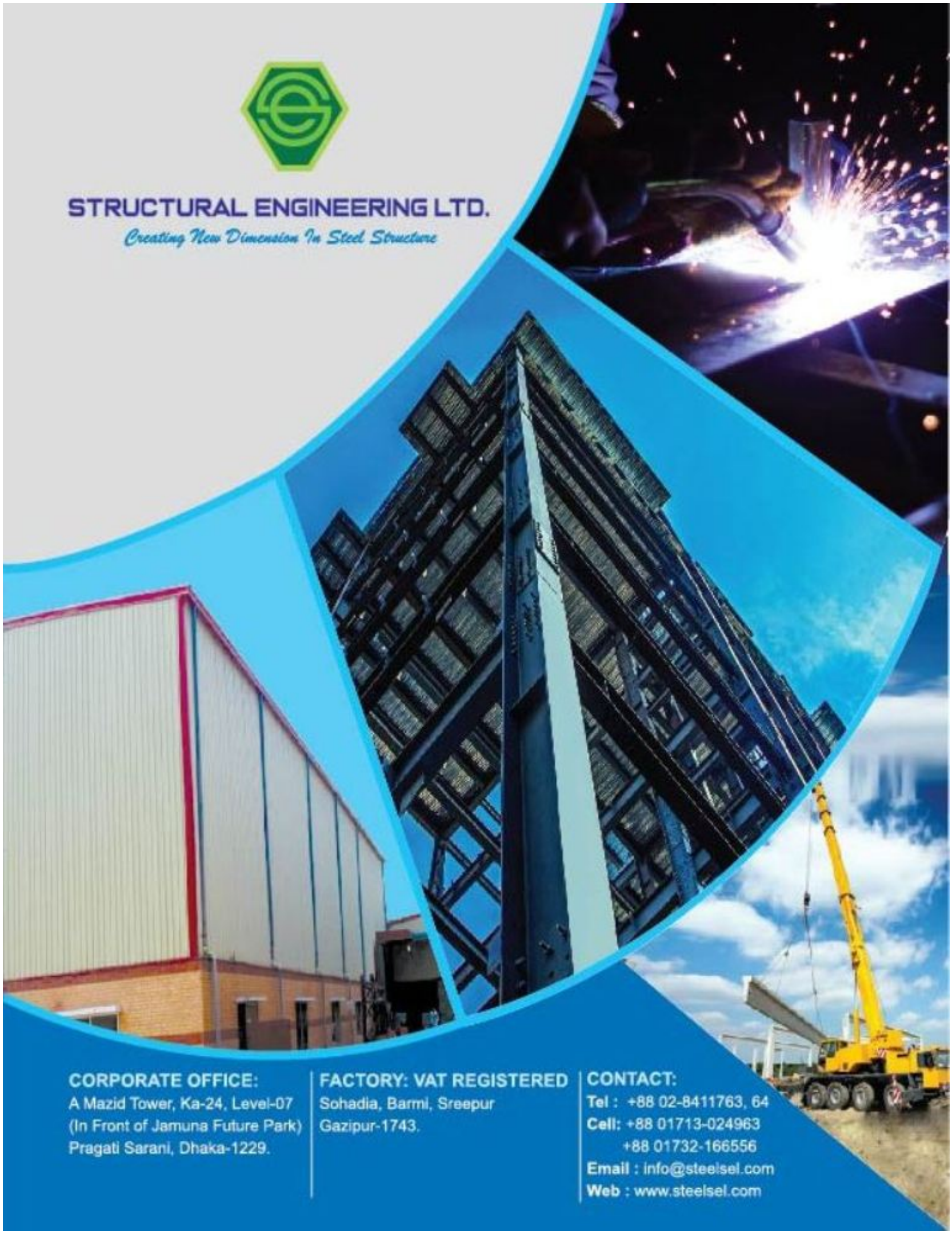
STRUCTURAL ENGINEERING LTD.

Creating New Dimension In Steel Structure



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Structural Engineering Ltd.
Barmi Dasar High School
Barmi Bazar
Barmi Bazar Technical Traning Center
Barmi Eidgah
Kurtadi Kiryoghat Jame Masjid
Melopara Jame Mosque
Mohalla Jame Masjid
Bilashear Jame Masjid
DARTA

Contents

MESSAGE FROM CHAIRMAN

It is my great pleasure to warmly welcome you and thank you for your interest in our company.

To cope with the rapid growth of the market share in home SEL has established highly trained Professionals and well equipped factory.

Each client is like an extended family member to us. And like family, we understand our client's needs.

Our professionalism, coupled with a strong personal touch enhances the probability of success at every step. Our goal is to create a long-lasting client-candidate relationship, which will translate into long term winning strategies and exponential growth for both parties.

SEL follows BNBC & US design standards and codes of practice while designing its buildings and uses sophisticated software to ensure accurate manufacture and problem free Structure.

Each member of our organization is professional and very dedicated to our customer with their best effort.

We believe that our success is fully depends on customers satisfaction.

SEL is dedicated to work all kinds of large, medium and small, structures with maintaining proper Engineering and Architectural values.

We promise to provide Quality Products, so that relations with our customers may continue forever.

We give our clients to our grateful thanks again to support us. We hope to support our customers more in future for an initiative to build a better Bangladesh.

To maintain and develop our business further, we are constantly restructuring: strengthening management and providing sound leadership to ensure that all our operations and processes are transparent, efficient and effective.

To achieve this, we have been promoting through business ethics and insistence on clear working mechanisms.

Our projection for the future is backed by a great deal of optimism and we are ready as a company to seize every opportunity to further strengthen our good corporate image with high quality products and strong relationship with our customers.

I would like to sincerely thank our valued consumers again, for your continued support in ensuring that we remain the leading PEB Company in Bangladesh.

Engr. S.M. Touhiduzzaman
B.Sc In Civil Engg, MIEB, MBA In OPM
CHAIRMAN & CO-FOUNDER

MESSAGE FROM MANAGING DIRECTOR

STRUCTURAL ENGINEERING LTD started its operation as one of the most diversified steel manufacturer in Bangladesh with specialized services in designing, fabricating and erecting steel buildings as well as civil and architectural works and services.

We provide different types of consultancy and construction services like Industrial, Commercial Complex, residential and Academic Building as per National and International standard and technologies. We thank you for being interested in Pre engineering building(PEB) as one of the most attractive product.

SEL is fully dedicated to work hard for the best services to our client and achieve the organizational goals by utilizing the technical knowledge and experience that we have acquired. The company has good factory facilities with sufficient support of steel building fabrication. Above all, we are assuring to meet your requirement with most efficient manner.

We are ready to use optimum level of resources to solve problems and identify growth opportunities that are beneficial to all. We promise the excellency in services for the long term relationship with valued client like you.

We hope to explore our creativity by using highest effort and potentiality to achieve a market leading position through distinctive ideas.

Quality Management System is our top Priority to meet up Clients demand .We always upgrade our activities to meet up new challenges of coming days."

Customer is the main focus of our business. We always try to meet up customers demand . We provide all technical support, give quotation within short time and minimize the project completion time, so that our customer can go to production quickly .

In the current process of widespread globalization, we understand that meeting our customer's requirement is essential to the success of our organization. We can say that in previous years we had served and it is clearly seen that we have intensively delivered our best performance to focus on customer satisfaction.

Pre-engineered buildings can be adapted to suit a wide variety of structural applicatons the greatest economy will be realized while utilising standared design methods. An efficiently designed stel building can be lighter than the convertional buildings up to 30%

I would like to thank our valuable customers for giving us chance to be their construction partner. Besides, I would like to make a special mention of our staffs' enthusiastic contribution in establishing our organization. we know that our highly trained engineers apply their specialized knowledge to reliably and efficiently produce high quality service.

I wish you all the best and may the almighty bless all to lead and serve in this sector.

Engr. Md. Tazbir Haque
Managing Director & Co-Founder
B.Sc In Civil Engg. (BUET)
Executive MBA (IBA, DU) MIEB-32454

INTRODUCTION

Structural Engineering Ltd. (SEL) has now been emerged as one of the leading Pre-fabricated Steel Building manufacturing company in Bangladesh to meet up the growing demand of PEB Industry.

SEL started its Journey in the year 2014 with a group of most experienced Professionals.

SEL has set up its factory with Automatic and most modernized machineries for producing best quality products with a current monthly capacity 1500MT. Our factory Floor area is 60,000 Sft. with another 40,000 Sft open land.

With the increasing market demand Structural Engineering Ltd. has already taken preparation to increase its capacity.

We are following national and International codes of practice in design and use latest software to ensure accurate manufacture, rapid delivery and problem free erection.

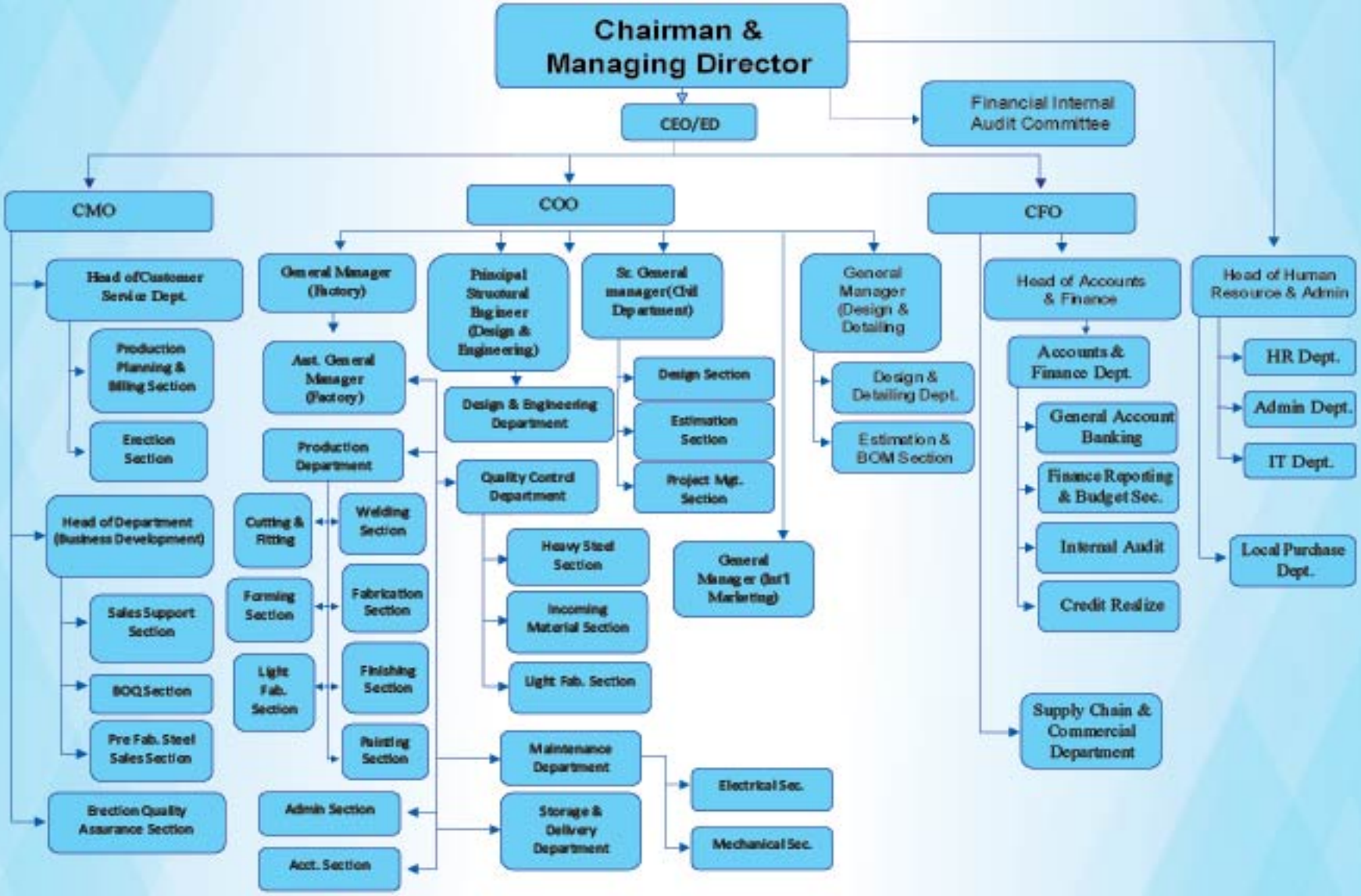
Our team members are dedicated in their service. We believe that increasing the business growth and customer satisfaction are the main keys.

