

A cylindrical vessel 1 ft. 8 inches in diameter and 3 ft. 6 inches deep made from 1/8 inch aluminium. It has an aluminium grid 9 inches from the bottom and a steam pipe which delivers naked steam. There is a 2 inch faucet at the bottom closed by a clipped rubber tube.

Vessel for washing filter cloths.
69.

A cylindrical vessel ft. inches in diameter and ft. ins. deep made from 1/8 inch aluminium with a 1 inch by 1/4 inch mild steel band at the top. The vessel has no outlet at the bottom.

Engine for line shafting.
70.

Vertical single cylinder steam engine complete with fly-wheel and governor gear. Maker Robey & Co. Lincoln. Engine No. 23923. Speed of line shafting is revs./min.

Aluminium Gutter.
71.

The gutter is of 6 inch square section 21 ft. 6 inches long with both ends blocked. The outlet is 1 inch wide and 6 inches long and is 2 inches from one end. The other end carries a funnel 1 ft. 3 inches square and 6 inches deep. A 1.1/2 inch pipe is riveted on at an angle of about 30" to the edge of the funnel. The gutter is made from inch aluminium to drawing No. R.G.P.F. 3615.

Bin for empty purified bags.
72.

A square bin 3 ft. 0 inches square by 3 ft. 9 inches deep made from 1/8" aluminium with a 1 inch by 1/4 inch mild steel band at the top.

Bin for empty crude bags.
73.

A rectangular vessel 26 inches long by 16 inches wide by 20 inches deep made from 1/8 inch aluminium.

Racks for bags of purified tetryl (2)
74.

These are wooden racks 4 ft. long, 2 ft. 9 inches wide and 18 inches high. The framework is of 3.1/2 inch square wood. These racks are clean in the Explosives sense and the legs are painted red.

Racks for bags of crude tetryl.
75.

This is of the same size as the rack for purified material except it is only 12 inches high.

PLANT - CORNING.

C.E. CORNING HOUSE.

DRAWING No. H. 653.

C.E. Corning House.
99.

This is an untraversed building constructed in 9" brickwork 24' x 44'6" with a pitched roof 12' to the eaves and 20' to the ridge, and divided into two equal bays. Extensions on this are:-
(i) a shoe porch 9' x 10'6"
(ii) a motor room 7'3" x 16'9".
Both bays have a 4'6" doorway giving access to a trucking porch and the asphalt at both ends of this porch is channelled to carry wash waters to a wooden labyrinth. Both bays are fitted with 1.1/2" M.W.B. water supply and the North bay has in addition 1" hot water supply.

Incorporating Machines (5).
100.

These are Werner mixers of the type shown in drawing R.G.P.F. 917 to Specification R.G.P.F. 612, supplied by Baker Perkins, Kingsway, London. The main frame is constructed of cast iron carrying the main driving shaft of steel in bronze bearings fitted with Stauffer solid grease lubricators. One machine consists essentially of a cast iron trough 2' x 2'1" of approx. 4 cu. ft. capacity, the lower portion of which is jacketed, in which two cast iron mixing blades rotate in opposite directions at 5.1/2 and 11 R.P.M. respectively. The blades have a clearance of 1/4" at all points. There is a clearance of 1/100" where the shafts pass through the sides of the trough. The main shaft is fitted with reversing gear with clutch, pulleys and handwheel and a hand tilting gear is provided to tip the trough through 90°. For unloading the contents the trough is fitted with a removable aluminium cover.

Sieving Tables (4).
101.

These consist of wooden frames 2' x 3' x 2'5" high on which to rest an aluminium tray and sieve.

Sieves (4).
102.

This is a wooden frame 2' x 3' x into which is set 1/4" copper mesh.

Gum pot Platforms (3).
103.

A gum dissolving pot stands on a wooden platform 5'4" x 4'4" x 5' high provided with a handrail. The gum solution store pots stand on wooden platforms 4' 3" x 4'8" x 1'6" high and 1'7" x 1'9" x 1'6" high.

