

GLIMPSES

The Beginning

Noble Carr Richardson came to Bombay in 1852, with fiery ambition. In 1858 his ambition found expression in the form of a small foundry. The foundry was set up in the compound of his bungalow in Byculla, then a fashionable locality of Bombay. Through the years the foundry flourished, and in 1870 Richardson & Company came into existence. It was a partnership venture—with the two sons. Noble and William Richardson joining hands with their father.

A New Partnership

In 1880 Richardson & Company absorbed the business interest of Nicol & Company of Parel Road, Bombay. With the merger, John Cruddas, the manager of Nicol & Company became partner and thus began a new thriving partnership—Richardson & Cruddas—later to become the largest structural and mechanical engineering company in Western India.

A New Era dawns

Richardson & Cruddas as a partnership venture, continued to prosper both in Western and Southern India. However, with India's Independence the British partners sold the company to Haridas Mundhra who became it's sole proprietor. In 1949 the firm was turned into a Private Limited Company with 100% Indian Capital. In 1972 the business of the old Company Richardson & Cruddas Ltd. was acquired by the Government under an Act of the Parliament and a new company called Richardson & Cruddas (1972) Ltd., was formed on 15th March 1973 as a wholly owned, "Government of India Undertaking."

The Present and the Future

At present Richardson & Cruddas has four large workshops with approximately 4200 employees at Byculla-Bombay, Mulund-Bombay, Cassimode-Madras and M.I.D.C. Industrial Estate-Nagpur. This includes 300 qualified engineers. All the four units have individual large design and drawing offices to take care of the design and development of equipments & services pertaining to their unit. In the shops, besides skilled operators, R & C has built in all the units, a team of engineers and technicians from Foreman to Fitter level who have familiarised themselves with the drawings/designs of the equipments manufactured in respective units.

The main activities of R&C in its four units are:-

- Steel Structures and Bridges
- Technological Structures
- Transmission Line and Microwave Towers
- Pressure Vessels and Heat Exchangers
- Sugar Mill Machinery
- Boiling House Equipment for Sugar Plants
- General Industrial Plant and Equipments
- Rubber and P.V.C. Machinery
- Industrial Furnaces
- Graded Cast Iron Castings
- . C.S. and C.I. Gears upto 2100 mm. Dia. and 30 Module
- Railway Points and Crossings
- Refrigeration Engineering
- · Sanitary and Public Health Engineering, etc.
- Effluent, Water and Sewage Treatment Plants
- India Mark-II Deepwell Handpumps
- Turnkey Projects

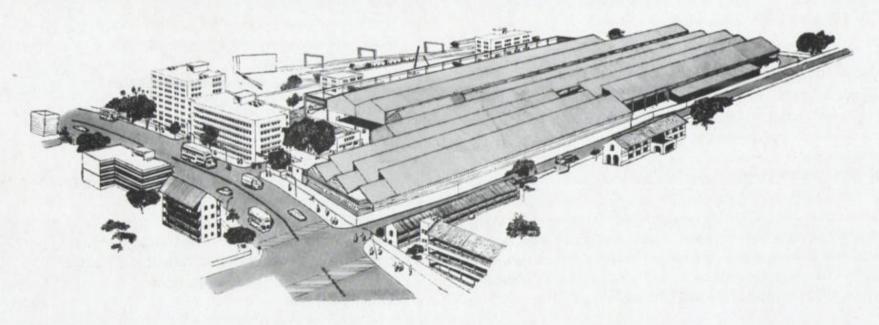
WORKS

This Unit has a 12-acre site with railway siding. The Unit specialises in design, fabrication and erection of all the types of steel structures, sugar/rubber machinery and other sophisticated engineering equipments. This work shop is completely equipped with latest types of precision machines. In this Unit fabricated structures upto 20 Tons can be handled. The total employee strength of this Unit is about 2200, which includes qualified Engineers.

Manufacturing Activities & Services:

- Fabrication of medium and heavy technological steel structures & Bridges.
- Fabrication of Railway Points & Crossings, Pressed Steel turnout Sleepers, Steel Track Sleepers, Slide Chairs etc.
- Large Rubber Mixing Mills in technical collaboration with Comerio Ercole, Italy.
- Sophisticated Rubber Extruders, Calenders & their complete Lines in technical collaboration with Hermann Berstorff, West Germany.
- Special wear resistant Sugar Rollers.
- Sugar Plants on turnkey basis.
- Grey Iron Castings upto 10 Tons in weight.

BIRD'S EYE VIEW OF THE REGISTERED OFFICE & WORKS BYCULLA, BOMBAY



Manufacturing Facilities

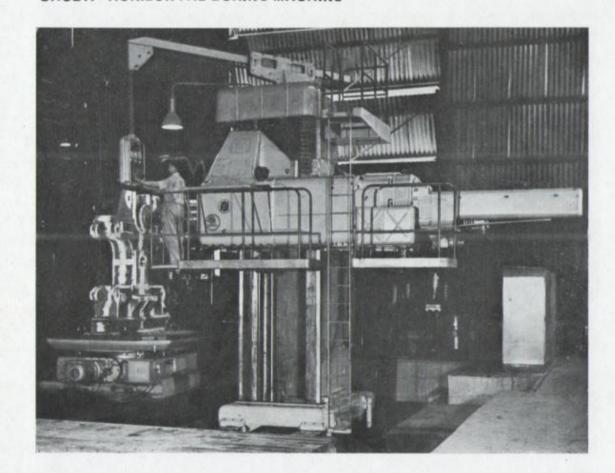
Equipment (Capacity-Tonnes/mm)

- Horizontal Boring and Milling Machines (20T/ 8000 lg, 2500 ht)
- Vertical Borer
 (16 T/3200 dia, 1600 ht)
- Planning Machine (16 T/8000 lg, 2000 ht)
- Face plate Lathes (8 T/3660 dia)
- Heavy Duty Lathes (16 T/1200 dia,5000 lg)
- Gear Hobbing Machines (250-2000 dia)
- 2 Plate Bending Machines (16 thk, 2500 lg)
- Oxyplane Gas Gutting Machines (150 thk,15000 lg)
- Guillotine Shears
 (28 thk,3150 width)
- Drilling Machines, Hydraulic Horse Shoe Rivetters, Acme Structural Mills, Sawing Machines, Cranes, Bending Machines, Hydraulic Presses, Automatic Welding Machines, Welding Aids etc.

Inspection Facilities:

 X-ray Machines, V-ray Machines, Ultrasonic Machines, Ultrasonic Thickness Meter, Mass Spectometer, Magnoport, 1000 MKI, Dye Penetrant, Universal Testing Machine, Metallurgical Microscope, Helium Leak Detector, Heat Treatment Furnace etc.

"SKODA" HORIZONTAL BORING MACHINE

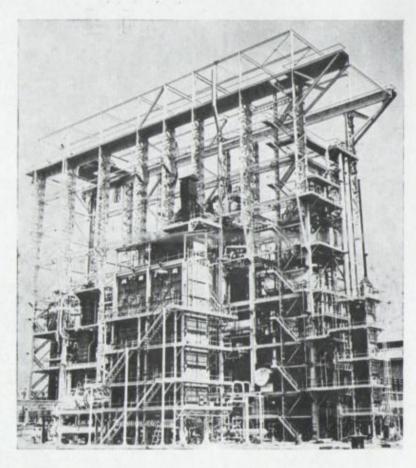


Steel Structures

R&C designs, fabricates and erects various types of medium/ heavy steel structures for factory buildings, general engineering workshops, Automobile Industry, Thermal Power Stations, Textile Mills, Ship Building Plants and Railway Work Shops.

MAINLINE STATION OF CENTRAL RAILWAY, VICTORIA TER-MINUS, BOMBAY

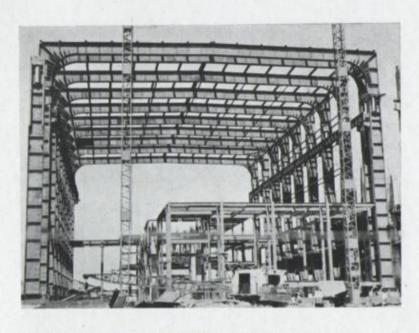




HEAVY WATER PLANT, BARODA FOR DEPT. OF ATOMIC ENERGY 54 MTRS. HEIGHT WITH 100T CAPACITY CRANE AT 48 MTRS, HEIGHT.

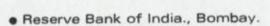
Some of our Prestigeous Clients:

- Dept. of Atomic Energy.
- Dept. of Space, Sriharikota.
- Indian Railways, Govt. of India.
- Raman Research Institute Bangalore.
- Gammon India Ltd., Chandigarh.
- Larsen & Toubro Ltd., Bombay.

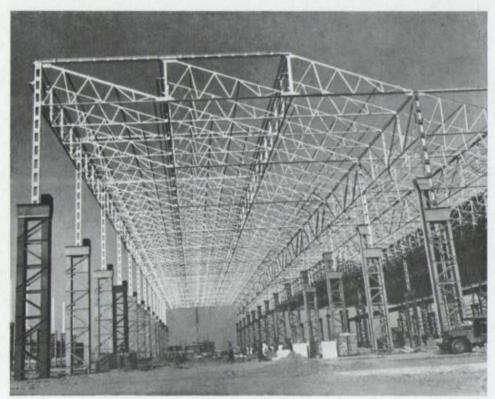


NASIK THERMAL POWER STATION 3200 MT, PORTALS OF 30 MTRS, HT & 39 MTR SPAN, FOR MAHARASHTRA STATE ELECTRICITY BOARD. (30,000 MT) DESIGNED, FABRICATED & ERECTRED BY R&C ALL WELDED STEEL COLUMN, 16T WEIGHT & 24 MTRS LONG.