For our quality management System, ISO 9001 : 2015 accreditation certification is awarded.

We have specialty in Industrial, Commercial and Residential Steel Structure. We provide services including metal framing, cladding, Structural decking, Purlin, necessary accessories Steel design and erection of the building.

We believe in transparent business and sincere dealing with our customer. Structural Engineering Ltd. has completed hundreds of projects starting from warehouse to multistoried commercial building. We have experience to complete a single project which consumes 2200 MT Steel.

ORGANIZATIONAL STRUCTURE



Quality Certification

The Company is ISO 9001:2015 Certified for Quality Management System

Sustainable Management System

Sustainable Management System Inc.

Certificate of Registration

This is to certify that the

MANAGEMENT SYSTEM

of

Structural Engineering Ltd.

Shohadia, Barmi, Sreepur, Gazipur-1743, Bangladesh

for

Manufacturer & Installer of Prefabricated Steel Structure & Civil Construction

has been assessed and registered against the provision of

ISO 9001:2015

International Standard

With

Registration Number	: 080720213	Certificate Number	: 202107083
Certification Date	: 08/07/2021	Code	: 34
Re-Certification Due Date	: 07/08/2024	Exclusions	: 8.3
		Issue No	: 01

Certification Approved By

President & CEO

SUSTAINABLE MANAGEMENT SYSTEM INC. CORPORATE SEAL 2014 NEW YORK

IRQAO

ASCB

This is an accredited certificate authorised for issue by Accreditation Service for Certifying Bodies LLC who have assessed Sustainable Management System Inc. against defined criteria and in cognisance of ISO 17021:2015 'Conformity Assessment - Requirements for bodies providing audit and certification of management systems'. This certificate is only valid when confirmed by the register listed in the International Register of Quality Assessed Organisations: www.irqao.com.

This certificate is the property of Sustainable Management System Inc.
3706 Suite#6B| 69 Street| Woodside |New York 11377| USA
The validity of this certificate can be checked at "www.smscert.com/certificate-check".

OUR MISSION

- Making functional structure both from design and aesthetic view.
- Maintaining all national & international codes.
- Giving all engineering services.
- Aiming to build better Bangladesh through PEB building.
- Nourishing clients with superior products at highest competitive price.
- Contribution to society with economic development & Industrial empowerment.
- Increasing Industrial capacity in home through speedy delivery of material.
- Using modern machineries & updated equipment's.

OUR VISION

SEL sets up a standard for the entire sector through supreme quality product, proper engineering and remarkable customer services.

OUR SERVICES

- Economically safe and technologically advanced building.
- Uncompromised quality guarantee.
- Low cost structure.
- Accurate & precise fabrication.
- Quickest delivery and unique cladding system.
- Erection with expertise technicians.
- Instant response to our valued customers.
- We provide after sales service.

STRUCTURAL ENGINEERING LTD. BUSINESS MODEL

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BASICS OF PRE ENGINEERED STEEL BUILDING

Steel Building materials comes in our country from China/Japan/Korea/India. but before purchasing, SEL make sure the physical properties of the plate. Steel plates' quality does not depend on the country of origin, the only thing matter is plate grade. Worldwide Steel Building materials standard grade are same almost everywhere. Steel Building is constructed by continuous welding which makes structures safe and stable.

Pre Engineered Steel Buildings are manufactured or produced in the plant itself. The manufacturing of structural members is done on customer requirements. The detailed structural members are designed for their respective location and are numbered, which cannot be altered; because members are manufactured with respect to design features. These components are made in modular or completely knocked condition for transportation. These materials are transported to the customer site and are erected.

In structural engineering, a pre-engineered building is designed by a manufacturer to be fabricated using a pre-determined inventory of raw materials and manufacturing methods that can efficiently satisfy a wide range of structural and aesthetic design requirements. The primary framing structure of a pre-engineered building is an assembly of I-shaped members, usually formed by welding together steel plates to form of I section. I sections are then field-assembled with bolted connections to form the entire frame of the pre-engineered building. While making I sections, plates are chosen to reduce wastage. Joints are firmly welded to ensure safety of structure. This is the difference between buildup members and hot rolled sections. In a buildup member, two or more joints may be seen as to reduce wastage of plates. Lighter weight equates to less steel and a potential price savings in structural frame work.

Cold formed Z and C-shaped members are used as secondary structural elements to fasten and support the roof and external cladding. Roll-formed profiled steel used for the external roof and cladding of the building.

In order to accurately design a pre-engineered building, engineers consider 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.

In pre-engineered building concept the complete designing is done at the factory and the building components are brought to the site. These components are then fixed/jointed at the site and erected with the help of cranes or manual erection support. The pre-engineered building calls for very fast construction of buildings and with good aesthetic looks and quality construction.

FIREPROOFING METHODS FOR STRUCTURAL STEEL

Many building codes require fireproofing protection to structural steel as a safety precaution. The most common way to provide such protection is by spraying low-density fiber or cementitious compounds, now called spray-applied fire-resistive material (SFRM). The product can be sprayed on steel to provide heat resistance. Building codes dictate the required thickness of the coat is applied. Sprays are divided into a wet spray or dry spray materials. Building materials and fireproofing methods typically are rated in minutes, based on tests conducted. For example, if a particular fireproofing method is rated for 60 minutes, that means it should help maintain structural integrity for at least 60 minutes. Obviously, the higher the rating, the more time that buys for evacuation and for extinguishing the fire while limiting damage.

Intumescent Coatings

It is known as intumescent paint. This method provides fire resistance to structural steel members. One of the key benefits is that intumescent coatings will expand as much as 100 times the original thickness of the material, providing superior fire resistance by creating a buffer between the fire and the steel members. The coating will undergo a chemical reaction and expand when subjected to extreme temperatures—but before the temperatures become hot enough to affect the integrity of the steel. Intumescent coatings are a great solution when aesthetics come into play with steel that is exposed to the general public. The product is applied just like paint, with every layer adding to the overall thickness of the product.

Rigid Board Fireproofing

Rigid board fireproofing can be installed quickly and easily. One of the benefits is that it can be installed as you go during the process of installing steel decks and beams. Rigid board fireproofing provides the right fireproofing requirements as well as thermal and acoustic control. This type of fireproofing can be mechanically fastened and can prevent pests and termite attacks. It also is available in different thicknesses to meet UL requirements and can withstand moisture and humidity without losing its fire-stopping characteristics. Boards can be designed to precise measurements and can include decorative finishes.

Flexible Blanket Systems

Specifically designed flexible blankets can be used as fireproofing material, making it easy to install and maintain a toxin-free environment in case of fire. Although a very practical and convenient method, there are only limited numbers of manufacturers. This application can meet almost all safety standards and codes, providing a cost-effective and reliable system to prevent a fire from spreading to structural members. Blanket systems can be a good option when dealing with complex shapes.

Autoclaved Aerated Concrete

Autoclaved aerated concrete can enhance and provide fire resistance when needed, especially around steel columns. This produces fireproofing characteristics when installed between the flanges and tied to the web of rolled sections. For longer fire resistance requirements, it can be beneficial to pour concrete between the flanges of the steel components using shear connections attached to the steel web. The concrete that is being placed needs to be retained at the bottom of the connection area.

Concrete

This option is far less common than it used to be, but for some projects, it can be beneficial to encase large sections of steel in concrete. Doing so requires more space because of the volume of concrete used, and it tends to be less aesthetically pleasing than other options. Structures like large parking garages are less concerned with these factors, so such structures might still employ this method.

Liquid Convection Cooling

First patented in the 19th century, liquid convection cooling involves running water, a rust inhibitor, and antifreeze through hollow structural members. If there is a fire, the hot liquid will rise, allowing cooler water to be run into the portion of the structure affected by the fire, thus reducing the temperature of the structural members.

PROMISE TO QUALITY

SEL has aim to become and retain market leader in PEB in home through its quality and commitment. SEL always undertakes its initiative to deliver quality products to our customers. Before dispatching the material from our factory to site, all members are quality checked. To maintain quality we take training programmers to our team members with professionals. we have quality Management manual and quality is implemented through quality manager. We follow zero tolerance in maintain quality Products and safety works. We are following ISO: 9000:2015 quality management system.

