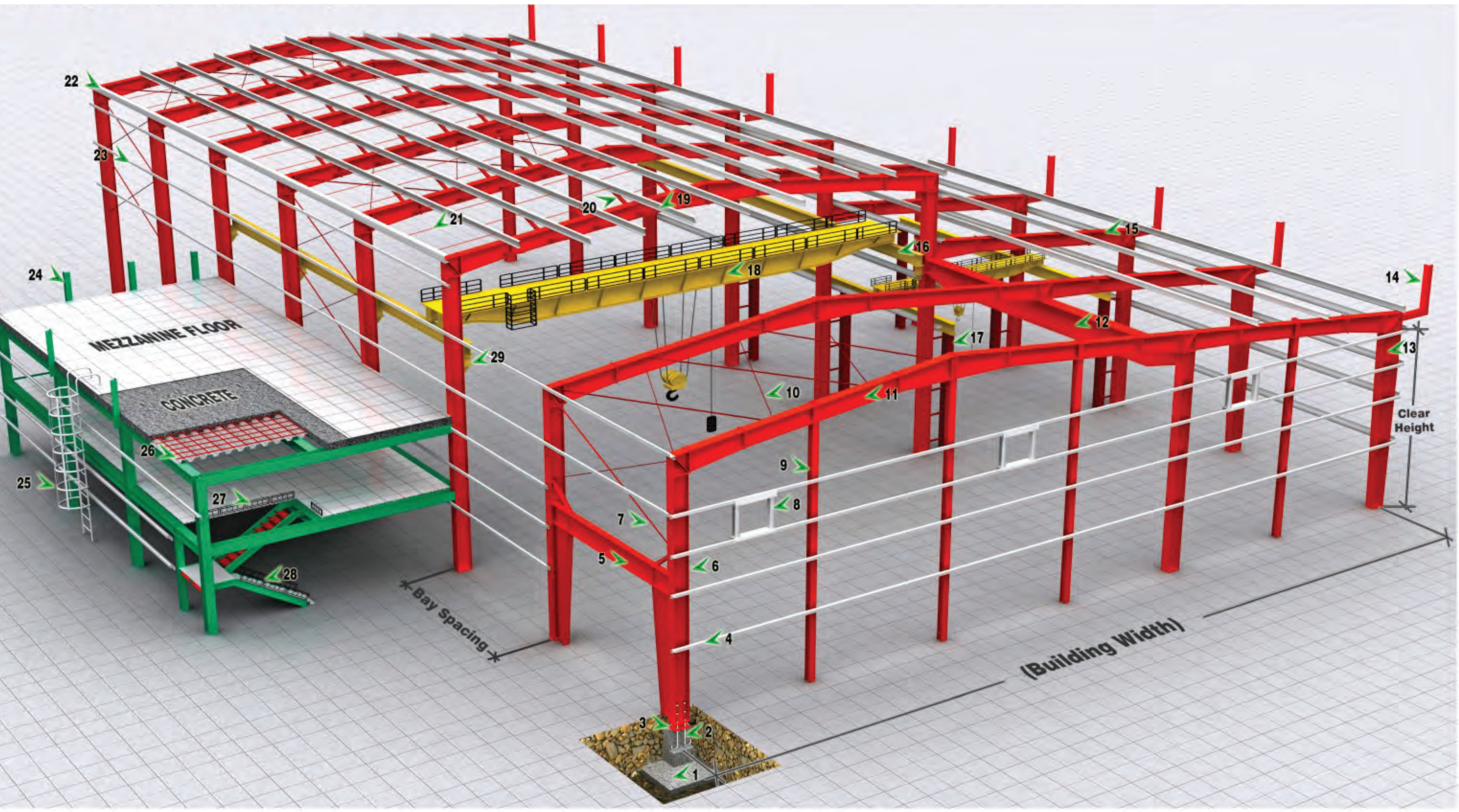
Kirby BUILDING SYSTEMS

TECHNICAL HANDBOOK

COMMITTED TO EXCELLENCE

PRE-ENGINEERED BUILDINGS

PEB Skeleton Structure



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25. Cage Ladder
26. Deck Panel with Steel Mesh
27. Hand Rail (Steel)
28. Staircase (Checker Plate/C Channel
29. Crane Bracket

PEB Advantages

Faster construction

Economical

Space flexibility - Larger spans for flexible interior design

High quality and durability

Environmentally friendly

Adjustable design -Can cater to future expansions (vertical and horizontal)

Minimal maintenance

Seismic (earthquake resistant) design

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INTRODUCTION

1.1 INTRODUCTION

The purpose of the **Kirby Technical Handbook** is to assist the building designer or potential metal building owner in the proper and economical use of the pre-engineered buildings (**PEB**) and **structural steel** systems.
It is further intended that building officials, architects, designers, consultants and engineers will refer to and apply the data in this manual when considering approval of Kirby buildings.

Kirby buildings are designed by professional engineers and this manual was prepared under their direct supervision.

Dimensions and units used in this manual are in accordance with SI-the International System of Units. Where applicable, the unit now in common use is also shown for reference.

This manual is the property of **Kirby Building Systems** and will be revised periodically as changes are innovated. Architectural, structural and mechanical adaptations shown in this manual are intended to be typical only and Kirby therefore accepts no responsibility unless specifically agreed in writing.

1.2 DRAWINGS, CALCULATIONS & COMPANY PROFILE

Prices for all buildings include one set of printed building installation drawings, shipper and one building installation procedure manual sent with shipment and four sets of building installation drawings issued to the client via the sales office prior to the time of shipment.

If required, two sets of standard computer calculations for main frame cross section, and load tables for purlins, girts, and covering will be furnished upon request. If calculations are required, under no circumstances will Kirby begin fabrication until one set is returned approved, unless approval is waived in writing by the client. In lieu of calculations, a Letter of Certification (signed by a Professional Engineer) can be furnished at no charge.

When requested, four sets of approval building installation drawings will be furnished. No further work will be done by Kirby until one set of drawings Is returned "Approved" or "Approved as Noted". Resubmittal of approval drawings will be only at the request of the client, otherwise Kirby will incorporate the noted amendments in the final building installation drawing when issued for construction.

Drawings submitted for approval constitute an integral part of the contract between the client and Kirby. The contents of the Approval Building installation drawings are intended specifically for the job at hand; and therefore, they supersede, in case of contradiction, any other information published for general use.

Anchor bolt plans will be issued "For Construction" after receipt of signed approval drawings. Only drawing stamped "For Construction" shall he used for setting anchor bolts and building installation.

Company profile:

Kirby Building Systems is the pioneer manufacturer of steel buildings and structures in GCC, Middle East, Eastern Europe & CIS, Africa, Indian Sub-Continent and South East Asia. In operation since 1976, Kirby maintains a strong reputation for providing cost effective solutions for buildings manufactured to the highest quality standards. 'Quality' for KIRBY epitomizes a combination of speed of construction, safety of the structure, sustainability against natural and man-made disasters, suitability to the purpose, unmatched pre and post sales service, scalability, and substantial savings in terms of both time and money.

Kirby's state of the art manufacturing plants produce hundreds of custom made steel buildings each year. Kirby plants are located in Mina Abdullah- Kuwait, Ras Al Khaimah- UAE, Hyderabad and Haridwar- India. Combined Kirby has a total production capacity of 425,000 MT per year. Kirby has been ISO 9001:2008 certified company since 2010.

In the Middle East and African region, Kirby manufactures Pre-Engineered and Structural Steel out of two manufacturing locations in Ras Al-Khaimah, UAE and Mina Abdullah, Kuwait. In Southeast Asia, a manufacturing plant in Ho Chin Minh City, Vietnam.

Kirby's sales and distribution network includes 24 offices in the GCC countries (Kuwait, Saudi Arabia- Riyadh, Dammam and Jeddah, Qatar, Oman, Bahrain and Dubai and Abu Dhabi in the UAE), the Middle East, and Africa.

Kirby has designed, manufactured and supplied more than 50,000 steel buildings and established its presence as an industry-leading steel structures company. Kirby delivers customized pre-engineered and steel structures to a broad range of customers in sectors such as Oil & Gas, Infrastructure, Industry and Commercial building applications.

Kirby's customer base covers thousands of satisfied clients including General Motors, AT&T, PepsiCo and Coca Cola, Ministries of Defense, Oil companies and Petrochemical projects and other key international organizations over the world.

Kirby Building Systems is a wholly-owned subsidiary of Alghanim Industries. Alghanim Industries has consistently maintained its position as a leading private sector trading and industrial group both in Kuwait and the GCC during the past 60 years. It is a privately owned, professionally managed holding company. The executive management is composed of professionals with international education and experience in varying areas of expertise. Overall, with the company's wholly owned subsidiaries, joint ventures and associations, Alghanim Industries employs over 8,000 people from over 40 different countries around the world.

The group's major areas of activity are trading and distribution of consumer electronics, food and consumables, automotive vehicles and products, industrial manufacturing, engineering, technology, travel, shipping and transportation services, advertising, insurance and contracting.

Furthermore each of Alghanim's separate businesses employs operating autonomy with its own general manager, marketing managers and finance managers. Corporate policy matters remain centrally controlled and direction is provided through strategic business planning processes, quarterly operating review meetings and long term forecasting.

Multinational in both outlook and operation, Alghanim Industries has offices in countries that span four continents. The diverse nationalities of the employees contribute to the company's strength and widen its perspective. Alghanim Industries has successfully fused progressive business procedures, local market place requirements and international resources.

1.3 DEFINITION OF TERMS

ACCESSORY -
A building component added to a basic Kirby structure, such as door, window, ventilator, etc.
AISI -
American Iron and Steel Institute
AISC -
American Institute of Steel Construction
ALUMINIZED -
Aluminum coated steel
ANCHOR BOLTS -
Bolts used to anchor structural members to a foundation or other support
ANCHOR BOLT DRAWINGS -
Show the size, location and projection of all anchor bolts for the components of the metal building system, the length and width of the foundation (which may vary from the nominal size of the metal building system) and column reactions(magnitude and direction). The maximum base plate dimensions may also be shown.
APPROVAL DRAWINGS -
Include anchor bolt drawing, framing plans, elevations and sections through the building for approval of the buyer / or his consultant.
ASSEMBLY -
Two or more components welded together.
AUTOMATIC WELDING -
A welding procedure utilizing a machine to make a weld.
AUXILIARY LOADS -
All dynamic live loads required by the contract documents such as cranes and material handling systems.
A. W.S. -
American Welding Society
AXIAL FORCE -
A force tending to elongate and shorten a member.
B C -
Beam and Column building. A single gable, rigid frame building with interior columns.
BASE ANGLE
A continuos angle secured to foundation to support wall panel
BASE CHANNEL -
A light gauge cold formed channel which replaces the base angle when liner panel or double sheeted partitions are required.
BASE PLATE -
A plate attached to that portion of a beam or column that rests on the supporting surface, usually secured with anchor bolts.
BAY (END) -
The distance between first interior frame and inside of endwall panel.
BAY (INTERIOR) -
The distance between center lines of two rigid frames or transverse bents, measured parallel to the ridge.
BEAM -
A structural member usually horizontal carrying vertical loads which is ordinarily subjected to bending.
BEAM, CANTILEVER -
A beam supported at one end only and free at the other; such as brackets, canopies, flagpoles.
BEAM, CONTINUOUS -
A beam which has more than two points of support, (continuous span).
BEAM, SIMPLE -
A beam simply supported at both ends, theoretically with no rotational end restraint.
BEARING FRAME -
Frame made up of beams and columns so constructed that joints are not capable of transferring moment due to lateral loads, usually used at sheeted endwalls of a metal building, and when not subject to auxiliary loads or to further building expansion.
BILL OF MATERIALS -
A list of items or components used for fabrication, shipping, receiving and accounting purposes.
BIRD SCREEN -
Wire mesh used to prevent birds from entering the building through ventilators and louvers.

BLIND RIVET-
A small headed pin with expandable shank for joining light gauge metal. Typically used to attach flashing, gutter, etc.
BRACE RODS, ANGLES -
Braces used in roof and walls to transfer loads, such as wind loads, seismic and crane longitudinal load to the foundation.
BRACKET -
A structural support projecting from a wall or column on which to fasten another structural member. Examples are canopy brackets, lean-to brackets and crane runway brackets.
BRIDGE CRANE -
A load lifting system consisting of a hoist which moves laterally on a beam, girder or bridge which in turn moves longitudinally on a runway made of beams and rails. Loads can be moved to any point within a rectangle formed by the bridge span and runway length.
BRIDGING -
Structural members used to give weak axis stability to open web joists.
BRITISH THERMAL UNIT (BTU) -
That amount of heat required to raise the temperature of one pound (0.454 kg.) of water by 1°F (0.560°C).
BUILDER -
A general contractor or sub-contractor responsible for providing and erecting pre-engineered buildings.
BUILDING CODE -
Regulations established by a recognized agency describing design loads, procedures and construction details for structures.
BUILT-UP ROOFING -
A roof covering made up of alternating layers of tar and asphaltic materials (mostly used for flat roofs).
BUILT-UP SECTION -
A structural member, usually an " I " section, made from individual flat plates welded together.
BUTT PLATE -
The end plate of a structural member usually used to rest against a plate of another member in forming a connection. Sometimes called a splice plate or bolted end plate.
BY-FRAMED WALL -
A wall framing system where the girts are mounted on the outside of the column.
BUTTERFLY CANOPY -
A free standing, single column supporting roof structure, having a valley gutter at the centerline of the building, and the two outer edges of the roof projecting upwards.
"C" SECTION -
A member cold formed from steel sheet in the shape of a block "C" with or without lips at edge of flanges.
CALORIE -
Quantity of heat required to raise the temperature of one gram of water through 1°C (1 BTU = 252 Calories)
CAMBER -
Upward curvature of a beam in the plane of its web before loading, to offset an anticipated deflection when load is applied
CANOPY -
A projecting beam that is supported and restrained at one end only.
CAPILLARY ACTION -
That action which causes movement of liquids when in contact with two adjacent surfaces such as panel sidelaps.
CAP PLATE -
A plate located at the top of a column or end of a beam for capping the exposed end of the member.
CAULK -
See sealant.
CHANNEL- HOT ROLLED -
A "c" shaped member formed while in a semi-molten state at the steel mill to a shape having standard dimensions and properties.
CLIP -
A plate or angle used to fasten two or more members together.
CLOSURE STRIP -
A resilient strip formed to the contour of ribbed panels and used to seal around openings created by metal panels joining other components and at horizontal and vertical corners of a building.
COLD FORMING -

The process of using press brakes of rolling mills to shape steel into desired cross sections at room temperature.

COLLATERAL LOAD -
All additional dead loads required by the contract documents other than the weight of the metal building system such as sprinklers, mechanical and electrical systems and ceilings.

COLUMN -
A main member used in a vertical position on a building to transfer loads from main roof beams, trusses, or rafters to the foundation

COMPONENT -
A part of a metal building system.

COMPRESSION -
The act of causing material to contract or shorten.

CONCENTRATED LOAD -
A load applied on a member at a point or over a very short distance.

CONTINUITY -
The terminology given to a structural system denoting the transfer of loads and stresses from member to member as if there were no connections.

CONTRACT DOCUMENTS -
The documents which define the responsibilities of the parties involved in the sale, design, supply and building installation (if any) of a metal building system. Such documents normally consist of a contract and specification. Plans may be included.

CORNER TRIM -
Preformed sheet metal trim used to close the junction of sidewall and endwall sheets.

COVERING -
The exterior metal roof and wall paneling of a metal building system.

CRANE -
A machine designed to move material by means of a hoist.

CRANE RAIL -
A track supporting and guiding the wheels of a bridge crane or trolley system, and mounted on crane runway beams.

CRANE RUNWAY BEAM -
The member that supports a crane rail and is supported by columns or rafters depending on the type of crane system. On under hung bridge cranes, runway beams also act as crane rail.

CURB -
A raised edge on a concrete floor slab.

CURTAIN WALL -
Perimeter wall panels which carry only their own weight and wind load.

DAMPER -
A baffle used to open or close the throat of ventilators.

DEAD LOAD -
The self weight of the metal building system construction, such as framing, and covering members.

DEFLECTION -
The displacement of a structural member or system under load.

DESIGN LOADS -
The loads expressly specified in the contract documents which the metal building system is designed to safely resist.

DIAGONAL BRACING -
See Brace Rods

DIAPHRAGM ACTION -
The capacity of a roof, wall, or floor system to resist load in its own plane. (As building roof and wall systems resisting longitudinal wind load without rod bracing).

DOOR GUIDE -
An angle or channel guide used to stabilize or keep plumb a sliding or rolling door during its operation.

DOWNSPOUT -
A conduit used to carry water from the gutter of a building.

DRIFT PIN -
A tapered pin used during building installation to align holes in steel members to be connected by bolting (also called spud wrench).

EAVE -
The line along the sidewall formed by the intersection of the planes of the roof and wall.

EAVE GUTTER -
See Gutter.

EAVE HEIGHT -
The vertical dimension from bottom of column base plate to top of the eave strut.

EAVE STRUT -

A structural member located at the eave of a building which supports roof and wall paneling. Also member which transmits longitudinal wind forces on endwall from roof brace rods to wall brace rods.

ELASTIC DESIGN -
A design concept utilizing the proportional behavior of materials when all stresses are limited to specified allowable values of the yield stress of the materials.

END FRAME -
A frame located at the end wall of a building which supports the loads from a portion of the end bay.

END WALL -
An exterior wall which is perpendicular to the ridge of the building.

END WALL COLUMN -
A vertical member located at the end wall of a building which supports the girts.

END WALL EXTENSION -
The projection of the roof past the endwall.

BUILDING INSTALLATION -
The on-site assembling of fabricated components to form a complete structure.

BUILDING INSTALLATION DRAWINGS -
A package of drawings, issued for construction and includes anchor bolt drawings and roof and Wall framing (building installation) plans that identify individual components and accessories furnished by Kirby in sufficient detail to permit proper building installation of the building.

EXPANSION JOINT -
A break or space in construction to allow for thermal expansion and contraction of the materials used in the structure.

FABRICATION -
The manufacturing process performed in a plant to convert raw material into finished metal building components. The main operations are cold forming, cutting, punching, welding, cleaning and painting.

FASCIA -
A structural framing member projecting from the face of a wall for decorative purposes.

FIELD -
The “job site”, “building site” or general marketing area.

FILLER STRIP -
See “Closure”.

FIXED BASE -
A column base that is designed to resist rotation as well as horizontal or vertical movement (develops bending moment).

FLANGE -
The projecting portion of a structural member (C, I, H shapes).

FLANGE BRACING -
A bracing member used to provide lateral support to the compression flange of a beam, girder or column.

FLASHING -
See Trim.

FLUSH FRAMES -
A wall framing system where the outside flange of the girts and columns are flush.

FOOTING -
A pad or mat, usually of concrete, located under a column, wall or other structural member, that is used to distribute the loads from that member into the supporting soil.

FOUNDATION -
The substructure which supports a building or other structure.

FRAME -
Primary structural members made up of columns, rafters which support secondary framing.

FRAMED OPENING -
Jambs, headers and flashing which surround an opening in the wall of a metal building.

GABLE -
The triangular portion of the endwalllocated above the elevation of the bottom of eave strut.

GABLE ROOF -
A ridged roof that terminates in gables.

GAGE -
Distance between holes along transverse axis of plate.

GAUGE -

Numerals referring to thickness of thin sheeting materials. No direct mathematical relation between gauge number and
thickness; the higher the gauge number, the thinner the sheeting material.

GALVANIZED -
Steel coated with Zinc for corrosion resistance.

GIRDER -
A main horizontal or near horizontal structural member that supports vertical loads. It may consist of several pieces.

GIRT -
A horizontal structural member that is attached to sidewall or endwall columns and supports panelling.

GLAZE OR GLAZING -
The process of installing glass in windows and doors.

GRADE -
The term used when referring to the ground elevation around a building.

GRADE BEAM -
A concrete beam around the perimeter of a building.

GROUT -
A mixture of cement, sand and water used to fill cracks and cavities. Sometimes used under base plates or leveling plates to obtain uniform bearing surfaces. Not normally used in conjunction with metal building systems.

GUSSET PLATE -
A steel plate used to reinforce or connect structural elements.

GUTTER -
A light gauge metal member at an eave, valley or parapet designed to carry water from the roof to downspouts or drains.

"H" Section -
A steel member with an H cross section.

HAIRPIN -
U-shaped reinforcing steel or round bar hooked around anchor bolts and embedded in concrete floor mass, to transfer the horizontal thrust at the base of the rigid frames to the concrete floor.

HAUNCH -
The deep-end portion of a column or rafter designed to accommodate the higher bending moments at such point. (Usually occurs at the connection of column and rafter). Also referred to as Knee.

HAUNCH BRACE -
A diagonal brace from the intersection of the column and rafter section of the rigid frame to the eave to prevent lateral buckling of the haunch.

HEADER -
The horizontal framing member located at the top of a framed opening.

HEM -
Edge of trim or flashing turned 180 degrees on itself for increased strength.

HIGH STRENGTH BOLTS -
Any bolt made from steel having a tensile strength in excess of 100,000 pounds per square inch(690 MPa).

HIGH STRENGTH STEEL -
Structural steel having a yield stress in excess of 36,000 pounds per square inch (250 MPa).

HINGED BASE -
A column base which is designed to resist horizontal and vertical movement but not rotation. Also referred to as pinned base.

HIP ROOF -
A roof which rises by inclined planes from all four sides of a building. The line where two adjacent sloping sides of a roof meet is called the Hip.

HOIST -
A mechanical lifting device usually attached to a trolley which travels along a bridge, monorail or jib crane. May be chain or electric operated.

HOOD -
Metal flashing to cover exterior sliding door track along the full length of the door header.

HOT ROLLED SHAPES -
Steel section (angles, channels, S-shapes, W-shapes, etc.) which are formed by rolling mills while the steel is in a semi-molten state.

IMPACT LOAD -
A dynamic load resulting from the motion of machinery, elevators, crane ways, vehicles, and

other similar moving forces. See Auxiliary Loads.

IMPACT WRENCH -
A pneumatic device used to tighten nuts on bolts.

INSULATION -
Any material used in building construction to reduce heat transfer.

INTERNAL PRESSURE -
Pressure inside a building which is a function of wind velocity and number and location of openings.

JACK BEAM -
A beam used to support another beam or rafter or truss and eliminate a column support.

JAMB -
The vertical framing members located at the sides of wall openings.

JIB CRANE -
A cantilevered boom or horizontal beam with hoist and trolley. This lifting machine may pick up loads in all or part of a circle around the column to which it is attached.

JIG -
A device used to hold pieces of material in a certain position during fabrication.

JOIST -
Open web beam for supporting the floor or roof, made of continuous angular top and bottom chords which are connected with vertical and diagonal angles. For open web joist, the joist can be built-up or hot rolled.

KICK-OUT -
An extension attached to the bottom of a downspout to direct water away from a wall. Also referred to as Turn-Out or Elbow.

KILO-CALORIE (K.CAL) -
Quantity of heat required to raise the temperature of one Kilogram of water by 1°c.

KILOGRAM -
Metric Unit of Mass. (1 Kg 2.2 lbs).

KIP - An imperial unit to measure force equal to 1000 pounds equivalent to 4.4 kilo newtons.

KIRBY-DECK PANEL -
Standard corrugated panel used for floor deck.

KIRBY-RIB PANEL -
Standard corrugated panel used for roof, liner and soffits.

KIRBY-WALL PANELS -
Standard corrugated panel used for exterior surface of walls.

KNEE BRACE -
A diagonal brace designed to resist horizontal loads usually from wind or moving equipment connecting the column to a beam by forming a rigid triangle.

LEAN - TO -
A structure such as a shed, having only one column and depending upon another structure for partial support.

LEVELING PLATE -
A steel plate used on top of a foundation or other support on which a structural column can rest.

LINER PANEL -
A metal panel attached to the inside flange of the girts, or the purlin.

LINTEL -
A beam: concrete, steel or stone, in masonry walls, placed above doors, openings or windows to support masonry above.

LIP -
A stiffener at the edge of flange of cold formed members.

LIVE LOAD -
Any moving or variable load which the structure must support due to the use or occupancy of the building.

LOUVER -
An opening provided with fixed or movable, slanted fins to allow flow of air.

MAIN MEMBERS -
The main load carrying members of a structural system including columns,end wall posts, rafters and other main support members.

MANSARD FASCIA -
A tilted fascia projected from the wall and extended above roof line to form as decorative appearance and to hide the roof line.

MASONRY -
Construction materials such as bricks, concrete

blocks, ceramic blocks, and concrete.

MASTIC -
Material used to seal cracks, joints and laps.

MBMA -
Metal Building Manufacturers Association.

MBMA CODE OF STANDARD PRACTICES -
A listing of normal conditions that apply to the sale, design, fabrication and building installation of a metal building system.

METAL BUILDING SYSTEM -
A metal building system consists of a group of coordinated components, including structural members, exterior covering panels, fastening devices and accessories, which have been designed for specific loads, which will work together compatibly and which have been engineered so that they may be mass produced and assembled in various combinations, or in a combination with various collateral materials, to provide an enclosed or partially enclosed structure.

METER -
Metric unit of length (1 m = 3.28 ft.)

MEZZANINE -
An intermediate floor within a metal building used for offices or storage, may or may not be connected to main frame building, and consisting of beams, columns, joists, deck and edge angles to receive reinforced concrete.

MICRON -
Equivalent to 0.001 Millimeter.

MIL -
Equivalent to 0.001 inch

MOMENT -
The tendency of a force to cause rotation or bending about a point or axis. Force times a distance (Torque).

MOMENT CONNECTION -
A connection designed to transfer moment as well as axial and shear forces between connecting members.

MOMENT OF INERTIA -
A physical property of a member which helps define strength and deflection characteristics.

MONITOR -
Raised gable or triangular portion of main building at ridge location to allow lighting or ventilation at vertical sides of monitor.

MONOLITHIC CONSTRUCTION -
A method of pouring concrete grade beam and floor slab together to form the building foundation without forming and pouring each separately.

MONORAIL -
A single rail support for a material handling system. Normally a standard hot rolled I-Beam.

MPa -
Mega Pascal

MULLION -
Vertical member connecting two windows located side by side.

MULTI-SPAN BUILDING -
Building consisting of more than one gable across the width that may or may not have interior columns within each gable.

NEWTON -
Metric unit of force (1 N = 0.2248 lbf)

PANEL -
Gauge metal sheets usually with ribbed configuration and used for Roof and Wall skins

PARAPET -
That portion of the wall which extends vertically above the roof line to form a fascia type appearance.

PARTITION -
An interior dividing wall.

PASCAL -
Metric unit of stress or pressure, force per unit area (N /M2)

PEAK -
The uppermost point of a gable.

PEAKPANEL -
A" Kirby-Rib" panel located at the building peak conforming to roof slopes.

PEAK SIGN -
A sign attached to the peak of the building at endwall showing Kirby as the building manufacturer.

PERSONNEL DOOR -
A door used by personnel for access to and exit

from a building.
PIECE MARK -
A number given to each separate part of the building for building installation identification. Also called mark number and part number.
PIER -
A concrete structure designed to transfer vertical load from base of column to a footing.
PIG SPOUT -
A sheet metal section designed to direct the flow of water out through the face of the gutter rather than through a downspout.
PILASTER -
A reinforced or enlarged portion of a masonry wall to provide support for roof loads or lateral loads on the wall.
PINNED BASE -
A column base that is designed to resist horizontal and vertical movement, but not rotation.
PIN CONNECTION -
A connection designed to transfer the axial and shear forces between connecting members, but not moments.
PITCH -
Distance between holes along longitudinal axis of plate.
PLASTIC DESIGN -
A design concept based on multiplying the actual loads by a suitable load factor using the yield stress as the maximum stress in any member.
PLASTIC PANELS -
See Translucent Light Panels.
PONDING -
The gathering of water at low or irregular areas on a roof.
POP RIVET -
See" Blind Rivet".'
PORTAL FRAME -
A rigid frame structure so designed that it offers rigidity and stability in its plane. It is used to resist longitudinal loads where diagonal bracing is not permitted. (also "Wind Bent").
POST (END POST) -
See" End Wall Column".
ROOF SNOW LOAD -
The load induced by the weight of snow on the roof of the structure.
ROPESEAL -
(See "Sealant").
PRE-ENGINEERED BUILDING -
A building structure that consists of pre-engineered, pre-fabricated factory components that are combined together and engineered structurally.
PRE-PAINTED COIL -
Coil metal which received a paint coating prior to the forming operation.
PRESS BRAKE -
A machine used in cold-forming metal sheet or strip into desired cross section.
PRESTRESSED CONCRETE -
Concrete in which the reinforcing cables, wires or rods in the concrete are tensioned before there is load on the member, holding the concrete in compression for greater strength.
PRISMATIC BEAM -
A beam with uniform rectangular cross section.
PURLIN -
A horizontal structural member attached to the main frames which supports roof panels.
RF -
A single gable rigid frame building.
RAFTER -
The main beam of the frames supporting the roof system.
RAKE -
The intersection of the plane of the roof and the plane of the endwall.
RAKEANGLE -
Angle fastened to purlins at rake for attachment of endwall sheets.
RAKETRIM -
Sheet metal flashing used to cover the intersection of the roof and the endwall of a building.
REACTIONS -
The resisting forces at the column bases of a frame, holding the frame in equilibrium under a given loading condition.

REINFORCING STEEL -
The steel bars placed in concrete to help carry the tension, compression and shear stresses, as well as temperature stresses.
RIDGE -
Highest point on the roof of the building which describes a horizontal line running the length of the building.
RIDGE CAP -
A transition of the roofing materials along the ridge of a roof.
RIGID CONNECTION -
See" Moment Connection".
RIGID FRAME -
A structural frame consisting of members joined together with rigid (or moment) connections so as to render the frame stable with respect to the design loads, without the need for bracing in its plane.
ROLL-UP DOOR -
Door that is supported on a shaft or drum and a vertical track.
ROOF COVERING -
The exposed exterior roof skin consisting of panels or sheets,
ROOF LIVE LOAD -
Those loads induced by the use and occupancy of the building, not including wind load, seismic load, dead load or snow load.
ROOF OVERHANG -
A roof extension beyond the endwall or sidewall of a building.
ROOF PITCH -
Ratio of rise to total width of a single slope.
ROOF SLOPE -
The angle that a roof surface makes with the horizontal. Usually expressed in units of vertical rise to 10 units of horizontal run.
S S -
Single Slope clear span buildings
S V -
Space Saver building - a single gable clear span with straight columns and flush girts to offer maximum clearances.
SAG ROD, STRAP, OR ANGLE -
A tension member used to limit the deflection of a girt or purlin in the direction of the weak axis.
SANDWICH PANEL -
A panel assembly used as covering; consists of an insulating core material with inner and outer skins.
SAND TRAP LOUVER -
A type oflouver having fixed C-shaped sections placed altenatively in a vertical configuration allowing sand and heavy dust separation.
SCREEDING -
The process of striking off the excess concrete to bring the top surface of the concrete to proper finish and elevation.
SEALANT -
Any material which is used to seal cracks, joints or laps.
SECTION MODULUS -
A physical property of a structural member. It is used to design and basically describes the bending strength of a member.
SEISMIC LOAD -
The assumed lateral load acting in any horizontal direction on a structural system due to the action of an earthquake,
usually a proportion of dead load.
SELF DRILLING SCREW -
A fastener which combines the functions of drilling and tapping. It is used for attaching panels to purlins and girts.
SELF TAPPIN G SCREW -
A fastener which taps its own threads in a pre-drilled hole. It is for attaching panels to purlins and girts, for connecting trim, flashing, and panel side lap.
SHEAR -
The force tending to make two contacting parts slide upon each other in opposite directions parallel to their plane of contact.
SHEET NOTCH -
A notch or block formed along the outside edge of the foundation to provide support for the wall panels and serve as a closure along their bottom edge,
SHEETING ANGLE -

An angle used to support sheeting.
SHIM -
A piece of steel used to level base plates or square beams.
SHIPPER -
A list that enumerates by part number or describes each piece of material or assembly to be shipped. Also called talley sheet or bill of materials.
SOLDIER COLUMN -
A column in sidewalls, outside the main frame lines, located in extended bays to support sidewall girts framed at top with jack beam to adjacent two main frames.
SHOP PRIMER PAINT -
The initial coat of primer paint applied in the shop.
SHOULDER BOLT -
A fastener used to attach wall and roof paneling to the structural frame. It consists of a large diameter shank and a small diameter stud. The shank provides support for the panel rib.
SHOT PIN -
A device for fastening items by the utilization of a patented device that uses powdered charge to imbed the item in the concrete and/ or steel.
SI -
The International symbol for the metric unit used by the United States (Le Systeme International d'Unites).
SIDE LAP FASTENER -
A fastener used to connect panels together at the side lap.
SIDE WALL -
An exterior wall which is parallel to the ridge of the building.
SIDE WALL OVERHANG -
A projection of the roof past the sidewall.
SILL -
The bottom horizontal framing member of an opening such as a window or door.
SILL ANGLE -
See" Base Angle"
SIMPLE SPAN -
A term used in structural analysis to describe a support condition for a beam, girt, purlin, etc, which offers no resistance to rotation at the supports; opposite to continuous.
SINGLE SLOPE -
A slope in one plane. The slope is from one wall to the opposite wall.
SINGLE SPAN -
A building or structural member without intermediate support.
SKYLIGHT -
A translucent panel. A roof accessory to admit light, made of fiber glass reinforced polyester to the profiles of Kirby standard sheeting profiles.
SLIDING DOOR -
A single or double leaf door which opens on a horizontal track by means of overhead trolleys.
SLIDING FOLDING DOORS -
A form of manual sliding doors where-in the doors are made of leaves suspended and connected in a manner so as to fold against each other.
SOFFIT -
A metal panel which covers the underside of an overhang, canopy, or fascia.
SOIL PRESSURE -
The load per unit area a structure will exert through its foundation on the soil.
SPALL -
A chip or fragment of concrete which has chipped, weathered or otherwise broken from the main mass of concrete.
SPAN -
The out-to-out of steel lines for building frames, or the distance between supports of beams for secondary members.
SPLICE -
A connection in a structural member.
STAINLESS STEEL -
An alloy of steel which contains a high percentage of chromium. Also may contain nickel or copper.
STIFFENER -
A member used to strengthen a plate against lateral or local buckling. Usually a flat bar welded perpendicular to the longitudinal axis of the

member.

STIFFENER LIP -
A short extension of material at an angle to the flange of cold formed structural members, which adds strength to the member.

STILES -
The vertical side members off ramed and paneled doors.

STRESS -
A measure of the load on a structural member in terms of force per unit area (kips per sq. in.) (MPa) .

STRUT -
A brace fitted into a framework which resists axial compression forces.

STRUT PURLIN -
An additional purlin in braced bays located close to the purlin at the intersection of roof brace rods and the frame rafter as required by design.

STUD -
A vertical wall member to which exterior or interior covering or collateral material may be attached. May be either load bearing or non-load bearing.

SUCTION -
A partial vacuum resulting from wind loads on a building which cause a load in the outward direction.

TAPERED MEMBER -
A built-up plate member consisting of flanges welded to a variable depth web.

TEMPERATURE REINFORCING -
Light weight deformed steel rods or wire mesh placed in concrete to resist possible cracks from thermal expansion or contraction.

TENSILE STRENGTH -
The longitudinal pulling stress a material can bear without tearing apart.

THERMAL BLOCK -
A spacer of low thermal conductance material.

THERMAL CONDUCTIVITY (k) -
The rate of heat transmission by conduction in unit time through unit area of an infinite slab in a direction perpendicular to the surface for unit temperature difference, expressed as BTU per hour per square foot per inch thickness per °F.

THERMAL CONDUCTANCE (C) -
The rate of heat flow, in BTU's per hour, through a square foot of material of specified thickness whose surfaces have a temperature differential of 1°F.

THERMAL RESISTANCE (R) -
Resistance to heat flow. The reciprocal of conductance (C).

THERMAL TRANSMITTANCE (U) -
The rate of heat transmission in unit time through unit area of an assembly of materials for unit temperature difference, expressed as BTU per hour per square foot per °F. This is also referred to as the overall coefficient of heat transfer.

THROAT -
Minimum width of ventilator air inlet.

THRUST -
The horizontal component of a reaction

TIE -
A structural member that is loaded in tension

TORQUE WRENCH -
A wrench containing an adjustable mechanism for measuring and controlling the amount of torque or turning force to be exerted, often used in tightening nuts and high strength bolts.

TRANSLUCENT LIGHT PANELS -
Translucent plastic panels used to admit sunlight.

TRANSVERSE -
The direction perpendicular to the ridge.

TRIBUTARY AREA -
The area which contributes load to a specific structural component.

TRIM -
The light gauge metal used in the finish of a building especially around openings and at intersection of surfaces. Often referred to as flashing.

TRACK -
A metal guide for moving components; consisting of angles or channels, with fastenings, ties, etc. for a crane way, monorail or slide door.

TRUSS -

A structure made up of three or more members, with each member designed to carry a tension or compression force. The entire structure in turn acts as a beam.

TURNOUT -
See" Kickout ".

TURN-OF-THE-NUT METHOD -
An approved method for pre-tensioning high strength bolts. The nut is turned from the snug-tight position, corresponding to a few blows of an impact wrench or the full effort of a man using an ordinary spud wrench, the amount of rotation required being a function of the bolt diameter and length.

UNIFORM LOAD -
A load which is evenly spread over a large area of a framing system.

UPLIFT -
Wind load on a building which causes a load in the upward direction. (See "Suction")

VALLEY GUTTER -
A channel used to carry off water from the "V" of roofs of multi-gabled buildings.

VENTILATOR -
An accessory, usually used on the roof, that allows the air to pass through.

WAINSCOT -
Wall material, used in the lower portion of a wall, that is different from the material in the rest of the wall.

WALL, BEARING -
Wall capable of supporting a vertical load, other than its own weight.

WALL COVERING -
The exterior wall skin consisting of panels or sheets.

WALL, NON BEARING -
Wall capable of supporting its own weight only.

WEB -
That portion of a structural member between the flanges.

WEB MEMBER -
A secondary structural member vertical or diagonal interposed between the top and bottom chords of a truss.

WICKET DOOR -
An access door within one leaf of a sliding door.

WIND BENT -
See" Portal Frame".

WIND COLUMN -
A vertical member supporting a wall system designed to withstand horizontal wind loads usually at end walls.

WIND LOAD -
The load caused by the wind blowing from any horizontal direction.

"Z" SECTION -
A member cold formed from steel coil in the shape of a block "Z".

ZINC-ALUMINIUM COATED -
Steel coated with zinc and aluminum for corrosion resistance

2 : SPECIFICATIONS

2.1 GENERAL

2.1.1 Scope:

2.1.1.1 The standard building scope of supply shall include the structural framing, metal roofing & siding,bracing, doors, windows. insulation, hardware, fasteners, sealants and any other component parts for the metal building as specified or shown on the drawings.

2.1.1.2 All buildings shall have diagonal cable bracing in the roof, side walls; common walls between main building and Lean-to's, between interior columns under valley lines for multi span type buildings, unless otherwise stated in KBS offer.

2.1.1.3 In case of discrepancies, the provisions of the Final Order Acknowledgement Form shall govern unless agreed by Kirby Building Systems in writing.

2.1.2 Standard building description:

2.1.2.1 Clear-span, Rigid Frame Buildings: "RF" (Rigid Frame). The building shall be a single gable, clear span, tapered column. pin base, by-frame girts, 1/10 roof slope, rigid frame type.

2.1.2.2 Clear-span Spacesaver Buildings: " SV " (Spacesaver). The building shall be a single gable, clear span, straight column, pin base, flush framed girts, 0.5/1 0 roof slope, rigid frame type.

2.1.2.3 Beam and Column Buildings: " BC " (Beam and Column). The building shall be a single gable, tapered column, pin base, by-frame girts, 1/10 roof slope, rigid frame type, supported by intermediate columns as shown on drawings.

2.1.2.4 Clear Span, Single Slope Buildings: 'SS' (Single Slope). The buildings shall have a single slope roof with tapered columns pinned at base and straight rafters. The roof slope shall be 0.5/10 and sidewalls sheeted with by-framed girts.

2.1.2.5 T-Canopy Buildings: 'T-CAN' (T-Canopy). The building shall consist of single straight columns fixed at base at each frame with a double cantilever roof sloping towards the center columns.

2.1.2.6 L-Canopy Buildings: 'L-CAN'(L-Canopy). The building shall consist of single straight columns fixed at base at each frame with a single cantilever roof sloping towards the column.

2.1.2.7 Lean-To Buildings: 'LT'(Lean-To). The building shall have a single slope roof and connected on the high side to the main building on which it depends for partial support. The roof slope shall be either 1/10 or 0.5/10 matching with the main building roof slope and wall sheeted with flush girts.

2.1.3 Building nomenclature:

2.1.3.1 The building "width" and "length" shall be measured from inside to inside of wall covering.

2.1.3.2 The building eave height shall be measured from bottom of primary frame base plate to top of the eave strut. The top of the eave strut is the point of intersection between the inside surfaces of the wall and roof covering.

2.1.3.3 The bay spacing shall be measured as follows:

a. Interior bays from center-line to center-line of interior frames.

b. End bays from inside of Endwall sheets to center-line of first interior frame.

2.1.4 Drawings & calculations:

The following shall be provided free of charge in 3 sets each after the receipt of the Final Order:

2.1.4.1 Anchor bolt setting plans will be provided by Kirby Building Systems or the franchised builder.

2.1.4.2 Building installation drawings will be provided by Kirby Building Systems

2.1.4.3 Preliminary drawings, design calculations and/ or letter of Certification for the structural framing and covering panels, signed by a Professional Engineer, may be submitted for client's approval upon request.

2.2 DESIGN

2.2.1.1 All structural steel sections and welded plate members shall be designed in accordance with the applicable sections, relating to design requirements and allowable stresses, of the latest edition of the American Institute of Steel Construction "Specification for the Design, Fabrication and Building installation of the Structural Steel for Buildings."

2.2.1.2 All light-gauge, cold formed, structural members and covering shall be designed in accordance with the applicable sections, relating to design requirements and allowable stresses, of the latest edition of the American Iron and Steel Institute " Specification for the Design of Cold Formed Steel Structural Members".

2.2.2 Design loads:

2.2.2.1 The design loads shall be as stated in part I (Building description of Kirby Building Systems offer)

2.2.2.2 Loads are applied as follows :

a. Seismic loads shall be applied in accordance to International Building Code (IBC)

b. Other loads applications :.

The minimum loads required in applying on the structure in order to ensure the safety and serviceability of the building shall be in accordance to the International building Code (IBC) latest edition.

2.2.2.3 Basic design load combinations shall be in accordance to IBC latest edition. Other load combination as applicable per MBMA code.

2.3 STRUCTURAL FRAMING

2.3.1 General:

2.3.1.1 All framing members shall be shop fabricated or bolted field assembly, unless otherwise noted on building installation drawing.

2.3.1.2 All framing members shall be cleaned by power or hand-wire brushing to remove all dirt, grease, oil, loose mill scale, weld slag, flux deposit and other foreign matter, and given one shop coat of red oxide, air drying, phenol modified alkyd resin primer to a nominal dry film thickness of 25 microns.

2.3.2 Primary members :

2.3.2.1 Primary structural framing shall refer to the transverse rigid frames, lean-to rafters and columns canopy rafters, interior columns (beam and column frames), bearing frame rafters and corner columns, and endwall wind columns.

a. Members fabricated from plate or bar stock shall have flanges and webs joined on one side of the web by a continuous welding process. This plate or bar stock shall have a minimum yield strength of 345 MPa (50,000 psi) and will conform to the physical specifications of ASTM A-572 (Grade 50) or equivalent.

b. Members fabricated by cold forming process shall have a minimum yield strength of 345 MPa (50,000 psi) and will conform to the physical specifications of ASTM A653 (Galvanised G90) or equivalent.

c. Members fabricated from hot rolled structural shapes shall have a minimum yield strength of 250 MPa (36,000 psi) and will conform to the physical specifications of ASTM A-36 or equivalent.

d.Beam and Column interior columns will be fabricated from tube sections according to ASTM A500 Grade C, which have a minimum yield strength of 345 MPa (50,000 psi)

2.3.3 Secondary members:

2.3.3.1 Secondary structural framing shall refer to purlins, girts, eave struts, wind bracing, flange bracing, base angles, clips and other miscellaneous structural parts.

a. Purlins, girts and eave struts shall be cold formed from steel which has a minimum yield strength of 345 MPa (50,000 psi) and will conform to the physical specifications of ASTM A-653 (Grade 50) or equivalent.

1. Purlins and girts shall be roll formed Z sections, 200 mm deep with 64mm flanges. Each flange shall have a 16mm stiffening lip formed at 45° to the flange.

2. Eave struts are 200mm deep with a 105mm wide top flange, a 117.5mm wide bottom flange, both are formed parallel to the roof slope. Each flange has a 22.5mm stiffener.

b .Cable bracing shall have a minimum tensile force of 119 kn and will conform to the physical specifications of ASTM A475 or equivalent.
All other miscellaneous secondary members shall have a minimum yield strength of 250MPa (36,000 psi).

2.3.4 Connections:

2.3.4.1 All field connections shall be bolted (unless otherwise noted).

a. All primary bolted connections, as shown on drawings, shall be furnished with high strength bolts conforming to the physical specifications of ASTM A-325 (or equivalent). All high strength bolts, nuts and washers shall be zinc plated with a bronze iridite finish for easy identification.

b.All secondary bolted connections, as shown on drawings, shall be furnished with machine bolts conforming to the physical specifications of ASTM A-307 (or equivalent). Machine bolts, nuts and washers will be zinc plated.

2.3.4.2 All shop connections shall be welded using either submerged or shielded arc process, and welding shall be in accordance with the applicable sections, relating to design requirements and allowable stresses, of the latest editions of the American Welding Society "Structural Welding Code".

2.4 ROOF AND WALL COVERING

2.4.1 General:

2.4.1.1 Typical roof, wall and liner panels shall be color coated, 26 gauge, galvalume or galvanized coated steel, ribbed panels. (Other materials and thickness available upon request).

2.4.2 Panel materials:

2.4.2.1 Base material for color coated galvanized or galvalume substrate steel panels shall have a minimum yield strength of 345 MPa (50,000 psi) and will conform to the physical specifications of ASTM A-653 or A-792 or equivalent.

2.4.2.2 The zinc coating is a hot dip galvanization process conforming to ASTM Specification A653 with a coating class of G-90 (0.90 oz/ft2 or 275 g/m2) or with galvalume coating to ASTM A-792 - AZ 150 (150 g/m2) or equivalent.

2.4.2.3 The painting shall be baked enamel polyester or High Durability (HD) polyester for color sheeting with a film thickness of 25 microns. The reverse side shall be white with 10 microns film thickness.

2.4.3 Panel configuration:

2.4.3.1 "Kirby Rib" panel shall have 32 mm deep major ribs which taper in width from 11 mm to 40 mm, and are spaced 333mm on center. Between major ribs are additional minor stiffening ribs spaced at 111 mm on center. Each panel shall provide one meter coverage.

2.4.3.2 "Kirby Wall" panel shall have 26.4 mm deep major ribs which taper in width from 29 mm to 59 mm and are spaced 333mm on center. Between the ribs the panel shall be formed into a sculptured "Valley" shape. Each panel shall provide one meter coverage.

2.4.3.3 "Kirby Deck" panel shall have 41 mm deep major ribs which taper in width from 12 mm to 42 mm, and are spaced 164 mm on center. Additional minor stiffening ribs are located between major ribs, at 82 mm on center. Each panel shall provide 820 mm coverage.

2.4.4 Fasteners:

2.4.4.1 Standard fasteners shall be No 14, Type A, self-drilling sheet metal screws with metal and EPDM washers, which conform to American Standards Association Specifications. All screws shall have hex heads.

2.4.5 Sealer:

2.4.5.1 Sealer for sidelaps, endlaps and self-flashing windows shall be 6 mm wide x 5 mm thick, composed of synthetic rubbers, plasticisers and inert fillers. The sealer shall be non-asphaltic, non-shrinking, non drying and non-toxic and shall have superior adhesion to metals, plastics and painted surfaces at temperatures from -40°C to +90°C.

2.4.6 Installation of roof & wall panels:

2.4.6.1 Roof panels shall be continuous from ridge to eave for buildings 18m wide or less, where endlaps are required, the width shall be approximately 150 mm (as specified on the drawings), and shall occur over a roof purlin.

2.4.6.2 Sidewall panels shall be continuous from the eave to 40 mm below the column base plate, except where the required panel length would exceed 9.0m. For a panel length in excess of 9.0m, the panel shall be spliced, and endlap shall be 100 mm wide (minimum) and occur over a wall girt.

2.4.6.3 Endwall panels shall be continuous from the eave to 40 mm below the column base plate, except where the required panel length would exceed 9.0m. For a panel length in excess of 9.0m, the panel shall be spliced and the endlap shall be 100mm wide (minimum) and occur over a wall girt. All endwall panels shall be square cut in the factory for 1:10 slope buildings, or bevel cut in the field for 3:10 slope buildings.

2.4.6.4 All laps of roof panels shall be sealed with a continuous ribbon of tape sealer.

2.4.6.5 Roof panels shall be secured to intermediate framing members with No. 14 sheet metal screws at a maximum spacing of 333mm. At endlaps, the maximum spacing of screws shall be 111 mm. At four corners of the buildings, panel to structural fastener spacing shall not exceed 111 mm, to an area equivalent to x2. Dimension x is determined by the following rule:

A. The smaller of

(1) 10 % of the least horizontal dimension of the building (span or length)

(2) 40 % of the eave height.

B. But not less than

(1) 4% of the least horizontal dimension of the building

(2) 0.9 meter

2.4.6.6 Wall panel shall be secured to intermediate framing members with No. 14 sheet metal screws at a maximum spacing of 333mm. At endlaps, the maximum spacing of screws shall be 166mm.

2.4.6.7 Sidelaps of roof panels shall be stitched through the high rib with two, equally spaced, No. 14 sheet metal screws between supports (screw spacing not to exceed 525 mm). Sidelaps of wall panels shall be stitched through the low rib with one No. 14 sheet metal screw centered between two supports (screw spacing not to exceed 1050 mm).

2.4.7 Flashing, trim & closures:

2.4.7.1 Flashing and/or trim shall be furnished at the rake, corners, eaves, framed openings, and wherever necessary to provide weather tightness and finished appearance. Color shall be selected from Kirby Building Systems standard colors, with the exception of the corner trim, which matches the building wall color.

2.4.7.2 Color coated steel for flashing, metal closure, trim and other miscellaneous uses shall be 26 gauge of the same specification as the roof and walls covering material.

2.4.7.3 A formed peak panel matching the slope and profile of adjoining panels shall be provided along the building ridge.

2.4.7.4 Solid or closed cell, preformed, E.T.P. (Ethylene Polypropylene Terpolymer) closures matching the profile of the panel shall be installed along the eave, rake and other locations specified on Kirby Building Systems drawings.

2.4.8 Color finish:

2.4.8.1 Unless specified otherwise, all wall and roof panels, flashing, trim and other exposed steel surfaces shall be color coated.

a. Color of panels and corner trim shall be selected by the customer from Kirby Building Systems standard colors.

b. The gutters, downspouts, rake trim, eave trim and door flashing shall be white unless otherwise selected from Kirby Building Systems standard colors.

2.5 ACCESSORIES

2.5.1 Personnel doors:

2.5.1.1 Single swing doors are designated as 3070M and 3070G. Double Swing doors are designated as 6070M and 6070G

2.5.1.2 Door leaves shall be 45 mm thick, full flush, fabricated from electro galvanized steel of 0.9 mm nominal thickness (20 gauge) including the base steel and zinc coating. Door shall have a solid core of rigid polyurethane (foamed in place) to completely fill the inside of door. 3070G and 6070G doors shall be provided with opening for glass for field glazing (glass and glazing by others).

2.5.1.3 3070 doors shall be furnished with a cylindrical lock set which meets or exceed U.S. Federal specification F.F.H. 106a -Series 160A.

2.5.1.4 6070 doors shall be furnished with a cylindrical lock set on one leaf and a cylindrical handle set on the other leaf.

2.5.1.5 Inactive leaf of the 6070 door (R.H. inactive) shall have a fool, head and a chain bolt supplied loose for field installation, unless specified otherwise astragal shall be installed on right hand inactive leaf.

2.5.1.6 Each door leaf shall swing from three 114 x 114mm galvanized steel, interlocking template butt hinges.

2.5.1.7 Door frame consisting of jambs and header is of knock down type for field assembly through bolted connections, jambs and header are made from cold formed 1.5mm thick 36 KSI steel 210mm deep.

2.5.1.8 Door leaves and frames shall be shop painted with one coat of vinyl base neutral gray primer.

2.5.1.9 The threshold shall be an extruded aluminum shaped to provide adequate weather seal

2.5.2 Sliding doors:

2.5.2.1 Sliding door shall be constructed from cold formed channel or Zee shaped steel framing, having a minimum yield strength of 345 MPa (50,000 PSI). The framing shall be covered on the outer face with panels as specified for the wall. The door leaves shall be adequately flashed and counter flashed. Doors are field assembled with bolted connections.

2.5.2.2 Door leaf covering the framed opening of the door when split into two parts, each part sliding in the opposite direction shall be referred to as double slide door.

2.5.2.3 Door leaf covering the framed opening of the door with a single leaf sliding in one direction shall be referred to as single slide door.

2.5.2.4 The door leaves shall be suspended from trolley which is guided on a header assembly. The header is cold formed C section, track is welded to header channel, header assembly is supported at four points by brackets which are connected to the building wall framing. Header assembly is protected by a counter flashed hood.

2.5.2.5 Trolleys are galvanized sheet metal stamping having four wheels on two axel, the axel is supported on nylon (teedelrin) bearings housed in the trolley body. A pivoted bolt with two nuts is provided at the center of the body for suspending the door leaf.

2.5.2.6 Adequate weather sealing is provided at center and at ends by neoprene rubber closures and strips.

2.5.2.7 Wind reaction and swaying at the bottom is absorbed by V shaped cold formed guide made of 3.5mm thick 50 KSI steel embedded in the concrete foundation through angle guide provided for this purpose.

2.5.2.8 The doors shall have inside and outside locking devices and handles, single slide doors shall have a retainer at one end.

2.5.2.9 Door framed opening jambs shall be cold formed shapes. The cold formed members shall be given one shop coat of standard primer.

2.5.3 Roll-up doors:

Roll-Up doors are supplied as buyouts generally in accordance with the following specifications:

2.5.3.1 Door curtain shall be color coated 22 gauge galvanized steel having a minimum yield strength of 345 MPa (50,000 psi) and will conform to the physical specifications of ASTM A653 or equivalent. Class G-90 (0.90 ozjft2 or 275gjm2) or its equivalent. Curtain shall be constructed of interlocking roll formed slats, to provide curtain stiffness to withstand wind pressures of 1.25 KNj m2. Alternate slats are to be equipped with endlocks to prevent lateral movement of the slats. Endlocks are made of Nylon secured to the slat by Nylon rivets. The bottom of each curtain shall be reinforced by cold formed steel trims.

2.5.3.2 Guides are to be fabricated from 3mm minimum thickness steel having minimum yield strength of 345 MPa (50,000 psi), assembled with 10 mm DIA. bolts to the door jambs.

2.5.3.3 Door curtain is secured to spiders which is welded to 40 N.B.M.S. pipe, each end of the pipe is fitted with precision machined shafts to accept the bearing. Antifriction ball bearings are provided which are housed in a pillow block or flange mounting.

2.5.3.4 Brackets are constructed from steel plates of 6mm thick minimum or structural angles. Holes are prepunched on the bracket to install it on the supporting column or door jambs, and to receive the bearing block and the operator.

2.5.3.5 Operation:

a) Manual Operator:

Manually operated by means of endless galvanized hand chain. Locking clip shall be provided for securing the chain. Hand chain wheel is attached to worm reduction gear box, the output shaft of the reducer is connected to the door shaft by means of a rigid coupling.

b) Electric Operator:

Electric operation is by means of an integral motor reducer, connected to the door shaft by a set of sprockets and roller drive chain. The unit is mounted on the support brackets. Motor operates on 380- 415 volts, 3 phase 50/60 Hz. rated for the specific application-with high starting torque. Insulation class F or E, type of motor is T.E.F.C.

Primary reduction is by worm and worm wheel with an extended shaft to accept a chain wheel for emergency manual operation by hand chain.

Limit switches shall be provided for upper and lower limit, mounted on reducer housing, actuated by rotary gear with adjustable strikers.

Control buttons are set in a rigid box for up and down door operation, with emergency stop and built in overload cut out.

Electro-magnetic spring set disc brake is fitted to the motor end, totally enclosed to protect against damage from dust and moisture, manual release attachment (auto reset) for emergency operation in case of power failure is provided for hand chain operation.

Brakes are provided for door above 16M2 area only, the braking is effected on smaller doors by means of self-locking gear box.

2.5.4 Windows:

2.5.4.1 Aluminum windows are specifically designed for installation with exterior wall panel. Windows shall be singleslide

(horizontal) self flashing with preglazed clear glass and removable half insect screen, complete with latching device, weather stripping.

2.5.4.2 Single windows are IM wide x IM high nominal size, double or multiple windows are formed by joining the window jamb fins together.

2.5.4.3 Windows shall be fitted with 2.4 mm (3/32")D.S.B clear glass using vinyl glazing beads and shall be back bedded

2.5.4.4 All structural members shall be extruded aluminum with a minimum thickness of 1mm, assembled with screws and sealed at junctions, and shall meet or exceed the American Aluminum Manufacturers Association Specification HS-B2.

2.5.4.5 Nylon roller and roller housing is attached to each end of sash bottom rail.

2.5.5 Sky light:

2.5.5.1 Sky Light are made of translucent fiberglass reinforced polyester to the profile of Kirby rib panel called skylight and Kirbywall panel called wall light and are available only in 2.44 Kg/m2 (8 ounces/ft2). Conforming to U.S. Commercial Standard CS-214-517.

2.5.5.2 Each panel has a coverage of 1 meter. Standard length for skylight is 3305 mm and for wall light is 4140mm. Panel shall be of 1.5mm thick.

2.5.5.3 Color of the panel shall be white with smooth surface finish with a light transmitting capacity of 60 % ﬂ 5%

2.5.5.4 Installation of light panels is similar to that of steel panel, it can be worked with ordinary tools and may be drilled, sawed, punched without damage to panel and are shatter resistant.

2.5.5.5 Light panels have low heat transmission acts as insulation. (K factor 1.0 to 1.5; U factor 1.09) and are not affected over a temperature range of 50°F below zero to 200°F. (fire resistance 25 flame spread, test according to UL-94 tunnel test).

Panels are corrosion resistant and most chemicals do not affect the panels.

2.5.6 Eave gutters and down spouts:

2.5.6.1 Eave gutters shall be box shaped, color coated, 0.5 mm nominal thickness (26gauge) galvanized steel. The outside face of the gutters shall be supported with color coated, 0.5 mm nominal thickness (26 gauge) galvanized straps to the eave member at a maximum spacing of 1.20 m.

2.5.6.2 Downspouts shall be rectangular shaped, color coated, 0.5mm nominal thickness (26 gauge) galvanized steel. Downspouts shall have a 45-degree elbow at the bottom and shall be supported by attachment to the wall covering at 3.0 m maximum spacing.

2.5.7 Ventilators:

There are 2 types of ventilators

1. 300mm throat (Standard with adjustable damper)

2. 600mm throat (KRV-600 with fix type)

Ventilators shall be supplied in length of 3m shopassembled. Ventilators shall be supplied in length of 3m shop assembled.