FACTORY BUILDING FOR BHARAT HEAVY ELECTRICALS LTD.

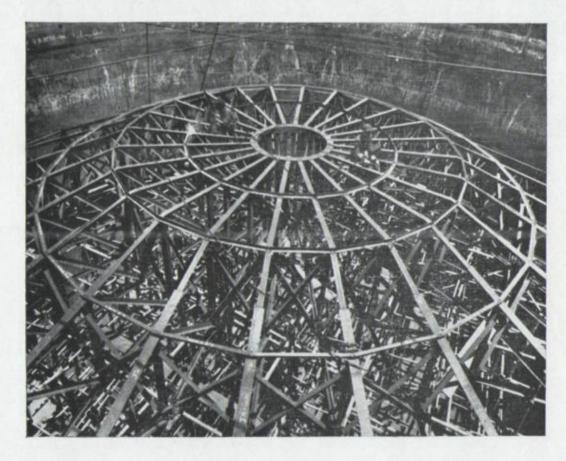


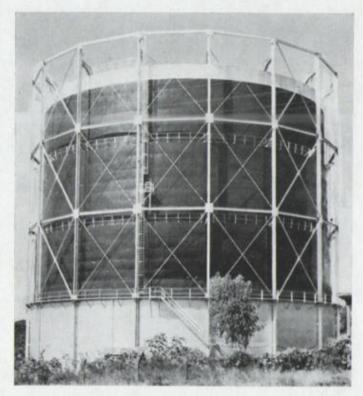
- Hindustan Steel Work Construction Ltd., Bhilai.
- Heavy Electricals India Ltd., Bhopal.
- Premier Automobiles Ltd., Bombay.
- Bharat Heavy Electricals Ltd.
- Tata Hydro-Electric Bower Supply Co. Ltd., Trombay.
- Neyvelite Lignite Corporation, Madras



Gas Holders

R&C Specialises in the design, fabrication and erection of complete Gas Holders of various capacities and intricate designs. These jobs include 2 lifts with cup and dip arrangement for Water Connections, Venting Device, Inlet and Outlet Water Connections with Water Seals for isolation of Gas Holders, Platforms, Stairways, Manhole Covers, Cast Iron Ballasts, Manometers etc.





DESIGN, FABRICATION & ERECTION OF 30,000 M3 COLUMN GUIDED WET SEAL GAS HOLDER FOR MYSORE IRON & STEEL LTD. BHADRA-VATI

ROOF FOR GAS HOLDER FOR F.C.I.

Bridges

R&C Specialises in the design and fabrication of Railway Bridges (Underslung and Through types) and Road Bridges.

Some of Our Prestigeous Clients:

Dharamtar Creek Road Bridge, Bombay. Banastarim Road Bridge, Goa. Borim Road Bridge, Goa. Railway Bridge, Wardha. Railway Bridge, Bangalore.





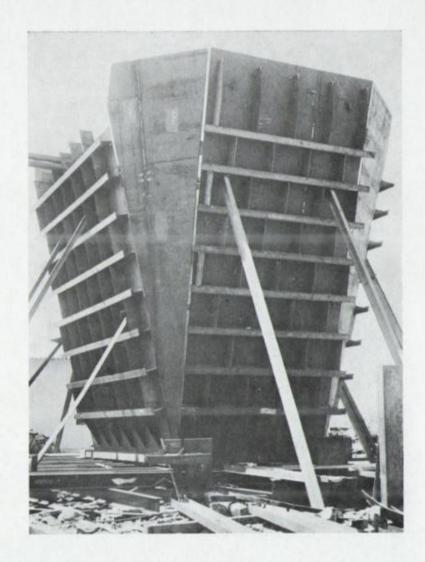
WARDHA RILWAY BRIDGE 7 SPANS, 200 FT THRO' TYPE RIVETTED

BORIM ROAD BRIDGE, GOA 8 SPANS, 10 FT THRO' TYPE RIVETTED LATTICE GIRDERS FOR P.W.D.

Technological Structures and Equipments

R&C is completely equipped to design, fabricate and erect Technological Structures for Chemical, Petrochemical, Atomic Power Plants, Air Terminal Buildings etc.





COAL BUNKER FOR PARLI THERMAL POWER STATION, BHEL, DELHI.

MOUNT FOR MILLIMETER TELESCOPE (10 MTR DIA) WITH AZIMUTH & ELEVATION AXIS DRIVE SUPPLIED TO RAMAN RESEARCH INSTITUTE BANGALORE

Machine Building Division

R&C started manufacturing rubber machines about 40 years ago in the true pioneering spirit. Later the growth of rubber industry necessitated the manufacture of 42" & 60" Mills, Calenders, Extruders and presses as regular products.

To meet the increasing demand for sophisticated rubber machines in the country R&C collaborated with M/s. Comerio Ercole, Italy, one of the leading rubber machinery manufacturers on the Continent, for the manufacture of large 84" rubber mixing Mills. Meanwhile many tyre and tube industries were envisaged to be set up during the 5th Five Year Plan. To cater to the requirement of these tyre and tube industries R&C collaborated with M/s. Hermann Berstorff, West Germany, for the manufacture of large 4-Roll/3-Roll Calenders, 200/250 mm Extruders and their complete lines.

To enable assemble such heavy sophisticated machines, at our Byculla Unit, the capacity of assembly and testing bay was expanded. At the moment R&C can undertake simultaneously assembly of one 84" mill, three 60" mills, two 42" mills, one large 68" 3-Roll Calender with line, one 200 mm extruder with line. The special feature of the assembly shop is that the machines are assembled on completely leveled bay to ensure accurate alignment and

reliability demanded of such machines. The machining of all the major and critical components is being carried out in well equipped medium/heavy machine shop ensuring high quality of the components. The excess capacity of the foundry, both hand and machine moulding, caters to the chemical, sugar, electrical and mechanical power transmission industries.

Welding booms, positioners and rotators are also manufactured for it's own use and for the welding industry in general. Many of these machines have already been installed in some of the large fabrication shops in the country.

Some of Our Prestigeous Clients:

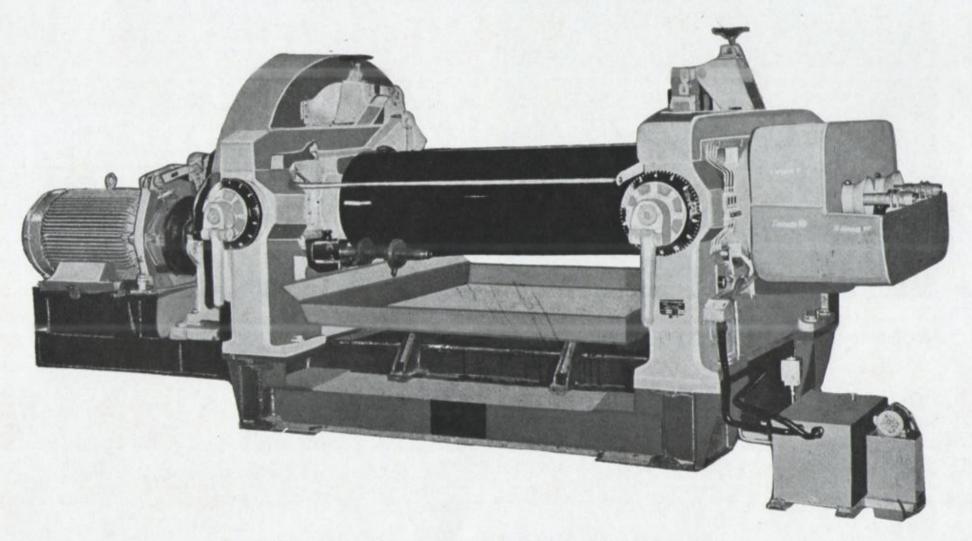
- Dunlop India Ltd., Calcutta & Madras.
- · Modi Rubber Ltd., Modipuram.
- Nirlon Synthetic Fibres & Chemical Ltd., Bombay.
- Good Year India Ltd., Faridabad.
- Premier Tyres Ltd., Bombay.
- Hindustan Organic Chemicals Ltd., Maharashtra.
- Dharamsi Morarji Chemicals Co. Ltd., Ambernath.
- Mukund Iron & Steel Works, Kalwe.
- Crompton Greaves Ltd., Bombay.
- Cadbury India Ltd., Bombay.
- Godrej Soaps Pvt. Ltd., Bombay & Hyderabad.
- Parle Products Pvt. Ltd., Bombay.

Rubber

RUBBER MIXING MILL

660 mm. x 2140 mm. (Approx. 26 in. x 84 in.)

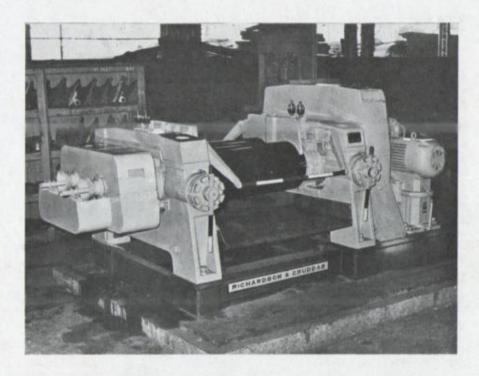
IN COLLABORATION WITH COMERIO ERCOLE, ITALY



MILL SUPPLIED TO MODI RUBBER LTD., MODIPURAM

RUBBER MIXING MILL

406 mm x 1067 mm (Approx. 16 in. x 42 in.)



