A REPORT ON THE INDUSTRIAL VISIT TO PHENIX, SANANAD

30th May 2016

Objective: "Gain Technical Knowledge and Exposure on the various technical aspects of Production, Process & Inspection."

Venue: Sanand, Ahmedabad

Date: 27 May 2016

No. of Students: 43 (VI - Mechanical & Automobile Students)

Head of the Department: Mrs. Aarti Patel

Faculty Members for Visit with Students: Mr. Akshay Thakkar, Mr.Amit Thakkar

Industrial Visit Co-ordinator: Mr. Akshay Thakkar, Mr.Amit Thakkar, Mr Hitesh Patel

1 INTRODUCTION ABOUT PHENIX

Phenix Construction Technologies is a gen-next steel infrastructure solutions company that caters to the global need of next-gen Pre-Engineered Buildings (PEBs) and Structural Steel.

A future-forward innovation hub, Phenix features among the top three steel construction companies in India and has established itself as a specialized player in designing, manufacturing and installing light to heavy and complex steel structures using leading-edge solutions for Pre-Engineered Buildings.

Phenix takes pride in its enviable project portfolio that includes execution of future-ready solutions for a gamut of industries, from core infrastructure, automotive, food & beverages, pharmaceutical, transportation to engineering, power, warehousing and others. Phenix is one of the largest exporters of PEB & Structural Steel solutions from India and also holds an Export House status.

Phenix philosophy lies in decoding the complexities of the three dimensional space and presenting feasible solutions that find a perfect fit with the rising industrial demands for simplified thinking. Needless to say, the systems thinking approach at Phenix has set new examples in the world of Steel Construction Technology.

Exploring new frontiers of construction technology and adding a new perspective to existing system designs, the Phenix innovation hub is always a step ahead in providing cutting edge end to end construction solutions that address all stages of the construction processes like designing, detailing, manufacturing, fabrication, transportation, installation, maintenance and after-sales services.

Adding an enigmatic appeal to the Phenix ecosystem is the state of the art production facility with a production capacity of 72, 000 MT per annum, situated in Gujarat, India. The perpetual cycle of innovation at Phenix has only added another dimension to the execution of systems thinking in the world of construction and infrastructure.

Adhering to precision analysis through application of sophisticated technologies, makes the project process more efficient and time specific. The use of sophisticated CNC equipment procured from USA, Canada and Europe helps Phenix deliver fast-track, cost-effective Structural Steel and PEB solutions.

2. Department of PHENIX Visited

1. PRODUCTION DEPARTMENT

Production center of the Tool Room of Phenix Sanand is equipped with the latest automatic machines. Phenix Company mainly consists of the 5 various lines of the production according to the working capacity. It mainly consists of following machines.

1. Shearing machine
2. Plasma welding machine
3. Submerged arc welding
4. Rod bending machine
5. Mechanical Press machine
6. MIG Welding machine
7. CNC Lathe machine
8. Drilling machines

Production line of phoenix consists of the above machines in three categories 1. Low capacity 2. Medium Capacity 3. High Capacity. The various parts which produced at phenix and its detail description are as given below.

1. Hot rolled sections

Phenix is a leading supplier of hot-rolled structures, which offer extensive performance characteristics, versatility and economy, as well as dedicated properties for specific applications.

Hot rolled steel structures are extensively used in High rise buildings, Refineries, Power plants, Infrastructure projects and various other applications.

2. H Type Beam

H-beam is named by its H-shaped cross-section. It is convenient and simple to connect, manufacture and install due to its parallel flanges. Compared with reinforced concrete structure, this H-shaped beam increases 6% in usable floor area, but decreases its dead load by 20% ~ 30%. In addition, this product can be manufactured into T-shaped, greatly meeting the requirements of engineering projects.

As a new construction material, H-beam offers a reasonable cross-sectional shape and good mechanical properties. Compared with I-beam, this product comes with the merits of high precision, lightweight and high section modulus. This product includes HW wide flange, HM medium flange, HN narrow flange, etc. Thanks to their high stability, high plasticity and ductility, they are used for buildings that need to bear a heavy load and to withstand strong vibration and natural calamity, particularly those constructions located in earthquake belt.

3. I Type Beam

   Hot rolled I-beam, also called steel girder, is a strip steel product with I shaped cross-section. Its cross-sectional size is represented by web height * flange thickness * web thickness in millimeters. This product is available in various categories. I-beam is blessed with a reasonable cross-sectional shape, which can improve its load-bearing capacity. All in all, I-beam has high stability and high strength. It is mainly used in Plants, Bridges, Ships, Vehicles and other large-scale structures.

