



BNAL

PREFABS PVT. LTD.

Transforming the way you Build

PRE-ENGINEERED BUILDINGS | PREFABRICATED STRUCTURES | PUF PANELS

February 17, 2016

BNAL Prefabs Pvt. Ltd. – Company Overview

Consistent innovation and an unyielding commitment to providing impeccable quality standards

Successfully executed numerous prestigious projects across India

- Established in 1989, BNAL Prefabs Pvt. Ltd. is one of the pioneer companies in the country manufacturing and erecting Pre-Fabricated and Pre-Engineered Buildings (PEBs)
- Headquartered in Chandigarh and manufacturing facilities in Baddi, Himachal Pradesh
- In-house facilities for conceptualization, design, manufacture, supply and erection of various types of PEBs
- Equipped with the latest and most modern plant and machinery required for the manufacture of PEB's and PUF panels
- Provide precision engineered structures for permanent, semi-permanent and temporary use for various commercial and residential segments
- Registered with prestigious Governmental, Defence and Para-Military Organizations for the supply and erection of Prefabricated and PEBs



Our Products



PRE-ENGINEERED BUILDINGS

- BNAL pre-engineered buildings have revolutionized the construction market using built-ups in place of conventional hot rolled sections
- PEB is a steel structure built over a structure concept of primary members, secondary members and cover sheeting connected to each other
- The structural members are custom designed to be lighter in weight as well as high in strength
- PEBs can be fitted with different structural additions like trusses, mezzanine floors, fascias, canopies and crane systems as per user requirements



PREFABRICATED STRUCTURES

- BNAL prefabricated structures are manufactured in an off-site industrial facility as per pre-determined designs and then shipped to the site in knocked down condition
- The structures are erected on-site using bolted and inter-locking connections
- These cost effective, yet highly durable structures can be used in various industrial, commercial and residential segments
- BNAL Prefabs manufactures customized prefabricated structures:
 - PUF Insulated shelters
 - Cement board shelters
 - Portable bunk houses



PUF PANELS

- BNAL factory engineered PUF panels are manufactured on a Cannon sandwich panel foaming plant imported from Italy
- These panels have skins on both sides of suitable material as per requirement and PUF of required thickness and density sandwiched in between
- The modular design offered by these panels enables easy and quick installation along with durability
- These panels are interlocked with each other using Cam Lock Systems or through Tongue and Groove arrangement, which ensures precise interlocking of panels and dimensional accuracy

BNAL Pre-Engineered Buildings (PEBs)

Pre-Engineered Buildings Parts

- Factory manufactured steel buildings with outside cladding of pre-profiled color coated sheets/Galvanized Iron (GI) sheets/PUF panels/Galvalume sheets
- No or minimum fabrication is carried out on-site and the required building can be assembled in a short period of time
- Clear span between bearing points, bay spacing, roof slope, live loads, dead loads, collateral loads, wind uplift, deflection criteria, internal crane system, maximum practical size and weight of fabricated members are considered while designing a robust Pre-engineered building
- Pre-engineered buildings consist of Primary member/frame, secondary member/frame and Roof and Side cladding

Primary Frame/Member

- Consists of:
 - I beams
 - H beams
 - Plate girders
- Formed by welding together steel plates to form H/I shaped sections
- I-beams are field-assembled to form the entire frame
- Framing members vary in web depth according to the local loading effects
- Larger plate dimensions are used in areas of higher load effects

Secondary Frame/Member

- Consists of:
 - Purlins
 - Side runners
- Made out of cold form sections in Z and C shape as per design requirement
- Size and depth of sections vary as per design

Roof and Side Cladding

- Consists of:
 - Profiled sheets
 - PUF panels
 - Brick wall
 - Cement blocks
 - Any other material
- Choice of material depends upon the use of the building, prevailing weather conditions, etc.