Salient Features

- · Chilled Cast Iron Rolls with mirror finish.
- · Heavy duty close grained alloy cast iron side frames.
- · Heavy duty cast steel caps.
- Heavy duty close grained alloy cast iron/cast steel bull gear, back gears with moulded/machine-cut teeth and forged alloy steel pinion with machine-cut teeth.
- Specially designed cylindrical type shear plates.
- Split type sealing rings for main bearings.
- Pneumatic with complementary plug braking for instantaneous stoppage.
- Split type base frame as per latest continental practice.

MILL SUPPLIED TO ANDREW YULE & CO. LTD. CALCUTTA

Mills in our range: Mixing Mills

- 560 mm x 1530 mm (22 in. x 60 in.)
- 350 mm x 800 mm (14 in. x 32 in.)
- 200 mm x 400 mm (8 in. x 16 in.)

Refining Mills

• 535 mm x 610 mm x 865 mm (21 in. x 24 in. x 36 in.)

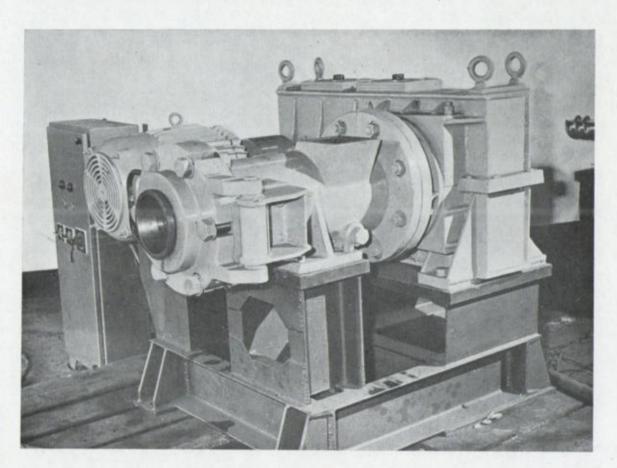
Cracker Mills

- 660 mm x 850 mm (26 in. x 34 in.)
- 560 mm x 630 mm (22 in. x 25 in.)

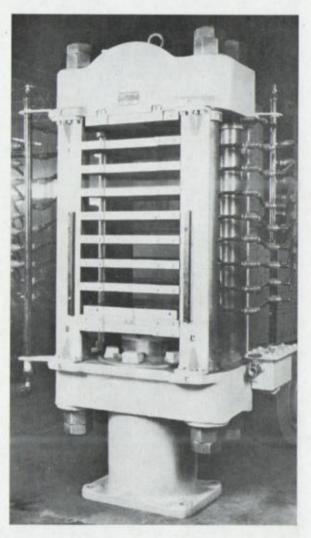
Extruder

Of sizes 60 mm, 90 mm, 100 mm, 120 mm, 150 mm, 200 mm and 250 mm with complete accessories and line equipments for the manufacture of Tread, Tubing, Hose, Profile Bead etc.

100 MM EXTRUDER SUPPLIED TO NIRLON SYNTHETICS, MAHARASHTRA



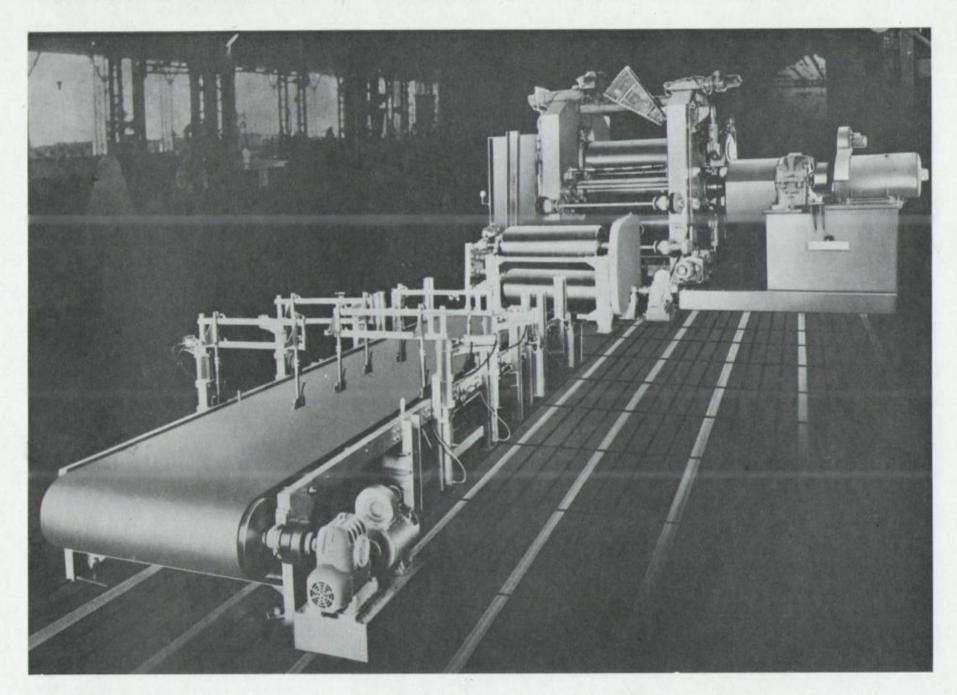
Hydraulic Press



1200 T HYDRAULIC PRESS SUPPLIED TO SHREE PRODUCTS LTD. PUNE.

Presses Upto 4000 Tonnes and Platen 1400 mm x 6300 mm for Conveyor Belt and general moulding are in our standard range.

3-ROLL CALENDER & COMPLETE LINE 610 mm x 1730 mm (Approx. 24 in. x 68 in.)



SUPPLIED TO M/S J. K. INDUSTRIES LTD. RAJASTHAN FOR THEIR AUTOMOBILE TYRE & TUBE PLANT.

Salient Features

- Imported Chilled Cast iron Rolls, camber bored, with mirror finish.
 - Double poured rolls for special application.
- Central roll fitted with anti-friction Timken Roller Bearings.
- Top and Bottom Roll Journals fitted with steel sleeves.
- Hydraulic Roll Bending on top and bottom rolls.
- Heavy duty Cast Iron Side Frames to IS. Grade 30.
- Aluminium Stock Guides with Polyamide Lining.
- Nip Adjustment by our independent motor reducer units. incorporating special globoidal worm and worm wheel.
- Selsyn Receiver Counter System for precise nip gap indication.
- Forced feed oil lubrication for main bearings complete with filtering and cooling units, two high oil delivery pumps, flow controls etc.
- Central grease Lubrication Pump for all Calender points.
- Pneumatic brake for instantaneous stoppage of the Calender.

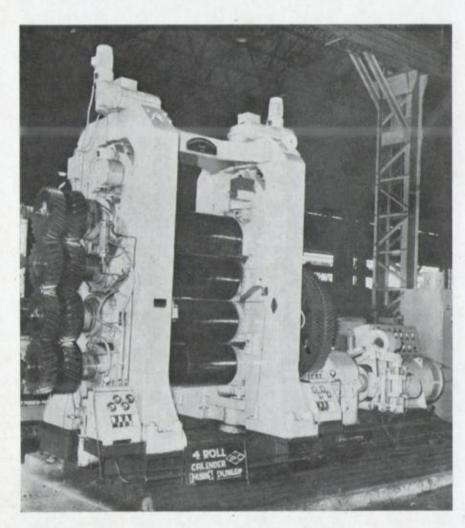
Other sizes in our range:

3/4 Roll Calenders:

- 400 mm x 1000 mm.
- 457 mm x 1372 mm.
 610 mm x 1730 mm.
- 'Z' & 'L' shape and in many other combinations with camber, Cross axis arrangement, Fine roll nip adjustment, bull, gear drive, uni-drive etc. including complete Calender

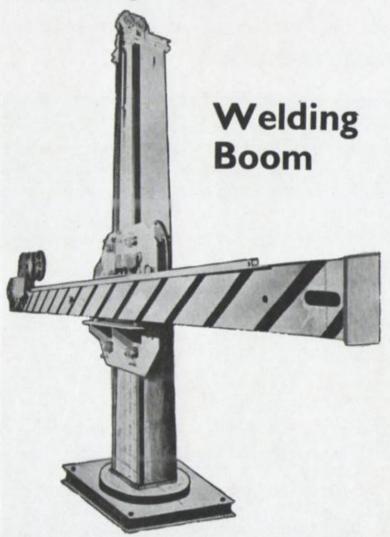
Lines.

4-ROLL CALENDER



SUPPLIED TO DUNLOP INDIA LTD. CALCUTTA.