2.5.7.2 Ventilators are designed specifically to fit on top of Kirby rib roof panel, end cap skirt assembly, closure strips and sealants shall be furnished to ensure weather tightness.

2.5.7.3 Individual ventilators are furnished with one set of Standard accessory package for damper control. Multiple units are furnished with one set of accessory package for two ventilators and shall be manually operated pull type.

2.5.7.4 Outer shell, damper, rain shield, end cap and skirts shall be fabricated from 26 GA galvanized steel painted white base metal conforming to ASTM specifications A653 Grade 50, G90 or its equivalent.

2.5.7.5 Skeleton of the ventilator is made of galvanized sheet metal stamping and cold-formed members of 1mm thick minimum, assembled with rivets.

2.5.7.6 Ventilators shall be furnished with bird screen.

2.5.8 Louvers:

2.5.8.1 Std Louvers are adjustable with overlapping type blades providing maximum weather tightness while closed, allowing free air flow while open. Standard nominal size of louver is 1M wide by 1M height, self supporting on K.W. profile wall panel and self flashing,

2.5.8.2 Sandtrap Louver

2.5.8.2 Multiple units are formed by joining the supportfins; suitable jamb supports shall be furnished for multiple unit installation.

2.5.8.3 Std Louver frames are fabricated from 1.2mm thick (18 gauge) galvanized steel, and blades from 0.9mm thick (20 gauge) galvanized steel, conforming to ASTM specification A653 Grade 50 steel,G-90 galvanizing or its equivalent. Louver shall be painted white.

2.5.8.4 Std Louvers are furnished with crank and levers for the adjustment of blades and the outside face of louver is fitted with removable insect screen.

2.5.9 Insulation:

2.5.9.1 The insulation shall be fiber-glass, blanket type and suitable for application to roofs and walls of industrial buildings. The insulation shall be made of long and fine fiber-glass evenly distributed and of uniform density bonded with phenolic thermosetting resins with a vinyl facing resulting in strength, long life and low water permeability.

2.5.9.2 The standard insulation thickness shall be 50mm and 75mm supplied in rolls. The density of the insulation shall be 10 kg/m3 with a thermal conductivity of 0.31 BTU in/ft2 hr °F at a mean temperature of 77 °F.

2.5.9.3 The fire resistance of the facing shall be in accordance with the Underwriters' Laboratories Test Method UL723, and shall have a fire hazard classification for flame spread 15 and smoke developed 105

2.5.9.4 The vinyl facing shall have a high vapor barrier efficiency with a low perm rating to prevent condensation.

2.5.9.5 The insulation material shall neither promote nor accelerate corrosion on steel. The insulation shall be tough, resilient, dimensionally stable and have a high ageing resistance. It shall be odorless, non hygroscopic, chemically inert and resistant to humidity, corrosive vapors, moisture and insects.

2.5.9.6 The insulation shall be easy to install and can be cut with an ordinary knife to allow installation even on special profiles, curves, T-pieces etc.

2.5.10 Roof curb:

2.5.10.1 Curbs shall be one-piece construction manufactured from a self- extinguishing glass fiber reinforced polyester 3 mm thick with 15 mil polyester gel coated weathering surface on exterior. Unit shall be white in color and opaque to light. Base shall have the same configuration as the Kirby rib profile. The top of the curb shall provide a level surface at 1.10 roof slope.

2.5.10.2 Curbs shall be available in sizes of 600 x 600 mm, 900 x 900 mm and 1200 x 1200 mm.

2.5.11 Roof jack:

2.5.11.1 Roof jacks shall be a one-piece construction manufactured from self-extinguishing fiber glass reinforces polyester 3mm thick with 15 mil polyester gel coated weathering surface on exterior. Unit shall be white in color and opaque to light. Base shall have the same configuration as Kirby rib profile.

2.5.11.2 Roof jacks shall be available in opening sizes of 50-100 mm and 150-300 mm in jack heights of 365 mm and 290 mm respectively.

2.6 SANDWICH PANEL POLYURETHANE INSULATED PANELS

2.6.1 General:

Sandwich Panels shall be manufactured by the press injection method to produce a rigid polyurethane core between exterior steel facings. The manufacturing process shall be carefully controlled with steel facings maintained at around 40 C during the injection process to ensure proper reaction and adhesion. Also the pressure on the moulds shall not be released till completion of reaction.

2.6.2 Panel types:

The Sandwich Panels are available in three types, i.e. KRIP, KWIP, and KCIP. Panel type KRIP is suitable for application as an exterior roof or wall panel, Type KWIP is suitable for wall panel, and KCIP for wall and partition panels. All three types of panels shall be supplied in 1 Meter net coverage.

2.6.3 Panel facing:

Standard panels shall have both exterior and interior facings of 26 Gauge steel galvanized and color coated having a minimum yield strength of 345 MPa (50,000 psi) and shall conform to the physical specifications of ASTM A-653 or equivalent. The zinc coating shall be by hot dip galvanization process G90 (0.90 oz/ft or 275 g/m2) and for galvalume coated panels to A-792 AZ 150 or its equivalent. The painting shall be baked enamel polyester (white) or silicon polyester (color blue or gold) with a film thickness of 25 microns. The reverse side shall be white with 10 microns film thickness.

The panel facing profiles shall be as follows:

a) Type KRIP & KWIP

Standard panels shall have exterior skin 26 Gauge steel galvalume / galvanized and prepainted Kirby rib or Kirby wall profile sheets. The interior skin shall be 26 Gauge steel galvanized and color coated, generally flat profile sheet with low ribs at 250 mm centers.

b) Type KCIP

Standard panels shall have both exterior and interior skins of 26 Gauge steel galvanized or galvalume substrate and color coated of generally flat profile. KCIP panels are provided with tongue & groove joints with concealed fasteners.

2.6.4 Panel thickness:

Type KRIP Panels shall have a nominal thickness of 40mm, 50 mm, 60mm, 75 mm or 100 mm at bottom of ribs.

Type KWIP panels shall have a nominal thickness of 40mm, 50 mm, 65 mm or 75 mm at bottom of ribs.

Type KCIP panels shall have a nominal thickness of 50 mm, 60 mm, 75 mm or 100 mm.

2.6.5 Panel core:

Standard panels shall have core insulation of rigid polyurethane foam which shall be foamed-in-place between panel facings and shall have an approximate total density of 40Kg/m3, with a heat transmission value of 0.0198 Watt/M2.

The mechanical properties of the foam shall have approximately the following values:

Compression Strength (at 10% deformation)	= 1.6 Kg/cm2
Compression Modulus	= 36 Kg/cm2
Shear (with metal sheet)	= 1.63 Kg/cm2
Shear Modulus	= 20.4 Kg/cm2
Adhesion to metal sheet	= 1.5 Kg/cm2
Water Vapor Transmission	= 80 gr/24hm2
Water Absorption	= 4 % in volume
Closed Cell Content	= 95 % min

2.6.6 Fasteners:

Standard fasteners shall be No. 14 self drilling screws with EPDM washers. All screws shall have hex heads.

2.6.7 Sealer:

Panel type KRIP shall have sealer for sidelaps and endlaps of 6mm wide x 5thick pressure sensitive butyl tape. The sealer shall be non-asphaltic, non shrinking, non drying and non toxic and shall have superior adhesion to metals, plastics and painted surfaces at temperatures from 50°C to + 104°C. KCIP panels are supplied with tube sealant for field application and joints.

2.6.8 Installation of roof & wall panels (type KRIP/KWIP):

2.6.8.1 Roof panels shall be continuous from ridge to eave for buildings 18m wide or less, where endlaps are required, the width shall be approximately 150 mm (as specified on the drawings), and shall occur over a roof purlin.

2.6.8.2 Sidewall panels shall be continuous from the eave to 40 mm below me column base plate, except where the required panel length would exceed 9.0 m. For a panel length in excess of 9.0 m, the panel shall be spliced, and endlap shall be 100 mm wide (minimum) and occur over a wall girt.

2.6.8.3 Endwall panels shall be continuous from the eave to 40 mm below the column base plate, except where the required panel length would exceed 9.0 m. For a panel length in excess of 9.0 m, the panel shall be spliced and the endlap shall be 100 mm wide (minimum) and occur over a wall girt. All endwall panels shall be square cut in the field for 3:10 slope buildings.

2.6.8.4 All laps at roof panels shall be sealed with a continuous ribbon of tape sealer,

2.6.8.5 Roof panels shall be secured to intermediate framing members with No. 14 sheet metal screws at a maximum spacing of 333 mm. At endlaps, the maximum spacing of screws shall be 111mm. At four corners of the buildings, panel to structural fastener spacing shall not exceed 111 mm, to an area equivalent to x2 Dimension x is determined by the following rule:

A. The smaller of

(1) 10% of the least horizontal dimension of the building (span or length)

(2) 40% of the eave height.

B. But not less than

(1) 4% of the least horizontal dimension of the building

(2) 0.9 meter

2.6.8.6 Wall panels shall be secured to intermediate framing members with No. 14 self-drilling and tapping screws at a maximum spacing of 333 mm. At endlaps the maximum spacing of screws shall be 111 mm.

2.6.8.7 Sidelaps of roof and wall panels shall be stitched through the high rib with No. 12 sheet metal screws at 500 mm centers.

2.6.9 Flashing, trim & closures:

2.6.9.1 Flashing and/or trim shall be furnished at the rake, corners, eaves, framed openings, and wherever necessary to provide weather tightness and finished appearance. Color shall be selected from Kirby Building Systems standard colors, with the exception of the corner trim, which matches the building wall color.

2.6.9.2 Color-coated, galvanized steel for flashing, metal closure, trim and other miscellaneous uses shall be 26 gauge of the same specification as the roof and walls covering material.

2.6.9.3 A formed peak panel matching the slope and profile of adjoining panels shall be provided along the building ridge.

2.6.10 Color finish:

2.6.10.1 Unless specified otherwise, all wall and roof panels, flashing, trim and other exposed galvanized steel surfaces shall be color coated.

a. Color of panels and corner trim shall be selected by the customer from Kirby Building Systems standard colors.

b.The gutters, downspouts, rake trim, eave trim and door flashing shall be white unless otherwise selected from Kirby Building Systems-Kuwait standard

3 : STANDARD STRUCTURAL SYSTEMS

3.1 STANDARD FRAMES

MAIN FRAMES

Standard frame types:

Suggested width range (metres) for most economical buildings.

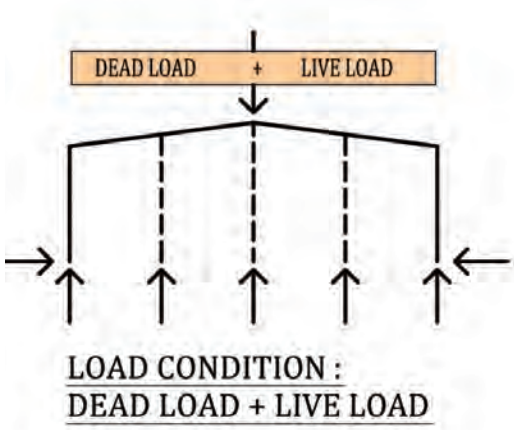
L-CANOPY (L-CAN)	3 6
LEAN-TO (L-TO)	3 18
BUTTERFLY CANOPY (T-CAN)	6 12
SPACE SAVER (SV)	6 18
SINGLE SLOPE (SS)	6 18
RIGID FRAME (RF)	6 36 96
BEAM AND COLUMN (BC-1)	24 60
BEAM AND COLUMN (BC-2)	36 72
BEAM AND COLUMN (BC-3)	48 96
MULTI-SPAN (MS)	24 60

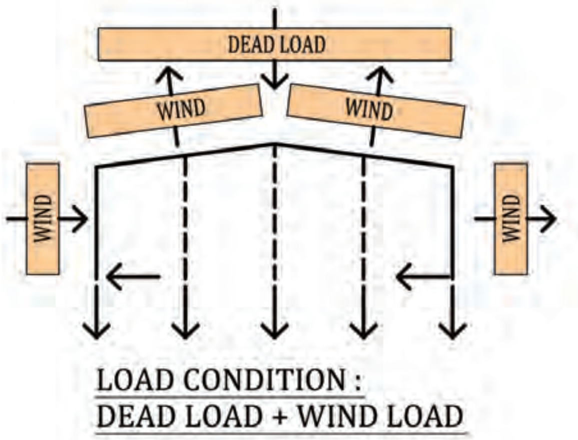
Standard Eave height : 3 m - 8 m
Standard bay spacing : 6m / 7.5m / 9m
Standard Loadings : Live load 0.5/0.6/1.0 kN/M²
Wind load 0.75/1.0/1.25 kN/M²

The table above is a general guideline on recommended frame types for different widths. Kirby custom designs each order to the specified type, width, height, bay spacing, loading and other building parameters to customer requirements.

3.2 STANDARD LOADINGS

Single Gable buildings:





Standard buildings are available for the following loadings:

Dead load	= building self weight
Live load	= 0.57 Kn /m²
Wind load	= 1.25 Kn /m²

Design wind co-efficients for enclosed single gable buildings

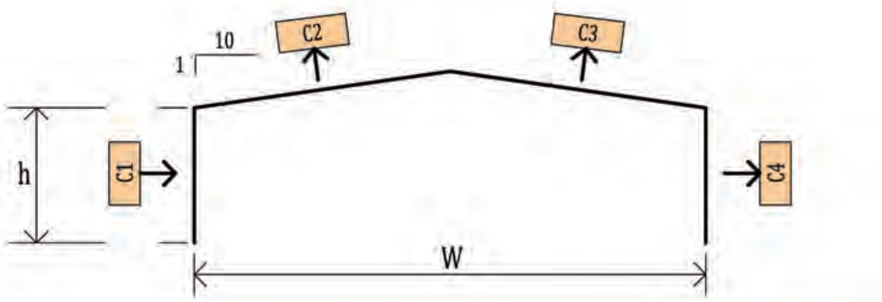
Asce 7 -10

(GCPe - GCPI)

DESIGN WIND CO-EFFICIENTS FOR ENCLOSED SINGLE GABLE BUILDINGS

ASCE 7 - 10

(GCPe - GCPi)

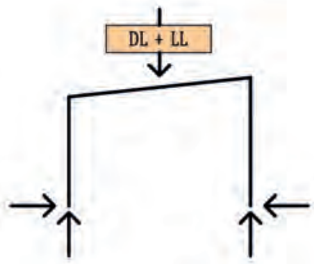


	C1	C2	C3	C4
Balanced	+0.22	-0.87	-0.55	-0.47
Un-Balanced	+0.58	-0.51	-0.18	-0.11

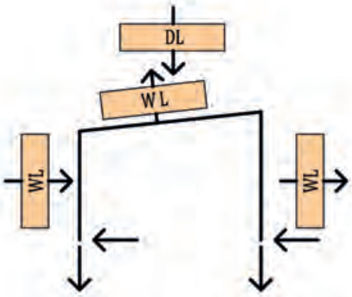
$h \leq 60$ ft.
$w/h \leq 1$

P = (wind pressure)
P = q (c), where c is wind co-efficient

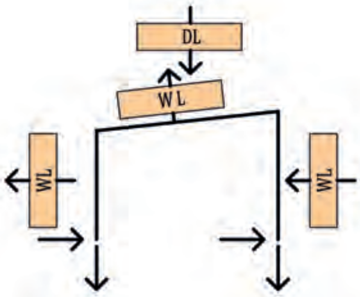
Single slope buildings:



LOAD CONDITION :
DEAD LOAD + LIVE LOAD



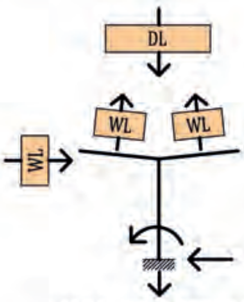
LOAD CONDITION :
DEAD LOAD + WIND LOAD
(LEFT)



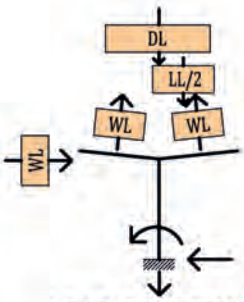
LOAD CONDITION :
DEAD LOAD + WIND LOAD
(RIGHT)

T-canopy:

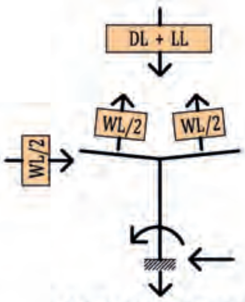
LOAD CONDITION :
DEAD LOAD + LIVE LOAD



LOAD CONDITION :
DEAD LOAD + WIND LOAD

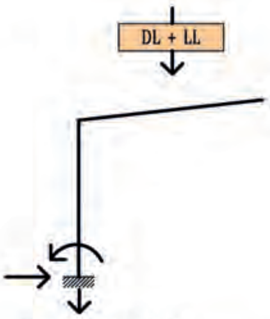


LOAD CONDITION :
DEAD LOAD + WIND LOAD
+LL/2 (HALF-SPAN)

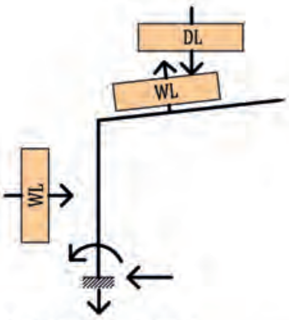


LOAD CONDITION :
DEAD LOAD + LIVE LOAD
+ WIND LOAD

L-Canopy:



LOAD CONDITION :
DEAD LOAD + LIVE LOAD



LOAD CONDITION :
DEAD LOAD + WIND LOAD

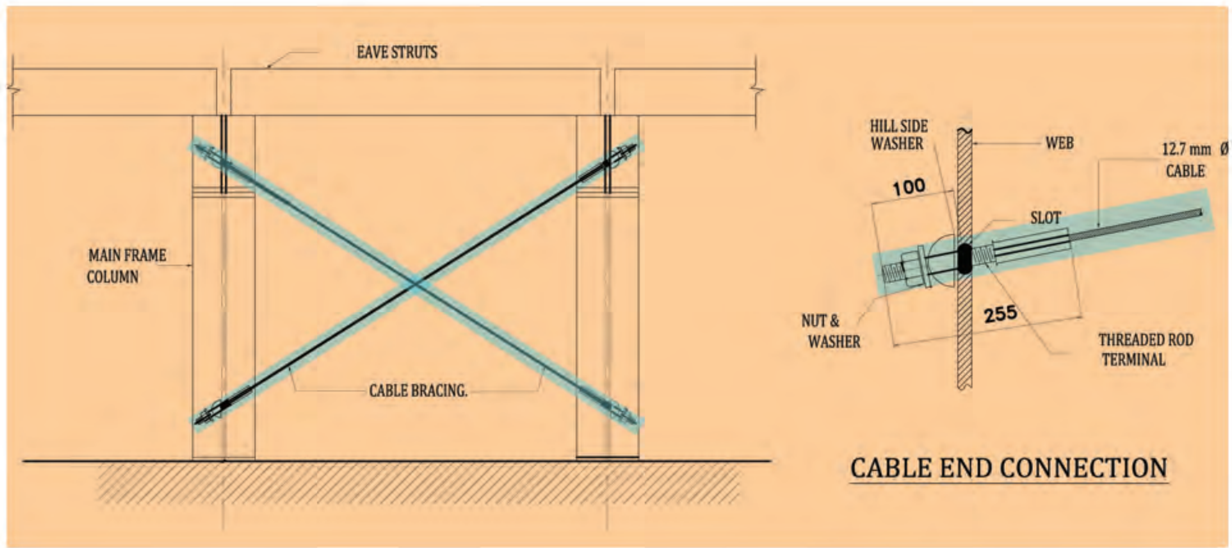
- Standard loadings are same as for single gable buildings.
- Wind coefficients for single slope buildings are applied as per table for single gable buildings.
- Full wind load (c=1.3) Is applied for t-canopy & l-canopy structures.

3.3 STANDARD BUILDINGS

Width (M)	Length (M)	Eave height (M)	Bay spacing	Project no.	Page
36.00	48.00	6.00	8@6.00M.	BC-36660	212
36.00	48.00	8.50	8@6.00M.	BC-36685	218
36.00	48.00	6.00	6@8.00M.	BC-36860	224
36.00	48.00	8.50	6@8.00M.	BC-36885	230
18.00	48.00	6.00	8@6.00M.	RF-18660	236
18.00	48.00	8.50	8@6.00M.	RF-18685	242
18.00	48.00	8.50	6@8.00M.	RF-18885	248
21.00	48.00	6.00	8@6.00M.	RF-21660	254
21.00	48.00	8.50	8@6.00M.	RF-21685	260
21.00	48.00	6.00	6@8.00M.	RF-21860	266
21.00	48.00	8.50	6@8.00M.	RF-21885	272
36.00	48.00	6.00	8@6.00M.	RF-36660	278
36.00	48.00	6.00	8@6.00M.	RF-36685	284
36.00	48.00	6.00	6@8.00M.	RF-36860	290
36.00	48.00	8.50	6@8.00M.	RF-36885	296

Building installation drawings are located at chapter 7,
7.26 Page 211- standard buildings continuation

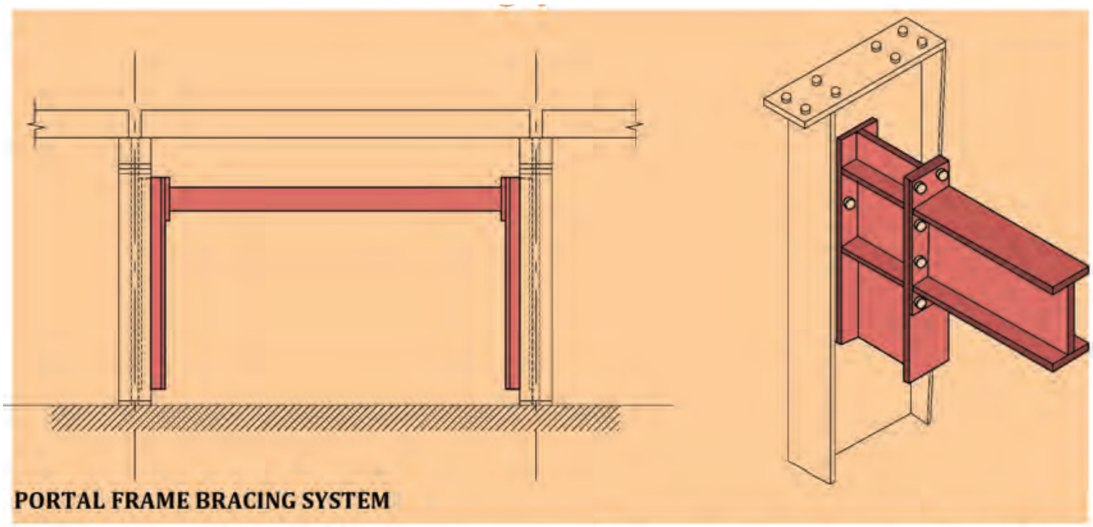
3.4 STANDARD CABLE BRACING SYSTEM



Wind forces acting transversely are transferred to the foundation by means of "Frame Action". However, wind forces acting longitudinally (i.e. On the end wall) are transferred by means of roof and walls bracing between frames. Number of braced bays depends on width and length of building.

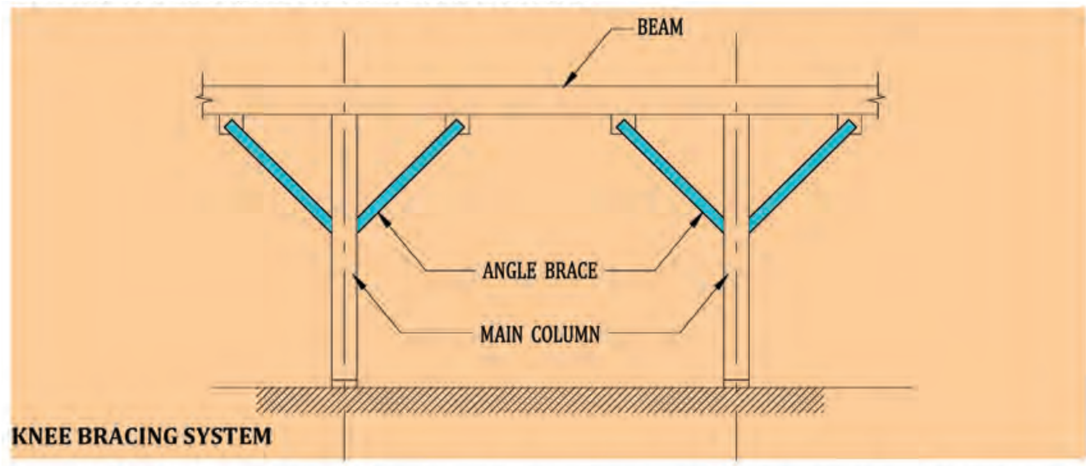
All braced bays share equally in transmission of wind reactions from the wind column to the foundation. The reactions at the top of each wind column is transmitted to the Roof system where each braced bay takes it proportional share of wind reaction. Full Wind is applied in accordance with asce 7 -10.
Standard roof and wall bracing consists of galvanised extra high strength seven
Strand cable of 12.7Mm diameter (1/2") acting always in tension.

3.5 PORTAL FRAME BRACING SYSTEM



When sidewalls are open for access (passage) or where there are accessories such as doors etc., Portal bracing (wind bents) is substituted in walls of braced bays instead of cable bracing. Horizontal and vertical clearance must be considered since the portal bracing members are mounted on main frame columns just to clear the haunch connection of m.F. Column and rafter.
The structural design of portal frames is based on rigid connection between portal
Columns and beam, and a pinned base condition.

3.6 KNEE BRACING SYSTEM



When diagonal bracing is not allowed in sidewalls because of access or accessories such as doors etc. And portal frame cannot be used for bracing because of clearance, a knee brace is used as shown in sketch above.
A knee brace consists of a hot rolled beam in the purling line either only at braced bays or continuous as required by design with diagonal angle braces connecting the beam to the main frame column web.
The structural design of knee brace is based on the beam being pinned at both ends
With the main column designed for weak axis bending.

3.7 DIAPHRAGM BRACING SYSTEM

Diaphragm bracing system
Diaphragm action:

Kirby wall panels properly fastened to supporting structural framing form structural units capable of resisting loads through in-plane shear resistance. This shear resistance Effects a shear transfer of these loads to the foundation with a minimum amount of Deflection. Such resistance is referred to as 'diaphragm action'.
The wind loads acting on the endwalls of standard space saver and lean-to buildings and on a portion of the sidewall at standard bearing endwalls are transferred to the Foundation by diaphragm action of the flush girts and sheeted walls. The resistance of kirby-wall sheeting acting as a diaphragm is approximately 2.2 Kn/m (150 lbs/ft).
The minimum effective lenghts of sheeting required at sidewalls of standard space saver Buildings and at endwalls of all standard buildings with bearing endwalls for the Standard windload of 1.25 Kn/m2 are shown in the following tables. The effective lengths shall be exclusive of any framed openings for accessories etc.

Diaphragm action table:

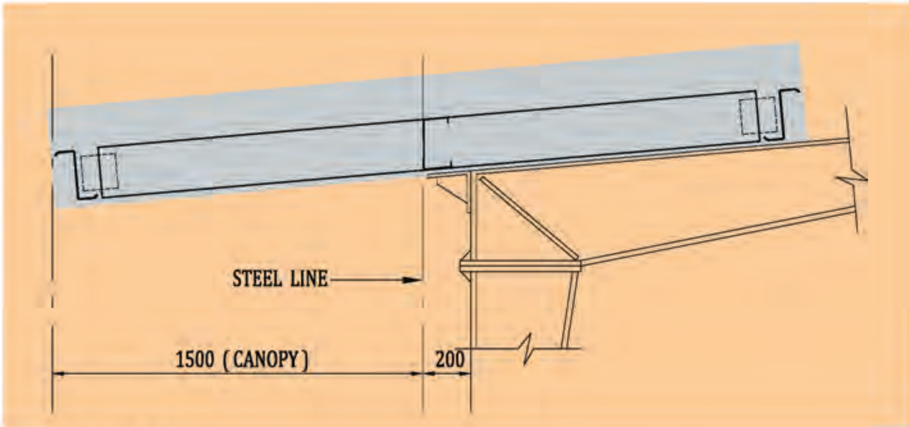
Effective length of sidewall sheeting (meters) required for diaphragm action:

Effective length of endwall sheeting (meters) required for diaphragm action:

Span (meters)	Eave height (meters)					
	3	4	5	6	7	8
6	2.0	2.7	3.3	3.9	4.6	5.2
9	3.0	4.0	5.0	5.9	6.9	7.9
12	4.1	5.4	6.7	7.9	9.2	10.5
15	5.2	6.8	8.4	10.0	11.6	13.2
18	6.3	8.2	10.1	12.0	14.0	15.9

Effective length of endwall sheeting (meters) required for diaphragm action:

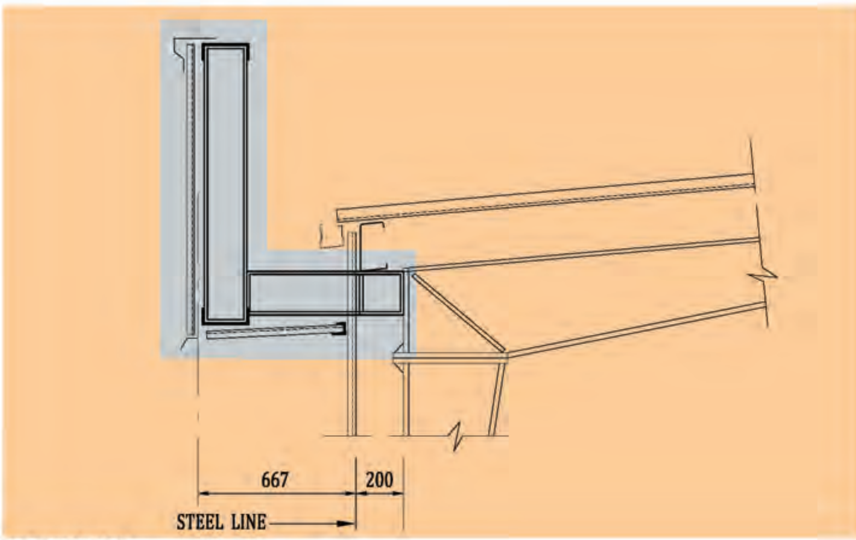
Eave Ht. (Meters)	6.0 M End bay	7.5 M Endbay
3	2.0	2.4
4	2.6	3.2
5	3.3	4.1
6	3.9	4.9
7	4.5	5.7
8	5.2	6.5



3.8 STANDARD EAVE CANOPY

A standard eave canopy up to 1.5M wide and a standard endwall purlin extension of up to 1.73M can be added to any of the standard frame type buildings.

For canopies other than standard, refer to sales office or headquarters for a special price and details.



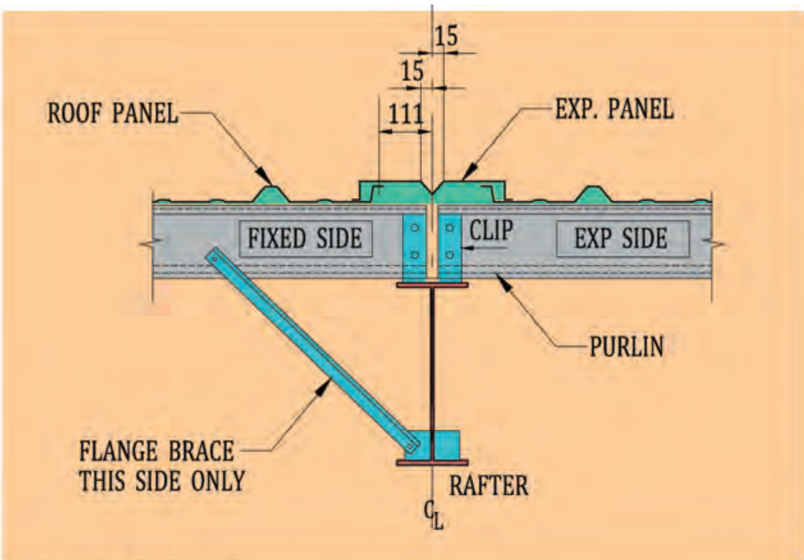
3.9 STANDARD FASCIA

A standard fascia of upto 1.8 Meters height can be added to any of the standard frame type buildings.

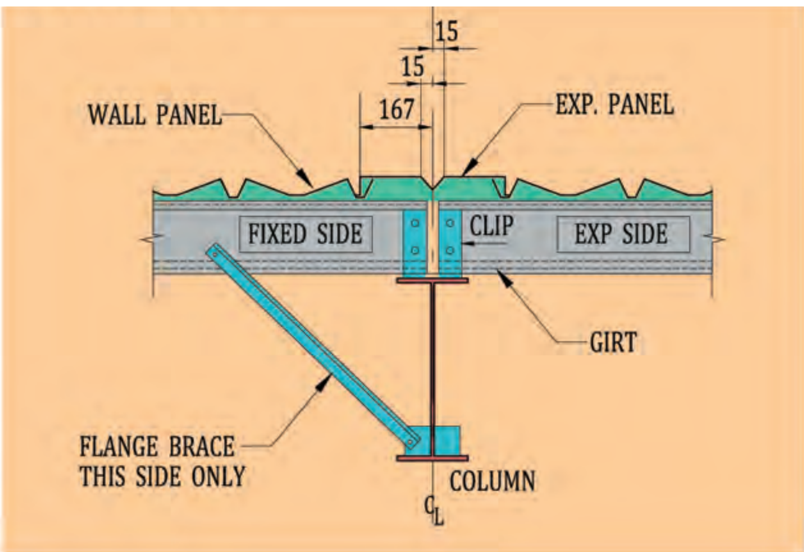
The standard fascia extends out 667 mm from the sidewall and endwall steel line, is single sheeted and provided with soffit.
For fascias other than standard refer to sales office or headquarters for a special price and details.

3.10 STANDARD EXPANSION JOINTS

Expansion joint at roof:



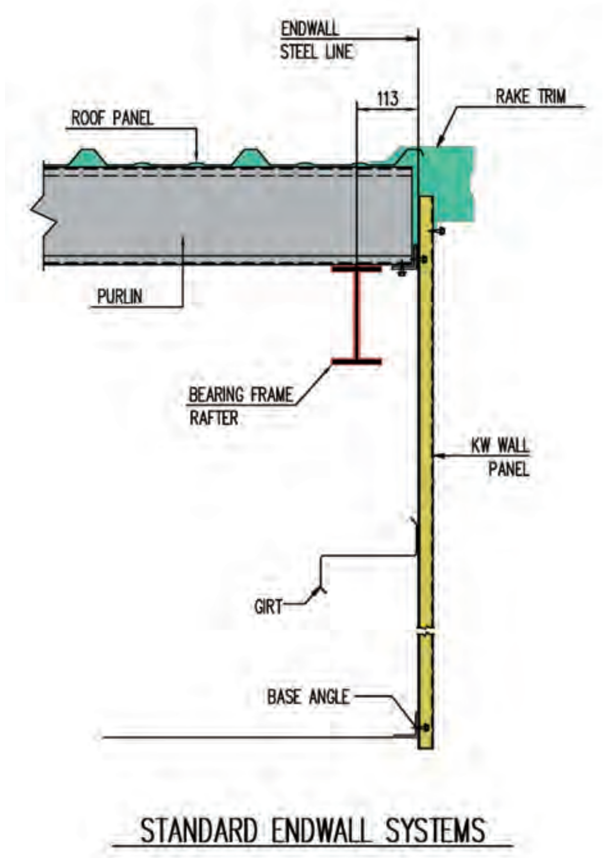
Expansion joint at wall:

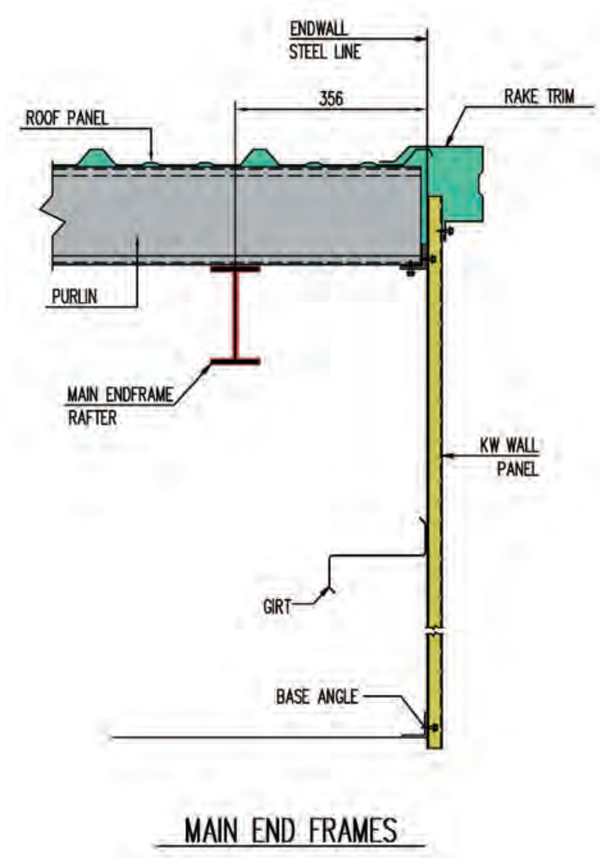


A longitudinal expansion joint is provided for buildings with length greater than 120 meters as shown above.

If the width of the building exceeds 120 meters, double columns are used to cater for Expansion.

3.11 STANDARD ENDWALL SYSTEMS





Standard endwall systems:

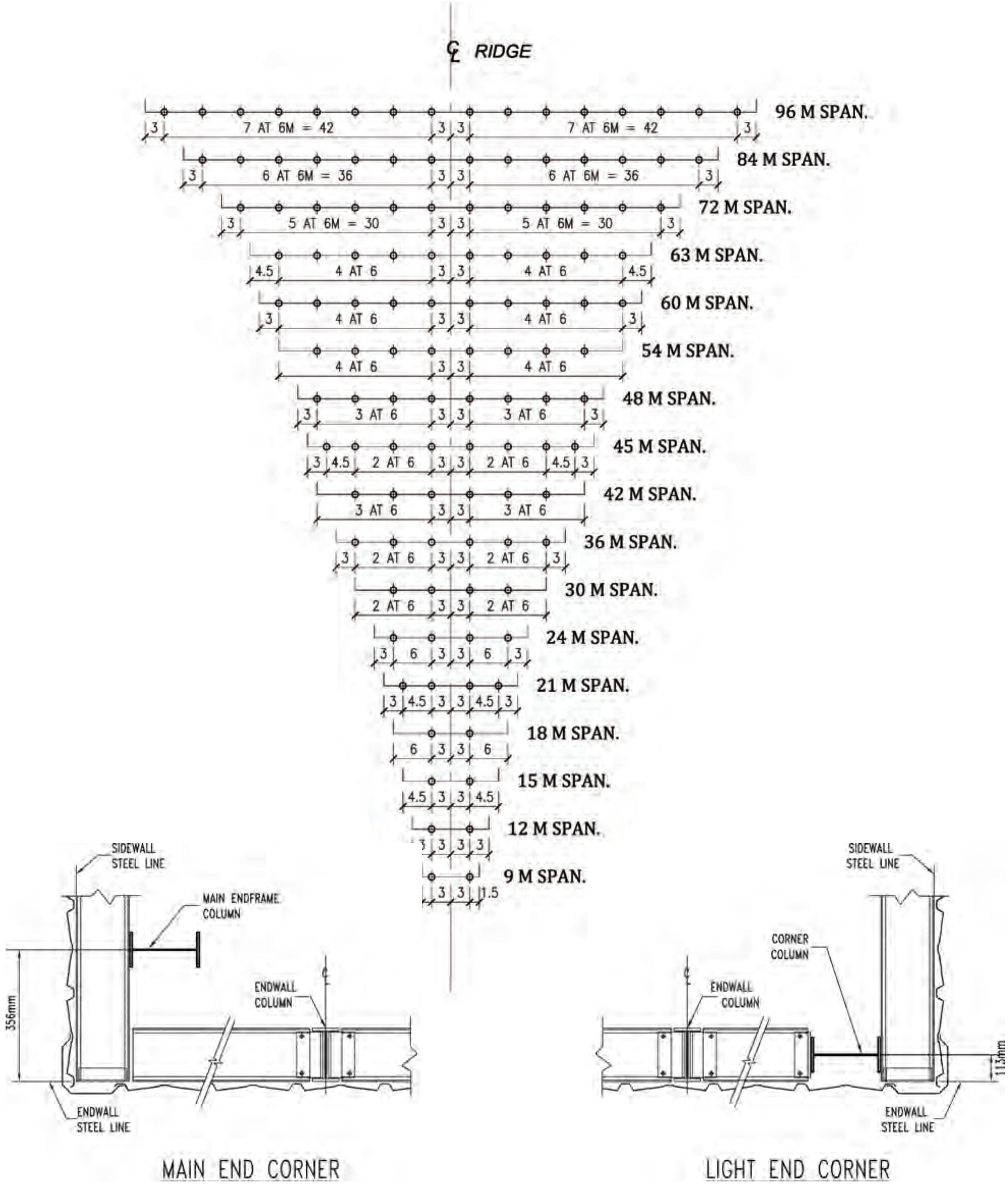
Endwalls of standard buildings have two light endwalls. The light endwall rafter is a hot-rolled I-section and is designed as a continuous beam over wind column supports. The Standard corner columns are i-sections designed as pinned at both ends. The endwall girts are fwsh with the wind columns. As there is no frame action at a light end frame, the lateral wind-load from the half-bay tributary area acting on the frame is resisted by the diaphragm action of the sheeted endwall.

Main end frames:

A main end frame is normally used when a future extension to the building is required. It is also used for buildings with cranes or full open endwalls. A main end frame is designed for a full bay loading similar to an interior frame. Main end frame centerline is located 356 mm from the endwall steel line.

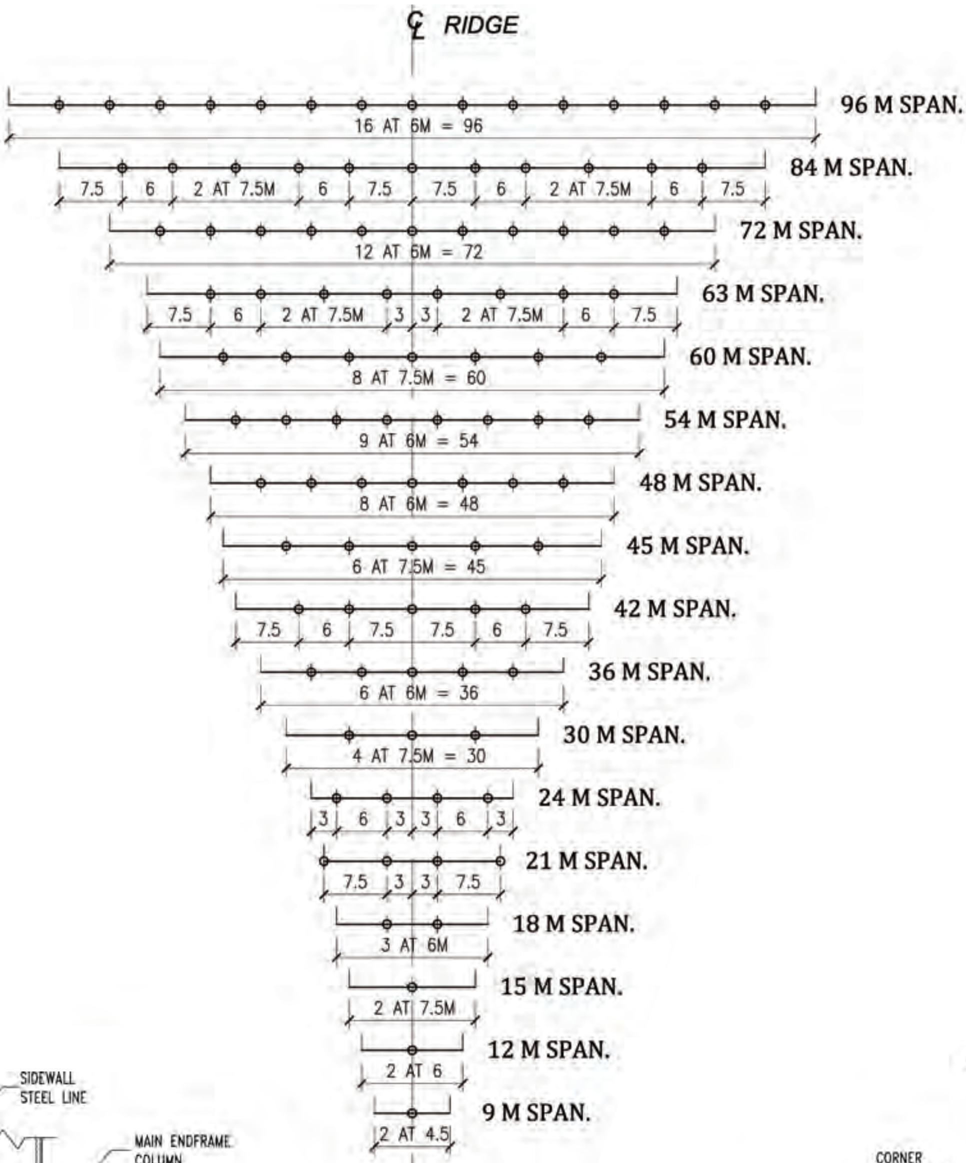
A building with only two bays shall have at least one main end frame while building with only one bay shall have both main end frames.

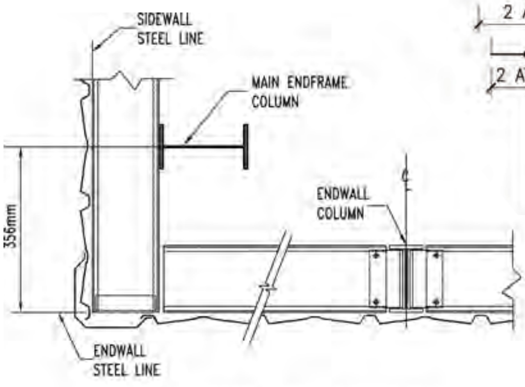
3.12 STANDARD WIND COLUMN SPACING



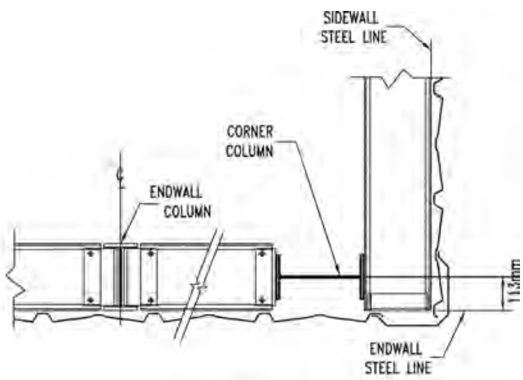
All dimensions are in meters

3.13 STANDARD WIND COLUMN SPACING WITH MEZZANINE





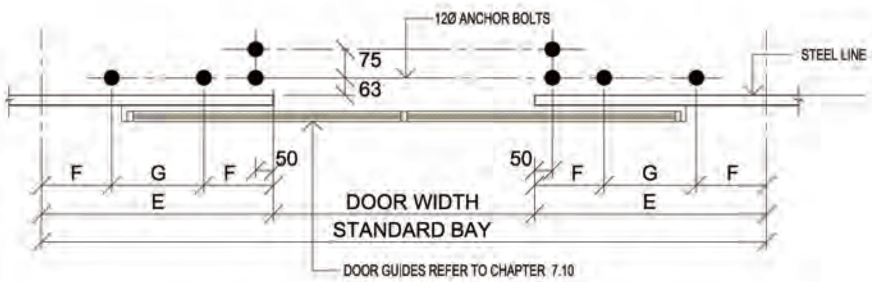
MAIN END CORNER



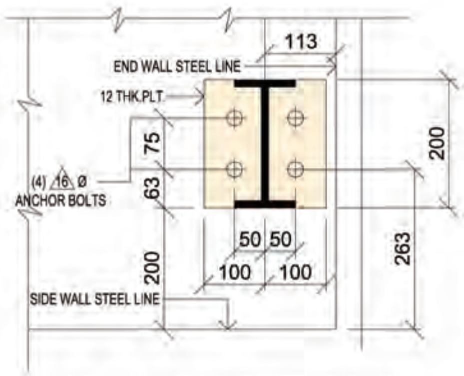
LIGHT END CORNER

All dimensions are in meters

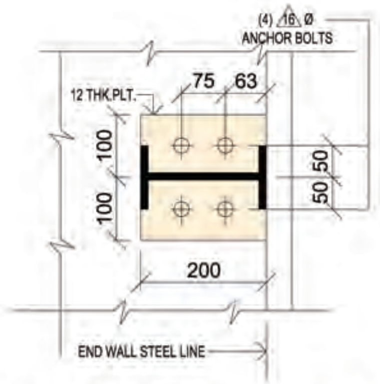
3.14 STANDARD ANCHOR BOLTS DETAIL



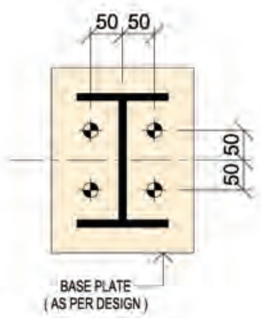
BOLT PLAN FOR SLIDE DOOR



BOLT PLAN FOR 'I' SECTION
CORNER COLUMN



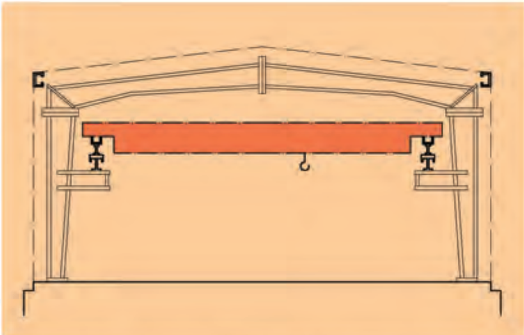
BOLT PLAN FOR 'I' SECTION
WIND COLUMN

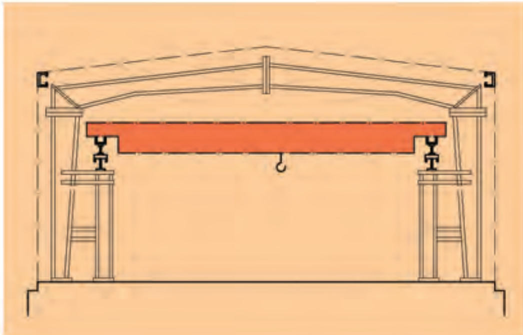


BOLT PLAN
FOR INTERIOR
MEZZANINE COLUMN

4 : SPECIAL STRUCTURAL & PRE-ENGINEERED BUILDING SYSTEMS

4.1 RIGID FRAMES WITH OVERHEAD CRANES





Rigid frames with overhead cranes:

Rigid frame buildings with electric overhead travelling cranes are designed for the effect of the loads in accordance with the aisc manual. Cranes of 3.2 Mt., 5.0 Mt. ,10.0 Mt. and 15.0 Mt. up to a span of 21 meters are mounted on brackets welded to the main frame columns. For crane capacities in excess of 10 ml. It is generally recommended to provide independent support columns tied laterally to the main frame columns. The complete crane system includes brackets/ columns, bracing beam and crane runway.

In the design of the rigid frame an impact allowance of 10 % of max. Wheel load is considered for pendant operated and 25 % of max. Wheel load for cab operated cranes. The lateral force due to the effect of moving crane trolley is 20 % of the sum of the lifted load and crane trolley (exclusive of other parts of the crane). The longitudinal force is 10 % of the max. Wheel load. The lateral and longitudinal forces are applied at the top of rail. The loading conditions in accordance with MBMA are:

Dead + wind load,
Dead + crane loads + one-half live or wind load
Dead + crane loads + 3/4 snow load
Whichever is critical.

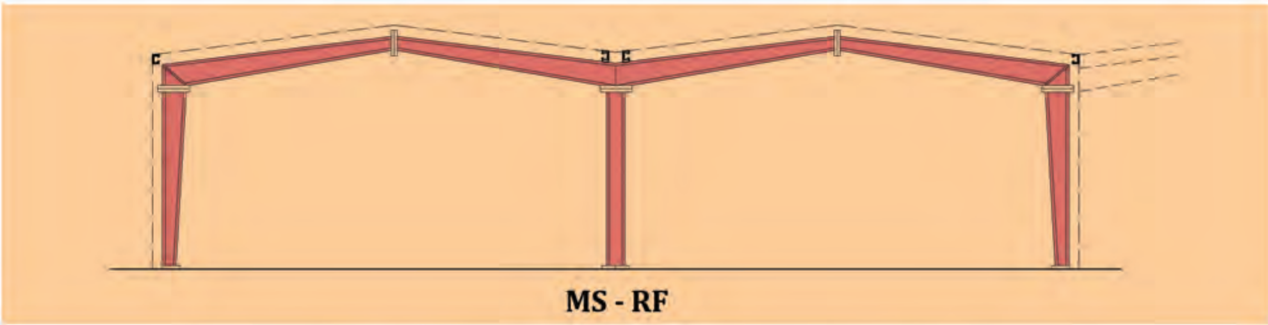
In buildings with multiple Cranes effect of the moving loads for the worst case of loading is considered in the design of the main frames and the crane system. Cranes travelling outside the building are supported on independent 'a' or 'h' frames as required.

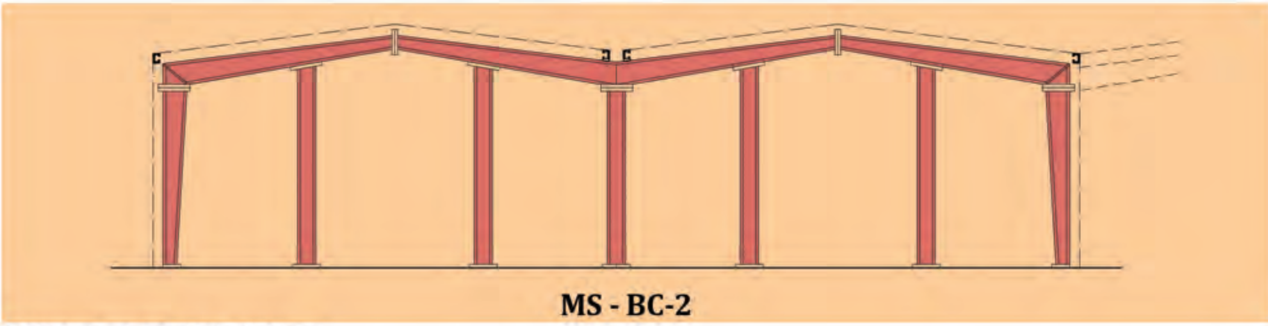
Cranes:

Buildings can be designed to support any required crane system. Generally, overhead travelling cranes up to 15 mt are supported on brackets. for higher capacities, an independent support system is provided. Crane support for overhead travelling cranes includes brackets, beams and bracings.

Al-adasani pipe factory - kuwait

4.2 MULTI-SPAN FRAMES & TRUSSES





Multi-span frames:

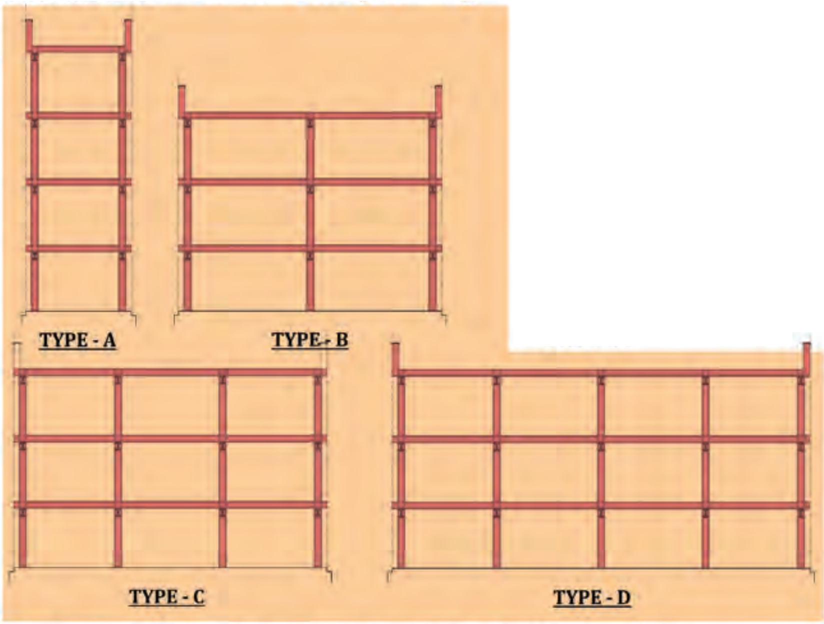
Multi-span frames up to 6 spans or 120 meters are analysed without lateral expansion joint. For frame widths in excess of the above, a double column expansion joint is provided. Exterior columns are built-up sections tapered or straight, pinned or fixed at base depending on eave height of building. Exterior columns have rigid (moment) connection at top and the rafters are built-up sections and continuous throughout the length. Interior columns are generally pinned at both ends. Valley gutters are designed assuming interior downspouts (supplied by others) at bay spacing. However if internal drainage is not allowed larger valley gutters can be supplied depending on the drained area of the roof.

Trusses:

Kirby truss system is one of the company's most popular and highly economical products. It is a rigid structure, ideal for large span roof systems, multiple bay buildings and as mezzanine floor framing. Significant reductions in clearances and building heights are possible by running service pipes/ducts through the trusses. Foundation costs are also reduced due to fewer columns being required to support larger spans. The kirby truss system structures are individually designed to meet the specific requirements of each building and are fabricated utilizing high quality efficient fixtures. The system allows for easy building installation as all connections are field bolted. Except for field splices on very large spans, no site welding is required.

Sultan centre - kuwait

4.3 MULTI-STOREY BUILDINGS



Multi storey bank building

Multi-storey structures are available in the following types:

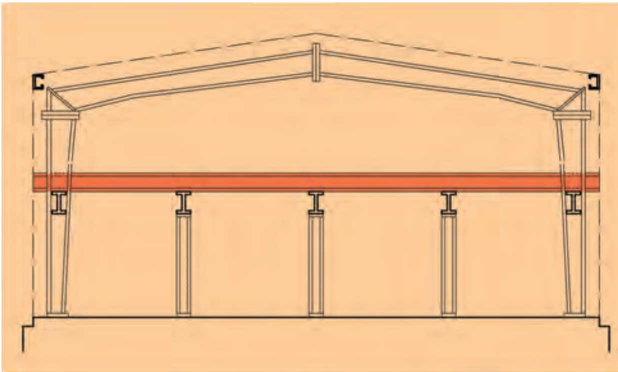
Type	No. of spans	No. of floors
AI	1	2
A2	1	3
A3	1	4
BI	2	2
B2	2	3
CI	3	2
DI	4	2

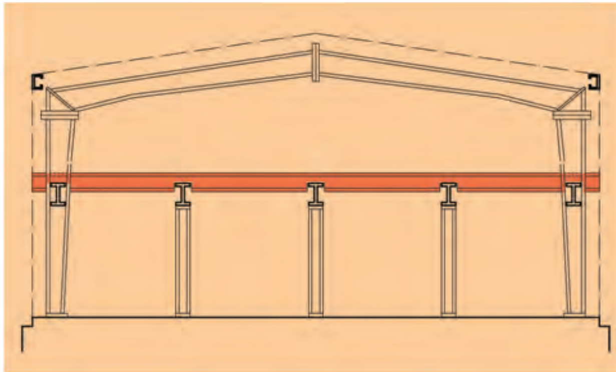
Columns and joists are fabricated from hot rolled sections and beams from either hot rolled or built-up sections. Floor and roof steel deck is profiled galvanised sections suitable for supporting the dead load of the reinforced concrete slab and 0.5 Kn/m2 construction load.

