

DESIGNERS , FABRICATORS & ERECTORS OF PRE - ENGINEERED STEEL BUILDINGS (PEB'S)

PRODUCT CATALOGUE



" QUALITY IS OUR POLICY "



P.O. Box : 22814
DOHA - QATAR

Tel. : +974-4411-4447
Fax : +974-4411-4449

E-mail : info@bsi-steel.com
sales@bsi-steel.com
Website : www.bsi-steel.com

QUALITY IS OUR POLICY



STEEL / PEB



ALUMINIUM CLADDING FOR TUNNELS



LIGHT STEELS



RAILWAY STATION



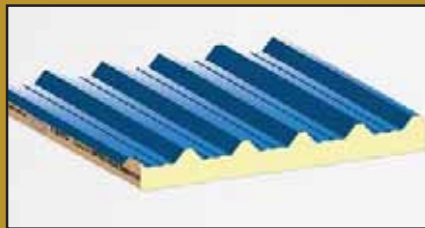
ALUMINIUM CLADDING FOR HIGHWAY



STANDING SEAM CLADDING



AIRCRAFT HANGAR



PU PANEL / ROCKWOOL



STRUCTURAL STEEL



FACTORIES



INSULATION PANEL



COMMUNICATION MAST

P.O. Box : 22814
DOHA - QATAR

Tel. : +974-4411-4447
Fax : +974-4411-4449

E-mail : info@bsi-steel.com
sales@bsi-steel.com
Website : www.bsi-steel.com

Table of Contents

- Basic Building Parameters	1
- Building Types (Frame System)	3
- Crane Systems	4
- Types of Fascias	5
- Roof Extention, Canopies and Roof Monitors	6
- Mezzanine	7
- Roof Platforms and Staircases	8
- Endwalls and Bracing Systems	9
- Secondary Structural Members	10
- Panels	11
- Panel Accessories	12
- Applicable Design and Building Codes	14
- US Design Codes	
- US Building Codes	
- Design Loads	
- Surface Preparation and Shop Painting	



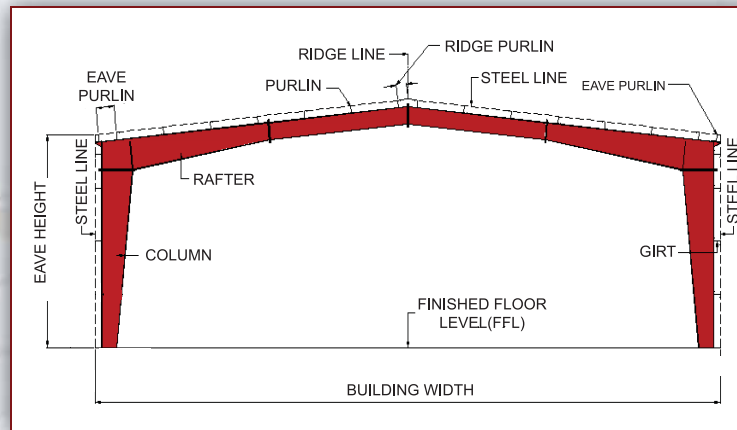
BSI-STEEL was established in 2006. We service Qatar and export markets by providing our clients with the highest quality of Pre-Engineered steel buildings in the region.

BSI-STEEL'S head office and plant is located in New Industrial Area - Doha. The plant layout is designed to accommodate state of the art machinery to fabricate 4000MT of PEB's per month.

We comply with the USA's latest applicable design codes and building codes for the design and fabrication of PEB's.

A Basic PEB steel structure building comprises of:

- Columns
- Rafters
- EvePurlin
- Purlin
- Girt



The size of the building is determined by the:

Building Width

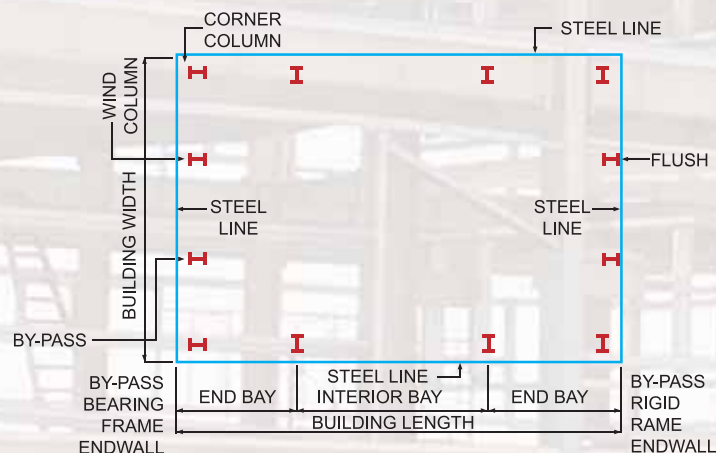
Which is defined as the distance from outside of eave purlin of one side wall to the outside of eave purlin of the opposite side wall.

Building Length

It is the total length between girts located at endwalls.

Endwall Options

- Flush: when girts are seated inside endwall columns. (Endwall columns located at structural line)
- By-pass: when girts are seated outside endwall columns.



Roof Slope ($x/10$)

The angle of the roof with respect to the horizontal. The most common roof slopes in the area is 0.5/10 and 1/10.

Interior Bay Length

The distance between the center lines of columns of two adjacent interior rigid frames.

Most economical range of interior bays is 7.5m and 8.5m. However, the common interior bay lengths in the industry are 6, 7.5, 8, 9 and 10m. Maximum economy limit the end bay length to 6 meters or less and use bypass endwall girts.

End Bay Length

- Flush endwall girts: Distance from the outside of endwall girts to the center line of the columns of the first interior rigid frame.
- By-pass endwall girts: Distance from the outside of endwall girts to the center line of the columns of the first interior rigid frame.

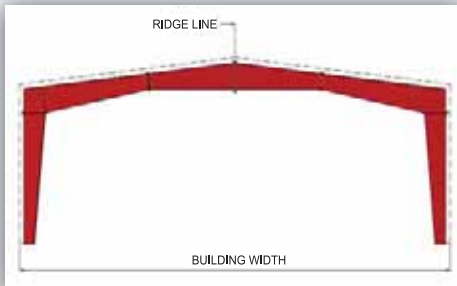
Building Height

- Eave height: Distance from finish floor level to the top of the outer point of the eave Purlin.
- Clear height: Distance from finish floor level to the knee where the column and rafter connect.