Welding Aids



SUPPLIED TO LARSEN & TOUBRO LTD., BOMBAY

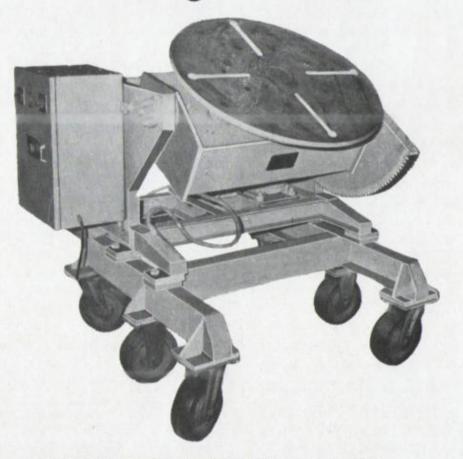
Welding Booms

Model Range: 4532 4542 6042

Max. Travel

Vertical (mm): 4500 4500 6000 Horizontal (mm): 3200 4200 4200

1,000 kg. Welding Positioner



SUPPLIED TO BHARAT HEAVY ELECTRICALS LTD., HYDERABAD

Welding Positioners

500 Kgs. 800 Kgs. 1250 Kgs. 2000 Kgs. 3200 Kgs. 5000 Kgs. 8000 Kgs. 12500 Kgs.

Welding Rotators

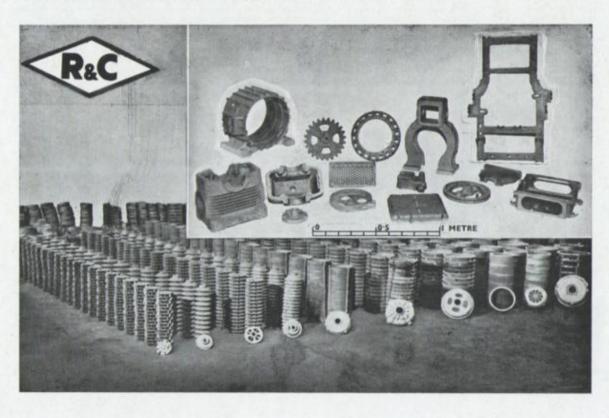
16, 25, 40, 60 and 100 Tonnes

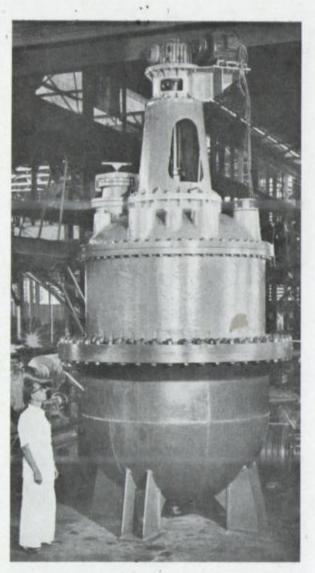
Castings

SALIENT FEATURES

- Heavy Duty close grained cast iron and alloy iron castings.
- Single piece weight upto 10 tonnes.
- · Acid resisting/Heat resisting.
- Castings upto ISS 210-1970 Grade 20.
- Machine moulded castings for Motors, Switch Gears, Reduction Gear, Elevator and other industries.

INTRICATE & THIN WALLED MACHINE MOULDED CASTINGS SUPPLIED TO DAVID BROWN GREAVES LTD., LARSEN & TOUBRO LTD.ETC.





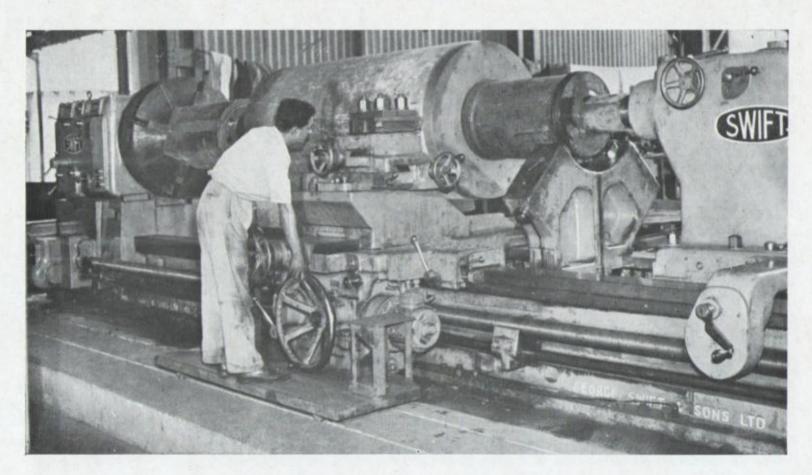
CAST IRON REACTION VESSEL WITH MILD STEEL JACKET 1800 mm DIA x 5400 LTRS CAPACITY SUPPLIED TO INDIAN DYESTUFF INDUSTRIES LTD., KALYAN, MAHARASHTRA.

Sugar

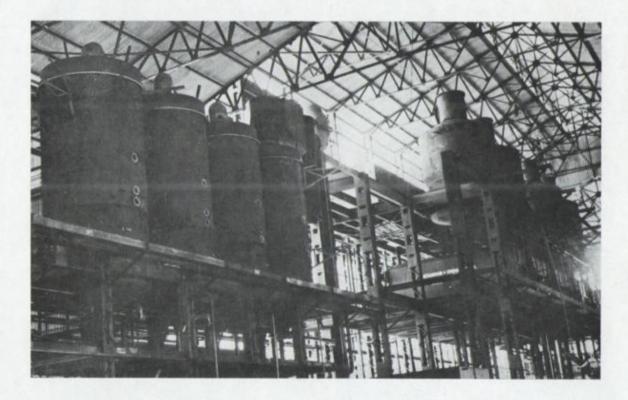
SALIENT FEATURES

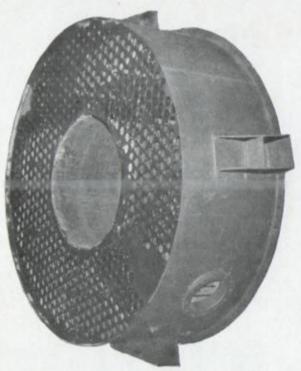
- Top and Bottom Rollers upto 978 mm. dia x 1980 mm. long.
- Finest Open Grain Alloy Cast Iron to withstand sugar juice corrosion.
- Best Quality EN-8 Forged Steel Shafts.
- Shells shrunk on shafts by special process to safeguard against cracks.
- Grooving of Rollers to various pitches.

SUGAR MILL ROLLER DURING FINAL MACHINING



INSIDE VIEW OF SHRI VITHAL S.S.K. LTD., PANDHARPUR MAHARASHTRA. DESIGN, MANUFACTURE, SUPPLY, HANDLING AT SITE ERECTION & COMMISSIONING OF 1250 TCD SUGAR PLANT BY R&C BYCULLA.





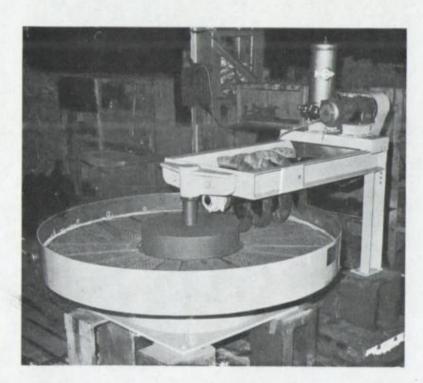
CALANDRIA FOR 40 MT VACUUM PAN

Special Purpose Machines

R&C has the complete infra-structure to manufacture special type of machines for different applications. Some of these special machines manufactured for various clients are given as under:

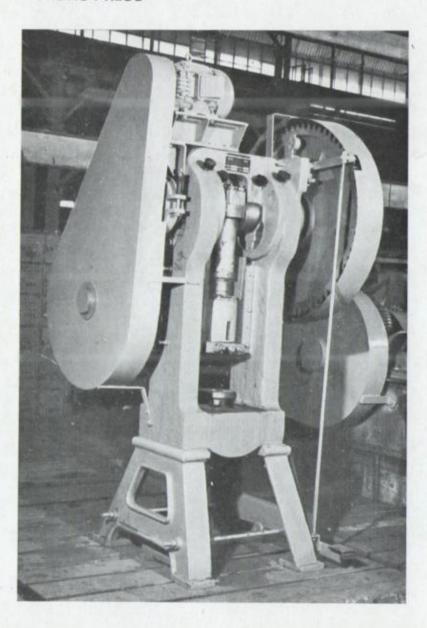
- Ro-Ro Arrangement for loading/unloading cars in/from ship for Mazgaon Dock Ltd, Bombay.
- 3 Roll Grinding Mill 400 mm x 1000 mm size for printing Inks and Paints for Rainbow Inks & Varnish Mfg Co. (P)
 Ltd.
- 10 Tonnes E.O.T. Cranes for Bharat Heavy Plates & Vessels Ltd Vizak.

8 FT DIA HORIZONTAL FILTER IN STEEL CONSTRUCTION WITH SCROLL DISCHARGE FOR HINDUSTAN DOOR-OLIVER LTD., BOMBAY



- Roasting Pan & Oxidising Vessel for red lead for Kamani Metallic Oxides Ltd.
- Continuous type Plant for solvent extraction for Desmet (India) Pvt. Ltd.
- Flaking Roller Mills for solvent extraction Plant for Walchandnagar India Ltd.

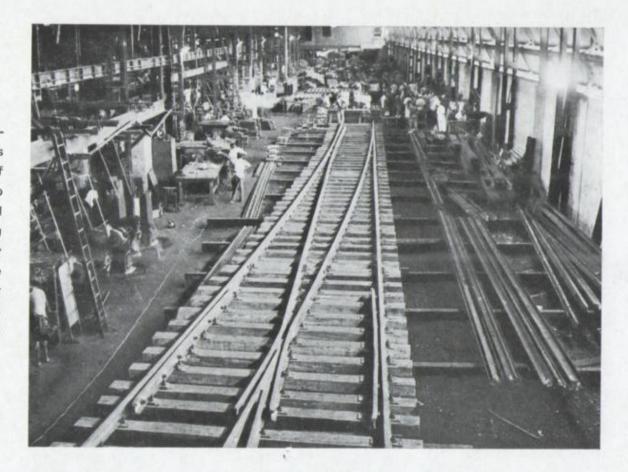
ROHDAS PRESS



Railway Points & Crossings

R&C is one of the largest manufacturers of Railway Points & Crossings in India with more than 60 years of experience in the line. The work shop is fully equipped to manufacture all types of Points & Crossings including curved switches which are increasingly required by the Railways due to the adoption of higher speeds on their trunk routes. These Points & Crossings are manufactured to Indian as well as Continental standards.