The standard design loads are:

Floor - live load = 4 kn/m2 suitable for residential and office occupancy.
Dead load = 4 kn/m2 which covers self wt. of steel framing, concrete slab (100 mm), light floor finishes (carpets, vinyl tiles) light weight partitions, ceilings and services.
Roof - live load = 1 kn/m2
- Dead load = 5 kn/m2 which covers all loads as for floor plus built-up roof.
-Wind load = 1.25 Kn/m2
All beam to column connections are moment resisting connections field bolted with H.S. Bolts.

4.4 MEZZANINE FLOORING SYSTEM



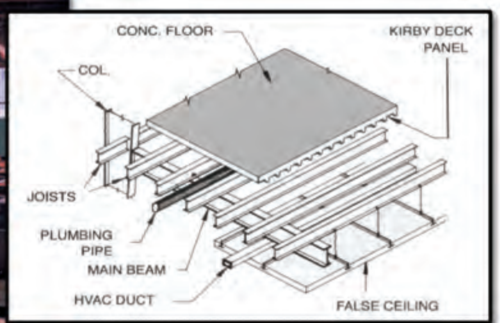


The standard mezzanine framing consists of profiled steel deck, joists, beams and intermediate support columns. Beams are built-up sections spanning in the longitudinal direction, joists are hot rolled sections spanning in the lateral direction and intermediate support columns are either pipe sections or hot rolled aisc shapes.

The standard mezzanine finished floor level is 3.5 Meters with a clear height at bottom of joists of 3.1 Meters. The total thickness of floor slab inclusive of deck and finishings is assumed to be 100 mm.

Beams and joists are designed as simply supported at both ends and the intermediate support columns are designed as pinned at both ends. The standard design live load is 5 kn/m21 covering most of the occupancies encountered in usual practice per aisc tables and the Design Dead Load is 3 kn/m2 which covers self weight of framing, 100 mm concrete slab and light finishes. Refer to tables for the standard intermediate column spacings and the occupancies covered for the standard live load.

Mezzanine floors of non-standard dimensions and loading to suit special customer requirements are also available upon request.



4.5 OPEN WEB STEEL JOISTS

Definition:

The Open Web Steel Joist is a secondary steel truss member fabricated from crimped angles welded onto top and bottom chords. The elements of the open joist are made of hot rolled as well as cold formed grade 50 steel. Open Web Steel Joists are used as mezzanine joists, roof purlins, among others.

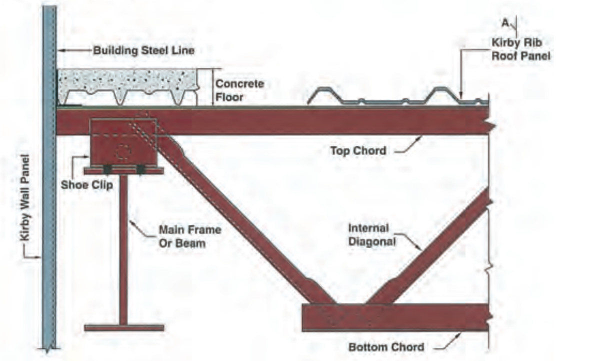
Advantages:

- Offers an economical solution for long spans carrying heavy loads or light loads compared to conventional steel structure .
- Allows more clearance to the building by minimizing the mezzanine overall depth by designing beams at the short direction and the joists at the long direction without increasing the weight.
- Ducts and mechanical accessories can be installed in between the web openings .
- Cambering will prevent tiles, partitions or any other delicate finishings from cracks by maintaining the finish floor level straight.

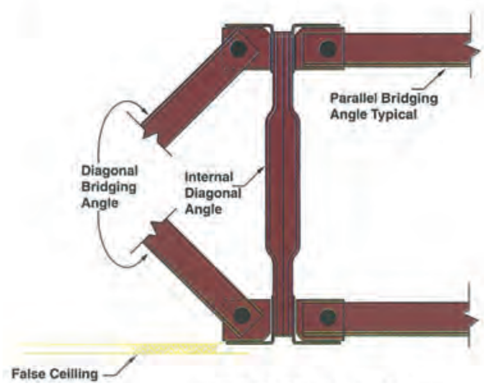
Aircraft Hangar with 14 m open web cantilever joist erected at Kuwait International Airport.

Kirby offered the customer a high quality economical solution using open web steel joists in this project instead of a rival space frame option.

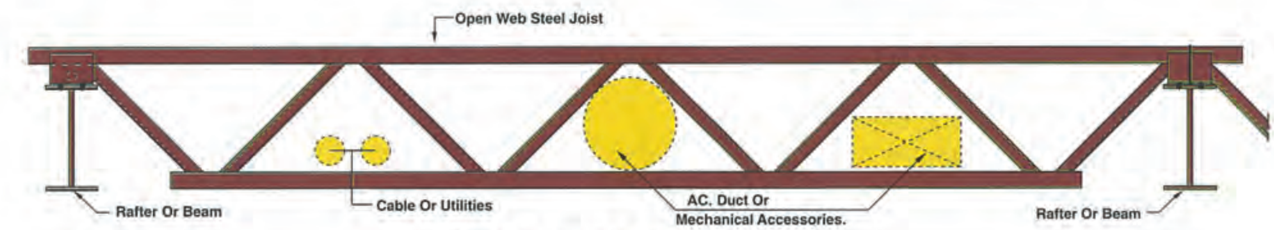
Detailing:



Open Web Steel Joist Connection Detail



Section A -A



OPEN WEB STEEL JOIST

Specifications:

Kirby Open Web Steel Joist is designed in accordance with the latest editions of: Steel Joists Institute (SJI), American Iron and Steel Institute (AISI), American Institute of Steel Construction (AISC), American Welding Society (AWS).

Material specifications are in accordance with ASTM A570, A572, A1011 or equivalent.

Load tables:

Kirby's Open Web Steel Joists is recognized by Kirby's standard designation as follows: KJ (Depth mm)-(Chord Size-Letter) Example: KJ 400-A.

Allowable total load (kN/lm) Open Web Steel Joists

Span (mm)	KJ 300-A 7.20 kg/m	KJ 300-B 8.93 kg/m	KJ 300-C 10.74 kg/m	KJ 300-D 13.53 kg/m	KJ 300-E 16.03 kg/m	KJ 300-F 19.4 kg/m	KJ 300-G 22.6 kg/m	KJ 300-H 26.33 kg/m
6000	3.20	4.80	6.00	8.50	10.10	13.00	15.30	18.40
7000	2.35	3.53	4.41	6.24	7.42	9.55	11.24	13.52
8000	1.80	2.70	3.38	4.78	5.68	7.31	8.61	10.35
9000	1.30	2.05	2.55	3.60	4.30	5.50	6.50	7.80
10000	1.05	1.66	2.07	2.92	3.48	4.46	5.27	6.32
11000		1.37	1.71	2.41	2.88	3.68	4.35	5.22
12000		1.10	1.30	1.90	2.30	3.00	3.50	4.20

Span (mm)	KJ 400-A 7.4 kg/m	KJ 400-8 9.21 kg/m	KJ 400-C 11.09 kg/m	KJ 400-D 13.96 kgm	KJ 400-E 16.37 kg/m	KJ 400-F 19.88 kg/m	KJ 400-G 23.4 kg/m	KJ 400-H 27.26 kg/m
6000	4.30	6.60	8.20	11.60	13.90	17.70	21.00	25.20
7000	3.16	4.85	6.02	8.52	10.21	13.00	15.43	18.51
8000	2.42	3.71	4.61	6.53	7.82	9.96	11.81	14.18
9000	1.80	2.80	3.50	4.90	5.90	7.60	9.00	10.70
10000	1.55	2.38	2.95	4.18	5.00	6.37	7.56	9.07
11000	1.28	1.96	2.44	3.45	4.14	5.27	6.25	7.50

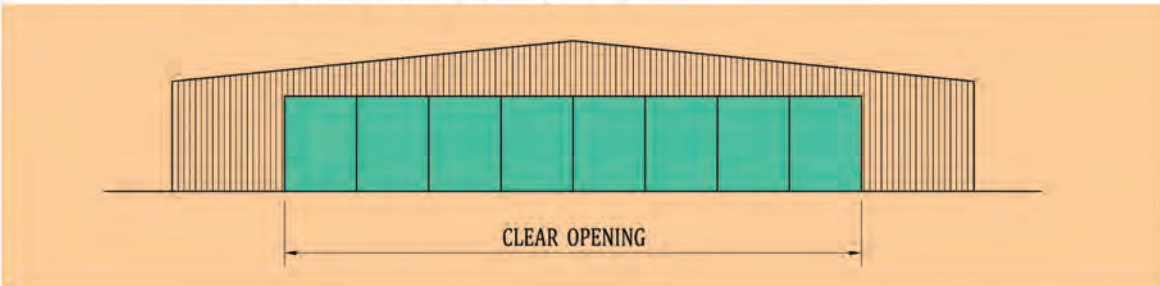
Span (mm)	KJ 600-A 8.22 kg/m	KJ 600-8 10.19 kg/m	KJ 600-C 12.29 kg/m	KJ 600-o 15.45 kg/m	KJ 600-E 18.32 kg/m	KJ 600-F 21.98 kg/m	KJ 600-G 25.5 kg/m	KJ 600-H 29.42 kg/m
6000	6.60	10.10	12.60	17.80	21.40	27.40	32.40	38.90
7000	4.85	7.42	9.26	13.08	15.72	20.13	23.80	28.58
8000	3.71	5.68	7.09	10.01	12.04	15.41	18.23	21.88
9000	2.80	4.30	5.40	7.60	9.20	11 .70	13.90	16.70
10000	2.27	3.48	4.37	6.16	7.45	9.48	11 .26	13.53
11000	1.87	2.88	3.61	5.09	6.16	7.83	9.30	11 .18
12000	1.50	2.50	2.95	4.20	5.00	6.50	7.70	9.20
13000		2.00	2.50	3.50	4.30	5.50	6.50	7.80
14000		1.72	2.16	3.02	3.71	4.74	5.60	6.73

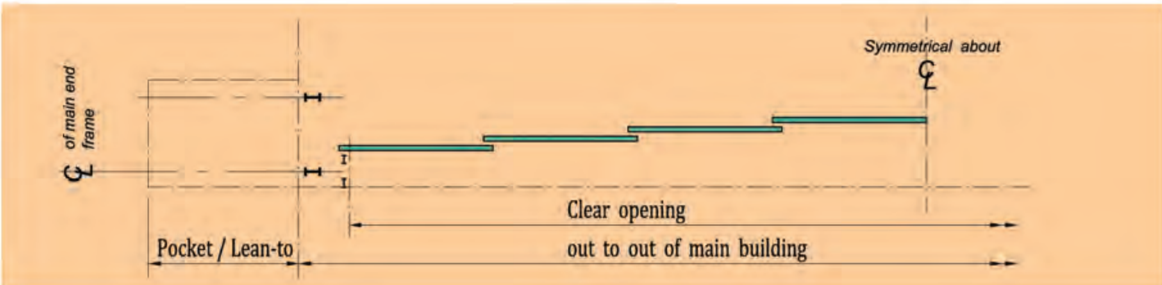
Span (mm)	KJ 800-C 13.45 kg/m	KJ 800-D 16.54 kg/m	KJ 800-E 19.43 kg/m	KJ 800-F 23.34 kg/m	KJ 800-G 27.42 kg/m	KJ 800-H 31.63 kg/m	KJ 800-1 34.24 kg/m	KJ 800-J 35.61 kg/m
11000	4.79	6.86	8.26	10.58	12.56	15.04	16.28	17.52
12000	3.99	5.63	6.81	8.68	10.33	12.44	13.50	14.55
13000	3.40	4.80	5.80	7.40	8.80	10.60	11.50	12.40
14000	2.93	4.14	5.00	6.38	7.59	9.14	9.92	10.69
15000	2.50	3.53	4.21	5.46	6.49	7.85	8.42	9.10
16000	2.20	3.10	3.70	4.80	5.70	6.90	7.40	8.00
17000		2.75	3.28	4.25	5.05	6.11	6.56	7.09
18000		2.34	2.90	3.68	4.46	5.35	5.79	6.24
19000		2.10	2.60	3.30	4.00	4.80	5.20	5.60
20000			2.35	2.98	3.61	4.33	4.69	5.05

For direct order, use the above tables as follows:

1. Select your span from the First left column [SPAN (mm)]
2. Move to the right until you Find your desired load or nearest higher value.
3. Read the column header KJ (Depth mm)-(Size-Letter) and make your direct order from Kirby's Sales Offices.

4.6 HANGAR DOOR SYSTEM





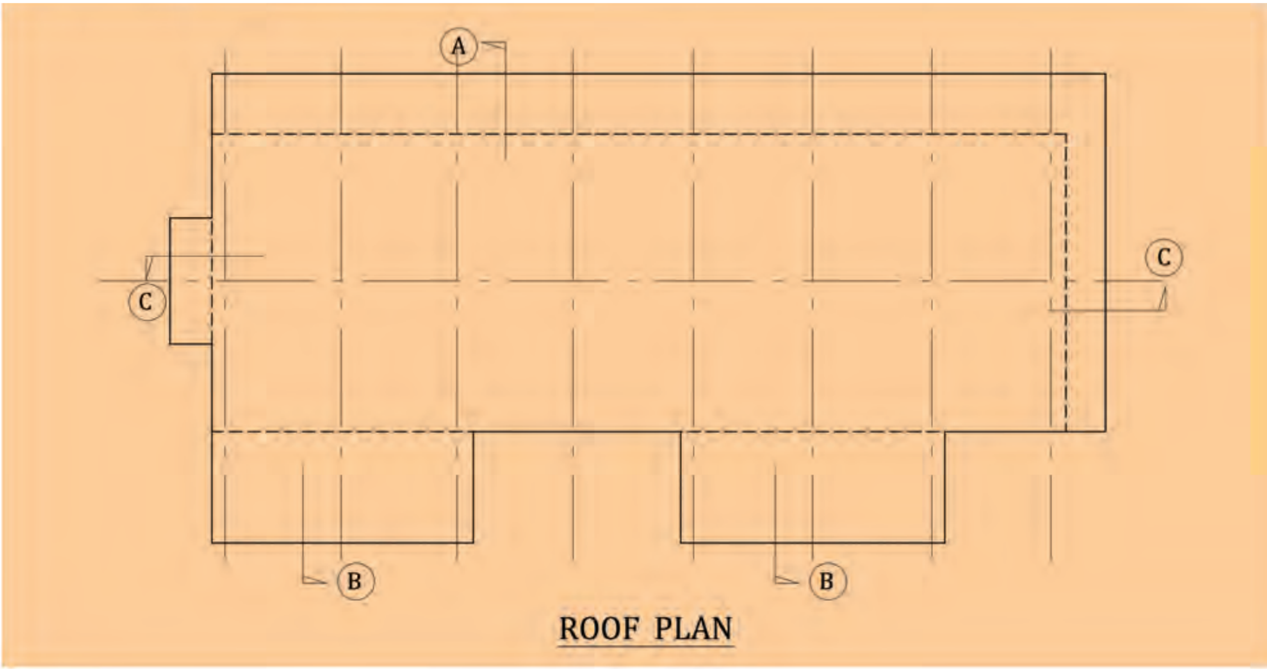

Aircraft hangar - Jordan

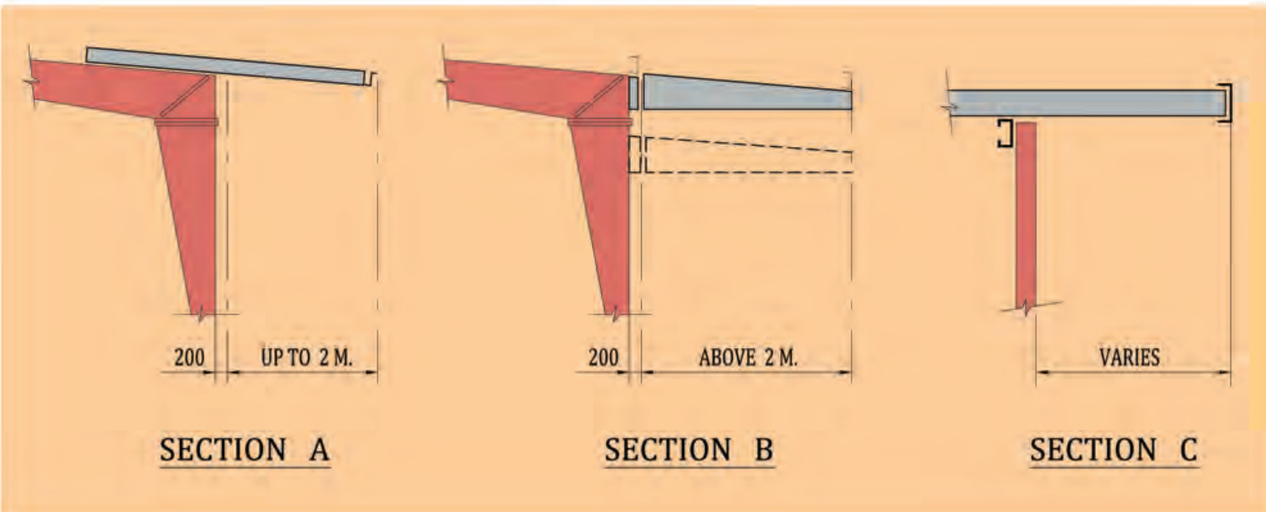
Buildings with hangar doors are designed to accommodate air crafts types DC8, DC9, B707, B727 & B737. The maximum available door opening size is 51 meters clear width and 15 meters clear height.

For smaller doors up to a height of approx. 9 meters an overhang header support system is provided and for larger doors above 9 meters height an additional frame is used at the exterior to minimise deflection.

The hangar door system is available as either manually or electrically operated. For manually operated doors the top guide beams are hot rolled angles or tee sections and for electrically operated doors the top guide beams are hot rolled i-sections which prevent the door leaves from slipping due to uplift of the frame from wind forces. Hangar doors are supported on rails embedded in concrete. The door leaf is adequately braced to resist the wind forces and are offered with either one side sheeted or both sides sheeted. Door pockets at ends are supplied with either sheeted or open walls.

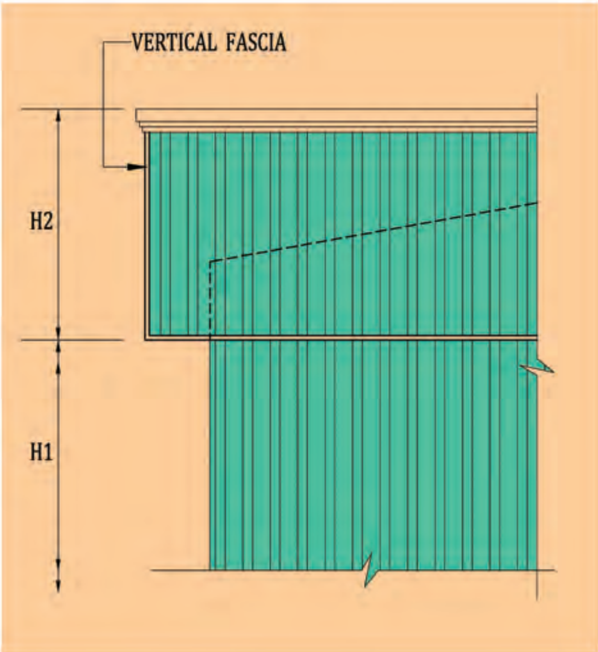
4.7 SPECIAL CANOPIES

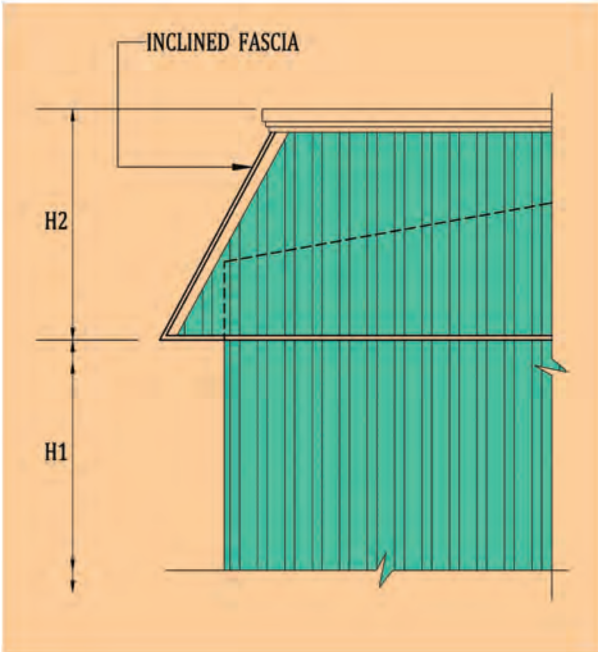




Special canopies of width in excess of the standard canopy width of 1.5 Meters and up to 6 meters are made of either hot rolled i-sections or built -up sections bolted to rafter end plate or column flange as required. Canopies are supplied with or without soffit. Canopies exceeding 6 meters are treated as part of the frame through continuation of the roof rafter.

4.8 SPECIAL FASCIAS





Special fascias:

Fascias are used for architectural purposes to conceal the gable of the building. A variety of fascias either straight or inclined can be provided as shown in the sketches.

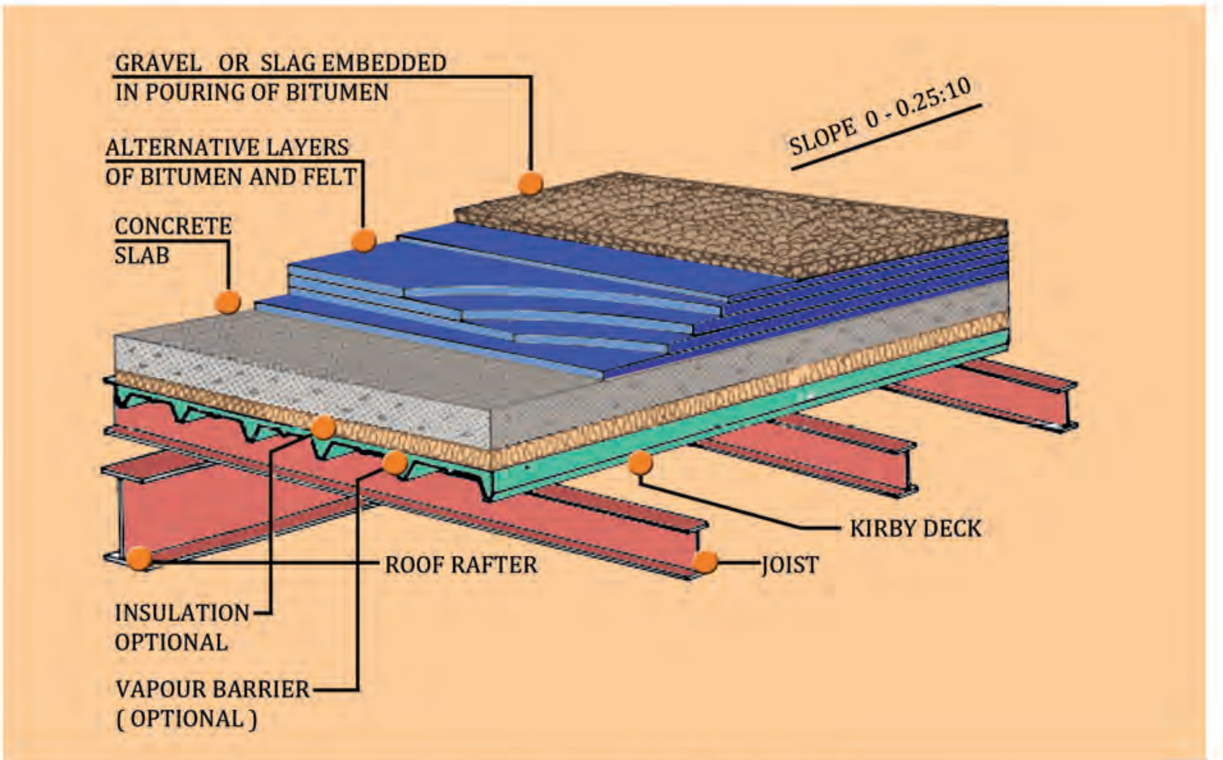
Fascias are cantilevered from the main frame columns on the sidewall and from the wind columns on the endwall. Flush fascias or parapets can also be provided.

Fascias and canopies:

KIRBY provides fascias especially designed to customer requirements. This can be either vertical, horizontal or with curved sheeting to enhance the architectural look of your building. Wall canopies at eaves, endwalls, over doors and windows are also available.

Kisr office building - Kuwait

4.9 BUILT-UP ROOFS



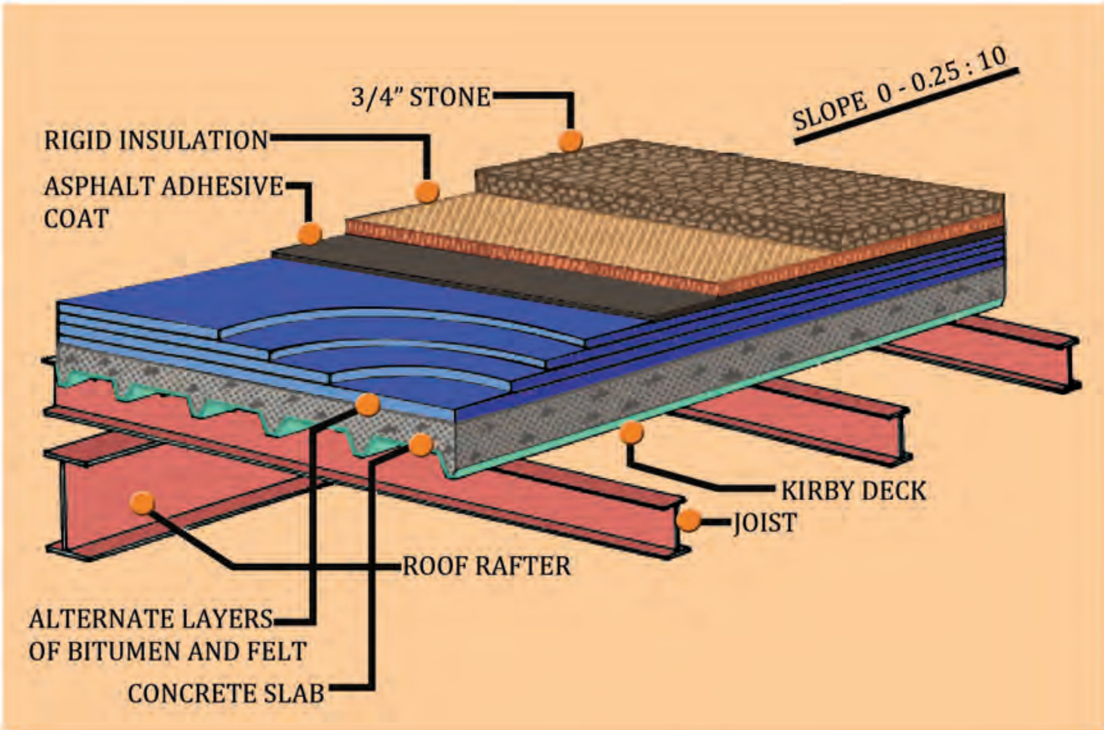
Built up roofs:

Built-up roofing is required for flat roofs and may be used for roofs with low slopes. It can be applied (not by KBSK) over Kirby roof deck to weatherproof the building to meet client specifications or architectural requirements. Buildings requiring built-up roofs shall be identified at the design stage to ensure structural adequacy for the required additional dead loads and compatibility to receive the specified built-up roofing system. The two commonly used built-up roofing systems are briefly described below:

4.9A CONVENTIONAL BUILT-UP ROOFING SYSTEM

Conventional built-up roof system may be composed of some or all of the following elements depending on end use of the building, geographical location, desired aesthetic effect, cost and other factors. Roofing elements from inside to outside of building over roof purlins/joists are Kirby steel deck, vapor barrier, rigid insulation, reinforced concrete slab, alternate layers of saturated felt and moppings of bitumen and an optional top pouring of pitch or asphalt in which slag or gravel may be embedded which completes the built-up roof. Vapor barrier protects the insulation from condensation wherever conditions of high humidity exist inside the building or on roof decks in cold climates and on decks of heated buildings where winter temperature may fall below 7° C. Vapor barrier materials commonly used are coated base sheets, saturated felts, laminated kraft papers and PVC sheets. Concrete slab supporting flat built-up roofing is normally pitched towards drains at the center of the slab areas connected to internal drainage system.

4.9B INVERTED BUILT-UP ROOFING SYSTEM

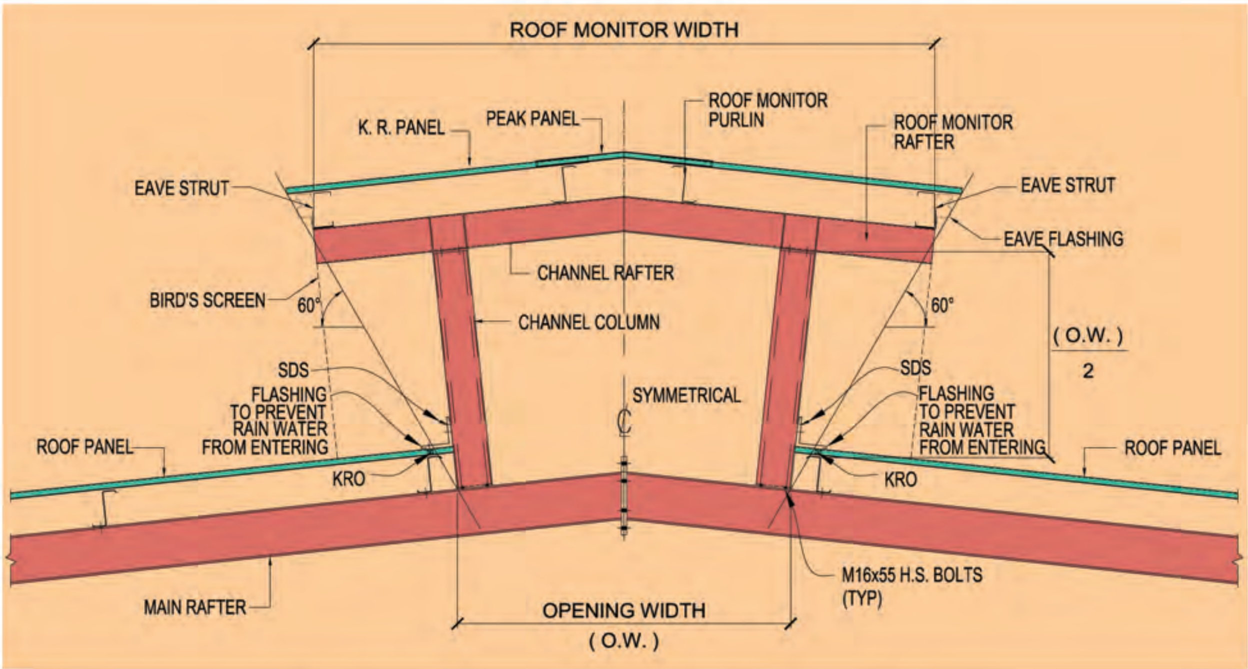


Also known as upside down roof assembly, an inverted built-up roofing system consists of several layers installed in a sequence as shown in sketch. First a standard built-up roofing (without insulation and vapor barrier) is applied directly to the concrete deck. Then, rigid insulation that is impervious to moisture such as extruded polystyrene foam is bonded to the top of the built-up roofing with a mopping of steep asphalt. A layer of 3/4 inch crushed stone on top of the insulation completes the assembly. Gravel or slag should not be used because the sharp edges would damage the bare insulation underneath.

This roofing system is based on the theory that the insulation set above the roofing both insulates the building and protects the built-up roofing from the harmful effects of thermal cycling, ultraviolet degradation, weathering and roof traffic. This virtually eliminates the common defects caused by these elements such as blistering, ridging, cracking, alligatoring and wrinkling, however the inverted built-up roof system is relatively heavier than the conventional built-up roof system due to the increased stone content.

4.10 ROOF MONITOR

Typical section of monitor roof:



A roof monitor is a structure mounted on the ridge of the building and is used for ventilation purposes. It is fabricated from either cold formed channel sections or hot rolled I-sections.

It is generally used when a standard ridge ventilator is not adequate to give the required number of air changes inside the building.

4.11 CURVED BUILT UP MEMBERS

Curved process conducted during fabrication:

- Design and production system is integrated with that of the building structure, ensuring on-time delivery.
- Accurate detailing and manufacturing techniques assure correct appearance and perfect fit at site.
- Flanges range from 125mm x 5 mm to 400mm x 16mm.
- Depth range from 200mm to 1200mm
- Mass production of members with 10m radius or more.
- Variable depth and tapered members
- Capability of curvature in three dimensions.

Semi auto curve beam welders:

a. Single Fillet to each flange in one pass
   Min Fillet Size = 3mm
   Max Fillet Size = 6.Smm
b. Length of Built up member
   Min = 200mm
   Max = 14000mm
c. Max Flange Thickness = 16 mm
d. Uniform Flange width per member
e. Max Web Taper = 0-10 Meters
f. Max Feed = -120 in\min
   i.e= -3048 mm\min -3mm fillet
g. Filler AWS/ASME SF AS.I7 EM13K

Delhi Metro Station, India

Arc - Curved Aircraft Hangar, Yemen

Curved Roof, Enma Mall, Bahrain

4.12 SECONDARY MEMBERS

Bracings:

The Cable Bracing is a secondary structural member that ensures the stability of the building against forces in the longitudinal direction such as wind, cranes and earthquakes.

Cold formed members:

Secondary structural framing refers to purlins, girts, eave struts, wind bracing, flange bracing, base angles, clips and other miscellaneous structural parts.
Purlins, girts, and eave struts are cold formed from steel which has a minimum yield strength of 345 MPa (50,000 psi) and will conform to the physical specifications of ASTMA 570 (Grade 50) or ASTM A-653 (Grade 50) or equivalent.

Z - purlin / girt:

Purlins and girts shall be roll formed Z sections, 200 mm deep with 64 mm flanges shall have a 16 mm stiffening lip formed at 45° to the flange.

Eave strut:

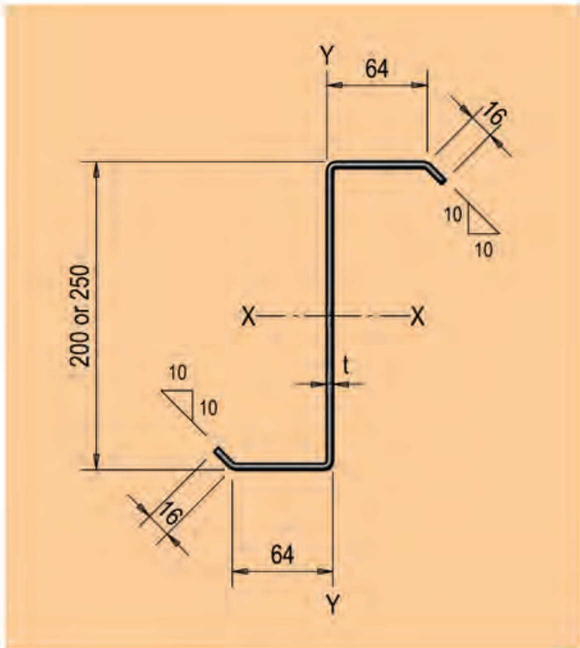
Eave struts are 200 mm deep with a 104 mm wide top flange, a 118 mm wide bottom flange, both are formed parallel to the roof slope. Each flange has a 24 mm stiffener lip.

C - section:

C- Sections are 200mm deep with a 100mm flange. The flanges are perpendicular to the web and have a 24mm stiffening lip.

CHAPTER 5 : ENGINEERING DATA

5.1 PURLIN & GIRT 200Z / 250Z - SECTION PROPERTIES



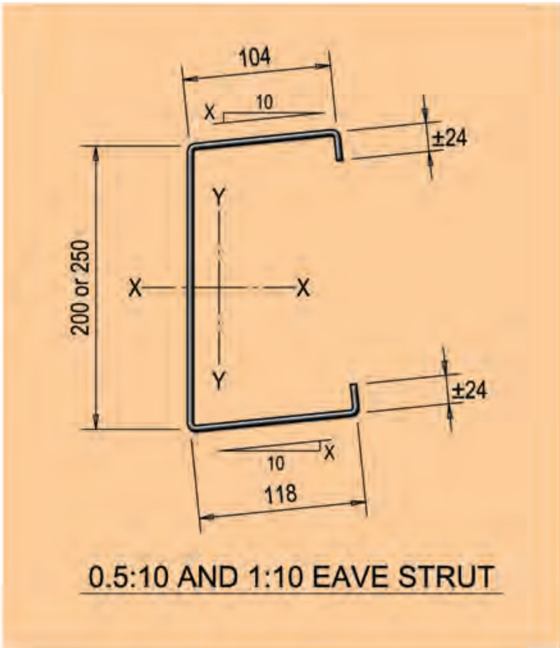
Minimum Specified Yield Stress Fy= 34.5 Kn/cm^2 (50 KSI)

Table of properties for Z section									
Section	General information			Deflection Inertia	Elastic modulus	Allowable shear	Allowable moment		
	Girth	Area	Weight	Lx	Sx	Va	Ma	Ma*	Ma**
	(mm)	(cm2)	(Kg/1m)	(cm4)	(cm3)	(KN)	(KN-m)	(KN-m)	(KN-m)
200Z1 .5	346	5.19	4.07	310.11	26.02	10.90	5.37	3.49	3.76
200Z1.75	346	6.06	4.75	364.43	31 .51	17.35	6.50	4.23	4.55
200Z2.0	346	6.92	5.43	420.87	37.27	25.97	7.69	5.00	5.39
200Z2.5	346	8.65	6.79	520.33	48.80	45.35	10.07	6.55	7.05
250Z2.5	400	10.00	7.85	883.44	67.28	40.28	13.89	6.94	9.72

Section Properties are calculated in accordance with the 2001 Edition of the American Iron and Steel Institute "Specifications" (A.I.S .I). Updated on 10 January 2003

1. Top Flange : Fully braced
2. Bottom Flange : Fully unbraced
3. Ma: Capacity under Gravity Load
4. Ma*: Wind Uplift for simply supported beam
5. Ma **: Wind Uplift for continuous beam
6. Stress Increment of 33% is not allowed any more

5.2 EAVE STRUT - 0.5:10 AND 1:10 SLOPE - SECTION PROPERTIES



Minimum Specified Yield Stress Fy = 34.5 Kn/ Cm² (50 Ksi)

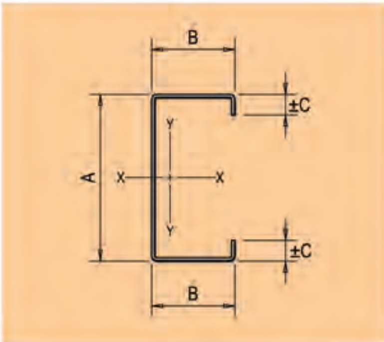
Table of properties for eave strut

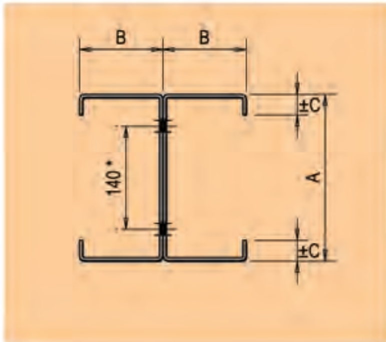
Section	General Information			Slope	Allowable	Allowable	Top in Compression		Bot in Compression	
					Shear Force	Comp. Force	Deflection Inertia	Allowable Moment	Deflection Inertia	Allowable Moment
	Girth (mm)	Area (cm2)	Weight (Kg/1m)	Slope (:10)	Va (KN)	Pa (KN)	Deflx (cm4)	Ma (KN-m)	Deflx (cm4)	Ma (KN-m)
200x1 .5	451	6.77	5.31	0.5	10.93	64.51	433.02	6.51	419.04	6.53
200x1 .75	451	7.89	6.20	0.5	17.40	80.29	502.09	8.06	487.52	8.21
200x2.0	451	9.02	7.08	0.5	26.04	97.30	575.48	9.34	561.50	9.57
200x2.5	451	11 .28	8.85	0.5	45.47	135.46	738.70	12.04	694.37	12.42
250x4.0	501	20.04	15.73	0.5	116.34	289.65	1947.42	28.88	1931 .01	29.76
200x1 .5	451	6.77	5.31	1.0	11 .02	64.52	430.59	6.39	419.56	6.44
200x1.75	451	7.89	6.20	1.0	17.54	80.30	499.67	7.76	488.34	8.18
200x2.0	451	9.02	7.08	1.0	26.25	97.31	572.24	8.99	562.69	9.54
200x2.5	451	11 .28	8.85	1.0	45.82	135.48	735.84	11 .59	693.44	12.37
250x4.0	501	20.04	15.73	1.0	117.03	289.87	1942.95	28.11	1927.81	29.37

Section Properties are calculated in accordance with the 2001 Edition of the American Iron and Steel Institute "Specifications" (A.I.S.I). Updated on 10 January 2003

1. Section is considered fully braced
2. Stress Increment of 33% is NOT ALLOWED ANY MORE

5.3 COLD FORMED 'C' SECTIONS - SECTION PROPERTIES





Minimum Specified Yield Stress Fy = 34.5 Kn/Cm² (50 Ksi)

Table of properties for C section

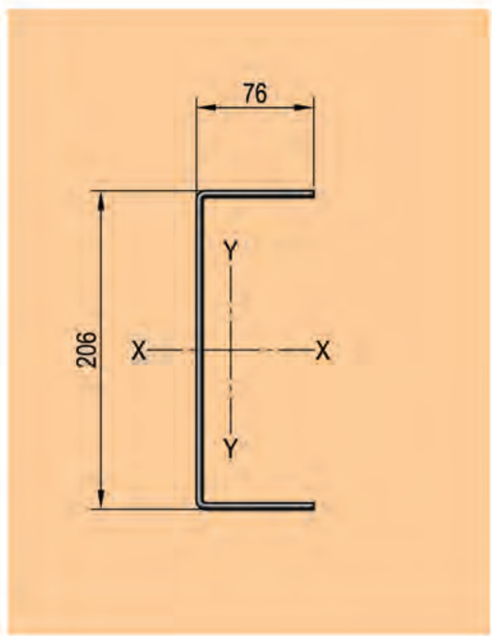
Section	General Information						Deflection Interia	Elastic Modulus	Allowable Shear	Allowable Moment		
	Girth (mm)	A	B (mm)	C	Area (cm²)	Weight (Kg/1m)	Ix (cm⁴)	Sx (cm³)	Va (KN)	Ma (KN-m)	Ma* (KN-m)	Ma** (KN-m)
100x50C1 .5	226	100	50	24	3.38	2.66	54.21	10.54	16.33	2.18	1.31	1.31
1 00x50C1. 7 5	226	100	50	24	3.95	3.10	62.54	12.63	20.25	2.61	1.56	1.56
100x50C2.0	226	100	50	24	4.51	3.54	70.68	14.27	23.01	2.95	1.77	1.77
100x50C2.5	226	100	50	24	5.64	4.43	86.37	17.44	28.44	3.60	2.16	2.16
1 00x50DC1.5	226	100	50	24	6.77	5.31	108.43	21 .08	32.65	4.35	2.61	2.61
100x50DC1 .75	226	100	50	24	7.89	6.20	125.09	25.25	40.50	5.21	3.13	3.13
1 00x50DC2.0	226	100	50	24	9.02	7.08	141 .35	28.54	46.02	5.89	3.53	3.53
1 00x50DC2.5	226	100	50	24	11.28	8.85	172.74	34.88	56.88	7.20	4.32	4.32
200x 1 OOC1 .5	451	200	100	35	6.77	5.31	412.67	32 .97	10.90	6.81	4.08	4.08
200x1 OOC1 .75	451	200	100	35	7.89	6.20	493.73	42.33	17.35	8.74	5.24	5.24
200x1 OOC2.0	451	200	100	35	9.02	7.08	577.30	50.78	25.97	10.48	6.29	6.29
200x1 OOC2.5	451	200	100	35	11.28	8.85	730.54	68.14	45.35	14.07	8.44	8.44
200x1 OODC1 .5	451	200	100	35	13.53	10.62	825.34	65.94	21 .80	13.61	8.17	8.17
200x1 OODC1 .75	451	200	100	35	15.79	12.39	987.45	84.65	34.70	17.48	10.49	10.49
200x1 OODC2.0	451	200	100	35	18.04	14.16	1154.61	101.57	51 .94	20.97	12.58	12.58
200x1 OODC2.5	451	200	100	35	22.55	17.70	1461 .08	136.28	90.70	28.13	16.88	16.88
250x80C1 .5	440	250	80	24	6.60	5.18	617.34	40.22	8.63	8.30	4.98	4.98
250x80C1 .75	440	250	80	24	7.70	6.04	727.55	50.37	13.73	10.40	6.24	6.24
250x80C2.0	440	250	80	24	8.80	6.91	826.83	59.31	20.54	12.24	7.35	7.35
250x80C2.5	440	250	80	24	11.00	8.64	1021 .94	77.49	40.28	16.00	9.60	9.60
250x80DC1.5	440	250	80	24	13.20	10.36	1234.68	80.43	17.26	16.60	9.96	9.96
250x80DC1 .75	440	250	80	24	15.40	12.09	1455.10	100.73	27.46	20.79	12.48	12.48
250x80DC2.0	440	250	80	24	17.60	13.82	1653.65	118.63	41 .08	24.49	14.69	14.69
250x80DC2.5	440	250	80	24	22.00	17.27	2043.88	154.98	80.56	31.99	19.20	19.20

Section Properties are calculated in accordance with the 2001 Edition of the American Iron and Steel Institute "Specifications" (AI.S.I). Updated on 10 January 2003

1. Top Flange: Fully braced
2. Bottom Flange: Fully unbraced
3. Ma : Capacity under Gravity Load
4. Ma* Wind Uplift for sim ply supported beam
5. Ma**: Wind Uplift for continuous beam
6. Stress Increment of 33% is NOT ALLOWED ANY MORE

   * not applicable for 100x50DC

5.4 BASE AND CAP CHANNEL - SECTION PROPERTIES



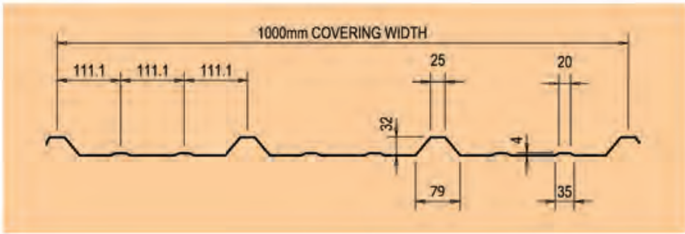
Minimum Specified Yield Stress Fy= 34 .5 Kn/cm² (50 Ksi)

Table of properties for cap channel									
Section	General Information			Deflection Inertia	Elastic Modulus	Allowable Shear	Allowable Moment		
	Girth	Area	Weight	Def Ix	Sx	Va	Ma	Ma*	Ma**
	(mm)	(cm²)	(Kg/lm)	(cm⁴)	(cm³)	(KN)	(Kn-m)	(KN-m)	(KN-m)
206x76C01.5	346	5.19	4.07	264.65	17.39	10.56	3.59	2.15	2.15
206x76CO1.75	346	6.06	4.75	313.45	23.65	16.82	4.88	2.93	2.93
206x76CO2.0	346	6.92	5.43	365.37	29.30	25.17	6.05	3.63	3.63
206x76CO2.5	346	8.65	6.79	476.88	38.86	45.35	8.02	4.81	4.81

Section Properties are calculated in accordance with the 2001 Edition of the American Iron and Steel Institute "Specifications" (A.I.S.I). Updated on 10 January 2003

1. Top Flange: Fully braced
2. Bottom Flange: Fully unbraced
3. Ma: Capacity under Gravity Load
4. Ma*: Wind Uplift for simply supported beam
5. Ma**: Wind Uplift for continuous beam
6. Stress Increment of 33% is not allowed any more

5.5 KIRBY - RIB, ROOF & LINER SHEETING (KR) SECTION PROPERTIES & LOAD TABLES (STEEL)



Fastener Data Sheet	Pull out					Pull over			
	Purlin Thickness (mm)	1.50	1.75	2.00	2.50	Panel Thickness (mm)	0.50	0.60	0.70
	Ultimate Pull Out (KN)	1.16	1.83	2.09	2.32	Ultimate Pull Over (KN)	5.12	5.72	6.67

Minimum specified yield stress fy = 34.5 Kn/cm 2 (50 ksi)

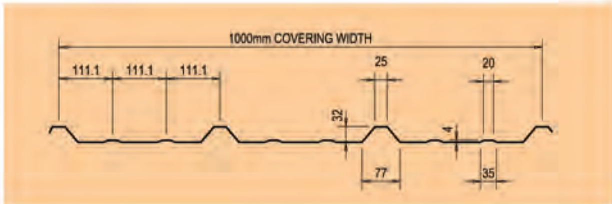
Steel panel properties (KR)												
Panel Nominal			Shear & Web Crp		Top Flat in Compression				Bot Flat in Compression			
Thickness	Girth	Weight	Va	Pa	(Def) Ix	Sx (top)	Sx (bot)	Ma	(Def) Ix	Sx (top)	Sx (bot)	Ma
(mm)	(mm)	(kg/m²)	(KN)	(KN)	(cm⁴)	(cm³)	(cm³)	(KN-m)	(cm⁴)	(cm³)	(cm³)	(KN-m)
0.5	1145	3.93	5.39	3.27	4.82	1.45	7.10	0.30	4.12	1.75	3.12	0.36
0.6	1145	4.83	8.88	4.96	5.99	2.04	8.71	0.42	5.38	2.19	4.78	0.45
0.7	1145	5.73	13.11	5.91	7.28	2.75	10.69	0.57	6.92	2.72	7.18	0.56

Section Properties are Calculated in accordance with the 2001 Edition of the American Iron and Steel Institute "Specifications" (AI.S.I). Updated on 10 January 2003

Allowable Uniform Load (Kn/m²)											
Panel Nominal		Load	Purlin								
Thickness		Case	Thick	Span (m)							
(mm)		(-)	(mm)	1.00	1.20	1.40	1.50	1.60	1.75	2.00	2.20
0.5		D+L	-	2.32	1.78	1.41	1.27	1.15	1.00	0.81	0.70
	Roof system Allowable	WP	-	2.32	1.78	1.41	1.27	1.15	1.00	0.81	0.70
	Capacity (KN/m²) based	WS	1.50	1.55	1.29	1.11	1.03	0.97	0.88	0.74	0.61
	on 3 spans and	WS	1.75	2.44	2.00	1.48	1.30	1.14	0.96	0.74	0.61
	3 fasteners per lm	WS	2.00	2.79	2.00	1.48	1.30	1.14	0.96	0.74	0.61
		WS	2.50	2.83	2.00	1.48	1.30	1.14	0.96	0.74	0.61
0.6		D+L	-	3.22	2.45	1.93	1.73	1.57	1.36	1.09	0.92
	Roof system Allowable	WP	-	3.22	2.45	1.93	1.73	1.57	1.36	1.09	0.92
	Capacity (KN/m²) based	WS	1.50	1.55	1.29	1.11	1.03	0.97	0.88	0.77	0.70
	on 3 spans and	WS	1.75	2.44	2.04	1.74	1.63	1.53	1.36	1.04	0.86
	3 fasteners per lm	WS	2.00	2.79	2.33	1.99	1.84	1.62	1.36	1.04	0.86
		WS	2.50	3.10	2.58	2.11	1.84	1.62	1.36	1.04	0.86
0.7		D+L	-	3.92	2.99	2.36	2.12	1.91	1.66	1.34	1.14
	Roof system Allowable	WP	-	3.92	2.99	2.36	2.12	1.91	1.66	1.34	1.14
	Capacity (KN/m²) based	WS	1.50	1.55	1.29	1.11	1.03	0.97	0.88	0.77	0.70
	on 3 spans and	WS	1.75	2.44	2.04	1.74	1.63	1.53	1.40	1.22	1.11
	3 fasteners per lm	WS	2.00	2.79	2.33	1.99	1.86	1.74	1.60	1.40	1.16
		WS	2.50	3.10	2.58	2.21	2.07	1.94	1.77	1.41	1.16

1. D+L : Dead Load + Live Load.
2. Deflection Criteria L/240 for D+L
3. Web Crippling is based on a minium Flange Width of 100 mm

5.6 KIRBY - RIB, ROOF & LINER SHEETING (KR) SECTION PROPERTIES & LOAD TABLES (ALUMINUM)



Fastener Data Sheet	Pull out					Pull over		
	Purlin Thickness (mm)	1.50	1.75	2.00	2.50	Panel Thickness (mm)	0.50	0.70
	Ultimate Pull Out (KN)	1.16	1.83	2.09	2.32	Ultimate Pull Over (KN)	2.15	2.80

Minimum Specified Yield Stress Fy = 14.49 Kn/Cm 2 (21 Ksi)

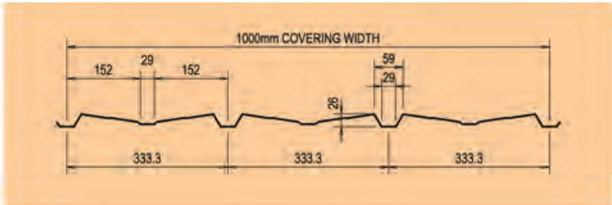
ALUMINUM PANEL PROPERTIES (KR)											
Panel Nominal			Shear & Web Crp		Top Flat in Compression				Bot Flat in Compression		
Thickness	Girth	Weight	Va	Pa	(Def) Ix	Sx (top)	Sx (bot)	Ma	(Def) Ix	Sx (top)	Sx (bot)	Ma
(mm)	(mm)	(kg/m²)	(KN)	(KN)	(cm⁴)	(cm³)	(cm³)	(KN-m)	(cm⁴)	(cm³)	(cm³)	(KN-m)
0.5	1145	1.55	3.09	1.93	5.76	1.81	8.44	0.16	5.03	2.10	4 .09	0.18
0.7	1145	2.11	5.81	3.48	7.98	3.00	11 .66	0.26	7.58	2.97	7.83	0.26

Section Properties are Calculated in accordance with the 2001 Edition of the American Iron and Steel Institute "Specifications" (AI.S.I). Updated on 10 January 2003

Allowable uniform load (Kn/m²)											
Panel Nominal Thickness (mm)		Load Case (-)	Purlin Thick (mm)	Span (m) 1.00	1.20	1.40	1.50	1.60	1.75	2.00	2.20
0.5	Roof system Allowable	D+L	-	1.28	0.97	0.77	0.69	0.62	0.54	041	0.31
	Capacity (KN/m2)	WP	-	1.28	0.97	0.77	0.69	0.62	0.54	0.44	0.37
	based on 3 spans and	WS	1.50	1.50	1.06	0.78	0.69	0.60	0.51	0.39	0.32
	3 fasteners per lm	WS	1.75	1.50	1.06	0.78	0.69	0.60	0.51	0.39	0.32
		WS	2.00	1.50	1.06	0.78	0.69	0.60	0.51	0.39	0.32
		WS	2.50	1.50	1.06	0.78	0.69	0.60	0.51	0.39	0.32
0.7		D+L	-	2.04	1.54	1.20	1.08	0.97	0.83	0.56	0.42
	Roof system Allowable	WP	-	2.04	1.54	1.20	1.08	0.97	0.83	0.64	0.53
	Capacity (KN/m2) based	WS	1.50	1.55	1.29	1.11	1.03	0.97	0.84	0.64	0.53
	on 3 spans and	WS	1.75	2 .44	1.76	1.30	1.14	1.00	0.84	0.64	0.53
	3 fasteners per lm	WS	2.00	2.51	1.76	1.30	1.14	1.00	0.84	0.64	0.53
		WS	2.50	2.51	1.76	1.30	1.14	1.62	0.84	0.64	0.53

1. D+L : Dead Load + Live Load WP.: Wind Pressure WS.: Wind Suction
2. Minumum deflection = Span/180 for D+L
3. Stress Increment of 33% is not allowed any more
4. Fasteners Uplift Capacity is based on the manufacturer's Pull Out and Pull Over Data

5.7 KIRBY WALL SHEETING (KW) SECTION PROPERTIES & LOAD TABLES (STEEL)



Fastener Data Sheet	Pull out					Pull over			
	Purlin Thickness (mm)	1.50	1.75	2.00	2.50	Panel Thickness (mm)	0.50	0.60	0.70
	Ultimate Pull Out (KN)	1.16	1.83	2.09	2.32	Ultimate Pull Over (KN)	5.12	5.72	6.67

Minimum specified yield stress Fy = 34.5 KN/cm 2 (50 KSI)

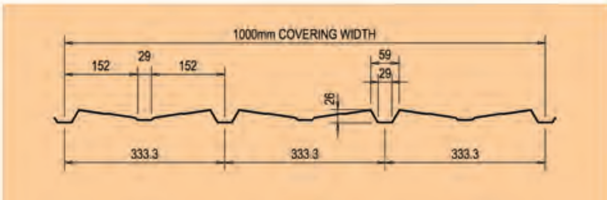
Aluminum panel properties (Kr)												
Panel Nominal			Shear & Web Crp		Top Flat in Compression				Bot Flat in Compression			
Thickness	Girth	Weight	Va	Pa	(Def) Ix	Sx (top)	Sx (bot)	Ma	(Def) Ix	Sx (top)	Sx (bot)	Ma
(mm)	(mm)	(kg/m2)	(KN)	(KN)	(cm⁴)	(cm³)	(cm³)	(KN-m)	(cm⁴)	(cm³)	(cm³)	(KN-m)
0.5	1145	3.93	6.62	3.84	1.74	1.00	1.43	0.21	2.36	1.93	1 .46	0.30
0.6	1145	4.83	9.03	5.78	2.34	1.36	1.80	0.28	3.01	2.45	1.91	0.39
0.7	1145	5.73	11.41	6.89	2.79	1.77	2.17	0.37	3.59	2.96	2.38	0.49

Section Properties are Calculated in accordance with the 2001 Edition of the American Iron and Steel Institute "Specifications" (A.I.S.I). Updated on 1 0 January 2003

Allowable uniform load (Kn/m²)											
Panel Nominal Thickness (mm)		Load Case (-)	Purlin Thick (mm)	Span (m)							
				1.00	1.20	1.40	1.50	1.60	1.75	2.00	2.20
0.5	Wall system Allowable	D+L	-	2.32	1.67	1.05	0.86	0.71	0.54	0.36	0.27
	Capacity (KN/m ²) based	WP	-	2.32	1.75	1.32	1.15	1.01	0.81	0.54	0.41
	on 3 spans and	WS	1.50	1.55	1.29	1.05	0.91	0.80	0.67	0.51	0.43
	3 fasteners per lm	WS	1.75	2.03	1.42	1.05	0.91	0.80	0.67	0.51	0.43
		WS	2.00	2.03	1.42	1.05	0.91	0.80	0.67	0.51	0.43
		WS	2.50	2.03	1.42	1.05	0.91	0.80	0.67	0.51	0.43
06		D+L	-	3.24	2.25	1.42	1.15	0.95	0.73	0.49	0.37
	Wall system Allowable	WP	-	3.24	2.44	1.79	1.56	1.37	1.09	0.73	0.55
	Capacity (KN/m 2) based	WS	1.50	1.55	1.29	1.11	1.03	0.97	0.88	0.70	0.58
	on 3 spans and	WS	1.75	2.44	1.93	1.42	1.24	1.09	0.91	0.70	0.58
	3 fasteners per lm	WS	2.00	2.76	1.93	1.42	1.24	1.09	0.91	0.70	0.58
		WS	2.50	2.76	1.93	1.42	1.24	1.09	0.91	0.70	0.58
07		D+L	-	3.96	2.69	1.69	1.38	1.13	0.87	0.58	0.44
	Wall system Allowable	WP	-	3.96	2.98	2.33	2.03	1.70	1.30	0.87	0.65
	Capacity (KN/m 2) based	WS	1.50	1.55	1.29	1.11	1.03	0.97	0.88	0.77	0.70
	on 3 spans and	WS	1.75	2.44	2.04	1.74	1.61	1.42	1.19	0.91	0.75
	3 fasteners per lm	WS	2.00	2.79	2.33	1.85	1.61	1.42	1.19	0.91	0.75
		WS	2.50	3.10	2.51	1.85	1.61	1.42	1.19	0.91	0.75

1. D+L : Dead Load + Live Load
2. Deflection Criteria L/240 for D+L
3. Web Crippling is based on a minium Flange Width of 100 mm

5.8 KIRBY WALL SHEETING (KW) SECTION PROPERTIES & LOAD TABLES (ALUMINUM)



Fastener Data Sheet	Pull out					Pull over		
	Purlin Thickness (mm)	1.50	1.75	2.00	2.50	Panel Thickness (mm)	0.50	0.70
	Ultimate Pull Out (KN)	1.16	1.83	2.09	2.32	Ultimate Pull Over (KN)	2.15	2.80

Minimum Specified Yield Stress Fy = 14.49 Kn/Cm 2 (21 Ksi)

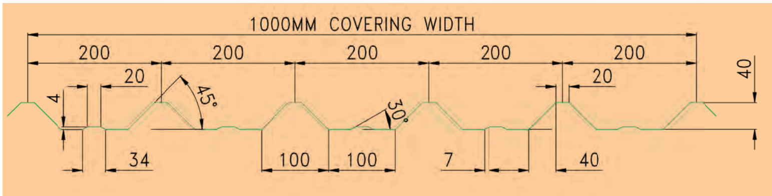
Aluminum panel properties (KR)												
Panel Nominal			Shear & Web Crp		Top Flat in Compression				Bot Flat in Compression			
Thickness	Girth	Weight	Va	Pa	(Def) Ix	Sx (top)	Sx (bot)	Ma	(Def) Ix	Sx (top)	Sx (bot)	Ma
(mm)	(mm)	(kg/m²)	(KN)	(KN)	(cm⁴)	(cm³)	(cm³)	(KN-m)	(cm⁴)	(cm³)	(cm³)	(KN-m)
0.5	1145	1.55	3.54	2.26	2.11	1.22	1.71	0.11	2.83	2.31	1.76	0.15
0.7	1145	2.11	4.92	4.03	3.49	1.92	2.37	0.17	3.94	3.22	2.59	0.23

Section Properties are calculated in accordance with the 2001 Edition of the American Iron and Steel Institute "Specifications" (AI.S.I). Updated on 10 January 2003

Allowable uniform load (Kn/m²)											
Panel Nominal Thickness		Load Case	Purlin Thick	Span (m)							
(mm)		(-)	(mm)	1.00	1.20	1.40	1.50	1.60	1.75	2.00	2.20
0.5	Wall system Allowable	D+L	-	1.19	0.69	0.43	0.35	0.29	0.22	0.15	0.11
	Capacity (KN/m 2) based	WP	-	1.26	0.92	0.65	0.53	0.44	0.33	0.22	0.17
	on 3 spans and	WS	1.50	1.04	0.73	0.54	0.47	0.41	0.34	0.26	0.22
	3 fasteners per lm	WS	1.75	1.04	0.73	0.54	0.47	0.41	0.34	0.26	0.22
		WS	2.00	1.04	0.73	0.54	0.47	0.41	0.34	0.26	0.22
		WS	2.50	1.04	0.73	0.54	0.47	0.41	0.34	0.26	0.22
0.7		D+L	-	1.97	1.14	0.72	0.58	0.48	0.37	0.25	0.18
	Wall system Allowable	WP	-	2.01	1.45	1.06	0.87	0.72	0.55	0.37	0.28
	Capacity (KN/m2) based	WS	1.50	1.55	1.14	0.84	0.73	0.65	0.54	0.41	0.31
	on 3 spans and	WS	1.75	1.63	1.14	0.84	0.73	0.65	0.54	0.41	0.31
	3 fasteners per lm	WS	2.00	1.63	1.14	0.84	0.73	0.65	0.54	0.41	0.31
		WS	2.50	1.63	1.14	0.84	0.73	0.65	0.54	0.41	0.31

1. D+L ·Dead Load+ Live Load WP · Wind Pressure WS: Wind Suction
2. Minimum deflection= Span/180 for D+L
3. Stress Increment of 33% is not allowed any more
4. Fasteners Uplift Capacity is based on the manufacturer's Pull Out and Pull Over Data

5.9A KIRBY STANDARD STEEL PANEL (KCS 40-200)



Fastener Data Sheet	Pull out					Pull over		
	Purlin Thickness (mm)	1.50	1.75	2.00	2.50	Panel Thickness (mm)	0.50	0.60
	Ultimate Pull Out (KN)	1.16	1.83	2.09	2.32	Ultimate Pull Over (KN)	5.12	5.72

Minimum Specified Yield Stress fy = 34.5 KN/cm2 (50 KSI)

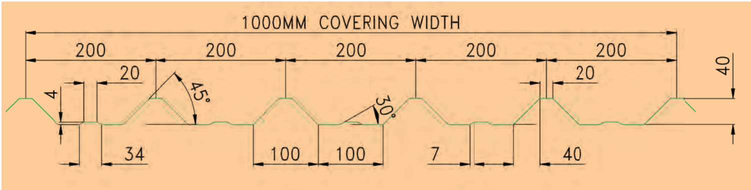
Steel panel properties (KR)												
Panel Nominal			Shear & Web Crp		Top Flat in Compression				Bot Flat in Compression			
Thickness	Girth	Weight	Va	Pa	(Def) Ix	Sx (top)	Sx (bot)	Ma	(Def) Ix	Sx (top)	Sx (bot)	Ma
(mm)	(mm)	(kg/m^2)	(KN)	(KN)	(cm^4)	(cm^3)	(cm^3)	(KN-m)	(cm^4)	(cm^3)	(cm^3)	(KN-m)
0.5	1219	4.19	6.97	5.29	9.54	2.71	8.33	0.56	8.23	3.25	4.59	0.67
0.6	1219	5.14	13.44	8.12	12.55	2.65	6.15	0.80	10.96	4.16	6.54	0.86

Section Properties are Calculated in accordance with the 2001 Edition of the American Iron and Steel Institute "Specifications" (A.I.S.I). Updated on 10 January 2003.