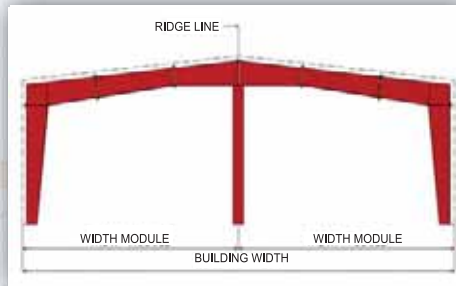
Steel Line

Is the plane of the out to out of secondary members along the perimeters of the building.

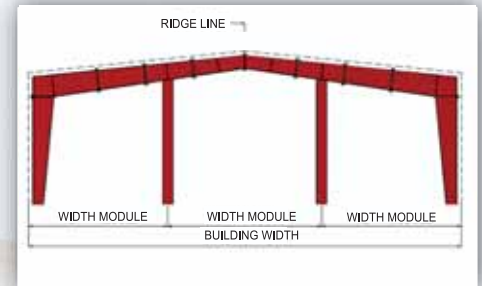




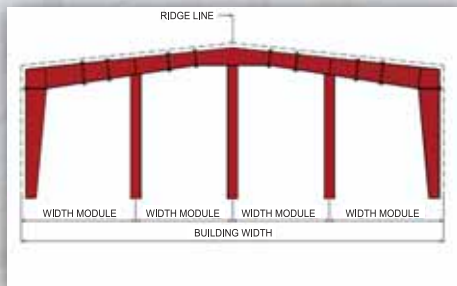
Clear Span (CS)



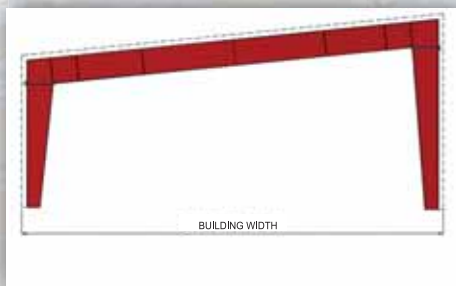
Multi Span-1 (MS-1)



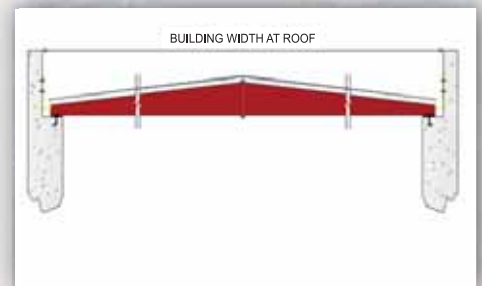
Multi Span-2 (MS-2)



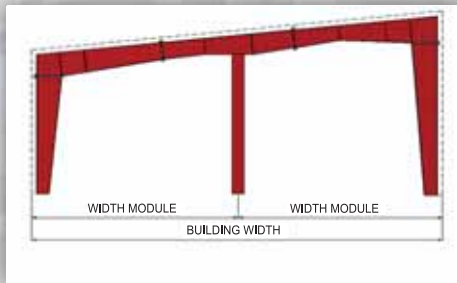
Multi Span-3 (MS-3)



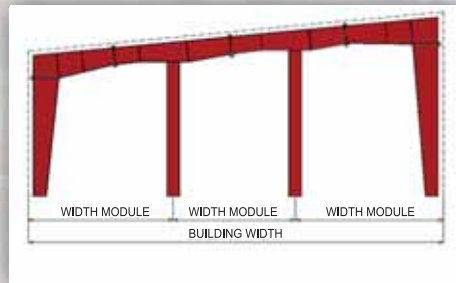
Single Slope (CS)



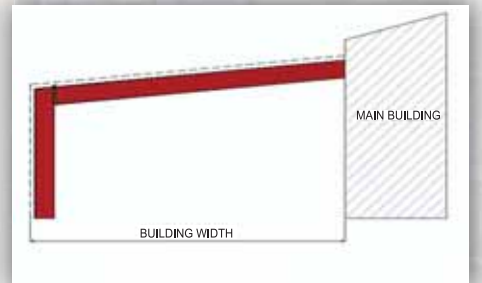
Roof System



Single Slope (MS-1)



Single Slope (MS-2)



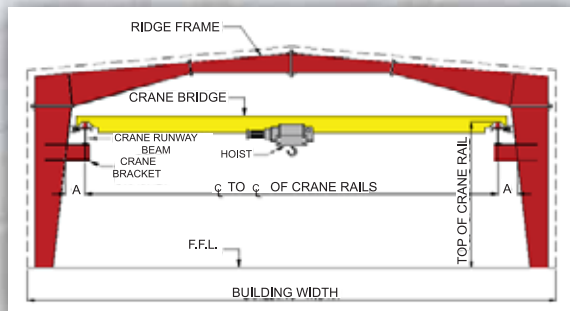
Lean-To

We design the building to take the loads of the followings crane systems as per customer requirements.

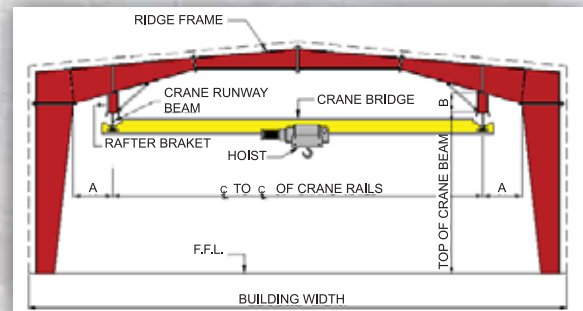
Our scope of supply where applicable will include:

- Crane bracket
- Crane beams
- Lateral kicker angles
- Vertical bracing
- Rafter brackets

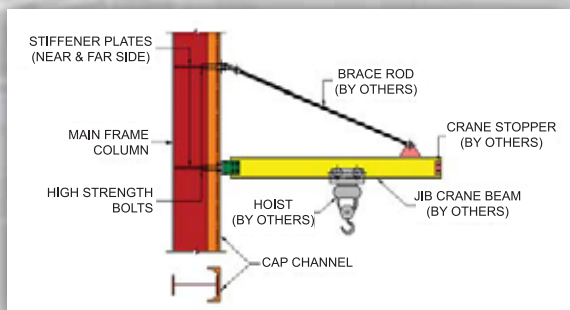
Crane rails, modular beam, hoist and bridge are excluded from our supply. For most economical and accurate building design, please advise your crane manufacturer's contact details at time of request for quotation.