Gum Dissolving Pot (1).
104.

This is a 1/8" aluminium cylindrical pot 22.1/2" diameter and 37" high fitted with an aluminium lid through which a wooden stirrer can project. A pot has two 1.1/4" faucets, one at the bottom and one 3" above it, both being fitted with lengths of 1" rubber hose. The bottom faucet is only used for washing out purposes. The box is normally tied up. The upper faucet hose is equipped with a locked clip.

Gum Solution Store Pots (2).

105.

These are similar to the dissolving pot and the lid has a hole sufficiently large to admit the rubber hose from the top faucet of the dissolving pot. The lid is normally fastened with a lock. In the top of the pot is a 175 mesh copper sieve 22" dia. x 6.1/2" deep with a 1.1/4" rim overlapping the rim of the pot.

Water Stills (2).

106.

Two copper water stills 2'6" dia. x 2' and 3'6" dia. x 2' with a 1" steam supply to a 2" copper heating coil and provided with condensers yield a sufficient quantity of distilled water.

Platform.

107.

This is a wooden platform 10' x 3' wide x 1'6" high on which filled bags are stood.

Bin.

108.

This is a 1/8" aluminium bin 3' square x 2'1" deep in which empty bags are placed.

Motor

109.

The motor driving the main shafting is by the General Electric Co. and develops 25 B.H.P. at 700 R.P.M.

PLANT DRYING.

C.E. Drying Stove
Number 1.
110.

This is an untraversed building constructed of asbestos board on a wooden framework, outside dimensions being 13' long x 12'2" wide and 6'6" high rising to 8'8". It contains five sets of wooden racks holding a total of 100 trays.

Cold air is blown into the stove through an aperture 2'11" x 11" at the bottom of one wall and impinges on a bank of 4" steam radiators. The hot air exhausts through an 8 mesh copper gauze screen 1'10" x 1'8" at the top of the opposite wall.

Racks (5)
111.

These are made of wood 6'3" high 2'3" wide and 6' long provided with 10 pairs of wooden runners spread at 6" up the rack, the bottom pair being 1' off the floor. Each rack holds 20 trays.

Heating Plant.
112.

Seven 4" radiator steam pipes extending the length of the stove 1' from the wall.

Fan.
113.

Direct coupled fan, impeller 12' dia. x 6" approx.

Motor.
114.

Motor by Standard Engineering Co. Leicester .25 H.P. at 1650 R.P.M.

C.E. Drying Stoves (2).
Numbers 2 and 4.
Drawing No.H.416.
115.

This is an untraversed building constructed of 3/4" weather board 12'2" x 22'3" with a pitched roof 6'3" to the eaves and 10' to the ridge. It is divided into 8 equal compartments lined on three sides, ceiling and floor with uralite sheet and fitted with wooden doors provided with gunmetal locks. All doors open on to a "clean" val de travers floor 21'6" long x 5' wide. There is a fall of 1" from the back of the stove to the barrier board. Outside the barrier board is an asphalt trucking porch 22'3" long x 3'4" wide.

Drying Cupboard.

Each compartment, 3'6" long x 2'5" wide x 6'3" high on the inside, is provided with 8 pairs of earthed 1.1/2" aluminium angle irons, spaced at 6" up the cupboard, the bottom pair being 1'6" from the floor. These angle irons support the trays containing the material being dried. Hot air is blown into the bottom of the compartment and circulates round the staggered trays and leaves at the top through an 8 mesh gauge screen 9" x 6" in the back wall.

Heater.
116.

The heater is of the multi-tubular vertical type with approx. 60 tubes 1" dia. x 6' long supplied by a 1" 75 lbs./sq. inch steam supply.

Fan.
117.

This is a cast iron direct coupled fan by Egg & Co. and Davidson & Co. 1917 with an impeller 24" x 9" approx. and 7" diameter ducting to the heater. The fan is fitted with an air filter of 6' square.

