Navratan

Pipe and Profile Limited

www.navratangroup.com

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INTRODUCTION

Incepted in the year 1986, Navratan Group, commenced operations in the field of manufacturing & marketing of ERW Black and GI pipes & profiles for various applications in varied industry segments. The enterprise has been certified for ISO 9001 Certification for “Quality Management System”. The group ventured into the field of manufacturing & marketing high quality Pre-Engineered Metal Buildings alongwith pre-painted roofings, claddings, cold form “Z” & “C” profiles and accessories.

ABOUT THE PRODUCT

NAVRATAN Pre-Engineered Metal Buildings are tailor-made solutions to a customer's needs and are custom designed to meet exact requirements. These buildings are flexible enough to suit different building dimensions; they are easily expandable, can withstand harsh climatic conditions and come with maintenance free exteriors. Pre-Engineered Metal Buildings are suitable for both, industrial and commercial operations. Warehouses, factories, aircraft hangers, cold storages, workshops, sports halls, supermarkets or any high-rise building; NAVRATAN Pre-Engineered Metal Buildings offer modern solutions to all building constructions.

MANUFACTURING FACILITY

We have a state-of-the-art manufacturing facility having manufacturing capacity in excess of 80,000 MT per annum for pipes and structural steel and over 20,000 MT per annum for roofing & cladding systems. We have complete solutions for production and shipment of heavy structures. At our in-house production unit, all work from concept designing to finalization is taken care with ease. With modern technology and machinery, our set-up enables us to undertake complex and/or bulk operations very efficiently. The manufacturing facility is located in RIICO industrial area at Khushkhera, Bhiwadi (Rajasthan).

A Typical PRE-ENGINEERED METAL BUILDING

Main Frame

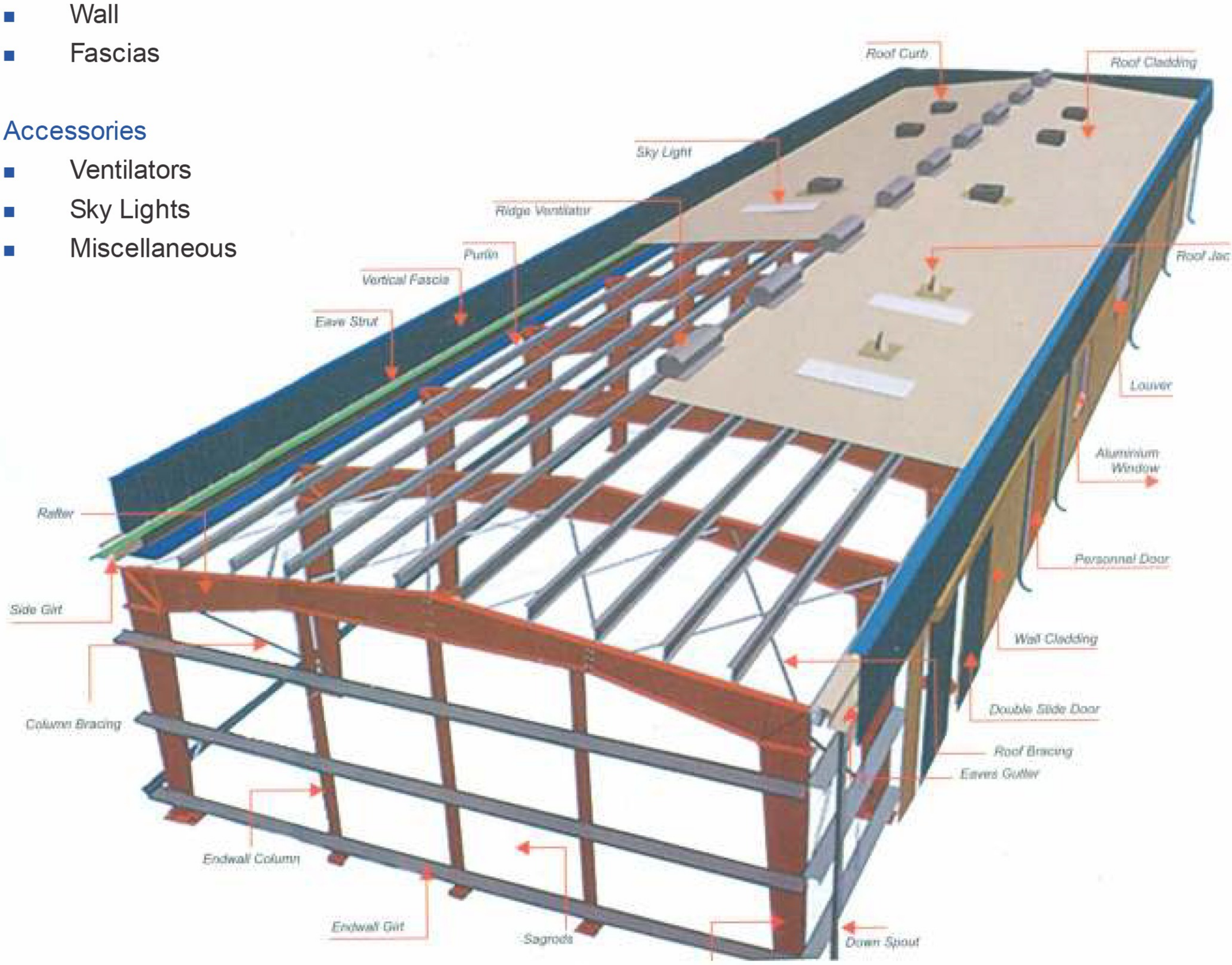
- Primary Member
  - Column
  - Rafter
- Secondary Members
  - Purlin
  - Girt

Sheeting

- Roof
- Wall
- Fascias

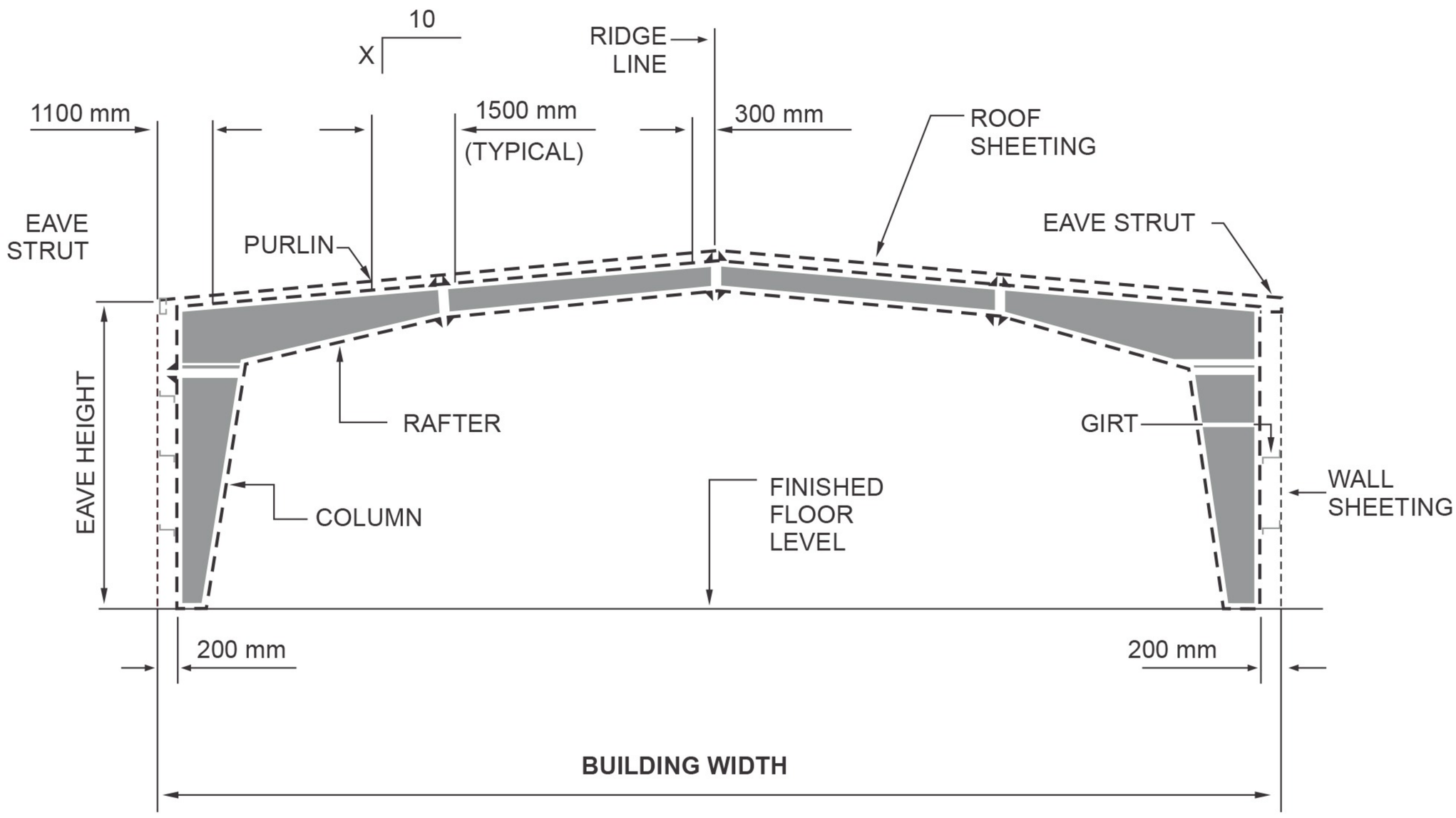
Accessories

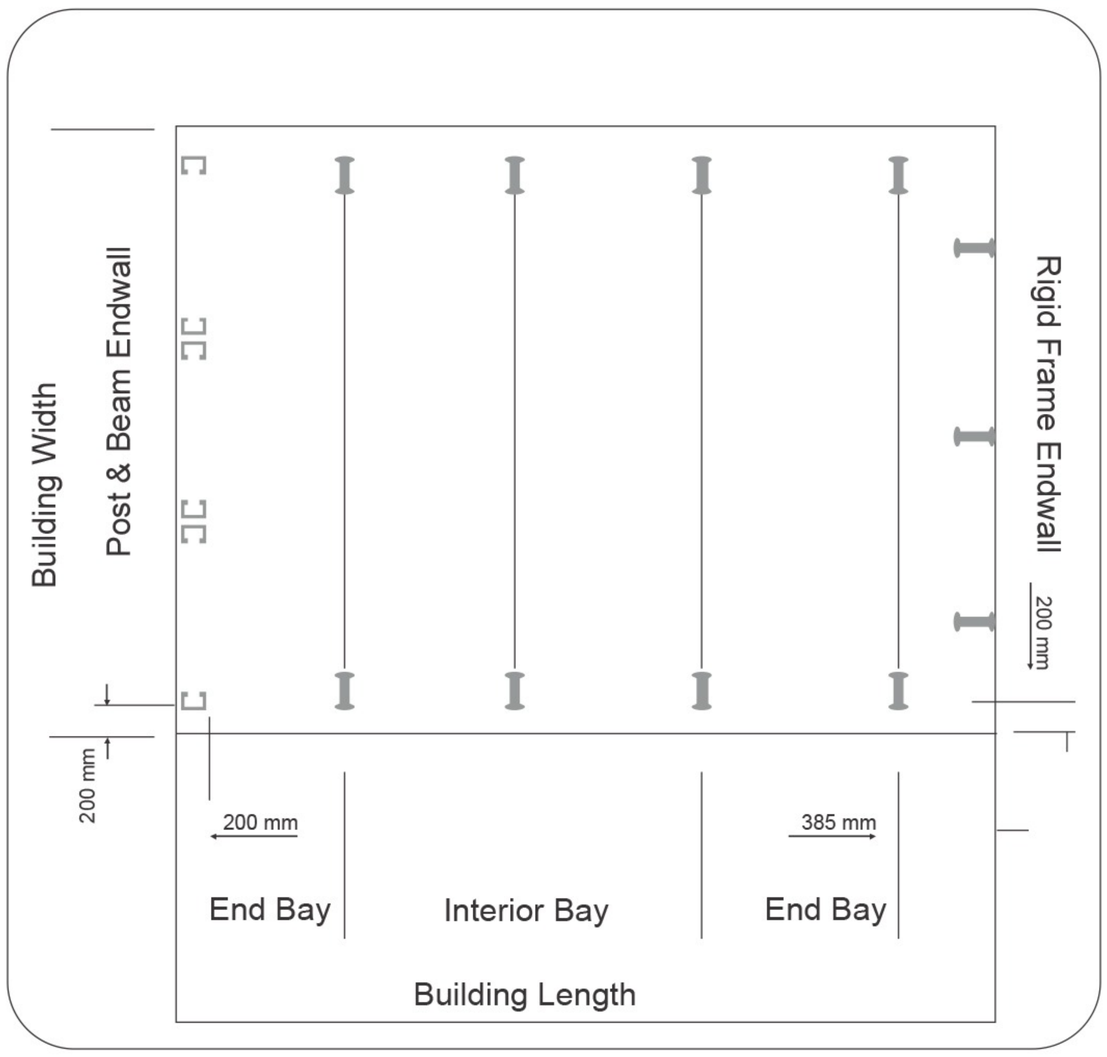
- Ventilators
- Sky Lights
- Miscellaneous



TECHNICAL DETAILS

Basic Building Parameters





BUILDING NOMENCLATURE

NAVRATAN pre-engineered metal buildings are custom designed to meet your exact requirements. The basic parameters that define a pre-engineered metal building are:

Building Width

Building width is defined as the distance between the outer side of an eave strut of one side wall to the outer side of an eave strut of the opposite side wall.

Building Length

This is defined as the distance between the outside flanges of endwall columns in the opposite endwalls, and is a combination of several bay lengths.

End Bay Length

This is the distance from the outer side of the outer flange of endwall columns to centre line of the first interior main frame column.

Interior Bay Length

This is the distance between the centre line of two adjacent interior main frame columns. The most common bay spacings are 6m, 7.5m and 9m. The bay lengths can go up to 12m.

Building Height

Building height is the eave height, which is usually the distance from the bottom of the mainframe column base plate to the top outer point of the eave strut. Eave height can go up to 30m. When columns are recessed or elevated from finish floor, eave height is the distance from finished floor to the top of the eave strut.

Roof Slope (x/10)

This is the angle of the roof with respect to the horizontal base. The most common roof slope is 1/10. However, any practical roof slope is possible.

Design Loads

Unless otherwise specified, NAVRATAN pre-engineered metal buildings are designed for the following minimum loads:

Roof Live Load: 0.57 KN/m2

Design Wind Speed: As per IS:875 for given site location

Design for Seismic loads, collateral loads or any other local conditions must be specified at the time of quotation.

Loads are applied in accordance with the latest American Codes and Standards applicable to pre-engineered metal buildings unless otherwise requested at the time of quotation.