TYPICAL VIEW OF RAILWAY POINTS & CROSSINGS SHOP, BYCULLA



MULUND WORKS

Mulund Works is a premier plant, manufacturing, equipments for Chemical, Petro-chemical complexes, Refineries, Pharmaceutical, Fertilizer, Steel, Dairy & Food Industries and Nuclear Power Projects.

Mulund Plant has a collaborative arrangement with Newell Dunford Engineering Limited, U.K., for the manufacture of Crushing Mill equipments and Rotary Machines for ore Benefication.

The total employee strength of this unit is 965 which includes qualified engineers.

Manufacturing Activities:

Chemical, Petro-chemical, Fertilizer Plants and Refineries:

Pressure Vessels, Storage Tanks, Heat Exchangers, Columns Towers, Reaction Vessels, Boilers and Tankers for bulk transport of LPG, Ammonia, Chlorine etc.

Sugar Industries:

Complete Projects on turn-key basis.

Dairy & Food Processing Industries:

Milk Storage Tanks, Milk Transportation Tanks, Boilers and Stainless Steel Vessels with Agitators.

Steel Industry:

Electric Arc Welding Furnaces from 10 MT to 200 MT capacities.

Mineral Industries:

Roasters and Calciners.

Stress Relieving:

As per customers requirement within the furnace range.

Dishing:

Dished ends upto 210mm thk and diameter upto 3500mm in single piece. Construction in Carbon Steel, Clad Steel and Stainless Steel.

0

0

Material of Construction:

Carbon steel, Boiler quality to specification IS: 2002 Gr 2A SA: 515 Gr 60/70, SA: 516 Gr 60/70, DIN H-II, H IV, H V, SA: 285 Gr C Chrome-moly steels, BS 1501, SA: 240-TP, 304, 304 L, 316 316 L, 316 Ti, 321, BS: 845 Ti, Monel, Inconel, Incoloy Naval Brass Cupro Nickel etc.

Code of Construction:

IS: 2825, ASME Sec. VIII, Div. I, ASME Sec. III, BS: 5500 API: 650, TEME Class R, C, B, Ad Merkblatter etc.

Inspection Agencies associated with R & C so far:

Lloyds Industrial Register, Bureau Veritas, Linde, Uhde India, PPED, BARC, FPDIL/Sindri, EIL, DR. C. Otto, IBR, TCE, Dalal Consultants, Humphreys & Glasgow, Powergas, Fabrication Surveyor Simon Carves etc.

Some of our Prestigeous Clients:

- Hindustan Petroleum Corporation Ltd., Bombay.
- Bhabha Atomic Research Centre, Bombay.
- Bharat Petroleum Corporation Ltd.
- Indian Oil Corporation Ltd., Bombay.
- Mahindra & Mahindra Ltd., Bombay.
- Indian Dyestuff Industries Ltd., Bombay.
- · A.C.C. (India) Ltd., Bombay.
- Hindustan Paper Corporation Ltd., Kerala.
- Shri Ambuja Petrochemicals Ltd., Baroda.
- Simon Carves India Ltd., Calcutta.
- Oil & Natural Gas Commission, Bombay.
- Pfizer Ltd., Bombay.
- Zuari Agro Chemicals Ltd., Goa.

Manufacturing Facilities

PRESSINGS:

Hydraulic Presses upto 1200 Tonne (1800 mm \times 4399 mm Bolster \times 600 mm shut height \times 3600 mm daylight) capacity for Dished ends and other pressings upto 200 mm thickness.

ROLLING:

Various sizes of high power Bending Rolls for plates upto 54 mm Thickness and 2.5 meter in width.

STRESS RELIEVING:

Bogie type stress relieving furnace of $(4.6 \times 8.5 \times 5.8)$ meters with Precision Temperature Recording Instruments.

PLATE PREPARATION:

Multi-nozzle oxyplaners (4350 x 17300 x 180)mm Stainless steel Plasma cutting machine-upto 150 mm thickness Duplex Plate Edge Planer—100 mm x 12.5 metre Various profile cutting machine etc.

WELDING:

MIG, TIG, Fuse Arc, Co₂ Submerged Arc and various other automatic/Semi-automatic, Longitudinal or Circumferential shielded Arc Welding equipments.

Welding Rotators of upto 100 tonnes capacity
Welding Positioners upto 12.5 tonnes
For material handling facility cranes upto 60 tonnes

TESTING:

Full-fledged chemical, physical and metallurgical laboratory and mechanical testing facilities which includes:

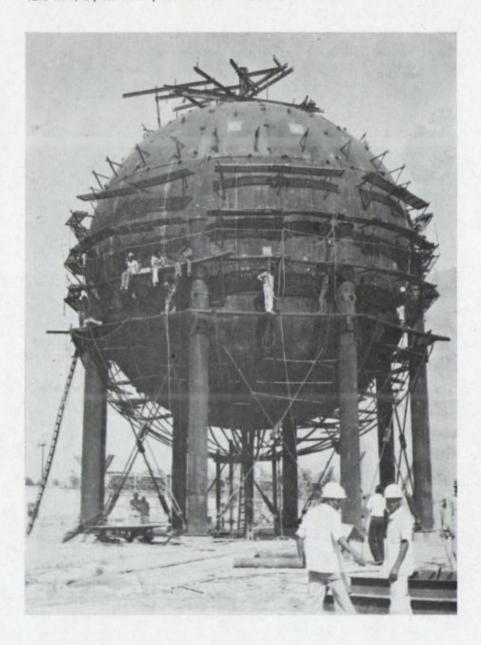
Upto 300 kv 6 MA X-Ray units 20 Curies Gamma Ray equipment Ultrasonic Flaw Detector
Spectro Calorimeter
Carbon, Sulphur and Phosphorus Analyser
Metallurgical Microscope
Helium Leak Detector
Ultrasonic Thickness Guage for Dished ends
Charply/Izod Testing equipments
Upto 900 kg/cm² Hydraulic testing facilities etc.

VERSON 1200 HYDRAULIC PRESS



Horton Sphere

HORTON SPHERE (500 T LPG STORAGE) FOR INDIAN OIL CORPORATION LTD., SHAKURBASTI, NEW DELHI SIZE 12.7 M I/D, 32 THK, 17.0 MTR. HEIGHT



Dished Ends

IDEAL SINGLE PIECE CONSTRUCTION BY HOT PRESSING

- Thinning allowance reduced to minimum—reduces blank material weight and cost.
- Normalising not required.
- · Reduces the number of welds.
- Smooth surface formed

GIANT CAPABILITIES:

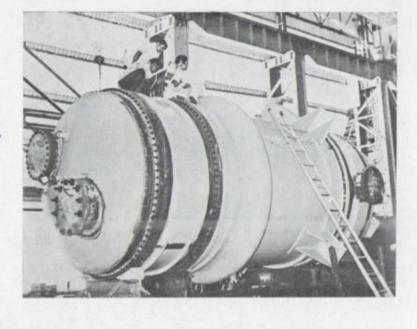
- Thickness upto 200 mm
- Diameter upto 3500 mm
- Pressing capacity 1200 tonnes
- Plate heating 1200°C

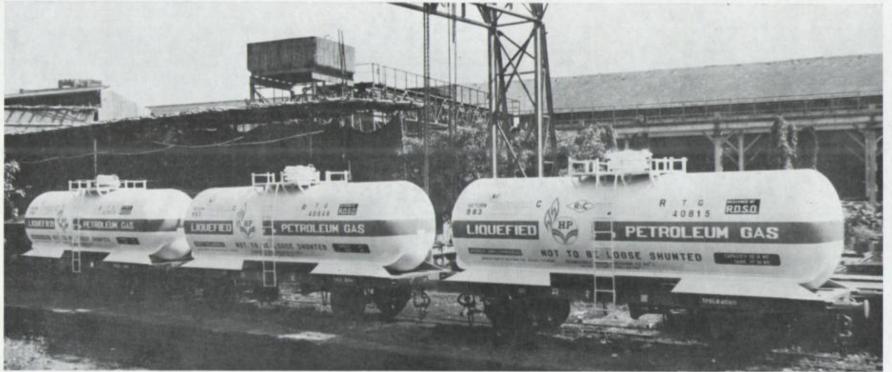


ANILINE MAIN REACTOR FOR HOCL, RASAYANI SIZE 2.6 M I/D X 12 MM THK X 6.9 MTR LONG. DESIGN PRESSURE 6 KG/CM² & DESIGN TEMP 350°C, MATERIAL OF CONSTRUCTION ASTM-A-515 GR. 70.

LIQUID PETROLEUM GAS (L.P.G.) RAIL TANKERS (9.1 MT EACH) SUPPLIED TO HINDUSTAN PETROLEUM CORPORATION LTD., BOMBAY.







