

Purification of Tetryl.

The purification house operates on a gravity principle i.e. the Tetryl is dissolved at a high level and transferred from stage to stage by flow under gravity. Each house contains two dissolving vessels, four solution filters, two precipitating vessels, four tetryl filters and two wringers, i.e. two units housed side by side.

200 lbs. of crude tetryl are dissolved in 350 lbs. of acetone in a steam jacketed vessel. The acetone is pumped directly from drums which contain 700 lbs. The temperature of the solution is raised by the jacket, if necessary, to between 20°C. and 25°C. The tetryl is dissolved by stirring with a wooden paddle. The acetone dissolving is run into a filter, the filtering medium being one layer of linen, one of unbleached muslin and one of spinnaker cloth. From the filter the solution runs to an aluminium precipitating vessel which is fitted with a stirrer rotating at 32 revs. per min. Two dissolving batches are run into the vessel making the precipitation batch 400 lbs. of crude tetryl. The dip of the acetone solution in the precipitating vessel is about 19.1/2 ins. To precipitate the tetryl, water is added through sprays over a period of 2.1/2 hours until the suspension of tetryl in Mother liquor is 2 inches from the top of the vessel at the edges. This means that the level is about 3 inches from the top at the centre of the vessel owing to the vortex. The quantity of water added is about 1,150 lbs.

When the precipitation is completed, the tetryl is filtered from the Mother liquor on a coarse linen filter. The acetone liquor flows into a large vat for recovery. The tetryl is pressed down on the filter with an aluminium rammer to assist draining. Water is then added to a depth of 2 inches above the tetryl and the washings allowed to pass into the recovery vat. The outlet from the filters is then transferred to a filter, the outlet of which leads to the drain and the tetryl washed with hot water. When the washing is completed the tetryl is dug from the filters and transferred to a ~~stainless steel~~ gutter down which a stream of water is flowing. The gutter delivers into a Broadbent steam wringer. The tetryl is further washed in the wringer and then wrung for 20 minutes. It is dug out of the wringer and weighed up in rubber bags at 108 lbs. gross weight.

Recovery of Acetone.

The acetone liquor and washings at each house are accumulated in two vats. At No.1 House these are arranged in parallel, at No.2 they are in series with the second at a higher level so that a pump is necessary to transfer from the first to the second. This gives an increased settling time for any tetryl which may precipitate in the vats. The distillation of the acetone liquor takes place in two stages. The stills are heated by a steam coil. There are no fractionating columns above them. A hollow lead tube delivers the vapour into a 2 inch lead cooling coil immersed in a tank of cold water.

The primary stills are filled with liquor from the storage vats and 2 gallons of an approximately 12% solution of caustic soda (made by dissolving 90 lbs. of soda in 60 gals. of water) are added. The distillation takes approximately 3 hours, the distillate between S.G. 0.800 and 0.980 being run into the secondary still. At No.1 House there are two secondary stills

each fed by two primaries. At No.2 House there is one secondary still fed by four primaries. Acetone is distilled from the secondaries between S.G. 0.800 and 0.830. The secondaries are emptied^{back} into the primaries at intervals in order to keep the level below the maximum working level.

Throughout the purification house, no cocks are used where there is any acetone. All outlets are closed by clipped rubber tubes.

The recovery process is extremely inefficient. At No.1 House the recovered acetone is of the order of 0.820 S.G. at No.2 House about .810 S.G. The overall recovery is a little more than 50%, more than 50% of the loss being in the recovery process.

The Tetryl produced has:-

V.M. 5% - 6%.
Stability .3 - 1.0 ccs. at 16 hours.
Sieving 40% retained 60 B.S.S.
45% pass 100 B.S.S.

Labour required:- The capacity of the house is 4 batches (1,600 lbs. crude throughput) per shift. 4 men are required to work the house 3 men on the purification and one man on acetone recovery.

All the drains from the purification house pass through wooden labyrinths to trap any tetryl which may escape the filters.

The unbleached muslin cloth which is the top cloth in the solution filters is washed in cold water after each dissolving has been through it. The other two cloths are washed every four dissolvings. The cloths are thoroughly dried before being re-used.

The cloths in the tetryl filters and the wringers are washed once per shift.

Corning Tetryl.

The tetryl is moved by boat from the Purification House either to a store for purified material or to a landing stage from where the 100 lb. bags are taken by truck to the Corning House where the tetryl is incorporated with Gum Arabic solution, 100 lbs. of purified tetryl is loaded into one of the Werner-Pfiederer mixers through a 1/4 inch mesh copper wire sieve. One gallon of 10% Gum Arabic solution and 1/4 of a pint of distilled water are added. With wet purified material containing 5 to 55% of water this gives the correct V.M. content for the wet corned material of 13% to 13.5%. The tetryl is thoroughly mixed with the gum in the machine for 1 hour. If it is too wet owing to a high V.M. of the purified material, dust from the Sieving House is added to reduce the V.M. If it is too dry more distilled water is added. At the end of this time it is unloaded into 3 aluminium trays, a third of the tetryl on each tray. This is done by tipping the machine, removing as much as possible by revolving the blades outwards and unloading the remainder by hand with the blades stopped and the safety catch of the machine on. Each tray of corned tetryl is then rubbed through a 1/4 inch mesh copper wire sieve on to another aluminium tray. It is then ready for stoving. The batch No. of the tetryl is chalked on the tray.