Allowable uniform load (Kn/m^2)											
Panel Nominal Thickness		Load Case	Purlin Thick	Span (m)							
(mm)		(-)	(mm)	1.00	1.20	1.40	1.50	1.60	1.75	2.00	2.20
0.5	Roof system Allowable	D+L	-	3.97	3.07	2.45	2.21	2.01	1.75	1.42	1.22
	Capacity (KN/m2) based	WP	-	3.97	3.07	2.45	2.21	2.01	1.75	1.42	1.22
	on 3 spans and	WS	1.50	2.58	2.15	1.84	1.72	1.61	1.47	1.29	1.13
	5 fasteners per lm	WS	1.75	2.58	2.15	1.84	1.72	1.61	1.47	1.29	1.13
		WS	2.00	2.58	2.15	1.84	1.72	1.61	1.47	1.29	1.13
		WS	2.50	2.58	2.15	1.84	1.72	1.61	1.47	1.29	1.13
0.6	Roof system Allowable	D+L	-	5.65	4.33	3.43	3.09	2.80	2.43	1.96	1.68
	Capacity (KN/m2) based	WP	-	5.65	4.33	3.43	3.09	2.80	2.43	1.96	1.68
	on 3 spans and	WS	1.50	2.58	2.15	1.84	1.72	1.61	1.47	1.29	1.17
	5 fasteners per lm	WS	1.75	2.58	2.15	1.84	1.72	1.61	1.47	1.29	1.17
		WS	2.50	2.58	2.15	1.84	1.72	1.61	1.47	1.29	1.17

1. D+L: Dead Load + Live Load WP: Wind Pressure WS: Wind Suction
2. Minumum deflection = Span/180 for D+L
3. Stress Increment of 33% is not allowed any more
4. Fasteners Uplift Capacity is based on the manufacturer's Pull Out and Pull Over Data

5.9B KIRBY STANDARD ALUMINUM PANEL (KCS 40-200)



Fastener Data Sheet	Pull out					Pull over		
	Purlin Thickness (mm)	1.50	1.75	2.00	2.50	Panel Thickness (mm)	0.50	0.70
	Ultimate Pull Out (KN)	1.16	1.83	2.09	2.32	Ultimate Pull Over (KN)	2.15	2.8

Minimum Specified Yield Stress fy = 14.5 KN/cm2 (21 KSI)

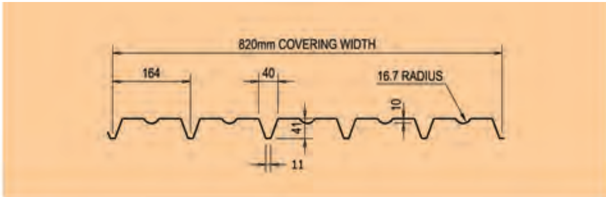
Aluminum panel properties (KR)												
Panel Nominal			Shear & Web Crp		Top Flat in Compression				Bot Flat in Compression			
Thickness	Girth	Weight	Va	Pa	(Def) Ix	Sx (top)	Sx (bot)	Ma	(Def) Ix	Sx (top)	Sx (bot)	Ma
(mm)	(mm)	(kg/m²)	(KN)	(KN)	(cm⁴)	(cm³)	(cm³)	(KN-m)	(cm⁴)	(cm³)	(cm³)	(KN-m)
0.5	1219	1.62	4.29	3.28	11.91	3.51	10.12	0.30	10.40	4.01	5.97	0.35
0.7	1219	2.25	10.95	6.29	17.07	5.87	14.01	0.51	15.96	5.85	10.28	0.51

Section Properties are Calculated in accordance with the 2001 Edition of the American Iron and Steel Institute "Specifications" (A.I.S.I). Updated on 10 January 2003.

Allowable uniform load (Kn/m²)											
Panel Nominal Thickness (mm)		Load Case (-)	Purlin Thick (mm)	Span (m) 1.00	1.20	1.40	1.50	1.60	1.75	2.00	2.20
0.5	Roof system Allowable	D+L	-	2.29	1.75	1.39	1.25	1.13	0.98	0.80	0.63
	Capacity (KN/m2) based	WP	-	2.29	1.75	1.39	1.25	1.13	0.98	0.80	0.68
	on 3 spans and	WS	1.50	2.58	1.99	1.49	1.30	1.15	0.97	0.74	0.62
	5 fasteners per lm	WS	1.75	2.58	1.99	1.49	1.30	1.15	0.97	0.74	0.62
		WS	2.00	2.58	1.99	1.49	1.30	1.15	0.97	0.74	0.62
		WS	2.50	2.58	1.99	1.49	1.30	1.15	0.97	0.74	0.62
0.7	Roof system Allowable	D+L	-	3.85	2.91	2.29	2.05	1.85	1.59	1.20	0.90
	Capacity (KN/m2) based	WP	-	3.85	2.91	2.29	2.05	1.85	1.59	1.26	1.04
	on 3 spans and	WS	1.50	2.58	2.15	1.84	1.72	1.81	1.47	1.26	1.04
	5 fasteners per lm	WS	1.75	2.58	2.15	1.84	1.72	1.81	1.47	1.26	1.04
	3 fasteners per lm	WS	2.00	2.58	2.15	1.84	1.72	1.81	1.47	1.26	1.04
		WS	2.50	2.58	2.15	1.84	1.72	1.81	1.47	1.26	1.04

1. D+L: Dead Load + Live Load WP: Wind Pressure WS: Wind Suction
2. Minumum deflection = Span/180 for D+L
3. Stress Increment of 33% is not allowed any more
4. Fasteners Uplift Capacity is based on the manufacturer's Pull Out and Pull Over Data

5.10A KIRBY DECKING (KD), LIGHT DECKING SECTION PROPERTIES & LOAD TABLES



Minimum Specified Yield Stress Fy = 34.5 Kn/Cm²
(50 KSI)

Steel deck properties (KD)												
Panel Nominal			Shear & Web Crp		Top Flat in Compression				Bot Flat in Compression			
Thickness	Girth	Weight	Va	Pa	(Def) Ix	Sx (top)	Sx (bot)	Ma	(Def) Ix	Sx (top)	Sx (bot)	Ma
(mm)	(mm)	(kg/m²)	(KN)	(KN)	(cm⁴)	(cm³)	(cm³)	(KN-m)	(cm⁴)	(cm³)	(cm³)	(KN-m)
0.5	1145	4.80	10.55	8.46	7.94	5.72	2.64	0.54	8.10	7.75	2.24	0.46
0.6	1145	5.89	18.43	12.65	10.24	7.82	3.33	0.69	10.55	9.51	3.05	0.63
0.7	1145	6.99	26.19	17.54	12.55	10.10	4.03	0.83	12.56	11.28	3.95	0.81

Section Properties are calculated in accordance with the 2001 Edition of the American Iron and Steel Institute "Specifications" (AI.S.I). Updated on 10 January 2003

Allowable uniform load (Kn/m²)											
Panel	Type										
Thickness	of	Span (m)									
(mm)	Span	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90
0.5	2 Spans	4.23	3.62	3.09	2.64	2.28	1.99	1.75	1.55	1.38	1.24
	>3 Spans	5.10	4.37	3.79	3.27	2.83	2.47	2.18	1.93	1.72	1.55
0.6	2 Spans	5.95	5.02	4.22	3.60	3.11	2.71	2.39	2.12	1.89	1.70
	>3 Spans	7.19	6.15	5.26	4.49	3.88	3.38	2.98	2.64	2.36	2.12

NOTES:

1- Deck Panel must be designed to width stand the concrete net weight of 0.5 Kn/m² construction load
2- Deflection Criteria L/240 for D+L
3- Web Cripling is based on a minimum Flange Width of 100 mm
4- Allowable uniform load for KD0.7 is available on next page

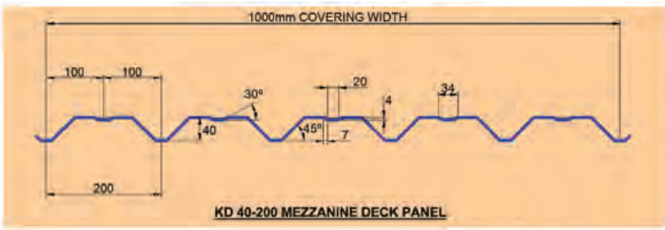
5.10B KIRBY DECK PANELS KD 40-200 AND KD 0.7 LOAD TABLES

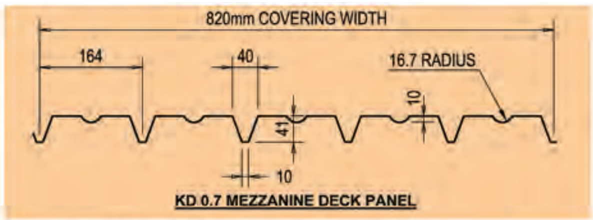
Kirby deck panels are designed in accordance with the 2001 Edition of the American Iron and Steel Institute Specifications (A.I.S.I.).

KD 40-200: The application of KCS 40-200 panel has been extended to mezzanine deck panels. The thickness available is 0.7mm. This panel is made from 1219mm coil unlike the KR, KW and KD panels which are made from 1145mm coil.

KD 0.7: The profile is the same as KD 0.5 and 0.6 deck panels. Panel thickness is 0.7mm and is made from 1145mm coil. Refer to Section 5.10A on Page 65 for section properties.

Material Specification and Sizes:





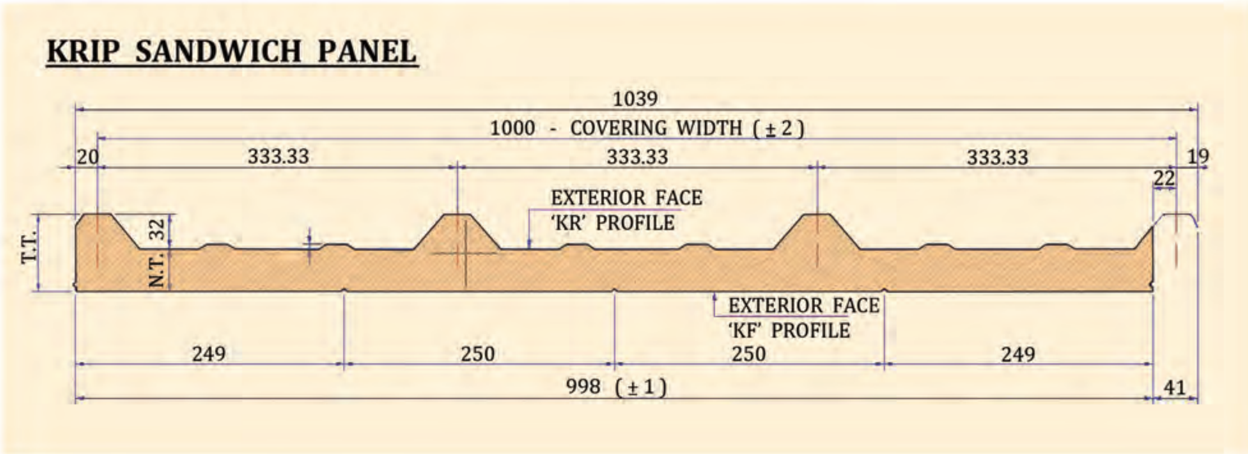
1. The KD 40-200 and KD 0.7 are available in steel only.
2. The specific yield stress for steel = Fy = 34.5 KN/cm² as per ASTM A792 GRADE 50 or ASTM A653 GRADE 50
3. The steel panel thickness is 0.7 mm.
4. KD 40-200 and KD 0.7 are available as galvanized or AluZinc based on availability.
5. Deflection limited to l / 240 for gravity loads.

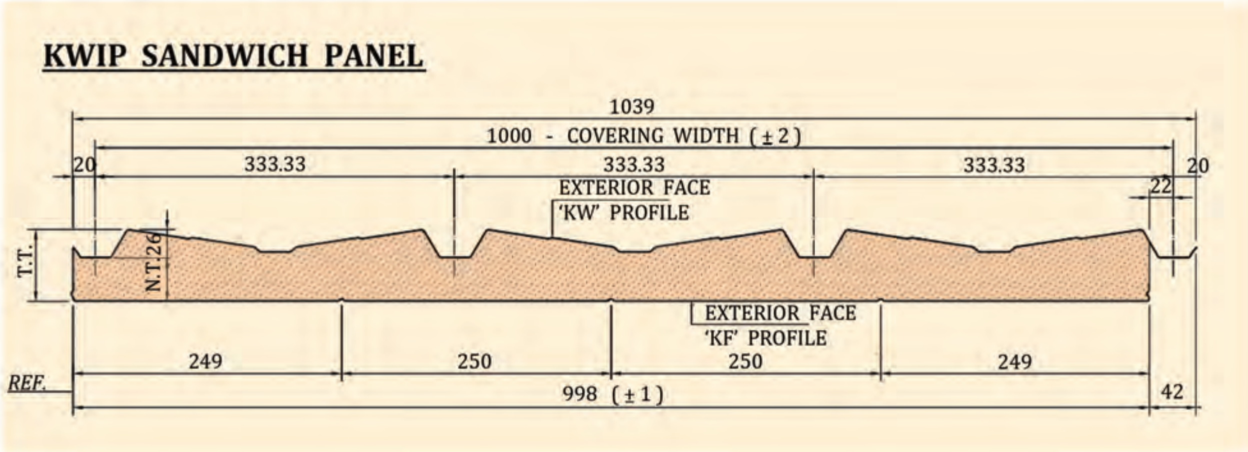
Allowable uniform load (Kn/m²ᶻᶻ)													
Deck Panel Type	Span (m)												
	1	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.75	1.8	1.9	2	2.2
KD 40-200	7.67	6.65	5.83	5.16	4.60	4.12	3.72	3.38	3.22	3.08	2.95	2.82	2.19
KD 0.7	9.27	7.93	6.82	5.82	5.03	4.38	3.86	3.42	3.23	3.05	2.74	2.38	1.79

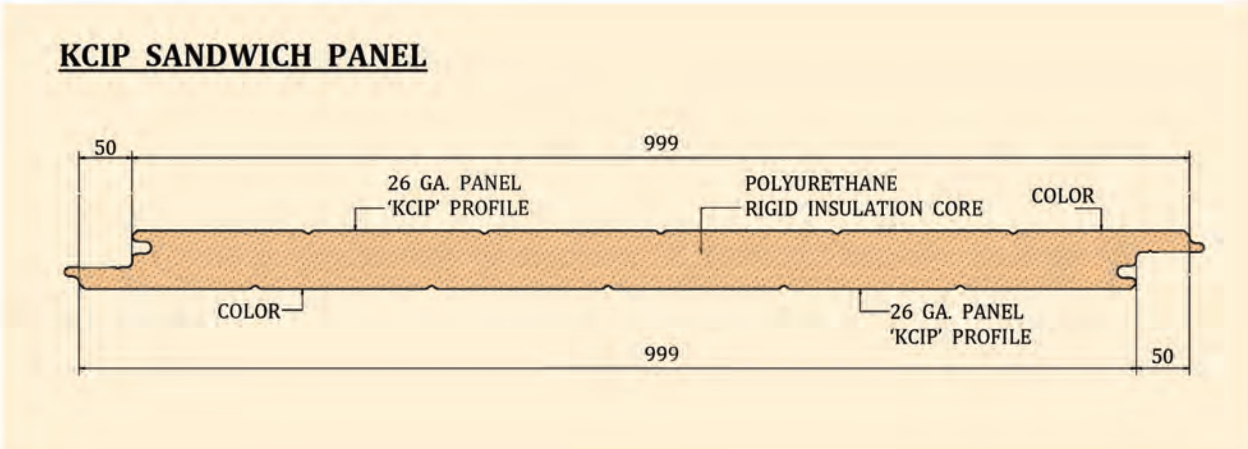
NOTES:

1. Deck panel must be designed to withstand Concrete Wet Weight + 0.5 kN/m² construction load
2. The type of span is equal or greater than 3 continuous spans.
3. For panel thickness of 0.5mm & 0.6mm properties, check Kirby Decking (KD) Section Properties & Load Tables on Chapter 5.10a

5.11 KIRBY INSULATED SANDWICH PANELS ROOF, WALL & PARTITION PANEL

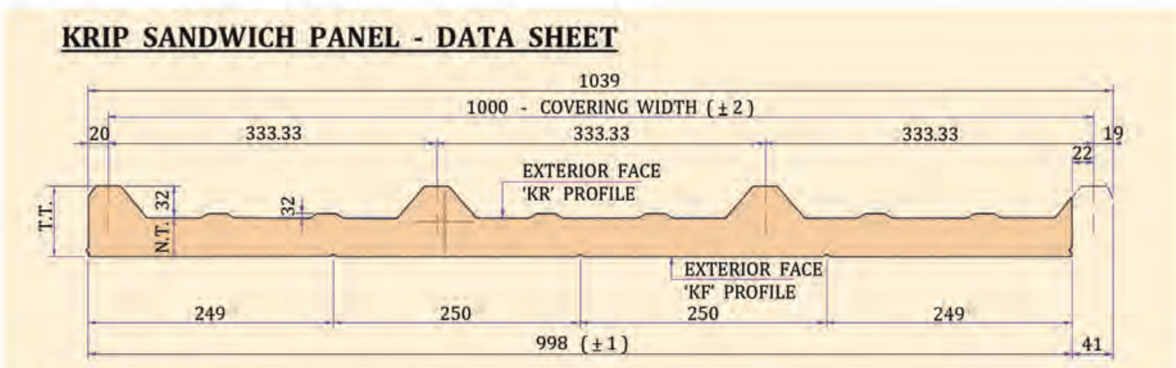






- N.T. - Nominal Thickness / P.U. Core Thickness
- T.T. - Total Thickness = N.T. + Depth of Panel

5.12 KRIP SANDWICH PANEL



Specifications:

Minimum Specified Yield Stress for Steel F_y = 34.5 kN/cm² (50 KSI) ASTM A792 Grade 50
Panel Core Specifications are as follows:

Approximate Total Density = 40 kg/m³
Compression Strength (at 10% deformation) = 1.6 kg/cm²
Shear (with metal sheet) = 1.63 kg/cm²
Adhesion to metal sheet = 1.5 kg/cm²
Water Absorption = 4% in volume

Heat Transmission Value = 0.0198 W /m²
Compression Modulus = 36 kg/cm²
Shear Modulus = 20.4 kg/cm²
Water Vapour Transmission = 80 g/24h.m²
Closed Cell Content = 95% (min)

Fastener Data Sheet	Pull out					Pull over		
	Purlin Thickness (mm)	1.50	1.75	2.00	2.50	Panel Thickness (mm)	0.50	0.60
	Ultimate Pull Out (kN)	1.16	1.83	2.09	2.32	Ultimate Pull Out (kN)	5.12	5.72

Thermal Heat Transmission U-Values:

	KRIP 40	KRIP 50	KRIP 60	KRIP 75	KRIP 100
BTU /FT^2 h.f.	0.085	0.070	0.059	0.048	0.037
KCAL/M^{2}K	0.414	0.340	0.288	0.234	0.179
WATT/M^{2}K	0.482	0.396	0.335	0.273	0.208

Allowable Loading for KRIP (Kn/m²):

	Span in meters												
	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
KRIP 50	6.83	5.47	4.56	3.90	3.42	3.04	2.73	2.48	2.28	2.10	1.95	1.60	1.32
KRIP60	8.20	6.56	5.47	4.69	4.10	3.64	3.28	2.98	2.73	2.54	2.34	2.17	1.79
KRIP 75	10.25	8.20	6.83	5.86	5.13	4.56	4.10	3.37	3.42	3.15	2.93	2.73	2.56
KRIP100	13.66	10.94	9.12	7.80	6.84	6.08	5.46	4.96	4.56	4.20	3.90	3.20	2.64

Allowable Loadling due to Fasteners Capacity (Kn/m²) ..

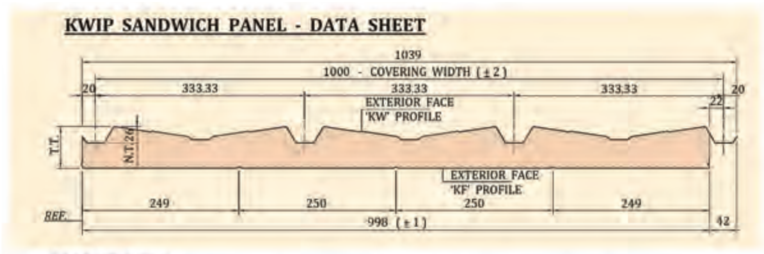
	Span in meters												
	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
3 Fasteners/m	3.48	2.78	2.32	1.99	1.74	1.55	1.39	1.27	1.16	1.07	1.00	0.93	0.87
6 Fasteners /m*	6.96	5.56	4.64	3.98	3.48	3.10	2.78	2.54	2.32	2.14	2.00	1.86	1.74

*In case of KRIP 50, please refer to the above table values.

Kirby Building Systems reserves the right to make changes without prior notice KBS-KRIP-2 80811-00

¨ N.T. - Nominal Thickness / P.U. Core Thickness
¨ T.T. - Total Thickness = N.T. + 32

5.13 KWIP SANDWICH PANEL



Specifications:

Minimum Specified Yield Stress for Steel Fy = 34.5 kN/cm² (50 KSI) ASTM A792 Grade 50

Panel Core Specifications are as follows:

Approximate Total Density = 40 kg/m3
Compression Strength (at 10% deformation) = 1.6 kg/cm²
Shear (with metal sheet) = 1.63 kg/cm²
Adhesion to metal sheet = 1.5 kg/cm²
Water Absorption = 4% in volume

Heat Transmission Value = 0.0198 W /m²
Compression Modulus = 36 kg/cm²
Shear Modulus = 20.4 kg/cm²
Water Vapour Transmission = 80 g/24h.m²
Closed Cell Content = 95% (min)

Panel Structural Properties:

Fastener Data Sheet	Pull out					Pull over		
	Purlin Thickness (mm)	1.50	1.75	2.00	2.50	Panel Thickness (mm)	0.50	0.60
	Ultimate Pull Out (kN)	1.16	1.83	2.09	2.32	Ultimate Pull Out (kN)	5.12	5.72

Thermal Heat Transmission U-Values:

	KWIP 40	KWIP 50	KWIP65	KWIP75	KWIP100
BTU /FT² h.f.	0.071	0.060	0.049	0.043	0.035
KCAL/M²K	0.347	0.293	0.238	0.211	0.170
WATT/M²K	0.404	0.341	0.277	0.246	0.198

Allowable Loading for KWIP 40, 50, 65, 75, 100mm (Kn/m²):

	Span In meters												
	1.00	1.25	1.5	1.75	2.0	2.25	2.5	2.75	3.00	3.25	3.5	3.75	4.00
KWIP 40	5.46	4.38	3.65	3.12	2.74	2.43	2.18	1.98	1.82	1.68	1.56	1.36	1.12
KWIP 50	6.83	5.47	4.56	3.90	3.42	3.04	2.73	2.48	2.28	2.10	1.95	1.70	1.40
KWIP 65	8.88	7.11	5.92	5.08	4.44	3.95	3.55	3.23	2.96	2.73	2.54	2.37	2.20
KWIP 75	10.25	8.20	6.83	5.86	5.13	4.56	4.10	3.37	3.42	3.15	2.93	2.73	2.56
KWIP 100	13.67	10.93	9.11	7.81	6.84	6.08	5.47	4.49	4.56	4.20	3.91	3.64	3.41

Allowable Loading due to Fasteners Capacity (Kn/m²):

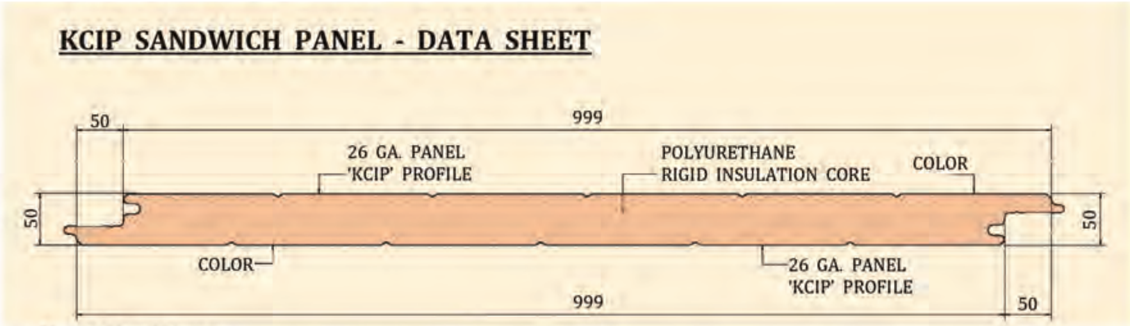
	Span In meters												
	1.00	1.25	1.5	1.75	2.0	2.25	2.5	2.75	3.00	3.25	3.5	3.75	4.00
3 Fasteners/m	3.48	2.78	2.32	1.99	1.74	1.55	1.39	1.27	1.16	1.07	1.00	0.93	0.87
6 Fasteners/m	6.96	5.56	4.64	3.98	3.48	3.10	2.78	2.54	2.32	2.14	2.00	1.86	1.74

*In case of KWIP 50, please refer to the previous table values.

¨ N.T. - Nominal Thickness / P.U. Core Thickness
¨ T.T. - Total Thickness = N.T. + 26

Kirby Building Systems reserves the right to make changes without prior notice KBS-KWIP-050911-00

5.14 KCIP SANDWICH PANEL



Specifications:

Minimum Specified Yield Stress for Steel F_y = 34.5 kN/cm² (50 KSI) ASTM A792 Grade 50

Panel Core Specifications are as follows:

Approximate Total Density = 40 kg/m³
Compression Strength (at 10% deformation) = 1.6 kg/cm²
Shear (with metal sheet) = 1.63 kg/cm²
Adhesion to metal sheet = 1.5 kg/cm²
Water Absorption = 4% in volume

Heat Transmission Value = 0.0198 W /m²
Compression Modulus = 36 kg/cm²
Shear Modulus = 20.4 kg/cm²
Water Vapour Transmission = 80 g/24h.m²
Closed Cell Content = 95% (min)

Panel Structural Properties:

Fastener Data Sheet	Pull out					Pull over		
	Purlin Thickness (mm)	1.50	1.75	2.00	2.50	Panel Thickness (mm)	0.50	0.60
	Ultimate Pull Out (kN)	1.16	1.83	2.09	2.32	Ultimate Pull Out [kN)	5.12	5.72

Thermal Heat Transmission U-Values:

	KCIP 50	KCIP 60	KCIP 75	KCIP 100
BTU /FT² h.f.	0.077	0.065	0.052	0.038
KCAL/M²K	0.378	0.315	0.252	0.189
WATT/M²K	0.440	0.367	0.293	0.220

Allowable Loading for KCIP (Kn/m²):

	Span in meters												
	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
KCIP 50	6.83	5.47	4.56	3.90	3.42	3.04	2.73	2.48	2.18	1.70	1.40	1.12	0.92
KCIP 60	8.20	6.56	5.47	4.69	4.10	3.64	3.28	2.98	2.73	2.47	1.98	1.62	1.32
KCIP 75	10.25	8.20	6.83	5.86	5.13	4.56	4.10	3.37	3.42	3.15	2.93	2.50	2.08

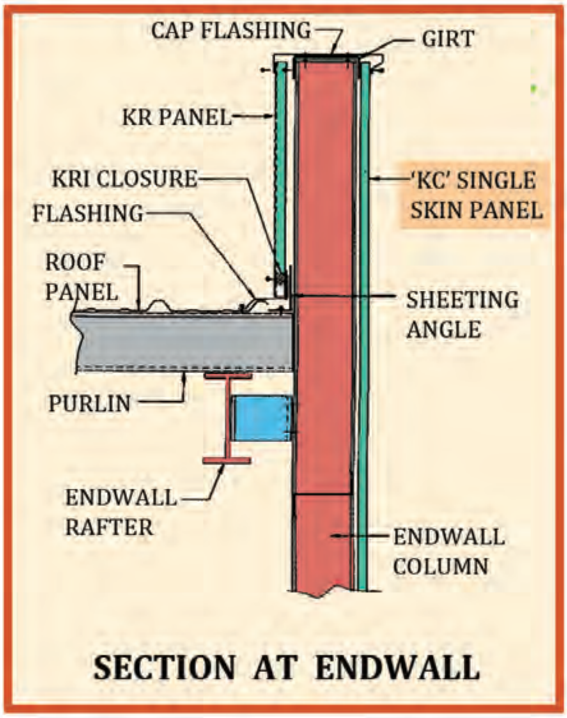
Allowable Loading due to Fasteners Capacity (Kn/m²):

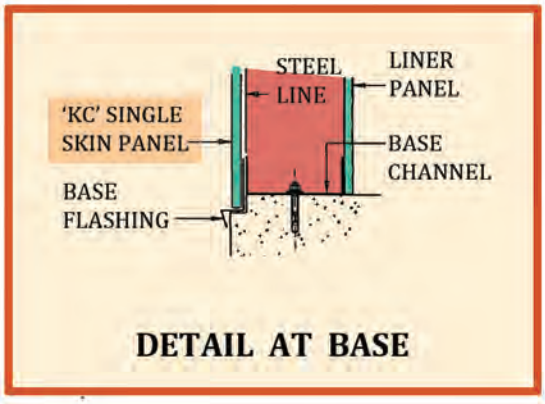
	Span in meters												
	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00
3 Fasteners/m	3.48	2.78	2.32	1.99	1.74	1.55	1.39	1.27	1.16	1.07	1.00	0.93	0.87
6 Fasteners fm*	6.96	5.56	4.64	3.98	3.48	3.10	2.78	2.54	2.32	2.14	2.00	1.86	1.74

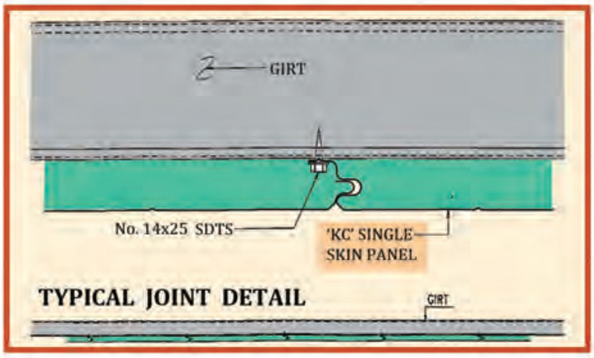
* In case of KCIP 50, please refer to the previous table values.

Kirby Building Systems reserves the right to make changes without prior notice KBS-KCIP-050911-00

5.15 CONCEALED FASTENER CLADDING
SINGLE SKIN CLADDING - TYPE KC







Features:

- Single concealed fastener cladding type- kc is used for exterior wall cladding and interior roof and wall Liner panels .
- Panels have interlocking tongue & groove joints.
- Supplied in covering widths of 333mm & 666mm with Thickness of 0.5 And 0.6Mm .
- Available in all kirby standard colours.

Benefits:

- An attractive architectural look for commercial and Institutional buildings .
- Flat surface without exposed fasteners & no corrugation .
- For external panel only.

5.16 CONCEALED FASTENER SINGLE SKIN CLADDING TYPE (KC) SPECIFICATIONS

1.0 GENERAL

1.1 The Kirby concealed fastener panel system type 'KC' shall be furnished with other integral components to form the exterior envelope and/or the interior partitions of the building as described herein.

1.2 Installation of the panel system shall be in accordance with Kirby Building installation drawings.

2.0 PANEL DESCRIPTION

2.1 Exterior wall panels shall be 333mm covering width, 26G or 24G thickness and interlocking joints to conceal the fasteners to the structural members within the joints .

2.2 Interior liner or Partition panels shall be either 333mm-26G/24G or 666mm-24G thickness and interlocking joints to conceal the fasteners to the structural members within the joints .

2.3 Panels shall be precision roll formed at the factory to a total panel depth of 35mm using precoated sheeting coils.

2.4 Panels shall be one piece from base to top of wall or partition upto a maximum length of 9 meters.

2.5 Both ends of the panel shall be square cut and unpunched.

3.0 PANEL MATERIAL AND FINISH

3.1 Panel material shall be either zincalum coated or galvanized steel to ASTM A792 Grade 50B AZ150 or ASTM A653 Grade 50 with G90 coating.

3.2 The finish coating shall be polyester or silicon polyester coating 25 microns on exterior face and 10 microns on interior face of the panel. Other finish coatings are available upon request.

3.3 Panel color shall be one of Kirby standard colors . Other colors are available upon request.

4.0 PANEL DESIGN

4.1 Panel design shall be in accordance with AISI Cold Formed Steel Design Manual and good engineering practices .

5.0 FASTENERS

5.1 Panels shall be fastened to structural members using #14 self tapping screws with metal and EPDM washers. Screws shall have hexagonal heads and shall be zinc plated and color coated to match the panel colors.

5.2 No panel to panel fasteners are required . All fasteners shall be made from the outside, hidden in the panel joint thus eliminating exposed fasteners.

6.0 FLASHINGS AND TRIMS

6.1 Flashing and trims shall be furnished at corners, eaves, rake, framed openings and wherever necessary to provide weather tightness and a good finished appearance .

6.2 Flashing and trims shall be of the same specifications as the panel materials.

7.0 ACCESSORIES

7.1 Accessories as specified such as doors , windows, etc.. , shall be furnished or framed openings provided as shown in the building installation drawings . Accessories when supplied shall be to Kirby standard specifications unless otherwise noted on building installation drawings.

7.2 Location and type of accessories shall be as shown in Kirby building installation drawings .

7.3 Blanket insulation may be used with the panel system. Panel configuration can accommodate up to 100mm thick, 12 Kg/m3 density insulation.

8.0 PACKAGING AND SHIPPING

8.1 For shipments, panel faces and corners shall be suitably protected . Panel bundles shall be packaged for safe and ease of handling and transport.

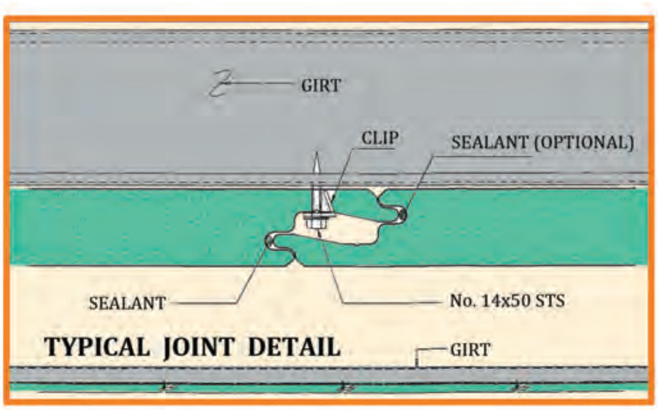
9.0 FIELD INSTALLATION

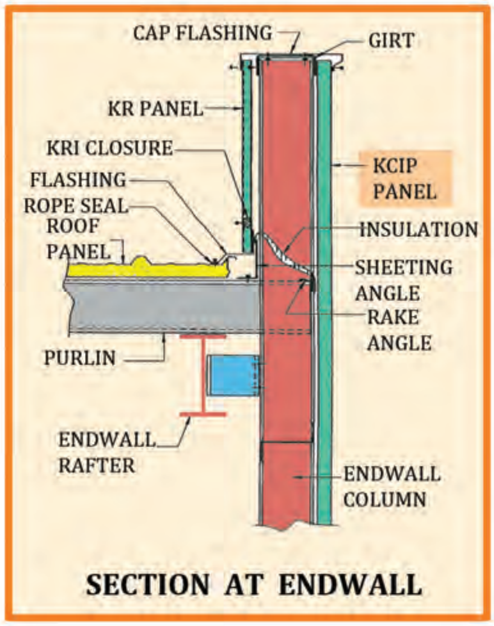
9.1 Structural system shall be plumb within AISC/MBMA tolerances before wall/partition panels are attached to girts.

9.2 Sealant shall be applied at panel joints to ensure weather tightness . Flashing and trim shall be installed true and in proper alignment for best appearance.

9.3 All installation shall be done in accordance with Kirby building installation drawings and good working practices.

5.17 CONCEALED FASTENER INSULATED CLADDING TYPE KCIP



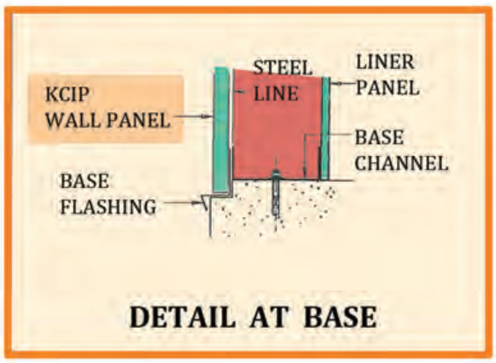


Features:

- Sandwich panel concealed fastener cladding type-kcip is used for exterior wall cladding and exterior partition.
- Panels have interlocking tongue & groove joints.
- Supplied in covering widths of 666mm & 1000mm and thickness of 0.5 & 0.6Mm ,top & bottom skin thickness.
- Available in all kirby standard colours.

Benefits:

- An attractive architectural look for commercial and Institutional buildings.
- Flat surface without exposed fasteners & no corrugation.
- Ideal for internal office & room partitions.



5.18 CONCEALED FASTENER INSULATED PANEL CLADDING TYPE (KCIP) SPECIFICATIONS

1.0 GENERAL

1.1 The Kirby concealed fastener insulated panel system type 'KCIP' shall be furnished with other integral components to form the exterior envelope and/or the interior partitions of the building as described herein.

1.2 Installation of the panel system shall be in accordance with Kirby Building installation drawings.

2.0 PANEL DESCRIPTION

2.1 Exterior wall and partition panels shall be 1000mm covering width and maximum possible length(not to exceed 9 meters), to minimise the number of joints. The panels shall be manufactured by the press injection method to produce a rigid polyurethane core of 35 Kg/m3 nominal density between steel facings. Panels shall have a generally flat profile with minor ribs and interlocking joints to conceal the fasteners to the structural members.

2.2 The panels shall be available in nominal thickness of 50mm, 60mm, 75mm and 100mm.

2.3 Panels shall be one piece from base to top of wall or partition upto a maximum length of 9 meters.

2.4 Both ends of the panel shall be square cut and unpunched.

3.0 PANEL MATERIAL AND FINISH

3.1 Panel facings shall be precision roll formed from either zincalum coated or galvanized steel substrate to ASTM A792 Grade 50B AZ150 or ASTM A653 Grade 50 with G90 coating.

3.2 The finish coating shall be polyester or silicon polyester coating 25 microns on exterior face and 1 0 microns on interior face of the panel facings. Other finish coatings are available upon request.

3.3 Panel color shall be one of Kirby standard colors. Other colors are available upon request.

4.0 PANEL DESIGN

4.1 Panel design shall be in accordance with AISI Cold Formed Steel Design Manual and good engineering practices.

5.0 FASTENERS

5.1 Panels shall be fastened to structural membersusing #14 self tapping screws with metal and EDPM washers. Screws shall have hexagonal heads and shall be zinc plated and color coated to match the panel colors.

5.2 No panel to panel fasteners are required. All fasteners shall be made from the outside, hidden in the panel joint thus eliminating exposed fasteners.

6.0 FLASHINGS AND TRIMS

6.1 Flashing and trims shall be furnished at corners, eaves, rake, framed openings and wherever necessary to provide weather tightness and a good finished appearance.

6.2 Flashing and trims shall be of the same specifications as the panel facing materials.

7.0 ACCESSORIES

7.1 Accessories as specified such as doors, windows, etc .. , shall be furnished or framed openings provided as shown in the building installation drawings. Accessories when supplied shall be to Kirby standard specifications unless otherwise noted on building installation drawings.

7.2 Location and type of accessories shall be as shown in Kirby building installation drawings.

8.0 PACKAGING AND SHIPPING

8.1 For shipments, panel faces and corners shall be suitably protected. Panel bundles shall be packaged for safe and ease of handling and transport.

9.0 FIELD INSTALLATION

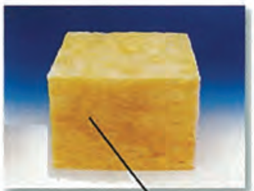
9.1 Structural system shall be plumb within AISC/MBMA tolerances before wall/ partition panels are attached to girts.

9.2 Sealant shall be applied at panel joints to ensure weather tightness. Flashing and trim shall be installed true and in proper alignment for best appearance.

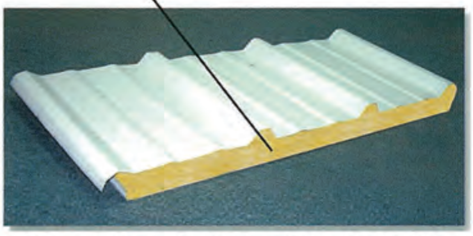
9.3 All installation shall be done in accordance with Kirby building installation drawings and good working practices.

5.19 FIBER GLASS INSULATED PANEL

WITH EXCELLENT PERFORMANCE CHARACTERISTICS



Kimmco
Fiber Glass
Insulation



KRGP- fiber glass insulated panel
For roof & wall

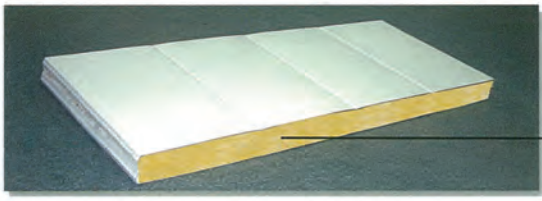
FIRE SAFE

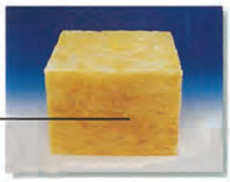
SUPERB THERMAL INSULATION

EXCELLENT ACOUSTIC INSULATION

ENVIRONMENT FRIENDLY

COST EFFICIENT
EASY TO INSTALL
SUITABLE TO RETROFIT
COMPATIBLE WITH KIRBY BLDGS





Kimmco
Fiber Glass
Insulation

KFGP- fiber glass insulated panel for partitions

5.20 FIBER GLASS INSULATED PANEL

KRGP

Fiber glass insulated panel for roof & wall

Description:

Top facing : Trapezodial profile 32mm deep at 333mm spacing, Steel 26g or 24g.
Bottom facing : Generally flat profile with minor stiffening ribs at 250 mm spacing, Steel 26g or 24g. The steel facings are high strength steel to ASTM A 792 grade 345 Mpa with zincalum coating to AZ150. The substrate is polyester coated to 25 microns nominal thickness on exposed side and 12 microns on reverse side. Available in full range of Kirby standard colors. Insulation : **FIRE SAFE CFC free** fiberglass insulation (which does not emit **TOXIC SMOKE)** laminated to the steel facings with special chemical glue, completely filling the insulation cavity.

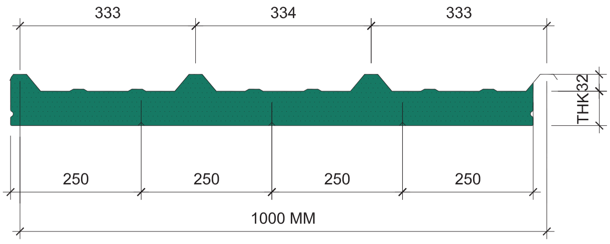
Performance Values:

- Thermal Heat Transmission (U-Value)

Applications :

As Roof and Wall cladding system on·:

- New Pre-engineered steel buildings.
- Retrofit applications on
- existing steel buildings

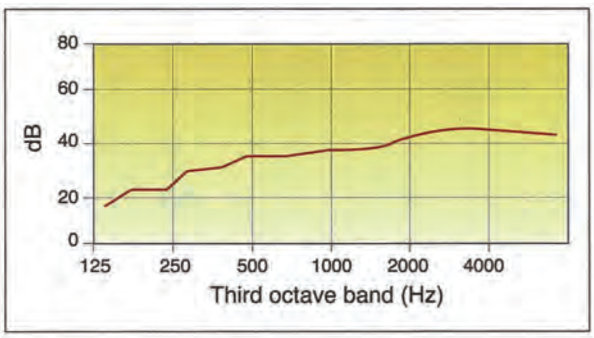


Dimensions :
Length : upto 9000 mm
width : 1000 mm
Thickness : 50,60,70 or
100 mm at low rib (add 32 mm to thickness at high rib)

NOTE :

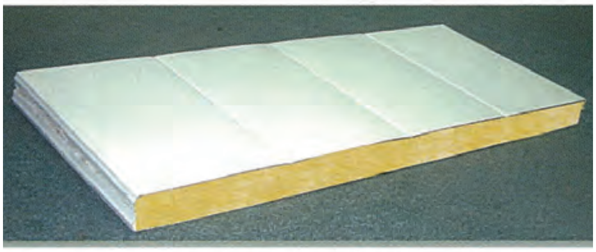
Panels in other thickness can also made available to meet any specified 'R' or 'U' value

	Krgp 50	Krgp 60	Krgp 75	Krgp 100
BTU/ft².h.f	0.108	0.092	0.076	0.59
W/M².K	0.613	0.524	0.431	0.332



- Maximum working temperature - 230o C
- Fire Safety - Non-combustible
- Acoustics - KRGP 60 : STC - 32dB

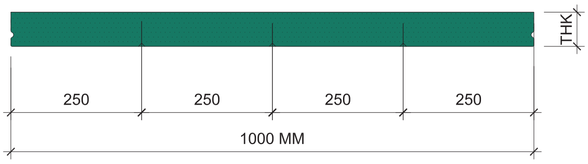
KFGP



Fiber glass insulated panel for partitions

Applications :

- AS Interior Partition Panels.
- Interior wall liner Panels.



Description:

Top facing and Bottom facing : Trapezodial profile 32mm deep at 333mm spacing, Steel 26g or 24g.

Bottom facing : Generally flat profile with minor stiffening ribs at 250 mm spacing, Steel 26g or 24g. The steel facings are high strength steel to ASTM A 792 grade 345 Mpa with zincalum coating to AZ150. The substrate is polyester coated to 25 microns nominal thickness on exposed side and 12 microns on reverseside. Available in full range of Kirby standard colors.

Insulation :

FIRE SAFE CFC free fiberglass insulation (which does not emit TOXIC SMOKE) laminated to the steel facings with special chemical glue, completely filling the insulation cavity.

Dimensions :

Length	: upto 9000mm
width	: 1000mm
Thickness	: 50, 60, 75 or 100 mm

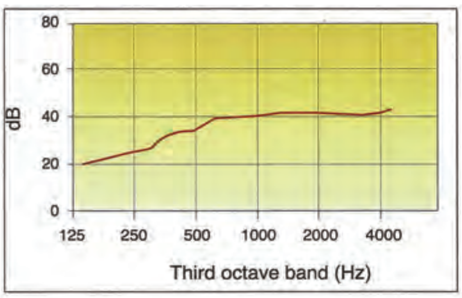
NOTE :

Panels in other thickness can also made available to meet any specified 'R' or 'U' value Performance Values:

Performance Values :

- Thermal Heat Transmission (U-Value)

	Krgp 50	Krgp 60	Krgp 75	Krgp 100
BTU/ft².h.f	0.114	0.097	0.079	0.60
W/M².K	0.645	0.548	0.447	0.342

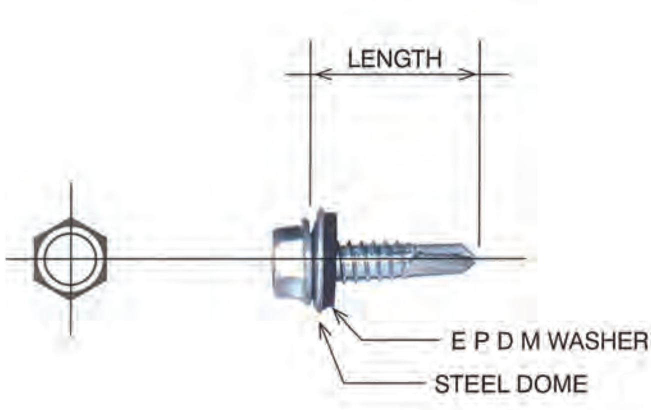


- Maximum working temperature - 230o C
- Fire Safety - Non-combustible
- Acoustics - KRGP 100 : STC - 37dB

5.21 SELF DRILLING SCREW (SDS)

Dimensions:

HEAD ACROSS FLATS	9.33 - 9.52 mm
THREAD DIA (O.D)	6.10 - 6.25 mm
THREAD DIA (I. D)	5.45 - 5.55 mm
EPDM WASHER DIA	19 mm



Pull out (Ultimate)				
Purlin Thickness (mm)	1.50	1.75	2.00	2.50
Ultimate Pull Out (KN)	1.16	1.83	2.09	2.32

Pull over (Ultimate)				
Panel Material	Steel		Aluminium	
Purlin Thickness (mm)	0.5	0.6	0.5	0.7
Ultimate Pull Over (KN)	5.12	5.72	2.15	2.80

5.22 CABLE BRACING

Definition:

The Cable Bracing is a primary member suitable to insure the stability of the building against forces in the longitudinal direction due to Wind, Cranes, Earth Quake ... etc.

Kirby's Cable Bracing is designed in accordance with the latest edition of the American Institute of Steel Construction AISC 2005.

Specifications:

1. Cables are made of Galvanized Extra High Strength Seven Strand Cable of 1/2" diameter conforming to ASTM A475 - 2003 Class 1 (G40).
2. Terminals are made of Galvanized (G40) 25 mm diameter rods conforming to ASTM A36
3. Hill Side Washers are made of Aluminum Alloy

Advantages:

- Higher Strength 60 KN
- Better corrosion resistance (Galvanized)
- Easy packing and shipping (Round Packing)
- Cable can be fabricated and shipped for any required length.
- Easy building installation.
- Light weight (Economical)

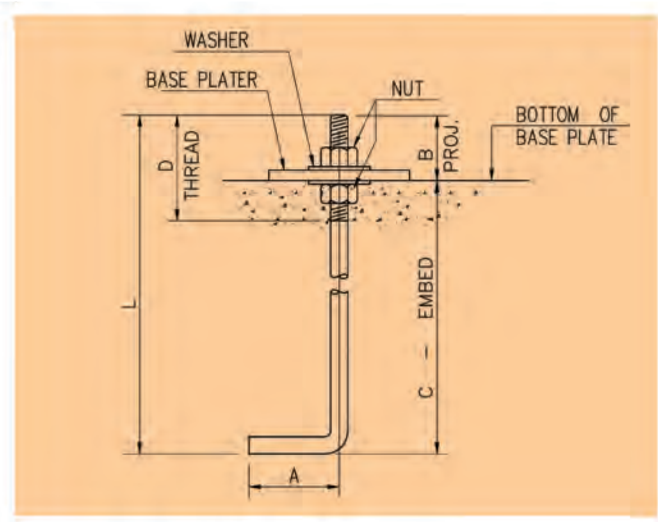
Revision Date : 01-01-07

5.23 ASTM A36 ANCHOR BOLTS COMPONENT SECTION PROPERTIES & LOAD TABLES

Standard specifications bolts:

ASTM designation - A36
Connection Type- N (Bearing type connection with threads included in shear plane)
Hole Type- STD (Standard round holes)

Fu =58 ksi (39.98 kN/cm2)
Ft = 19.1 ksi (13.16 kN/cm2)
Fv = 9.9 ksi (6.82 kN/cm2)



Anchor Bolt Setting

Table 3.7.1 - Allowable Loads

Bolt Diam mm	L mm	A mm	B mm	C mm	D mm	L_e^a mm	Pitch (P)	C/s mm2
16	400	100	75	325	100	545	2.0	201.06
20	500	120	100	400	150	670	2.5	314.16
24	650	140	100	550	150	870	3.0	452.39
32	950	200	100	850	150	1290	3.5	804.24

Allowable Comb.		Allowable comb.		
Max shear kN	**Corresponding tension kN**	**Corresponding shear kN**	**Max tension kN**	**Pull-out strength kN**
13.68	9.90	4.43	26.55	30.13
21.37	15.46	6.91	41.49	46.31
30.78	22.27	9.96	59.75	62.90
54.72	39.59	17.70	106.21	93.26

Effective length, Le = C + A + 8*Bolt diameter - Bolt radius

NOTE:

1. Shear and tension loads based on gross nominal area of bolt.
2. Allowable loads are including combined shear and tension.
3. Stress increase of 33% is NOT ALLOWED ANY MORE.
4. Pull out strength is based on 28 days concrete compressive strength 2.07 kN/cm^2
5. Pull out strength is calculated as per ACI (American Concrete Institute) Building Code 318.
6. Bolt specifications based on AISC 2005 Edition.