110 MTR LPG BULLET (41.0 MT)

Design Code

BS 1515

Inspection

M/s. Lloyds

Overall size

3400 I/D x 20 THK x 24.8 meters overall

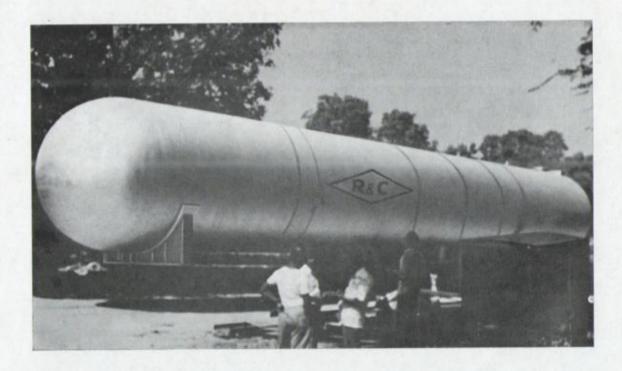
enaths

Design Pressure

17.6 kg/cm2 (250 Psig)

Material Specification SA 515 Gr. 70

110 MTR LPG BULLET (41.0 MT) FOR INDIAN OIL CORPORATION LTD., KANPUR.





LPG BULLET SHOP ASSEMBLY

REACTION VESSEL

Material of

Construction

SHELL SIDE JACKET SIDE

Size 20 mtr I/D 21.56 mtr I/D \times 8 mm thk 6 mm thk

Design Pressure 1.1 kg/CM 2 G 2.2 Kg/CM 2 G

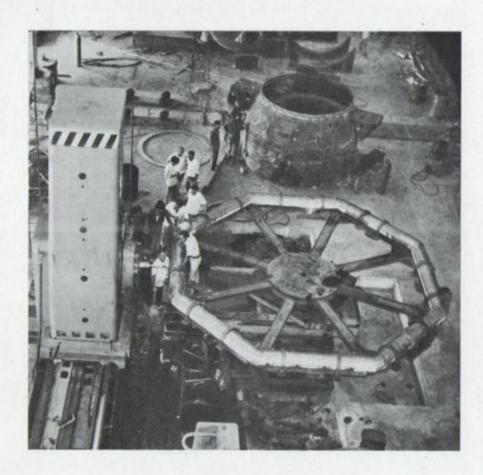
Design 120 $^\circ$ C 120 $^\circ$ C

Temperature

SS240TP316/IS

2002 GR. 2A.

REACTOR-5 MAIN HEADER SUPPLIED TO BARC



REACTION VESSEL SHELL 2.0 MTRS., I/D 8 MM THK., JACKET 2.16 MTRS., I/D 6 MM THK.



MADRAS WORKS

The branch office at Madras was set up in 1912. Initially this branch was engaged in selling sanitary fittings, light machinery and engineering sundries. With the growth of business this branch became one of the leading contractors, undertaking contracts for installation of sanitary equipment with allied drainage and water supply works. During 1926 the first fully equipped works was built in the vicinity of Madras Harbour for the manufacture of fabricated structural steel work.

As years went by, contracts for structural engineering began to flow in. To cope up with expanding business the original works near the harbour was transferred to Cassimode and extensions constructed. From then onwards the works at Cassimode Madras underwent continuous improvements. The total employee strength of the unit is 560.

The main activities of this plant are:

- Medium and Heavy Structural Fabrication
- Refrigeration Equipments
- Package Water Treatment Plants
- Industrial and Sewage Effluent Treatment Plants
- Sanitary and Plumbing Installations
- India Mark-II Deep Well Hand Pumps etc.

For effective treatment of effluents and sewage, this plant has completely equipped laboratory. Some of the major equipments in the laboratory are:

- 'ADCO-EVAQUIP' Single stage Rotary Vane type vacuum pump 30 Lit/min.
- 'ELICO' spectro photo meter model CL-24 for analysis of heavy metals.
- 'BOD' Incubator (10 cubic Feet) with voltage stabilizer

- . 'ADCO' Hot Air Drying & Sterilising Oven
- 'ELICO' Conductivity Bridge with conductivity cell for analysis of dissolved salts.

0

0

0

0

0

0

0

O

0

0

O

0

0

a

0

0

0

0

0

0

0

- Loviband Comparator box with Chlorine Disc.
- Autoclave size 14" x 22" (Gun Metal)
- Bacteriological Incubator.

A separate Research and Development wing of this plant has successfully developed India Mark-II Deep Well Hand Pump which is acclaimed as one of the best available in the market and Iron removal package water treatment plants. Some of the items under development are Plastic Cylinders for Deep Well Hand Pump, Surface Aerators, Package Water Treatment Plants for removal of fluorides etc.

This branch is completely equipped to offer consultancy services for:

- Water, Sewage and Effluent Treatment Plants.
- Pumping Stations for Water and Sewage including Electricals.

Some of Our Prestigeous Clients:

- UNICEF, New Delhi.
- Ashok Leyland Ltd., Ennore.
- Tube Investment Group, Madras.
- Bharat Heavy Electricals Ltd., Hyderabad.
- Integral Coach Factory, Madras.
- Amalgamation Group, Madras.
- Bokaro Steel Plant, Bihar.
- Rourkela Steel Plant, Rourkela.
- Cochin Shipyard Ltd., Cochin.
- Visakhapatnam Port Trust, Vizak.
- Hindustan Paper Corporation Ltd., Mevellore.
- Kerala Minerals & Metals Ltd., Quilon
- Hindustan Machine Tools Ltd., Bangalore.
- Brooke Bond India Ltd., Secunderabad.
- Thirumalai Tirupathi Devasthanam, Madras
- Hotel Woodlands, Bangalore & Madras.

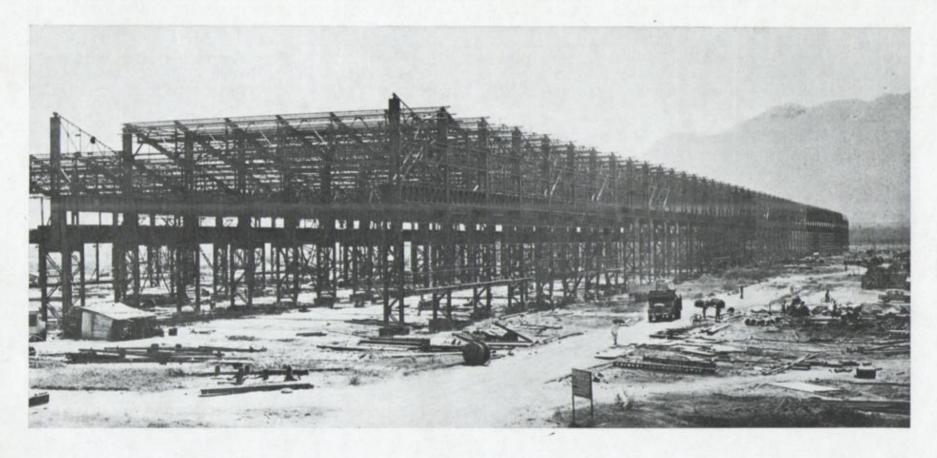
Manufacturing Activities & Facilities

Structural Engineering:

Medium & Heavy structural fabrication capacity of 300 MT per annum for Industrial Buildings, harbours, ports, airports, flood lighting towers, steel bridges, storage tanks, hoppers, chimneys, pressure vessels, pipelines etc. Fabrication facilities include automatic welding machines,

Rivetting, end Milling & Plate edge planing. Facilities are also available for carrying out Ultrasonic Flaw Detection, Radiographic Examination, dye-Penetrant testing etc. The plant is equipped to undertake fabrication at 2/3 sites simultaneously and complete erection of structural steel work including cloaking items.

FABRICATION & ERECTION (6000 MT) FOR SALEM STEEL PLANT, TAMILNADU



Sanitation & Public Health

Package Water Treatment plant for treatment of Turbidity micro-organism and iron concentration.

Sanitary and plumbing contracts involving supply and fixing of all sanitary wares, supply and installation of internal building water supply and sewage disposal systems for multistorey buildings, hotels, hospitals, offices, factory complexes, commercial establishments, etc.

Turnkey plants for treatment of water, Sewage, Industrial effluents from consultancy to commissioning. Plants can be provided for any industry manufacturing organic and inorganic chemicals, textiles, dyes or plants engaged in electro-plating, food processing, dairies, etc. Full fledged laboratory for Physico-chemical and biological analysis of Water, Sewage and effluents.

AERIAL VIEW OF EFFLUENT TREATMENT PLANT (2.25 MLD CAPACITY), HINDUSTAN MACHINE TOOLS, BANGALORE.



Package Water Treatment Plant

PLANT FUNCTIONING

The design of the units is characterised by ease and simplicity of operation and practically no maintenance is required. The filter medium washing depends on initial turbidity of Iron content and generally done once in a month or so, and this is achieved by reversing the flow of water very simply and effectively.

TYPES OF PLANTS

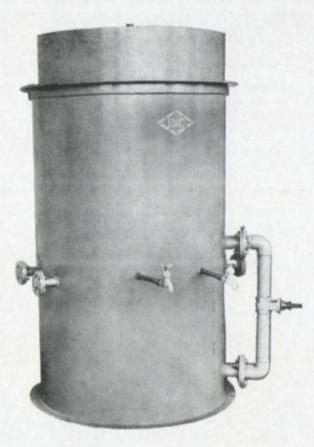
| TYPES OF PLANTS R & C Package Water Treatment Plants are available in three ranges | | | | | |
|---|---|-----------------------------|-----------------------------|--|--|
| Particulars | Type I | Type IIA | Type IIB | | |
| No. of persons served | 50-100 | 400-500 | 1000 | | |
| Suitable for | household or small commu- nity groups | Villages or town sectors | Villages or town sectors | | |
| Material of construction | RCC/MS | MS fabricated | MS fabricated | | |
| ■ Flow rate (M³/Hr) | 0.45 | 1.36 | 4.40 | | |
| Treated Water storage tank capacity (M³) | - | 0.17 | 1.63 | | |
| Mode of Water Feeding | Hand pump | Power pump | Power pump | | |

Besides the above ready made ranges, filtration units can be custom built to suit specific consumer needs.

TYPE I



TYPE II



Mechanical Engineering

This department specializes in the manufacture, supply, erection and commissioning on turnkey basis, pumping water sets which include mechanical and electrical equipments i.e. pumps, motors, pipings, transformers, switch gears, sub-stations, overhead cranes, external electrification etc. Besides, this department also manufactures and supplies India Mark-II Deep well Handpumps to the designs developed by R&C in close co-operation with UNICEF. Over 30,000 sets of these pumps have already been sold in India and abroad for rural drinking water programmes.