4. Plate fabricated beams

   The various beam which produced and their specification are listed below.

   Plus / Cross Beams

- Maximum weight per section can be 35 tons.
- Maximum size per column can be 2500 mm x 1000 mm.
- Range of plate thickness can be 6 mm to any thickness .

   T-Beams

- Flange width can be maximum of 1000 mm.
- Length up to 12 meters without welding joint.

   Box Beams

- Width can be maximum of 1200 mm x 1200 mm length up to 12 meters without welding joint.
- Beams and Girders are tailor made to customer’s specifications.
- Beams fabricated to precise dimensions through automatic / mechanized processing as compared to on-site fabrication.
- CNC programmed flame cutting produces high accuracy and precision in plate cutting.
- Edge and face mill facilities for precised finishing.
- Hole drilling, sawing and marking done on-line on automatic drilling / sawing / marking machines.
- Fabricated components shot / slag blasted before painting as per customers’ requirement.
- Mechanized handling eliminates any possibilities of mechanical damage.

- Beams can be delivered face milled, shot-blasted, painted or primer coated in factory finished condition.
- Jumbo size fabricated beams with drilled holes, studs, stiffeners, base plates, splice plates ready to be used at the site are supplied by Phenix fabrication facility at Sanand.
- Custom range of Plate Fabricated Beams, Boxes and Girders are used extensively in construction of Bridges (ROBs), Flyovers, Metro Rail Projects, Power Plants and Supercritical Boiler Columns, Industrial Structures, Material Handling Systems, Refineries, Steel Plants, Airports, Shopping Malls, Stadiums, Utility and Multi-Storied Buildings.

Columns & Rafters

- Flange thickness 40 mm and width up to 600 mm.
- Web depth 2000 mm and thickness up to 25 mm

2. PAINTING DEPARTMENT

Before the painting, the blasting of air is done on the work piece so that the oxygen content or the sediments are removed from the work piece. After the blasting the workpiece are spray painted in the machine with the three layer of the paint on it.

3. QUALITY CONTROL DEPARTMENT

The quality control department consists of the various precision measuring instruments like vernier micrometer, feeler gauge, slip gauge, plug gauge, surface roughness testor, microscope. The various instrument used for the quality control of the produced part. The various parts like rafter, beam and section checked against the original dimension and if the any variation found then part is rejected or scraped.

	Description	Model	Specification
1	Profile Projector	BATY INTERNATIONAL SM20	Range-50x150mm Accuracy :0.002(2µ)
2	Tool makers Microscope	CARL – ZEISS	Range-50x150mm Accuracy :0.001(1µ)
3	Linear Height Master	MITUTOYO	Range-600mm Accuracy :0.001(1µ)
4	Surface Roughness Tester	HOMMEL T-500	Minimum display Value 0.01µm Accuracy : CLASS1(DIN 4777)

3. Production line sequence at Phenix

The phenix company consists of the following fixed position production line sequence.

1. Stocking Facility

- Steel Plates Purchased directly from all major HR plate manufacturers of India.
- Delivered to length with minimum joints.
- State-of-the-art, efficient handling equipment.
- All weather mechanical plant.

2. Welding Bay with Sawing and Drilling Facility

- Automatic submerged arc welding lines.
- In-house DT and NDT testing facility.
- Ongoing inspection and welding quality testing.
- CNC controlled as well as manual cutting and drilling options.

3. Fabricated Sections Production Line

- Sections fabricated from plate.
- Automatic material handling.
- Automatic twin head welding.

- Sections up to 12 m long, 2 m deep.

4. Shot Blasting and Painting Line

- Shot blast to SA 2.5 or higher grade.
- Removal of all mill scale and rust particles.
- Ideal for paint adhesion.
- Red-oxide and other high grade paints.

4. POINTS COVERED IN INDUSTRIAL VISIT

The industrial visit at phenix covers the manufacturing process & Production Technology subject. In the visit students gained practical knowledge of the following manufacturing process.

Plasma arc welding
Submerged arc welding
Oxy acetylene welding
MIG (Metal Inert gas) Welding
Press working

1. Punching process
2. Piercing process
3. Notching process
4. Blanking process
5. Trimming process
6. Bending process

Bend Saw machine
Grinding machine
Spray coating machine
Galvanizing
Bend Saw machine
CNC lathe machine

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