REV DT	07/06/05	07/12/05	24/02/14

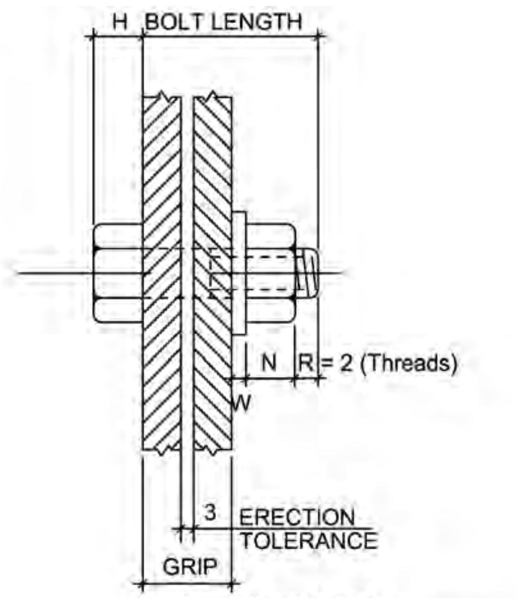
5.24 ASTM A325 HIGH STRENGTH BOLTS COMPONENT SECTION PROPERTIES & LOAD TABLE

Specifications:

Bolts, Nuts & Washers Finishing
Electro-Galvanized ASTM F 1135M Grade 1
Bolts Specification
Heavy Hex Structural ASTM A325M Type 1
Nuts Specification
Hex ASTM A 563M 10S
Washers Specification (Washers/Bolt)
Hardened Flat ASTM F 436M Type 1

For Detailers:

List the Bolt, Nut and Washers Seperatly in Shipper List
Add 2% extra (Minimum Extra is 2 Bolts)



L = Grip + 3 + W + R + N
Threads Length = L - (Grip + W) + R
N = 1 dia H = 0.7 dia

Bolts				W	Min-Max Grip (3 mm Building Installation Tolerance)	Allowable Forces		
Nom Dia mm	Bolt Length mm	Threaded Length mm	Threads Pitch mm/Thr	Nom Thick mm	0 10 20 30 40 50 60 70 120	Max Tension KN	Max S. Shear KN	Combined Tension KN
12	40	Full	1.75	3.10	18	35.06	18.66	10.52
16	55	Full	2.00		29	62.33	33.18	18.70
20	70	Full	2.50		39	97.39	51.84	29.22
24	75	Full	3.00	4.0	38	140.24	74.64	42.07
	95	Full			58			
30	120	Full	3.50	4.50	75	219.12	116.63	65.74
32	120	Full			73	249.32	132.70	74.80

* Maximum Grip (including 3mm tolerance) = Bolt Length - 3mm Erection Tolerance - 1 Washer - 1 Nut - (2 x Threads)

X Y Z

X: Minimum Grip
Y: Maximum Grip inluding 3mm erection tolerance
Z: Maximum Grip excluding 3mm erection tolerance

For Combined Tension and Shear refer to Table J3.2, and equations:
(J3-2), (J3-3a), (J3-3b) from the AISC 2005 Edition

5.25 STANDARD CRANE SYSTEM

General:

The kirby standard crane system is a single girder, pendant operated, top running system which includes a structural bridge member fabricated by kirby building systems, and electro-mechanical components fabricated by selected vendors and supplied as a complete Package.

Crane bridge:

The structural design of the crane bridge conforms to the allowable stresses as defined in the american institute of steel construction manual. The crane bridge is designed for the Crane capacity magnified by 10% for impact, and the total weight of bridge, hoist and trolley. Deflection under total load is limited to 0.001 Of span. The ends of the crane bridge are prepared with special connecting plates which are bolted to the end carriage. Field welding is required for the connection of bridge to end carriage and for bridges of spans larger than 12m require field welded splice to be performed under high quality control to ensure full penetration welds. Maximum span supplied with the standard end carriage is 21 m to control grabbing.

End carriage:

The end carriages are made of reinforced welded box sections. Each end carriage is equipped with its separate travelling machinery to eliminate the drawback of a long oscillating drive shaft. Motors are totally enclosed. Insulation class f, protection ip54. The end carriages come with double flange wheels, .3.4M on center, lathed toa diameter of 200 mm, and properly aligned in a uniaxial direction, and equipped with derailment protection suitable for travel along rails (aisc 30 lb. Rail) which are mounted on crane runway beams which in turn are supported on shop welded brackets to the frame columns. The rails are aligned by hook bolts which interlock the flange of the cap channel of the crane .Runway beams and through the adjusting nuts on. Either side of the rail neck.

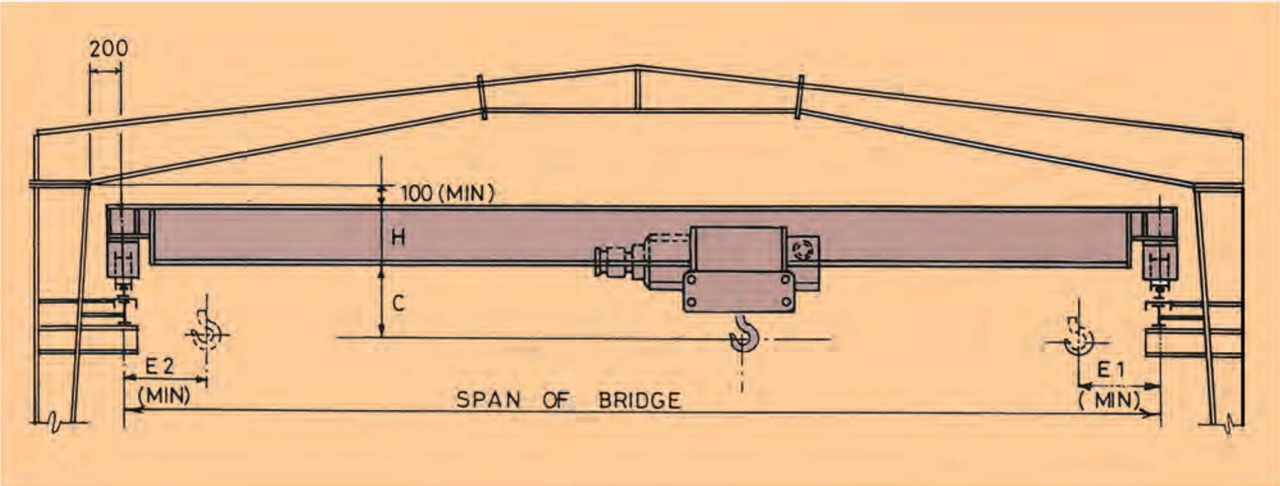
Hoist and trolley:

The hoisting trolley moves along the bonom flange of the crane bridge, and has special mounting at which the hoist is bolted. The hoist is a low headroom type to allow greater lifting heights needed particularly in low spaces. The hoist capacity is rated in accordance with fem 1am (federation europeenne de la manutention) standards which is based on load spectrum (% lifting load per % time), average operating time per day, daily working time and starting frequency, and as shown on the following page .

Crane runway beams:

The crane runway beams are oriented in the longitudinal direction of the crane travel and consist of h-sections with cap channels, designed for maximum combined·stresses generated from maximum wheel loads positioned at critical locations and acting vertically and Horizontally. The maximum wheel load is magnified by 10% for impact. The horizontal load is generated from 20% of the sum of the crane capacity and the weights of hoist and trolley.

5.26 STANDARD CRANE SYSTEM TYPE 'K' CLEARANCES & WHEEL LOADS

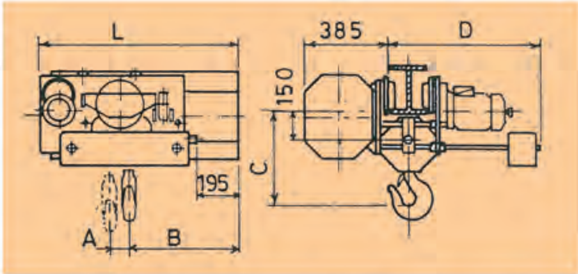


K I. THE LONGITUDINAL FORCE APPLIED AT THE TOP OF RAIL, AT EACH WHEEL.

K II. THE LATERAL FORCE OF CRANE RUNWAY DUE TO EFFECT OF MOVING LOAD AT THE TOP OF RAIL, AT EACH WHEEL.

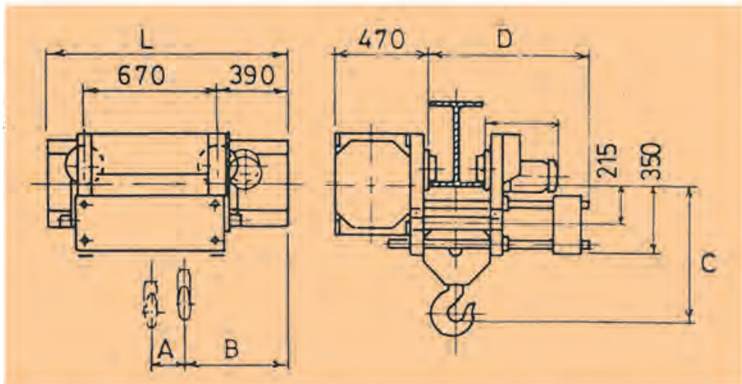
Crane Capacity M.t.	C mm	E1 mm	E2 mm	Span of Bridge	H mm	Wheel loan KD		
						Dyn.max	Ki	Kii
3.2	660	740	825	6	500	21.0	2.1	1.74
				9	500	23.9	2.39	
				12	500	26.2	2.62	
				15	750	31.3	3.13	
				18	750	31.3	3.13	
				21	800	32.0	3.20	
5.0	590	815	790	6	500	30.4	3.04	2.65
				9	500	34.4	3.44	
				12	500	37.3	3.73	
				15	750	40.7	4.07	
				18	750	43.2	4.32	
				21	900	43.6	4.36	
10.0	685	1015	1110	6	600	59.9	5.99	5.32
				9	600	64.2	6.42	
				12	600	68.0	6.80	
				15	850	72.0	7.20	
				18	900	75.8	7.58	
				21	1000	77.5	7.75	

5.27 STANDARD CRANE SYSTEM TYPE 'K' HOIST DETAILS



Crane capacity M.t.	Hoist type	Hoist Wt. Kg	Ht. Lift M	Hoisting speed M/Min	Cross travel speed M/Min	Dimensions				
						A mm	B mm	C mm	D mm	L mm
3.2	1221G	340	8	8	20	108	480	660	950	910
5	1441F	400	8	5	20	108	535	590	950	1080

Crane Capacity M.t.	Fem group	Hoisting motor		Wire rope	
		K.W.	% ED	NoS.	DIA. mm
3.2	1 AM	4.5	30	2	10
5	1 AM	4.5	30	4	10



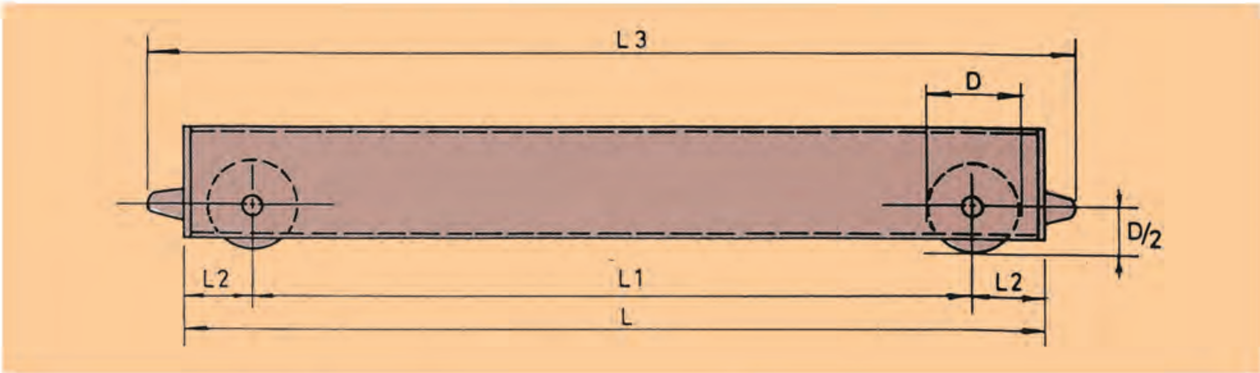
NOTE :

A. THE TRAVEL SPEED BY 2 STEP POLE CHANGE MOTOR.

Crane Capacity M.t.	Hoist type	Hoist Wt. Kg	Ht. Lift M	Hoisting speed M/Min	Cross travel speed M/Min	Dimensions				
						A mm	B mm	C mm	D mm	L mm
10	2441B	850	8	4	20	125	670	685	820	1255

Crane Capacity M.t.	Fem Group	Hoisting motor		Wire rope	
		K.W.	% ED	NoS.	DIA. mm
10	1 AM	7.5	50	4	14

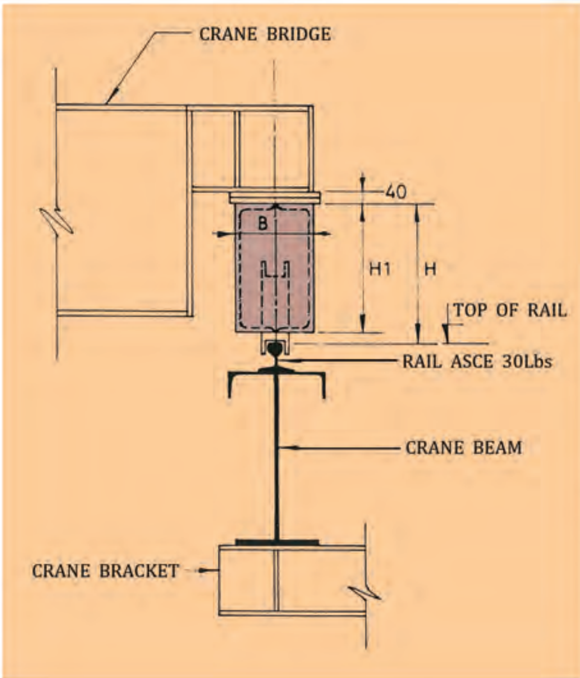
5.28 STANDARD CRANE SYSTEM TYPE 'K' END CARRIAGE DETAIL



Electrical Specifications:

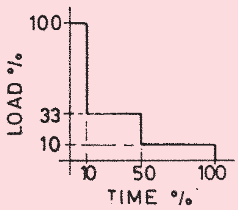
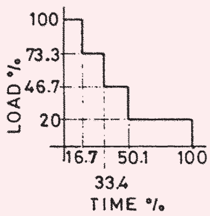
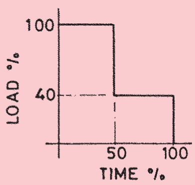
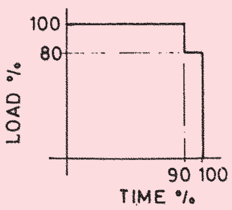
(FOR 3.2 T , 5.0 T & 10 T)

1. Motor voltage - 380v i 440v
2. Control voltage - 220v
3. Frequency - 3 phase, 50 cis 60 cis
4. Push button pendant control



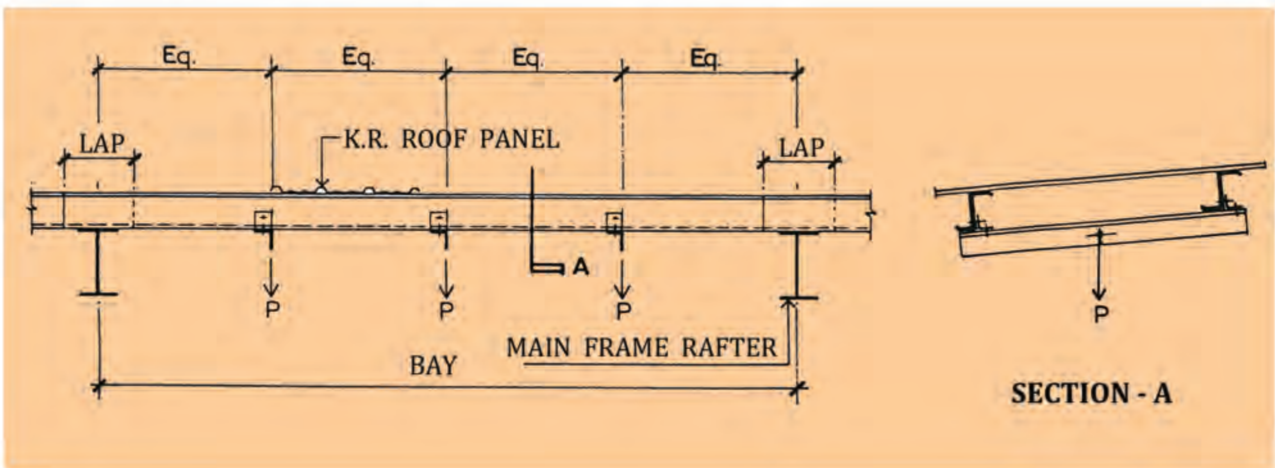
Type	L	L1	L2	L3	D	H	H1	B	Long travel speed M / Min
USP 206	3680	3400	140	3820	200	325	300	200	32 AND 10

5.29 STANDARD CRANE SYSTEM TYPE 'K' LOAD SPECTRUM

Fem group load spectrum			Fem 1Am	Fem 2Am	Fem 3Am
			Operating time		Hours / Day
	Light	LIGHT	≤4	4-8	8-16
	Medium	MEDIUM	≤2	2-4	4-8
	Heavy	HEAVY	≤1	1-2	2-4
	Severe	SEVERE	< 0.5	0.5-1	1-2
EQUIVALET CRANE CAPACITIES (TONS) FOR HIGHER FEM GROUP CLASSIFICATION			RATED CAPACITY	REDUCED CAPACITY	REDUCED CAPACITY
			3.2	2.5	2.0
			5.0	4.0	3.2
			10.0	8.0	6.3

5.30 SERVICE LOADS HANGING DETAILS & ALLOWABLE LOADS

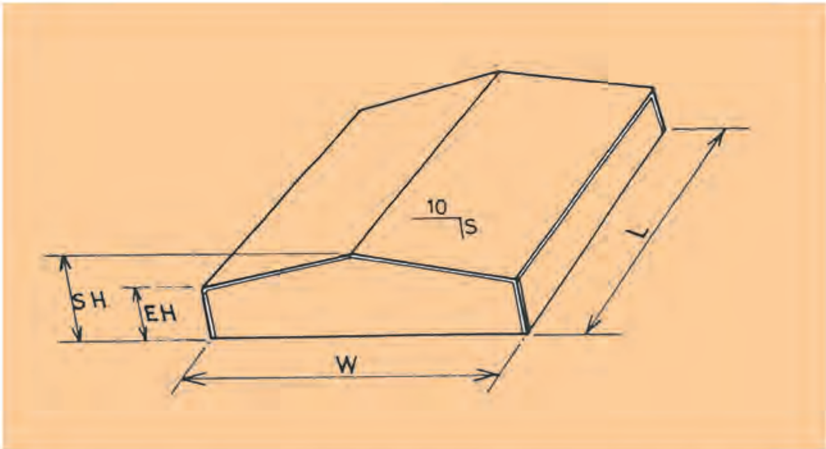
Service loads may be suspended from the Kirby roof purlins provided that the intensity and location of these loads are pre-defined at time of sales.
For standard buildings, where service loads are not pre-calculated, the suggested hanging details and maximum allowable suspended load table may be used for a specific bay length, purlin size and lap, and number of suspended loads per bay.
The recommended suspension details are intended for roof slope upto 10%. Multiple suspended loads shall be equi-spaced in a bay.
Only suggested suspension details as shown should be used to prevent localized buckling of purlins. For heavier auxiliary loads, additional framing members will be needed.
The suspension angles and fasteners are not supplied by Kirby.



Maximum allowable suspended load, p (kg), in addition to Roof live load of 0.6 Kn / m2

Purlin		Lap	Bay spacing (meter)							
			6.0				7.5			
			No. of loads / bay				No. of loads / bay			
			1	2	3	4	1	2	3	4
200 Z	1.5	107	65	45	30	25	0	0	0	0
		706	130	95	65	50	30	20	15	10
	1.8	107	140	100	70	55	40	30	20	15
		706	245	180	120	100	105	80	50	45
	2.5	107	275	205	135	110	145	105	70	60
		706	445	330	220	185	245	185	120	100

5.31 VENTILATION CALCULATION



The number of standard Kirby ridge ventilators and louvers can be determined from following procedure based on a given unit of air changes and known building geometry.

Building volume:

V = W X L X (EH + WS/40)
W = SPAN, L = LENGTH
EH = EAVE HEIGHT
S = ROOF SLOPE IN TERMS OF 10

Ventilation rates for types of building:

Type Of Building	Air Changes / Hour
Boiler house/engine room	15-30
Living quarters, rooms & wards	15-20
Classrooms, canteen	5-15
Offices, commercial shops, factories	5-10

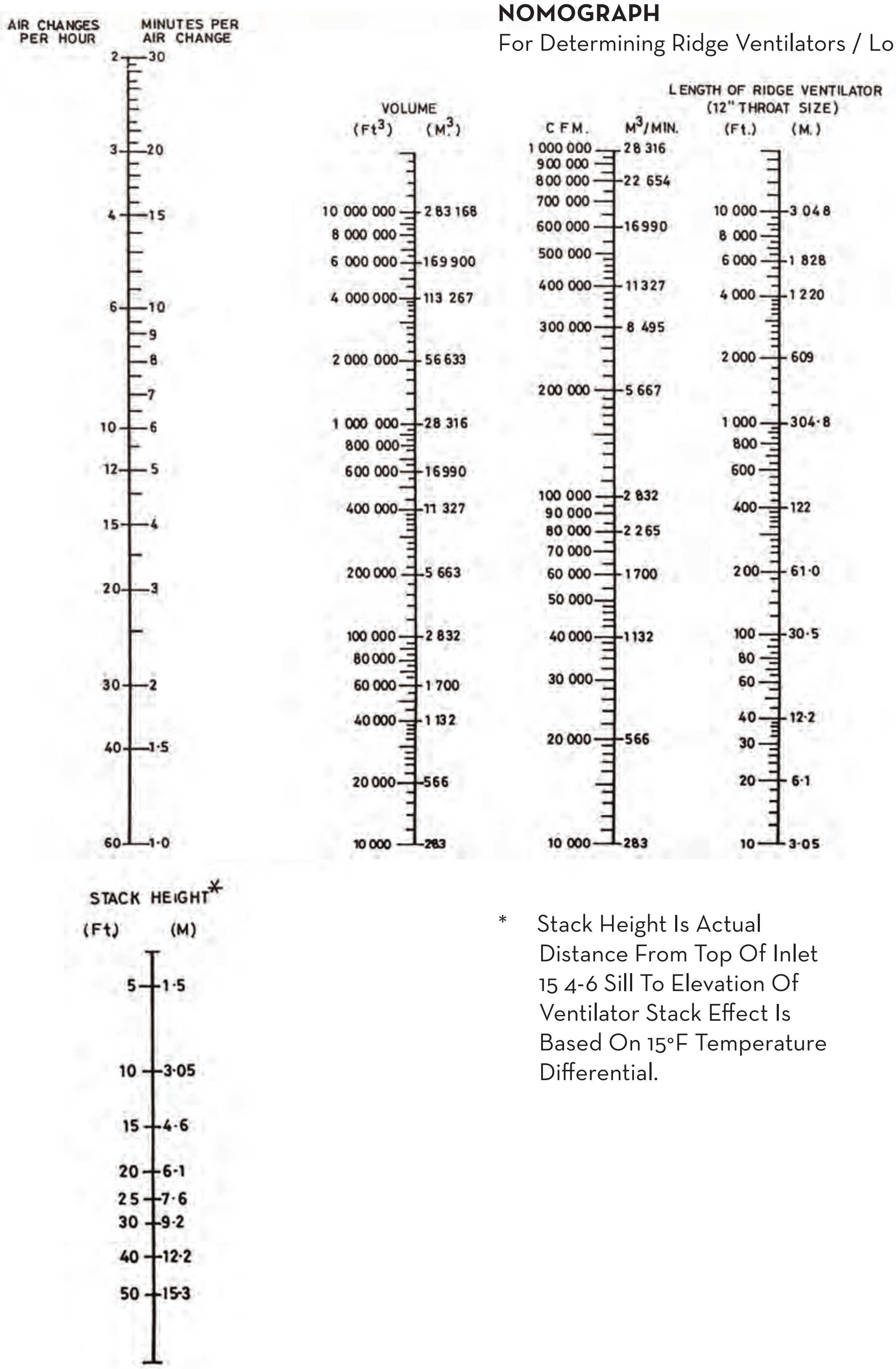
Procedure:

Using the following nomograph, draw a line connecting the known value of air changes per hour and the volume of the building to get the rate of air flow (cfm-m3/min). Then draw a line connecting the determined value of the rate of air flow and the stack height (sh) to find the length of ridge ventilator required, divide the length of ridge ventilator by 3m to get the number of kirby standard ridge ventilators. Wall openings (louvers, doors and windows) must be provided and well distributed. To ensure air inlet and proper ventilation cycle for each linear meter of ridge ventilators, one square meter of wall opening for air inlet is required.

If the required air changes cannot be achieved using natural ventilation as above, forced ventilation using power vents may be provided: consult head office for details. Refer to accessories for Kirby's standard louver and ridge ventilator details.

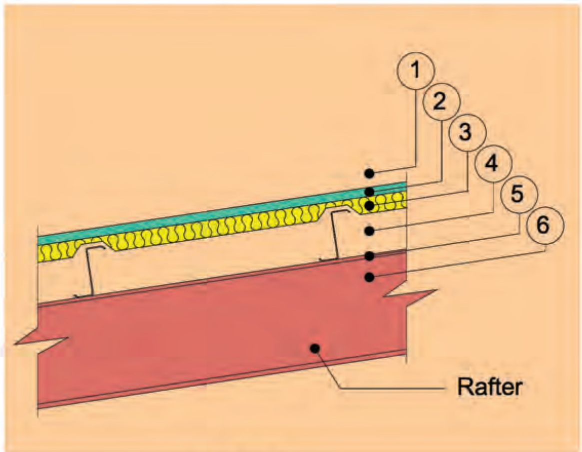
5.32 VENTILATION CALCULATION NOMOGRAPH

NOMOGRAPH
For Determining Ridge Ventilators / Louvers

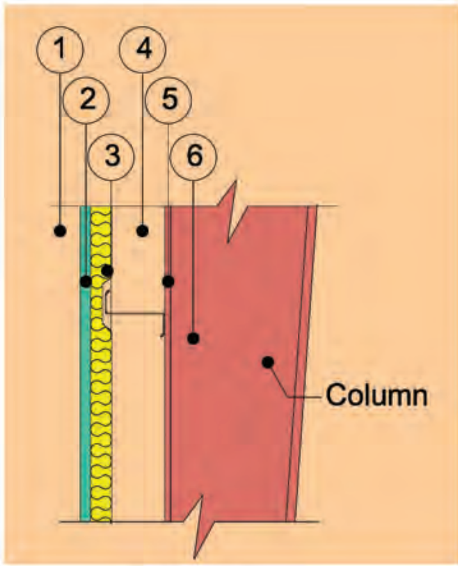


* Stack Height Is Actual Distance From Top Of Inlet 15 4-6 Sill To Elevation Of Ventilator Stack Effect Is Based On 15°F Temperature Differential.

5.33 KIRBY INSULATION (KIB-12) INSTALLED "U" VALUES



AT ROOF



AT WALL

At roof with 50 mm insulation		
Element	Construction	Resistance R
1	Outside surface (7.5 Mph wind)	0.25
2	Roof sheeting	0.00
3	Insulation 50 mm (@100ºf)	6.79
4	Air space	1.62
5	Liner	0.00
6	Inside surface (still air)	1.10
	Total	9.76

At wall with 50 mm insulation		
Element	Construction	Resistance R
1	Outside surface	0.25
2	Wall sheeting	0.00
3	Insulation 50 mm	6.79
4	Air space	0.52
5	Liner	0.00
6	Inside surface (still air)	1.35
	Total	8.91

INSULATION INSTALLED VALUES:

AT ROOF WITH 50mm INSULATION
U= 1= 1 = 0.102 BTU / HRFt^{2}oF
= 0.500 K Cal / HR M^{2}oC

AT WALL WITH 50mm INSULATION
U= 1= 1 = 0.112 BTU / HRFt^{2}oF
= 0.548 K Cal / HR M^{2}oC

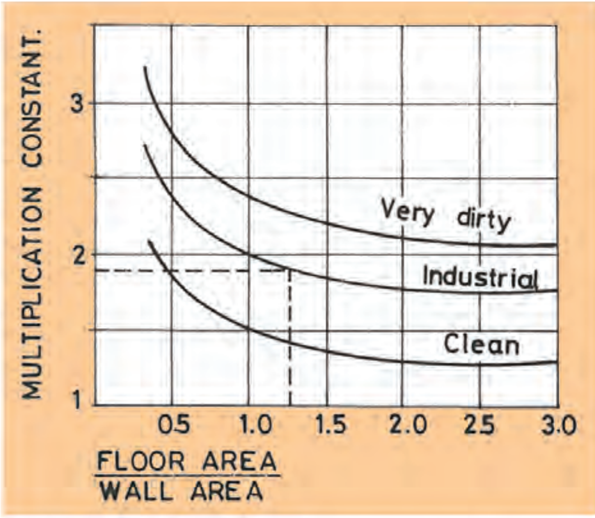
Table of insulation installed values				
Thickness of insulation mm	**"U" values**			
	At roof		**At wall**	
	K cal / hr m² ºc	**Btu / hr ft² ºf**	**K cal / hr m² ºc**	**Btu / hr ft² ºf**
50	0.500	0.102	0.548	0.112
75	0.371	0.076	0.397	0.081
100	0.295	0.060	0.311	0.064
150	0.215	0.044	0.220	0.045

5.34 ROOF LIGHTING REQUIREMENTS

Recommended roof lighting:

Daylight factors recommended for diferent activities are shown in table below:

In order to obtain the net area of skylights required, apply a multiplication factor from the graph to cover variations in wall to floor area ratio and location.
To allow for possible change in the use of a building, a daylight factor below 5 % is not recommended. Also any required daylight factors above 10 % should be supplemented by local artificial lighting. This minimises the heat transmission from sunlight.



Operation or type of building	recommended % Daylight factor
Warehouses, packing, large assembly heavy forging or casting, sawmills	2.0
Ordinary bench and machine work, average general lighting, fine casting, motor repair, general office work, Indoor tennis.	4.0
Drawing work, medium assembly, weaving. small type setting.	6.0
Small inspection and assembly.	
Small bench and machine work.	10.0

EXAMPLE :

Building in an industrial area of 30m span x 60m long x 8m eave ht.
Used as a weaving mill.
Floor area = 30x60 = 1800m²
Wall area = 8x180 = 1440 m²
$\frac{\text{Floor area}}{\text{Wall area}} = 1.25$

From table, daylight factor = 6 %
From' graph m'ultiplication constant = 1.9
,' . Net area of lighting required = $\frac{1.9X6x30x60}{100}$ = 205 m²
Approx. net area of one skylight (3305 lg) = 3 m²
No. of skylights required = 205/3 = 68.33, Say 70 nos.
Use 70 nos. Skylights evenly distributed on each roof slope.

5.35 ROOF DRAINAGE CALCULATIONS

Drainage calculations:

The assumed standard rain'fall to' be used on Kirby buildings shall be as follows:

Eave gutters:

Since it would not normally cause trouble to have the eave gutter overflow under extreme conditions.

The value of 7 · inches per hour shall be used unless otherwise specified. The following approximate design coefficients may be used to obtain the size of the gutter.
7· In/hr = 1.66 Sq. In. of eave gutter per 100 sq. ft. of roof area drained.

Valley gutters:

Since it would be undesirable to have valley gutters overflow even on extreme conditions.
The value of 12 · inches per hour shall be used unless otherwise specified. The following appropriate design coefficients may be used to obtain the size of the gutter.
12 · In/hr = 2.35 Sq. In of valley gutter per = 100 sq.ft. of roof area drained

Down spouts:

Standard downspouts are provided along each sidewall at spacing as recommended on roof drainage reuirements have been based on formula derived by "The Copper Development Association Inc." From tests conducted on level gutters at the U.S. bureau of standards in washington D.C. The formula are as follows:

DOWNSPOUT "S" $= \dfrac{(U)^{28/13} \quad (M)^{16/13}}{(0.4810\ 28/13 \quad (W1/43200)\ 10/13}$

WHEN GUTTER CAPACITY GOVERNS

OR "S" $= \dfrac{1200A}{WI}$ WHEN DOWNSPOUT CAPACITY GOVERNS

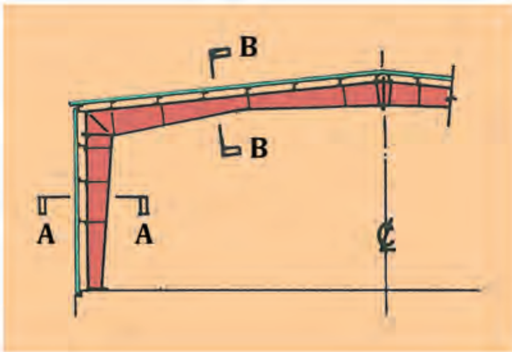
Where	S	=	downspout spacingin feet
	U	=	average width of gutter (ft)
	M	=	depth/width of gutter
	W	=	width of area being drained (ft)
	I	=	maximum intensity of rainfall (in/hr)
	A	=	area of downspout (sq.In)

The following approximate design coefficient may be used to calculate size of downspouts.

7 · 1/2 In/hr = 187.5 Sq.Ft. of roof area drained per so. In of downspout area.

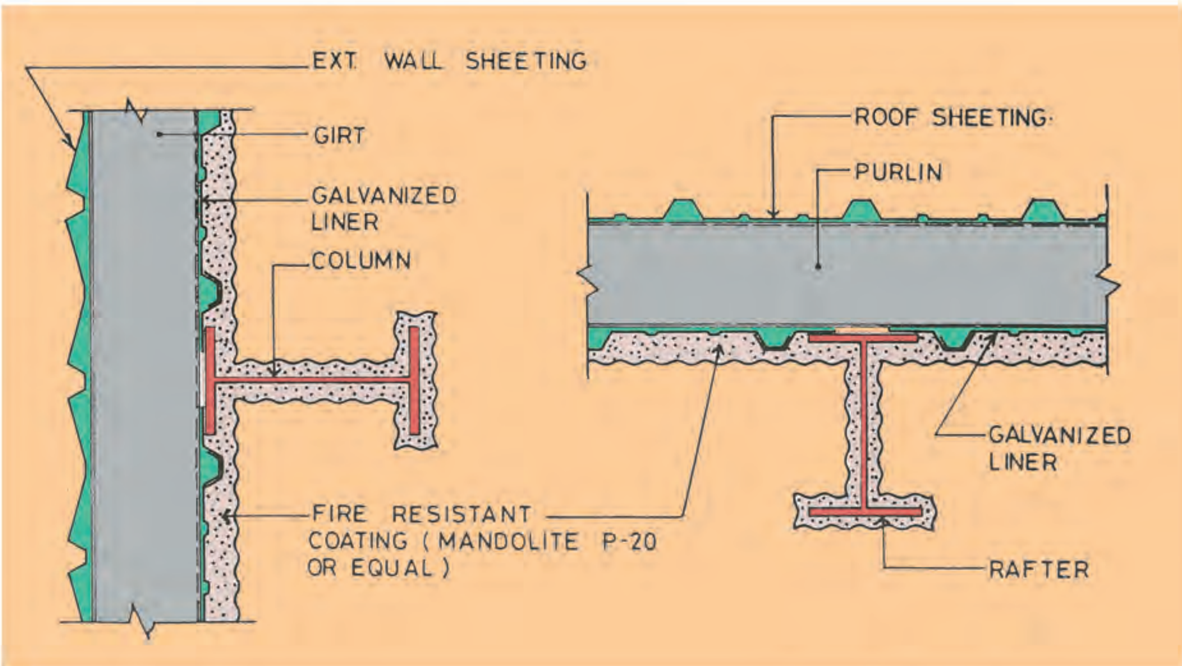
5.36 FIRE PROTECTION SYSTEM

Fire resistant coating mandoval p20 or equal can be applied to Kirby steel structure to achieve a given fire rating. Applied by spray, it provides a monolithic textured finish and has good in· sulation, sound absorption and bonding properties. The material is factory Pre-mixed and consists of vermiculite and portland cement. It does not spall or crack under impact and also highly resistant to both hot and cold thermal shocks. Mandolite p-20 contains no asbestos or fibre content and presents no known health hazard during or after application. An alkali resistant paint is applied to the main frames to receive the coating and on galvanised surfaces no special paint is required.



Physical properties (Mandolite p-20)

- Density - 320 kg/m3
- Bond strength - to bare steel 62 kn/m²
- To galvanised steel 59 kn/m²
- Compressive strength - 380 kn/m²
- Ph value - 12 -12.5
- Thermal conductivity - 0.078 Kcal m/m² hr ° c



SECTION - 'A - A'

SECTION - 'B - B'

5.37 BUILDING MATERIALS WEIGHTS

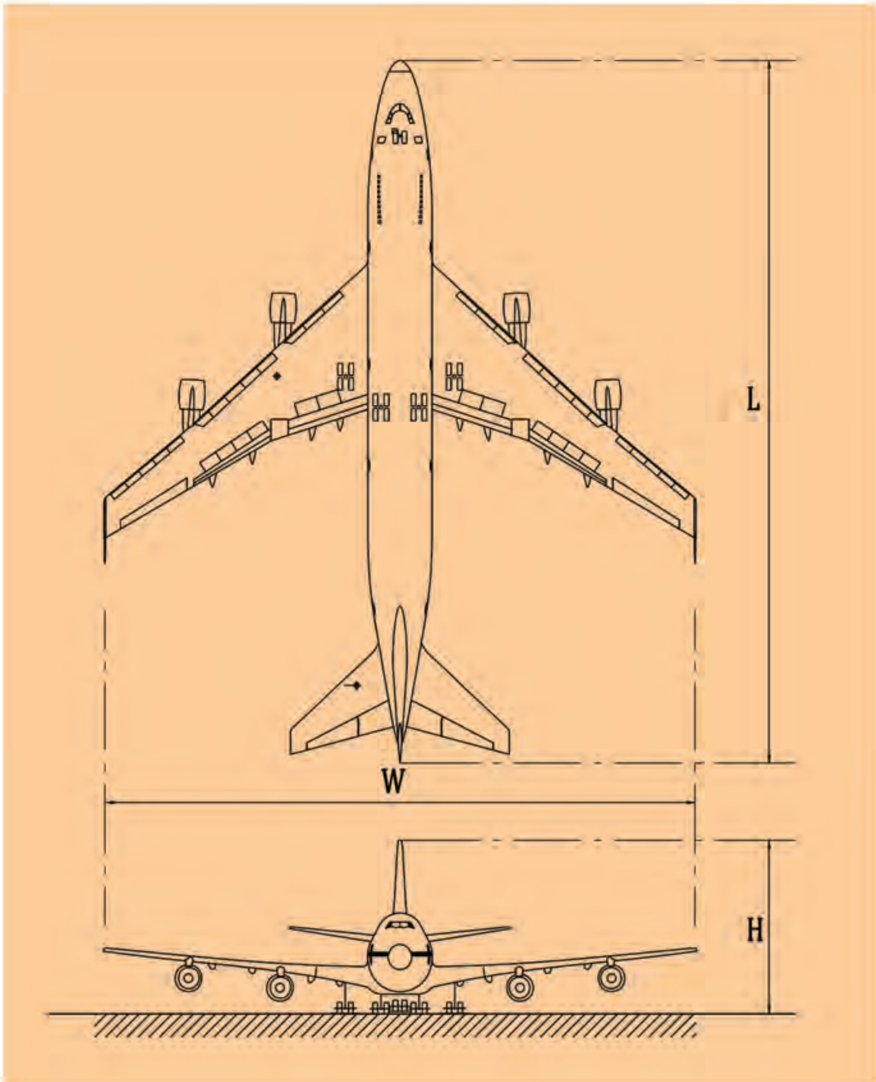
Materials	weight Psf	kg/m²
Ceilings		
Channel suspended system	1	4.9
Accoustical fiber tile	1	4.9
Partitions		
Clay tile		
31 IN. (76mm)	17	83.0
4 IN. (100mm)	18	87.9
6 IN. (150mm)	28	136.7
8 IN. (200mm)	34	166.0
10 IN. (250mm)	40	195.3
Gypsum block		
21 IN.	9.5	46.4
31 IN.	10.5	51 .3
41 IN.	12.5	61.0
51 IN.	14.0	68.4
61 IN	18.5	90.3
Wood studs 2"x4" (50xl00mm) 12-16 In.(300-400mm/o.C.)	2	9.8
Steel partitions	4	19.5
Plaster 1 in. (25mm)		
Cement	10	48
Gypsum	5	24.4
Lathing		
Metal	0.5	2.4
Gypsum board 1/2 in. (12mm)	2	9.8
Floors		
Kirby deck-26g	1.1	5.5
Concrete re-inforced 1 in. (25mm)		
Stone	12.5	61.0
Slag	11 .5	56.2
Lightweight	6-10	29.3-48.8
Concrete plain 1 in. (25mm)		
Stone	12	58.6
Slag	11	53.7
Lightweight	3-9	14.7-43.9
Fills 1 in. (25mm)		
Gypsum	6	29.3
Sand	8	39.1
Cinders	4	19.5
Finishes		
Terrazzo 1 in. (25mm)	13	63.5
Ceramic tile 3/4 in. (19mm)	10	48.8
Linoleum 1/4 in. (6mm)	1	4.9
Mastic 3/4 in. (19mm)	9	43.9
Hardwood 7/8 in. (22mm)	4	19.5
Softwood 3/4 in. (19mm)	2.5	12.2

Materials	weight PSF	kg/m²
Roofs		
Kirby-rib 26g	1	4.8
Kirby-rib 24g	1.2	5.9
3-Pl y ready roofing	1	4.9
3-Ply felt & gravel	5.5	26.9
5-Pl y felt & gravel	6	29.3
Shingles		
Wood	2	9.8
Asphalt	3	14.7
Clay tile	9-14	43.9-68.4
Slate 1/4 in. (6mm)	10	48.8
Sheathing		
Wood 3/4 in. (19mm)	3	14.7
Gypsum 1 in. (25mm)	4	19.5
Insulation 1 in.(25mm)		
Loose	0.5	2.5
Poured in place	2	9.8
Rigid	1.5	7.3
Walls		
Kirby-wall 26g	1	4.8
Kirby-wall 24g	1.2	5.9
Brick		
4 In. (100mm)	40	195.3
8 In . (200mm)	80	390.6
12 In .(300mm)	120	586.0
Hollow concrete Block (heavy Aggregate)		
4 In . (100mm)	30	146.5
6 In. (150mm)	43	210.0
8 In. (200mm)	55	268.6
12.5 In. (318mm)	80	390.6
Hollow concrete Block (light aggregate)		
Concrete plain 1 in. (25mm)		
4 IN. (100mm)	21	102.6
6 IN. (150mm)	30	146.5
8 IN. (200mm)	38	185.6
12 IN. (300mm)	55	268.6
CLAY TILE (LOAD BEARIN)		
4 IN . (100mm)	25	122.1
61N. (150mm)	30	146.5
8 IN. (200mm)	33	161.2
12 IN. (300mm)	45	219.7
STONE 4 IN. (100mm)	55	268.6
Glass block 4 in. (100mm)	18	87.9
Windows, glass, frame & Sash	8	39.1
Struct. Glass 1 in. (25mm)	15	73.3
Corrugated cement Asbestos 1/4 in. (6mm)	3	14.7

5.38 CONVERSION FACTORS

MEASURE	TO CONVERT		MULTIPLY BY
	From	TO	
Length	Inch	mm	25.40
	Foot	meter	0.3048
	Micron	meter	1.0 X 10-6
	Mil	meter	2.540 X 10-5
Area	Mile	meter	1609.30
	Yard	meter	0.9144
	Inch^2	mm^2	645.16
	Foot^2	meter^2	0.0929
Volume	Acres	kilometer^2	4.04687 X 10-3
	Inch^3	meter^3	1.638706 X 10-5
	Foot^3	meter^3	2.831685 X 10-2
	Gallon (U .S.)	Meter^3	3.785412 X 10-3
Mass	Gallon (U .S.)	Liters	3.78543
	Gallon (British Imperial)	gallon (U.S.)	1.20091
	Meter^3	liters	1000.0
	Pounds	kilograms	0.45359
Velocity	Metric Ton	pounds	2204.62
	Metric Ton	long ton	0.98421
	Metric Ton	short ton	1.10231
	Foot/hour	mile/hour	0.000190
Pressure Or Stress	Mile/hour (U . S .)	Kilometer/hour	1.609344
	Feet/minute	meter/second	0.00508
	Miles/hour	meter/second	0.44704
	Pound force/foot	newton/meter^2	47.88026
	Kg/cm^2	newton/meter^2	9.806650 X 10^4
	Kn/m^2	pounds/Foot^2 (psf)	20.885
Density	Kn/cm^2	kips/in2 (ksi)	1.4504
	Kg/mm^2	newton/mm2 (pascal)	9.8066
	Pounds/ft^3	kg/m^3	16.0185
	Pounds/inch3	grams/cm^3	27.680
Temperature	°F	°C	(°F-32)/1.8
	°C	°F	(°C x 1.8) + 32
	BTU/FT^2	KCal/m^2	2.71
Heat	BTU/FT HR °F	KCal/m^2 Hr °C	4.88
	BTU/FPHR °F	WATT/m^2°C	5.674466

5.39 AIRCRAFT DIMENSION



Aircraft type		L (m)	W(m)	H (m)
TUPOLEV				
TU-154	154B-2	54.10	44.84	16.50
	154M	54.10	44.84	16.50

Aircraft type	L (m)	W(m)	H (m)
EMBRAER			
170	29.90	26.00	9.85
175	31.68	26.00	9.73
190	36.24	28.72	10.57
195	38.65	28.72	10.55

Aircraft type		L (m)	W(m)	H (m)
BOEING				
B707	020	41.25	39.90	12.65
	120B	44.07	39.90	12.93
	320B	46.61	44.42	12.93
B717	200	37.80	28.47	8.92
B727	100	40.60	32.90	10.30
	200	46.70	32.90	10.30
	200F	46.70	32.90	10.30
B737	100	28.65	28.35	11.23
	200	30.53	28.35	11.23
	300	33.40	28.90	11.10
	400	36.40	28.90	11.10
	500	31.00	28.90	11.10
	600/700	31.20	34.30	12.60
	800/900	42.10	35.80	12.60
B747	100B	70.60	59.60	19.30
	200B	70.60	59.60	19.30
	300	70.60	59.60	19.30
	400/400ER	70.60	64.40	19.40
	8I	76.25	68.50	19.40
B757	200	47.32	38.05	13.56
	200F	47.32	38.05	13.56
	300	54.47	38.05	13.56
B767	200	48.50	47.60	15.80
	200ER	48.50	47.60	15.80
	300	48.50	47.60	15.80
	300ER	48.50	47.60	15.80
	300F	54.90	47.60	16.00
	400ER	61.40	51.90	16.80
B777	200	63.70	60.90	18.50
	200ER	63.70	60.90	18.50
	200LR	63.70	64.80	18.60
	Freighter	63.70	64.80	18.60
	300	73.90	60.90	18.50
	300ER	73.90	64.80	18.50
B787	8	57.00	60.00	17.00
	9	63.00	60.00	17.00

Aircraft type		L (m)	W(m)	H (m)
ANTONOV				
AN-148	100A	29.10	28.90	87.30
	100B	29.10	28.90	87.30
	100E	29.10	28.90	87.30

Aircraft type		L (m)	W(m)	H (m)
SUKHOI				
Superjet 100	SSJ 95	29.80	27.80	10.30
	SSJ 95LR	29.80	27.80	10.30

Aircraft type		L (m)	W(m)	
AIRBUS				
A300	600	54.10	44.84	16.50
	600F	54.10	44.84	16.50
	600ST	56.75	44.84	17.24
A310	-	46.66	43.90	15.80
A320	A319	33.84	34.10	11.76
	A320	37.57	34.10	11.00
	A321	44.51	34.10	11.76
A330	200	58.82	60.30	17.39
	200F	58.82	60.30	16.88
	300	63.69	60.30	16.83
A340	300	63.69	60.30	16.91
	200	59.40	60.30	16.80
	500	67.93	63.45	17.28
	600	75.36	63.45	17.22
A350	800	60.54	64.75	17.10
	900	66.89	64.75	17.10
	1000	73.88	64.75	17.90
A380	800	72.72	79.75	24.09

Aircraft type		L (m)	W(m)	H (m)
COMAC				
C919	-	38.90	35.80	11.95
ARJ21	700	33.50	27.30	8.40
	700ER	33.50	27.30	8.40
	900	36.40	27.30	8.40
	900ER	36.40	27.30	8.40

Aircraft type	L (m)	W(m)	H (m)
CANADIAN REGIONAL JET			
Bombardier crj-1000	39.10	26.20	7.10

6 : ACCESSORIES

6.1 WALK DOORS

Specifications:

Doors are fabricated from electro-galvanised steel (20 gauge), with a solid core of rigid polyurethane insulation: Doors are provided either all metal (ref 'M'), or with opening for glass (ref 'G'). Glass and glazing are not supplied by Kirby.

Each single door is supplied complete with one cylindrical lock, double doors have a cylindrical handle also.

Standard sizes are 914 mm wide x 2134 mm high (ref 3070 M or G) single swing doors and 1830 mm wide x 2134 mm high (ref 6070 M or G) double swing doors. All universal swing type. All doors shop painted one coat vinyl based. neutral grey primer.

Availability:

Panic hardware is available on special order as are removable mullions for 6070 doors where both leaves are active.

For standard details refer Installation Drawings.

6.2A SLIDING DOORS

Specifications:

All structural components are from cold formed steel sections. with panels on the outerface, to match with the building walls. Doors will be provided with liner if the building has also K.R. liners.

Doors are suspended by top track system within a header assembly and fitted with guides only at the base.

Single sliding door height available 3000(M), 3500(M), 4000(M), 4500(M), 5000(M), 5500(M) Door width available 3000(M), 4000(M), 5000(M),

Double sliding door height availability 3000(M), 3500(M), 4000(M), 4500(M), 5000(M), 5500(M) 6000(M) double width available 3000(M), 4000(M), 5000(M), 6000(M)

Availability:

The following parameters should be followed:

1. Doors are located in increments of 167mm The maximum dimension a single slide door can extend beyond the jamb is the door width + 167mm.
2. The maximum dimension a double slide door can extend beyond the jamb is half the door width+167mm.
3. No doors or windows may be located within operating limits of slide doors.
4. Doors are not operable beyond the corner of the building, nor within 500mm of the corner of a side wall with down spouts.
5. A maximum of one door may be located in each bay.
6. Jamb to header member connections must be field drilled, girt and base angles must be field cut.
7. Slide direction for single slide doors must always be specified.
8. For single slide door details refer Installation Dwg. 7.10
9. For double slide door details refer Installation Dwg. 7.10
10. For slide door details in masonry walls refer Installation Dwg. 7.10

6.2B SLIDING FOLDING DOOR

Description:

Kirby Sliding Folding Doors (KSFD) consist of 1040 mm leaves suspended and connected in a manner in order to move by folding against each other and designed to have maximum clear opening with minimum occupied space.

Door leaf is covered with KR, KW, KCS or KC panels with standard colors. The width of the opening is minimum 3.5 m and maximum 16 m; in excess of 16 m width, floating door units are used.

Features:

- KSFD provides a large clear opening with easy movement
- Doors are supported on top guide roller assembly
- Leaf frames are manufactured and shipped with "ready to erect" condition
- Track headers are manufactured from built-up members that are very easy to install without additional structural framing and additional cost.
- Track header is concealed without additional flashing.
- Aluminium and neoprene strip are provided for tight closure to prevent the penetration of light and dust from outside
- Bottom guide can be set after the door is erected to provide a better alignment
- Variety of profile colors is available for door sheeting.
- Easy to relocate and reinstall with minimum foundation cost

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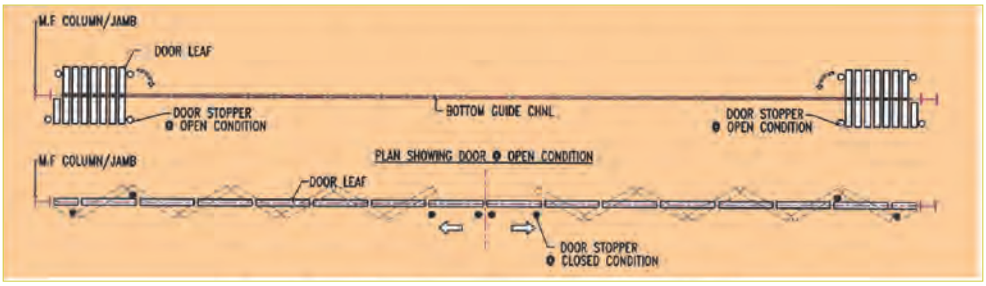
KBS-KSFD-120911-00

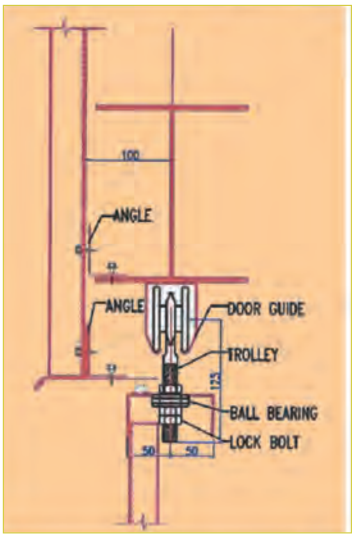
Material Specification:

Specific Yield stress of steel, Fy = 34.5 kN/cm² (ASTM A792 grade 50)

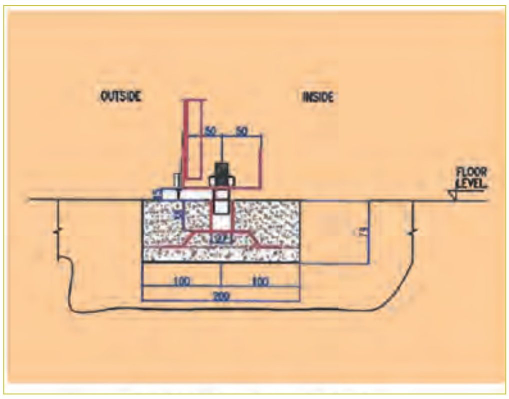
Door leaf frame	100 mm x 50 mm channel (pre-galvanized) with thicknesses 1.75, 2.0 and 2.5 mm
Top guide	LG-305 Kirby standard door guide
Door Guide Brackets	3A-305 and 3A-305C Kirby standard support brackets
Hangar Trolley	Kirby standard hanger trolley designed to turn 360o
Bottom roller	Kirby standard 104P /97
Bottom guide	Kirby standard channel guide 97P /3000 with channel lugs and universal coupler
Hinges	Heavy duty hinge
Panels	KC panels (333 coverage), KR, KWand KCS panels (1000 mm coverage)
Top stud roller	Top stud roller assembly with bronze bush



Plan showing door @ closed condition



Detail of door leaf with top guide

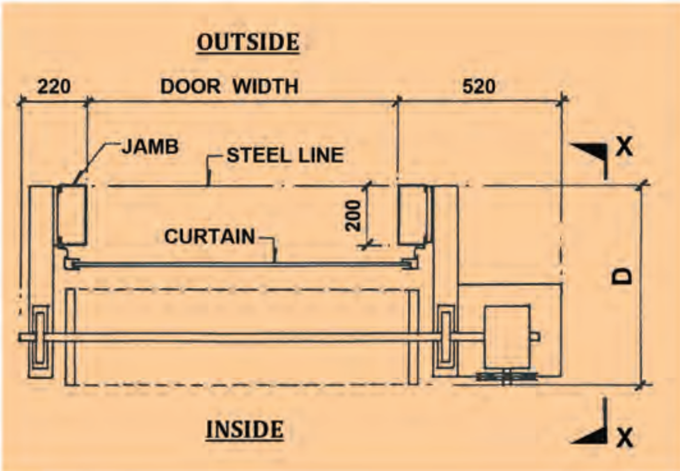


Detail of door leaf with bottom guide

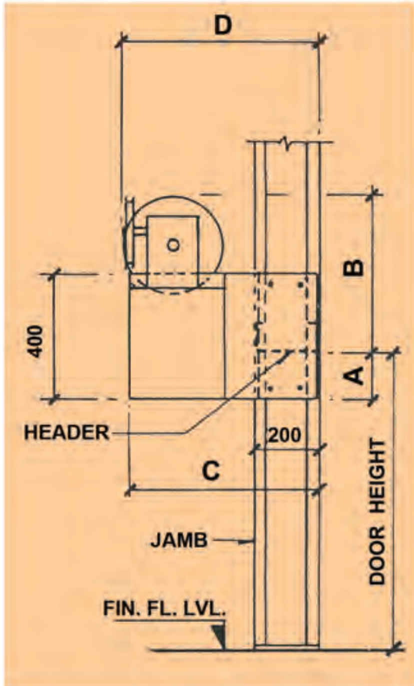
Kirby building systems reserves the right to make changes without prior notice

Kbs-ksfd-120911-00

6.3 ROLL-UP DOORS - MANUALLY OPERATED



PLAN

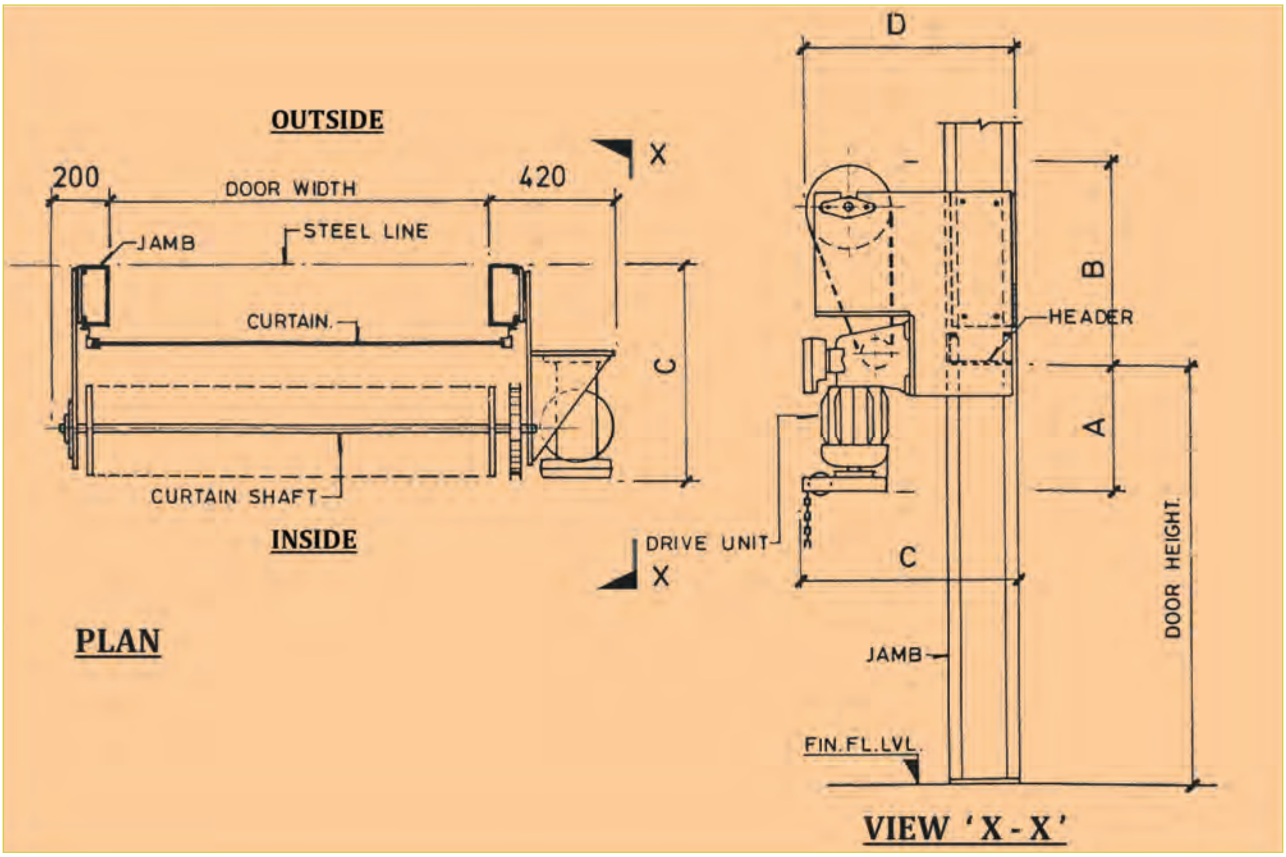


VIEW 'X-X'

Door height (m)	A (mm)	B (mm)	C (mm)	D (mm)
3.0	50	610	580	640
3.5	40	620	580	640
4.0	30	630	580	640
4.5	20	670	600	690
5.0	-	690	600	690

Standard door sizes	
DOOR WIDTH (M)	DOOR HEIGHT (M)
3.0, 4.0	3.0,3.5, 4.0, 4.5, 5.0
5.0	3.0, 3.5, 4.0

6.3 ROLL-UP DOORS - ELECTRICALLY OPERATED



Door height (m)	A (mm)	B (mm)	C (mm)	D (mm)
3.0	380	650	590	660
3.5	350	660	590	660
4.0	340	670	590	660
4.5	485	680	680	690
5.0	465	680	680	690
5.5	455	710	700	730
6.0	445	730	700	730

Standard door sizes		
Door width (m)	**Door height (m)**	**Motor**
3.0, 4.0	3.0,3.5, 4.0,	1 H.P.
4.0	4.5,5.0, 5.5, 6.0	2 H.P
5.0, 6.0	3.0,3.5, 4.0, 4.5, 5.0,6.0	2 H.P

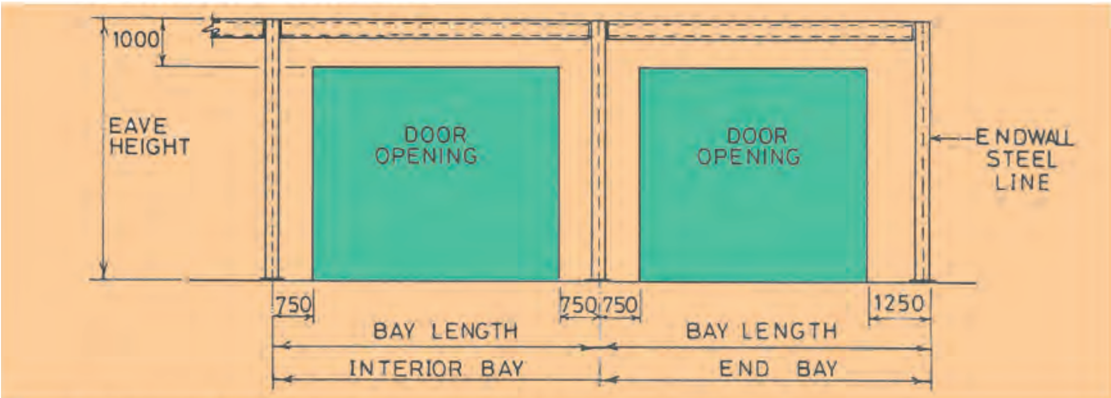
POWER SUPPLY:
1 H.P. -{220/380 V.
3Ø-50/60 Hz.
2 H.P. -{220/460 V.
3Ø-50/60 Hz.