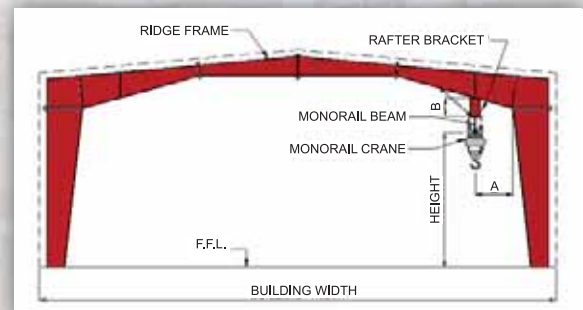
Top Running Crane



Underhung Crane



Jib Crane

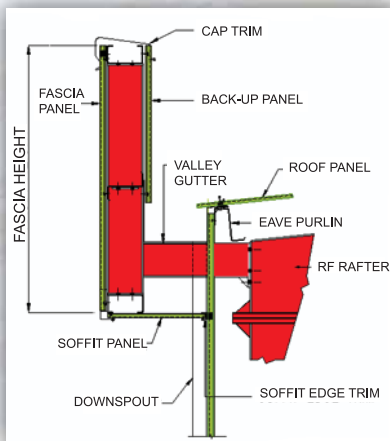


Monorail Crane

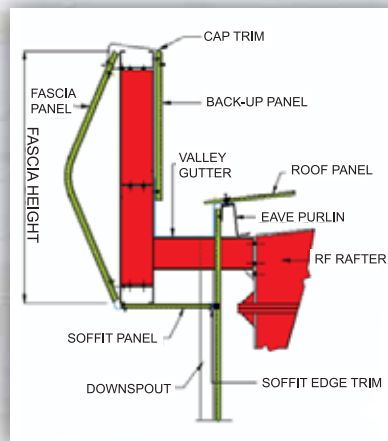
Types of Fascias

Fascias are used to conceal the gable roof slope of building.

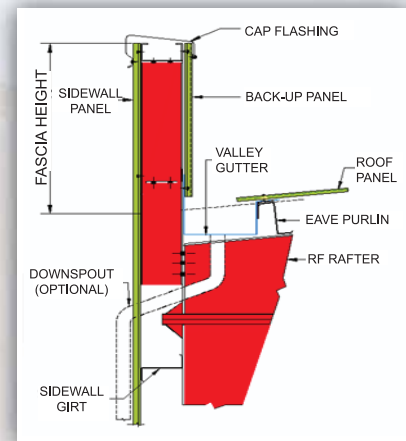
- Vertical Fascia
- Center Curved Fascia
- Parapet Fascia
- Bottom Curved Fascia
- Top & Bottom Curved Fascia



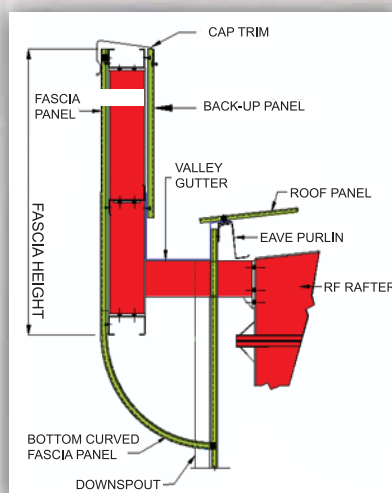
Vertical Fascia



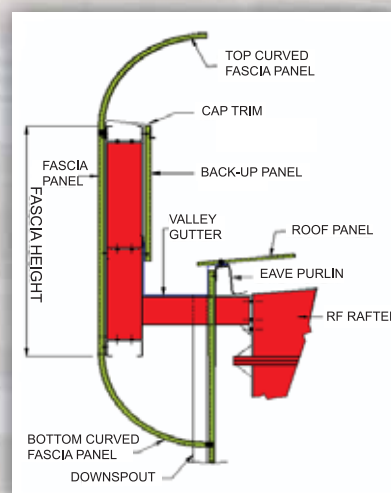
Center Curved Fascia



Parapet Fascia



Bottom Curved Fascia

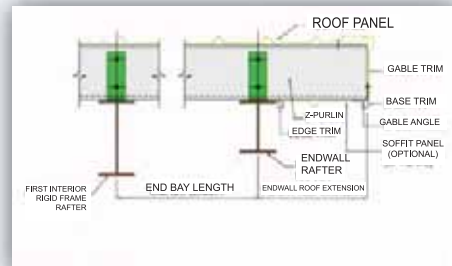


Top & Bottom Curved Fascia

Roof Extension, Canopies and Roof Monitors

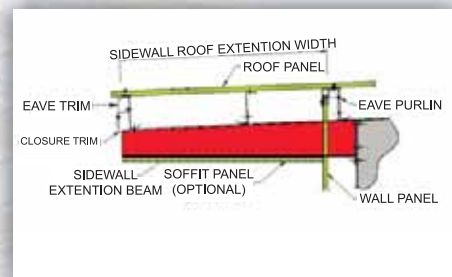
Roof Extension

Sidewall Endwall roof extensions are:
1500mm wide, by extending the End Bay purlins beyond the endwall steel line. They can accommodate an optional soffit panel without the need for additional framing.



Endwall

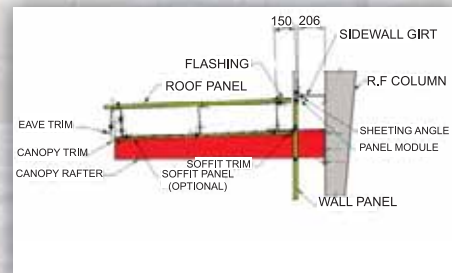
Sidewall Roof Extension are:
1500mm wide they are made of 200mm deep hot rolled or built-up member, and 200mm flush eave channels and purlins making it possible to add an optional soffit panel without the need for additional framing.