ENGINEERING STRENGTHS

NAVRATAN's engineering strength help convert complex and expansive conventional steel buildings into simpler and economical pre-designed, pre-engineered metal buildings without sacrificing utility and functional requirements. The company has, with the use of specialized software packages and custom developed analysis, computerized the entire engineering process. Design calculations are comprehensive and the explanations are furnished to enable the consultants in understanding the design of a NAVRATAN Pre-Engineered Metal Building.

INTERNATIONAL STANDARDS

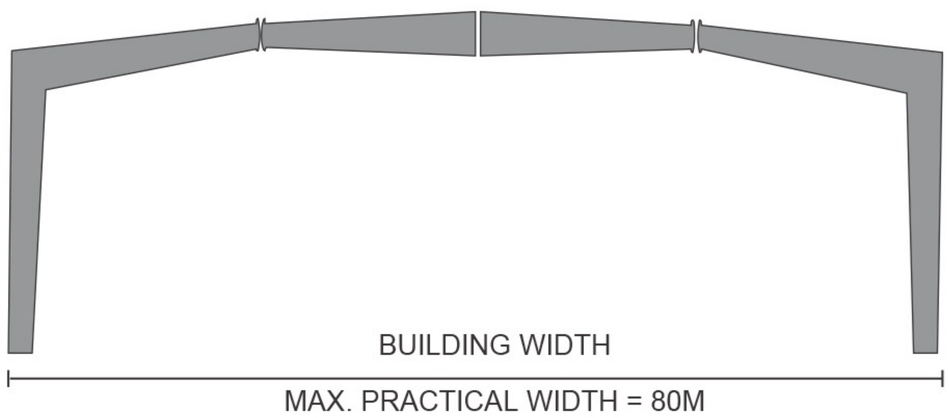
NAVRATAN's Pre-Engineered Metal Buildings are custom-designed solutions to meet the needs of the customer. All buildings are designed and constructed in accordance with the latest editions of the following codes:

- Low-Rise Building Systems Manual (MBMA) – Metal Building Manufacturers Association, USA
- Manual for Steel Construction, Allowable Stress Design (AISC) – American Institute of Steel Construction, USA
- Cold-Formed Steel Design Manual (AISI) – American Iron and Steel Institute, USA
- IS 800:2007
- IS 875:1987 (Part:III)
- IS 1893:2002

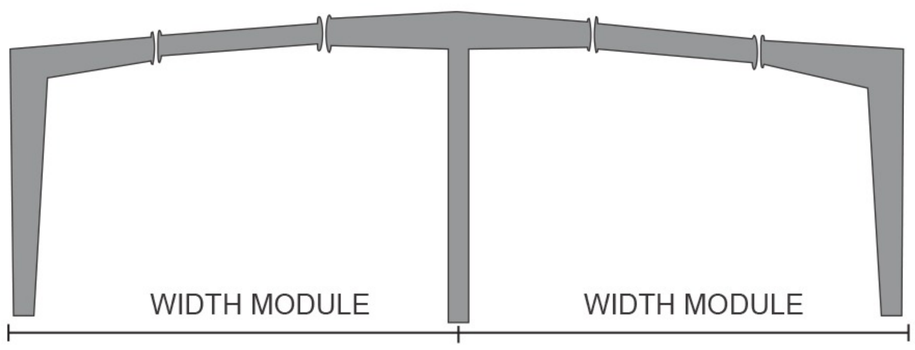
NAVRATAN pre-engineered metal buildings design and manufacturing confirms to all Indian and International Building Codes

PRIMARY FRAMING SYSTEMS

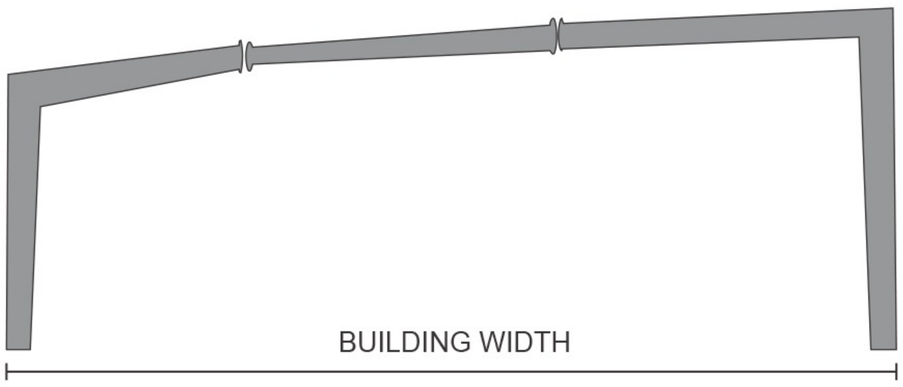
The most common primary framing systems are shown below. All are shown symmetrical about the ridge line. Framing system asymmetrical about the ridge line and Multispan Framing System with unequal width modules are possible but may require more engineering time and probable longer deliveries. Practically any frame geometry is possible. Consult a NAVRATAN engineer for your specific requirements.



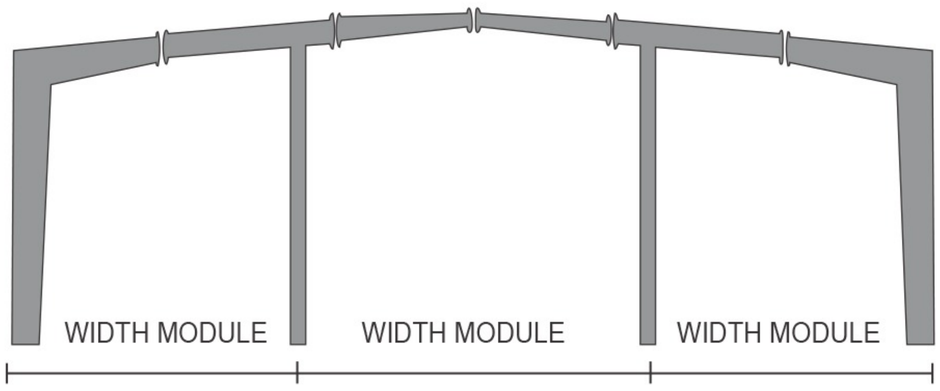
MAX. PRACTICAL WIDTH = 80M
CLEAR SPAN (TCCS)



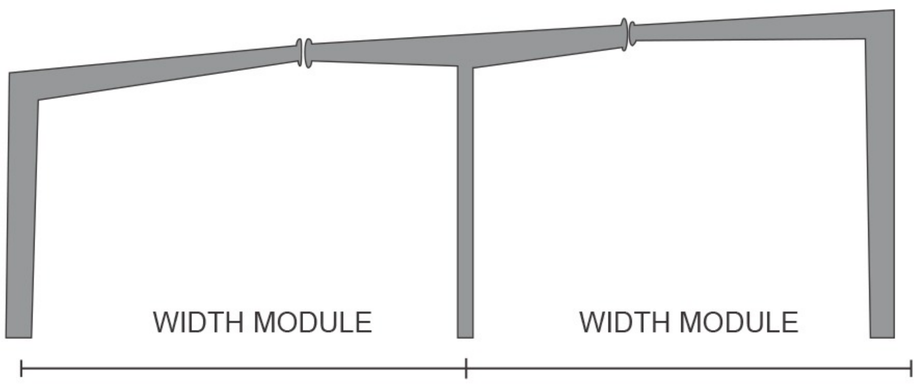
BUILDING WIDTH
MAX PRACTICAL WIDTH MODULE = 70M
MULTI SPAN "1" (TCMS-1)



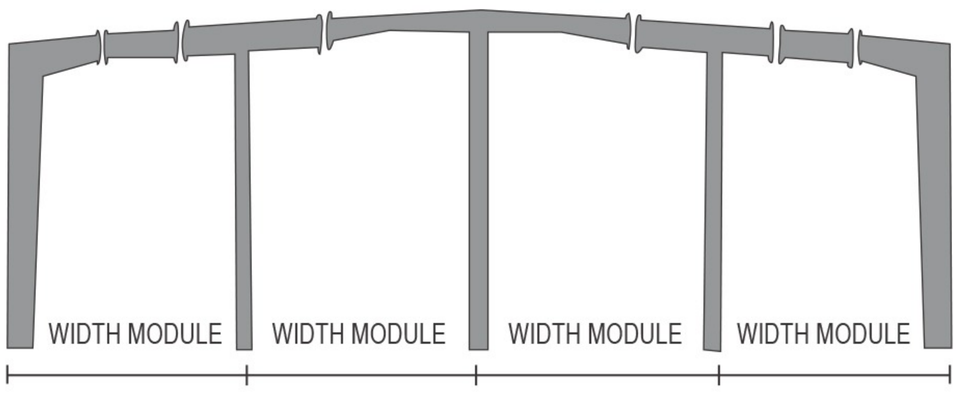
MAX. PRACTICAL WIDTH = 50M
SINGLE SLOPE (SSCS)



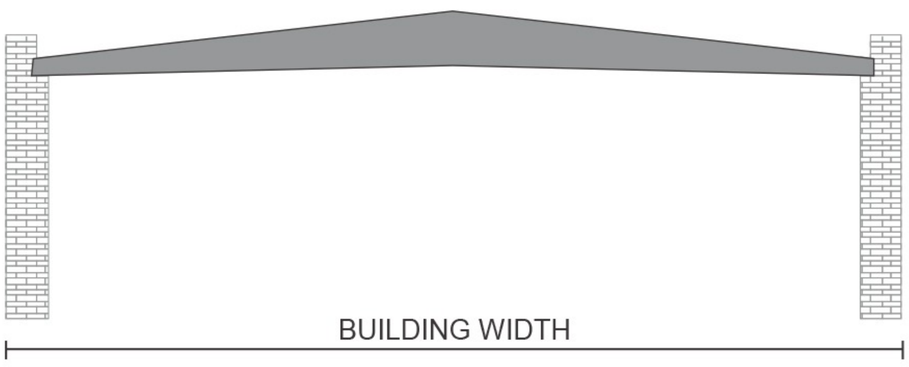
BUILDING WIDTH
MAX PRACTICAL WIDTH MODULE = 70M
MULTI SPAN "2" (TCMS-2)



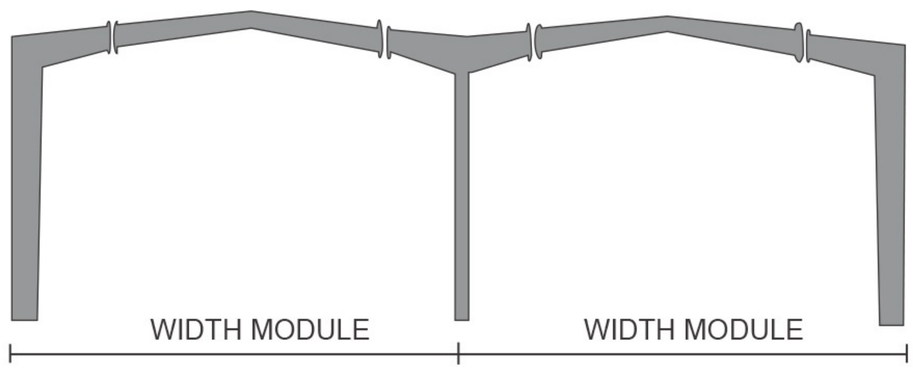
BUILDING WIDTH
MAX PRACTICAL WIDTH MODULE = 50M
SINGLE SLOPE MULTI SPAN "2" (SSCS-2)



BUILDING WIDTH
MAX PRACTICAL WIDTH = 70M
MULTI SPAN "3" (TCMS-3)

