Established in 1960, Bhilai Engineering Corporation Limited serves market segments such as but not limited to Railways, Mining, Steel Plants, Power Plants, General Engineering, Shipping & Marine for their requirements of Steel, Alloy steel and Manganese steel castings.

The company was set up with an objective of manufacturing high quality ferrous castings, heavy fabrication and to provide machining assistance to their valued customers using the latest State of Art technology. Our products are built to stringent International standards, and have been received with distinction and acclaim by all users, both in the International and Domestic market. Company is managed by a team of highly technical professionals. It is no wonder the company has withstood the test of time for the last 52 years, given the dynamic nature of the economy with a focused vision.

Our Foundry is a single manufacturing facility in India with complimentary light fabrication and machine shops.

The Steel Foundry consists of following divisions, namely:

- **Foundry Shop**:
  - Total Area: 56656 Sq. Mtr
  - Capacity: 12000 MT Per month

- **Heavy Fabrication**:
  - Total Area: 105200 Sq. Mtr
  - Capacity: 18000 MT Per Annum
  - Max. Weight: 50 Ton
  - Single piece

- **Machine Shop**:
  - Total Area: 16184 Sq. Mtr
  - Capacity: 300 Mt. Manganese Steel & 200 Mt. Steel Casting
The Liquid Metal is produced by using Three Phase Electric Arc Furnace and Induction Furnace.

Direct Arc Furnace: -- Furnace capacity 10 Tons (HBB & GE) -- Furnace capacity 8 Tons
Induction Furnace: -- Furnace capacity 2.5 Tons (GEC)

<table>
<thead>
<tr>
<th>Type</th>
<th>Capacity</th>
<th>Size</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil Fired</td>
<td>60 Tons</td>
<td>8.0 x 6.3 x 3.7m</td>
<td>With Water Quenching facility</td>
</tr>
<tr>
<td>Gas Fired</td>
<td>25 Tons</td>
<td>6.6 x 4.2 x 2.0 m</td>
<td>With Water Quenching facility</td>
</tr>
<tr>
<td>Gas Fired</td>
<td>16 Tons</td>
<td>8.5 x 2.2 x 1.0 m</td>
<td>With Rapid Quenching facility</td>
</tr>
<tr>
<td>Electric</td>
<td>5 Tons</td>
<td>3.0 x 3.0 x 1.5m</td>
<td>For Tempering</td>
</tr>
</tbody>
</table>
Handling Facilities

Facility spread over 125,000 sq.mt. with specialized fabrication, machining & assembly capabilities in designated area.

Foundry Shop is well equipped with Material Handling facilities for movement of produce based on operations as melting, molding, fettling, heat treatment, raw material etc.

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>EOT Cranes</td>
<td>5 – 25 Tons</td>
</tr>
<tr>
<td>Radio Remote Control EOT Cranes</td>
<td>5 – 8 Tons</td>
</tr>
<tr>
<td>Ground Transfer Trolleys</td>
<td>30 Tons – 3 Nos.</td>
</tr>
<tr>
<td>Semi Gantry Cranes</td>
<td>5 Tons</td>
</tr>
<tr>
<td>Jib Cranes</td>
<td>4 tons</td>
</tr>
<tr>
<td>Mono rail Cranes</td>
<td>2 – 4 Tons</td>
</tr>
<tr>
<td>Fork Lifters for water quenching</td>
<td>2 Furnaces</td>
</tr>
</tbody>
</table>
Shot blasting Facilities

Boom & Colum Welding

Plate Bending Machine

Tube / Pipe Bending machines

Shot blasting Facilities
Methoding of casting is the HEART and SOUL of making a sound casting in economical way. The total methoding technology is carried out in two parts:

- Pattern Design
- Methoding Technology
- Feeding Technology
- Gating Technology

We have 3D modeler “SOLID WORKS” which facilitates pattern design. Other than modeling software we also are fully equipped with Solidification Simulation package “CAST CAE” through which we can check sample casting up to NDT quality Level – 1, before producing it in the shop floor.
BEC’s Contribution to Environment
By using recycled sand we are:-

- Minimizes the soil pollution.
- Avoids Ground Water Pollution.
- Avoids excessive mining.
**Sand Reclamation** (Omega Foundry Machinery system, England) is equipped with three parts:

- **Attrition Unit**, **Cooling Classifier** and **Pressure vessel** used for pneumatic conveying of sand.

The reclaim sand is used for mould preparation in Alfa Set System.