NOTE:

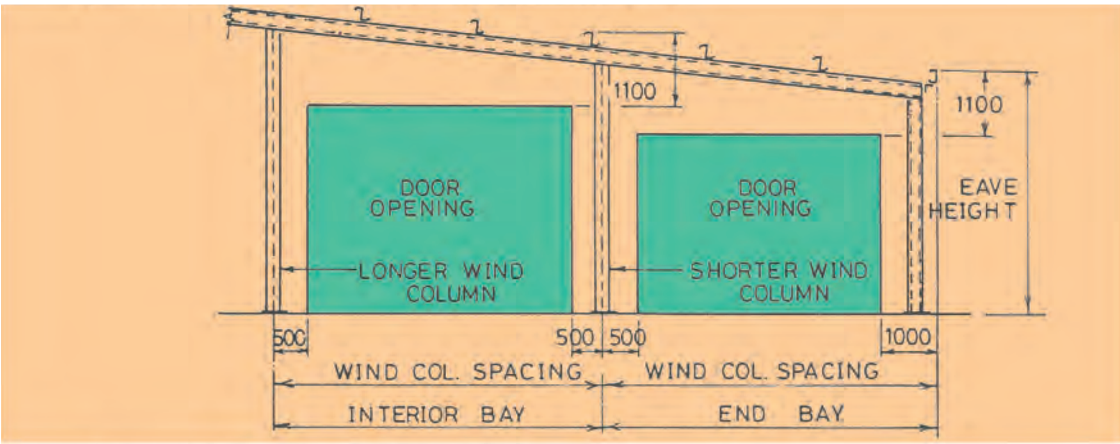
Operating voltage to be furnished, while ordering the electrically operated roll-up door.

6.3 ROLL-UP DOORS - CLEARANCES

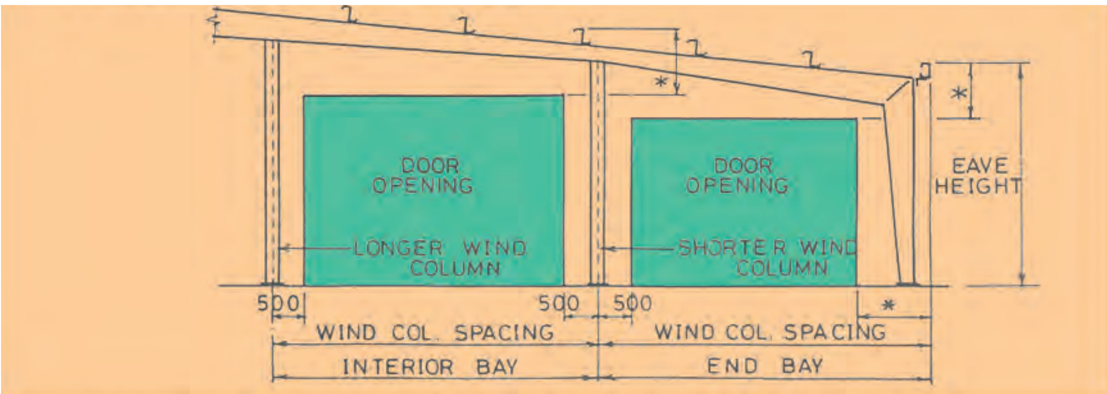
A. Doors in a sidewall:



B. Doors in a light (bearing) endwall:



C. Doors in a main frame endwall:



* Dimensions are determined per job to ensure that drive system and fittings clear main frame.

6.4 INSULATION

Physical Properties:

Type - KIB / 12
Density - 12 Kg / M^3

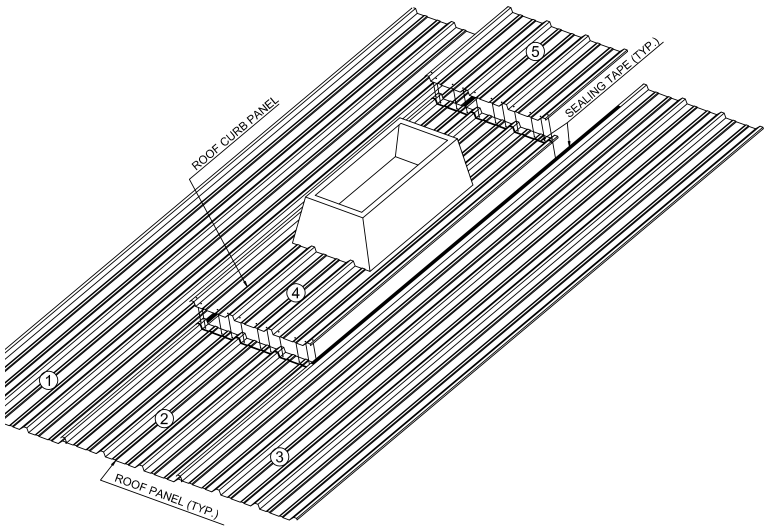
Thermal properties					
Mean temp. Deg. F.	K Btu In/Ft^2 Hr of	U (Btu / Ft^2 Hr of) 50mm	75mm	100mm	150mm
50	0.27	0.137	0.091	0.069	0.046
100	0.29	0.147	0.098	0.074	0.049
125	0.34	0.173	0.115	0.986	0.058
150	0.39	0.198	0.132	0.099	0.066

Conversion factors:

1 Btu ft^2 hr of = 4.88 K cal / m^2 Hr°c

= 5.67 W / m^2 °c

6.5 ROOF CURB



Specifications:

Curbs shall be a one-piece construction manufactured from a self-extinguishing glass fiber reinforced polyester, 3mm thick, with 15 mil polyester gel coated weathering surface on exterior. Unit shall be white in colour and opaque to light. Base shall have the same configuration as the Kirby Rib profile.

Availability:

The roof curbs are designed for installation on Kirby rib profile. Care should be taken in using either type unit in areas where the temperature exceeds 93 degrees C. as the strength of the unit will be reduced.

Design:

The top of the curb provides a level surface at the 1: 10 roof slope.

The upper end of the monolithic panel of the curbs is reduced in thickness to 2 mm to provide nesting under the above splice panel. The upper end splice portion may be cut off to install the unit as a patch on an existing roof.

CURBED OPENING DIMENSIONS					
Curb Size	**Curb height**		**Adapter Panel Dimensions**	**Weight (Kg)**	
	Front(min)	Back(min)	Width	Length	
1200 x 1200	360 mm	240 mm	1667 mm	1700 mm	21.00 max.
900 x 900	330 mm	240 mm	1334 mm	1700 mm	17.00 max.
600 x 600	300 mm	240 mm	1000 mm	1700 mm	13.50 max.

6.6 ROOF JACK

Specifications:

Roof Jacks shall be a one-piece construction manufactured from.a self-extinguishing glass fiber reinforced polyester, 3 mm thick, with 15 mil polyester gel coated weathering surface on exterior. Unit shall be white in color and opaque to light. Base shall have the same configuration as Kirby rib profile.

Availability:

The Roof Jacks (all sizes) are designed for installation on Kirby rib profiles. Care should be taken in using either type unit in
areas where the temperature exceeds 93 degrees C as the strength of the unit will be reduced.

Design:

The upper end of the monolithic adapter panel of the curbs is reduced in thickness to 2 mm to provide nesting under the above splice panel. The upper end splice portion may be cut off to install the unit as a patch on an existing roof.

Roof Jack Dimensions

Opening size	Jack height	Base dimensions		Weight (Kg)
		Width	Length	
50mm to 100mm	265mm	334mm	500mm	2.25 MAX.
150mm to 300mm	290mm	667mm	700mm	4.00 MAX.

6.7 WINDOWS

Sliding windows
(Aluminum)

Specifications:

All structural members are from extruded aluminium, with a minimum thickness of 1mm. Windows are single slide; supplied preglazed with clear glass and complete with half insect screen.

Standard, nominal window size is 1m wide x 1 m high.

Availability:

Windows are self flashing if located at a standard location within K.W. panel. When using multiple units to form continuous

windows, jamb fins are butted together and pop riveted.

For standard location of windows refer to standard building installation Dwg. No. C-18.

6.8 LOUVER

6.8A ADJUSTABLE LOUVER

Specifications:

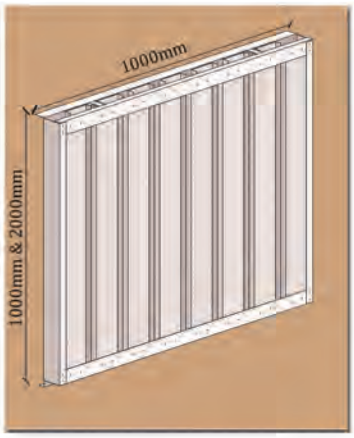
Louver frames are fabricated from 1.2 mm thick (18 gauge) galvanized steel with 0.9 thick (20 gauge) galvanized steel blades. Blades are adjusted by use of a hand crank. All louvers are complete with bird screens. Finished color of louvers is white.

Availability:

Single unit is self supporting and self flashing when used with K.W.panel only. When using multiple units, with K.W. panel, to form continuous louvers supporting jambs are provided.

For use with K.R., supporting jambs are provided for both single and continuous louvers. For standard location of louvers refer to Installation Details.

6.8 B. SAND TRAP LOUVER



Sand trap louver - data sheet
Description:

The sand trap louver is recognized by Kirby's standard designation as: **STL1-1000 or STL1-2000** since it can be produced with a 1 **m or 2 m Height.**
U - shaped profiles are placed alternatively in a vertical configuration allowing sand and heavy dust separation. These vertically arranged sections and the opening at the bottom ensure that the sand trap louver is self-cleaning and maintenance free.
The sizes of the STL1-1000 or STL1-2000 are 1.0 M height x 1.0M width and 2.0 M height x 1.0M width, respectively. The STL is available in 24 Ga (0.6 mm) steel only.

The specific yield stress for steel = fy = 34.5 kN/cm² as per ASTM A792 Grade 50.

Engineering and performance data:

Effective area factor.

Air flow rate

V_f -→ face velocity (m/s)
L → sand trap louver length (mm)
H → sand trap louver height (mm)

Air flow rate values in l/s For STL1-1000 or STL1-2000				
H / L	1000		2000	
	Vf = 1.0	Vf = 1.5	Vf = 1.0	Vf = 1.5
1000	254	382	554	832

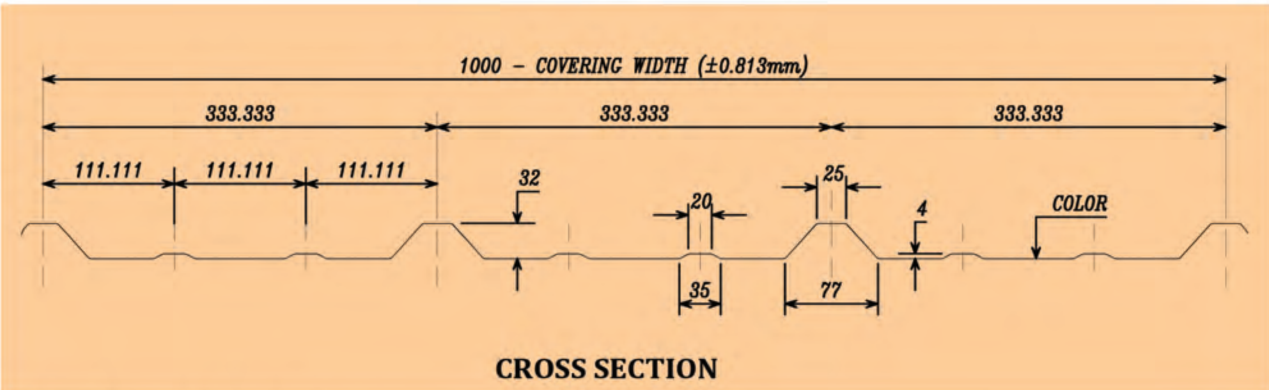
Filtration Efficiency :

The filtration performance is dependant on the dust type and the velocity of the air.

For normal operation conditions, Sand Trap Louvers used for natural ventilation purpose are rated at a recommended Face Velocity not exceeding 1.0 - 1.5 m/s.

Partical size range	Approx. Filtration efficiency in (%)	
	@ 1.0 m/s	@ 1.5 m/s
350-700	80	75
75-700	55	35

6.9 TRANSLUCENT PANELS



Skylights and wall lights:

Made of translucent GRP to match Kirby roof and wall panels, with an estimated light transmitting capacity of 60%.

Translucent panels:

Skylights and wall lights are translucent corrugated sheets matching the profile of kirby-rib and kirby-wall sheets respectively. The translucent sheets are made from glass fiber reinforced polyester structural plastic panels and provide an economic form of general purpose natural lighting.

6.9 TRANSLUCENT PANEL

Specifications:
Thickness = 1.5 mm
Covering Width = 1 m
Standard Length = 3.305 m
Light Transmission = 60% (ASTM D1494)
Solar Transmission = 35% (ASTM E424)
Infra-red Transmission = <10% (ASTM E424)

Physical Properties:
Density = 1431.9 kg/m^3 (ASTM D792)
Water Absorption = <0.25% (ASTM D570)

Operating Temperature:
The parameter is -30 ºC to + 75 ºC

Mechanical Properties:

Tensile Strength = 8.7 kN/cm^2	(ASTM D638)
Compressive Strength = 16.2 kN/cm^2	(ASTM D695)
Flexural Strength = 13.83 kN/cm^2	(ASTM D790)
Flexural Modulus = 728 kN/cm^2	(ASTM D790)
Shear Strength = 10.34 kN/cm^2	(ASTM D732)
Barcol Hardness = 40 to 60	(ASTM D2583)
Impact Strength = 470 J/m	(ASTM D256)

Thermal Properties:
Thermal Transmittance (U Value) = 5.7 W/m^2.K (ASTM C518)
Linear Thermal expansion Coefficient = 1.6 x 10 $^{-6}$ / F (ASTM D 696)

Panel Structural Properties:

Fastener Data Sheet	Pull out				
	Purlin Thickness (mm)	1.50	1.75	2.00	2.50
	Ultimate Pull Out (kN)	1.16	1.83	2.09	2.32

Base Material	Thickness (mm)	Covering width (mm)	Weight (kg/m)	Area (cm^2)	Full section (Ix) (cm^4)	Elastic modulus (E) kN/cm^2
Fibre Glass	1.50	1000	2.387	17.17	15.82	718

Allowable Uniform Loads kN/m^2):

Thickness (T) (mm)	No. of Spans	Load Case	Span in Meters							
			0.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50
1.5	1	**D+L**	2.99	1.92	0.99	0.57	0.36	0.24	0.17	0.12
		WP	2.99	1.92	0.99	0.57	0.36	0.24	0.17	0.12
		WS	2.99	1.92	0.99	0.57	0.36	0.24	0.17	0.12
	2	**D+L**	1.96	1.31	0.93	0.69	0.53	0.42	0.34	0.28
		WP	1.96	1.31	0.93	0.69	0.53	0.42	0.34	0.28
		WS	1.96	1.31	0.93	0.69	0.53	0.42	0.34	0.28

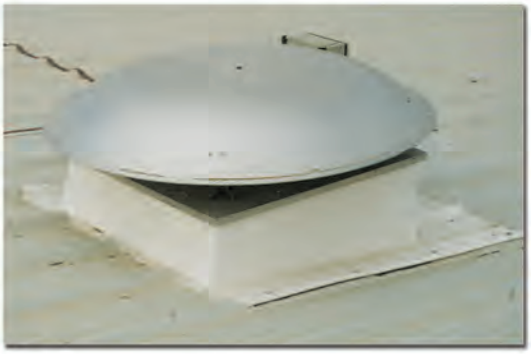
The Allowable loads for winds are without 33% increase
D+L - Dead + Live Load WP - Wind Pressure Load WS - Wind Suction Load
Allowable Deflection = Span / 45 crawling boards that span over the skylight must be used.
Kirby Building Systems reserves the right to make changes without prior notice

NOTE:

Skylights are not designed for walk-on. Building installation/ maintenance staff should avoid walking on the skylights else

KBS-SKY-l10811-01

6.10 VENTILATORS



RIDGE VENTILATORS

Specifications:

Ventilators are gravity type, fabricated from galvanized steel sheets, shop assembled with pop rivets.

Minimum throat width is 300 mm, with each complete length being 3m. Manually operated mechanical control dampers are provided, one set for each 6m length of continuous vent or one single vent. Bird screens are also provided.

Availability:

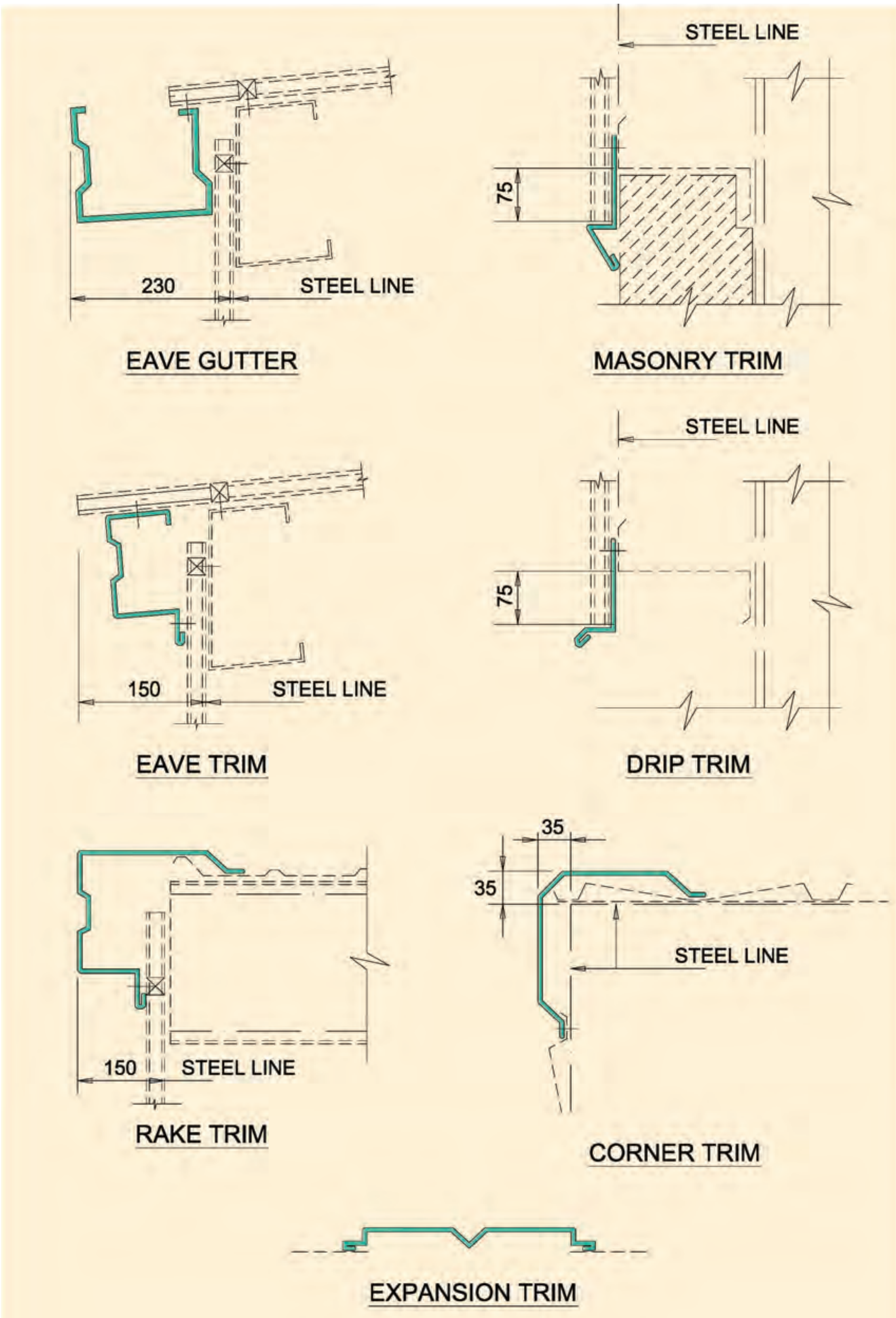
Continuous ventelators are formed by joining end skirts together. Providing the building length is divisible by 3 m, maximum length of ventilator is building length minus 333mm.

Powered Ventilators:

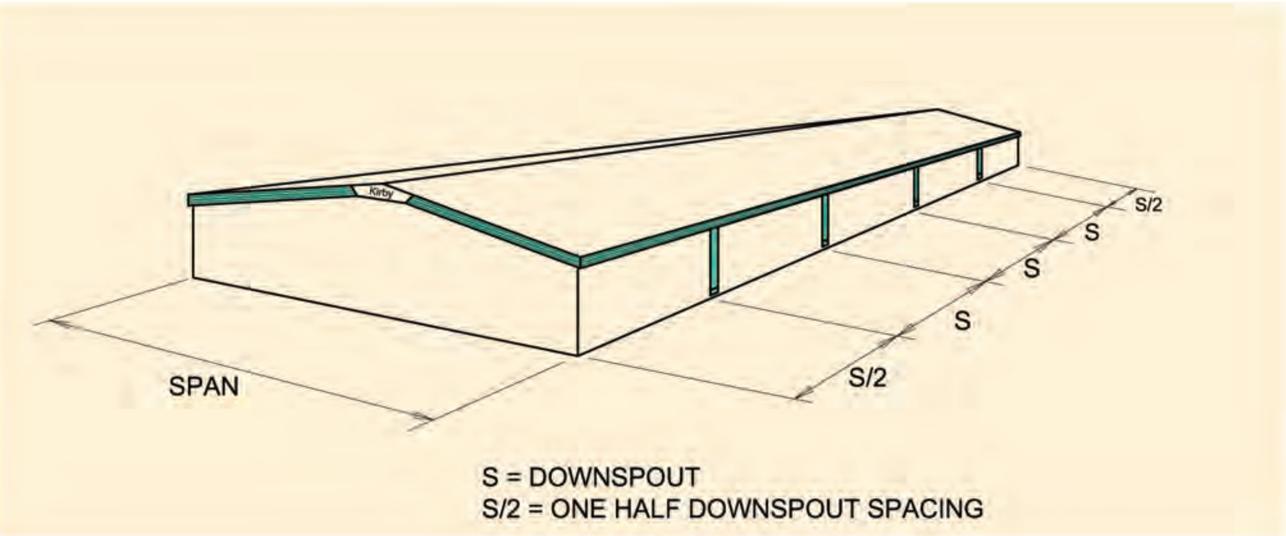
Kirby 'C' whirlwind low silhouette extract ventilator with spun aluminum non- return shutter and one
piece base and throat.

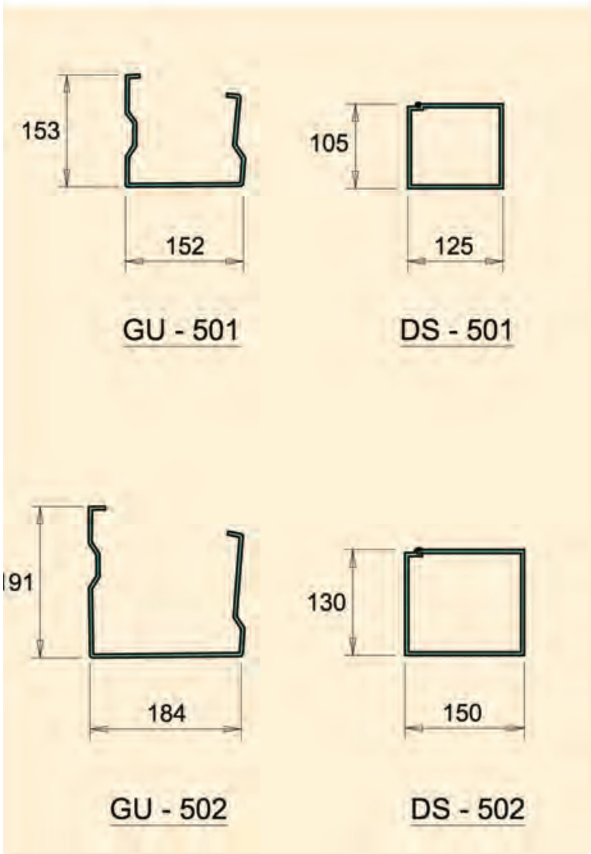
Mounted on GRP roof curb moulded to suit Kirby rib roof panels.

6.11 GUTTERS, FLASHINGS & TRIMS



6.12 GUTTERS & DOWNSPOUTS

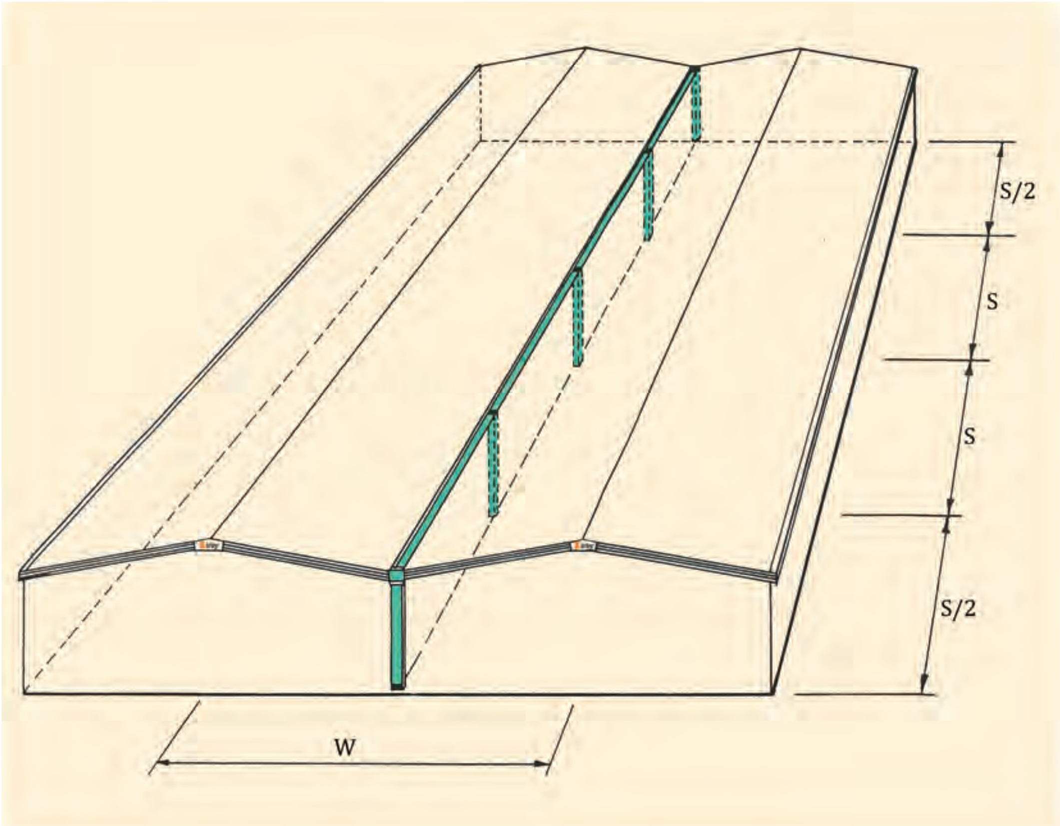


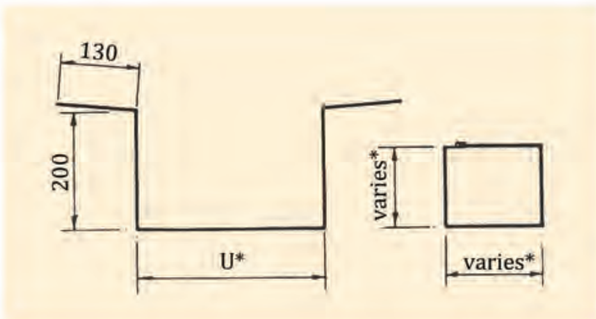


	Span	Downspout spacing
501 Series	6,9 & 12M	24.00M.O.C.
	15M	22.00M.O.C.
	18M	19.00M.O.C.
	20M	17.50M.O.C.
	21M	17.00M.O.C.
	24M	15.00M.O.C.
	30M	13.00M.O.C.
	36M	11.00M.O.C.
	42M	10.00M.O.C.
	45M	9.50M.O.C.

502 Series	48M	13.50M.O.C.
	54M	12.50M.O.C.
	60M	11.50M.O.C.
	72M	10.00M.O.C.
	84M	8.50M.O.C.
	96M	8.00M.O.C.

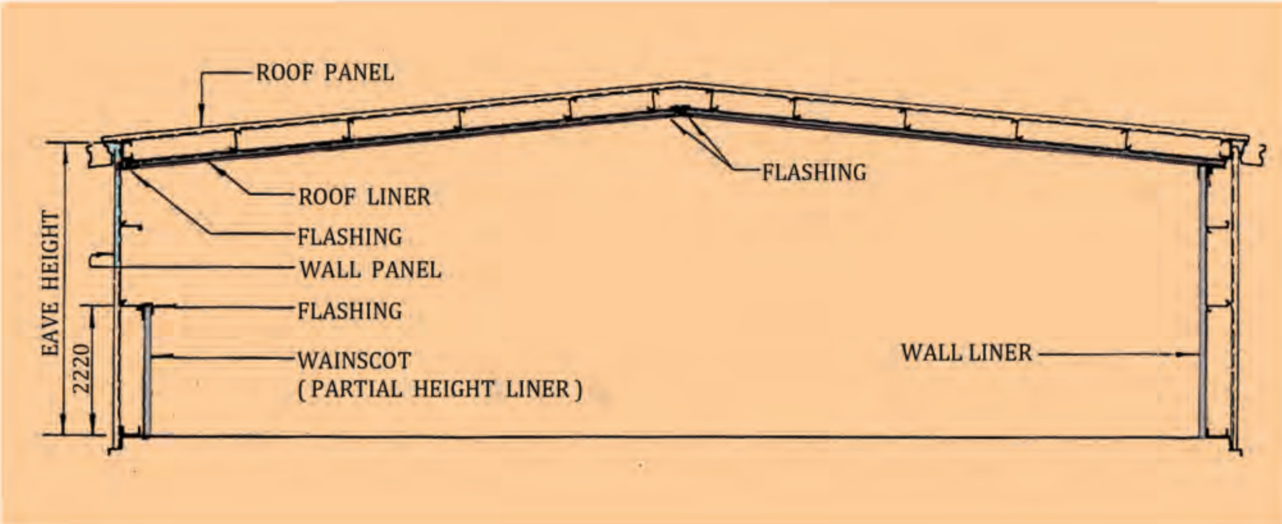
6.13 VALLEY GUTTER & DOWNSPOUT





* To be calculated based on drained area and downspout Spacing as given in formulae on sheet # 5.34

6.14 KIRBY ' M ' LINER



Specifications:

Kirby 'M' liner consists of sheet metal panel and flashing (26Ga.) attached to the girt from inside of the building by self tapping screws. Standard panelling is Kirby rib profile, galvanised or color coated (white only).

Availability:

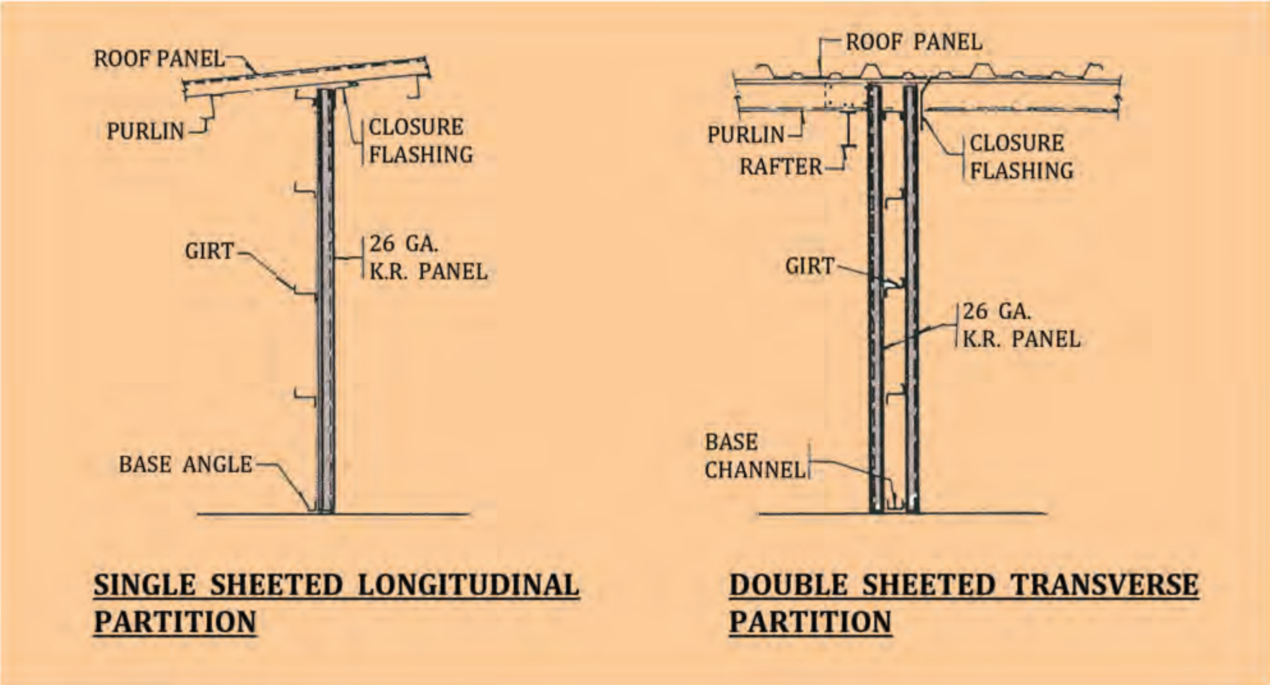
Wall liners are supplied either full height or partial height. Partial height wall liners are stopped at a standard girt locations. If the liners are stopped at non-standard girt locations an additional line of girt is required to support the liner.

At translucent panels, the liner panel shall be cut and the ends are trimmed with flashing unless double layer of translucent panels are ordered.

Slide doors shall be lined for building with wall liner. All framed openings and cut edges shall be furnished with flashings around the opening.

Wall liners are supported by base channel at base (base channel is supplied plain without holes.holes are to be field drilled to the exact spacing of anchor bolts as cast on site), by girts at the middle and by liner support flashing at eave. Roof liners are supported by the purlins.

6.15 KIRBY ' M ' PARTITION



Specifications:

Kirby 'M' partitions consist of steel frame work of columns and girts covered with galvanised color coated panel, either one side or both sides. Standard partition panels are 26 Ga. Kirby rib profile color coated (white only).

Availability:

Longitudinal partition columns are connected at base to foundation slab and at top to the rafter, generally same bay spacing as main frame columns. Girts are flush framed into the column. When sheeted from both sides of the framework it gives a neat appearance. Single side sheeted partitions are sheeted on one side of the framework.

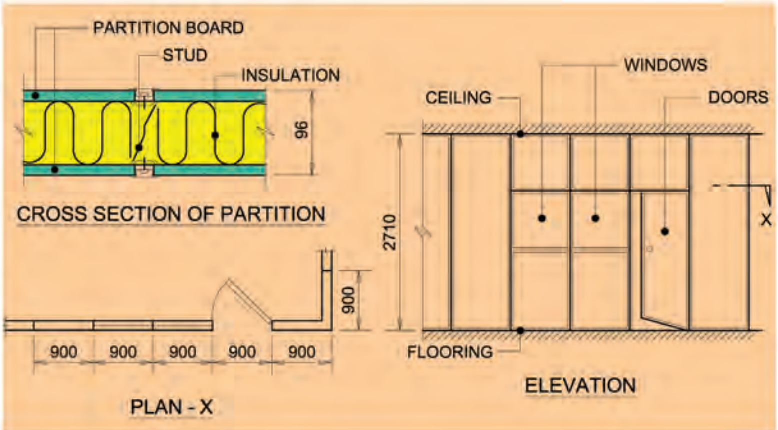
Standard transverse partitions are located 356mm minimum away from the center line of main frame.Transverse partitions can also be in the center line of the main frame provided the flange width of the frame does not exceed 200mm.

An angle section shall be provided at base and rake to support sheeting for single side sheeted partitions. A channel section shall be provided for double side sheeted partition.Base channel is supplied plain for field drilling of holes to the set-out anchor bolt dimensions.

Standard partitions are not supplied with insulation. However, insulation can be provided if specified.

Accessories such 3070 and 6070 doors, slide doors, roll-up doors etc. can be fitted to the partition

6.16 LIGHT PARTITIONS



Light partitions are generally not supplied by Kriby,

Following are suggested specifications only as a guideline to specifiers:

The partition system shall be a complete and functional system suitable for interior partitions or wall liner with acoustical and fire resistant properties and supplied as a finished product with no further treatment like painting, etc, required prior to occupation, The partition system shall allow for change in layout with all components fully reusable, The partition system shall be supplied in modular width of 0,9m x 2,7,1 m height with boards finished with vinyl wall paper of light grey color. The partition system shall comprise of gypsum board or melamine board panels mounted on both sides of vertical Z shaped steel studs and held by aluminum connection profiles which shall envelop the board panels to conceal the vertical joints, The aluminum profiles shall be fixed to vertical Z steel studs from either side by self penetrating screws. The vertical Z studs shall be spaced at cms C/C and held into their vertical position by bottom horizontal steel rails and top aluminum ceiling profiles. The bottom steel rails shall be 'C' shaped profiles fixed to floor by suitable fasteners. Aluminum 'C' profiles shall be used as upper rails and wall starters and fixed to the ceiling or wall by means of suitable fasteners. Black vinyl profile shall be used to cover the screws in the aluminum connection profiles. At corners, steel corner profiles shall be used instead of steel studs and supported by upper and lower rail.

Gypsum board panelS-shall be 13mm thick consisting of a core of gypsum reinforced with approximately 40 mm long glass fiber pieces on both sides. The gypsum board shall be covered by 0.8mm glued vinyl wall paper. Meanwhile board panels shall consist of 12mm chipboard covered on both sides by white melamine (80 g/m) added to the chipboard under pressure and heat.

Covered gypsum boards are used in dry areas like offices, shops, bedrooms, etc .. , melamine boards in semi dry areas like kitchen, toilets, etc. and plain gypsum boards to which ceramic tiles can be glued (by others) are used in wet areas like bathrooms, etc.

Insulation shall be 50mm glass wool in rolls of 0.9 x 10 m with a heat transmission value of 0.0387 Kca/m 2 Hr. C, and density of approx 14 kg/m3,

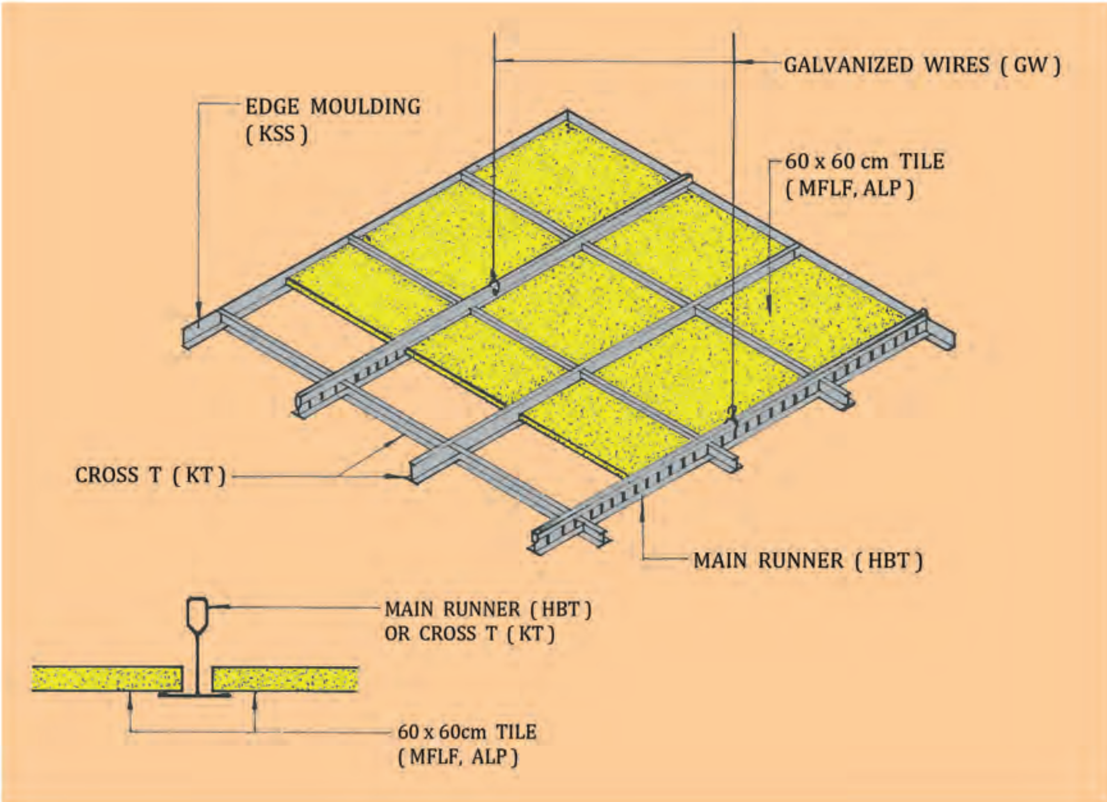
Galvanized steel profiles shall be of commercial quality with a thickness of 0.75mm and galvanized on both sides.

Aluminum profiles shall be made of natural anodized materials. Thickness of profile shall be 1.0/1 .2/2.25 mm depending on type of profile with an anodization thickness of 10 microns.

Internal doors in partitions shall consist of 830 x 2040mm mahogany veneered channel door leaf in aluminum frame fixed to partition by special fittings . The door shall be furnished with a steel door handle and cylinder lock.

Internal windows shall be 880 x 970 mm provided with aluminum profile window frames and suitable for glazing (by others) with 4mm glass which is secured with vinyl window profiles.

6.17 FALSE CEILING



False Ceilings are generally not supplied by Kirby.

Following are suggested specifications only as a guideline to specifiers:

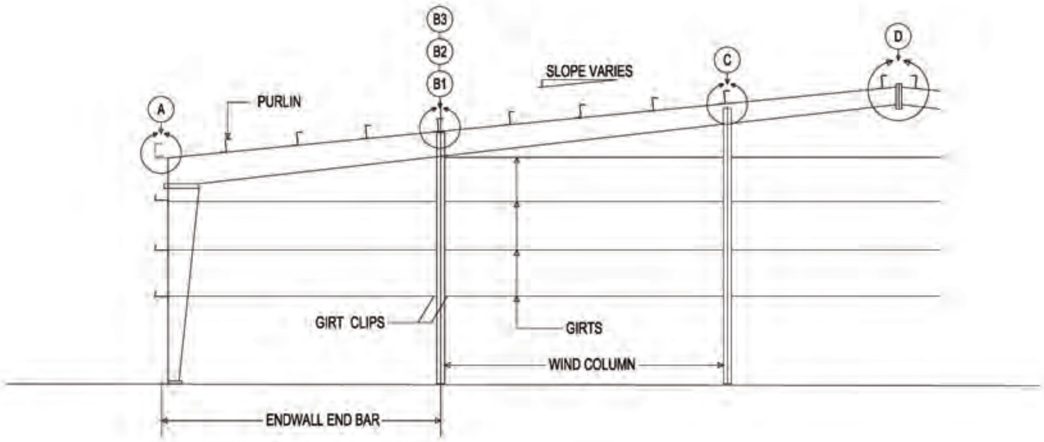
The suspended ceiling shall be a flexible modular system of visible structure type and easily demountable. Suspended ceiling tiles shall be 60 x 60cm either of mineral fiber for application in dry areas or asbestos tiles for application in wet areas. Mineral fiber tiles shall consist of 15mm hard pressed mineral wool and glue. The exposed surfaces shall be sprayed white. Asbestos ceiling tiles shall be of non-inflammable asbestos cellulose cement manufactured by using asbestos fiber, cellulose and cement. The tiles shall be hard pressed with a plain surface and a greyish color. The material composition shall provide fire resistant properties, strength and flexibility.

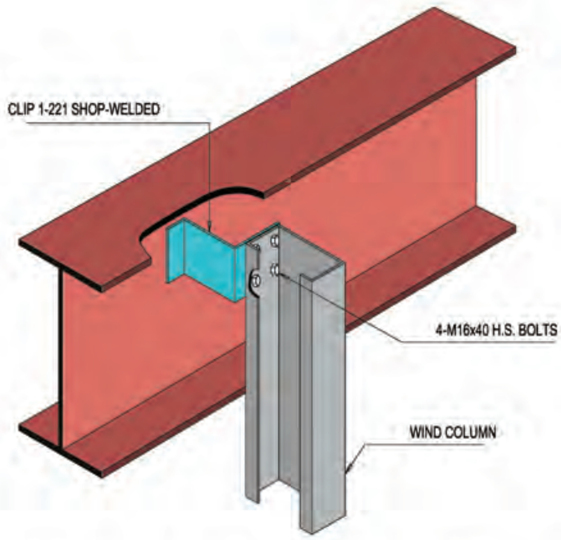
Main runners shall be T-shaped profiles running parallel to one another at a module of 120 cm in which the cross T form the network which hold the tile in position. The main runners shall be held to the structural ceiling by galvanized wires at intervals of 120cm.

Edge moulding shall be L-shaped profiles to be used as edge trim around the perimeter of the room . These shall be secured to the wall by suitable fasteners at a spacing of 50cm.

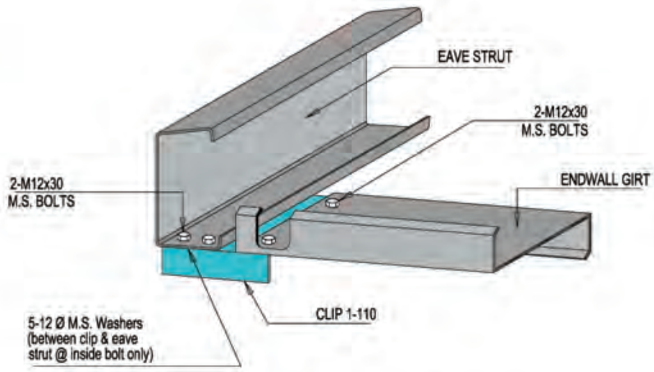
All galvanized steel for main runner, cross T and edge moulding shall be hot dipped galvanized to 20 micron Zinc. The steel thickness shall be 0.4 mm for cross T and main runner and 0.25mm for the edge moulding. The edge moulding shall be covered on the two outer sides by epoxy primer whereas the main runner and cross T shall be coated on exposed side only. Edge moulding shall be finished on one side by 20 micron polyester coating with 20% light reflection according to girder 60 degree.

7.1 ENDWALL DETAILS - MAIN END FRAME



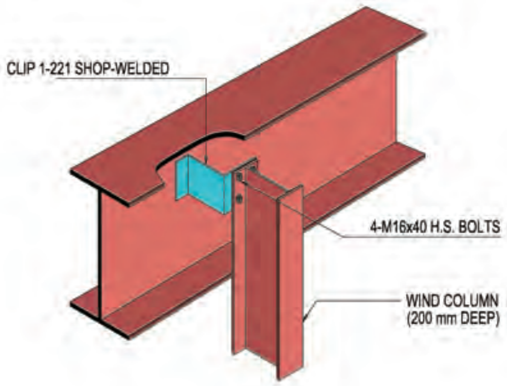


ENDWALL COLUMN (C-SECTION) CONNECTION
TO MAIN END RAFTER

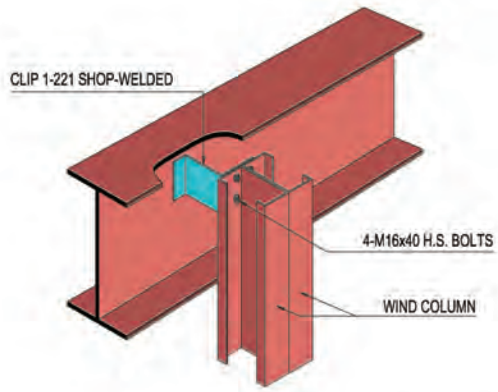


GIRT TO EAVE STRUT CONNECTION
AT MAIN END ENDWALL

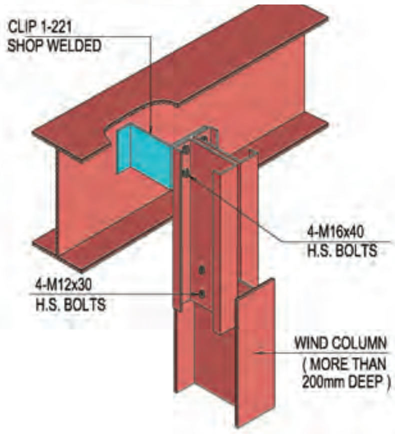
7.1 ENDWALL DETAILS - MAIN END FRAME



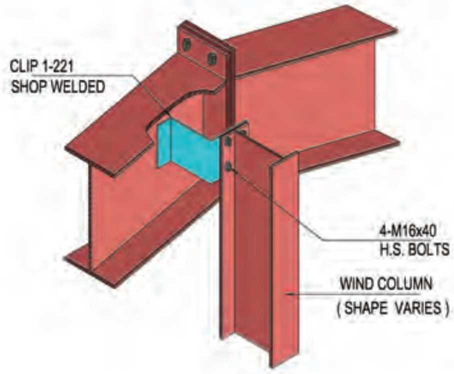
ENDWALL COLUMN (HOT ROLLED) CONNECTION
TO MAIN END RAFTER



ENDWALL COLUMN (C-SECTION) CONNECTION
TO MAIN END RAFTER



ENDWALL COLUMN (HOT ROLLED)
CONNECTION TO MAIN END RAFTER



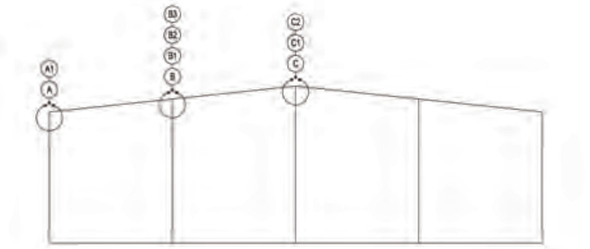
ENDWALL COLUMN CONNECTION
TO MAIN END RAFTER AT PEAK

NOTE :

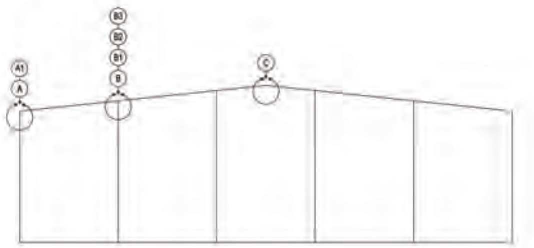
1. Details shown on this drawing may not occur all together in one building. Use those details which comply with the structural framing, refer building installation drawing.

2. All high strength bolts shall have one H.S. Washers and one H.S. Nut and shall be installed in accordance with astm a 325 bolt specifications.

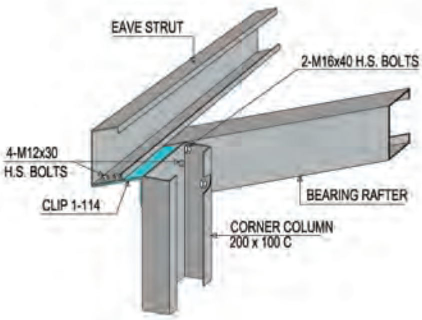
7.1 ENDWALL DETAILS - “C” BEARING FRAME



TYPE 'A' ENDWALL

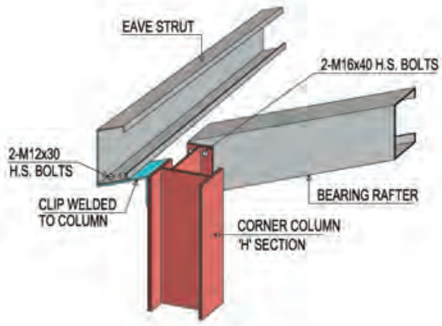


TYPE 'B' ENDWALL



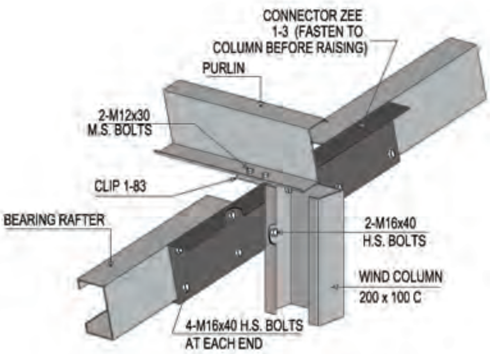
DETAIL 'A'

EAVE STRUT & BEARING RAFTER
CONNECTION TO C CORNER COLUMN



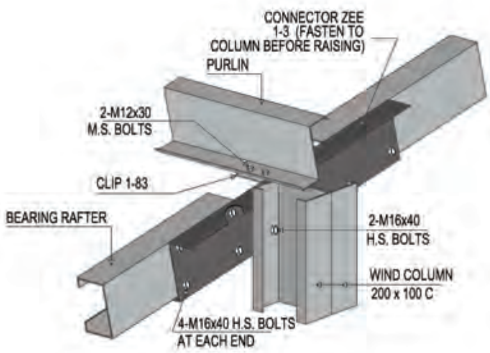
DETAIL 'A1'

EAVE STRUT & BEARING RAFTER
CONNECTION TO 'H' CORNER COLUMN



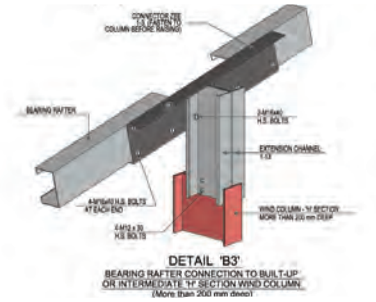
DETAIL 'B'

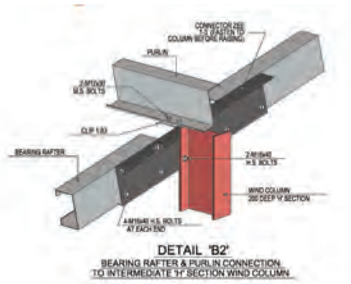
BEARING RAFTER & PURLIN CONNECTION
TO INTERMEDIATE 'C' WIND COLUMN

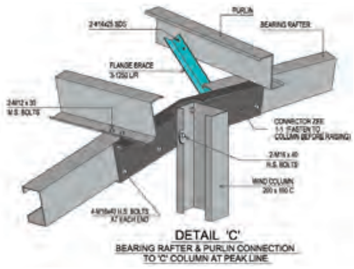


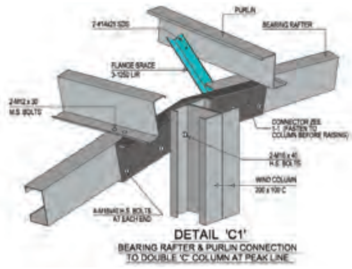
DETAIL 'B1'

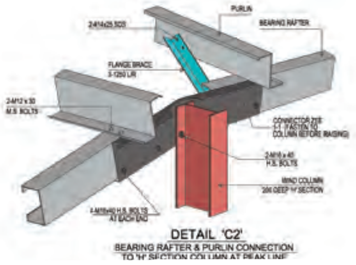
BEARING RAFTER & PURLIN CONNECTION
TO INTERMEDIATE DOUBLE 'C' WIND COLUMN

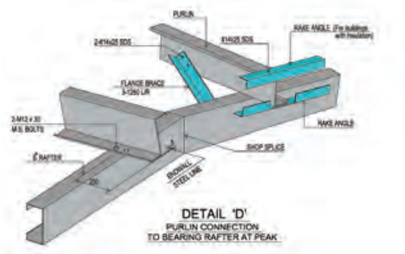












NOTE:

Rake angle at top & bottom of purlin for buildings with insulation up to roof slope 1.25:10. Rake angle at top of purlin only for roof slopes 1.3:10 And above (with or without insulation).

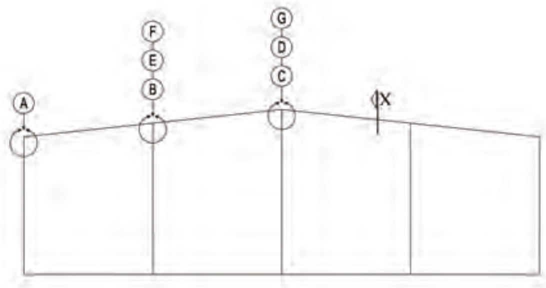
Building installation marks shown on this drawing is for building with roof slope 1:10. See table below for corresponding building installation marks for roof slopes other than 1:10.

NOTE:

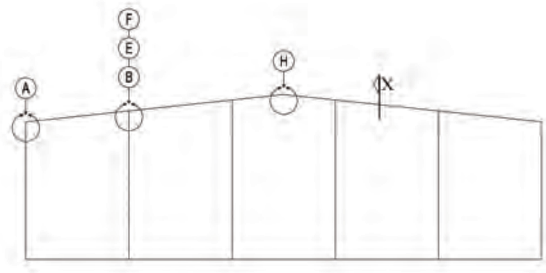
1. Details shown on this drawing may not occur all together in one building. Use those details which comply with the structural framing, refer building installation drawing.
2. All high strength bolts shall have one H.S. Washer and one H.S. Nut and shall be installed in accordance with astm a 325 bolt specifications.