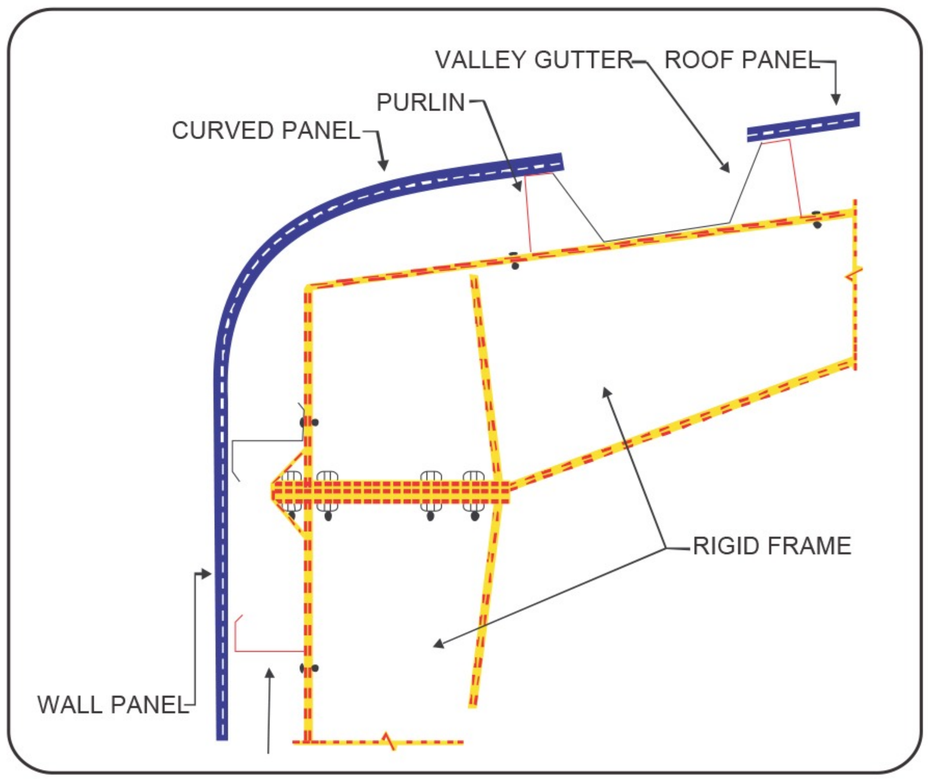


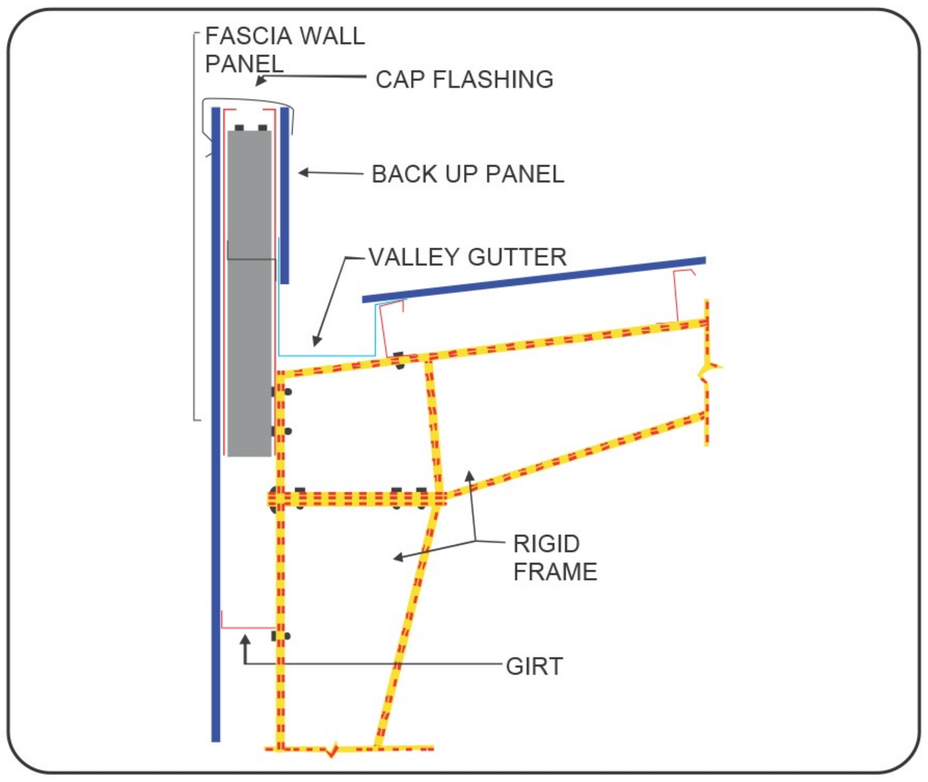
CLEAR SPAN RAFTER SYSTEM (CSRS)
MAX. PRACTICAL WIDTH = 50M

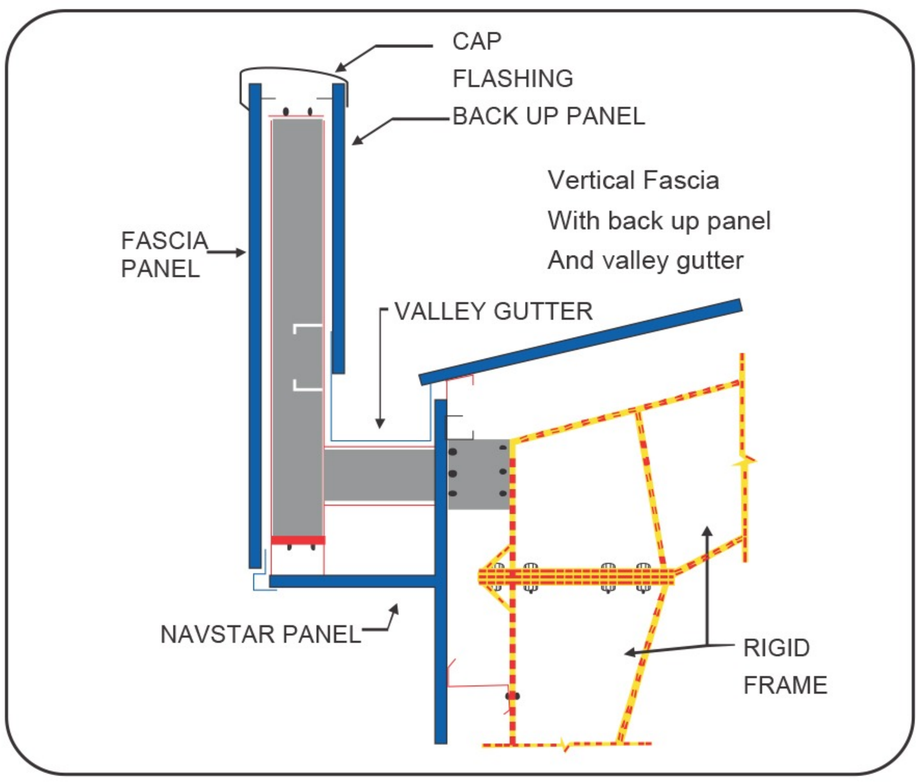


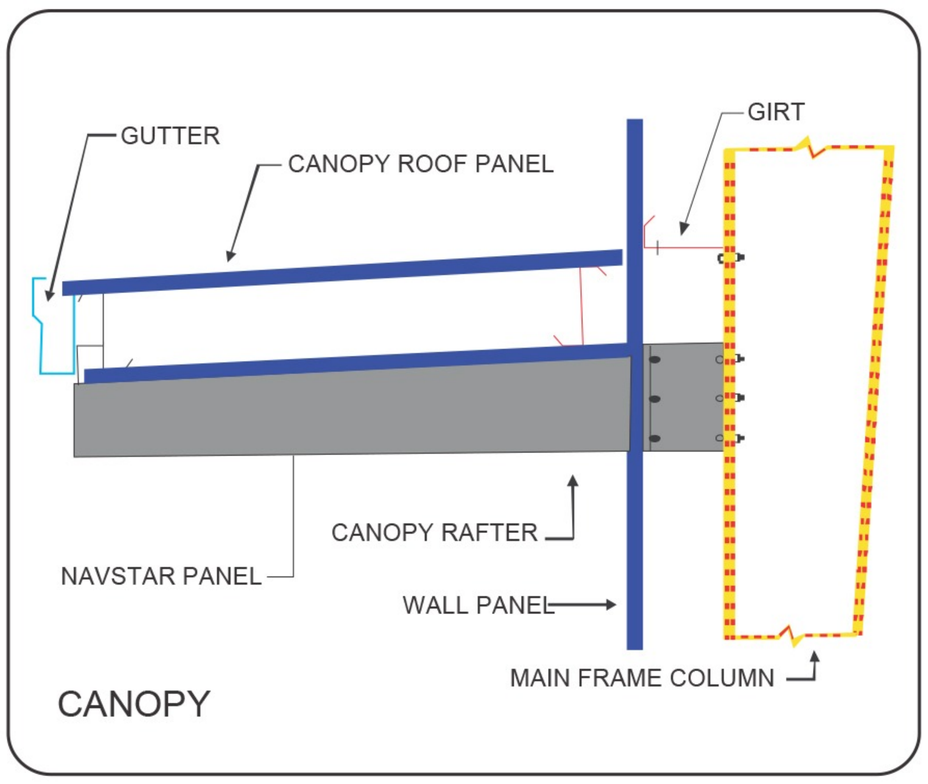
BUILDING WIDTH
MAX PRACTICAL WIDTH = 60M
MULTI GABLE (MG)

STRUCTURAL SUB SYSTEMS







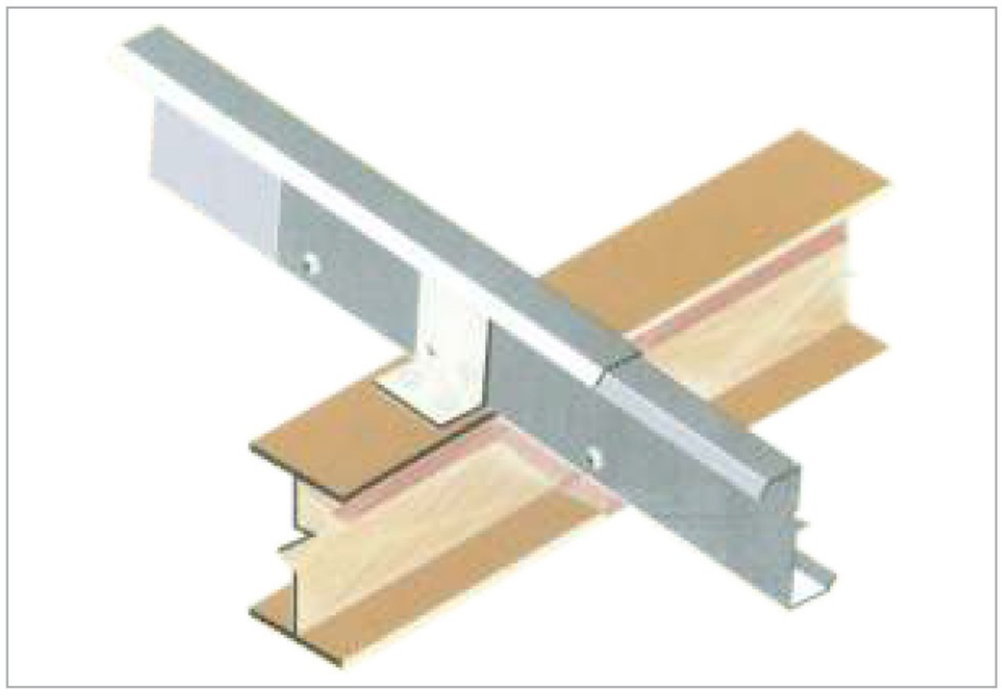


SECONDARY FRAMING SYSTEMS

Secondary framing consists of elements which support the roof and wall sheeting and transfer load to primary framing system. These include roof purlins, wall girts, eave struts, clips etc

Roof Purlins

Roof purlins are cold-formed Z profiles, normally 200 to 250mm deep manufactured out of 1.50 to 3.00mm thick steel. These are fixed to the top flanges of rafters by means of clips bolted to rafters.



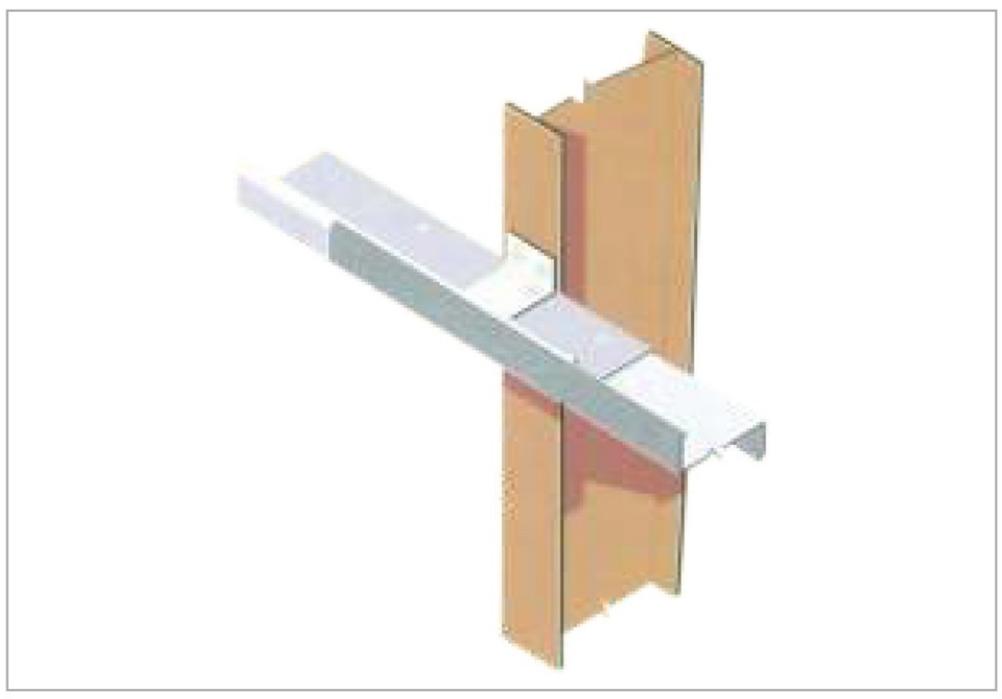
Purlins (Continuous Support)

Wall Girts

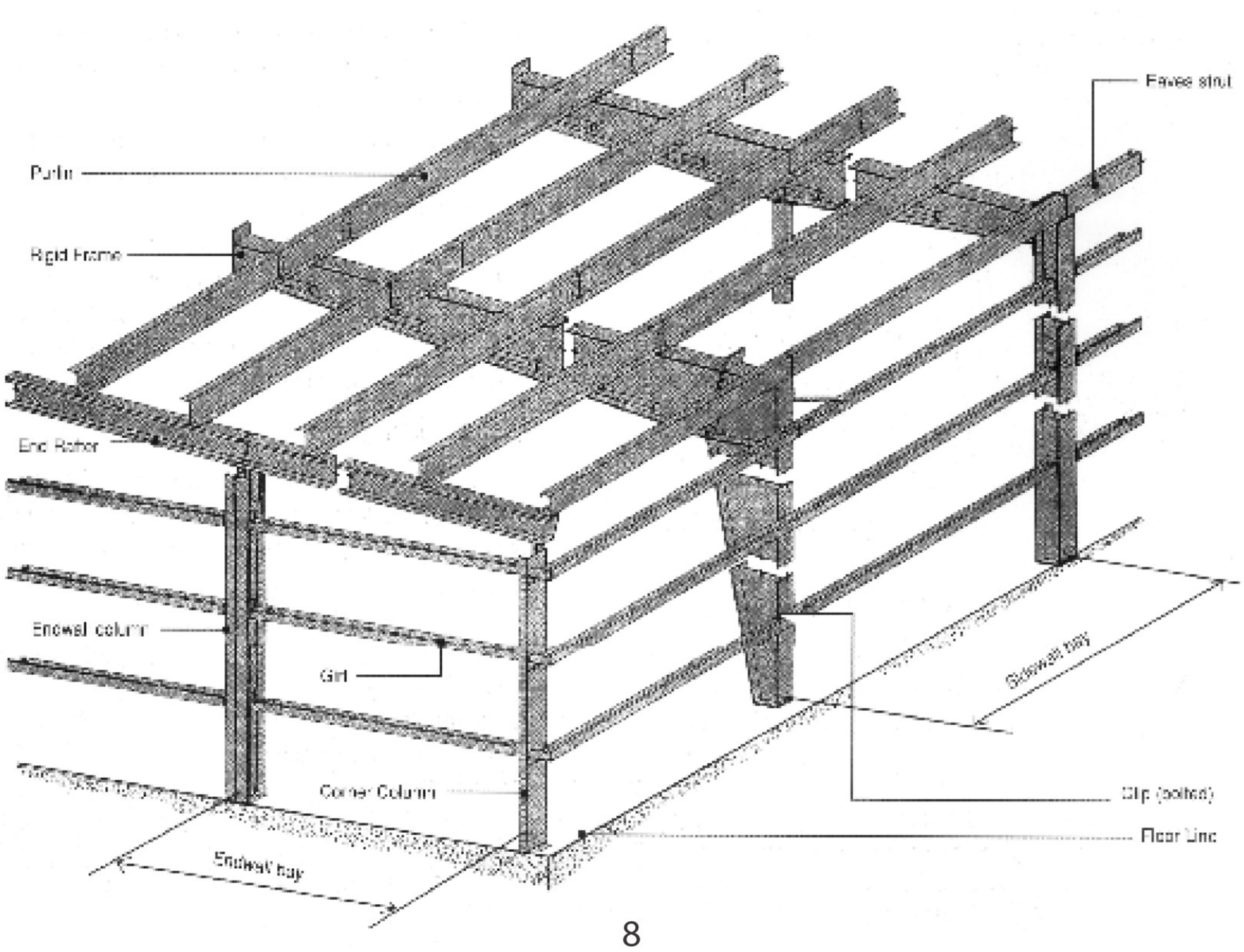
Wall girts are cold-formed Z profiles, normally 200 to 250mm deep manufactured out of 1.50 to 3.00mm thick steel. These are fixed to the outer flange of the sidewall columns.