### Alfa Set System:
- Phenolic Resin (Binder) + Easter (catalyst hardener)

### Green sand System:
- Water + Bentonite & Dextrin (Binder) + Sand (Olivine sand/ Silica Sand/Zircon sand/ Chromite Sand/Ceramic sand)

### CO2 sand system:
- CO2 (Hardener) + Sodium Silicate (Binder)

### Sand Reclamation

**Molding Process**

- **Hand Molding**:
  - Continuous Sand Mixer (20 T/hr. and 30 T/hr.) and Compaction Table
  - Sand Mixers (5T/hr.) - 3 units for Core making

- **Machine Molding**:
  - Kunkel Wagner Jolt, Squeeze with Rollover. Bed Size: 3.2 m x 1.2 m.
  - ARPA - 900 Jolt, Squeeze molding machine. Bed Size: 110 cm x 90 cm.

BEC has modern and sophisticated semi-automatic Molding Machine for Small Heavy Castings up to 10 Ton of single piece casting with Alphaset and Green Sand technology.

To feed with quality sand to machine BEC has a Thermal Reclamation Plant also.
Serving Core Sectors as Steel, Railways, Power, Shipping, Mines & Infrastructure sectors with global Presence through TOT, Collaboration & Exports of Heavy Engineering Products.

Our Technical Capability to deliver critical & fully finished components in the following Sectors:

- Capital Equipment
  - Heavy Machines
  - Technological Structures

- Railway
- Mining
- Power
- Shipping
- Steel
- Material Handling
Railway Products

Manganese Steel Crossings:
- Largest Producer and Exporter of Cast Manganese Steel Crossings in India.

Coupling System
- Coupler Assemblies for Railways

Locomotive Bogie Frames:
- One of the biggest manufacturers of Locomotive Bogie Frames and also exporting to USA.

Flexi Coil
- Flexi-coil Bogie

Coco Bogie:
- Cast Steel Locomotive Bogie Frame Assembly

Freight Car
- Wagon Casnub

Specializes in manufacturing different Types of Locomotive Bogie Frames
Turnouts

Thick Web Switches

Weldable CMS Crossings
Magnet Frame

High Pressure Valve Castings

End Shield

Bucket Teeth

Centre Pivot

Yoke
We offer a wide range of Railway crossings that includes Cast Manganese Steel Crossings (Frog) as per USA and Indian Railway design specifications.

Indian Railway – 6 types

Export –
- Frogs - 21 types.
- Inserts - 26 types.
- Spring Frogs - 04 types
- Universal Crossings - 02 Types

Our Foundry has long experience to produce various types of Frogs & Inserts.
Our in-house facility includes fabrication shop, blasting booth, paint booth, testing labs with all advance measuring and testing instruments. Our Quality Assurance Department is well equipped with modern testing facilities to control right from raw material to finished stage components.

Facility Includes:
- Radiography Lab
- Ultrasonic Testing
- Metallurgy Lab
- Easy Laser
- Paint Lab
- Pneumatic & Hydraulic Testing

High quality performance is maintained at every stage of fabrication and welding. The division's Quality Assurance system meets or exceeds our Accreditations listed.
BEC is equipped with Heavy Fabrication, Machine & Assembly shops and offers complete technological & metallurgical equipment.

BEC's goal is to provide solutions in Turbine Tubular Tower, Heavy Fabrication, using the best technology the world has to offer. But we are proud of much more than just the products we make.

The division operates from the three manufacturing units of combined area of 0.3 million sq. meter. All critical assemblies are performed under covered bays & are also integrated with the mechanized grit & sandblasting booth with painting & metallizing shops for the high quality applications which can last for even 15 years & more.

The equipments supplied from the division are pre-assembled with drives, trial tested & match marks are provided for ease of erection at site.

We specialize in the welding of all types of metal alloys in addition to quality welding of complex parts where precision is critical.
BEC shops are approved by BHEL, Enercon, Sandvik, Metso & SIEMENS for the manufacture of fabricated parts & Assemblies. Our offerings includes: Fabricated items for Electrical Parts, Infrastructure, Material Handling Equipments and their assemblies.

It includes:
- Boiler & Turbine Structures: Primary & Secondary
- Buck Stays
- Wind Boxes
- Wind Mill Towers for Wind power
- Radial Gates for the Hydel Power
- Cyclones
- Silos, Hoppers, Bunkers
- Chimneys & Stacks
The Indian mining equipment industry has expanded at a fast pace, making the country a significant producer of such highly sophisticated machinery and India has a substantial manufacturing base which largely helps in production of mining equipment and BEC is one of them offering comprehensive and diverse range of mining machinery for both opencast and underground mines.
We offer castings for Marine & Shipping Applications.

The range includes castings such as:

- A Bracket
- Stern Boss
- Rudder Stock etc.

These are high quality castings that meet the manufacturing requirements at client’s end.