Detailed Specifications of a Pre-Engineered Building

- Designed by a manufacturer to be fabricated using a pre-determined inventory of raw materials and manufacturing methods
- Also referred to as Pre-Engineered Metal Buildings (PEMB) or Engineered Metal Buildings (EMB)
- Primary framing structure of a PEB is:
 - Assembly of I-shaped members/beams
 - I-beams are formed by welding together steel plates to form I-sections
 - I-beams are then field-assembled to form the entire frame of the PEB
 - Larger plate dimensions are used in areas of higher load effects
 - Other forms of primary framing can include:
 - Trusses
 - Mill sections rather than 3-plate welded
 - The choice of economic form vary depending on factors such as manufacturing capabilities, transportation, construction and variations in material available compared to labor cost
 - Primary frames are typically 2-D type frames
- Secondary structural members, Z and C-shaped section members, support the external and roof cladding
- Pre-profiled steel sheet, insulated panels, precast concrete, masonry block, glass curtain wall or other materials are used for external cladding of the building
- For designing a PEB, the clear span between bearing points, bay spacing, roof slope, live loads, dead loads, collateral loads, wind uplift, deflection criteria, internal crane system and maximum practical size and weight of fabricated members are considered
 - Use pre-calculated tables for different structural elements in consultation with designers to select the most efficient I- beams for the project

Applications of Pre-Engineered Buildings

Applications of Pre-Engineered Buildings

Industrial Sheds and Workshops

Aviation Hangars

Factory Buildings

Metros and Railway Stations

Multistorey Residential/Office buildings

Cold Storage

Warehouses and Storage Sheds

Sports Complexes

Schools

Malls and Supermarkets

Display Showrooms/Retail Outlets

Petrol Pumps



BNAL Pre-Engineered Buildings process

We provide turn-key solutions from initiation to final delivery



- Create structural and foundation drawings
- Provide architectural assistance
- Customize designs as per customer requirements

- Build primary and secondary frames/members
- Roof and Side cladding
 - Profiled sheets
 - PUF panels
 - Brick wall
 - Cement blocks
 - Any other material

- Transportation of material to site
- Erection of building
- Joint inspection with client

BNAL Prefabricated Structures



PUF INSULATED SHELTERS

- Made of pre-coated Galvanized Iron (GI) sheet panels with PUF insulation of required thickness and density sandwiched in-between
- The panels are joined together using cam locks and tongue and groove arrangement for sealing
- Used for walling, roofing, false ceiling and flooring
- Offer a high degree of insulation



CEMENT BOARD SHELTERS

- The walls are made of two asbestos free cement sheets and EPS (compressed thermocol)/PUF insulation in between to form a composite insulated sandwich panel
- The false material is also made of the same material and can be insulated
- Aesthetically very appealing
- Offer high degree of insulation and comfort