VALUE:

- Creating a new dimension in this sector
- Show meaningful stories among all
- Following the updated building codes
- Perpetual Improvements on product
- Proving endless services to customers
- Maintaining long term relationship with customers
- Maintaining a healthy environment to all employees

FIRE PROTECTION PLAN: (BNBC 5.1.6)

A building or part thereof must have a fire protection plan for the following cases

a) High rise building or building sections 33 m and above in heights

b) Building or building sections classified in the occupancy groups G, H, J, K and M which are two or more storied in height with over 1858 m^2 per gross floor area or are two or more in height with total area exceeding 4717 m^2 gross

c) Building classified as A3 containing 30 or more dwelling units, A4 and A5 having gross floor area of the building more than 1200 m^2

d) Part of a building is used as mercantile,assembly institutional or health care having gross floor area of the building over 930 m^2

e) Alteration to a building or a portion thereof listed in Sections (a) to (d)above, if cost of alteration equivalent to one third cost of new construction of the same or more or involves changes in occupancy classification

f) The plan shall include information where applicable building address, height

GENERAL NOTES: WELDING

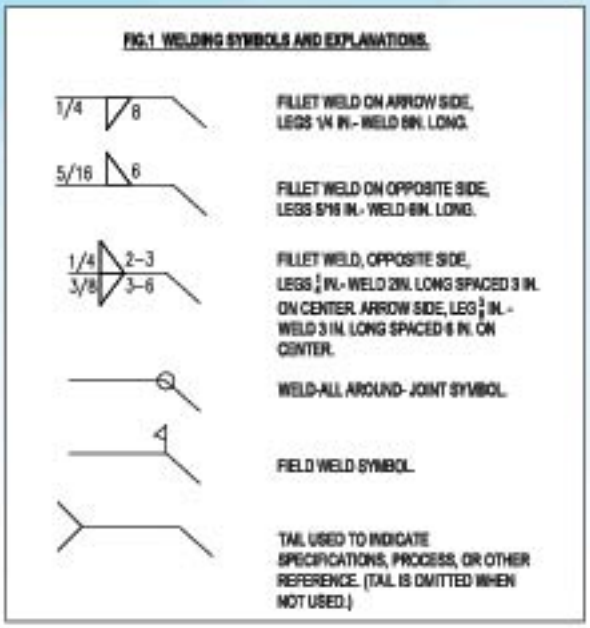
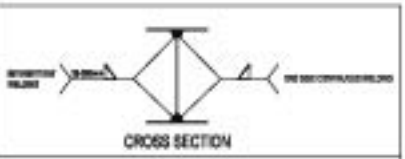
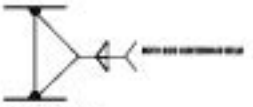


Table 5.8
Minimum Fillet Weld Sizes (see 5.14)

Base-Metal Thickness (T)[1]		Minimum Size of Fillet Weld[2]	
in.	mm	in.	mm
T ≤ 1/4	T ≤ 6	1/8 (Note 3)	3 (Note 3)
1/4 < T ≤ 1/2	6 < T ≤ 12	3/16	5
1/2 < T ≤ 3/4	12 < T ≤ 20	1/4	6
3/4 < T	20 < T	5/16	8

Notes:
1. For non-low-hydrogen processes without preheat calculated in conformance with 5.5.2, T equals thickness of the thicker part joined; single pass welds shall be used.
   For use low hydrogen processes using procedures established to prevent cracking in conformance with 5.5.2 and for low-hydrogen processes, T equals thickness of the thinner part joined; single pass requirement shall not apply.
2. Except that the weld size need not exceed the thickness of the thinner part joined.
3. Minimum size for cyclically loaded structures shall be 3/16 in. (5 mm).

WELDING CRITERIA
WELDING SIZE AS PER DESIGN & CODE (AWS)

WEB < 6mm	 CROSS SECTION
WEB >= 6mm	 CROSS SECTION
TUBE / PIPE	 CROSS SECTION

Maximum Spacing of Intermittent Welds: BNBC (2.12.2.1)
The Maximum longitudinal spacing of intermittent welds connecting a plate component to other components shall not exceed 24 times the thickness of the thinner plate nor exceed 12 in (300 mm). The longitudinal spacing between intermittent fillet welds connecting two or more rolled shapes shall not exceed 24 in (600 mm).

Minimum Length: BNBC (2.4.2.3)
The minimum length of a fillet weld shall be at least four times the nominal size, or the effective size of the weld shall be considered not to exceed 25% of its effective length.

Intermitter fillet welds BNBC (2.4.2.4)
The Minimum length of Segmenmerts of an intermitter fitter weld shall be 1-1.2 in (38mm).

ADVANTAGE OF THE STEEL BUILDING CONSTRUCTION:

- Reduction of Construction time
- Maximum Floor Space and Clear Height
- Reduction of Foundation Cost
- Quality Assurance
- Great salvage value
- Environment Friendly Structure
- Re-Location of Building

Design Codes Followed

The buildings are designed in accordance with the following codes:

A. Loads are Applied in accordance with:

- ASCE-7-05 (American society of Civil Engineers)
- BNBC-1993 /2021 (Bangladesh National Building Codes)
- MBMA-2005 (Metal Building Manufacturers Association)
- IBC-2006 (International Building Code)

B. Hot rolled and built-up Sections are designed in accordance with:

- Manual of Steel Construction, American Institutes of Steel Constructions, (AISC) ASD and LRFD Method

C. Cold-formed members are designed in accordance with:

- AISI- (American Iron and Steel Institute)

D. Welding is applied in accordance with:

- AWS- (American welding society.)

E. Structural Analysis, design and detailing is done by the aid of following softwares :

- STAAD Pro
- ETABS
- SAP
- Autodesk Robot Millennium.
- RISA 3D
- RAM Connection
- TEKLA
- Auto CAD
- SKETCHUP

FOUNDATION OF STEEL STRUCTURE:

1. The biggest difference between the old and new codes should pay attention to using the characteristic value of bearing capacity instead of the standard value.
2. The current norms correspond to the selection of the foundation with the standard value, that is, the bottom area of the foundation, and the calculation of the foundation should not be confused according to the design value.
3. The basis for settlement check calculations required is different from the old code, so be careful not to omit.
4. The requirements for steel structure foundation treatment (including filling soil) should be clearly marked, all data requirements should be filled in, and corresponding information should be submitted for new processes.
5. The pile type, bearing layer, bearing value, test pile requirements, anchor pile requirements, and settlement requirements should be stated in the selection of pile foundation.
6. The connection requirements of piles and caps must meet the requirements of the specification.
7. In addition to satisfying the requirements of bending and shearing resistance, the foundation should pay attention to local pressure. At present, some foundations often neglect the shear calculation except for the calculation area.

PURLIN INSTALLATION:

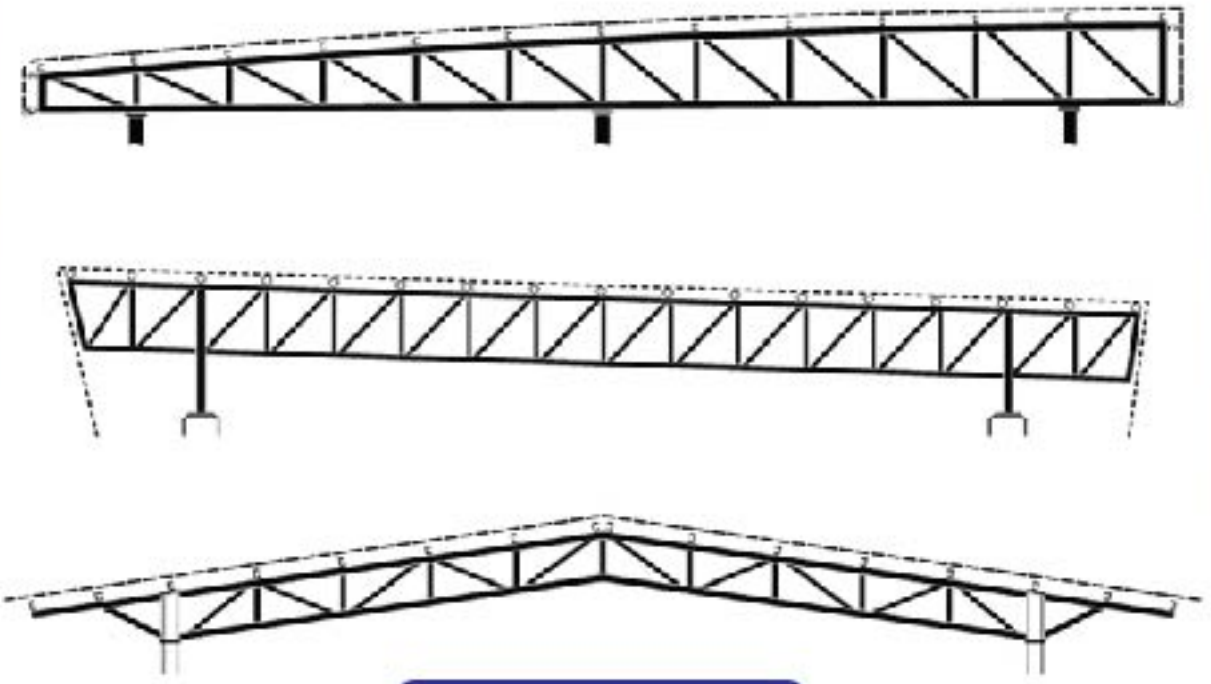
1. The installation of purlin should be carried out after the installation of steel support (TIE), horizontal support and inter column support, and after the main body of steel structure is adjusted.

2. The purlin clit shall be marked on the steel section according to the required size and the purlin clit shall be welded and fixed according to the line. The welding position of purlin clit in the same row shall be in a straight line, and shall be vertical to the steel beam (column).

3. For the roof whose slope is less than 1:12.5, attention should be paid to eliminate the roof irregularities caused by steel beam deflection when installing purlins.

4. The sag rod between purlins plays a stabilizing role on purlins. During installation, nuts at each end of purlins on both sides of purlins should be tightened to straighten purlins.

5. Welding operations must be carried out by certified welders.

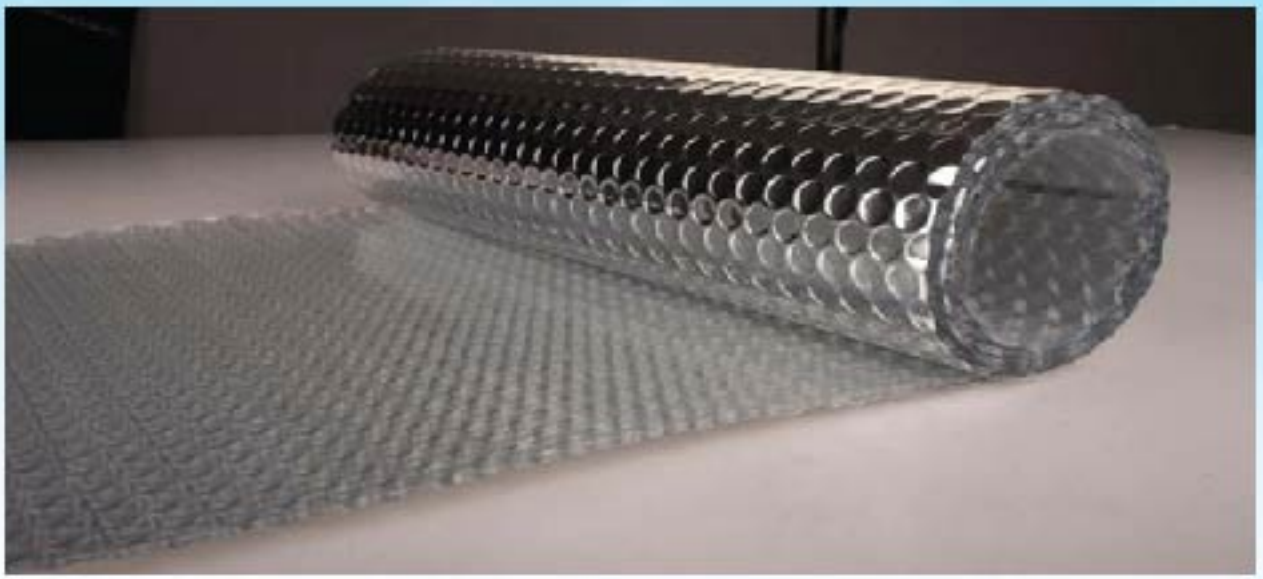


STEEL TRUSS

Truss is widely used in steel structure, such as in industrial and civil building's roof (roof truss, etc.) and crane beam (crane truss), bridge, crane (tower, beam or boom, etc.), hydraulic gate, offshore oil platform, steel truss is commonly used as the main component of load-bearing structure. In the roof structure of large-span public buildings, various types of steel grids are commonly used, which belong to space steel truss. Various types of tower, such as TV, power transmission, drilling, crane tower and mast tower, commonly use three, four or more plane truss space steel truss.