Our castings are approved by American Bureau of Shipping (ABS) for marine applications and are offered at very competitive price and assure timely delivery of all large and small orders.
BEC is a leading supplier for Specialty and Melt Shop Transfer Cars and heavy capacity-related equipment for steel mill applications.

BEC has successfully carved a niche in the competitive world of machines and equipment. We manufacture wide range of qualitative multi-dimensional product line / equipments for Steel Plants in various sizes and specifications which also can be customized as per customer’s requirements.

BEC believes in better engineering and develop customized solution as required by Steel Applications.

Our motto at BEC is to deliver the best and meet up to the industrial expectations for competent strategies.

Our major objective is to give our client full support so that they meet their objectives and not to superimpose on them a ‘fixed process or project model’.
BEC has set up numerous quality practices to ensure customers receive high-quality castings per their specifications.

**Stage – I**
- Liquid metal temperature
- Chemical composition

**Stage – II**
- Visual check – Before H.T.
- Visual check – After H.T.
- Mechanical Testing / Hardness of Test Piece

**Stage – III**
- Dye Penetration Testing.
- Magnetic Particle Testing.
- Radiography – 1 in 10 castings.

**Stage – IV**
- Dimension check using various Gauges, after Machining.
- Final Check after Assembly.

**Qualified NDT personnel – ASNT/ISNT Level – II**

**Volumetric Analysis & Sand Testing Lab**

**Portable Analyzer:**
- Scrap and Ferro Alloys identification

**Metallography - 1200 X**

**NDT:**
- T, RT (IR – 192 & X – Ray), LPT, MPT

**Spectro Analysis:**
- Up-to 30 elements

**Mechanical:**
- UTS (40 Ton & 60 Tons) Impact at subzero temperature, Hardness (BHN / Rockwell)

All products manufactured are thoroughly inspected, tried & tested for quality, efficiency, and reliability. Our in-house testing laboratories are equipped with advanced and sensitive testing equipment controlled by experienced engineers, infatuated with quality. The scope of Quality Control begins with incoming material and components and persists until the finished product is tested & rolled out.
BEC operate a mature Environmental Health and Safety Management System which we continue to review and improve. BEC strive to achieve the goal that it is unacceptable for people or the environment to be harmed as a result of our work, whether physically or mentally.
AAR (Association of American Railroads)

Ukraine Railway Certification for Bogie Frame (Bolster & Side Frame)

ISO 9001 – 2008 (Lloyd’s Register Quality Assurance Standard, UK)

RDSO (Research Design & Standards Organization, Railways) approved Class ‘A’ Foundry

IBR Approval for manufacturing Pressure Containing Castings Parts

Star Export House - Ministry of Commerce & Industry (GOI)

Certified by BEML for supply of Steel & Manganese Steel Castings

American Bureau of Shipping (ABS) Certification for supply of Steel & Iron Castings for Marine Appl.

RDSO Approved supplier for Truck Frame Assembly for EMD Locomotives

RDSO Approved supplier for Tri-Axle and Flexi-coil Bogie Frames & CS Bolster for BG Locomotives.

RDSO Approved supplier for HTCB Coupler and Draft Gear for Freight Wagons.

DAkkS (Germanischer Lloyd SE) GL System Certification for Fabrication & Manufacture of Heavy Boiler Component & Structural Fabrication of Tubular Tower Sections for Wind Mill & Other Industrial Application

RDSO Approved supplier for Cast Manganese Steel Crossings (1:8.5 and 1:12, 52 & 60 Kg)
Closing Remarks

Provisionally Managed Company

• High Value Castings

Robust Export Performance

Specialized in Mining Spares

• World Class Foundry

Highly Qualified Engineers

• Qualified to supply Railways

We desire to build best solutions that work for you.
We plan for expansion at our Foundry and Machine Shop for increasing the production of CMS Crossings and Locomotive Bogies.

We plan to invest in Tech up-gradation for new machines for machine weldable crossings, Cylinder Head and Liner for Locomotive Engines. New Plant set-up for Flash-Butt Welding and Centrifugal Castings.

We are interested in Joint-Partnership / Buy-back arrangements for Weldable Crossings, Cylinder Head and Cylinder Liner for Locomotive.

Future Plan

- In-house RT facility of Cobalt.
- Addition of new Multi Axis CNC Machine.
- Fast loop moulding line put up.
- Centrifugal Casting Plant.
- IS:27000
- 100 Mtr Wind Mill Towers
- Planning is underway to expand our manufacturing facility with latest technological machines to become a leader at the highest level of manufacturing excellence.

Future Vision
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Would like to extend gratitude and thanks to all for viewing this presentation with us.

BEC has long made it a priority to reduce its environmental impact. At our facilities, we are constantly seeking new ways to recycle and reduce energy consumption.