India Mark-II Deep well Handpump:

Salient Features:

- Trouble-free and easy to maintain.
- Balancing of weight between the handle and the connecting rods with mechanical advantage 8:1 makes operation of pump very easy.
- The pump head is sand blasted or phosphated before painting to make it corrosion resistant for years.
- Perfect sanitary seal is ensured when used in borewells of sizes from 100 mm to 150 mm.

| VITAL DATA | | | | |
|---------------------------------|--------------------------|--|--|--|
| Water depth maximum optimum | 60 mtrs. 28 — 32 mtrs | | | |
| Internal Diameter of a Cylinder | 63.5 mm | | | |
| Strokes per minute | 40-45 Nos. | | | |
| Discharge per stroke | 0.32 litres | | | |
| Discharge per minute | 12 14 litres | | | |

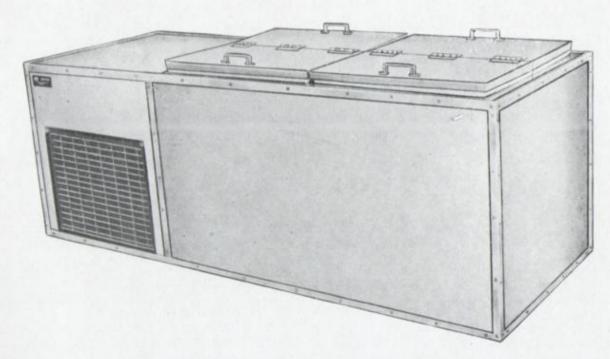
Note: In case pump has to operate beyond 60 mtrs. depth, the pump can be suitably modified. This pump can also be supplied as force lift pump with necessary design alterations.

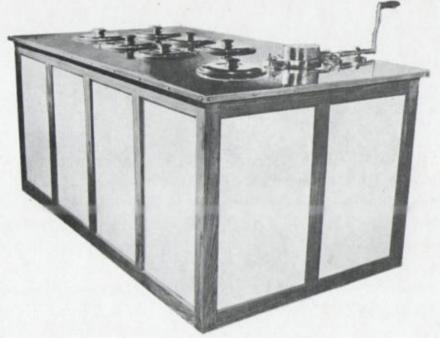


Refrigeration Engineering

Custom Built combination coolers, bottle coolers, water coolers, milk chilling units, display counters, deep freezers, ice-candy plants, ice-cream freezers, vaccine storage cabinets, hospital and mortuary cold rooms, etc. These are equipped with condensing unit, world famous 'FRIGIDAIRE' compressor to designs of General Motors, U.K.

450 LITRES CAPACITY DEEP FREEZER





8-CAN COMBINATION COOLER

NAGPUR WORKS

This work was set up in 1969 mainly to cater to the increasing demand for fabrication and galvanising of Transmission Lines and Microwave Towers. A scheme for expanding the manufacturing capacity to 10,000 Tonnes annually is now under implementation. A test bed for testing towers upto 400 KV capacity is proposed to be set up under this scheme. This Unit has total employee strength of 375 which include qualified engineers.

Manufacturing Activities & Services:

- Design Fabrication and Hot Dip Galvanising of Transmission Line Towers upto 400 KV, Microwave Communication Towers and overhead structures for Railway Electrifications.
- Erection of transmission lines including foundations, super-structures and stringing of conductors/earthwire.

Manufacturing Facilities:

Fabrication Section

- Cropping/Shearing/Sawing Machines.
- Punching and Drilling machines.
- Section Straightening presses.

- Hydraulic and mechanical presses for hot and cold bending.
- Welding, Grinding, Chipping equipments.

Galvanising Section:

- · Pre-treatment plant for pickling.
- · Galvanising bath and Furnace.
- Post-treatment facilities for dichromating.

Handling Facilities:

- . E.O.T. Mobile and fixed derrick cranes.
- Tractor-Trailers.

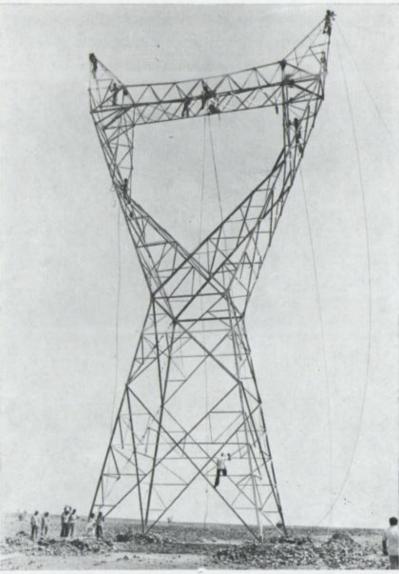
Some of Our Prestigeous Clients:

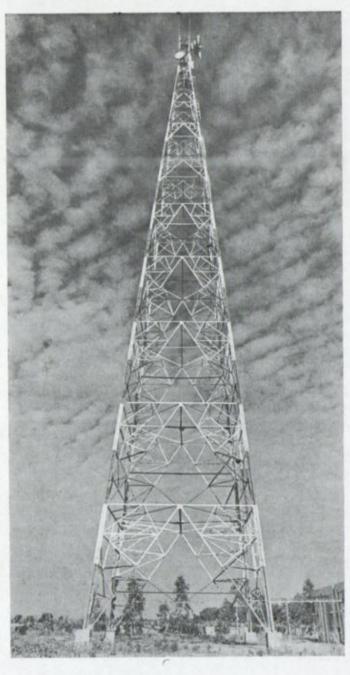
- Maharashtra State Electricity Board, Bombay.
- Rajasthan State Electricity Board, Jaipur.
- Goa Electricity Dept., Goa.
- Indian Posts & Telegraphs Dept., New Delhi.
- South Central Railway, Secunderabad.
- Crompton Engineering Co., Madras.
- Hindustan Steel Constructions Ltd., Calcutta.
- SICOM, Bombay
- Southern Railway, Madras.
- · Central Railway, Bombay.
- Firth (India) Steel Co., Bombay.
- Karnataka Electricity Board.
- Indian Explosives Ltd. Kanpur.

100 MTR MICROWAVE COMMUNICATION TOWER FOR POST & TELEGRAPHS DEPT. PATANSWNGI MAHARASHTRA.



400 KV T.L. TOWER





Projects

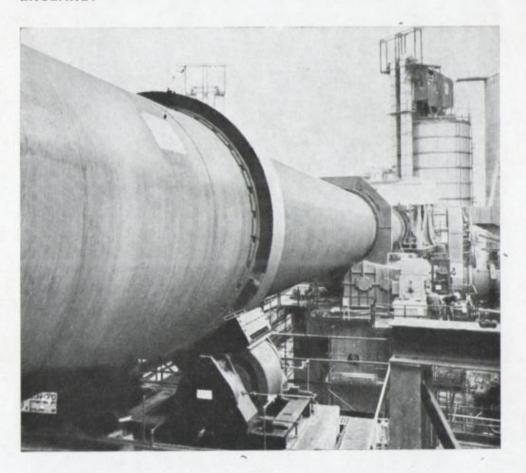
R&C is completely equipped to undertake Turnkey Projects for the manufacture of Rubber goods, Sugar, Mineral Processing, Transmission Line Towers, Structural Fabrication, India Mark-II Hand Pumps etc. For effective execution of such Turnkey Projects, a separate Project Division has been established with qualified and experienced Project Engineers.

MINERAL PROCESSING PLANTS:

R&C undertakes design, manufacture, erection and commissioning of assorted equipments for the mineral Processing industries. Some of these equipments are:-

- Roasters, Calciners and coolers for synthetic rutile plants and also Digesting system.
- Fertilizer Granulation Equipments, including Granpak System.
- Grinding Mills for processing minerals and cement industries.
- Waste paper recycling equipments for deinking plants.

A TYPICAL ROTARY KILN FOR ROASTING AND CALCINING.
SYSTEM BEING MANUFACTURED BY R&C UNDER TECHNICAL
COLLABORATION WITH NEWELL DUNFORD ENGINEERING LTD.,
ENGLAND.

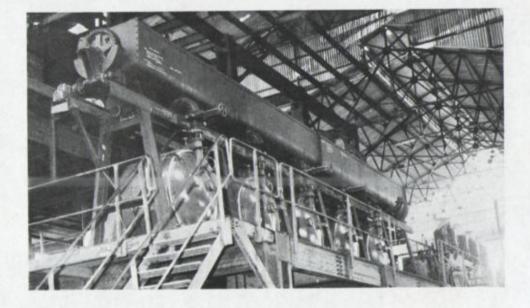


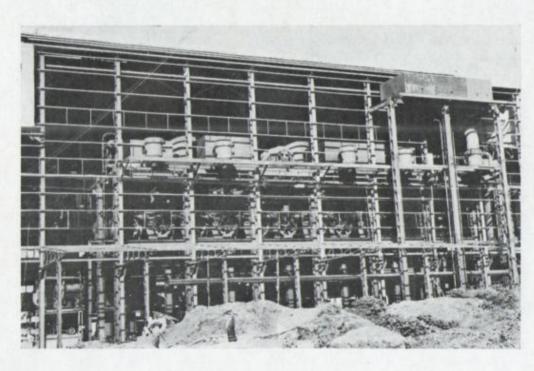
Sugar Plants

R&C undertakes design, manufacture, erection and commissioning of complete sugar plants. R&C successfully completed installation of 1250 TCD Sugar Plant on Turnkey basis for Shri Vithal Sahakari Sakhar Karkhana Ltd, Pandharpur, Maharashtra.