The most commonly used is plane truss, which is essentially lattice beam under transverse load. Compared with solid web steel beam, steel truss is characterized by chord instead of flange and web bars instead of web plates and web and chord are connected with each other through gusset plate (or other parts) with weld or other connection; Sometimes, the members can be directly welded (or other connected) to each other without gusset plates. In this way, the bending moment of the plane truss is expressed as the axial compression and tension of the upper and lower chords, and the shear force is expressed as the axial compression or tension of the web members.

Steel truss is a truss made of steel. Steel truss is used as the main load-bearing component in the roof structure, crane beam, bridge and hydraulic gate of industrial and civil buildings.



DOUBLE BUBBLE INSULATION (THICKNESS UP TO 10MM)

The bubble contains an air retention layer designed to provide increased strength and puncture resistance. Insulation is used to either contain heat on maintaining warmth or to resist heat on maintaining cold.

Double the bubbles for double the air space. The air space in the product, the better it is at slowing heat transfer.

Double bubble insulation provides maximum efficiency. Key benefit of this foil-faced double bubble include:

Physical Properties	Test	Reflective/ Double Bubble/ Reflective
NORMAL THICKNESS		±10 mm
TEMPERATURE RANGE	ASTM C411	50°F to 180°F
FIRE RATING	ASTM E84	CLASS 1/ CLASS A
THERMAL RESISTANCE (system)	ASTM C1224 (3.5" cavity)	R-15.2 (Heat Flow Down) R-8.5 (Horizontal Heat Flow) R-6.6 (Heat Flow Up)
EMISSIVITY	ASTM C1371	0.06
REFLECTIVITY	ASTM E 903	0.94
WATER VAPOR PERMEABILITY	ASTM E96 / CGSB 51.33-M89	Conforms Type I
RESISTANCE TO FUNGI & BACTERIA	ASTM C1338	Does Not Promote Growth
BLEEDING & DELAMINATION	ASTM C 1224	No Bledding or Delamination
PLIABILITY	ASTM C 1224	No Cracking or Delamination

1) 1/4" – 5/16" nominal thickness of foil bubble insulation.
2) 99.9% Pure aluminum bonded to tear resistant polyethylene core and bubble wrap insulation.
3) Highly reflecting foil facing.
4) Optional UV resistant polyethylene facing on one side, foil on the opposite side.
5) Very low rate of emissivity.
6) Acts as 100% vapor barrier.
7) Class A/Class 1 tier rating.
8) Barrier for methane, resist moisture, termites and other pests.
9) Held to minimize water leakage of roof & wall sheet.
10) Industrialized strength, lightweight yet durable insulation, design to hold staples without tearing, doesn't heat compress, collapse or disintegrate, reflects 97% of radiant & emits less than 3 y. of heat.

Basic Building Parameter :

Building Length:

Building Length is the sum of all bay lengths. For flush end wall, this is measured as the distance between outside flanges of two end wall columns on opposite end walls. For by-pass end walls, it is measured as the distance between outer faces of wall girt along two end walls.

Building Width:

Width of a building is defined as the distance between the outer sides of two eave struts along two sides of the building

Building Height:

Height of a building usually termed as eave height' is the height of top outer system. Point of the eave sturt from finished floor.

Roof Slope:

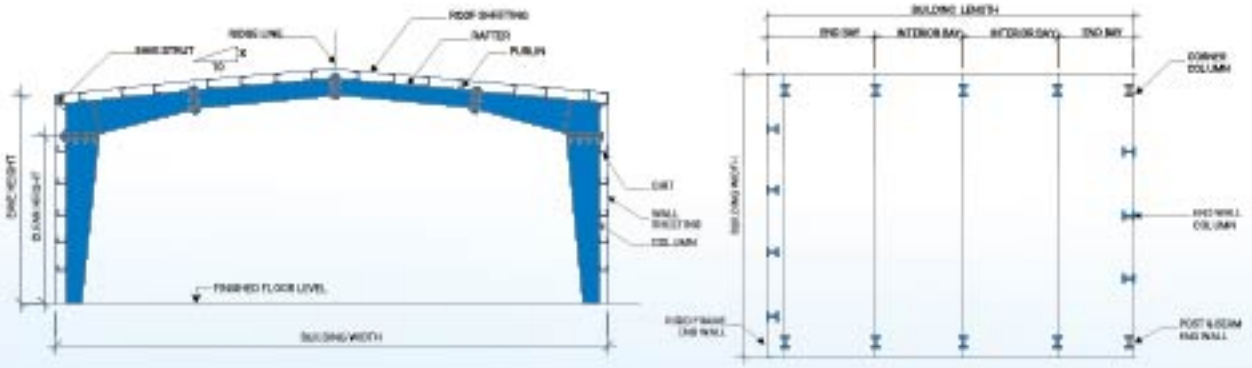
This defined as the angle between roofline with the horizontal. Any practical roof slope is possible. Most commonly used roof slope is 1:10.

Interior Bay Length:

This is the distance between the center lines of two adjacent interior rigid frames. Most common interior bay lengths are 6m, 7.5m, 8m & 9m.

End Bay Length:

This is the distance from the center line of first interior rigid frame to the outer flange of the adjacent end column (flush system) or outside of end wall girt (by/pass)



We Can Provide Construction Services in Turn Key Basis.

We Provide Following Expert Services To Our Cutomers :

- Economical Designs of Foundations, Supper Stuctures etc.
- Preperation of BOQ's and site managent by experienced Engineers and using latest Softwares.
- Construction using modern methodology and Equipment.
- Expert supervision by Senior Engineers.

We give much importance to continuous improvement in Quality products and services. We ensure quality of our steel members, before delivering those.

Prefabricated steel building has advantage to sustain in front of earthquake, cyclones etc. We are committed to save production time to ensure the quick return of customer's investment.

Structure Group is concerned for social duties and aiming to take part for building a clean and Pollution free Bangladesh.

We also train young professionals to gift the world as skilled manpower's. We invite all professionals to visit our office and factory to share views, so that by knowledge sharing our country can go ahead.

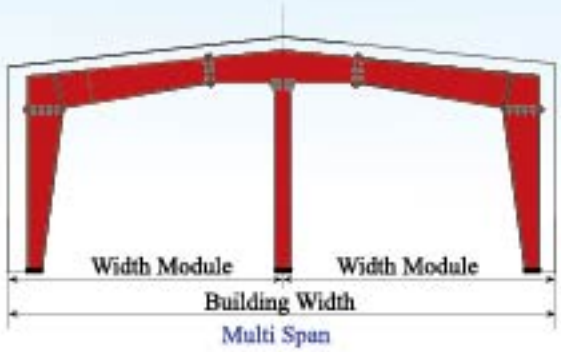
Basic Building Parameter:

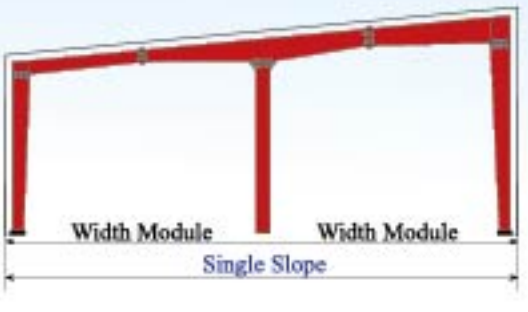
Primary Framing Systems-

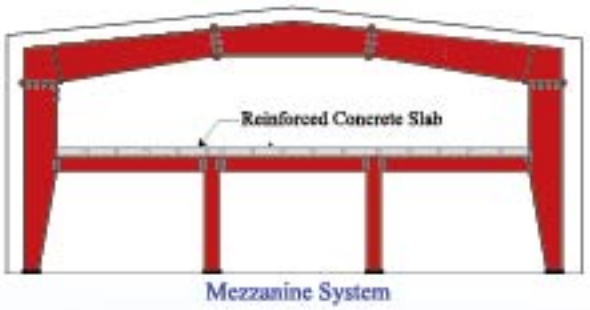
We will focus here the common framing systems. Majority of the frames are Symmetric about the ridge. We also do Unsymmetrical frame and multi framing systems with unequal width module. Our framing system can be as bellows. Besides the common type of frame all others framing system for aesthetic look/Architectural beauties can be possible with some value increase in costing.

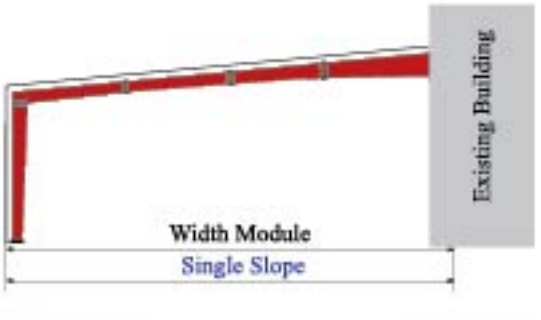
- Clear Span(CS)
- Multispan "1"(MS-1)
  (1 Interior Column)
- Multispan "2"(MS-2)
  (2 Interior Column)
- Multispan "3"(MS-3)
  (3 Interior Column)
- Roof System(RS)
- Multigable"1'(MG-1)
  (1 Interior Column)
- Mono Slope
- Lean-To(LT)

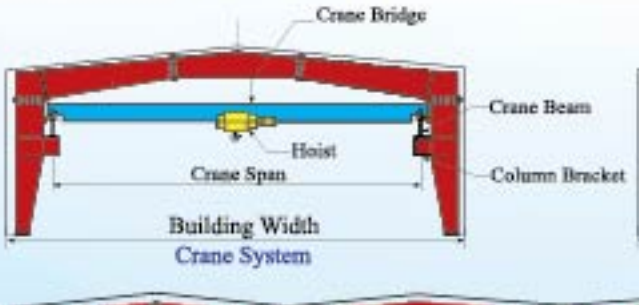
PRIMARY FRAMING SYSTEMS:

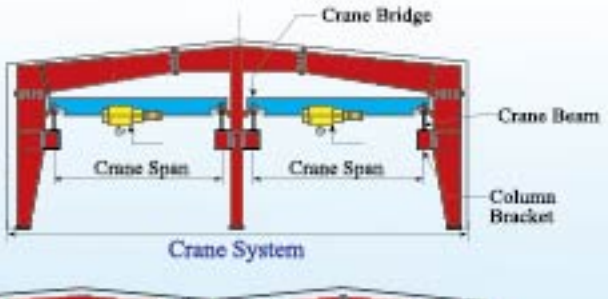




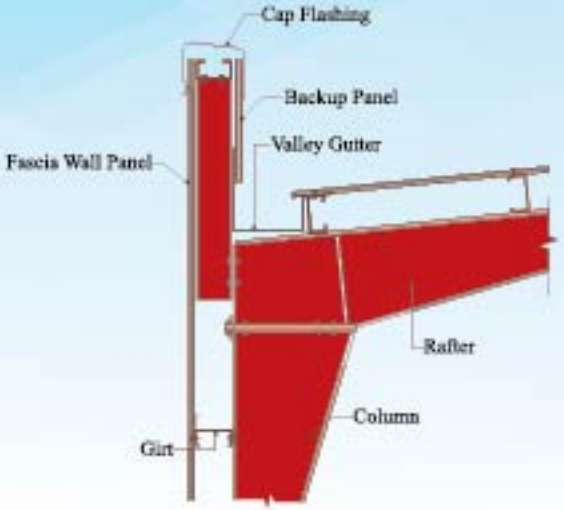




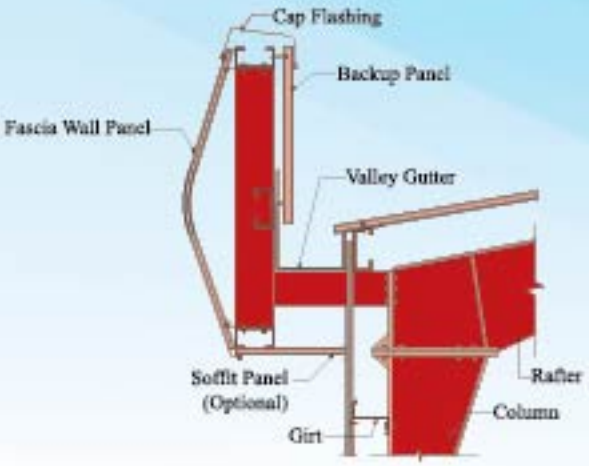




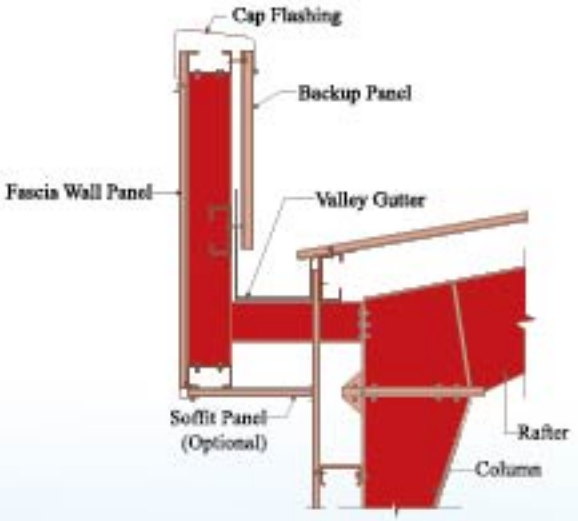
Fascia :



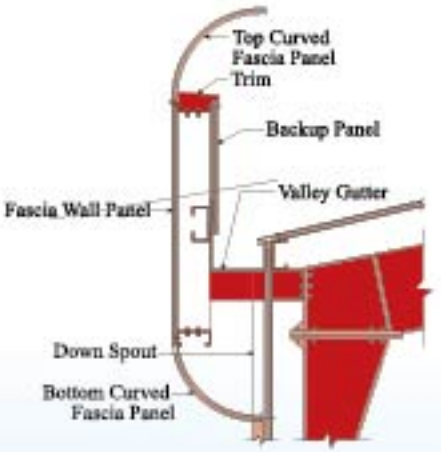
Paraper Fascia



Center Curved Fascia



Vertical Fascia with back up panel and valley gutter



Top & Bottom Curved Fascia

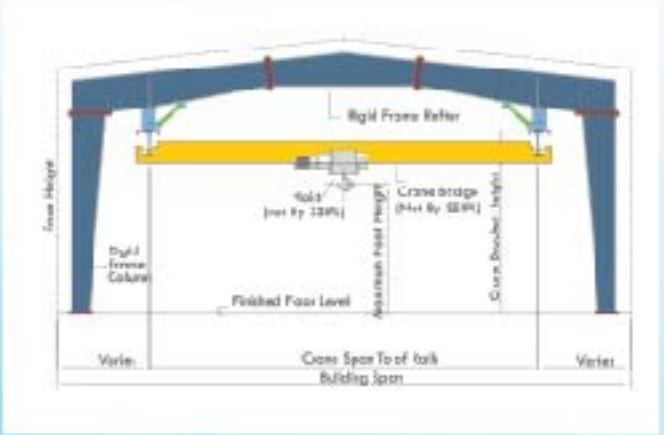
Crane System :

We design all types of Crane Structures. We Supply Brackets, Crane Beams and Bracings. For Properly design crane system we need to know Crane loads, manufacturers name and the crane system data sheet. All above information is required for proper size with minimum size crane design.

One out of every Six metal building systems are constructed for manufacturing facilities where cranes are needed for goods handeling. Overhead travelling cranes upto 20 metric tonnes are supported on brackets. Higher capacity cranes are generally supported on independent support system. Cranes other components include trolley, hoist,crain rails with their fastenings, Structural Supports, stops and bumpers. A motorized crane require electrical and mechanical components.

Underhung Crane

Underhung Crane



Underhung Crane

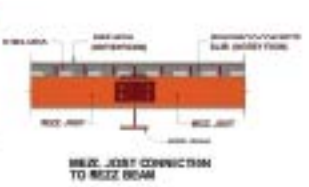
Mono Rail Crane

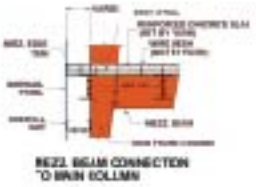
Mezzanine System:

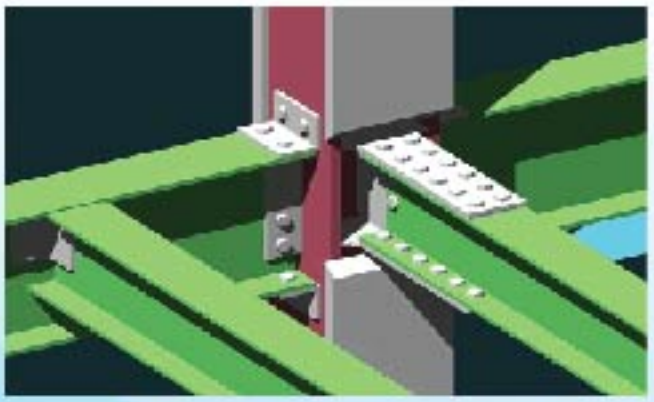
Our mezzanine floor system includes galvanized steel decking supported by joists framed with main mezzanine beams.

Reinforced Concrete slab(by clients) rest in cast in situ on top of the metal deck with floor finishes. The main beam is supported by intermediate columns. The mezzanine beams usually run across the width and the joists usally run lengthwise. Along with joists, there are called framing beams whose are connected with immediate columns. All main beams and framing beams interconnected with columns which make a rigid frame.

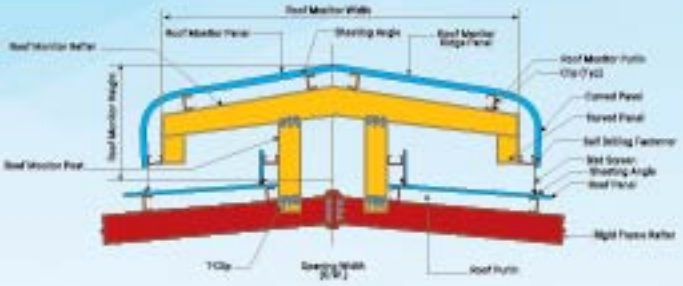
The effective mezzanine system depends on the applied loads and mezzanine column spacing. Multistoried mezzanines, interior platforms, steel stair, catwalks can be accommodated if that requires.

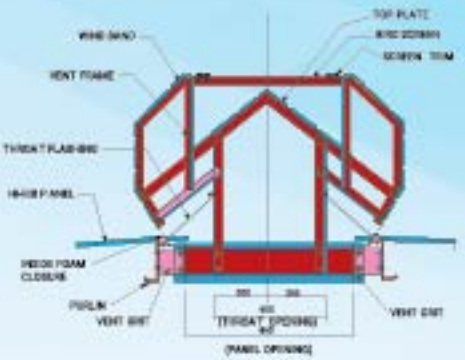






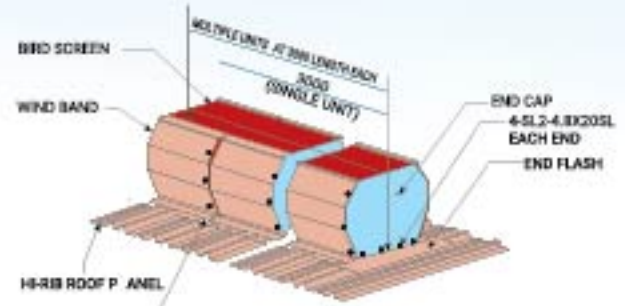
Ventilation System :



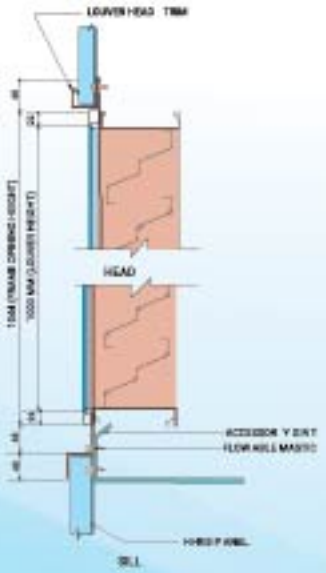


RIDGE VENTILATOR

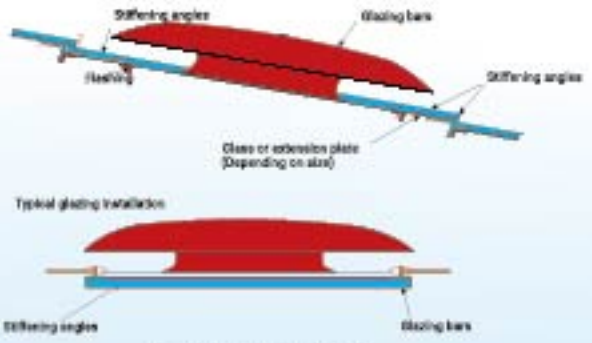
Turbo Vent



RIDGE VENT-ASSEMBLY



LOUVERS



POWER VENTILATOR

Sundry Items:

Fastener

Anchor Bolt

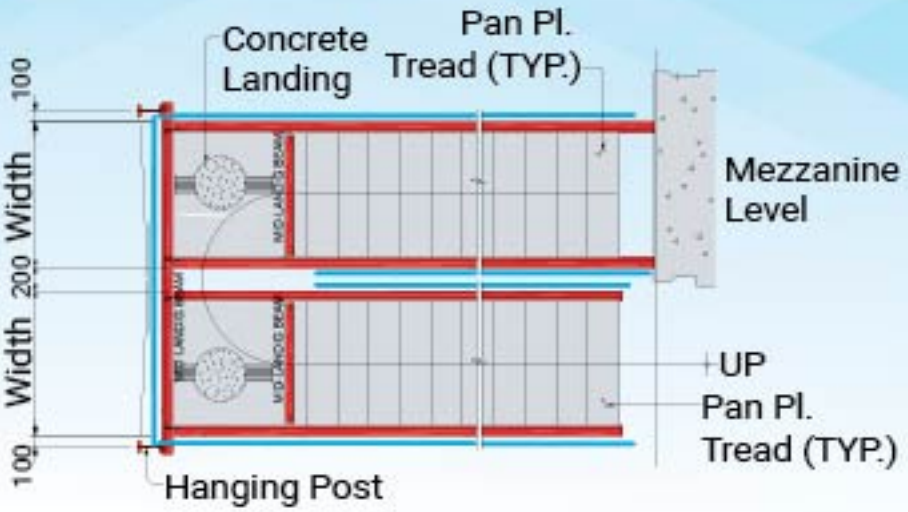
Silicon

Nuts & Bolts

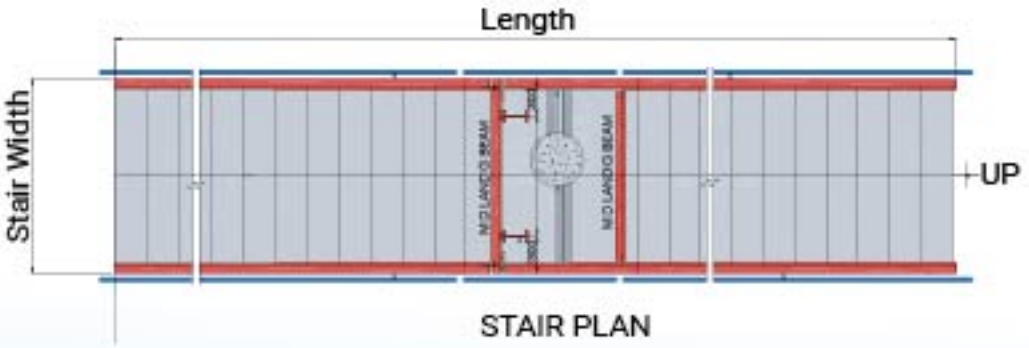
Anchor Bolts

Nuts & Bolts

Steel Stairs :



STAIR PLAN



STAIR PLAN

STAIR PLAN

Color Panel :

SE Blue - 100

SE Blue - 200

SE Blue - 300

SE Red - 200

SE Red - 100

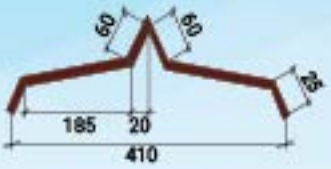
SE Green- 200

SE White-200

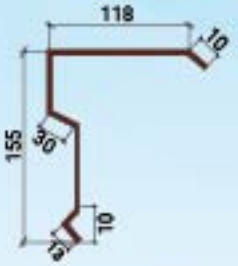
SE White-100

SE Green- 300

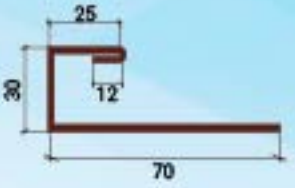
Trims & Drainage Components :



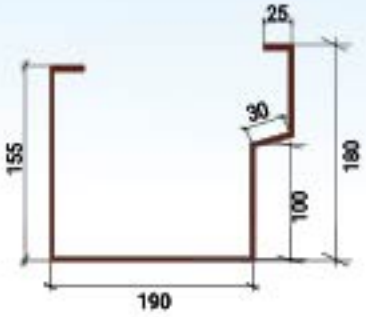
RIDGE CAPPING



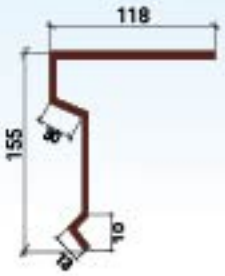
GABLE TRIM



FRAMED OPENING TRIM

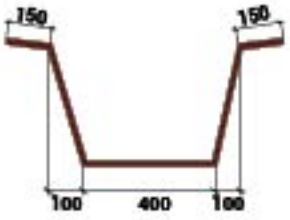


EAVE GUTTER

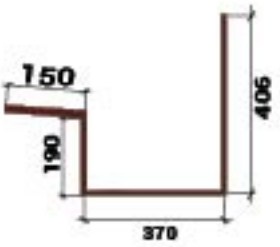


OASIS EAVE TRIM
OPTIONAL IN LIEU OF EAVE GUTTER
AT SIDE WALLS

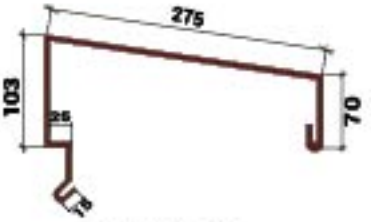
HOOD TRIM
FOR SLIDING DOOR



VALLEY GUTTER
(TYPE-1)

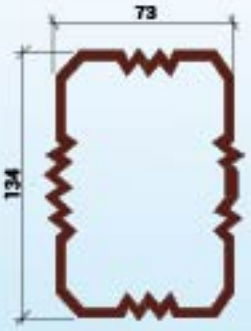


VALLEY GUTTER
(TYPE-2)



CAP FLASING

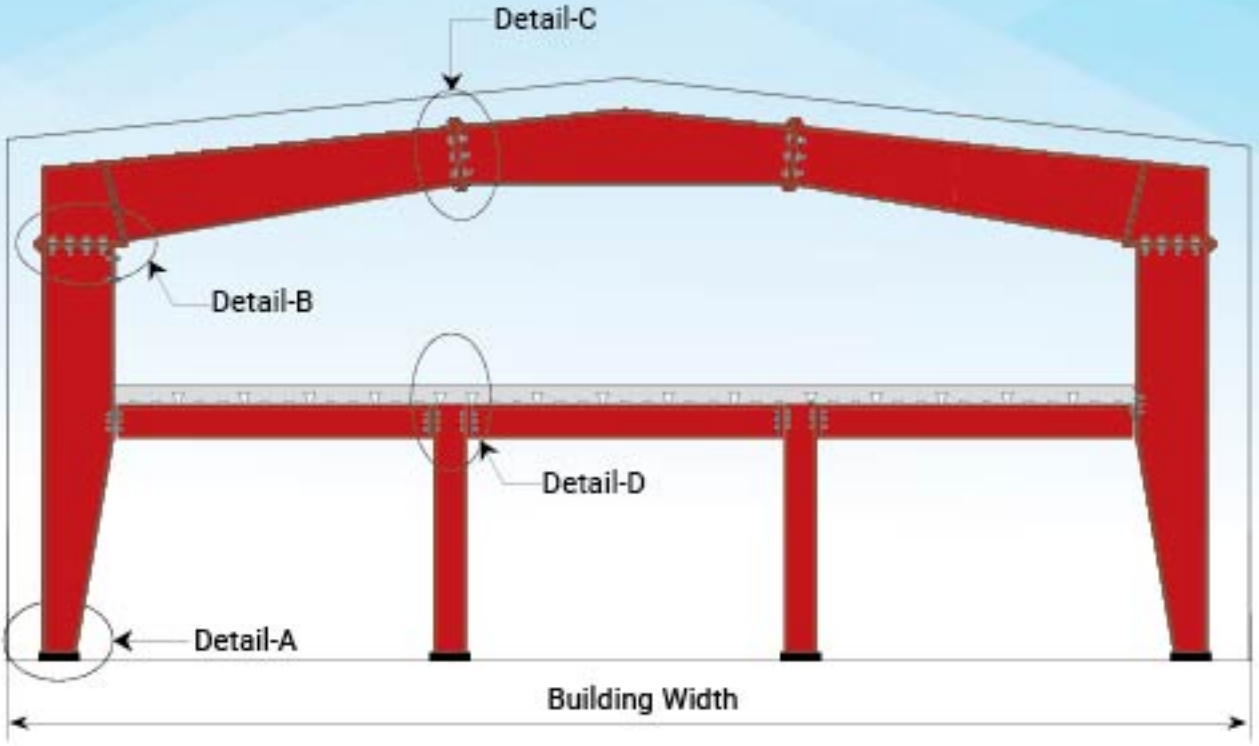
OUTSIDE CORNER TRIM

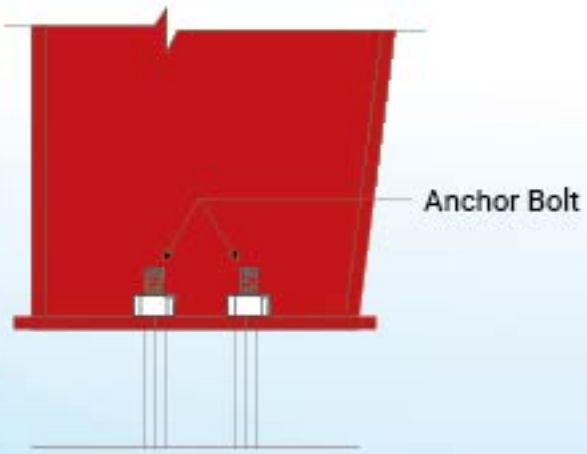


DOWN PIPE

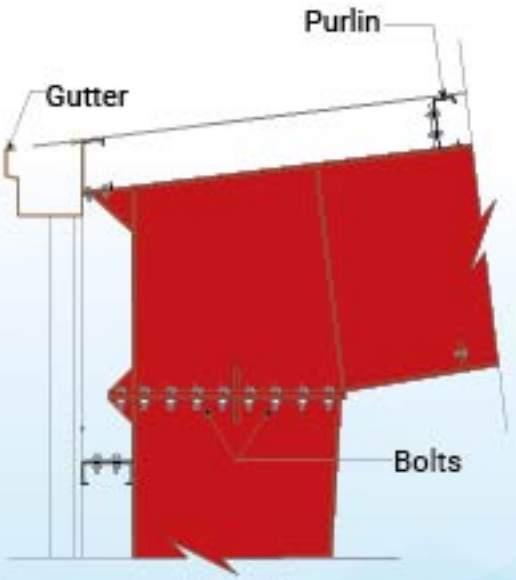
DRIP TRIM

Framing Connection Detail :