PORTABLE BUNK HOUSES

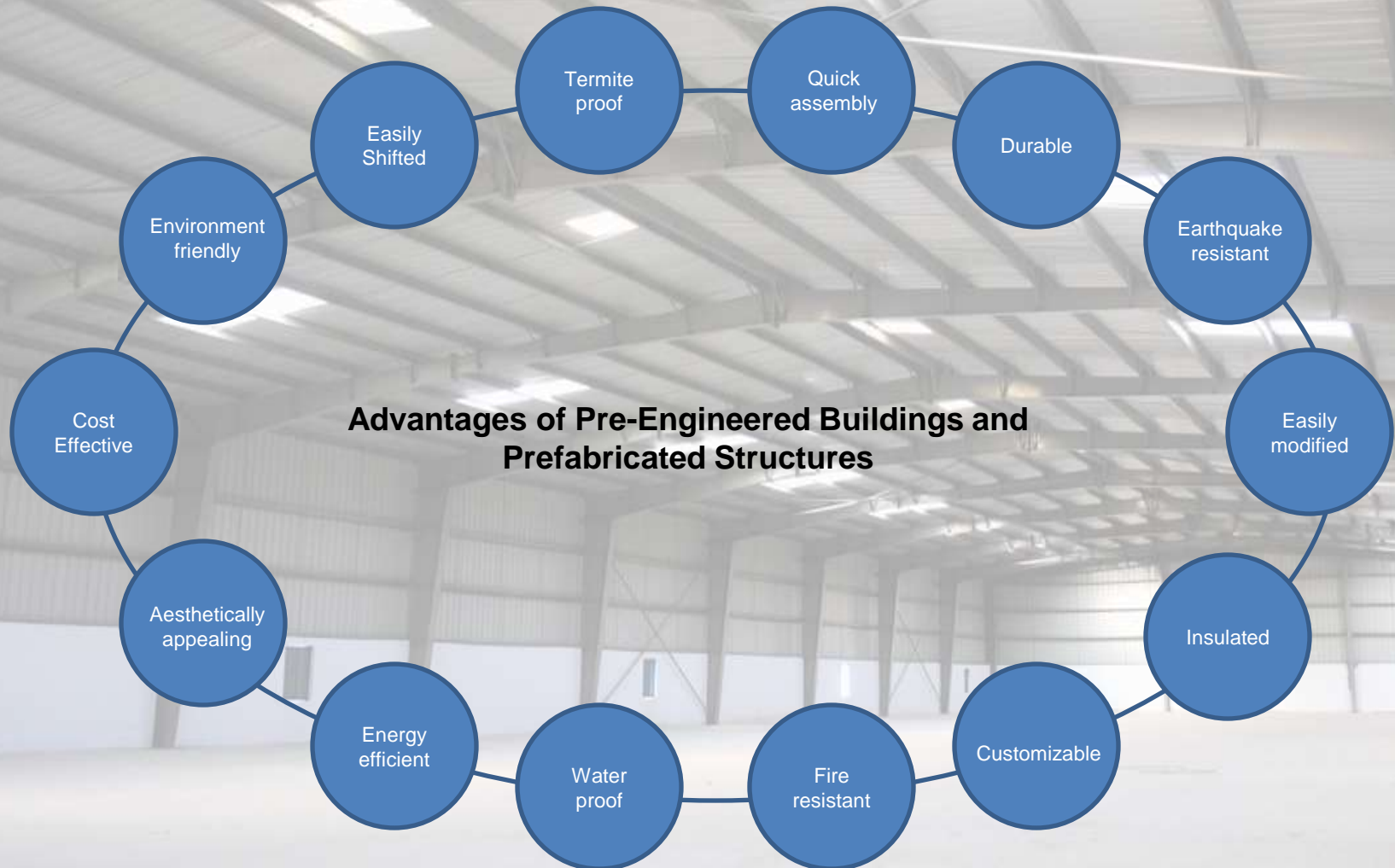
- Fully built up units in the shape of containers that can be loaded on to trailer trucks with the help of a crane and can be easily moved from one place to another
- Fully furnished structures with provision of air conditioning, lighting, telephone connection etc.
- All sanitary and electrical connections are pre-fitted into the bunk house and are ready to use, live-in accommodation

Applications of Prefabricated Structures

Applications of Prefabricated Structures	
Storage Sheds	Living Accommodation
Labor Camps	Site Offices/Accommodation
Hotels and Resorts	High Altitude Living Shelters
Schools	Army Shelters
Mobile Camps/Hospitals/Sheds	Barracks



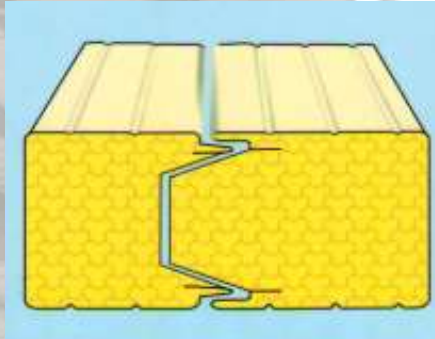
Advantages of Pre-Engineered Buildings and Prefabricated Structures