Motor.
118.

The motor is by the Electric Construction Co. Wolverhampton developing 3 B.H.P. at 1260 R.P.M.

Ducting.
119.

Each drying cupboard has two 2" hot air inlets, each fitted with butterfly valves, from the 7" dia. lagged ducting from the heater.

C.E. Drying Stove
Number 3.
120.

This building is of asbestos board on a wooden frame and has a pitched roof. Outside dimensions are 13.1/2" x 19.1/2" x 6'6" to the eaves and 12' to the ridge. Centrally placed in the stove is an aluminium frame for holding the trays containing the material to be dried.

(1) Tray Frame.

This is an aluminium frame 6'4" high x 6' x 12'6" containing 5 banks of aluminium angle iron runners on which the trays are supported. There are 12 pairs of runners to a bank spaced at 6" up the frame and each pair supports 2 trays. Hot air exhaust through an 8 mesh copper gauze screen 6'7" at the top of one wall.

Heater (1).
121.

Two vertical banks of four 4" steam pipes spaced at 10" are placed parallel to and 10" from the two shorter walls. These are supplied by a 1/2" 30 lb/sq. inch steam supply.

Heater (2).
122.

This heater is of the gilled tube type 4' x 2'4" x 1' with a 1" steam supply at 30 lbs./square inch.

Fan.
123.

This is a cast iron direct coupled fan by Egg & Co. Davidson & Co. 1917, with a 24" dia. x 9" impeller. An air filter of reel cloth is fitted to the fan.

Motor.
124.

The motor is made by Electrical Construction Co. and develops 4.1/2 B.H.P. at 1260 R.P.M.

Ducting
125.

The galvanised iron ducting from the fan to the heater is 8" diameter and that from the heater to the stove 1" diameter.

C.E. Drying Stoves (2)
Numbers 5 and 6.
126.

Drawing No. H.464. This is a traversed building constructed in 7" x 3/4" weatherboard externally and lined with 3/4" match board. It is a circular building, internal radius 13'4" with a tunnel 7'6" wide x 6'6" x 21'4" long leading to a trucking porch 8' x 7'6". The floor is of concrete covered with 6 lbs. per sq. ft. lead, the walls and ceiling of the stove are lined with painted canvas. From the lead floor to the eaves is 6' rising to 8' at the centre of the stove. There is a fall of 3" from the back of the stove to the porch. The travers consists of a brick wall 7'6" high and varying between 9" at the top to 18" at the bottom in thickness backed by earth having a 1.1/2 to 1 slope. The traverse space is 2'6" wide. No. 5 stove contains 13 small and 7 large racks. No. 6 stove contains 16 large racks.

Large Rack.
127.

These are constructed of wood, 7' x 2'2" x 4'8" long, the vertical members are 2" sq. The seven shelves, spaced at 10" up the rack are of 1.3/4" x 2.1/2" timber, the bottom shelf being 1'6" from the floor. Each rack holds 2 trays.

Small rack
128.

These are of similar construction 6'9" x 2'2" x 3'3" long with seven racks, the bottom one being 1'4" from the floor. Each rack holds one tray.

Heater.
129.

This is a multi-tubular horizontal air heater to Drawing No. R.G.P.F. 1705 and Specification 432. It contains 400 brass tubes 1.1/8" external dia. of 16 B.W.G. and 7' 8.1/2" long through which air passes and surrounding the tubes is steam at 25 lbs. per sq. inch pressure. Diameter of the heater is 3'4.1/2".

Fan.
130.

This is a direct coupled fan by the Standard Engineering Co., with an impeller 2' diameter x 6" approx.

Motor.
131.

This is by the Lancashire Dynamo Co. and develops 3.1/4 B.H.P. at 1200 R.P.M.

Ducting.
132.

Ducting of 12" diameter is used on both stoves.

C.E. Drying Stoves (4).
133.