Building installation Mark for slope 1:10	**Corresponding building installation mark for**			**Remarks**
	Slope 0.5:10	**Slope 3:10**	**others**	
1-114	1-115" 1-114"	1-114	See Building installation Dwg.	' For Flush Frame Slog. " For By-Frame Slog.
1-83	1-85	1-84	See Building installation Dwg.	
1-3	1-10	1-8	See Building installation Dwg.	
1-13	1-13	1-13	1-13	
1-1	1-5	1-6	See Building installation Dwg.	
3-1250 Ur	3-1250Ur	3-1250Ur	3-1250Ur	

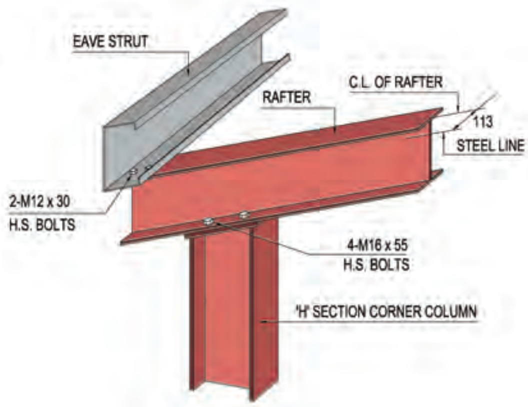
7.1 ENDWALL DETAILS- "I" BEARING FRAME (ALT,L)



TYPE "A' ENDWALL

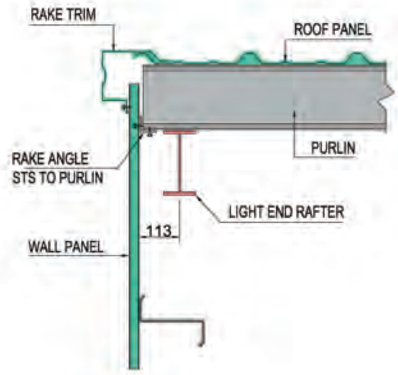


TYPE "B' ENDWALL

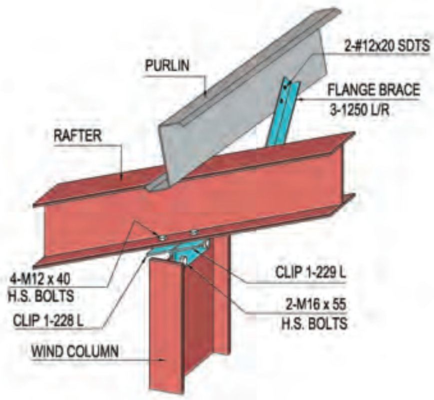


DETAIL 'A'

EAVE STRUT & RAFTER CONNECTION
TO 'H' SECTION CORNER COLUMN

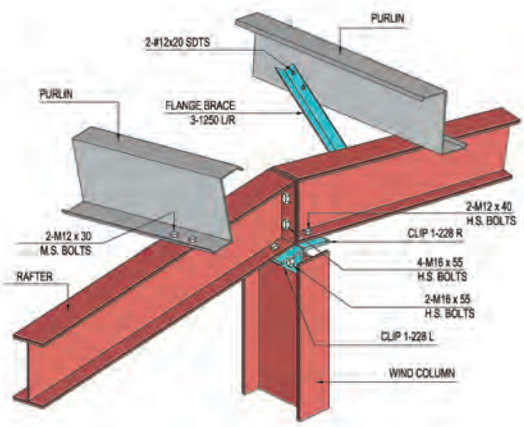


SECTION 'X'



DETAIL 'B'

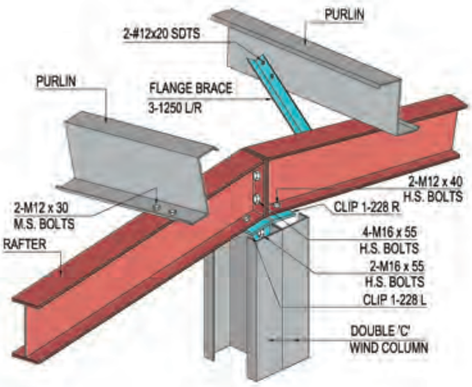
PURLIN & RAFTER CONNECTION
TO INTERMEDIATE 'H' SECTION COLUMN



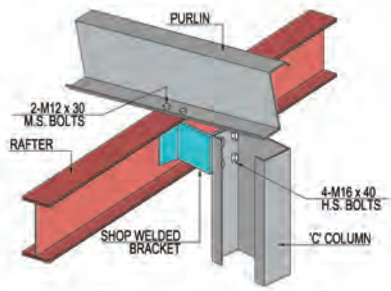
DETAIL 'C'

PURLINS & RAFTER CONNECTION
TO 'H' SECTION COLUMN ON PEAK LINE

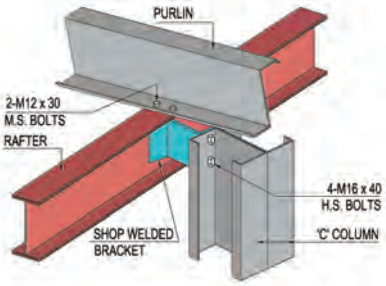
7.1 ENDWALL DETAILS- "I" BEARING FRAME (ALT,L)



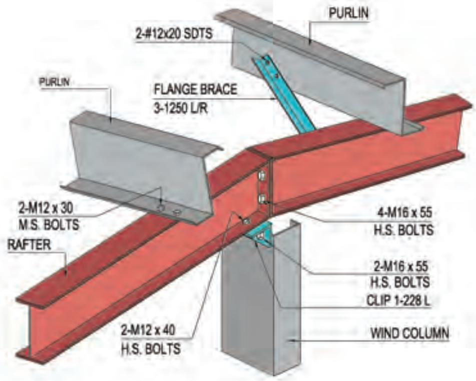
DETAIL 'D'
PURLINS & RAFTER CONNECTION
TO DOUBLE 'C' COLUMN ON PEAK LINE



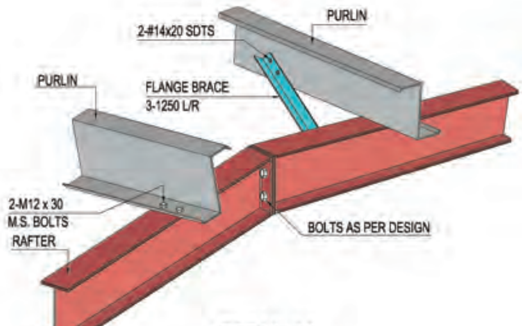
DETAIL 'E'
RAFTER & PURLIN CONNECTION
TO 'C' INTERMEDIATE COLUMN



DETAIL 'F'
RAFTER & PURLIN CONNECTION
TO DOUBLE 'C' INTERMEDIATE COLUMN



DETAIL 'G'
PURLINS & RAFTER CONNECTION
TO 'C' COLUMN ON PEAK LINE

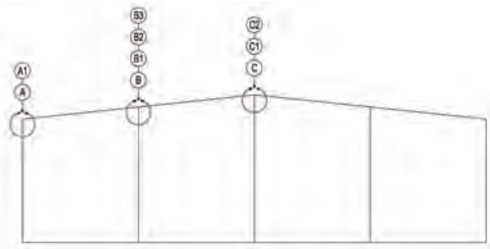


DETAIL 'H'
PURLIN CONNECTION
TO RAFTER AT PEAK

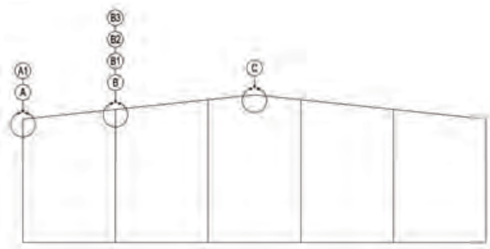
NOTE :

1. Details shown on this drawing may not occur all together in one building use. Those details which comply with the structural framing, refer to building installation drawings.
2. All high strength bolts shall have one H.S. Washers and one H.S. Nut and shall be installed in accordance with astm a 325 bolt specifications.

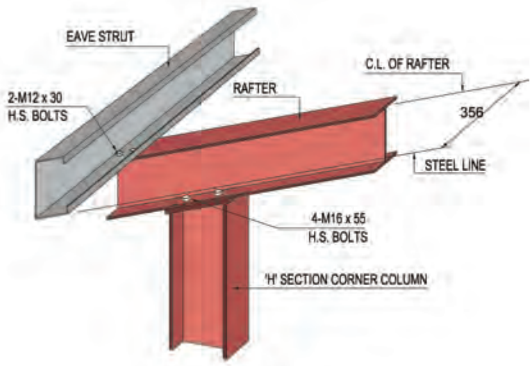
7.1 ENDWALL DETAILS- “I” BEARING FRAME (ALT,2)



TYPE 'A' ENDWALL

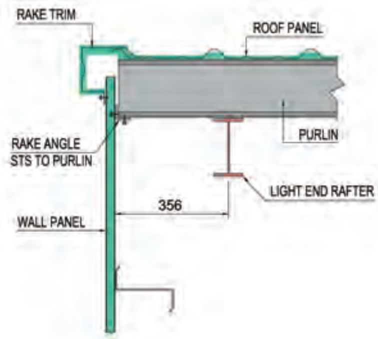


TYPE 'B' ENDWALL

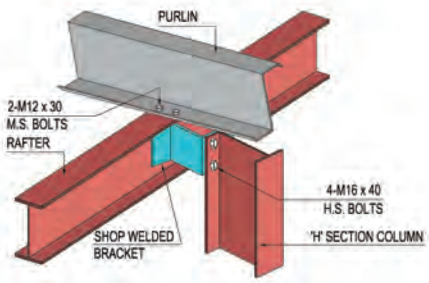


DETAIL 'A'

EAVE STRUT & RAFTER CONNECTION
TO 'H' SECTION CORNER COLUMN

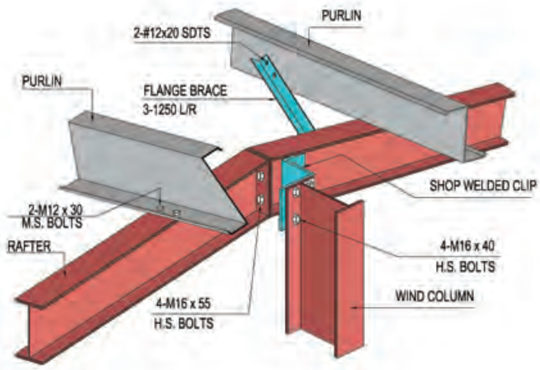


SECTION 'X'



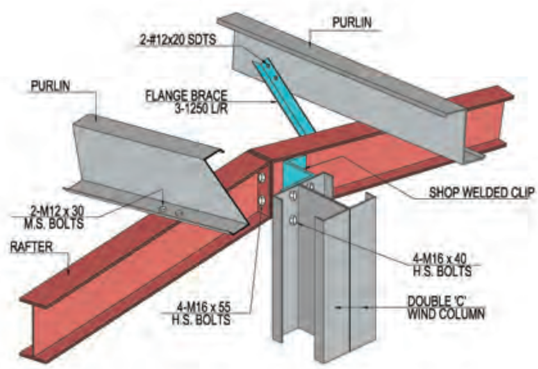
DETAIL 'B'

RAFTER & PURLIN CONNECTION
TO 'H' SECTION INTERMEDIATE COLUMN

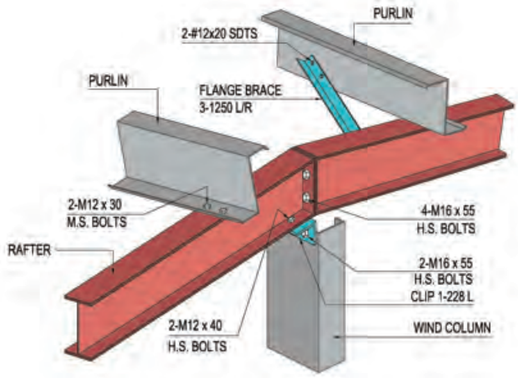


DETAIL 'C'

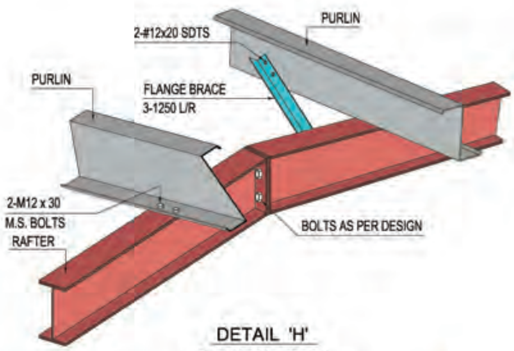
PURLINS & RAFTER CONNECTION
TO 'H' SECTION COLUMN ON PEAK LINE



DETAIL 'D'
PURLINS & RAFTER CONNECTION
TO DOUBLE 'C' COLUMN ON PEAK LINE



DETAIL 'G'
PURLINS & RAFTER CONNECTION
TO 'C' COLUMN ON PEAK LINE

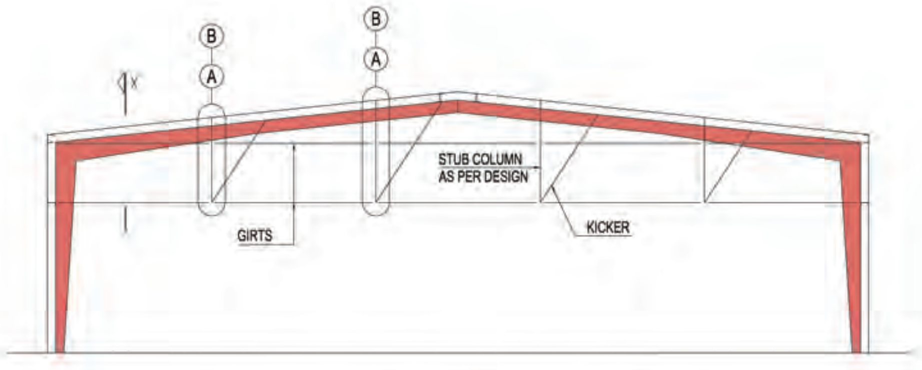


DETAIL 'H'
PURLIN CONNECTION
TO RAFTER AT PEAK

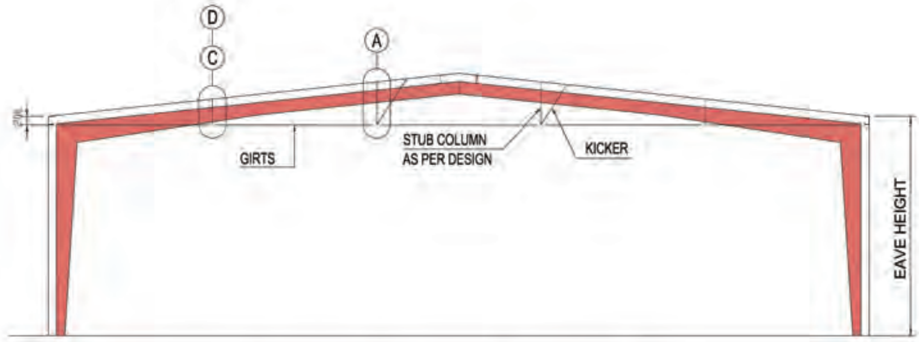
NOTE:

1. Details shown on this drawing may not occur all together in one building use. Those details which comply with the structural framing, refer to building installation drawings.
2. All high strength bolts shall have one H.S. Washer and one H.S. Nut and shall be installed in accordance with astm a 325 bolt specifications.
3. Part marks given are for 1:10 roof slope only. Refer to building installation drawings if roof slope is other than 1:10.

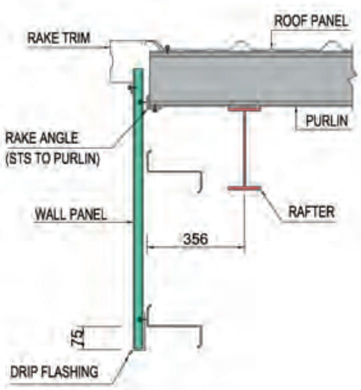
7.1 ENDWALL DETAILS-GABLE



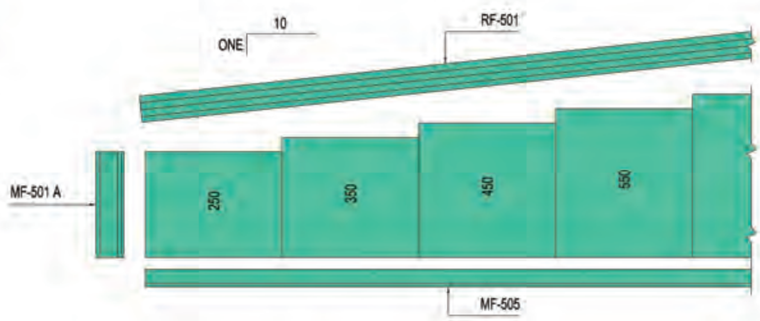
ENDWALL FRAMING ELEVATION
(PARTIALLY OPEN WITH STUB COLUMNS & KICKERS)



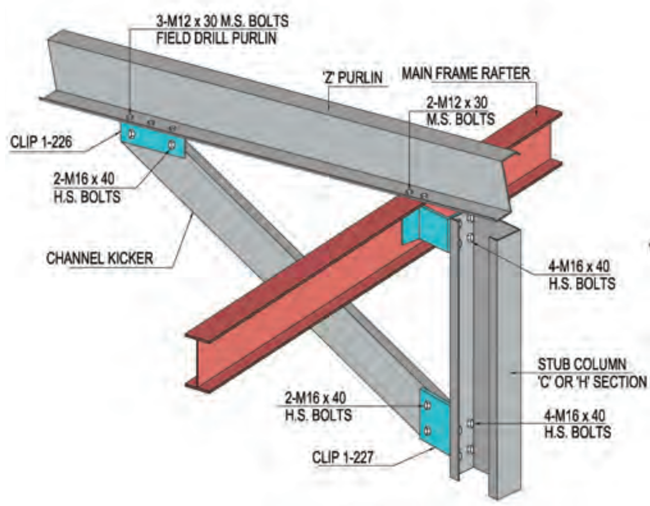
ENDWALL FRAMING ELEVATION
(OPEN UPTO EAVE - GABLE SHEETED)



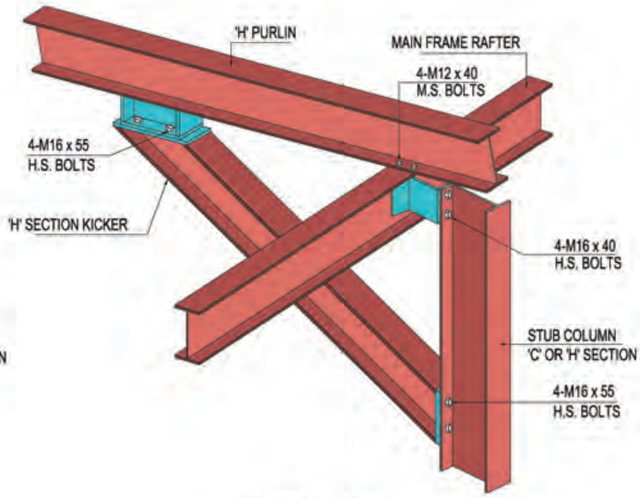
SECTION - "X"



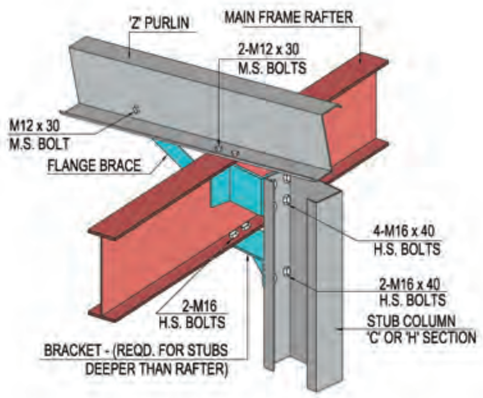
GABLE SHEETTING ELEVATION



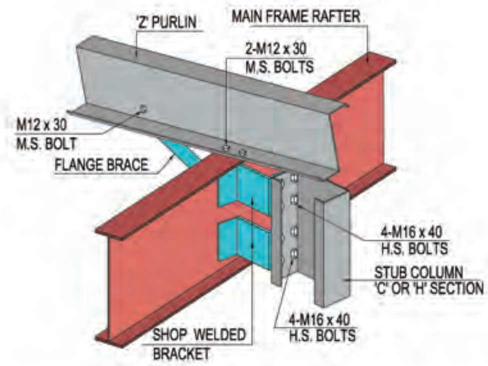
DETAIL 'A'



DETAIL 'B'



DETAIL 'C'



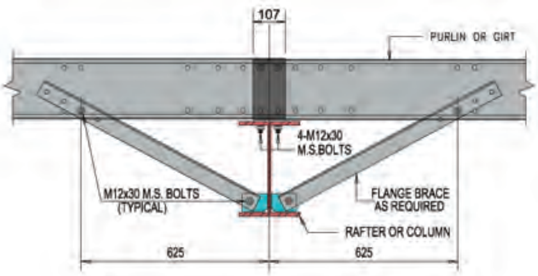
DETAIL 'D'

NOTE:

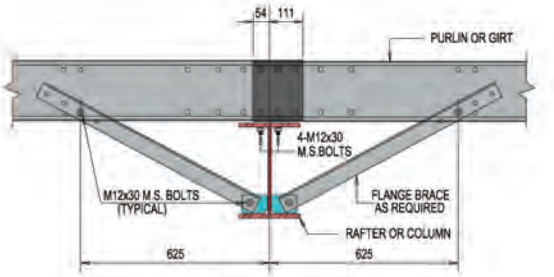
1. Details shown on this drawing may not occur all together in one building use. Those details which comply with the structural framing, refer to building installation drawings.

2. All high strength bolts shall have one H.S. Washer and one H.S. Nut and shall be installed in accordance with astm a 325 bolt specifications.

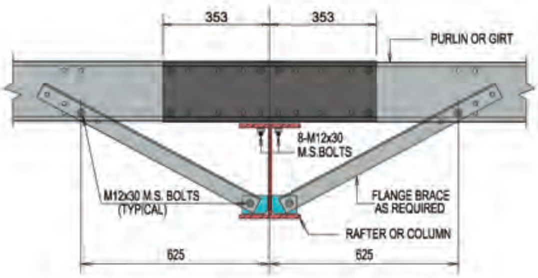
7.2 PURLINS, GIRTS & EAVE STRUT CONNECTIONS



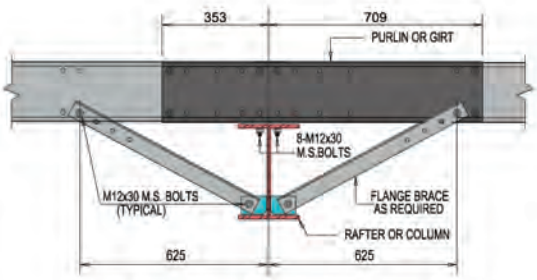
PURLIN/GIRT CONNECTION DETAIL
At Lines 3 ~ 9



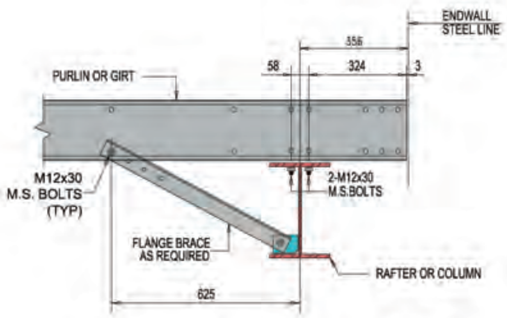
PURLIN/GIRT CONNECTION DETAIL
At Lines 2 & 9



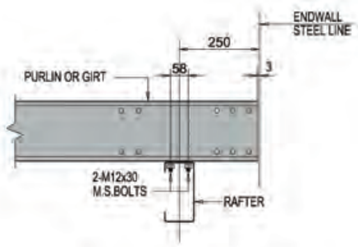
PURLIN/GIRT CONNECTION DETAIL
At Lines 3 ~ 9



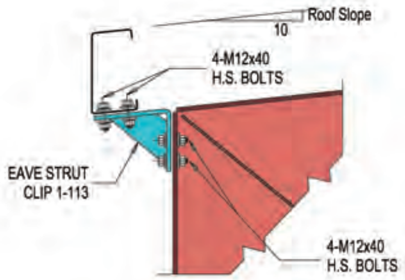
PURLIN/GIRT CONNECTION DETAIL
At Lines 2 & 9



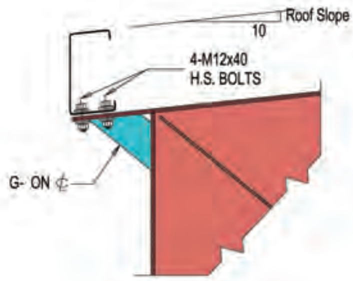
PURLIN/GIRT CONNECTION DETAIL
At Lines 1 & 9



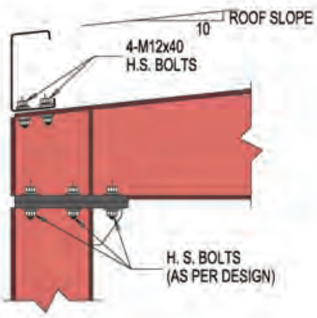
PURLIN/GIRT CONNECTION DETAIL
At Lines 1 & 9



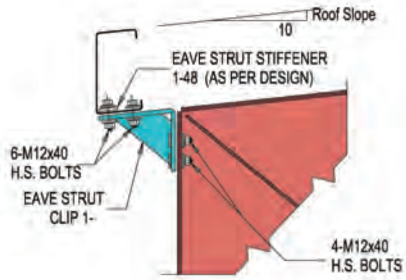
DETAIL AT EAVE



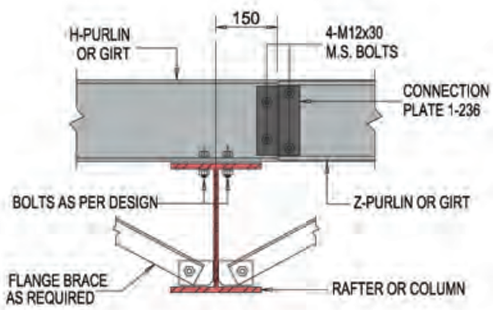
DETAIL AT EAVE



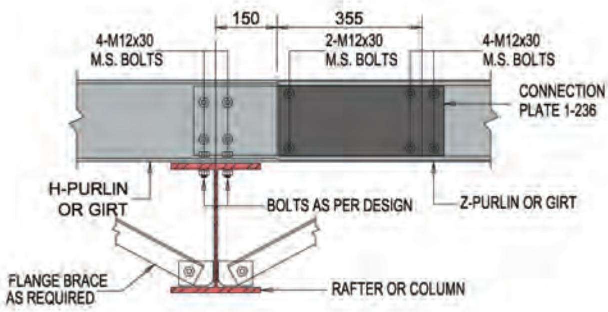
DETAIL AT EAVE



DETAIL AT EAVE

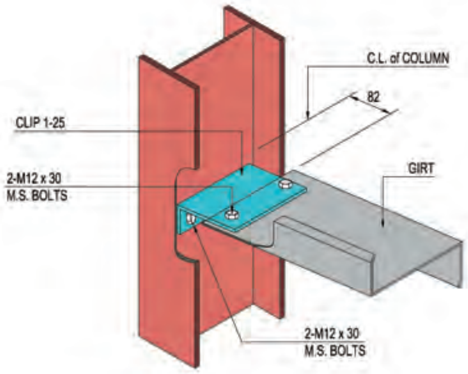


H & ZEE PURLIN/GIRT CONNECTION
AT 107 & 165 LAPS

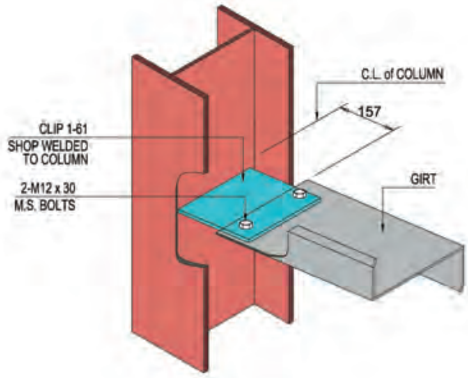


H & ZEE PURLIN/GIRT CONNECTION
AT 706 & 1062 LAPS

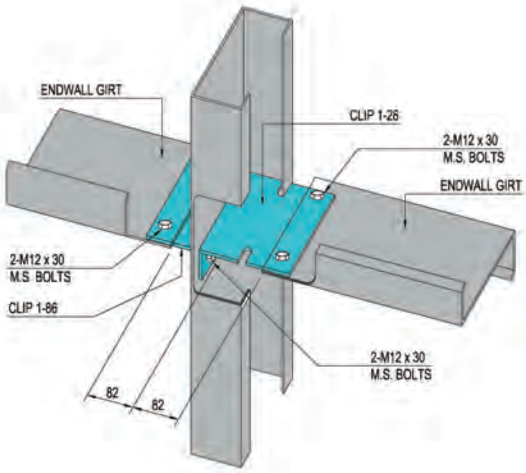
7.2 GIRT CONNECTIONS



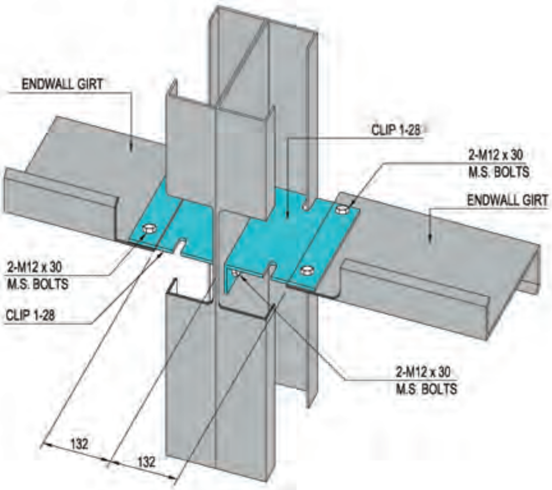
DETAIL 'A'
FLUSH GIRT - 'H' SECTION COLUMN
Flange Width = 150 mm



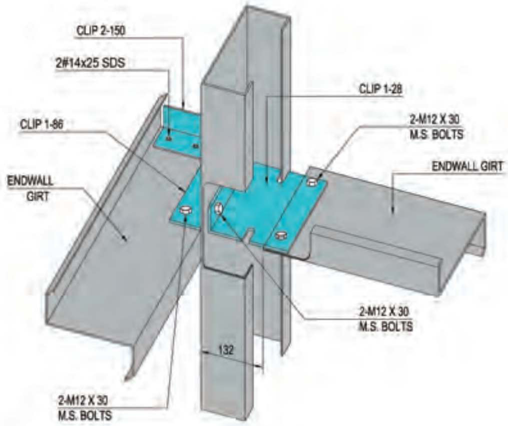
DETAIL 'B'
FLUSH GIRT - 'H' SECTION COLUMN
Flange Width = Over 150 mm



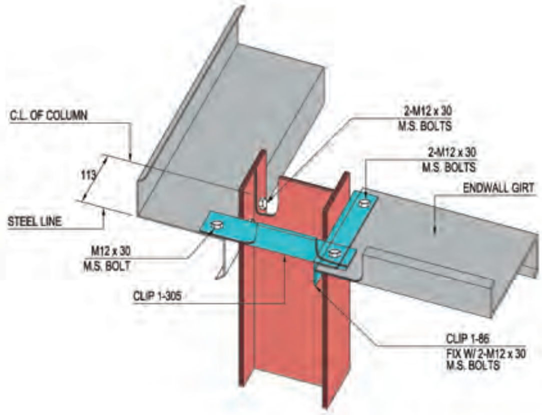
DETAIL 'D'
FLUSH GIRT - SINGLE 'C' COLUMN



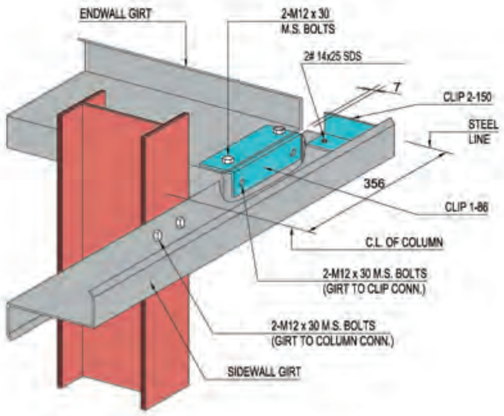
DETAIL 'F'
FLUSH GIRT - DOUBLE 'C' COLUMN



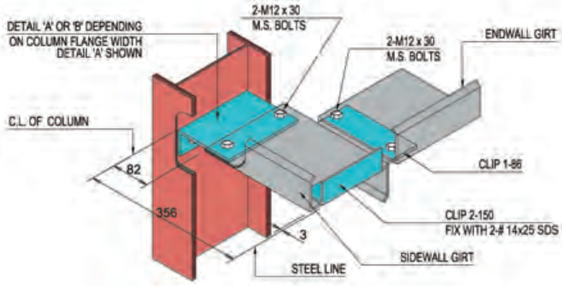
DETAIL `G'
BEARING FRAME - 'C' SECTION CORNER COLUMN



DETAIL `H'
BEARING FRAME - 'H' SECTION CORNER COLUMN

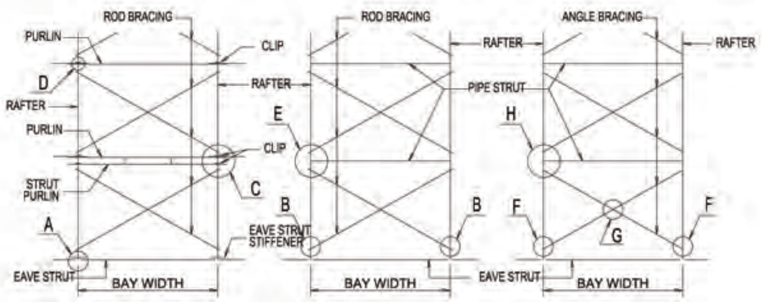


DETAIL `J'
MAIN FRAME ENDWALL CORNER DETAIL
SIDEWALL GIRTS ~ BY-FRAMED

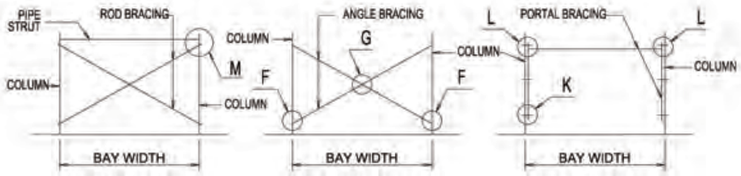


DETAIL `K'
MAIN FRAME ENDWALL CORNER DETAIL
SIDEWALL GIRTS ~ FLUSH

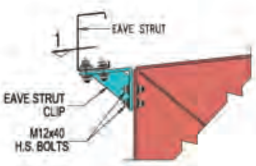
7.3 BRACING DETAILS



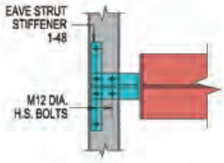
BRACINGS AT ROOF



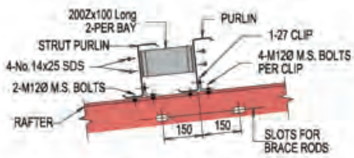
BRACINGS AT SIDEWALL



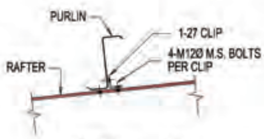
DETAIL `A'



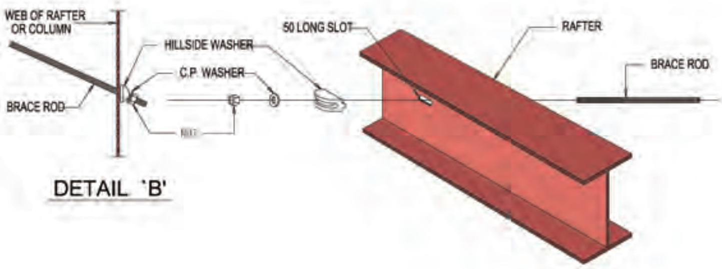
SECTION - 1



DETAIL `C'

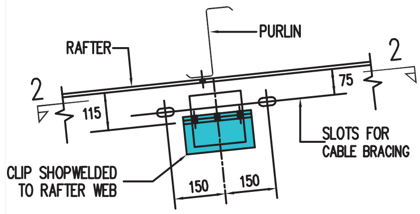


DETAIL `D'

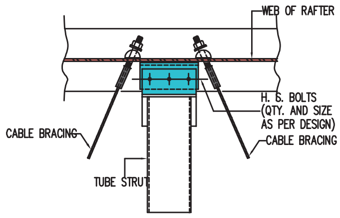


DETAIL `B'

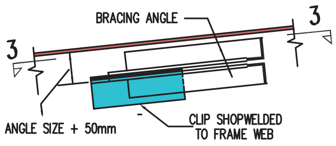
BRACE ROD FIXING DETAILS



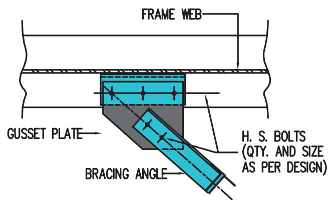
DETAIL "E"
ALT. # 1



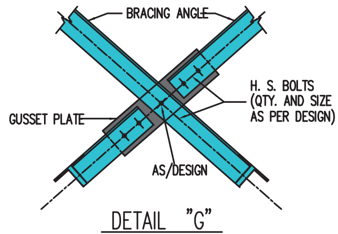
SECTION 2 – 2
(REF. DESIGN)



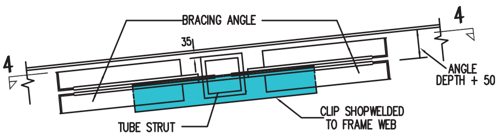
DETAIL "F"



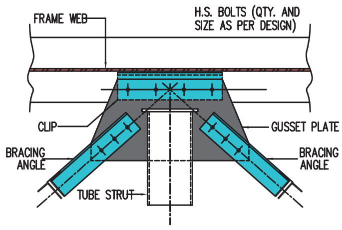
SECTION 3 – 3



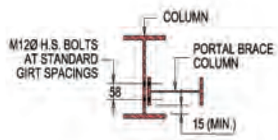
DETAIL "G"



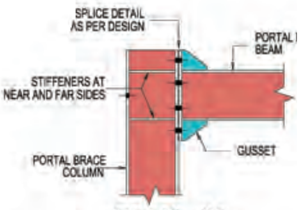
DETAIL "H"
ALT # 1 (REF. DESIGN)



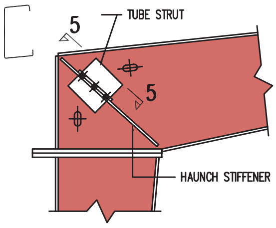
SECTION 4 – 4



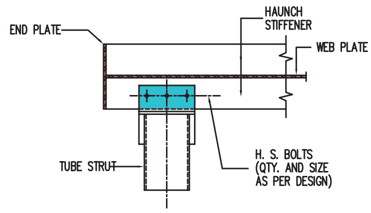
DETAIL 'K'



DETAIL 'L'



DETAIL "M" ALT. # 1

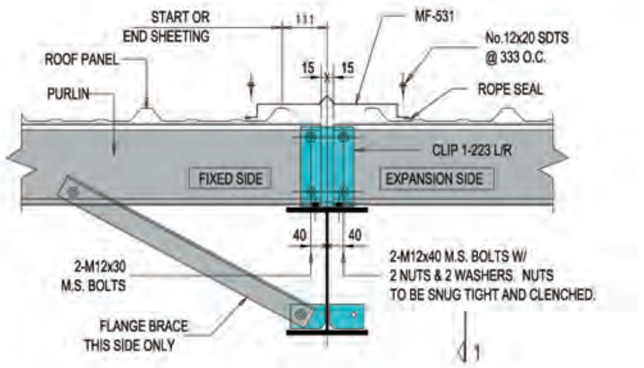


SECTION 5 – 5

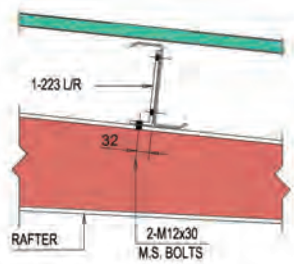
NOTE :

1. Details shown on this drawing may not occur all together in one building, use those details which comply with the structural framing drawings furnished with the building
2. Brace rods are indicated thus: 2r-6940 on building installation drawings, meaning 160 rod 6940mm long.
3. (1R=120, 3r=200, 4r=220 , 5r=240) bracing are not used in light endwalls or "s.V. Buildings" in fully sheeted condition as the lateral wind force is carried to the foundation by means of diaphragm strength of the fully sheeted wall.
4. When a sidewall of "s.V. Building" or light endwall (all buildings) is opened to a height greater than 2.2M rod bracing must be installed.
5. Bracings should never be dismantled for whatsoever the reasons may be. Connection bolts & nuts to be tight
6. And brace rods to be inspected periodically for anyslackness.

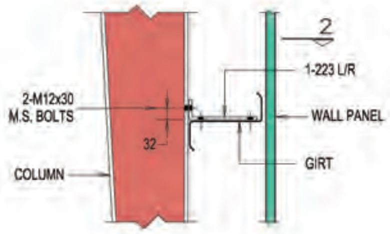
7.4 EXPANSION JOINT DETAILS



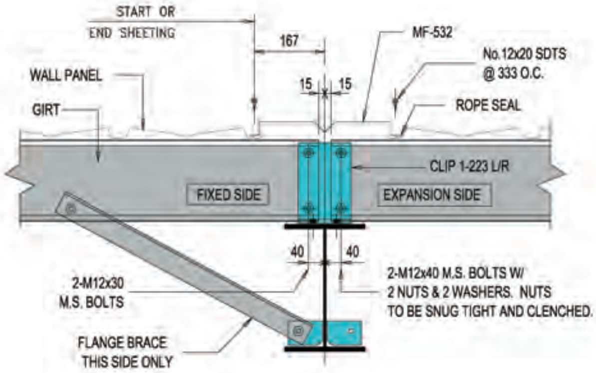
DETAIL `A'
AT PURLIN & ROOF PANEL



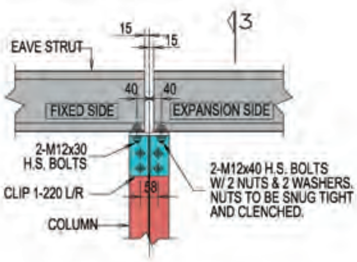
SECTION 1



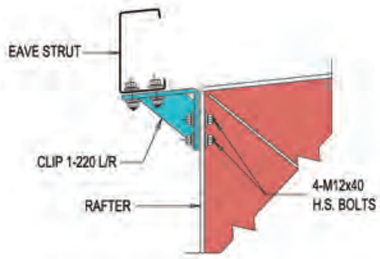
DETAIL `B'
AT GIRT & WALL PANEL



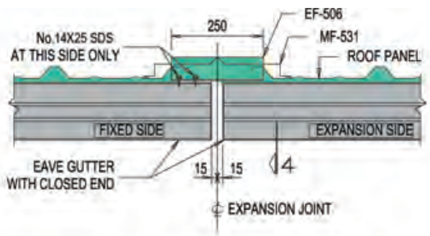
SECTION 2



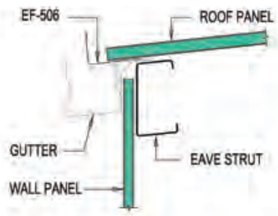
DETAIL `C'
AT EAVE STRUT



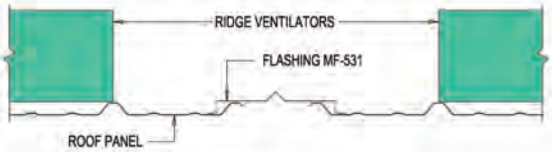
SECTION 3



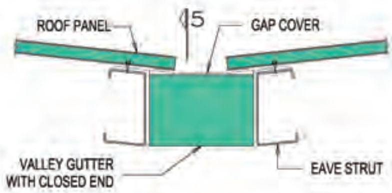
DETAIL 'D'
AT EAVE GUTTER



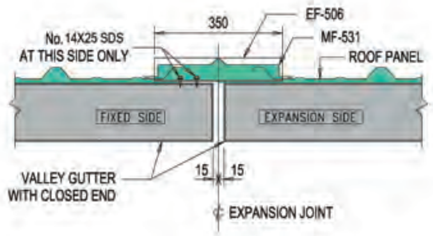
SECTION 4



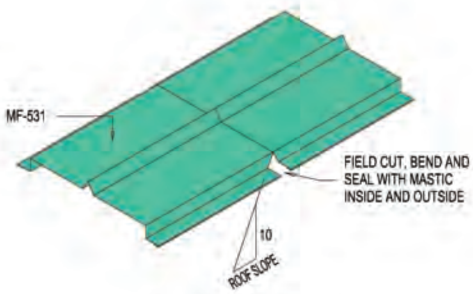
DETAIL 'E'
AT RIDGE VENTILATOR



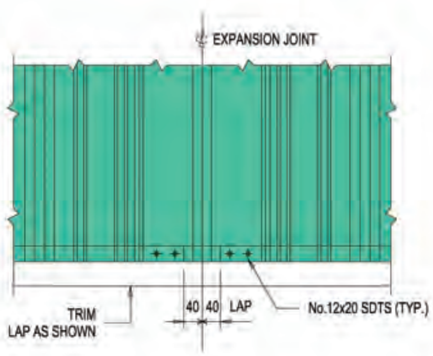
DETAIL 'F'
AT VALLEY GUTTER



SECTION 5

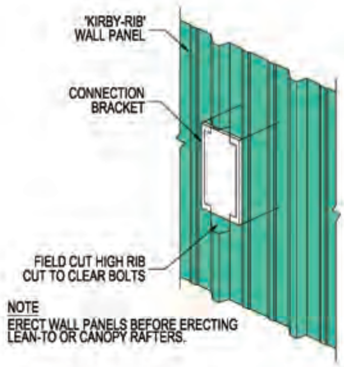


DETAIL 'G'
EXPANSION TRIM AT PEAK

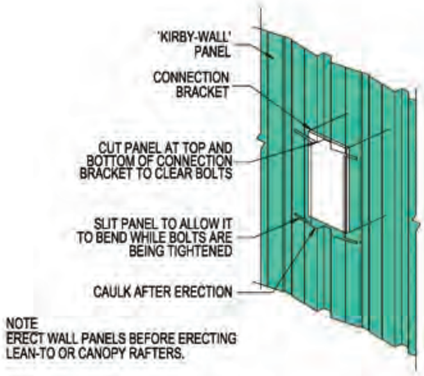


DETAIL 'H'
MISCELLANEOUS TRIM LAPS

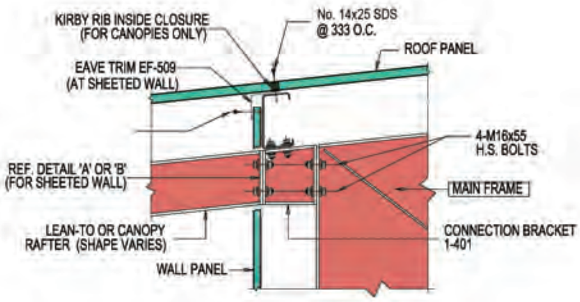
7.5 CANOPY & LEAN-TO CONNECTIONS TO MAIN BUILDING



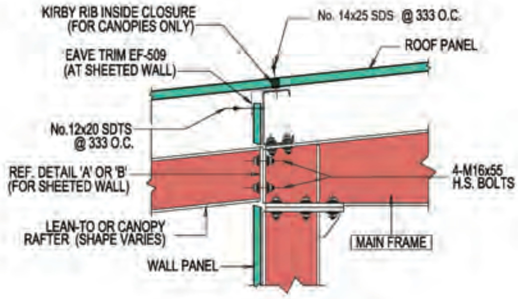
DETAIL `A'
CUTTING DETAILS FOR K.R. PANELS



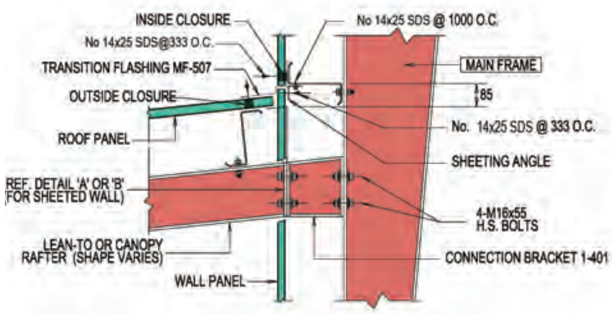
DETAIL `B'
CUTTING DETAILS FOR K.W. PANELS



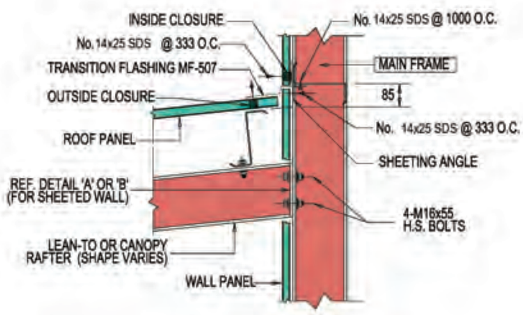
DETAIL `C'
BY-FRAMED CANOPY & LEAN-TO CONNECTION
AT MAIN BUILDING EAVE HEIGHT



DETAIL `D'
FLUSH-FRAMED CANOPY & LEAN-TO CONNECTION
AT MAIN BUILDING EAVE HEIGHT

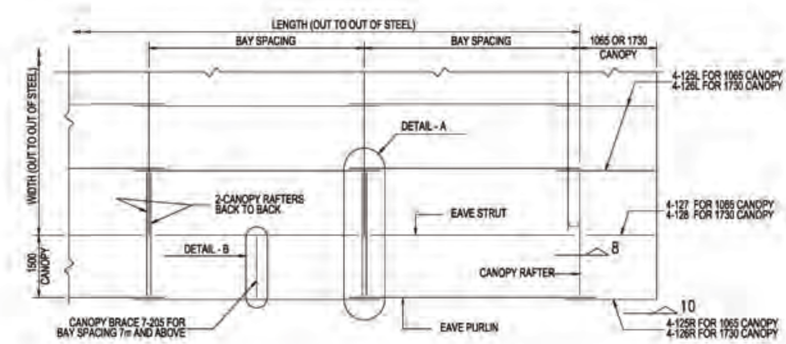


DETAIL `E'
BY-FRAMED CANOPY & LEAN-TO
CONNECTION AT SIDEWALL

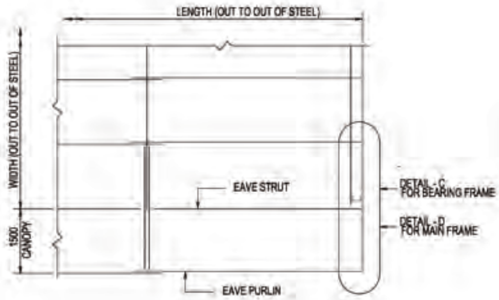


DETAIL `F'
FLUSH-FRAMED CANOPY & LEAN-TO
CONNECTION AT ENDWALL

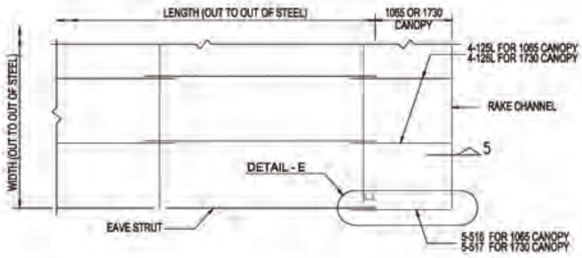
7.5 EAVE CANOPY & PURLIN EXTENSION DETAILS



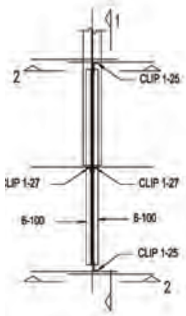
COMBINATION EAVE & PURLIN EXTENSION CANOPY



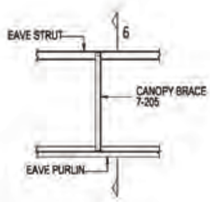
EAVE CANOPY



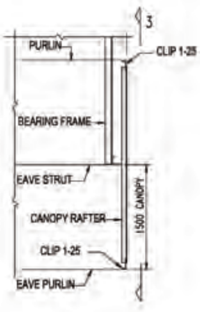
PURLIN EXTENSION CANOPY



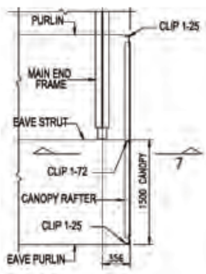
DETAIL 'A'



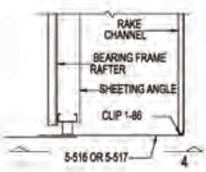
DETAIL 'B'

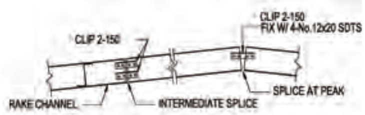


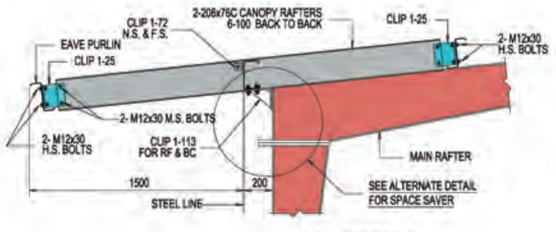
DETAIL 'C'



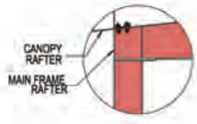
DETAIL 'D'



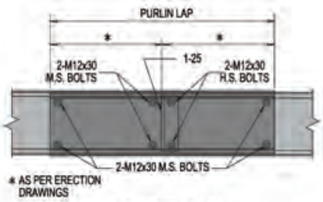




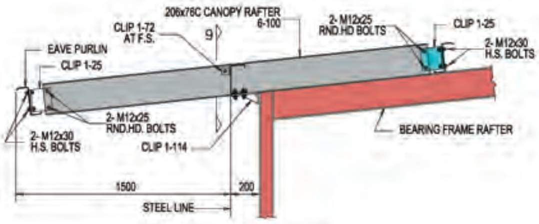
SECTION '1'



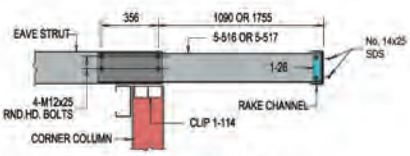
ALTERNATE DETAIL
FOR SPACE SAVER



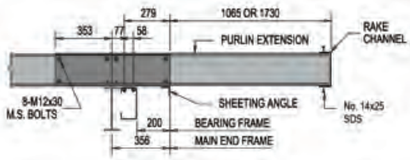
SECTION '2'



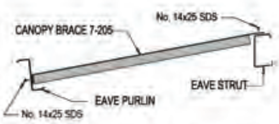
SECTION '3'



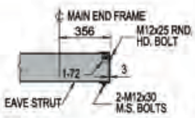
SECTION '4'



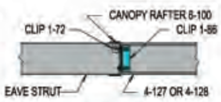
SECTION '5'



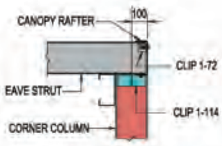
SECTION '6'



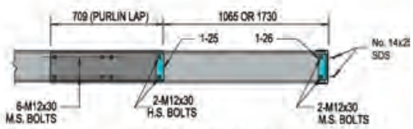
SECTION '7'



SECTION '8'



SECTION '9'

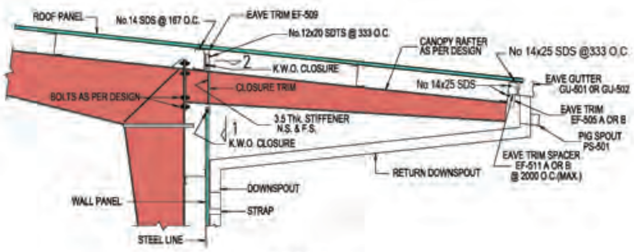


SECTION '10'

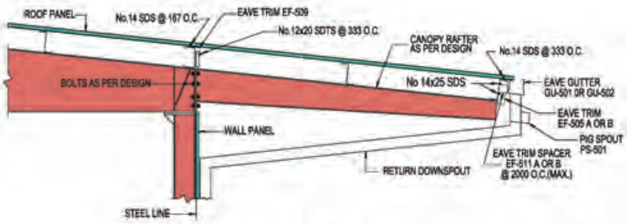
NOTE :

1. All canopy eave purlins as well as eave purlin laps are same as the required purlins in the main building.
2. Rake channel is made of un punched material (206x76cx1 .8)
3. All dimensions are in millimeters.
4. Part marks shown on this drawing are for roof slope 1:10 only.Refer to building installation drawings if roof slope is other than 1:10.

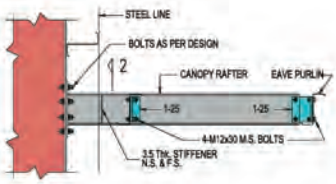
7.5 OVERHANG CANOPY DETAILS



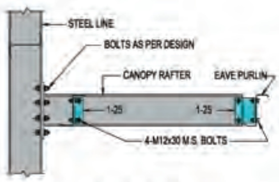
DETAIL 'A'
OVERHANG CANOPY AT BY-FRAME SIDEWALL



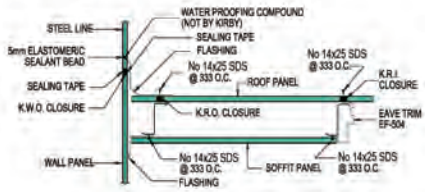
DETAIL 'B'
OVERHANG CANOPY AT BY-FRAME SIDEWALL
(ALL OTHER DETAILS SAME AS IN DETAIL 'A')



DETAIL 'C'
AT BY-FRAME SIDEWALL OR ENDWALL

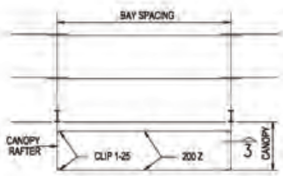


DETAIL 'D'
AT FLUSH FRAME SIDEWALL OR ENDWALL

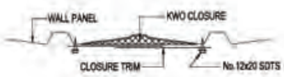


DETAIL 'E'
PANEL & TRIM INSTALLATION

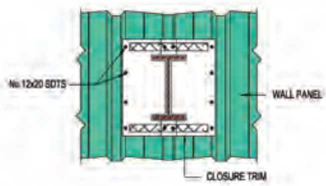
OVERHANG CANOPIES AT DOORS FRAMED OPENINGS ETC.