Eave Struts

Eave struts are C profiles or double Z profiles, normally 200 to 250mm deep manufactured out of 2.00 to 3.00mm thick steel. These are fixed to the outer flange of the sidewall columns by means of clips bolted to columns.

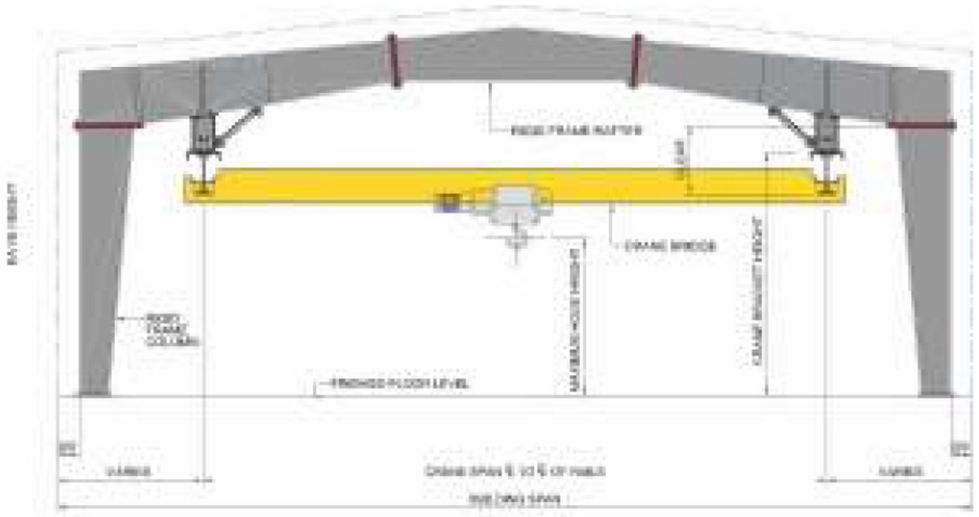


Girts (Continuous Support)



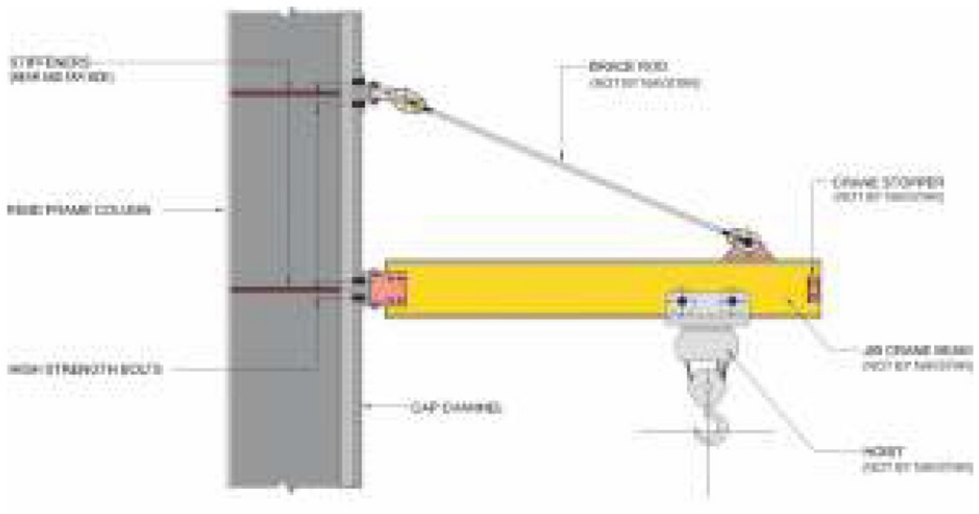
CRANES IN PRE-ENGINEERED METAL BUILDINGS

TOP RUNNING CRANE



UNDERHUNG CRANE

JIB CRANE AND MONORAIL CRANE



JIB CRANE DETAIL

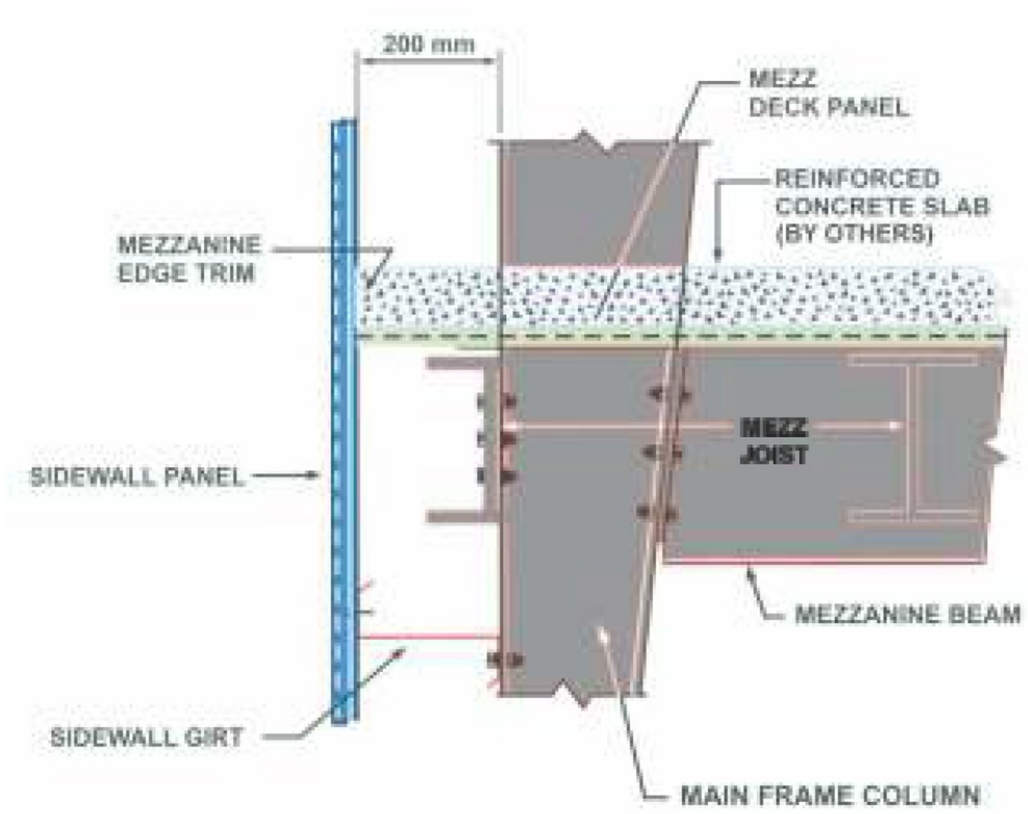
NAVRATAN pre-engineered metal buildings can be designed to accept most types of crane systems such as EOT, Under-hung, Monorail cranes and other load carrying devices like conveyors etc., in both clear span and multi span buildings. When a crane system is to be integrated, the company's scope is limited to brackets and crane runway beams which support the crane system. Complete information is required in order to design and estimate buildings with cranes.

MEZZANINE SYSTEMS IN PRE-ENGINEERED METAL BUILDINGS

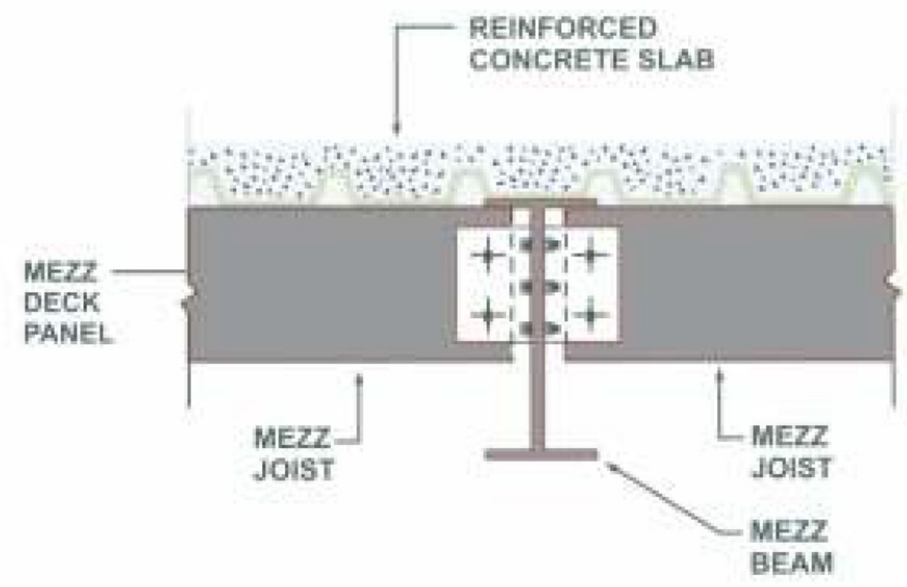
Intermediate mezzanine floors are possible in metal buildings. Mezzanine floors can be provided for complete or partial area in pre-engineered metal buildings to suit loading requirements for office and/or storage.

Mezzanine floor consists of steel decks, supported by joists bolted to the mezzanine beams. The economy of the mezzanine floor is affected by the applied load and support column spacings. Multi level equipment platforms, catwalks, staircases etc. can be accommodated, if complete data is provided at the time of estimation.

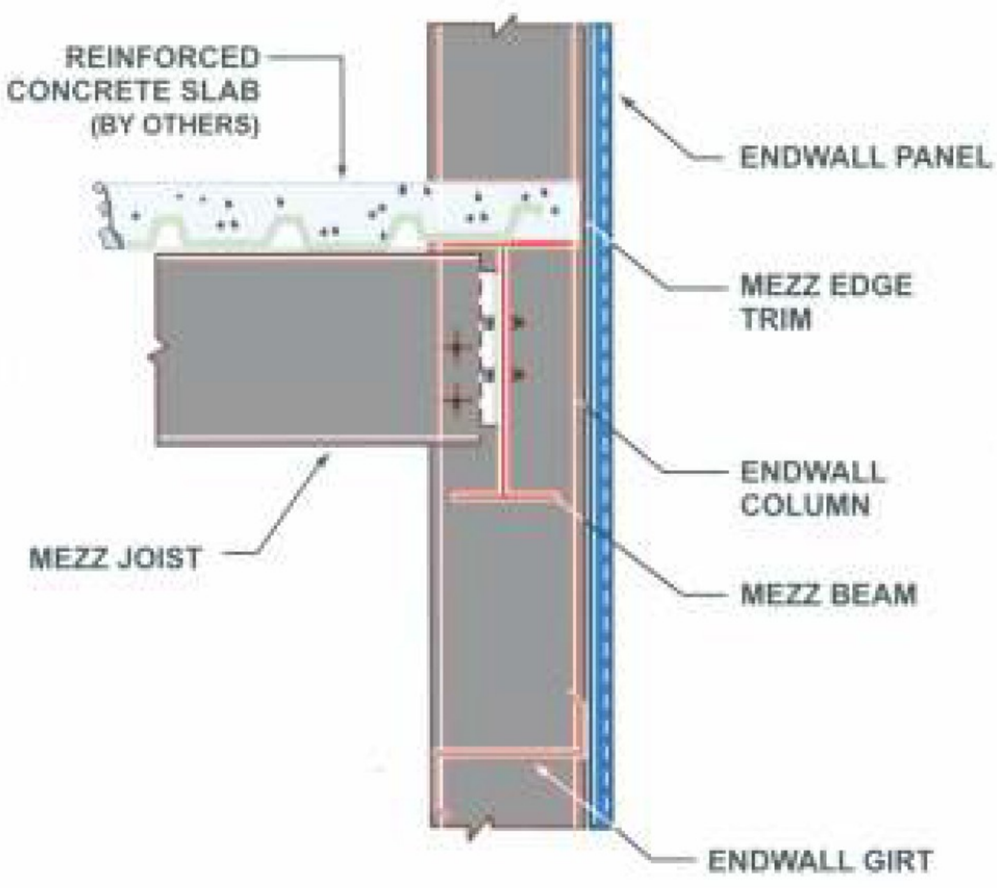
(Consult NAVRATAN for advice on the most economical Mezzanine design.)