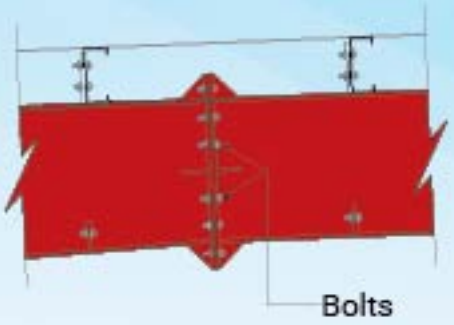


Detail-A

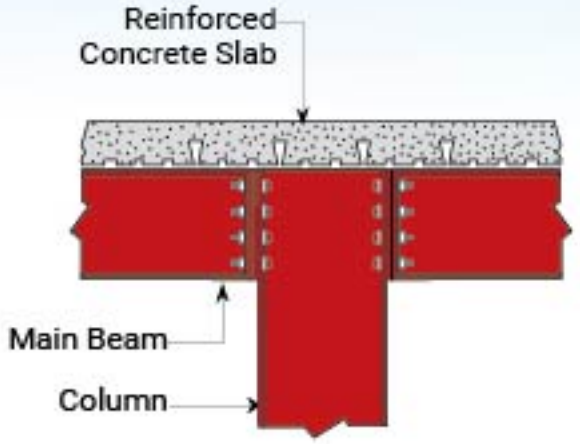


Detail-B

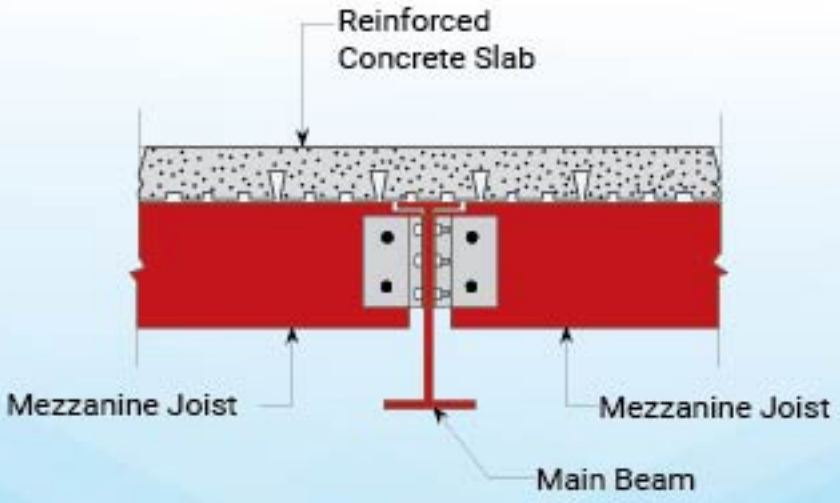
Framing Connection Detail :



Detail-C



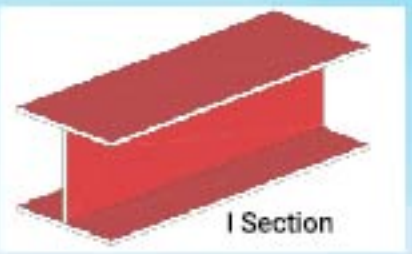
Detail-D



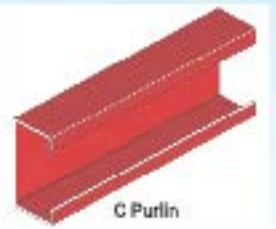
Mezzanine Joist
Connection to Main Beam

Steel Building Components :

a) Primary Build-up Section
Hot Rolled Plate-ASTM A570/ A577-50
or equivalent Fy=345 MPa



b) M.S Purlin and Girt
Rolled Formed High strength Steel.
Minimum yield Stress 345 MPa
(followed to offer)

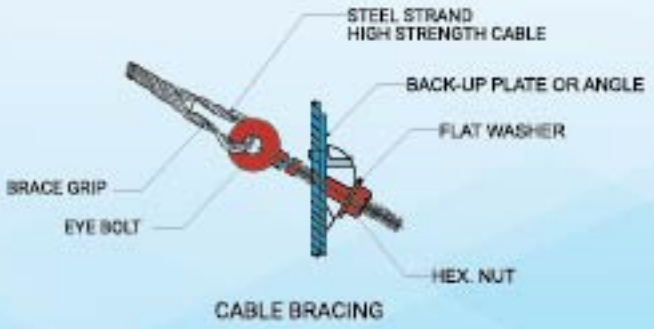


c) Electric Power Ventilator
Dia of Ventilator: 16"/18"/20"

Power Ventilator

d) Natural Ventilator
i) Dia of Ventilator: 14"/18"/20"
ii) Designed & constructed from
100% strong light weight Aluminum.
iii) Good for smoke/heat release ventilation
iv) Leak proof and operates under wing
load and without electricity.

Cable Bracing



STEEL BUILDING COMPONENTS:

LOUVER

CANOPY SYSTEM

GUTTER, DOWN PIPE

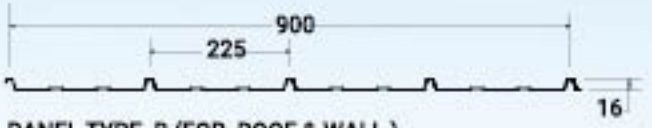
SKY LIGHT, BRACING SYSTEM

DOUBLE SLIDING DOOR

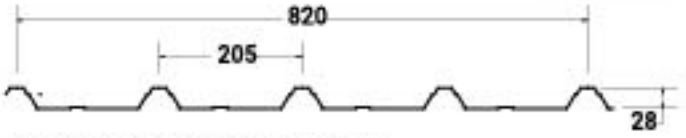
SHUTTER DOOR

ROOFING PROFILES:

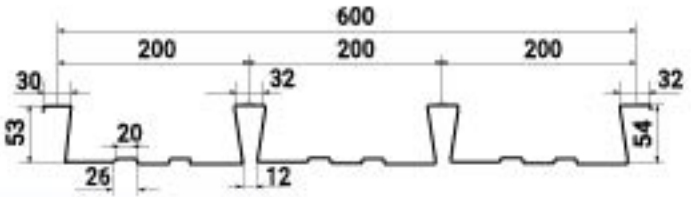
PANEL TYPE A (FOR ROOF & WALL)



PANEL TYPE B (FOR ROOF & WALL)



PANEL TYPE C (FOR ROOF & WALL)



DECKING PANEL

SANDWITCH PANEL 200 T(mm)=25,50,75,100

SANDWITCH PANEL 100 T(mm)=25,50,75,100

ERECTION METHODOLOGY:

Implementation Department of Structural Engineering Ltd. alwayes ensure the followings:

- Safety Measures.
- Materials unloading from Factory to Site.
- Tools list.
- Erection Team Member list.
- Procedure of Erection work.

SAFETY MEASURES :

Implementation Department of Structural Engineering Ltd. alwayes ensure the basic safety items (Helmets, Safety Belts, Safety Shoes, and Hand Gloves, Safety Nets) for erection team members.

MATERIALS UNLOADING FROM FACTORY TO SITE :

- From our factory materials are delivered using our regular vehicles (Trucks).
- Sending materials from factory are given painted with one coat grey oxide/ red oxide primer. Final coat are completed at site.
- Material unloading work to done manually or by crane.
- Delivered materials are placed at particular place at the time of unloading so that it are helpful for erection work.

Tools list:

Erection team provide the following tools. If any testing report of tools are required for the current project that also be submitted.

- All safety materials. Such as safety helmets, belt, shoes etc.
- Crane /Hydraulic
- Welding machines
- Gas cutter set with Oxygen and Acetylene cylinder
- Drill machine
- Screw gun
- Shear Stud Machine
- Different types of wrenches
- Scaffolding
- Stand pipes
- Soling ware
- Service cable
- Other supporting accessories
- Spanner
- Hammer

Erection Team Member List:

Before starting erection work, SEL alwayes provide team member list with their personal information and passport size photos.

Procedure of Erection work:

We alwayes maintain the following at the starting of erection work to finish of the work.

- Our erection coordinator will always be present there from the beginning to finish the work.
- After material delivery of certain portion of "Structure", we mobilize our erection team at site.
- After completing or arranging their living place or temporary shed at site, we also provide the supporting erection tools also.
- Tools and other small items will be stored in a temporary store room at site.
- At initial stage, erection team carry the members and start their materials sorting work from material unloading place to target place.
- For heavy materials lifting from PL to elevated area we use crane. Members of small types we carry manually.
- We use roller pipe or hand carrying systems (When necessary)
- Sometimes we use standpipe and chain pulley. (Where crane cannot be used)
- We use scaffolding and pipes for ereeting structures. (When require)
- Secondary joist will be fixed manually using ropes and chain pulley.
- After completing the main grid erection, we check the deflection limit of the erected section and then take necessary steps (if require)
- If required, welding machine and gas cutter set we use at site.
- After checking the super structure and getting clearance from site, we will start our decking sheet/ Root sheet fixing work.
- We use screw gun to fix the decking sheet on the secondary joist. Sometimes we use shear Stud gun to fix the shear studs to full fill the design requirement taking the power facility from site.
- Single one coat painting work we complete at site.

TORQUE DETAILS IN NUT BOLT TIGHTENING:

Size	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9	
	Lubricated		Dry		Lubricated		Dry		Lubricated		Dry		Lubricated		Dry	
	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft
M6	4	3	6	4	9	6	11	8	13	9	17	12	15	11	19	14
M8	12	8.5	15	11	22	16	28	20	32	24	40	30	37	28	47	35
M10	23	17	29	21	43	32	55	40	63	47	80	60	75	55	95	70
M12	40	29	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	65	47	80	60	120	88	150	110	175	130	225	165	205	150	260	190
M16	100	73	125	92	190	140	240	175	275	200	350	225	320	240	400	300
M18	135	100	175	125	260	195	330	250	375	275	475	350	440	325	560	410
M20	190	140	240	180	375	275	475	350	530	400	675	500	625	460	800	580
M22	260	190	330	250	510	375	650	475	725	540	925	675	850	625	1075	800
M24	330	250	425	310	660	475	825	600	925	675	1150	850	1075	800	1350	1000
M27	490	360	625	450	950	700	1200	875	1350	1000	1700	1250	1600	1150	2000	1500
M30	675	490	850	625	1300	950	1650	1200	1850	1350	2300	1700	2150	1600	2700	2000
M33	900	675	1150	850	1750	1300	220	1650	2500	1850	3150	2350	2900	2150	3700	2750
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2750	4750	3500

We do not use these values if a different torque value or we make sure fasteners threads tightening procedure is given for specific application are clean and that you properly

Torque values listed are for general use only. We check thread engagement. This tightness of fasteners periodically.will prevent from failing when tightening. Shear bolts are designed to fail under predetermined loads. We always replace shear bolts with identical propertyclass.

