6.4 Special Note on Relics

Relics are not always separate isolated items. More often they are part of a collection, assemblage or system.

Assemblages

An assemblage may be regarded as a relic, including all the tools and items normally associated with it when it was operating. This would include the spanners and wrenches used to tighten loose nuts, adjust gears and other speed regulating mechanisms, screens to prevent contact with moving parts and samples of completed and partially completed work. A pump for a hydraulic power plant is not merely a single machine. It is an assemblage consisting of a large number of parts, such as belts which transfer energy from the electric motor, spares for immediate replacement and the common tools, oil cans and wrenches needed to keep it operational.

Collections

A collection is usually a number of relics which belongs to a group of related relics which cannot function effectively if any one is removed.

6.5 Assessment of Assemblages, Collections and Systems

Where an assemblage, collection or system is intact it may be assessed as a whole. In almost all cases the criteria used to assess individual relics is suitable for assessing these groups. It is worth noting that when an assemblage, a collection or a system is assessed, it is quite often of greater cultural significance than any of the individual relics of which it is composed.

Because of the plant modernising programs and the more recent disposal of surplus plant which have been undertaken by the SRA at Chullora over the last decade, there are very few systems or collections of relics left intact. Several assemblages still exist over the site. Wherever a relic was part of an assemblage, collection or system, this was taken into account when the final assessment score was being established. Thus all scores throughout this text for each relic are composite, made up of one part for the individual relic and one part for the role it has in an assemblage, collection or system.

7.0 THE EARLY DEVELOPMENT OF CHULLORA RAILWAY WORKSHOPS

7.1 Introduction

No comprehensive history of Chullora Workshops has been compiled. However several documents exist which illustrate the technological importance of the site soon after it was established. Chullora created great interest in the frameport and engineering fields as it was designed to become the centralised workshop for the railways and more importantly it was to build the whole electrified suburban rail system. It was planned on a massive scale and was for some time the best equipped workshop in the Southern Hemisphere.

The following description is not comprehensive but it does indicate the size of each workshop group and the plant and equipment they housed. It has been compiled from Transactions of the Institution of Engineers of Australia in 1926 and a visit of inspection by the Engineers in 1927.

The development of Chullora has been continuous. In 1927 five workshops and the substation were operational. The Locomotive Boiler Shop has changed function completely, the Permanent Way Workshops have become the Manufacturing Centre, the Signal Workshops have been dismantled while the Electric Car Workshops and Welding Shop still exist in a greatly modified form and are equipped with modern plant.

It is almost invariable that removing a relic from a system decreases the cultural significance of both the relic and the system.

There will, of course, be exceptions to such a rule. A relic may be of exceptional significance - such as a steam engine - and its removal from a system with which it is not contemporaneous, may in fact allow its significance to be increased. In the main, however, systems and collections should not be separated.

7.2 Locomotive Boiler Shop

The locomotive boiler shop was the first section of the new works to be finished. Initially only new boilers were manufactured there but by September 1927 the heavy boiler repair work was being transferred from Eveleigh.

The building was 400' long x 200' wide. The layout of the shop was such that operations could be carried out in sequence with the materials moved progressively through three bays. Steel parts were dealt with in the northern bay and copper parts in the southern bay; these were then transferred to the centre or main bay for assembling. The final work on the boilers was done at the western end of the shop where the test pits were located.

All carrying was done by six electric overhead travelling cranes. These consisted of:

Northern Bay

(1 crane) : An electrically operated three-motor crane, using direct current at 600 volts. The crane had a span of 55' and travelled longitudinally.
Manufactured by: Gibson, Battle & Co. from plans of Ransome & Rapier.

Centre Bay (1 crane) : An electrically operated four-motor crane using direct current at 600 volts. The crane had a span of 75' and travelled longitudinally.
Manufactured by: Gibson, Battle & Co. from plans of Ransome & Rapier.

Eastern end of Centre Bay

(2 cranes) : Electrically operated three-motor cranes using direct current at 600 volts. The cranes travelled laterally and were specially fitted with slow motion push button controls for handling work over hydraulic gap riveters. Each spanned 16' 6".
Manufactured by: Babcock & Wilcox Ltd. and White Bay Steelworks.

Southern Bay

(1 crane) : An electrically operated three-motor crane using direct current at 600 volts. The crane had a span of 55' and travelled longitudinally.
Manufactured by: Gibson, Battle & Co. from plans of Ransome & Rapier.