Drawing Nos. (i) Stove Detail 8/40
(ii) General layout of stores 13/40.

These are of similar design to Stove Nos. 2 and 4 except that three walls are built of 9" brickwork. A row of eight drying cupboards open on to a clean val de travers floor and a trucking porch extends the length of the building, the latter constructed in 4" x 4" wood framing freed with asbestos sheet and over the whole is a pitched roof of corrugated asbestos sheets 6'6" to the eaves and 11'6" to the ridge. Floor area of heating compartments 21'6" x 3'6".
Area of "clean" area 21'6" x 5'.
Trucking porch 23' x 6'.

The four stoves are spaced at 15' from one another. 7 and 8, 9 and 10, are separated by a corrugated iron wall while 8 and 9 are separated by a 3' concrete wall.

Drying Cupboards. Each compartment, 3'3" long x 2'5" wide x 6' high on the inside, lined completely with asbestos board, is provided with 8 pairs of oak runners, spaced at 6" up the cupboard to bottom pair being 1'6" off the floor. Hot air leaves the compartment through a 8 mesh copper screen 9" x 3" at the top of the back wall.

Fans.
134.

These are by Musgrave of Belfast with 12" diam. x 14" impeller and 6" diam. ducting. The air is filtered through a reel cloth filter 27" x 27" x 18". No.7 Stove has in addition a Keith Blackman Fan with a 2' diam. x 1' impeller and 9" ducting also fitted with a reel cloth air filter.

Heaters.
135.

The heaters are of the gilled tube pattern and supplied by Musgrave. With a 60 lbs. per sq. inch steam supply they are designed to raise 400 cu. ft. of air per min. from 0° to 100°C.

Motors.
136.

The motors for the Musgrave fans develop 0.5 B.H.P. at 1780 R.P.M. The motor for the Keith Blackman fan develops 2.5 B.H.P. at 1000 R.P.M.

PLANT FOR SIEVING.

C.E. Sieving
House.
137.

Drawing No. H.652.

The building consists of three brick bays, each 20' x 24' and spaced with 10' gaps. A pitched roof of corrugated asbestos sheet 11' to the eaves and 18' to the ridge fitted with wooden louvres extends down to 7' over a 6' wide "clean" porch and a 6' wide trucking porch, both extending the length of the building, 83'.

Between Nos. 1 and 2 bays is a shoe-changing porch 10' x 8' and between Nos. 2 and 3 bays is a motor room 10' x 15'9". Each bay has a 4'6" doorway opening on to the "clean" porch which is equipped with three 1½" water hydrants with length of rubber hose. All "clean" floors are of bal de travers. The building may be warmed by a 4" dia. steam radiator pipe 6'9" off the floor.

Vibro Sieving
Machines (2).
138.

These are machines supplied by E.R. & F. Turner & Co. of Ipswich, to their Drawing No. 28586 and R.G.P.F. Drawing No. C.175.

A wooden frame 7'3" x 4'6" x 8' high supports the feed hoppers and a wooden frame containing the sieves. This frame, 3'4" wide, 5'1½" long and from 9" deep at the end farthest from the hoppers to 18" at the hopper end is supported from the main wooden frame by means of 4 leather straps. The material to be sieved is fed into this frame through two leather bag hoppers and there are three of these on the underside of the frame for the oversize and undersize material and the product. The machine contains four sieves.

Sieves.
139.

Sieves (2) 8 mesh B.S. copper sieves 1'6" x 4'.
Sieves (2) 32 mesh B.S. copper sieves 1'6" x 4'.

the 8 mesh sieves being over the 32 mesh sieves and inclined to them at an angle of about 30°. The bottom of the frame contains 16 "hedgehogs" which are 2" dia. wooden balls with 1" bristles, and these brush against the 32 mesh sieve and aid the sieving.

Rotary Sieve (1)
140.

Drawing No. R.G.P.F. 3284.