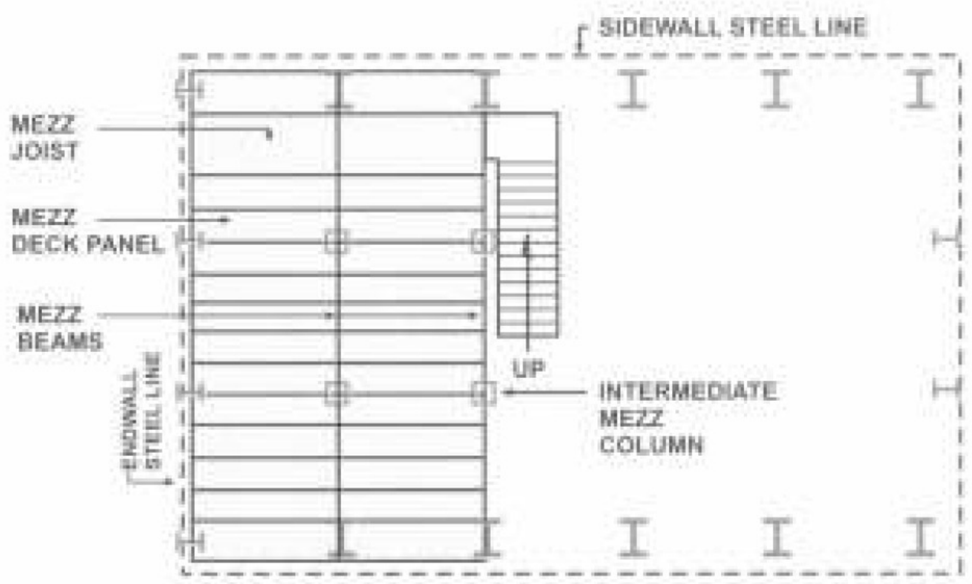
MEZZANINE BEAM CONNECTED TO MAIN FRAME COLUMN



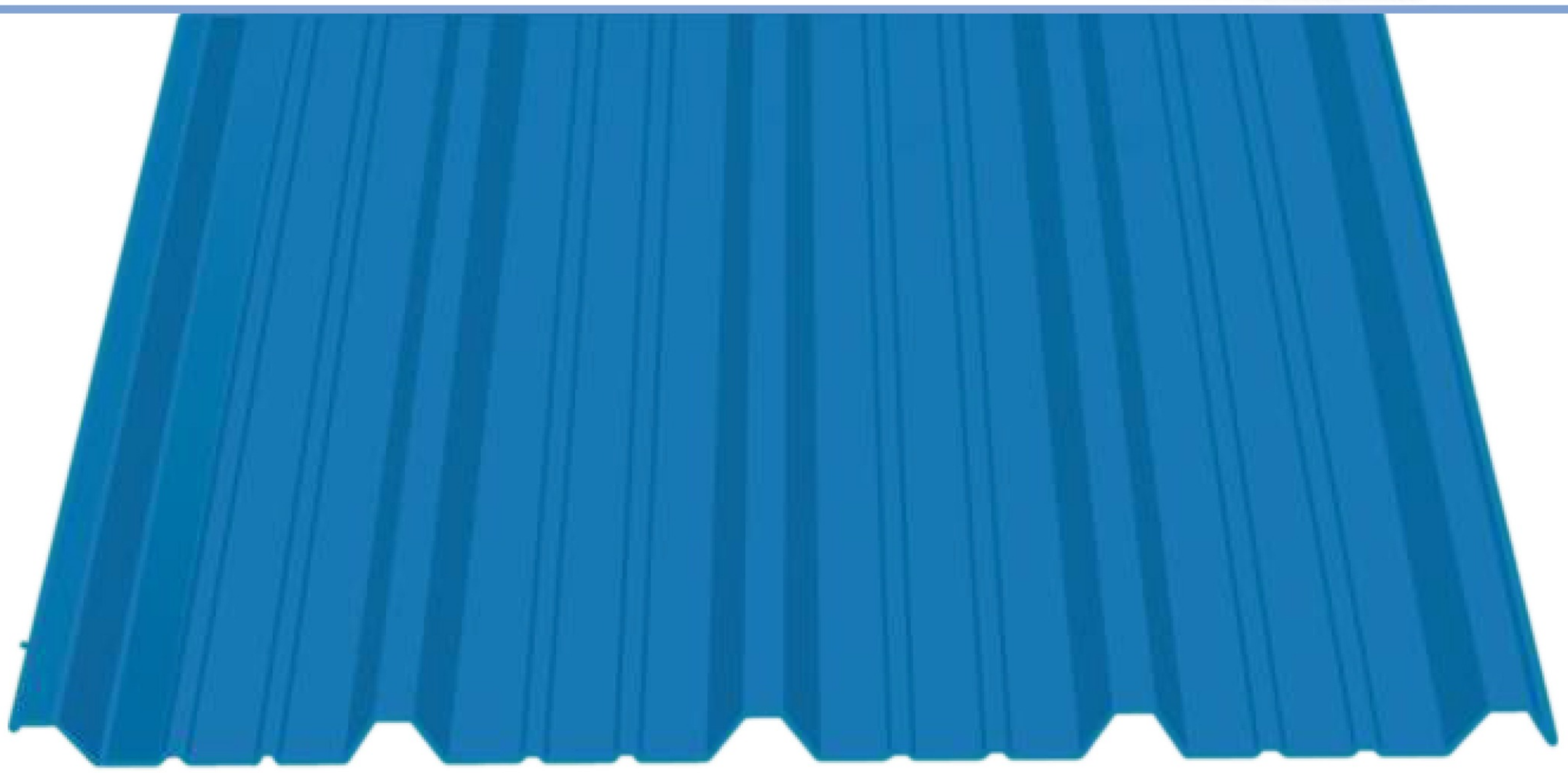
MEZZANINE JOIST CONNECTED TO MEZZANINE BEAM

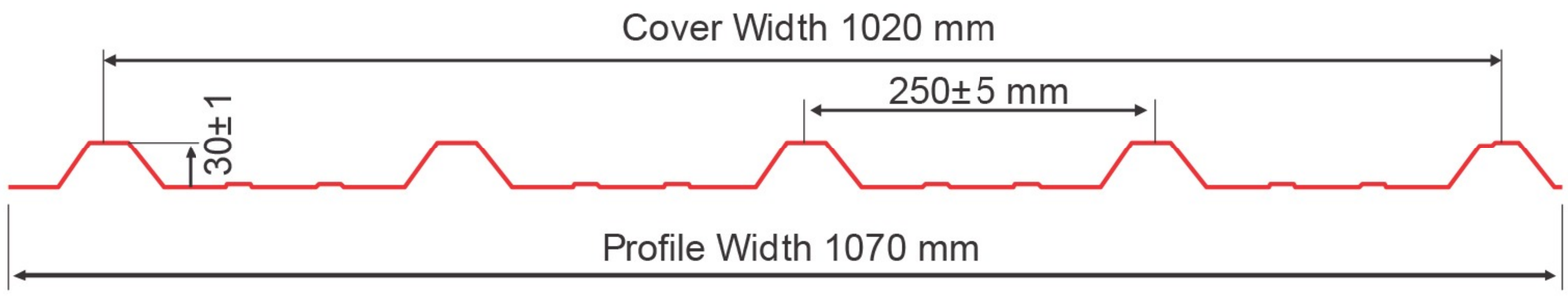


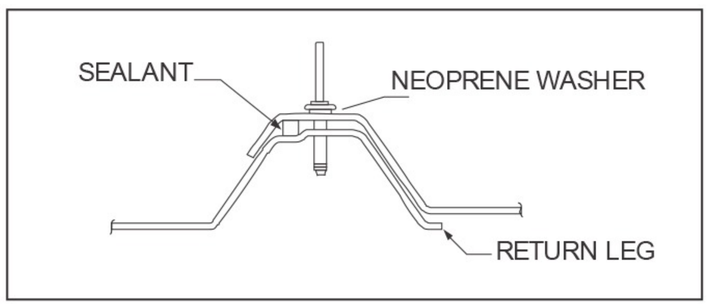
JOIST CONNECTED TO END WALL COLUMN



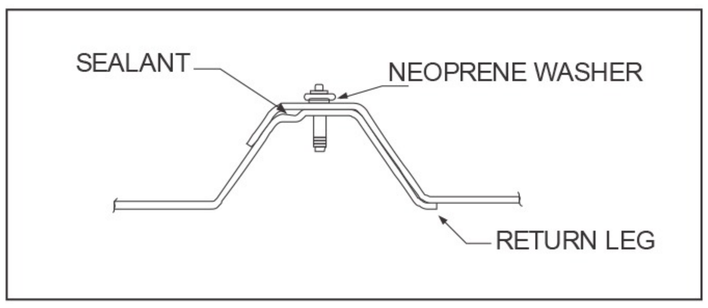
MEZZANINE PLAN







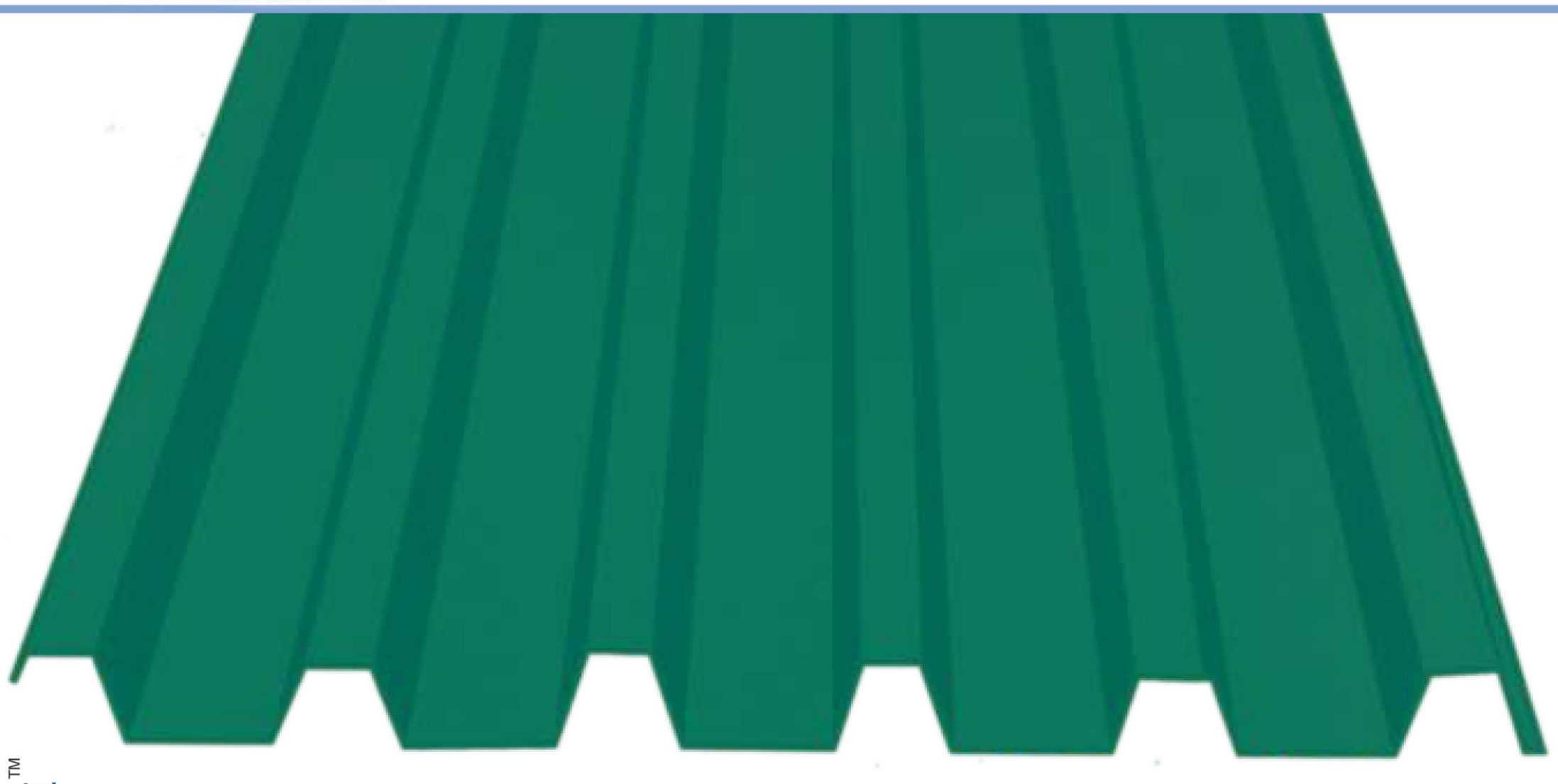
LOCK-RIVET OPEN



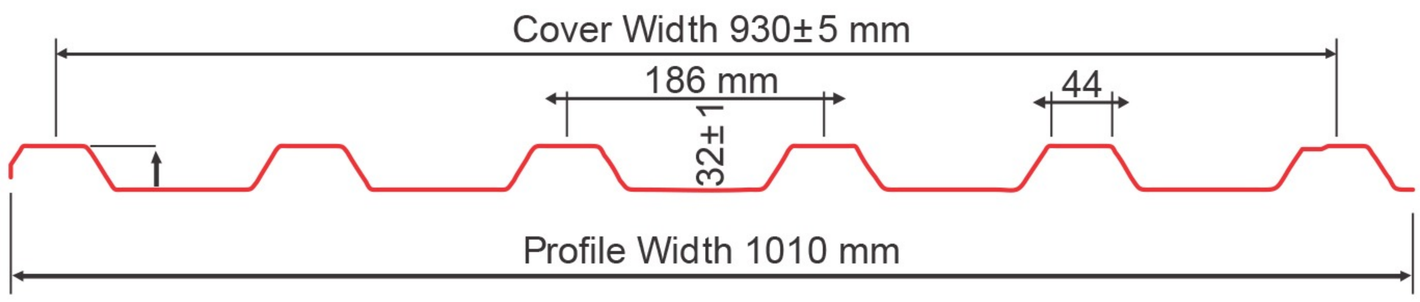
LOCK-RIVET CLOSED

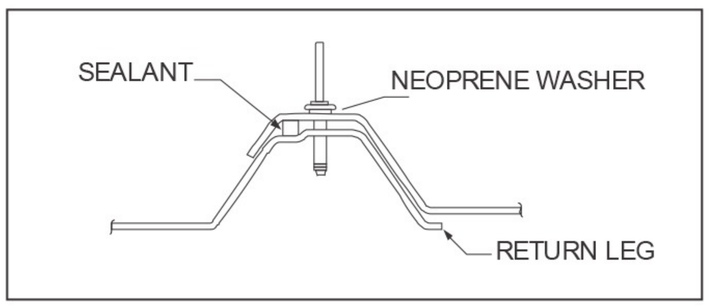
NAVRATAN RIB PROFILE™

NAVRATAN RIB SPECIFICATIONS			
Description	Mild Steel	High Tensile (350-550 Mpa)	
Crest Depth	30 mm±1	30 mm±1	
Pitch	250 mm±5	250 mm±5	
Sheet Width	1070 mm	1070 mm	
Covered Width	1020 mm	1020 mm	
Stiffening Ribs	2 nos.	2 nos.	
Length	upto 12 mtrs.	upto 12 mtrs.	
Thickness	0.4 mm to 1.0 mm	0.4 mm to 1.0 mm	
Material	Yield Strength	Colour Available	Coating
Pre-painted Galvanised Steel	240/350 mpa	As per requirement	120 gsm to 275 gsm
Pre-painted Galvalume Steel	245/300/350/550 mpa	As per requirement	150 (AZ 150) AS 1397
Bare Galvalume Steel	245/300/350/550 mpa	Bare	150 (AZ 150) AS 1397