Sidewall

Canopies

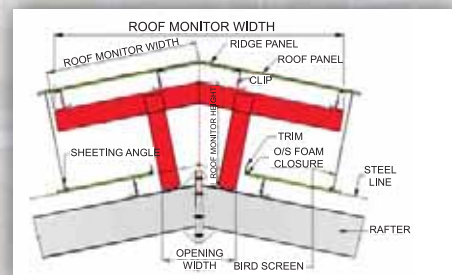
1500mm wide cantilevers beyond the steel lines of the building located below the eave.



Canopy at Sidewall

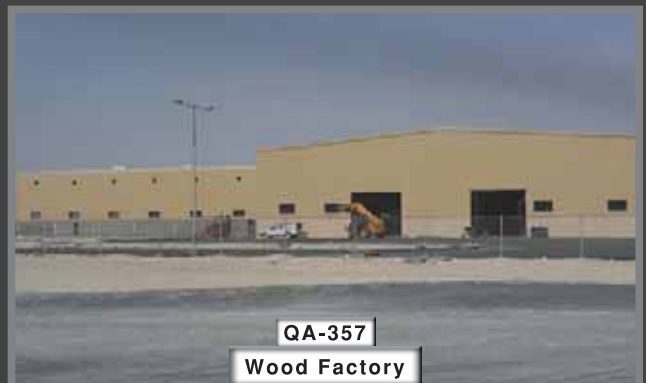
Roof Monitors

With a throat opening width (w) of 1000mm made of hot rolled or built-up covered with panels similar to the ones used for roof and walls of the building.



Roof Monitor Cross-Section

FACTORIES



USE / HANGAR / WORKSHOP

SHOWROOM/BREEDING FACILITY/SUPERMARKET

ACCOMMODATION / SCHOOL / TRAINING



QA-85
Hangar & Terminal DIA

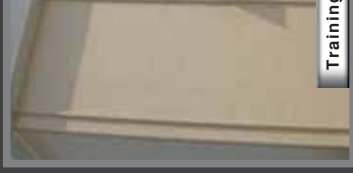


QA-149
Car Showroom & Car Workshop Facility



Before

QA-138
Training Center for Gulf Helicopter



Training



ty



QA-101
Workshop & Store Warehouse



QA-247
Al Meera Supermarket



Before

QA-121
Labor Camp's Kitchen



L



QA-89
Cold store



QA-388
Houbara Breeding Station



Before

QA-227
Labor Accommodation



L



CAR PARKING / LOUNGES



QA-87

Multi Story Vehicle Storage



QA-320

Truck Parking & Mechanical Workshop



QA-87

Multi Story Vehicle Storage



QA-320

Truck Parking & Mechanical Workshop



QA-360

Al Mana Motors



QA-320

Truck Parking & Mechanical Workshop



QA-360

Al Mana Motors



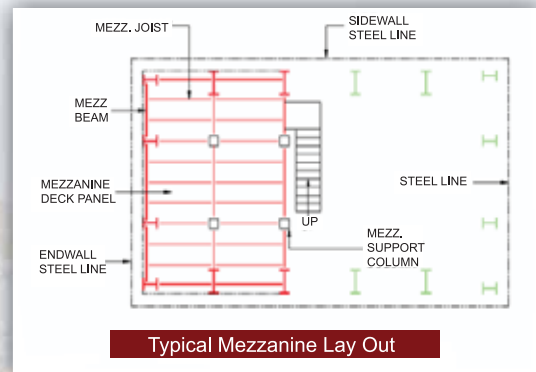
QA-295

Airport Business Class Lounge

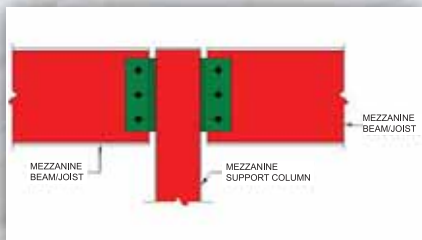
A mezzanine can occupy the full area or just partial area of the building. It is an elevated flooring system located inside the outer steel of a PEB. The mezzanine framing is normally connected to the main rigid frame columns for lateral stability.

A typical mezzanine structure consists of:

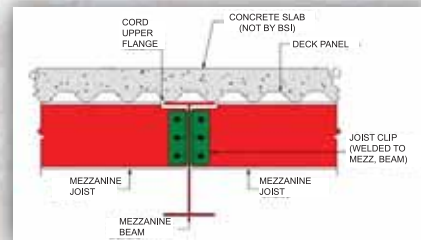
- Intermediate Support
- Columns
- Main Beams
- Joists
- Steel Deck (deck is fastened to the joist with self drilling fasteners)



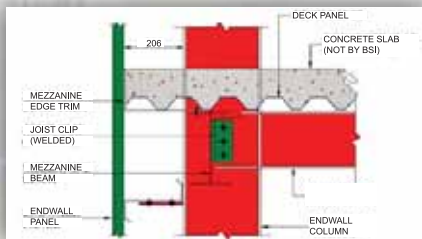
Mezzanine Systems



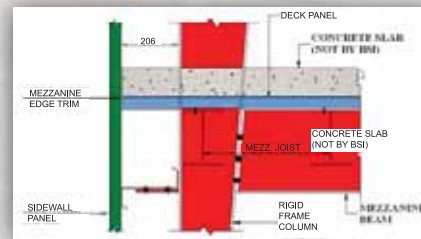
Beam/Joist Conn to Mezz. Column



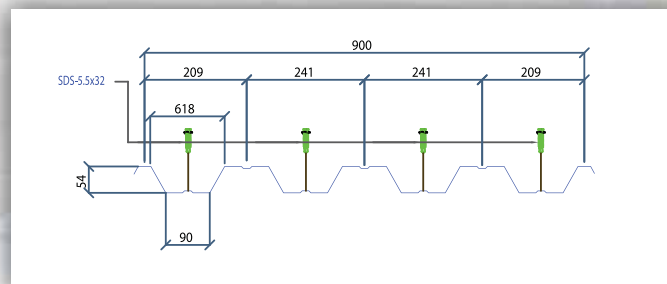
Joist Connection to Mezzanine Beam at Endwall