Fasteners should be replaced with the same or higher property class. If higher property class fasteners are used, these should only be tightened to the strength of The original.

"Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coating. "Dry" means plain or zinc plated without any lubrication.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, no to the bolt head. Tighten toothed or Serrated-type lock nuts to the full torque value.

GPS Positioning

Foundation Work

Digital Survey

Pilling Work

SEL CIVIL CONSTRUCTION

Our successful construction approach is based on active dedication, strong administration, accurate and low overhead are the motto of our farm. We employ only qualified engineers and sub-contractors who share our goal in creating a quality cost competitive project.

WHAT WE DO?

Architectural Design:

We do Conceptual drawing, Master Plan, 3-D Drawing, Rajuk/ Municipal/ Electrical Drawing as per Client's requirement with our knowledge, experience and expertise.

Structural Design:

We do safe and economic, easy and quick construction design as per Bangladesh National Building Code (BNBC).

Quantity Surveying:

We do accurate and quick estimate, Rate Analysis, Costing and Budgeting.

Project Planning and Progress Monitoring:

We do planning our project by MS Project with Critical Path and progress monitoring to complete the project with minimum time.

Cost Controlling and Monitoring:

We do Cash and Material Flow using MS Project and Cost monitoring by our software.

Quality Monitoring:

We do Concrete Strength, Brick, Sand, Stone-chip and MS Rod Test by BUET and Pile Integrity Test quality of construction. Piling with Integrity Test,

Floor Hardening, polishing:

We do floor hardening jobs to create a smooth path for fork lift movement. And floor polishing is a latest eco-friendly technology which is adapted by SEL.

Project Safety:

We do Safety Induction, Toolbox Meeting, Accident Reports and safety signs in-order to ensure safety during construction.

OUR PROJECT

Akij Food & Beverage Ltd. (2-Storied)
at Chattak, Sunamganj.

Golden Fiber Trade Center Ltd. at Jamalpur.

Rainbow Art Publicity at Narayanganj.

Bay Rubber Ltd. at Konabari, Gazipur.

Multi-purpose Shed of Savar Cantonment at Savar.

Five Rings Cement Mills Ltd. at Mongla Bagerhat.

OUR PROJECT

N.R Plastic Ltd. at Narsingdi.

ACI Godrej Agrovet (Pvt.) Ltd. (Repair) at Sirajganj.

Hatim Gas Generator Building, Gazipur.

Aesthetic Fashion Ltd. at Gazipur

BUET Civil Lab Extension

Reflection Products Ltd. at Bogura

OUR PROJECT

Akij Jute Mills Ltd. (Building No - 03)
Gopalganj

Akij Food & Beverage Ltd. (Snacks Building)
Dhamrai, Dhaka.

Hosaf Power Plant House at Noakhali

Akij Food & Beverage Ltd. Compressore Building
Dhamrai, Dhaka.

Axis Knitwear Ltd. Gazipur.

Dhaka Metropolitan Police, Mirpur

OUR PROJECT

Gumti Textiles Ltd. Shafipur, Gazipur

Akij Food & Beverage Ltd. (Electric Panel Buld.)
Dhamrai, Dhaka.

Union Steel Tubes Ltd. (Ware House)
Narayanganj.

Pentagon Fashion Wear Ltd. Gazipur.

Union Steel Tubes Ltd. (Office Building)
Narayanganj.

Way Agro Industries Ltd. at Bogra

OUR PROJECT

AG Ceramics Ltd. Habiganj

Akij Plastic Ltd. Chhatak, Sunamganj.

Akij Stadium, Jessore

Dubai Bangladesh Cement Mill Ltd. Mongla, Khulna

Hatim Factory-2, Narayanganj

Hatim Steel Structures Ltd. at Rupganj

OUR PROJECT

Nourish Poltry & Hatchery Ltd. at Jhenaidah

Reverie Power & Automation Engineering Ltd. at Narsingdi.

AG Poly & Fiber Industries Ltd. Habiganj

SR Chemical Industries Ltd. at Bogra

Akij Jute Mills Ltd. at Gopalganj
Building No - 01

Akij Jute Mills Ltd. at Gopalganj
Building No - 02

OUR PROJECT

Akij Juit Mills-4, Gopalganj

National Auto Rich Mills, Jamalpur

Red Crescent Project, Dhaka

Juit Mills, Gopalganj

Triplex Building, Mirpur-11

Nourish Project, Sreepur, Gazipur

OUR PROJECT

at Dhamrai ,Dhaka

Popular Pharmaceuticals, Tongi, Gazipur

Union Steel, Rupganj, Narayanganj

Bhandhap Tex, Narsingdi

9 Storied Commercial Building, Dhaka

DMP, Demra, Dhaka

OUR CORPORATE OFFICE

OUR FACTORY

OUR FACTORY MACHINARIES

IRON WORKER MACHINE

BENDING MACHINE

RADIAL DRILL MACHINE

PURLIN MACHINE

AUTO WELDING MACHINE

OVERHEAD CRANE

OUR FACTORY MACHINARIES

PURLINE & SHEET FORMING

SUBSTATION

SHEAR MACHINE

MIG WELDING MACHINE

GAS DRILL MACHINE

GENERATOR MACHINE

SBMA
BANGLADESH

Membership Certificate

This is to certify that

STRUCTURAL ENGINEERING LTD.

is a member of the

STEEL BUILDING MANUFACTURERS ASSOCIATION OF BANGLADESH

Membership No. 38

Jowher Rizvi
President

Md. Rashed Khan
General Secretary

OVERALL HEALTH SAFETY AND ENVIRONMENT POLICY:

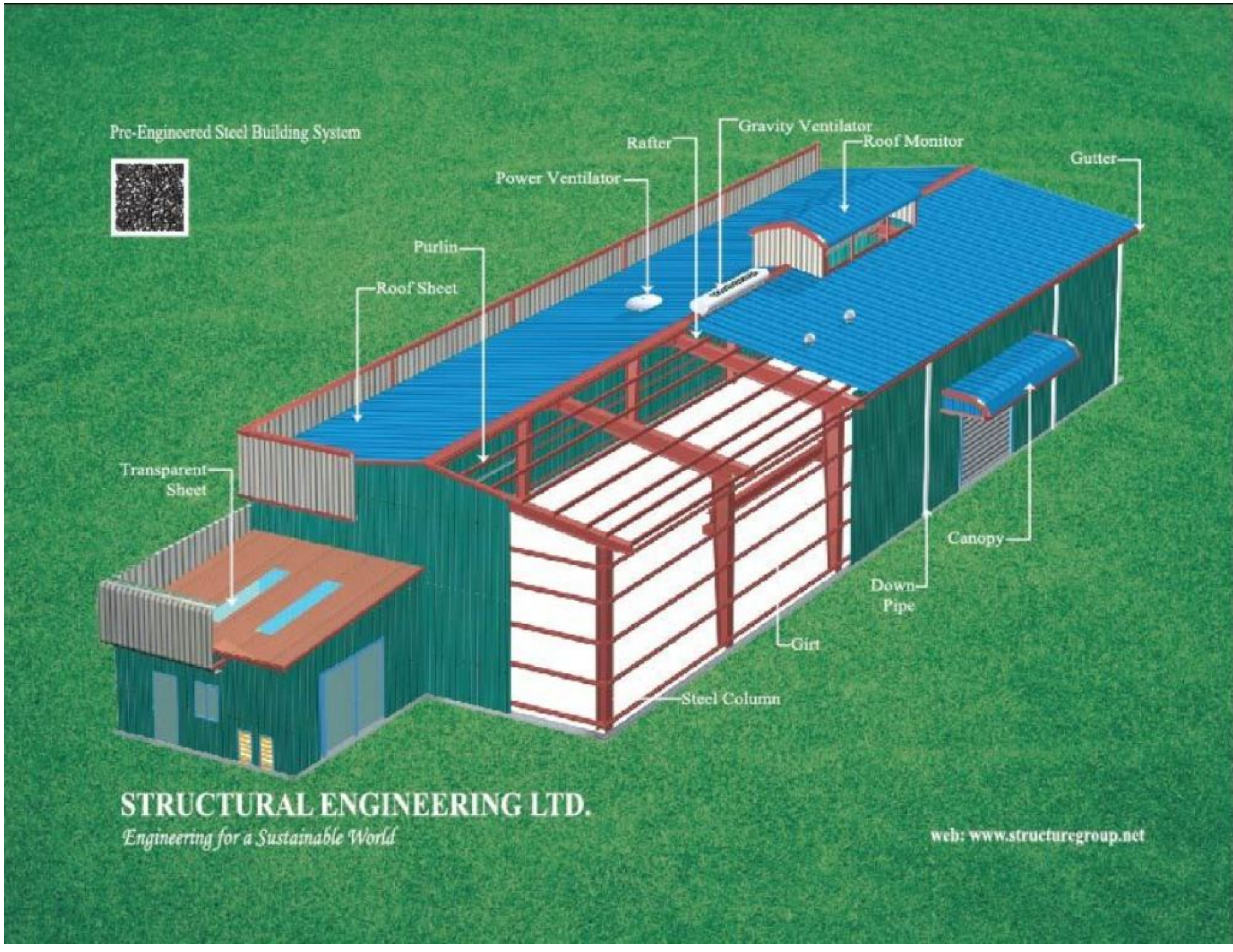
Zero Harm to plant, people and environment is our ultimate focus and is an important driver for continuous improvement in health and safety performance. Zero Harm is the core belief for all our Safety Management Systems. Our Health and Safety Policy is the foundation for driving safety consciousness within the Company and amongst all our stakeholders. A robust management system framework and a sound safety governance structure drive this policy. To achieve our corporate objective of 'Zero Harm', six long-term safety strategies have been prioritized and are being implemented through Central Safety Committees across organization. The progress is monitored and reviewed at different levels.

OHSE STRATEGIES:

- Working safely is a condition of employment.
- Employee involvement is essential.
- Management is accountable for Safety Performance.
- All injuries can be prevented.
- Training employees to work safely is essential.
- All operating exposures can be safeguarded.

Safety in SEL is top driven. Central safety Committee consists of the Senior Leadership Team including the Managing Director and all the stake holders of the organization, responsible for implementing and reviewing the safety in plants and off-side construction sites. Monthly review meeting agenda includes Safety KPIs– Target Vs Actuals, Safety performance of each of the plant, offsite construction sites, Environmental performance – Electricity consumption, water consumption, CHG emission, review of safety incidences SSOs (Significant Safety Occurrences). A robust management system framework and a sound safety governance structure drive our health and safety measures.

A PART OF OUR VALUABLE CLIENTS LIST


Pre-Engineered Steel Building System
Rafter
Gravity Ventilator
Roof Monitor
Gutter
Power Ventilator
Purlin
Roof Sheet
Transparent Sheet
Canopy
Down Pipe
Girt
Steel Column
STRUCTURAL ENGINEERING LTD.
Engineering for a Sustainable World
web: www.structuregroup.net