BNAL Poly Urethane Foam (PUF) Panels

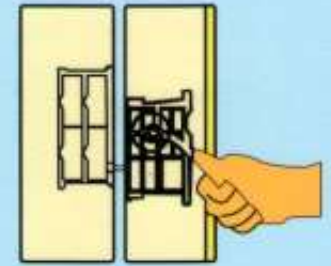
PUF Panels

- BNAL PUF sandwich panels are manufactured on a Cannon sandwich panel foaming plant imported from Italy.
- The PUF panels are manufactured using high quality two component CFC Free PU systems
- Poly Urethane Foam Filled Sandwich Panels are used for providing thermal & sound insulation
- These are light in weight and have good strength
- The panels are joined together by either the **Tongue and Groove arrangement** or **Cam Lock arrangement**



Tongue and Groove

- In this arrangement the panels are interlocked together by tongue and groove arrangement made in the outer skin of the panels
- This arrangement is especially useful for panels which are less than 50 mm thick



Cam Lock Arrangement

- Cam Lock Arrangement provides strong interlocking between ceiling, wall, door frame, floor corner and T panels
- The cam lock provides perfect and strong alignment between the panel joints
- These are spaced at equal distances along the perimeter of the panels, foamed strongly into the panels

Features and Technical Properties of PUF panels

Features of PUF panels	
Easy and quick installation	High load bearing capacity
Controlled temperature and humidity	Easy repair and replacement
Light weight	Good sound insulation
Easy to cut to any size	Long service life
Energy efficient	Modular construction
Lean construction	Cam-lock interlocking

Technical Properties of PUF panels	
Density	40+/-2 kg/m ³
Compressive strength	2.1 kg/cm ² (at 10% deformation)
Tensile strength	3.7 kg/cm ²
Bending strength	4.0 kg/cm ²
Adhesion strength	2.9 kg/cm ² (foam to steel)
Closed cell content	90-95%
Temperature range	-180°C - +110°C
Thermal conductivity at 10°C	0.018 k.cal/m.hr °C
Water vapour permeability	0.08-0.12 gms/hrm ² (at 90% RH and 38°C)

Prefabricated Structures executed by BNAL



Pre-Engineered Buildings executed by BNAL



Multi-Storey Buildings executed by BNAL



Our clients in the Private sector

BNAL Prefabs has over the years manufactured and erected more than 10,000 structures across India

Strabag-Affcons JV Ltd.	Himtechno Forge Ltd.
Leighton Contractors India Ltd.	IVRCL Ltd.
Emaar MGF Ltd.	C&C Constructions Ltd.
Khandelia Business Group	Rajdeep Buildcon Ltd.
Unipro Tecno Infrastructure Ltd.	Surya Pharmaceuticals
Globe Precision Industries Ltd.	Patel Engineering Ltd.
Chauhan Enterprises	ABC Paper Mills Ltd.
General Cable Industries (India) Ltd.	Himalayan Construction Company Ltd.
Umeed Foundation	Druk Chogley Construction Co. - Bhutan
Naandi Foundation	Broadway Links Pvt. Ltd.