Mezz. Beam Conn to Main Frame Column



Flush Mezz. Joist Connection to Mezz. Beam

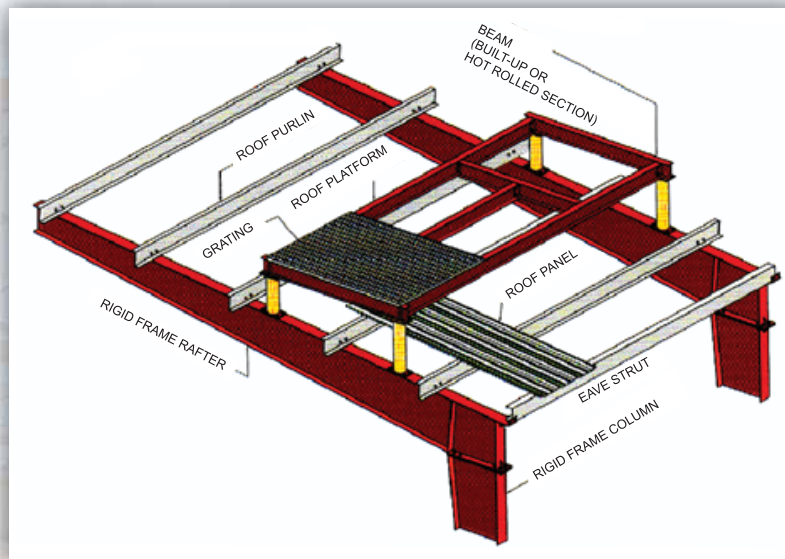


BSI STEEL Deck Profile - 54/241

Mezzanine deck panel is intended to carry only the dead load of the wet concrete. It acts as a permanent shuttering. BSI mezzanine deck is (54/241) and is made out of 0.7mm galvanized steel that conforms to ASTM A635M Grade SS:340.

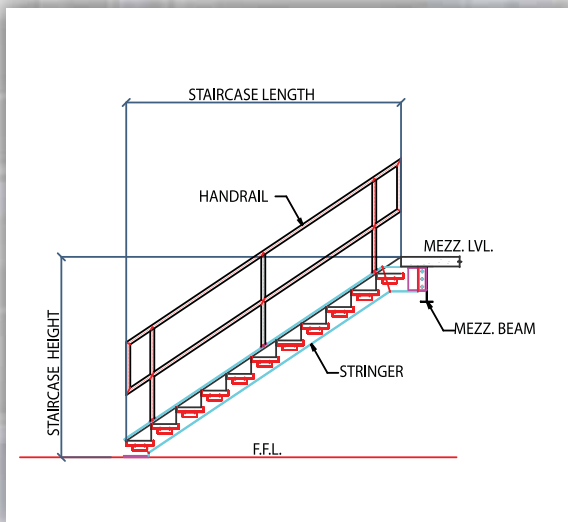
Roof Platform:

Is a structural frame, mounted on top of the roof. It is designed to support heavy roof accessories such as A/C units, water tanks and others. It is comprised of pipe, stub columns and structural framing made of built-up or hot rolled section. Grating is used and sometimes handrails are required.

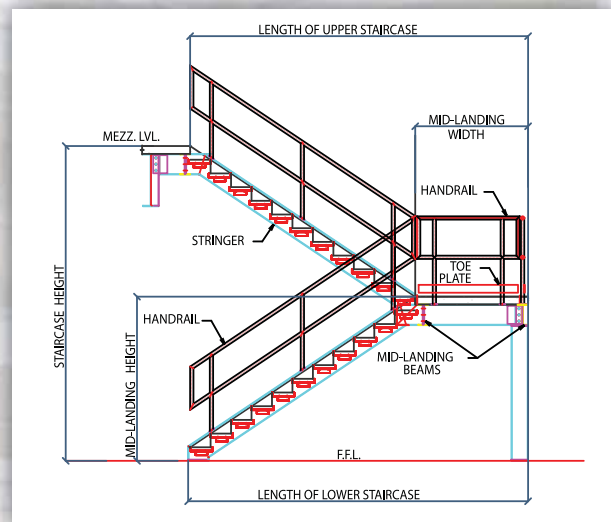


Roof Platform

Staircases:



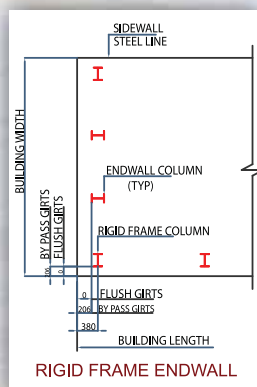
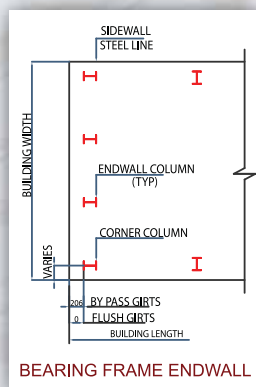
Single Flight Stair



Double Flight Stair

Endwalls and Bracing Systems

Endwalls are constructed with either Rigid Frames or more economical Bearing Frames (a PEB standard). (Endwall girts frame to corner columns and wind columns either in a flush manner or in the more economical by-pass manner). BSI Steel Bearing Frames and Wind Columns are manufactured from built-up I-sections instead of the less robust C-sections used by other PEB manufacturers in this region.



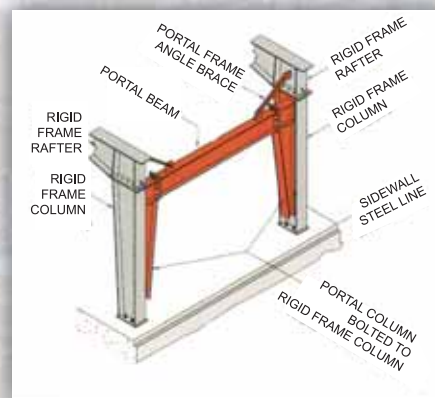
Bracing Systems All horizontal loads on a structure must eventually be carried to column bases and then to the building substructure (foundations and ground slabs). Horizontal loads result from the action of wind forces, seismic (earth quake) forces and overhead cranes on the building structure.

Diagonal Bracing Used in the roofs and walls of buildings to transfer wind forces to the building substructure. Standard bracing system commonly used are galvanized cable strands, solid smooth rods and flat bars or angles.