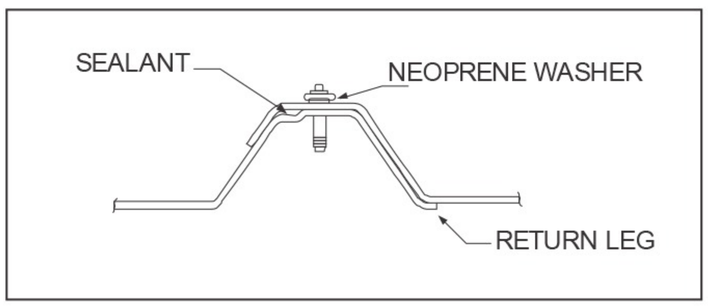


NAVRATAN CLAD PROFILE™



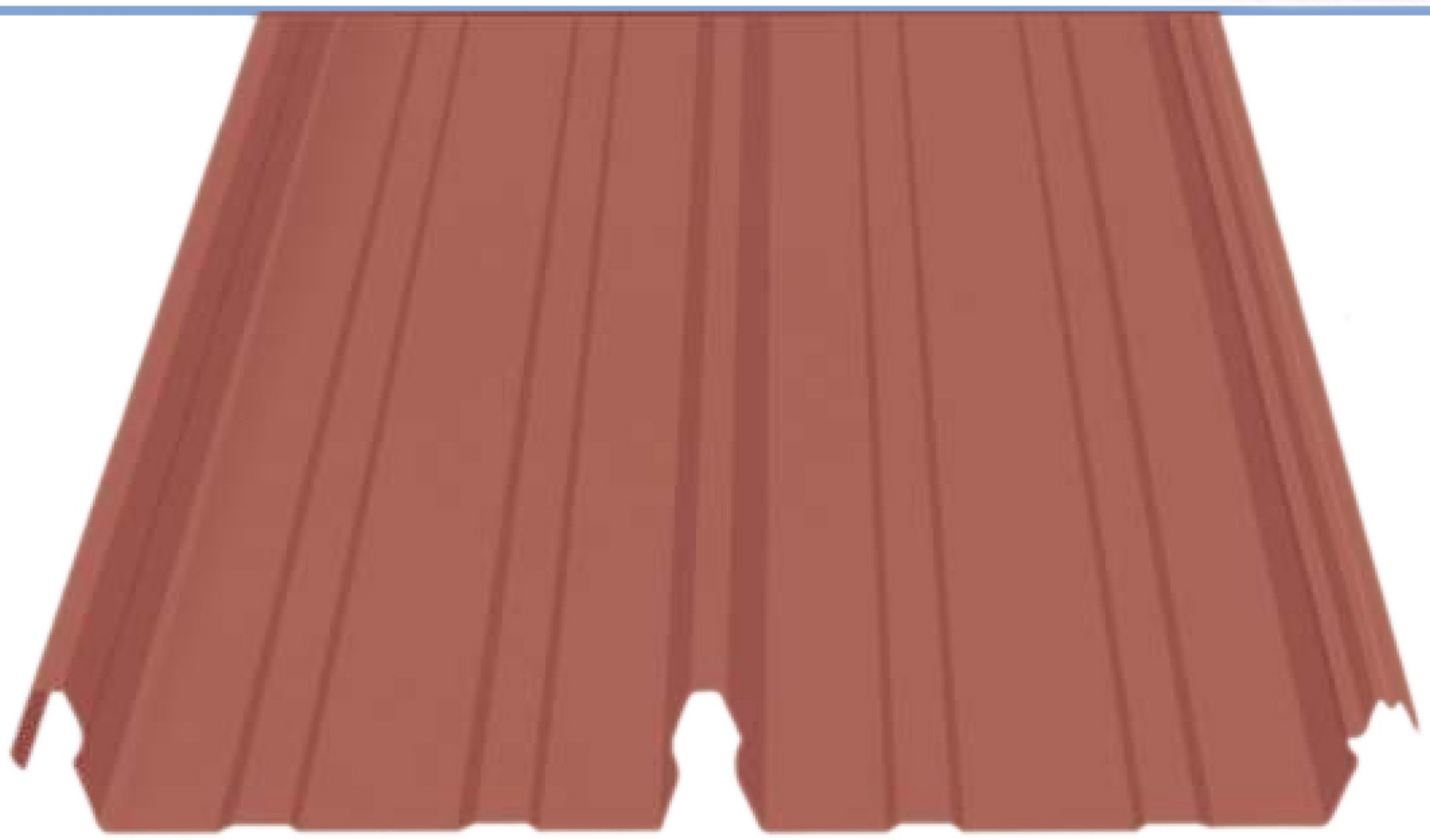


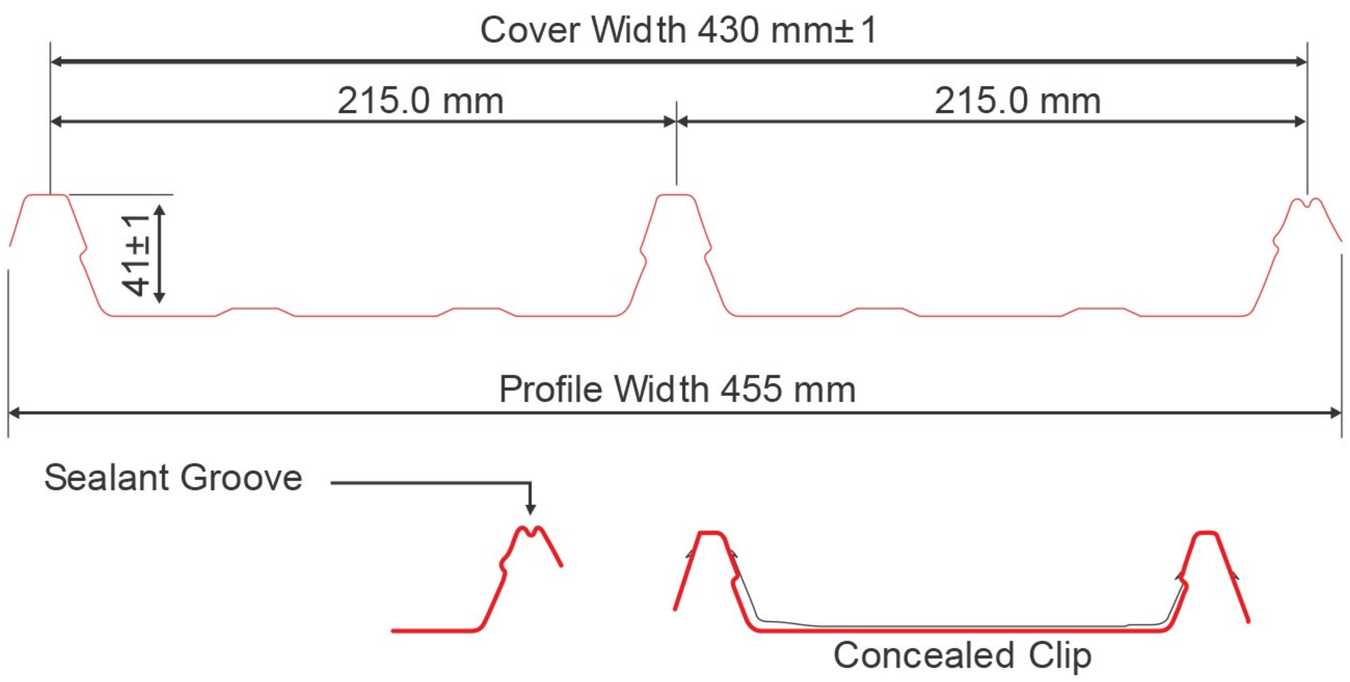
LOCK-RIVET OPEN



LOCK-RIVET CLOSED

NAVRATAN CLAD SPECIFICATIONS			
Description	Mild Steel	High Tensile (350-550 Mpa)	
Crest Depth	32 mm±1	32 mm±1	
Pitch	186 mm	186 mm	
Sheet Width	1010 mm	1010 mm	
Covered Width	930±5 mm	930±5 mm	
Length	upto 12 mtrs.	upto 12 mtrs.	
Thickness	0.4 mm - 1.0 mm	0.4 mm - 1.0 mm	
Material	**Yield Strength**	**Colour Available**	**Coating**
Pre-painted Galvanised Steel	240/350 mpa	As per requirement	120 gsm to 275 gsm
Pre-painted Galvalume Steel	245/300/350/550 mpa	As per requirement	150 (AZ 150) AS 1397
Bare Galvalume Steel	245/300/350/550 mpa	Bare	150 (AZ 150) AS 1397



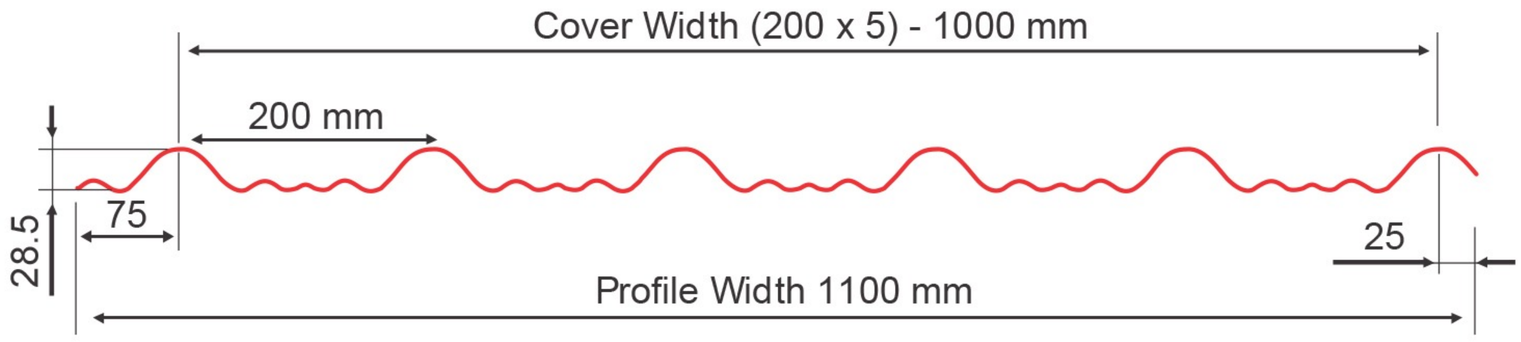


ACCESSORIES

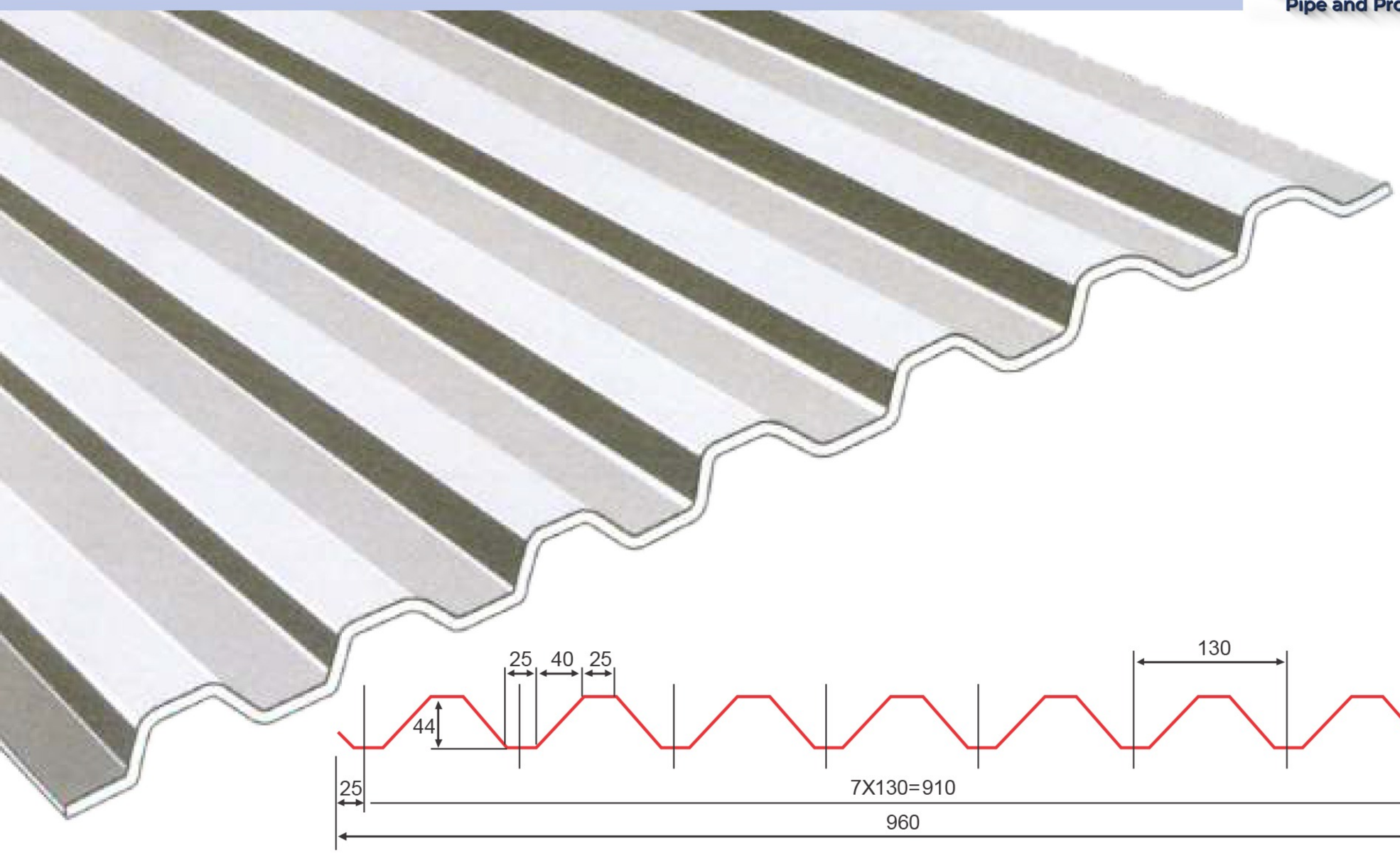
NAVRATAN LOK PROFILE™

NAVRATAN LOK SPECIFICATIONS			
Description	Mild Steel	High Tensile (350-550 Mpa)	
Crest Depth	41 mm± 1	41 mm± 1	
Pitch	215.0 mm	215.0 mm	
Sheet Width	455 mm	455 mm	
Covered Width	430 mm± 1	430 mm± 1	
Length	Upto 12 meters	Upto 12 meters	
Thickness	0.50 mm to 1.0 mm	0.5 mm to 1.0 mm	
Material	Yield Strength	Colour Available	Coating
Pre-painted Galvanised Steel	240/350 mpa	As per requirement	120 gsm to 275 gsm
Pre-painted Galvalume Steel	275/300 mpa	As per requirement	150 (AZ 150) AS 1397
Pre-painted Aluminium	245 mpa	As per requirement	Available alloy form
Bare Galvalume Steel	275/300 mpa	Bare	150 (AZ 150) AS 1397

NAVRATAN TILE PROFILE™



NAVRATAN TILE SPECIFICATIONS			
Description	Mild Steel	High Tensile (350-550 Mpa)	
Crest Depth	28.50 mm±	28.50 mm±	
Pitch	178 mm	178 mm	
Tile	10-12 mm	10-12 mm	
Sheet Width	812/990 mm	812/990 mm	
Covered Width	712/890 mm	712/890 mm	
Tile Pitch	100-350 mm	100-350 mm	
Length	Upto 6 meters	Upto 6 meters	
Thickness	0.3-0.8 mm	0.3-0.8 mm	
Material	Yield Strength	Colour Available	Coating
Pre-painted Galvanised Steel	240/350 mpa	As per requirement	120 gsm to 275 gsm
Pre-painted Galvalume Steel	245/300/350/550 mpa	As per requirement	150 (AZ 150)
Pre-painted Aluminium	245 mpa	As per requirement	Available alloy form
Bare Galvalume Steel	245/300/350/550 mpa	As per requirement	150 (AZ 150)



Deck (Wider) sections which are cold-roll formed sections used economically to support finished roofing material or serve as a permanent form and/or positive re-enforcement for concrete floor slabs. Deck profile metal sheets are used extensively for decking and cladding in industrial and commercial buildings.