Some of Our Prestigeous Clients:

- Sonepat Co-operative Sugar Factory Ltd., Haryana.
- Kisan Sahakari Chini Mills Ltd., Budaun, U.P.
- Talala Khand Udyod Mandali, Talala, Gujarat.





CENTRIFUGAL STATION FOR SHRI S.S.K. LTD. PANDHARPUR (MAH.)

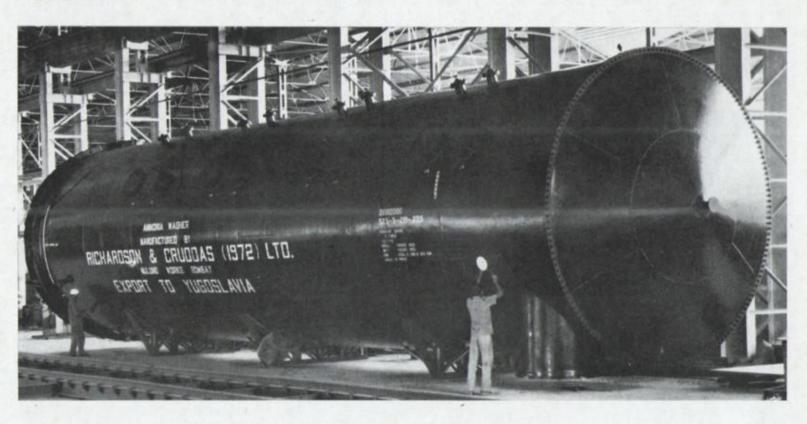
M.J. CONDENSOR; HOT & COLD WATER TANKS; PAN SUPPLY TANKS; VACUUM, WATER COOLED, AND AIR COOLED CRYSTALIZERS. DESIGN, MANUFACTURE, SUPPLY, HANDLING AT SITE ERECTION & COMMISSIONING OF 1250 TCD SUGAR PLANT OF SHRI VITHAL S.S.K. LTD. PANDHAR-PUR (MAH.)

Exports

R&C is fully equipped with precision machines and years of Engineering Experience. Besides, out of our 4 Workshops, 2 major plants are located in Bombay which is the largest and best equipped port in India. Both the above advantages have enabled R&C to make a considerable breakthrough in Engineering Exports during the last 7 years. Further, inorder to substantially increase our Export involvement, an Export Cell has been established at Byculla,

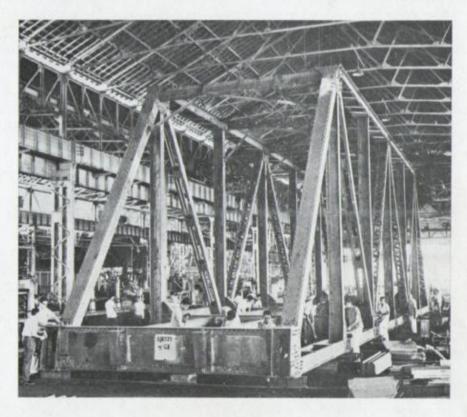
Bombay, to monitor effective Export Promotion of vast Engineering activities in its various plants in India. Infact at this stage, R&C is ready to offer Consultancy Services and undertake Turnkey jobs in foreign countries from feasibility stage to commissioning for various Engineering industries, especially plants for the manufacture of Rubber goods, Sugar, Transmission Line Towers, Fabricational Structures, India Mark-II Hand Pumps, etc.

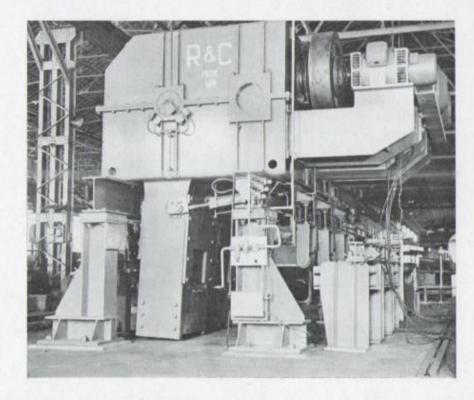
AMMONIA WASHER, 4.8 m DIA, 20 M LTH, 46 MT WEIGHT, IN SINGLE PIECE, FOR SISAC PROJECT, YUGOSLAVIA.



| Some Of The Prestigeous Export | | Client | Job Description |
|--|--|--|---|
| Jobs Executed | ougoodo Export | RAILWAY POINTS & CROSSINGS: | |
| Client | Job Description | Iranian State Railways | 480 Sets of 1435 mm Gauge |
| STEEL STRUCTURES: | | Tehran | turnouts with high manganese |
| Tata Exports, Bombay, for Burmah | 120 MT, Connaught Rly. Bridge 1 Span, 46 mtrs thro' type rivetted. | | monoblock crossings and special thk, web section tongue rails |
| | | East African Railways Corpn., | 50 Sets of 3'6" gauge turnouts |
| Govt. of Iraq, Iraq | 210 MT, Gantry girders | Tanzania | |
| Govt. of Kuwait, Kuwait | 2800 MT, Cargo & Terminal buildings of Kuwait International Airport. | Zambian Railways, Kabwe | 130 Sets of 1 in 8, 1 in 9 & 1 in 12 for 3' 6" gauge turnouts |
| Govt. of Iran, Iran | 1927 MT, Tabriz Refinery Platework | Egyptian Iron & Steel Company, Cairo | 40 Sets of 1435 mm Gauge Railway turnouts |
| Govt. of Kuwait, Kuwait | 900 MT, Shwaikh Transit & Storage Sheds | MECHANICAL EQUIPMENTS: | |
| Govt. of Kuwait, Kuwait | 120 MT, Blast Fence Units at International Airport. | Engineering Projects (I) Ltd. (Dr. C. Otto), W. Germany | 160 MT, Fabrication of Ammonia Scrubber Unit, Napthelene |
| Govt. of Kuwait, Kuwait | 334 MT, Flood light & Supporting Structures for Kuwait Stadium | for SISAC Yugoslavia | Scrubber & Tar Separator |
| Concast (I) Ltd., for Indonesia | 330 MT, Stagging & guillotine for continuous casting shop | Kosan Metal Products Ltd., Dubai | 390 MT, 2 fixed type welding Rotators |
| BHEL, Delhi for Libya | 2660 MT, Columns, Bunkers, Gantry girders etc. of Thermal Power Station. | Concast (I) Ltd., for Indonesia | 57 MT, 3 Strand Pendulum Billet Shearing Machine |
| BHEL, Delhi for Saudi Arabia | 210 MT, Wadi Jizan Electrification Scheme for Electricity Corpn. | H.V.A. (Metahara & Wonji), Ethiopia | Shelling Sugar Mill Rollers |
| Kinetics Technology (India) Ltd. for Bangladesh | 390 MT, Ashuganj Fertiliser Project. | Syarikat Gula N.S., Malaysia | Shelling Sugar Mill Rollers |
| | | Miwani Sugar Mills Ltd., Kenya | Sugar Roller Shells |
| TRANSMISSION LINE TOWERS: | | Al-Zaidi Trading & | India Mark-II Handpumps |
| Amalgamated Engineering & Commercial Company, Malaysia | 55 MT, 22 KV S/C Trans. Line Towers | Establishment Co., Oman | |
| | | Orbit Chemical Ltd., Nairobi | India Mark-II Handpumps |
| | 295 MT, 66 KV D/C Trans. Line | Pompes Guinard, France | India Mark-II Handpumps |

CONNAUGHT RAILWAY BRIDGE, 46 METRES FOR BURMAH RAILWAYS.





3 STRAND CONTINUOUS BILLET SHEARING MACHINE FOR STEEL CASTING PLANT, MANUFACTURED FOR CONCAST (I) LTD., FOR EXPORT TO INDONESIA.

LARGE SPAN TERMINAL BUILDING COMPLEX FOR KUWAIT INTERNATIONAL AIRPORT

Richardson & Cruddas did the detailed design, fabrication and supply of 2800 MT of steel structures for Kuwait International Airport. The main building had 12 girders connecting the whole net work of secondary beams inclined at 45° angle. The girders were fabricated out of high tensile steel weighing 60 MT, 300 ft. length and were test assembled in Bombay before shipment. The main bases were supported on circular columns 200 ft, apart having a cantilever of 50 ft. on

either side of the column.

Order was placed by M/s. Ballast-Nedan, Groep, Amsterlyeen, Holland. The order included fabrication and supply of steel structures for Passenger Terminal Building, Cargo Building, Floodlight Towers, Blast Fence and other Miscellaneous items. M/s. Pacific Consultants (International) Tokyo and M/s. Kehzo Tange and Urtec, Tokyo were Consultants and Architects for the main projects.





RICHARDSON & CRUDDAS (1972) LTD.

(A Govt. of India Undertaking)
Byculla Iron Works
Bombay-400008, India

Tel: 866832-39 Tix: 011 - 3662

BRANCHES & WORKS:

BOMBAY L.B. Shastri Marg, Mulund, Bombay-400 080.Tel: 502624-5 Tlx: 011-5005

MADRAS: First Line Beach, Mardas-600 001 Tel: 22401-4 Tix: 041-7128

NAGPUR: MIDC Industrial Estate, Nagpur-440 016 Tel: 7326, 7286, 7461. Tlx: 0715-328

LIAISON OFFICES:

NEW DELHI: 402, Surya Kiran, Kasturba Gandhi Marg, New Delhi-110 001 Tel: 351385, 351026 Tlx: 031-2936 CALCUTTA: Hindustan Building, 4, Chittaranjan Avenue, Calcutta-700 072 Tel: 278735 Tlx: Care 021-7209