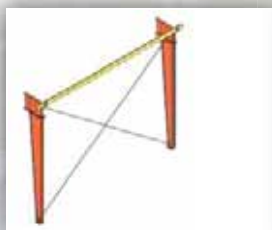
Diagonal Rod Bracing Used to transfer longitudinal horizontal loads of traveling overhead cranes to structure when the capacity of these cranes range between 5 MT and 20 MT.

Diagonal Angle Bracing Used to transfer longitudinal horizontal loads of traveling overhead cranes to substructure when the capacity of these cranes exceed 20 MT. They are also used as wall bracings in very high buildings.

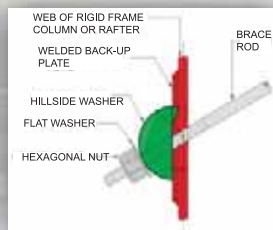
Portal Frames Used in exterior sidewalls or between the interior columns of Multi Span/Multi Gable buildings when diagonal bracing is not allowed because of a requirement for clear unobstructed space. Portal frames are made from built-up columns and beams. Their columns flanges are stitch-bolted to the webs of the rigid frame columns and extend down to 150 mm above F.F.L. Care must be taken to ensure that the bottom of the portal frame beam is higher than the required unobstructed height.



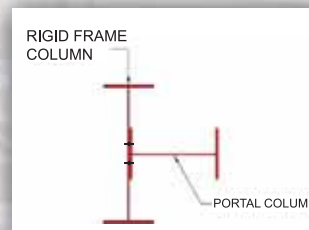
Portal Frame



Diagonal Bracing



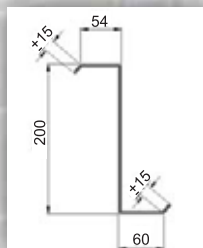
Rod Bracing Detail



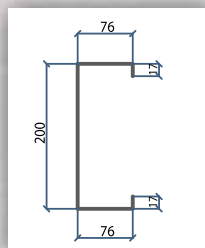
Portal Column Flange Is Bolted To Rigid Frame Column Web

Secondary structural members include roof purlins, wall girts, eave struts, C-sections, flange braces, gable angles and base angles. Purlins, Girts, Eave Struts and C-Sections (used as base channels and as door jambs and headers in framed openings of Double Sliding Doors and Roll Up Doors) are Cold formed from 345mm wide galvanized coils in thicknesses of 1.5, 1.75, 2.0, 2.25 and 2.5mm. They are made from material that conforms to ASTM A653M Grade SS: 340 Class IG90 and are designed in accordance with the 2002 Cold formed Steel Design Manual, published by "The American Iron and Steel Institute" (AISI).

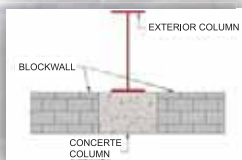
A common practice in the PEB industry is to connect the sidewall girts to the sidewall rigid frame columns in a by-pass condition and to connect the endwall girts to the endwall wind columns in a flush condition. The by-pass approach is more practical, even in endwalls, because it allows cables, pipes, etc. to be laid within the 200mm girt line all around the building. It also allows for a better construction of partial height blockwalls (normally 2.25 to 3.00m high) which are very common in this region.



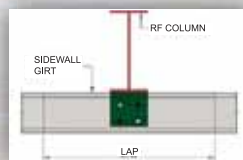
Z- Section



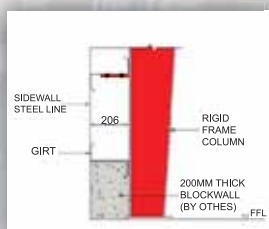
C- Section



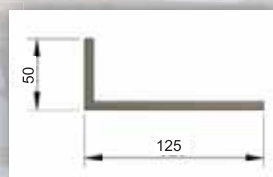
By-Pass Blockwall



By-Pass Girt

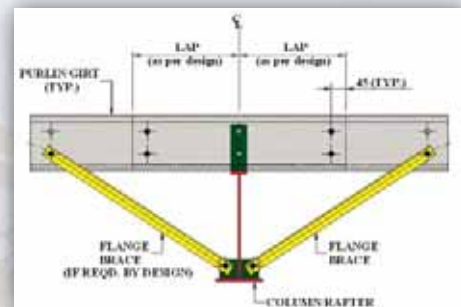


Partial By-Pass Blockwall



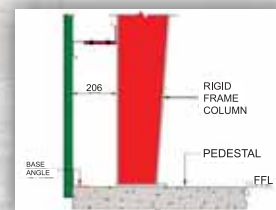
Base/Gable Angle

Flange Braces 4 or 5mm thick angle sections used to prevent rigid frame members from twisting or buckling laterally under load. They are used on one side or both sides of the rafters/columns depending on the magnitude of the required restraining loads.



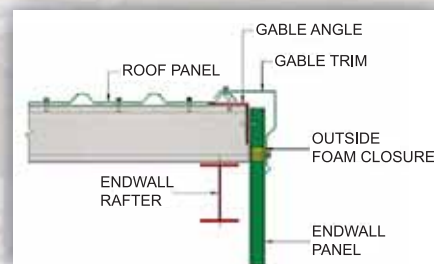
Flange Stay With LAP

Base Angles are fastened to the concrete floor with the masonry nails at 500mm on centers. They transfer the wind load from the wall panels directly to the slab. When interior wall liner is required, a base channel (C-Section) is used in lieu of a base angle.



Base Angle

Gable Angles are connected to bottom flanges of roof purlins at building ends using self-drilling fasteners. They transfer the wind load from the endwall panels (which are fastened to this gable angle) to the roof purlins, at the gable end of the building.