NAVRATAN DECK PROFILE™

DECK SPECIFICATIONS	
Description	Mild Steel
Crest Depth	44 mm
Pitch	130 mm
Sheet Width	570/700/830/960 mm
Covered Width	520/650/780/910 mm
Length	upto 12 meters
Thickness	0.6 mm to 2.0 mm

AREA & WEIGHT		
Thickness mm	Area cm^2	Self Weight Kg/Sq.M.
0.60	7.837	5.75
0.80	9.952	7.70
1.00	12.440	9.58
1.25	15.550	12.00
1.60	19.904	15.5
2.00	24.880	19.20

ADVANTAGES OF STAR DECK OVER CONVENTIONAL R.C.C. ROOF

RCC ROOF WITHOUT DECK

- Requires min. 100 to 150 mm thick slab including a minimum to 50 mm for reinforcement. Thus concrete requirement amount to 0.1 to 0.15 m^3.
- The main grade of concrete used is M 200 to M 250 with cement consumption of 370 kg/m^3 to 410 kg/m^3.
- The labour involved in lifting and placing heavy concrete is high.
- The reinforcement steel required for M 200 or M250 is min 100 kg/m^3 which is costly.
- Highly Skilled labour required for cutting, bending and placing etc.
- Too much manpower involved and process is prolonged, time consumed.
- Skilled team for shuttering is mandatory.
- Percentage of wastage in steel shuttering is high
- Constant supervision by qualified engineer/technician at all level is required.
- Not quick result oriented.

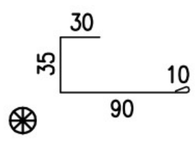
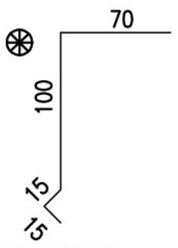
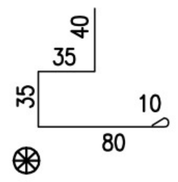
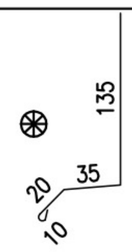
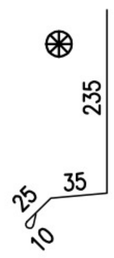
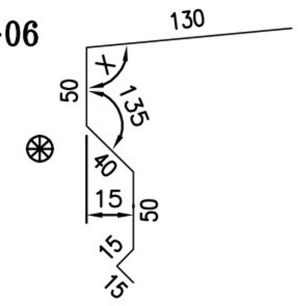
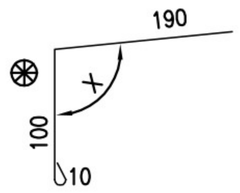
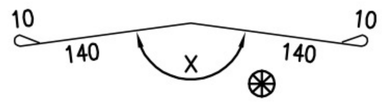
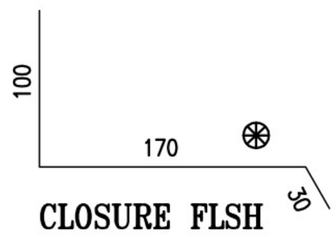
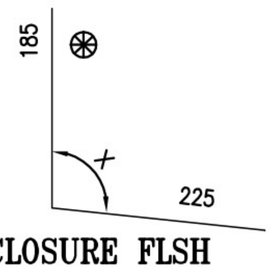
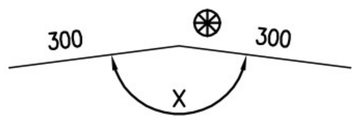
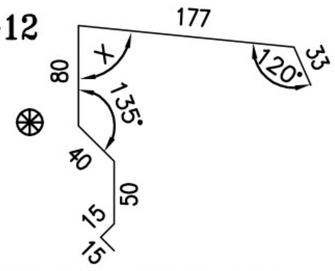
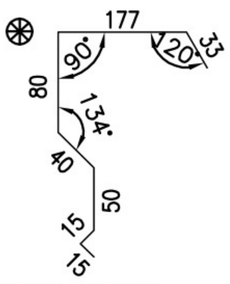
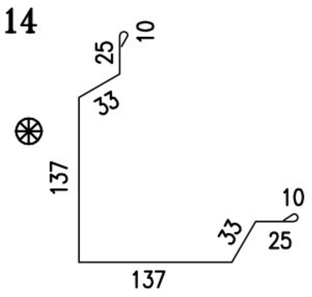
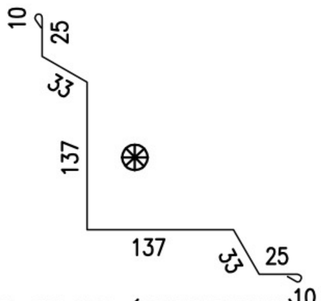
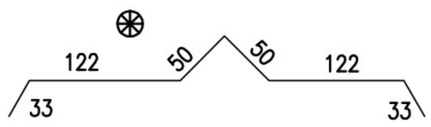
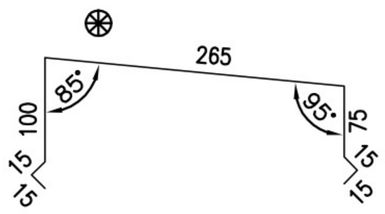
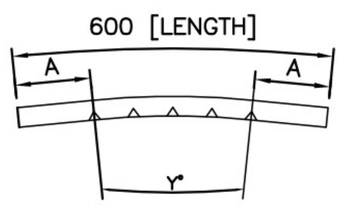
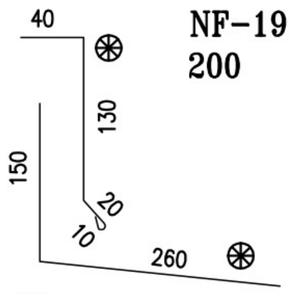
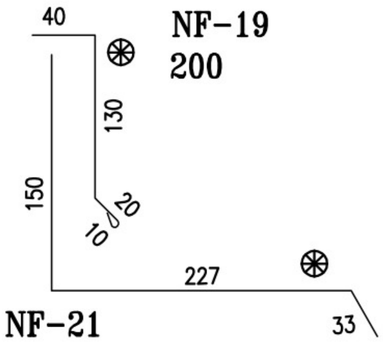
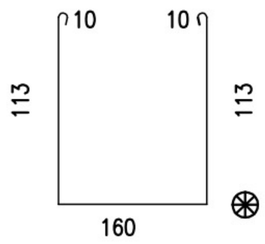
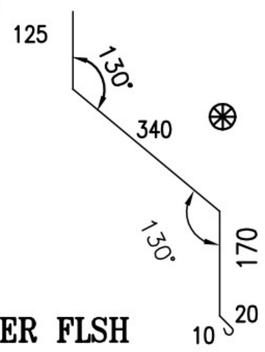
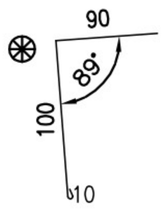
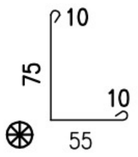
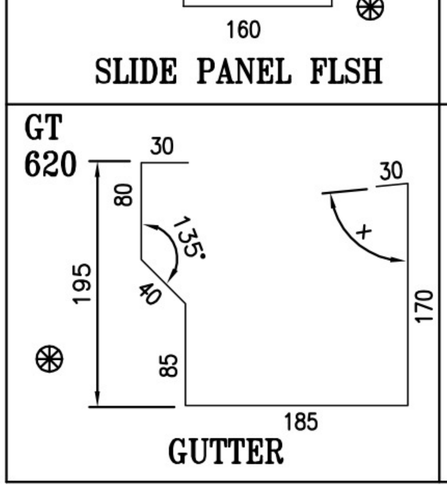
RCC ROOF WITH DECK

- Concrete can be done to a thickness of 45 to 50 mm. Total concrete requirement for an area of 1/.3 x 1 is 0.047 to 0.065 m^3.
- Concrete used is M 100 with low cement consumption of 230 kg/m^3 of 240 kg/m^3.
- Labour involved in pouring of concrete is very less.
- No reinforcement steel requirement.
- Decks are light in weight and can be handled easily by labour.
- Concreting can be done within a short period
- Handling of decks need no skilled team.
- No wastage at all.
- Supervision by non-technicians can also yield satisfactory results.
- Easy working and quick results.

FLASHING & TRIMS

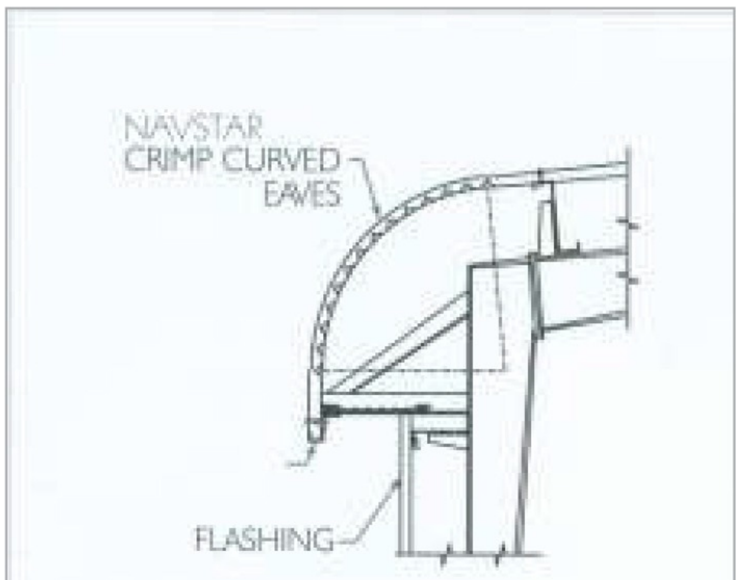
Precision engineered, factory finished flashings / trims as per site conditions are supplied.

Some typical flashings are detailed below

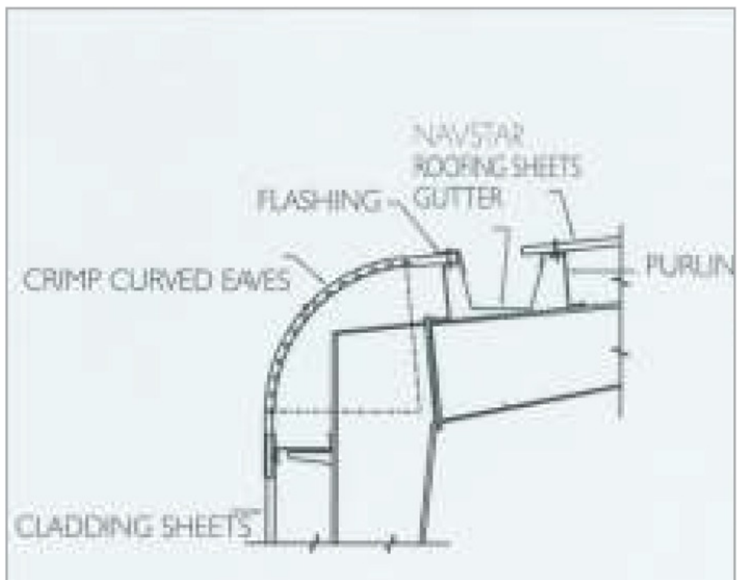
NF-01 165  JAMB FLSH	NF-02 200  BASE FLSH	NF-03 200  SILL FLSH	NF-04 200  HEAD FLSH
NF-05 305  DRIP BOTTOM FLSH	NF-06 300  EAVE FLSH	NF-07 300  GUTTER FLSH	NF-08 300  RIDGE FLSH (IN SIDE)
NF-09 300  CLOSURE FLSH	NF-10 410  CLOSURE FLSH	NF-11 600  RIDGE CAP	NF-12 410  SINGLE RIDGE CAP
NF-13 410  BARGE FLSH	NF-14 410  CORNER FLSH (EXTERNAL)	NF-15 410  CORNER FLSH (INTERNAL)	NF-16 410  EXPANSION CAP
NF-17 500  FACIA CAP	NF-18 600  RIDGE PANEL	NF-19 200  NF-20 410 APRON FLSH-I	NF-19 200  NF-21 410 APRON FLSH-II
NF-22 406  SLIDE PANEL FLSH	NF-23 665  COVER FLSH	NF-24 200  R.V. FLSH –1	NF-25 150  R.V. FLSH –2
GT 620  GUTTER			

All flashings and trims are custom designed to suit site requirements.