Dust from the Sieving House is treated in the same way except that the 1/4 gallon of gum and 3/4 gallon of water are added at the beginning of incorporation.

The gum arabic is received in 2 cwt. sacks, 20 lbs. of gum are dissolved in 16 inches of water in the dissolving vessel by blowing in naked steam and boiling for four hours. The gum adds 1.1/2 ins. to the dip and the condensate from the steam a further 3.1/2 ins. The specific gravity of the solution at 15°C. must be between 1.032 and 1.038. If this is not the case further gum or water must be added to bring the S.G. within these limits. The solution is then allowed to settle for two hours before being run into one of the storage vessels through the 170 mesh B.S. sieve in the top of the storage vessel.

The time for unloading and reloading a machine is 10 to 15 minutes giving a complete cycle of 75 minutes. There are five machines in the Corning House which means that one machine is unloaded and reloaded every 15 minutes. The output per shift is therefore 3,200 lbs. and the labour required is 4 men.

Stoving Tetryl.

The trays of corned tetryl are taken by truck from the Corning House to one of the stoves and placed on the racks of the stove or in the cupboards of the cupboard stove. When the stove has been filled, the batch nos. of all the trays of tetryl in each rack or cupboard are noted on a card which is kept at the stove. Hot air is then blown through the stove by the fan, the inlet temperature being 100°C. or less. Air is blown through for 72 hours in most of the stoves. In No.7.A. stove there is a larger fan and heater giving a larger air velocity and drying is completed in 36 hours. The tetryl is removed from the stove still in the trays and transported to the Sieving House.

The labour required is one man per shift as stove C/H. and a number of men per shift for transport of tetryl to and from the stoves, wet tetryl to the Corning House and dust and empty trays from the Sieving House to the Corning House. For 3,200 lbs. of tetryl corned and an equivalent amount sieved per shift the number of men required is four.

Sieving Corned Tetryl.

The tetryl is sieved on a Vibro sieve which has 8 and 32 mesh B.S. sieves fitted so that all material retained on the 8 sieve and all passing the 32 sieve are rejected. The coarse material is rubbed by hand through a 10 mesh B.S. sieve in a wooden frame and then put through the vibro sieve again. On the first sieving about 20% of fine material, 25% of coarse material and 55% of good material are obtained. After the coarse material has been rubbed through the 10 mesh sieve and resieved through the vibro, the yield is about 33% fine material and 67% of good tetryl. With careful control of the water content of the wet corned tetryl the yield of good tetryl would probably reach 75-80%. The fine material still contains 50% or more of tetryl which is within the sieving specification. The 32 mesh B.S. sieve had to be used on the Vibro sieve in order that the peace time specification of less than 5% tetryl passing 100 B.S.S. could be observed. The fine material from the vibro is resieved in a rotary sieve fitted with a 72 B.S. silk sieve, where the

tetryl is in contact with the sieve for a much longer period. About 50% of the fine material is retained on the sieve and is blended with the good material from the vibro sieve by hand. The fines passing the 72 B.S. silk sieve are returned to the Corning House for reworking.

Packing Corned Tetryl.

The sieved tetryl is taken by truck from the Sieving House to the Packing House. Here it is weighed into rubber bags to 45 or 90 lbs. net weight according to the size of case to be packed. The bags are placed in the cases. The cases are sampled by a Chief, under the supervision of a member of the C.I.D., before leaving the Packing House. The amount of tetryl removed for the sample is made up from a make-up case which has already been passed as fit. After sampling, the bags are re-tied securely and the cases screwed down. The cases are then taken by boat to the main store where they are retained until they are passed as fit by the C.C.I.'s representative and bonded.

For despatch the cases are taken by boat to a place where they can be loaded into a L.N.E.R. road-rail container.

Treatment of Rejected Tetryl.

1. If the tetryl is rejected for stability and is just above the permitted limit, it is reblended in the ratio of 1 rejected material to 4 new material in the Corning Machines. If the tetryl is a more than a little out of specification for stability it is repurified.
2. If tetryl is rejected for containing grit it is repurified.
3. If tetryl is rejected for containing too much fine material it is resieved. If odd cases only are rejected they are reblended with new tetryl in the Sieving House.
4. If tetryl is rejected for high V.M., the bag of tetryl is placed in a stove for 12 hours. The tetryl is not spread on trays but redried in the bag.

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.

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 6'1½" 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 cwts.

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 travers 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.