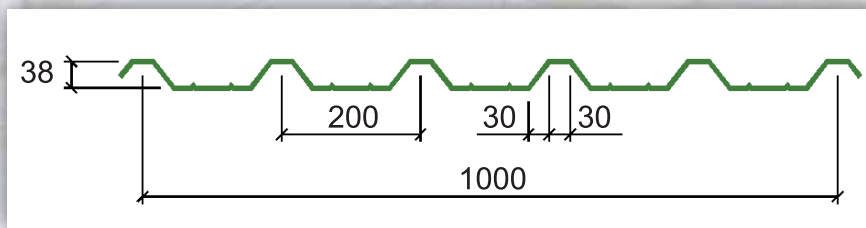


Gable Detail

Single Skin Panel Offering

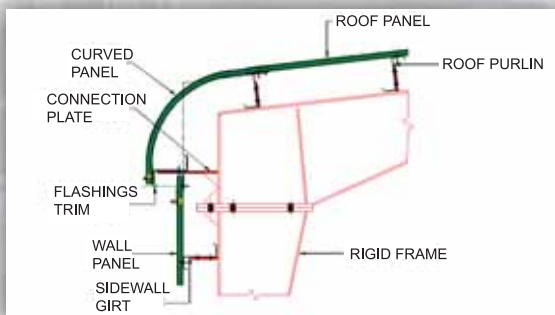
Single skin **Roof and Wall Panels** manufactured by BSI-STEEL are rolled formed from either 0.5 mm (Nominal) thick AluZinc coated steel (AluZinc is an Aluminum I Zinc alloy) which conforms to ASTM A 792 M Grade 345 classes having a minimum yield strength of 34.5 KN I CR 2 with Zinc I Aluminum coating conforming to AZ 150 (or optional). The coating is achieved by hot deep process of 55% aluminum and 45% zinc alloy. 0.7 mm (nominal) thick AluZinc coated steel is optional available in both mill finish and in pre-painted finish (in four standard colors).

Interior liner panels, partition panels, fascia panels and soffit panels are made using the same profile in 0.5 mm frost white AluZinc coated steel, 0.7mm pre-painted Aluzinc is an option that may be supplied, in any BSI-STEEL Standard color, for large projects.

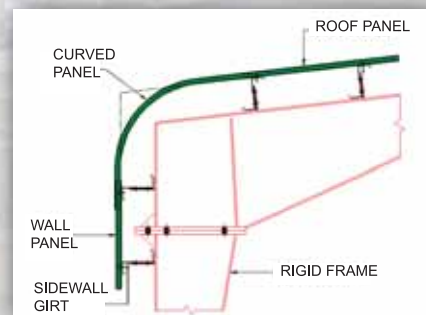


Single Skin Panels BS 38/200

Curved eaves are standard in roof monitors and optional in building eaves. There are two details for curved eaves. We recommend the curved eave with projection because it is considerably easier to erect. Fitting the ribs of the curved eave panels simultaneously with the ribs of both the roof and wall panels is a very difficult task whereas fitting the ribs of the curved eave panels with the ribs of the roof panels only is considerably easier.



Curved Eave With Projection



Curved Eave Without Projection

Standard Building System Integration Colors (printed colors differ from actual color)



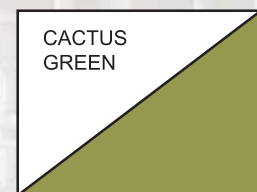
RAL 9002



RAL 5012



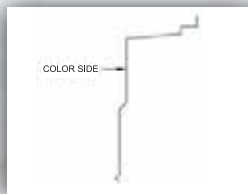
RAL 1001



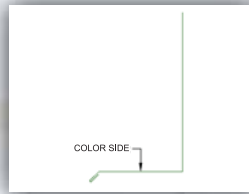
RAL 6021

Trims, Gutters, Downspouts and Sundry Items

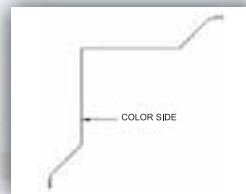
Standard Wall Trims, including corner trim, eave trim, gable trim, eave gutters and downspouts are produced from the same material as the Wall and Roof Panels.



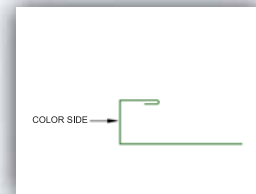
STD. HOOD TRIM



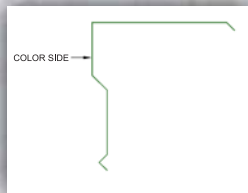
STD. DRIP TRIM



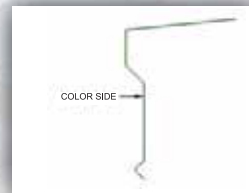
STD. OUTSIDE CORNER TRIM



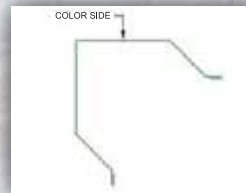
STD. PANEL END CLOSURE TRIM



STD. GABLE TRIM



STD. EAVE TRIM

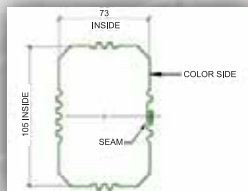


STD. OUTSIDE CORNER TRIM-2

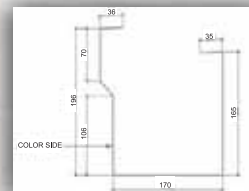


STD. EXPANSION JOINT TRIM

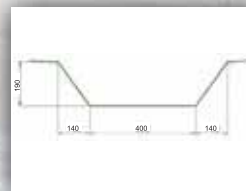
Valley Gutters are made from 0.9mm thick G-90 galvanized steel.



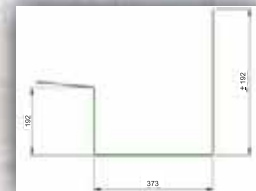
DOWNSPOUT



EAVE GUTTER



VALLEY GUTTER
(AT MULTI GABLE EAVES)

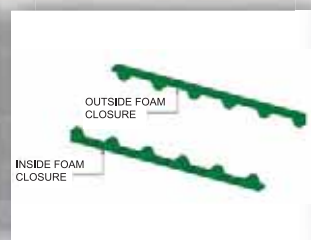


VALLEY GUTTER
(AT PARAPET WALLS)

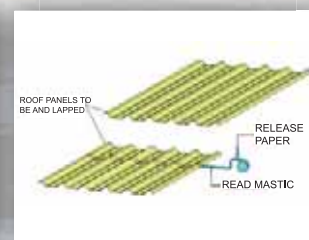
Panel Sundry Items: BSI uses selfdrilling carbon fasteners with AluZinc Coated Steel panels and stainless steel fasteners with Aluminum panels. Both have 5.5mm diameters and 19mm diameter washers.