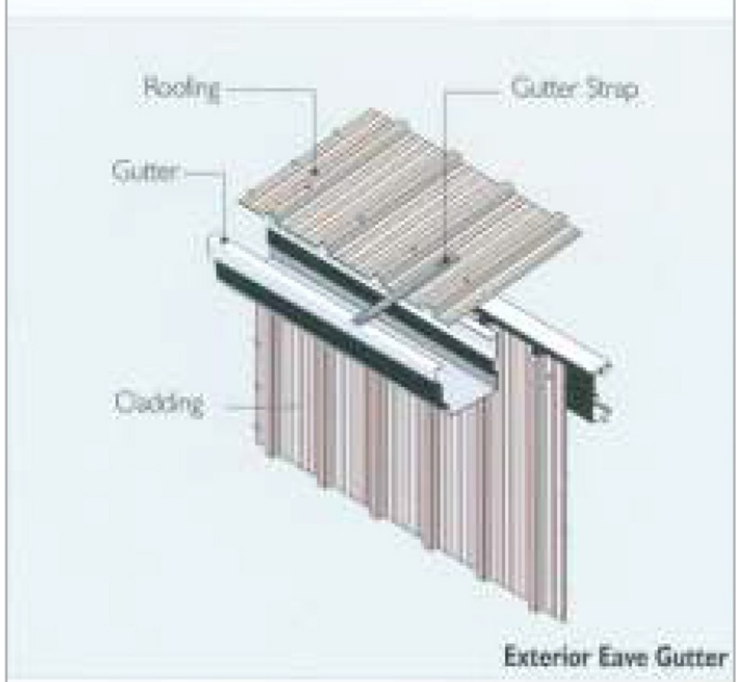
EAVES AND GABLE DETAILS



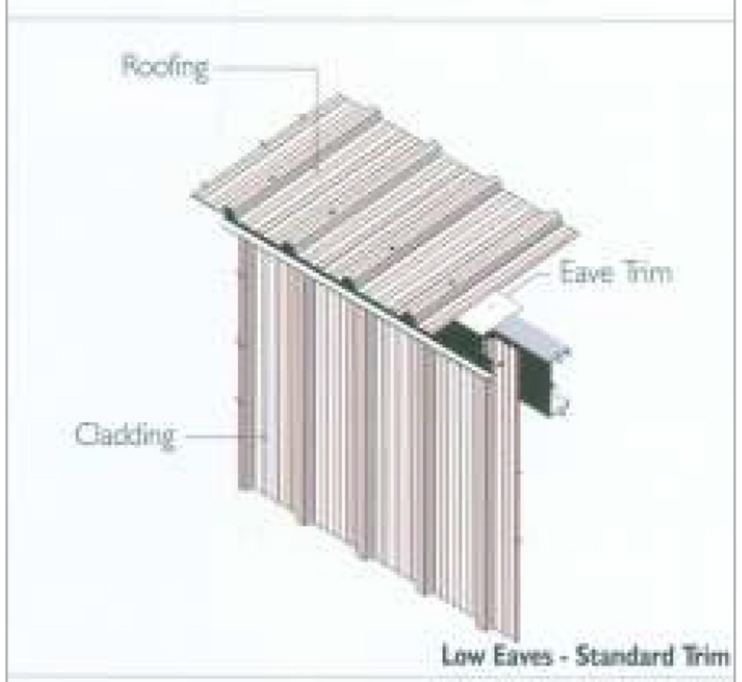
Curved Eave with Projection



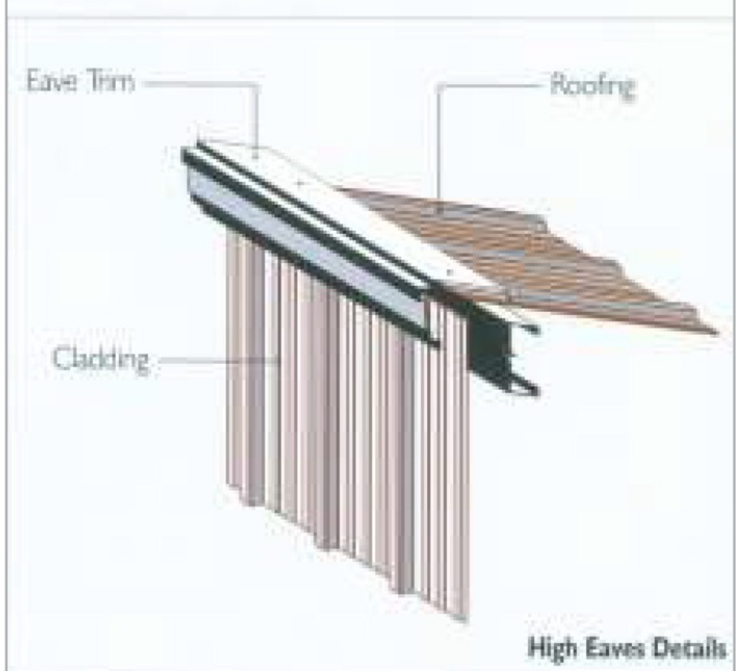
Curved Eave with Concealed Gutter



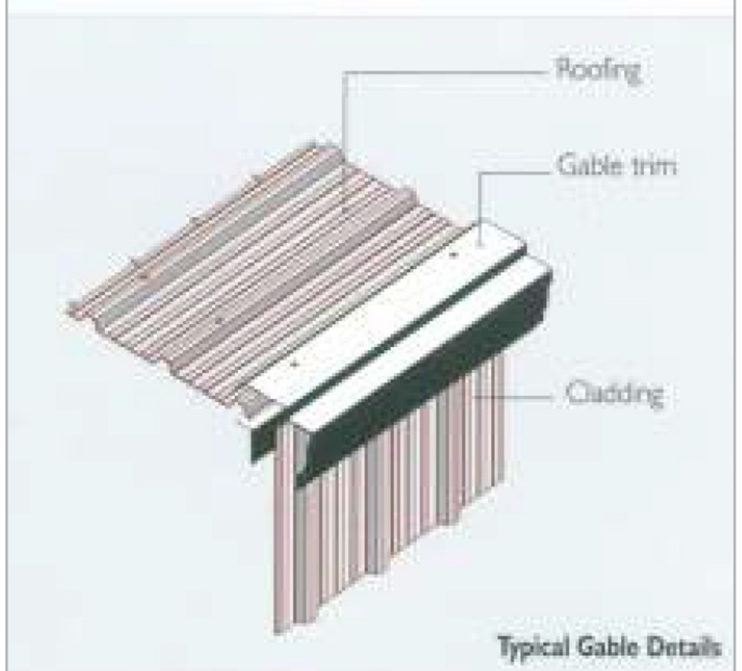
Exterior Eave Gutter



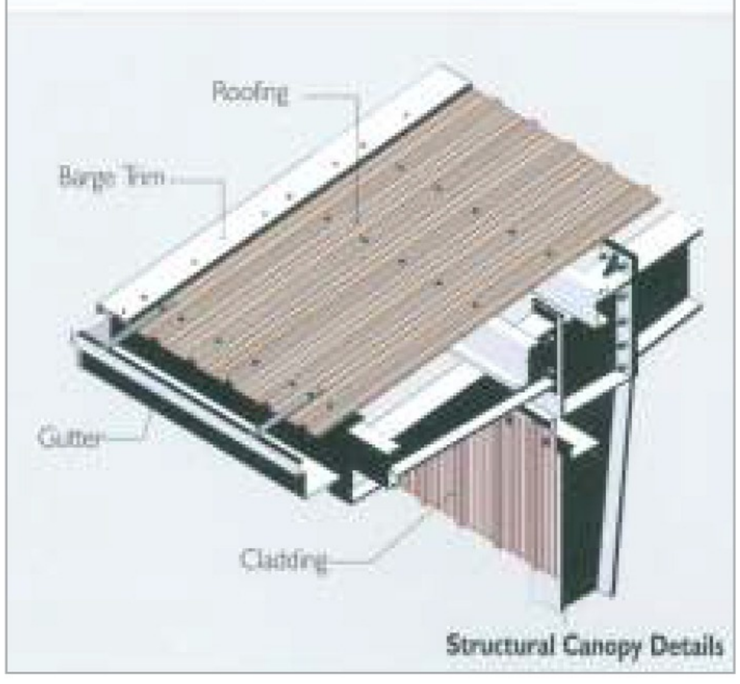
Low Eaves - Standard Trim



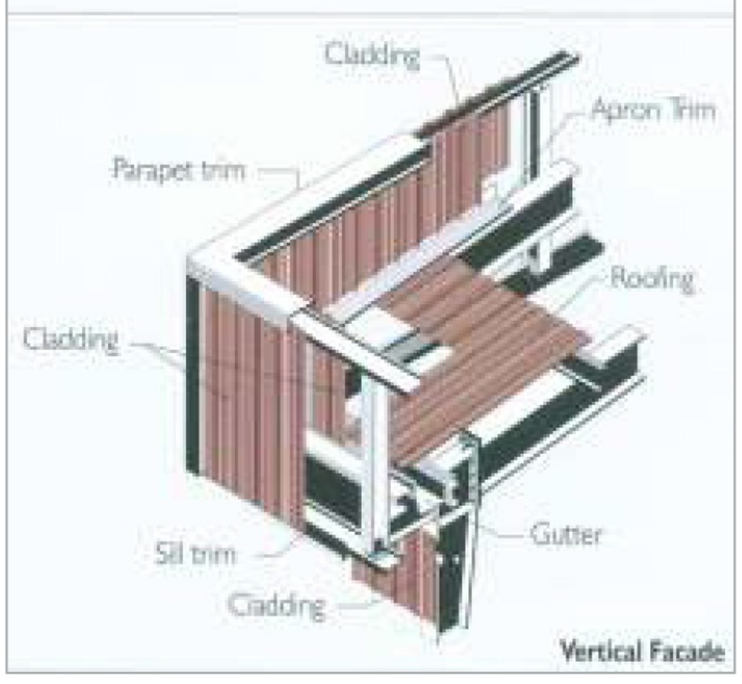
High Eaves Details



Typical Gable Details



Structural Canopy Details



Vertical Facade

ACCESSORIES

Framed Openings

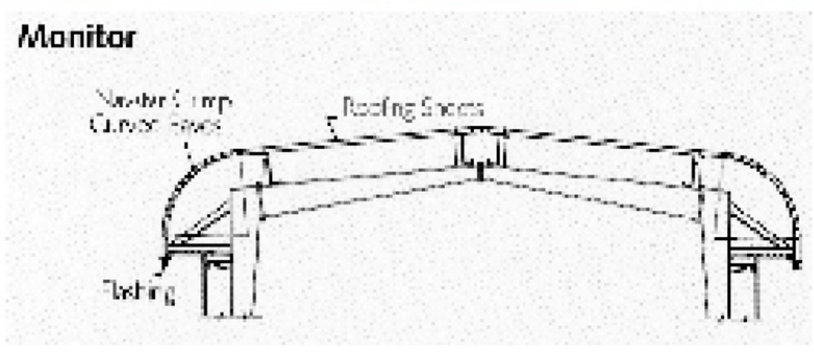
Framed openings are provided for doors, rolling shutters and windows etc. as per site requirements.

S-Type Louvers

S-Type louvers are available in depth of 50 mm. 100 mm and 200 mm for use on walls.

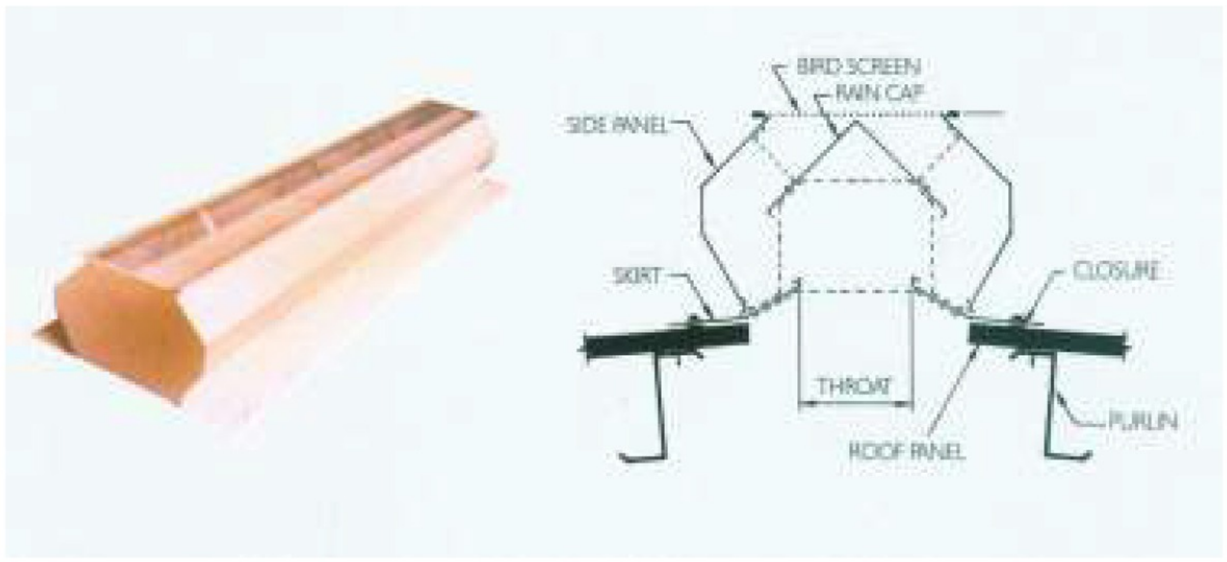
Roof Monitors

Roof monitors can be provided in buildings for natural ventilation and ridge lighting.



Sky Lights

GRP or Polycarbonate sky lighting panels compatible with the roof and wall panels are available. Flat panel strip lighting is also available.

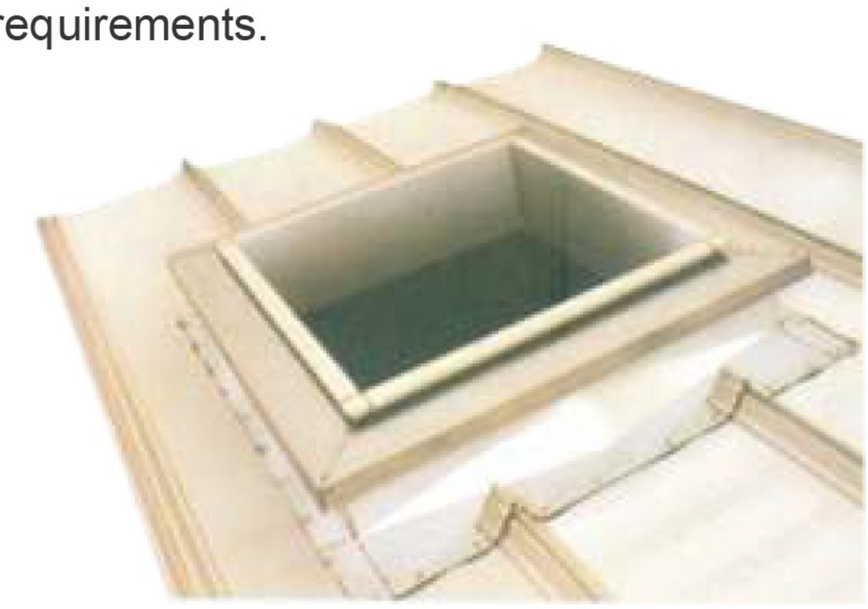


Ridge Ventilators

Navratan supplies a range of ventilators in throat sizes starting from 300 mm to 900 mm, with complete fixing accessories.

Roof Curb

Roofs curbs are supplied for equipment mounting on roofs or for special roof penetration requirements.



Turbo Ventilators

Navratan supplies a range of turbo ventilators in diameters sizes starting from 500 mm and above subject to site requirement, with complete fixing accessories.

A NAVSTAR BUILDING PROVIDES

- Easy integration of all traditional construction materials such as brick work, glazing, timber etc.
- Optimization in accordance with customer's requirements
- Addition of canopies as a direct continuation of the roof line or at a lower level with positive or negative roof slopes.
- Addition of parapets, partially or completely around the building.
- Optimized design of steel thereby reducing weight, while meeting all design requirements.
- Quality design, manufacturing and erection.

QUALITY

Quality is the hallmark of products made by Navratan Group. The NAVRATAN brand is respected in the market by virtue of the inherent quality, reliability and dependability of its products.

We are an ISO 9001:2000 certified company and has in place, an exhaustive Quality Management System and all products meet national and international standard requirements to deliver consistent quality to its customers.

The company ensures full traceability of all materials used in the manufacturing process and has ongoing training and skill improvement programmes in place, at all levels of the organization, to help deliver an outstanding customer experience.

LOGISTICS AND DELIVERY

Over the years, Navratan Group has successfully retained, trained and developed a dedicated team of logistic partners. They are carefully selected based on their overall capabilities which include vehicle fleet and support network. Quality of trailers and transport vehicles is checked prior to every dispatch to ensure timely delivery with minimum transit time. The consignment can be insured during transit as per requirement.

Major Projects

Navratan
Pipe and Profile Limited

Navratan

Pipe and Profile Limited

(A Division of Navratan Pipe & Profile Limited)

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PH 1 New Delhi 110064

E-mail : sales@navratanpipes.com

Works :
RIICO Industrial Area Karoli,
Rajasthan