Along the exterior northern wall

(1 crane) : This crane travelled longitudinally outside the shop. It was an electrically operated three-motor semi-Goliath crane, using direct current at 600 volts and used for racking material and handling die blocks for hydraulic presses. Its span was 72' 6".
Manufactured by: Gibson, Battle & Co. from plans of Ransome & Rapier.

The contents of the boiler shop were as follows -

Northern Bay

From east to west -

One electrically driven punching, shearing and angle-cutting machine, capable of punching 1" - 1 1/4 " holes in 1" - 1 1/4" plate, of shearing plates 1 1/4" thick and of cutting angles up to 6" x 6" x 5/8". Punch gap 36" deep, shear gap 30" deep.
Made by: John Bennie & Sons.

Four separately driven radial drilling machines with a 6' radius, with spindle speeds varying from 208 revs per minute for 1 3/8" diameter drill to 400 revs per minute on 3/4 " diameter drill. The lubrication for drilling was forced from a central well by a small centrifugal pump driven by a 1/2 h.p. induction motor.
Manufactured by: Messrs. William Asquith.

One vertical hydraulic plate bending machine capable of handling 1 1/4 " plates 12" wide.
Made by: Fielding & Platt.

One three spindle, variable centre, vertical travel, pit drill, driven by a10 h.p. motor, for drilling boiler barrels, etc. It was able to handle 6' diameter barrels, drilling 15/16" holes.
Made by: Craven Bros.

Horizontal plate rolls for handling plates up to 1" thick and having 12" clear between vertical columns, driven by 13 h.p. motor.
Made by: Hetherington & Sons.

One tower drilling machine capable of handling 6' diameter boiler barrels. The two spindles could be moved through a range of 11' vertically from the table surface.
Manufactured by: Campbell & Hunter.

One radial drill, belt-driven, maximum speed of spindle, 321 r.p.m., 6' radius.
Made by: Kendall & Gent.

One double head motor-driven drill for drilling holes up to usual size of 2 1/16" diameter. The table held tube plates up to 6' diameter
Made by: Craven Bros.

One radial drill, having six heads and revolving table, 6' 8" diameter, largest drill used, 7/16".
Made by: Beyer Peacock.

One circular saw, cold cutting.
Manufactured by: Craven Bros.

One single spindle milling machine, belt-driven, having 4' table. Gap, 3' wide.
Manufactured by: Kendall & Gent.

One radial drill, belt-driven with 5' radius, for drilling holes up to 2" diameter.
Made by: Sharpe & Stewart.

One vertical milling machine, driven by one 12 h.p. and one 6 h.p. motor. The distance between columns was 6' 1". Table stationary and 24' in length.
Manufactured by: Craven Bros.

One electrically driven plate bending rolls, to take 1" plate 8' wide, at a speed of 30 feet per minute through rolls driven by 35 h.p. motor and raised by 18 h.p. motor.
Made by: Berry & Co.

One double head, belt-driven, vertical drilling machine, 5' between columns.
Made by: Craven Bros.

One guillotine plate shearing machine for plates up to 10' x 3/4" with an independent motor drive.
Made by: Jas. Bennie & Sons.

One high speed belt-driven, double-headed traversing drilling machine, 7' 6" between standards, to handle plates 7' 6" wide. Table travels 6' 6". Used for drilling holes up to 1 7/8".
Made by: Campbell & Hunter.

Platė-straightening rolls, 6' between vertical sides, for handling 1/2" thick plates. Belt-driven.
Made by: Craig & Donald.

One double-headed vertical milling machine, 6' 6" between standards, 25' bed, 17' 6" table, driven by two motors, 18 and 7 1/2 h.p.
Made by: Wm. Muir & Co.

One radial drill, with radius of 5' for cutter bar up to 14 1/2" diameter in 1/2" plate. Belt-driven.
Made by: Kendall & Gent.

Two spindle variable centre tower drilling machines, 4" to 8 "drill, spindle centres 6' 6" diameter table, vertical range, 11' 6", separately driven.
Manufactured by: Campbell & Hunter.

Hydraulic Flanging Press: At the western end of the northern bay, on the north side; for flanging steel, throat, back and tube plates up to 7/8" thick. Capable of exerting a total pressure of 642 tons, from an accumulator pressure of 1,560 lb per sq inch. It was equipped with an adjustable inverted ram and cylinder for double flanging.