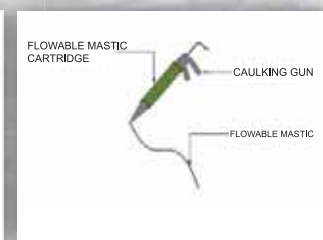
Pop Rivets



Foam Closures

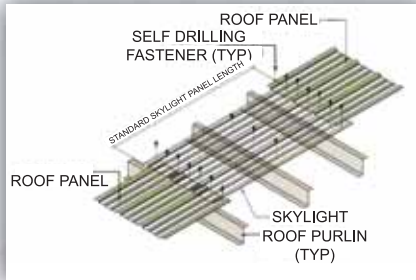


Bead Mastic

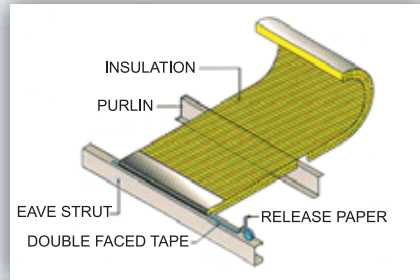


Flowable Mastic

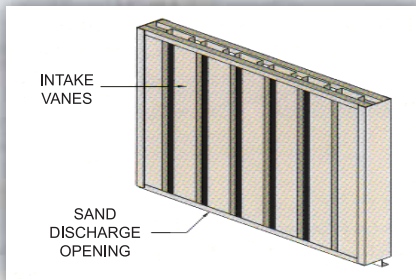
Building Accessories



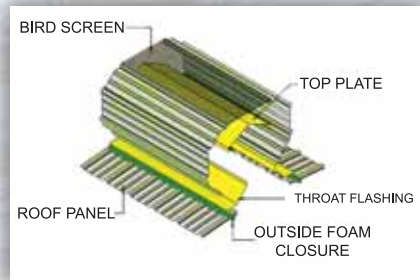
SKYLIGHT PANELS



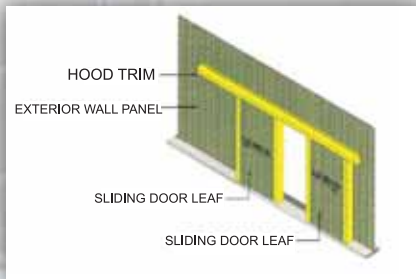
FIBERGLASS INSULATION



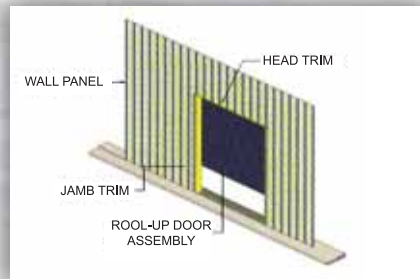
SAND TRAP LOUVERS



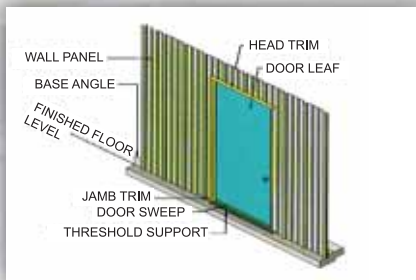
RIDGE VENTILATORS



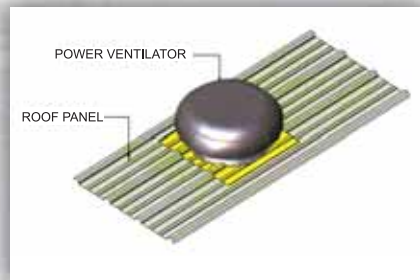
DOUBLE SLIDE DOORS



ROLL UP DOORS



SINGLE PERSONNEL DOORS



POWER VENTILATORS

US DESIGN CODES

- American Institute of Steel Construction (AISC)
Steel Construction Manual
- American Iron and Steel Institute (AISI)
Cold Formed Steel Design Manual
- American Welding Society (AWS)
Structural Welding Code - Steel AWS D1.1/D1.1M

US BUILDING CODES

- Metal Building Manufacturers Association
Metal Building System Manual - 2006 Edition
- International Code Council INC. (ICC)
International Building Code - 2006 Edition

MBMA is not a Building Code, It is worldwide recognized standard for the design and Manufacture of PEB's.

IBC is an international Building Code in the USA. BSI-STEEL will only use this code if it is specifically manufactured by a customer or if it is specified in the tender documents.

DESIGN LOADS

BSI-STEEL recommends the following minimum design loads in the State of Qatar:

Roof live load 0.6 KN/M²

Design wind speed of 162 Km/h

BSI-STEEL's design will be based on the relevant approved authorized design for earthquake loads, collateral loads etc (if required) must be specified at the time of request for quotation.

SURFACE PREPARATION AND SHOP PAINTING

- Surface Preparation of Steel Components

BSI-STEEL blast cleans all its steel components to Swedish Standard Sa-2 (regardless if blast cleaning is specified or not) and to Sa 2.5 when specified. **Blast components are more resistant to rusting than those that are cleaned manually using solvents or mechanical brushing.**

- Standard Shop Applied Primer

At BSI-STEEL, we use UNI-PRIMER Grey DFT 50 microns of high quality modified epoxy ester Primer with zinc phosphate rust inhibiting pigments by "HEMPL". This reduces the risk of corrosion of steel by preventing direct contact between the moisture in the air and the surface of the steel.

- Multi-Coat Paint Systems

BSI-STEEL can offer Multi-Coat Paint System as specified by the consultant or client to specified uniform paint film thickness to all member surfaces.

Disclaimer: Most of the photographs of buildings in this brochure are not of BSI. They are either photographed or extracted by us from publications of PEB Manufacturers and Specialized PEB Contractors in this region. They are reprinted in this brochure for the sake of showing real life examples of the PEB System.





QUALITY IS OUR POLICY





STEEL

Building System Integration sPc

شركة تكامل لأنظمة المباني ش س و

P.O.Box : 22814, Doha - Qatar

Tel : +974 - 4411 4447

www.bsi-steel.com

Fax : +974 - 4411 4449

E-mail : sales@bsi-steel.com

info@bsi-steel.com



Location Map