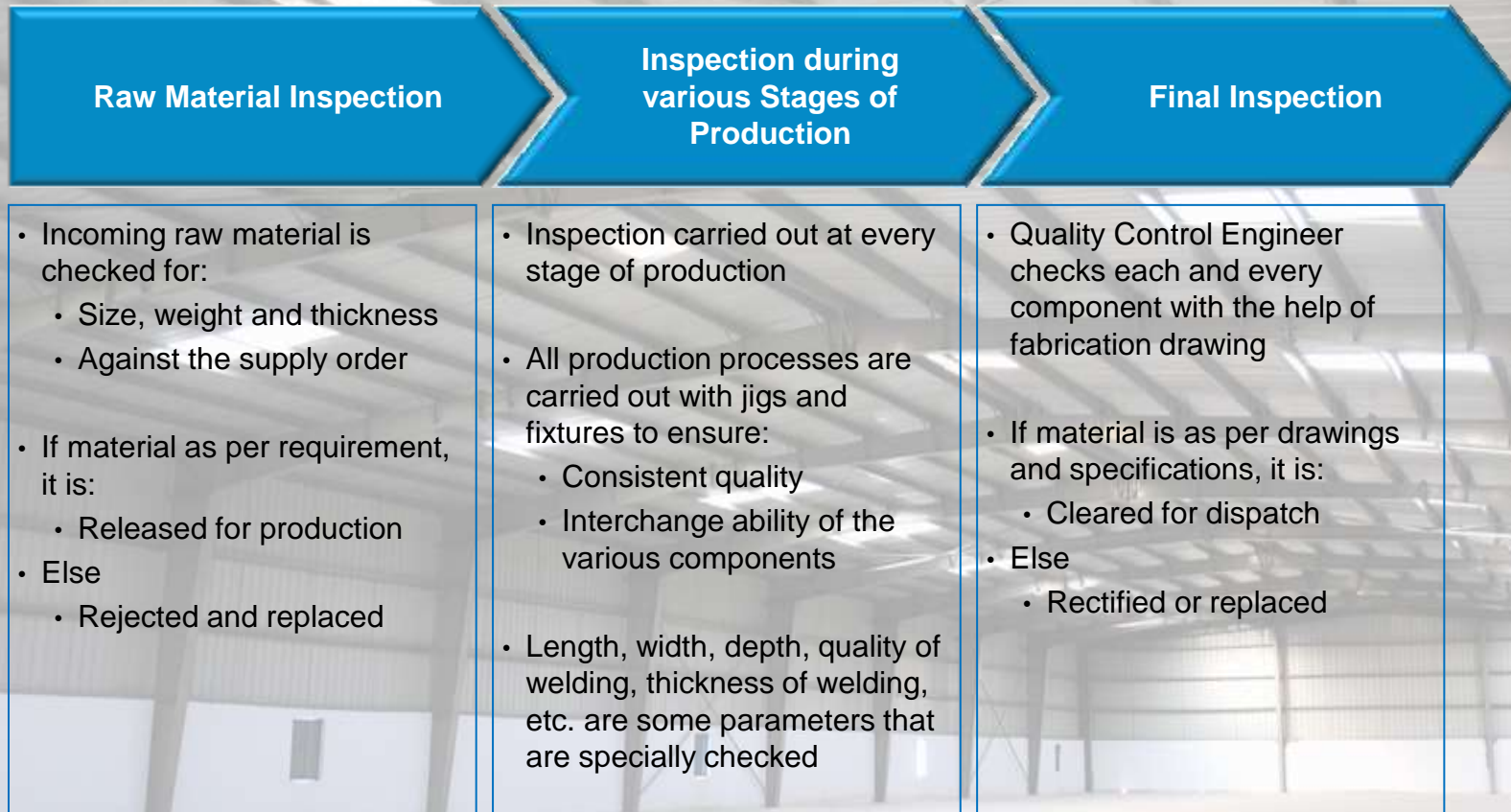
This list is not inclusive of all our clients

Our clients in the Public sector

The Indian Army	Hindustan Petroleum Corporation Ltd.
Central Reserve Police Force (CRPF)	Kribhco Infra Ltd.
Central Industrial Security Force (CISF)	Military Engineer Services (MES)
Border Security Force (BSF)	Central Public Works Department (CPWD)
Indo-Tibetan Border Police (ITBP)	Municipal Corporation of Delhi (MCD)
Indian Coast Guard	Various Border Roads Projects
National Hydroelectric Power Corporation (NHPC)	Military Engineering College, Pune
Director General of Supplies and Disposal (DGS&D)	Director General Ordnance Services (DGOS)
DG - Uttarakhand Police, Dehradun	Chandigarh Housing Board
National Security Guard (NSG)	DG - Punjab Police, Chandigarh.
H.P. Excise and Taxation Department Ltd.	H.P. State Electricity Board
Chandigarh Administration	BBN Development Authority

This list is not inclusive of all our clients

BNAL follows a stringent quality control process for raw materials, manufacturing and dispatch



BNAL is an ISO 9001-2008 accredited company



QUALITY

The ISO 9001:2008 standard provides a **tried and tested framework** for taking a **systematic approach** to managing an organization's processes so that they consistently turn out product that satisfies customers' expectations

We can be contacted at...

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