The machine is supplied by Turner & Co., Ipswich. The material to be sieved is fed through a ½" sieve into a hopper and falls into a horizontal rotary sieve 7' long x 2'2" diameter. The dust passing through the sieve is collected at one end by a spiral conveyor, the sieve being automatically kept clean by a spiral brush. The product is taken off at the end of the machine farthest from the hopper.

Sieves.
141.

36 mesh B.S. copper sieves and 76 mesh (equivalent to 72 B.S.S.) silk sieves are available for this machine. The sieves are in two sections 4'1½" x 3'5".

Tables (3)
142. Each bay contains a wooden table 4' x 10" x 2'6" high.

Sieving Tables (3)
143. Each bay contains a wooden table 2' x 3' x 2'5" high with a wooden hopper on which a bag could be tied.

Sieve.
144. On each sieving table rests a sieve. This is a wooden frame 2' x 3' x 3" deep containing a 10 mesh copper sieve.

Motor.
145. The motor driving the main shafting is by General Electric Company and develops 10 H.P. at 1000 r.p.m.

Labyrinth.
146. All water used in washing down the building flows to a wooden labyrinth similar to that employed at the Corning House.

Truck.
147. Drawing No. R.G.P.F. 3327.

These trucks are used for transport of tetryl contained in aluminium trays and bags. They are of wooden construction with open sides and a pitched wooden roof. Internal dimensions 6'1 $\frac{1}{2}$ " x 3'0" x 3'6" high, rising to 3'9". Overall height 5'2".

The track is 1'6" and the truck is provided with a hand operated 4 wheel brake.

C.E. Packing Store
No. 1.
149.

This is a traversed building of wooden construction 23' x 29' with a pitched roof 10' to the eaves and 16'9" to the ridge together with a "clean" porch to the river 14' x 5' wide and a shoe porch 14' x 14' wide.

The traverse extends round two sides of the building 18' high and consists of an external brick wall backed by earth.

Weighing Machine.

This is supplied by W.F. Avery of the platform steelyard type weighing to 3 cwt.

No. 2 C.E. Stove
Drawing No. C.211.
150.

This is a traversed building of wooden construction with a wood frame weather boarded and matchlined. It is painted inside and has a wooden floor.

Inside dimensions 19'6" x 20' 2" x 12' high together with a river loading porch 7' x 8'. A 10' wide concrete traverse 4'3" from the stove extends round the sides.

No. 3 C.E. Stove.
Drawing No. C.127
151.

This is an untraversed building with 2'3" concrete walls and a pitched slate roof. It is matched lined throughout and has a leather floor.

Internal dimensions 27'6" x 12'6" x 6'10" high rising to 9'1", together with a river loading porch 4'8" x 11'6" long.

No. 4 C.E. Stove.
Drawing Nos. 52/40
158/40.
152.

This is a traversed building constructed in wood with weather board outside and match board lining covered with painted canvas. The floor is asphalt.

Inside dimensions 20' x 32'6", with a pitched roof of corrugated asbestos sheets 9' to the eaves and 15' to the ridge, together with a river loading porch 10'6" x 6' wide.

No. 1 C.E. Box Store.
Drawing No. C.132.
153.

This is an untraversed brick building with a pitched slate roof. It is lined throughout with wood and has an asphalt floor. Inside dimensions 60' x 20' x 15' to the top of the semi circular roof, together with a river loading porch 18' x 16' and a shoe porch 8'6" x 6'.

No. 2 C.E. Box Store.
154.

This is constructed of weather board 29' square with a pitched roof fitted with louvres 10' to the eaves and 20' to the ridge.

Bag Bins (2).

Two wooden bins are provided for storing empty bags 3'6" x 3'6" x 2'8" high rising to the back to 3'6".

No. 3 C.E. Box Store.
155.

Drawing No. C.211.

This is identical with No. 2 C.E. Stove.

No. 4 C.E. Box Store.
156.

This is constructed of weather board 39'9" x 13'8" x 7'6" to the eaves of a normal pitched roof.