Column centres: 11' 9" x 5' 6"Table: 10' 6" x 10' 0"
Three main rams: 17 1/4" diameter x 5' stroke
Pressure on each ram: 162 tons
Two water saving rams: 7 5/8" diameter x 5' stroke
Pressure on each ram: 32 tons
Four vicing rams: 6 1/2" diameter x 2' stroke
Pressure on each ram: 23 tons

Plate Furnace: At the western end of the northern bay, on the north side; end charged, end fired type, using coal fuel, for heating steel plates. The roof was arched laterally with 9" rise at the centre. The grate area was 10' 0" x 3' 0" wide. The ashes were removed at ground level. The hearth measures etc. etc, the door opening measures etc etc and the floor level is 2'9" above ground level. There were four gas exit flues, each 12" x 4 1/2", discharging through passages under the furnace floor to an underground flue leading to a chimney outside the building. The openings for cleaning the flues were situated at suitable points. This was a departmental design.

Southern Bay:

From east to west -

One 10' hydraulic gap riveter, capable of exercising pressure of 30 to 60 tons. Served by separate 10 ton crane.
Made by: Henry Berry & Co.

Two "Humil-Calorac" electric rivet heaters, for rivets 3/4" to 1 1/2" diameter. Capacity, 1,200 rivets each per shift of eight hours.
Supplied by: R. W. Cameron & Co.

One high-speed belt-driven duplex drilling machine with a vertical range of 11' 6" and a table of 6' 6" diameter.
Made by: Campbell & Hunter.

Plate-straightening tables.

One 'Sirocco' high-speed rotary blower for angle-smith's fires, diameter of fan 25" direct, coupled to electric motor. Capacity, 1,000 cubic feet of free air per minute against a resistance equal to 10" water gauge with the fan running at a speed of 1,450 r.p.m.
Made by: Davidson & Sons, Sirocco Engineering Works.

One hydraulic punch and shears, with 3' shear gap and 3' 6" punch gap. Made by: the Hydraulic Engineering co., Chester, England.

One small horizontal hydraulic punch, 6' from bottom of gap to the C/L ram. Stroke, 2 3/4".
Made by: the Hydraulic Engineering Co. Chester, England.

One Wickstead plate sawing machine, cutting 4" to 8" per minute, bevel caulking edge. Movement effected by a revolving table on a sliding base. Electrically driven.

One combined plate bending and straightening machine, patent four roller type, for plates up to 8' x 3/4" driven by 10 h.p. motor.
Made by:Craig & Donald.

One radial, drilling and tapping machine, belt-driven.
Made by: Kendall & Gent.

The fires for angle-smiths' work were located adjacent to the southern wall.

One duplex traverser drill, belt-driven, having 5' travelling head with 4' between drills.
Made by: Craven Bros.

One single spindle milling machine, 2' 6" gap, having table moving by power, 4' 0" travel x 4' 0" traverse.
Manufactured by: Kendall & Gent.

One punching, shearing and angle cutting machine to punch 1" x 9/16" holes, shearing 3/4" plate, and to cut 3 1/2 x 1/2" angles. Punch gap 36", sheer gap, 36". Belt-driven.
Made by: Henry Berry & Co.

Hydraulic Flanging Press: For flanging copper tube and back plates. It was capable of exerting a total pressure of 600 tons, from an accumulator pressure of 1,560 lb per sq in. The Column centres are: 9' 9" x 5' 9". Three main rams have, 17 3/4 diameter x 5' 0" stroke with a Pressure on each ram of: 172 tons. The Four auxiliary rams have: 5" diameter x 5' 0" stroke with a Pressure on each ram of: 13 tons. The Three auxiliary rams have, 4 1/2" diameter have a Pressure on each ram of: 11 tons.
Made by C.H. Musker

One 60-ton hydraulic press.
Made by: Fielding & Platt.

Angle rolls, belt-driven, 3 x 3 x 7/8" angles.
Made by: Craven Bros.

Plate Furnace: End charged, end fired type, using coal fuel for heating copper plates. The roof was arched laterally with 9" rise at centre. The grate area was 10' 0" long x 3' 0" wide and the ashes were removed at ground level. The hearth was 15' 0" long x 10' 0" wide with a door opening 10' 0" x 2' 0" high. The four gas exit flues discharged through passages under the furnace floor to an underground flue transversely placed under the centre of the hearth. The openings for cleaning the flues were situated at appropriate points. This was a departmental design.

Two turret lathes for copper boiler stays. These were belt-driven, with three speeds.
Made by: Ward & Co. Birmingham.