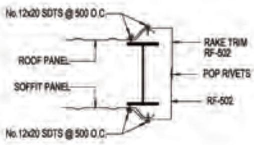
PLAN VIEW



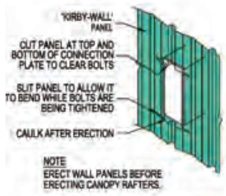
SECTION '1'



SECTION '2'

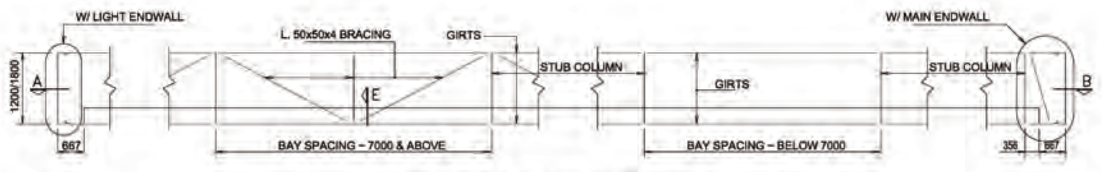


SECTION '3'

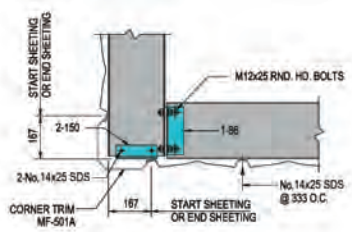


WALL PANEL CUTOUT
DETAIL AT FLUSH FRAME

7.6 VERTICAL FASCIA DETAILS

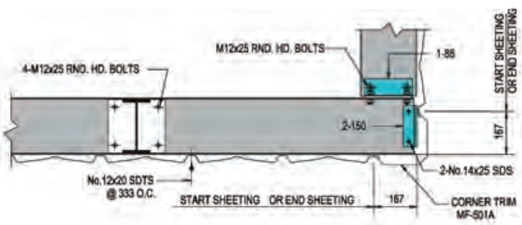


1200 & 1800 FASCIA ELEVATION



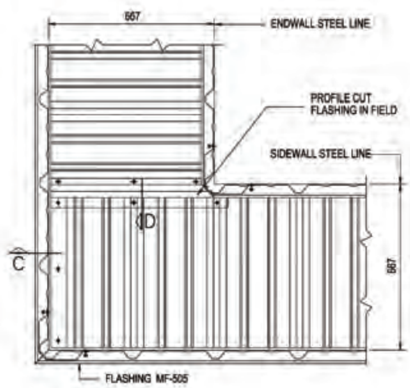
SECTION - A

(TYPICAL CORNER DETAIL AT LIGHT ENDWALL)



SECTION - B

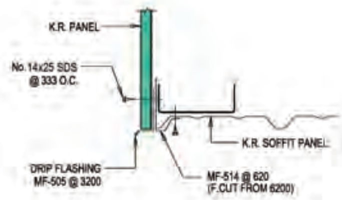
(TYPICAL CORNER DETAIL AT MAIN ENDWALL)



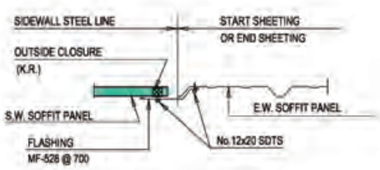
PLAN SHOWING SOFFIT PANEL

LAYOUT AT CORNERS

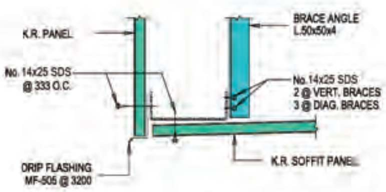
(STEEL NOT SHOWN FOR CLARITY)



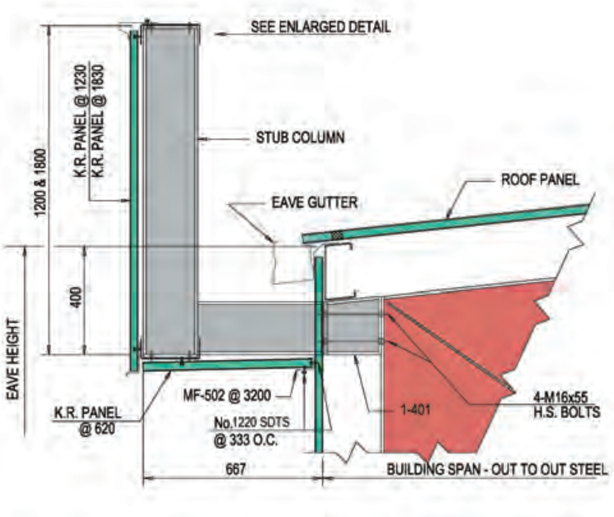
SECTION - C



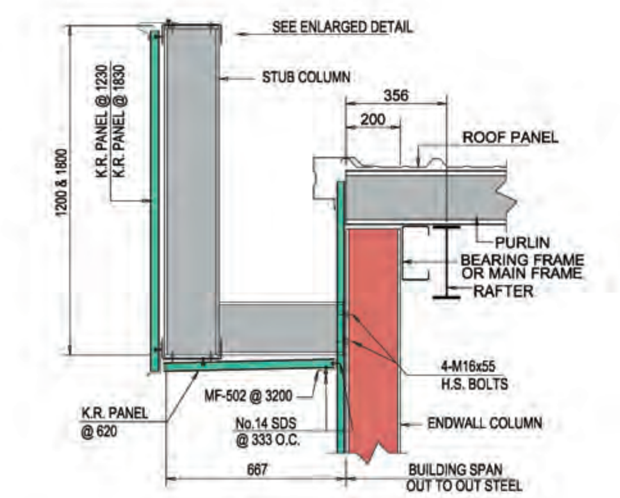
SECTION - D



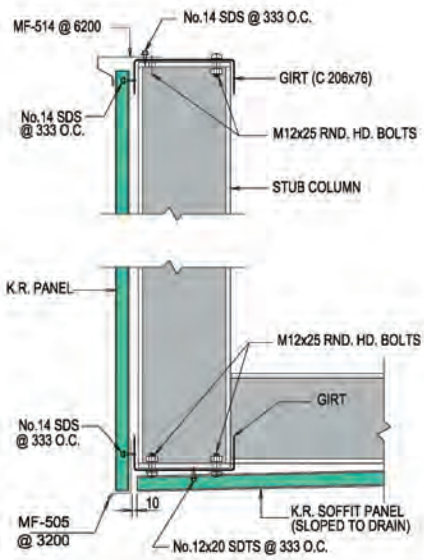
SECTION - E



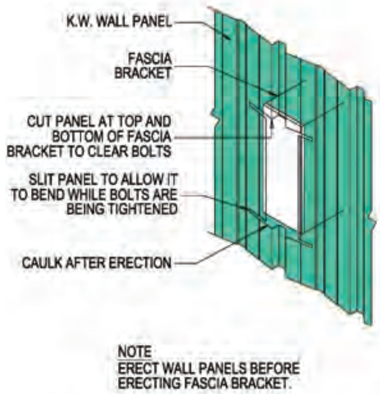
TYPICAL SECTION THRU' FASCIA AT SIDEWALL



TYPICAL SECTION THRU' FASCIA AT ENDWALL



ENLARGED DETAILS



DETAIL AT WALL PANEL

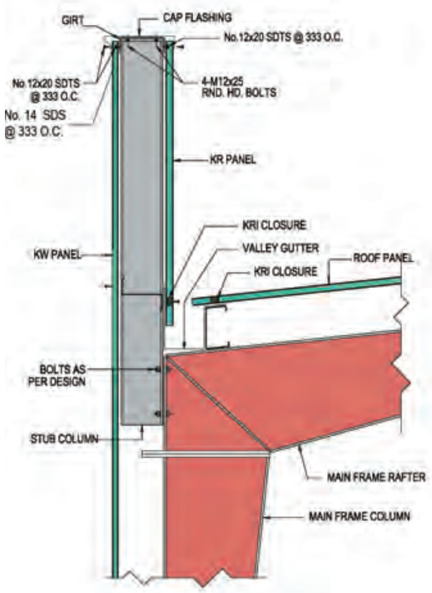
NOTE :

SCREWS

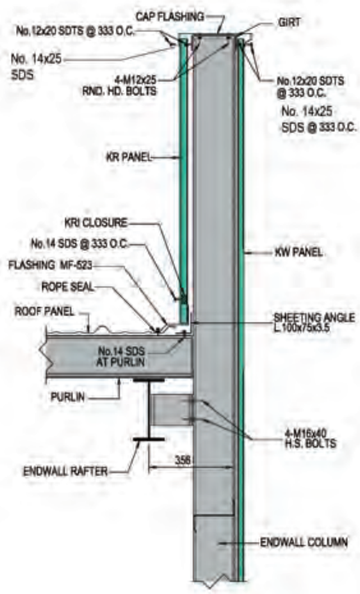
333 O.C. At each girt for k.W. Panel stitch (2 nos.) Between girt per side lap, 500 o.C. For mf 501a both sides.

333 O.C. At each support for k.R. Panel stitch (one@each support and (one) between per side lap.

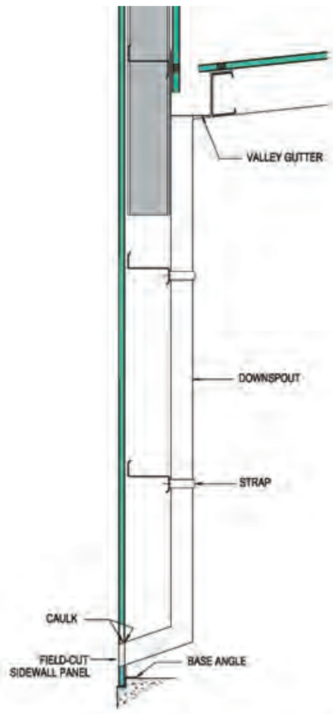
7.6 FLUSHWALL FASCIA DETAILS



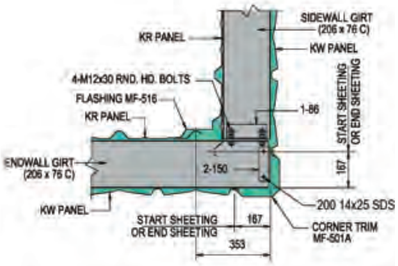
DETAIL `A'
SECTION AT SIDEWALL



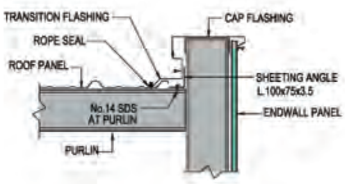
DETAIL `B'
SECTION AT ENDWALL



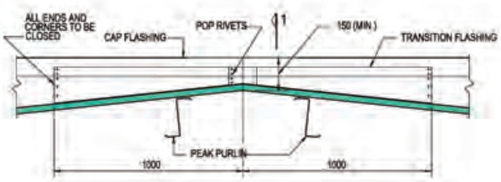
DETAIL `C'
DOWNSPOUT INSTALLATION



DETAIL `D'
SECTION AT CORNER

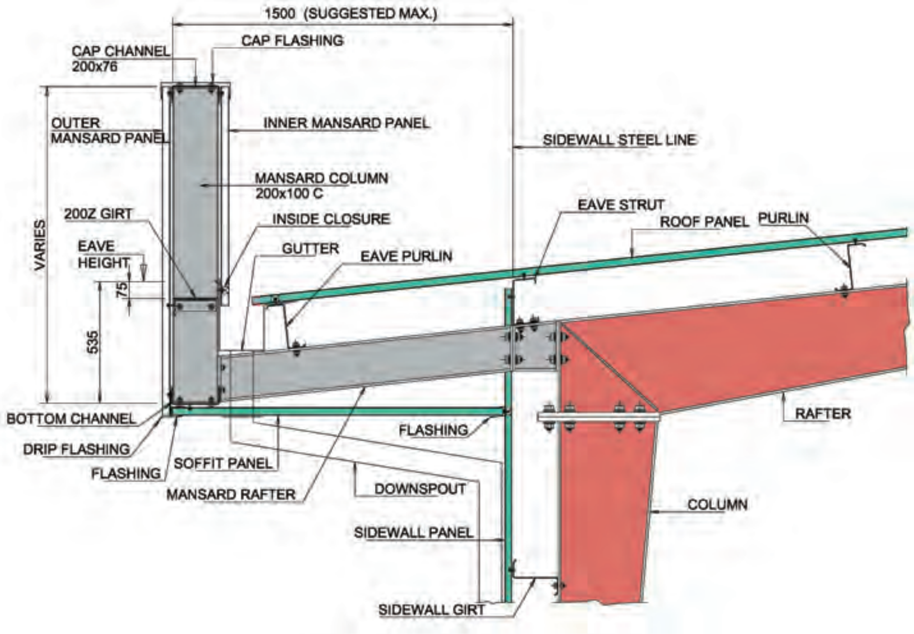


SECTION - 1

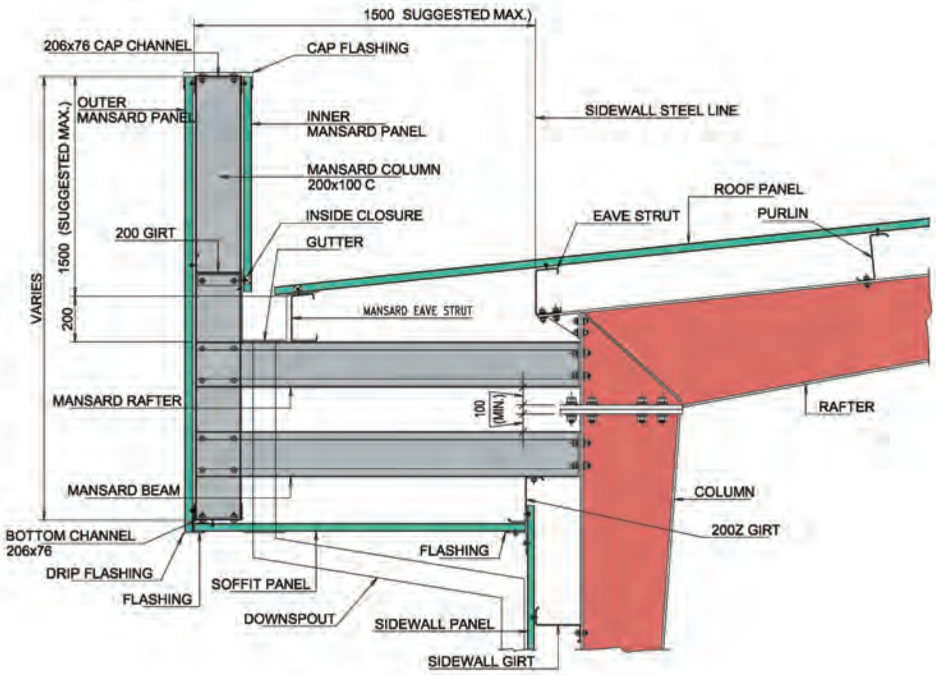


DETAIL `E'
AT PEAK

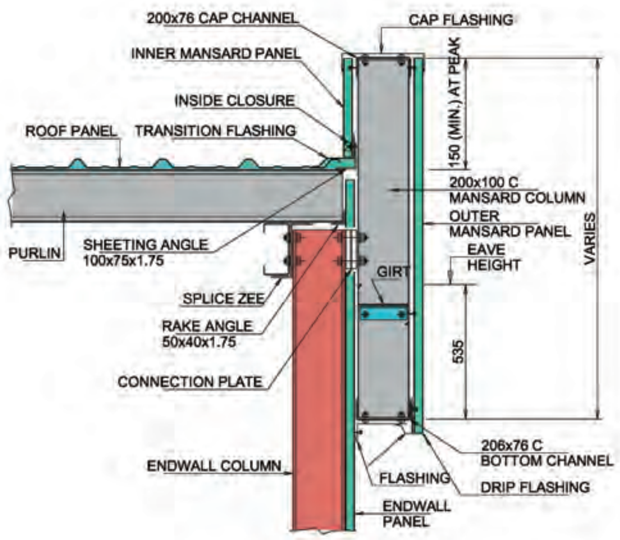
7.7 VERTICAL MANSARD DETAILS



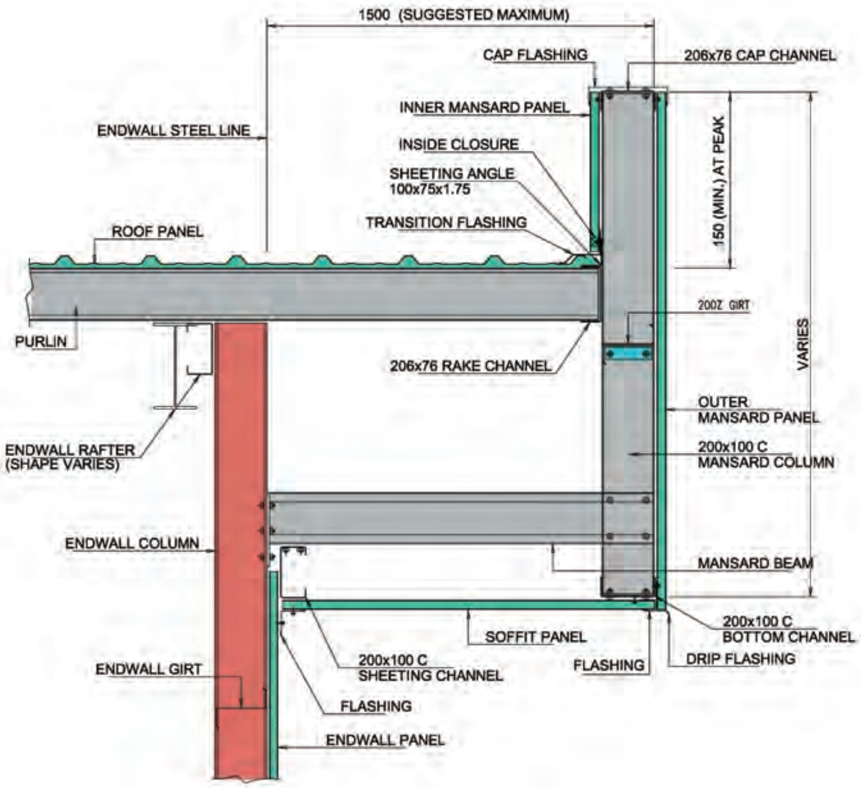
SECTION AT SIDEWALL



SECTION AT SIDEWALL



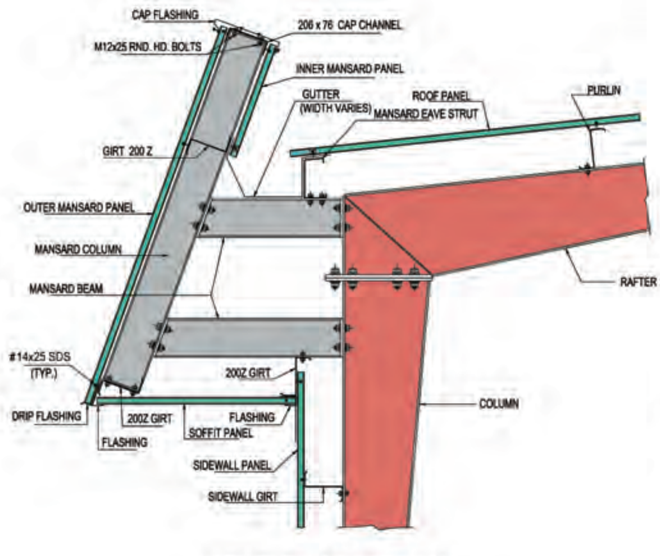
SECTION AT ENDWALL



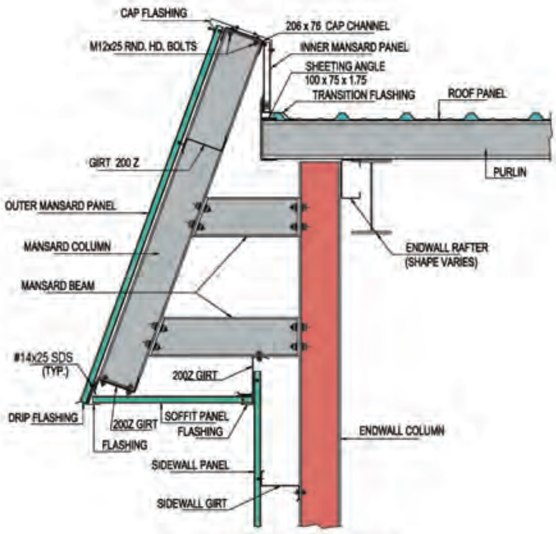
SECTION AT ENDWALL

7.7 CONVENTIONAL MANSARD DETAILS

TYPE- III:

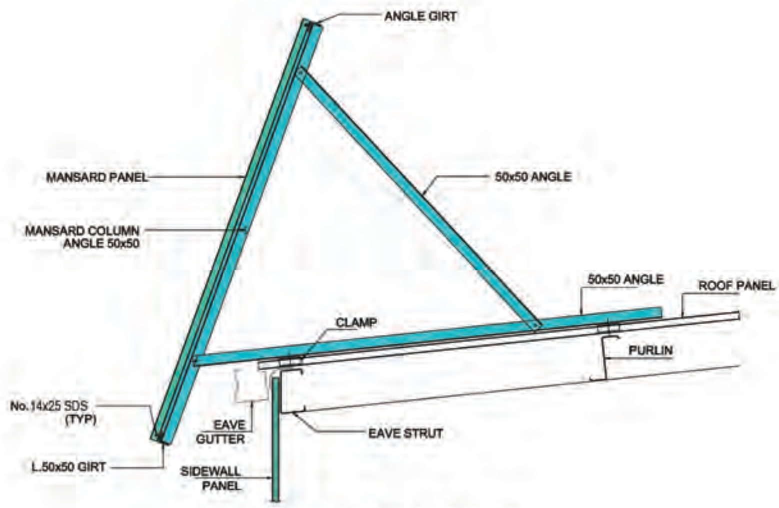


SECTION AT SIDEWALL



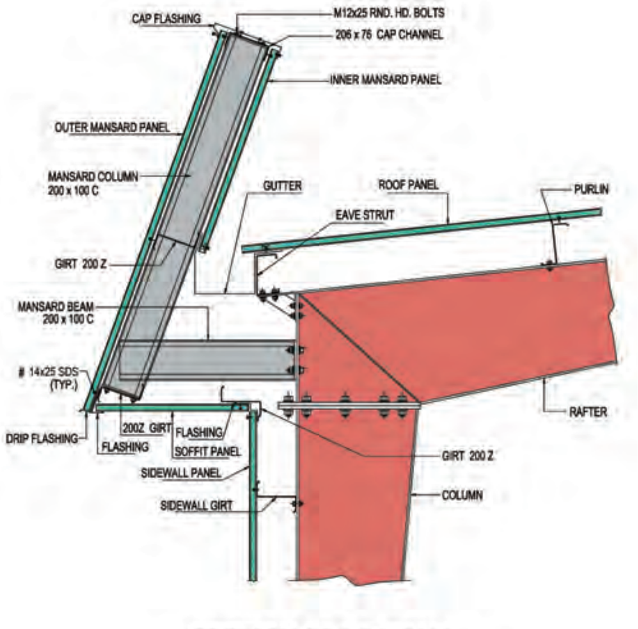
SECTION AT SIDEWALL

TYPE-V:

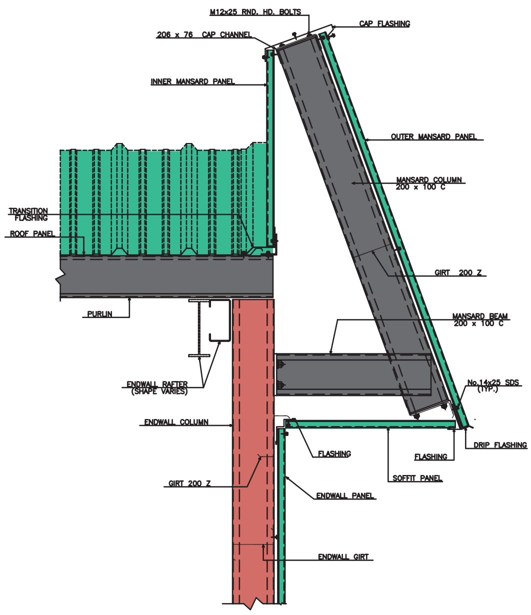


SECTION AT SIDEWALL

TYPE- IV:

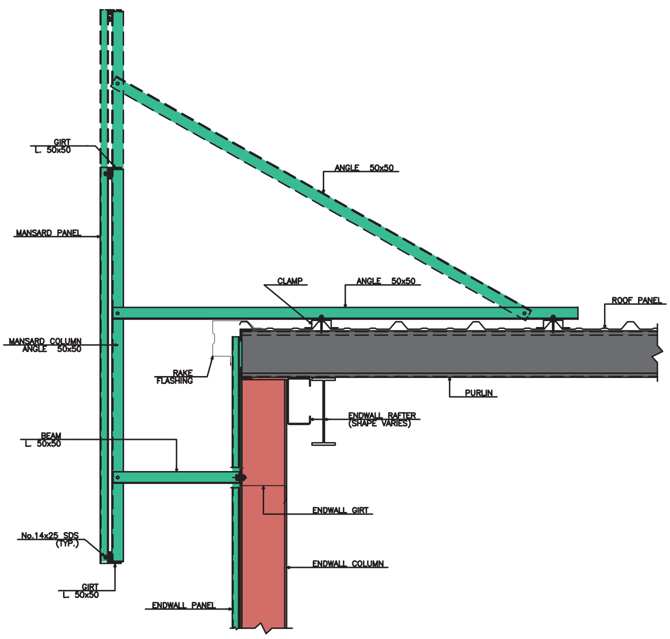


SECTION AT SIDEWALL



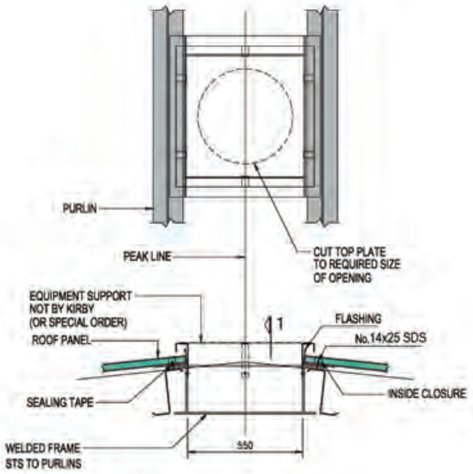
SECTION AT ENDWALL

TYPE-V:

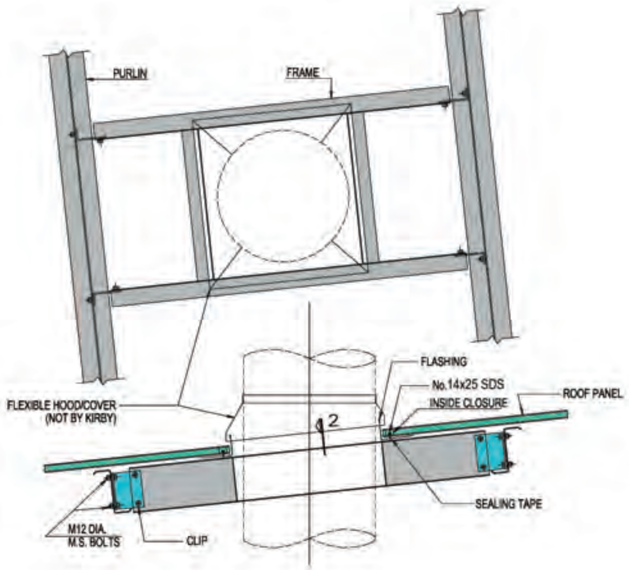


SECTION AT ENDWALL

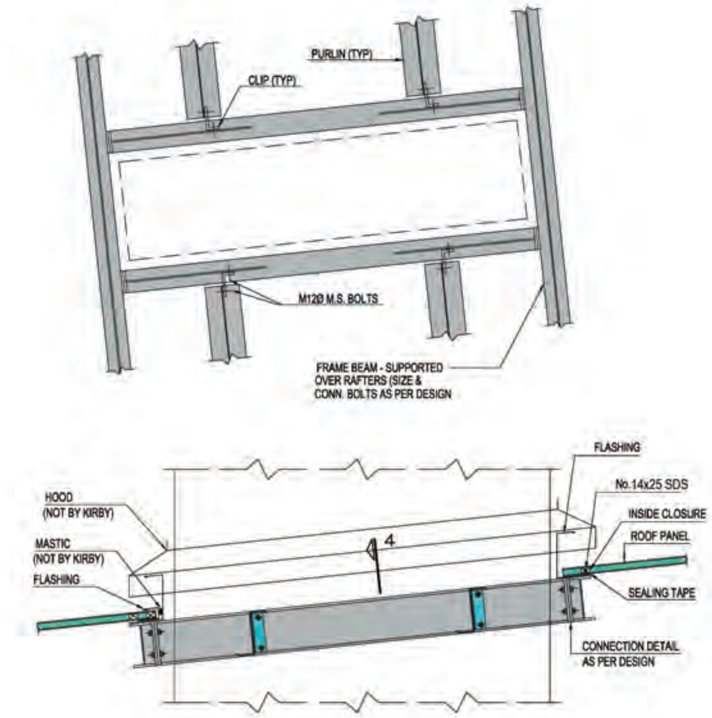
7.8 ROOF FRAMED OPENING DETAILS



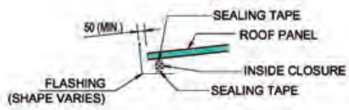
FRAMED OPENING AT PEAK
DETAIL 'A'



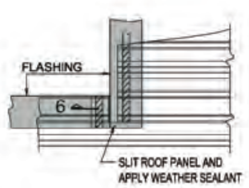
FRAMED OPENING FOR CHIMNEY
DETAIL 'B'



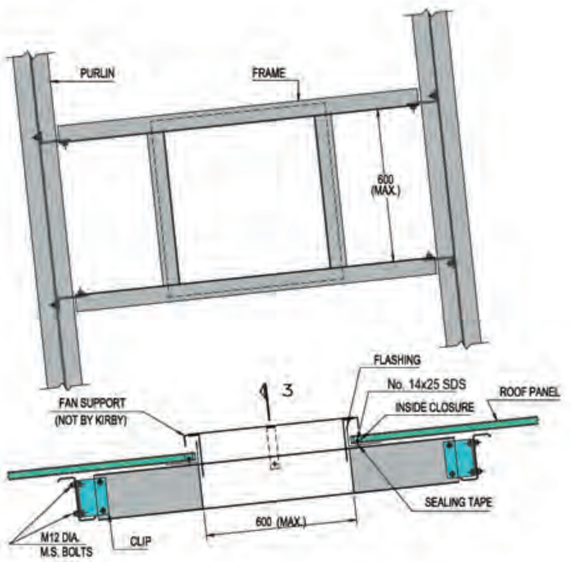
FRAMED OPENING FOR CHIMNEY
DETAIL 'C'



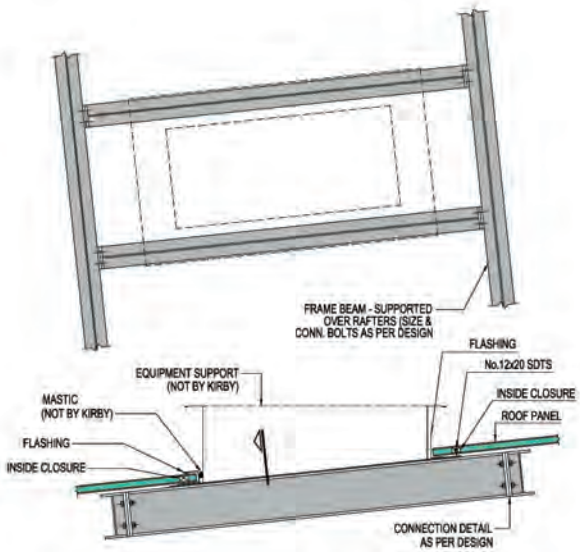
TYPICAL DETAIL OF FIXING
ROOF PANEL WITH FLASHING



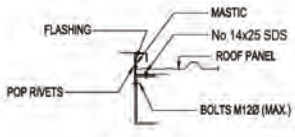
TYPICAL DETAIL AT CORNERS



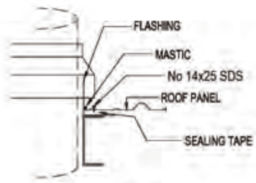
FRAMED OPENING FOR LIGHT WEIGHT FANS
DETAIL 'D'



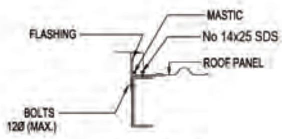
FRAMED OPENING WITH EQUIPMENT SUPPORT
DETAIL 'E'



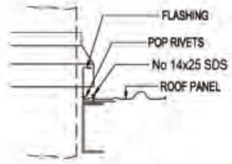
SECTION 1



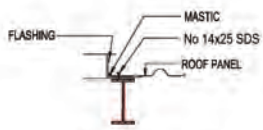
SECTION 2



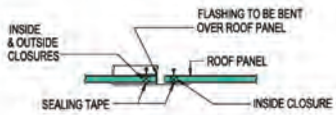
SECTION 3



SECTION 4

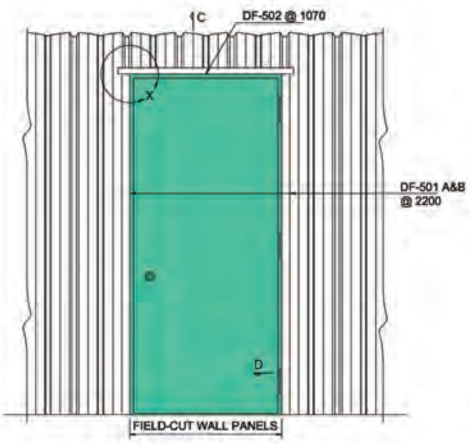


SECTION 5

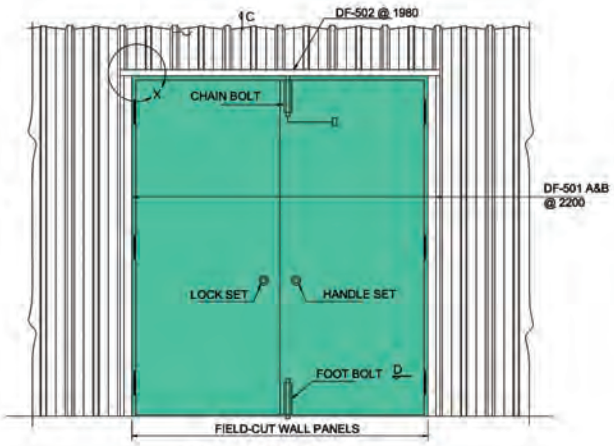


SECTION 6

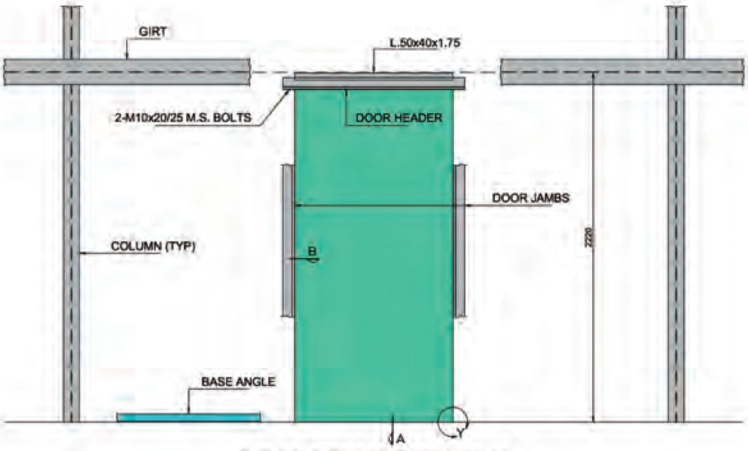
7.9 WALK DOOR DETAILS



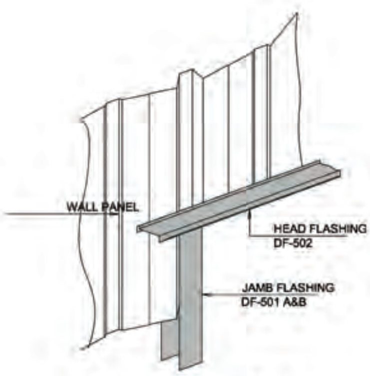
3'x7' WALK DOOR
(914X2134)



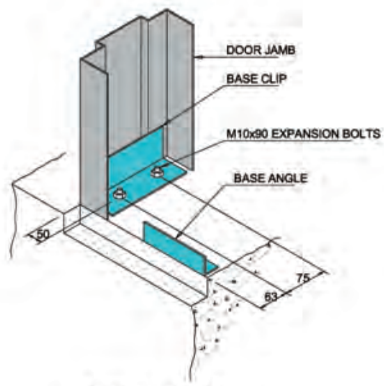
6'x7' WALK DOOR
(1830X2134)



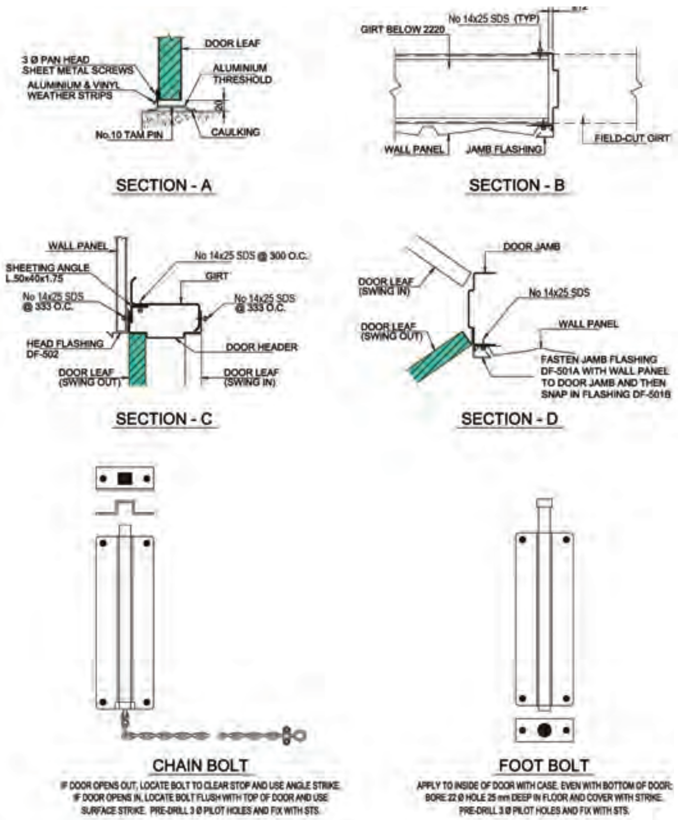
DOOR FRAME ERECTION



TRIM DETAIL AT 'X'



DETAIL AT 'Y'



NOTE :

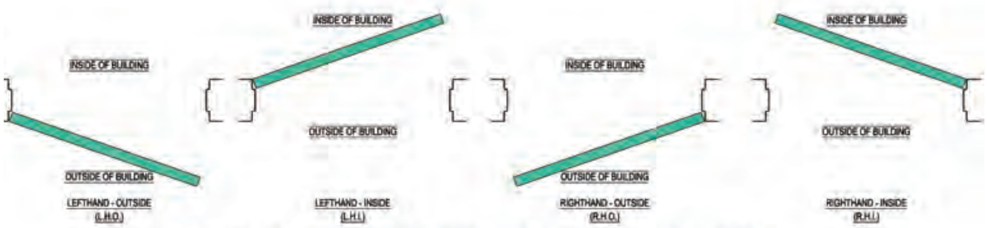
1. Glass & glazing for doors 6'x7' g and 3'x7'g not by kirby.
2. A stragal installed on right hand inactive Door leaf as a standard for 6'x7' doors . Installation on left hand on request .

6'x7' door accessory package:

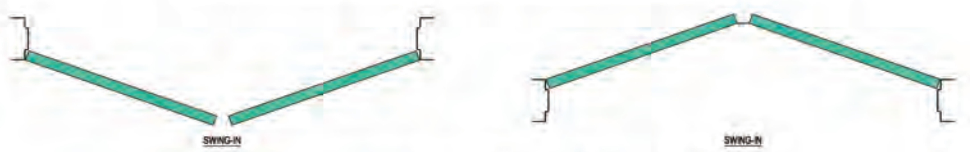
One no. Lockset consisting of:
2-Circular handles, 1-single point latch, 1-strike and 8-fixing screws.
6 Nos. Hinges with 108-fixing screws. One no. Foot bolt set consisting of: 1-6" foot bolt, 1-base strike,1-bolt housing,1-surface strike,1-sprjng, 1-Chajn, 1-chain clip and
10-Screws. One no. Threshold.
2 Nos. Aluminium strips.
2 Nos. Vinyl strips.
14 Nos. Screws.
8 Nos. No.10Tampins.
4 Nos. M10x20/25 m.S. Bolts with nuts.
25 Nos. No.12X20 SDTS

3'x7' door accessory package:

One no. Lockset consisting of:
2-Circular handles, 1-single point latch,
1-Strike and 8-fixing screws.
3 Nos. Hinges with 54-fixing screws.
One no. Threshold.
One no. Aluminium strips.
One no. Vinyl strips.
8 Nos. Screws.
4Nos. No.10Tampins.
4 Nos. M10x20125 M.S. Bolts with nuts.
25 Nos. No.12X20 SDTS

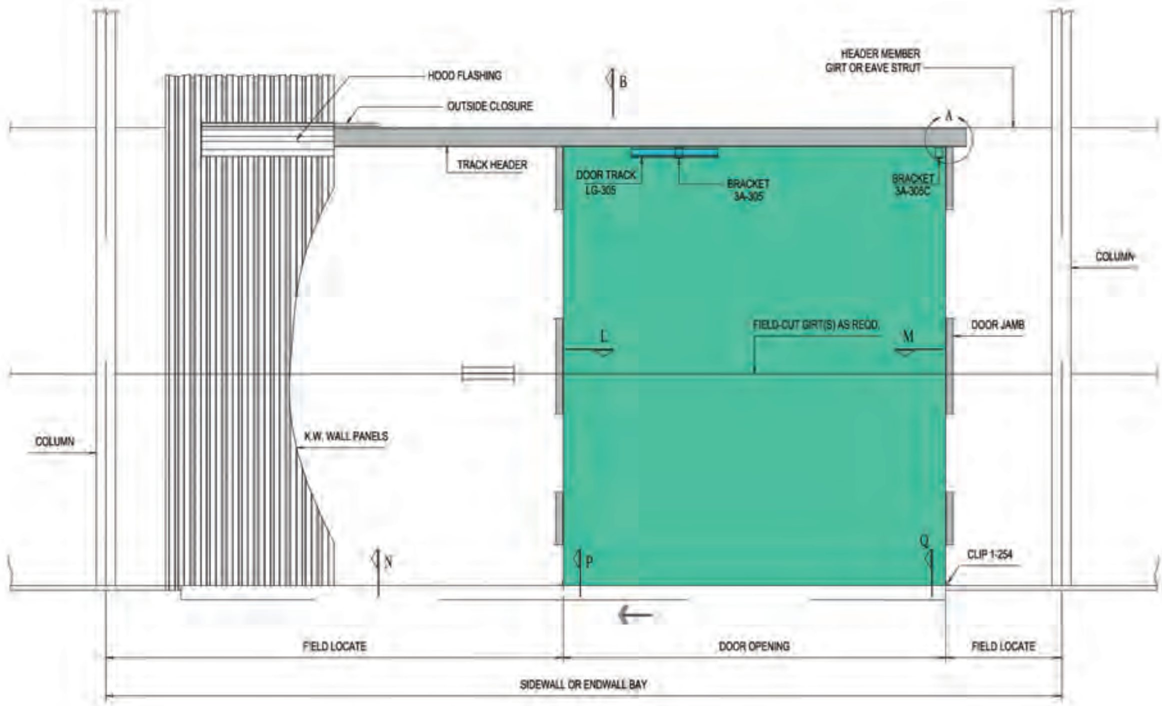


3o7o DOOR JAMB POSITION FOR L.H.O., L.H.I., R.H.O. & R.H.I. DOORS

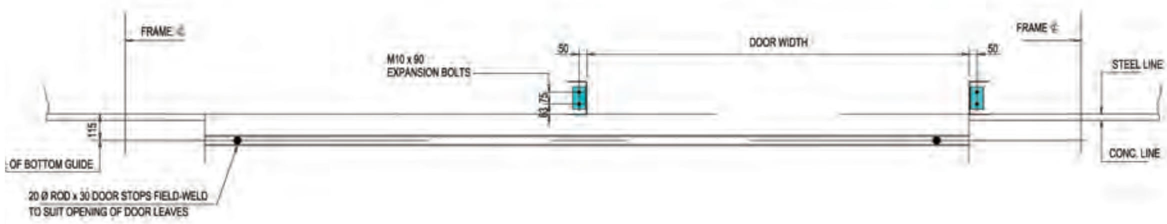


6o7o DOOR JAMB POSITION FOR SWING-OUT & SWING-IN DOORS

7.10 SINGLE SLIDE DOOR DETAILS



SINGLE SLIDE DOOR FRAMING ELEVATION



PLAN - BOTTOM DOOR GUIDES

Door stile schedule

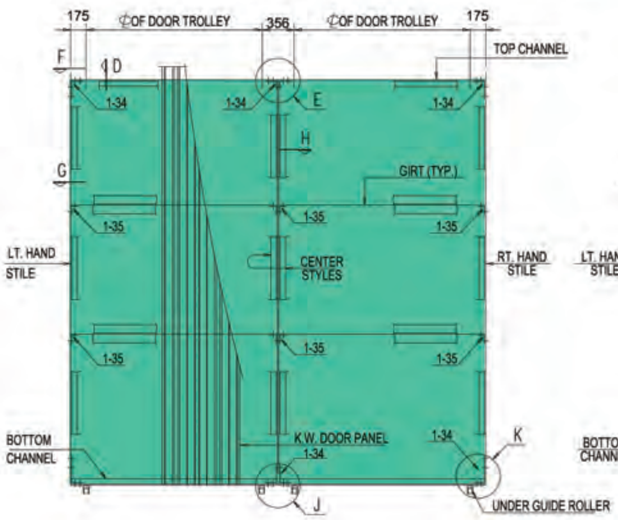
DOOR HEIGHT	LEFT HAND STYLE	RIGHTHANDSffiE	CENTER STYLES
3000	10x-110 L	10x-110 R	10x-215 L & R
3500	10x-112L	10x-112 R	10x-216 L & R
4000	10x-114 L	10x-114 R	10x-217L & R
4500	10x-116 L	10x-116 R	10x-218 L & R
5000	10x-118 L	10x-118 R	10x-219 L & R
5500	10x-120 L	10x-120 R	10x-222 L & R

Door jamb schedule

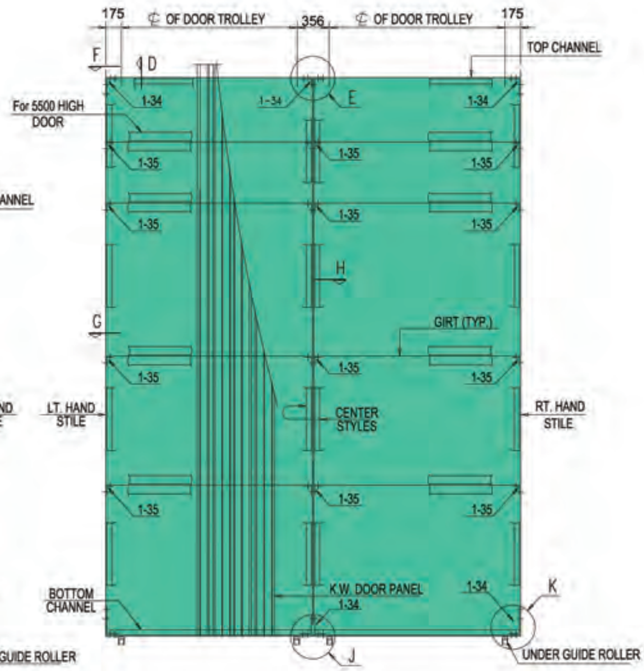
DOOR HEIGHT	DOORJAMB
3000	6-3x0
3500	6-3x5
4000	6-4x0
4500	6-4x5
5000	6-5x0
5500	6-5x5

Door track & bracket schedule

DOOR WIDTH	DOOR TRACK (LG-305)		BRACKET	
	LENGTH	QTY.	3A-305C	3A-305
3000	6000	ONE	2	6
4000	6000+2000	ONE EACH	2	11
5000	6000+4000	ONE EACH	2	12

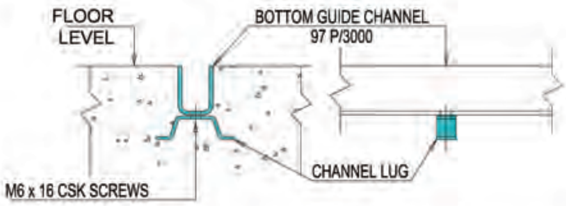


DOOR LEAF ERECTION
(FOR 3000, 3500 & 4000 HIGH DOOR)

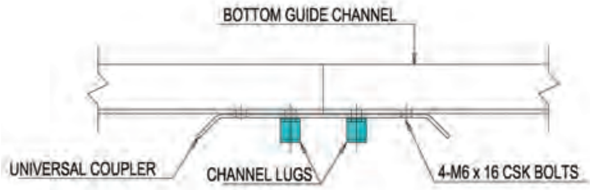


DOOR LEAF ERECTION
(FOR 4500, 5000 & 5500(AS NOTED) HIGH DOORS)

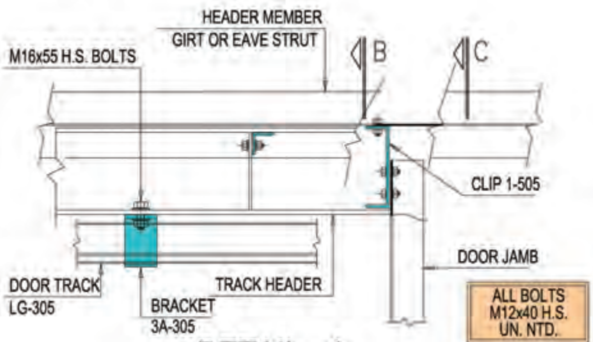
7.10 SINGLE SLIDE DOOR DETAILS



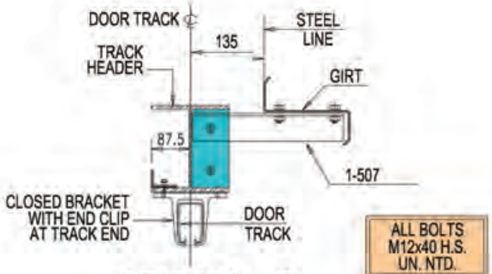
GUIDE CHANNEL ANCHORING DETAIL



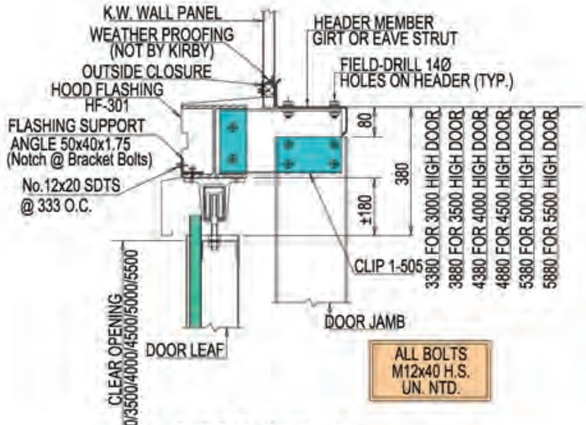
GUIDE CHANNEL SPLICE DETAIL



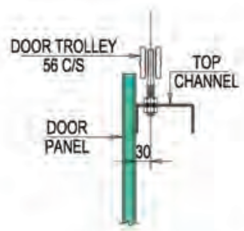
DETAIL - A



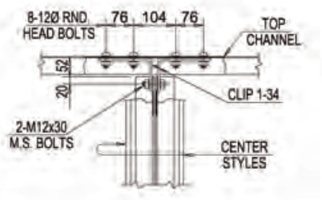
SECTION - B



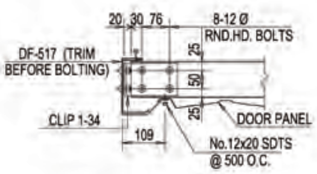
SECTION - C



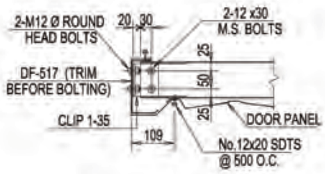
SECTION - D



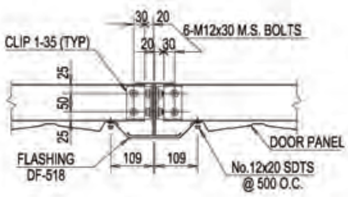
DETAIL - E



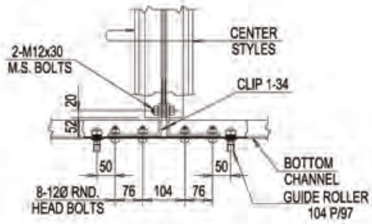
SECTION - F



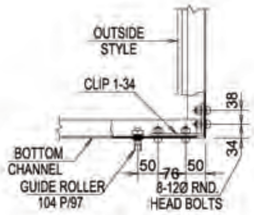
SECTION - G



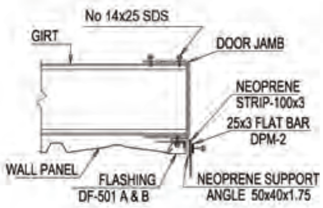
SECTION - H



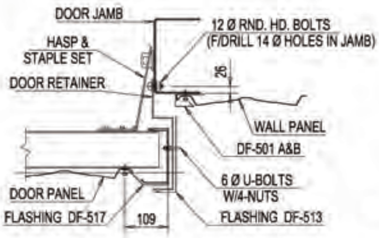
DETAIL - J



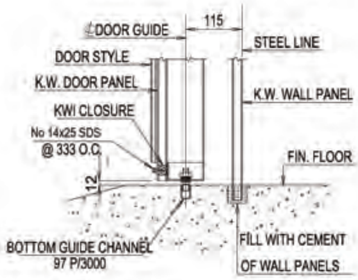
DETAIL - K



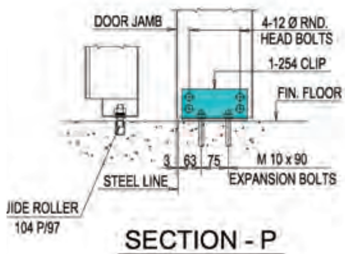
SECTION - L



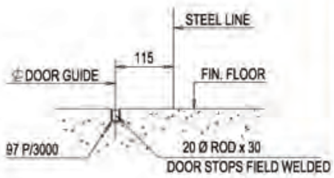
SECTION - M



SECTION - N



SECTION - P



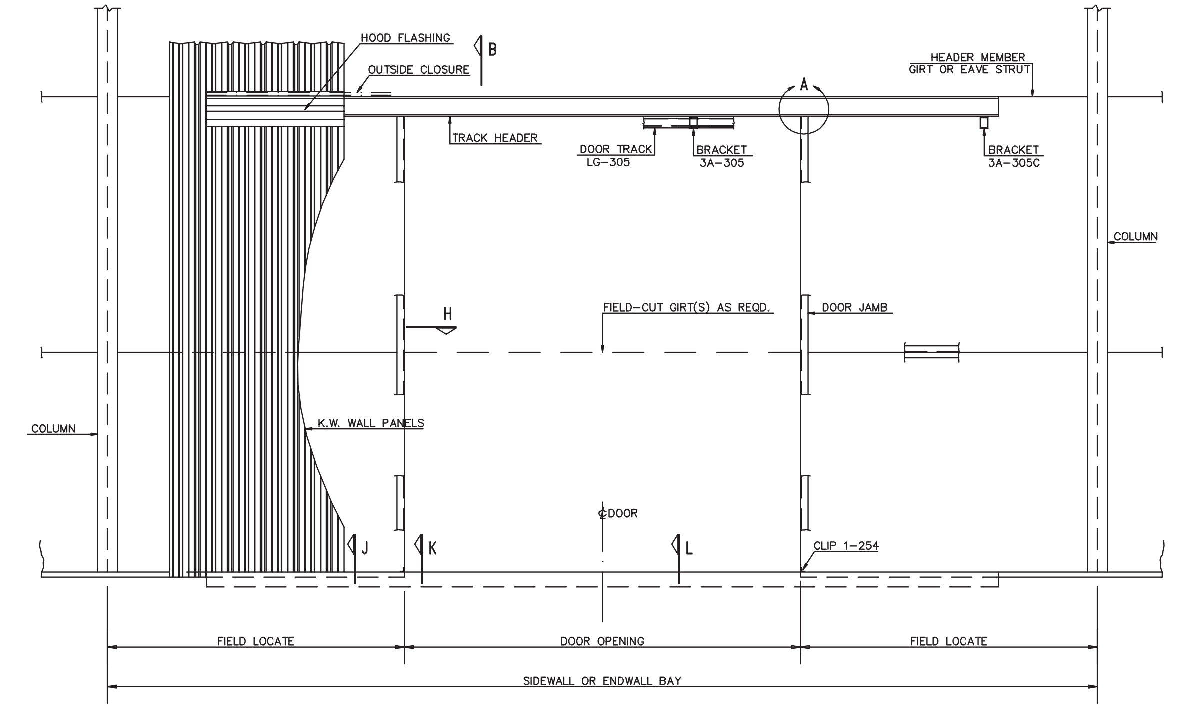
SECTION - Q

NOTE:

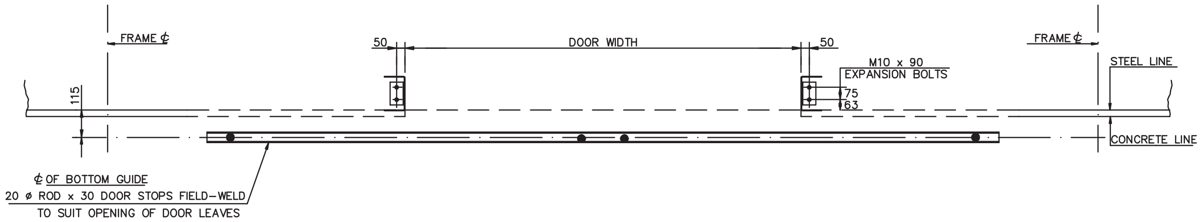
1. Check the level of trackheader assembly and make sure that it matches clear opening of door before building installation of door leaf.

2. Door handle w/dpm-1 to be fixed inside or outside of building on any steel member of door leaf.

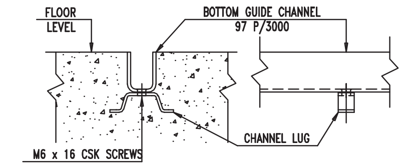
7.10 DOUBLE SLIDING DOOR DETAILS.



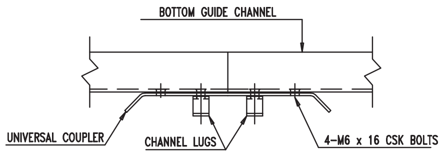
DOUBLE SLIDE DOOR FRAMING ELEVATION



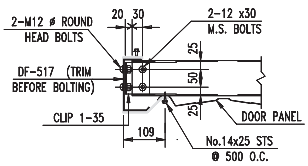
PLAN – BOTTOM DOOR GUIDES



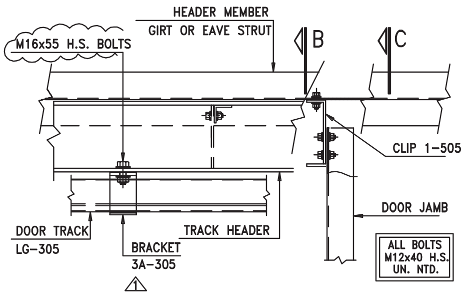
GUIDE CHANNEL ANCHORING DETAIL

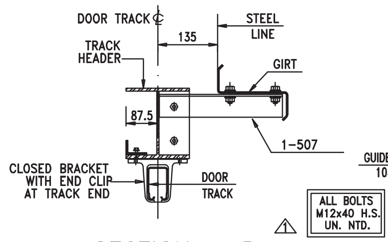


GUIDE CHANNEL SPLICE DETAIL

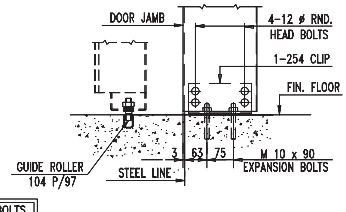


SECTION – F

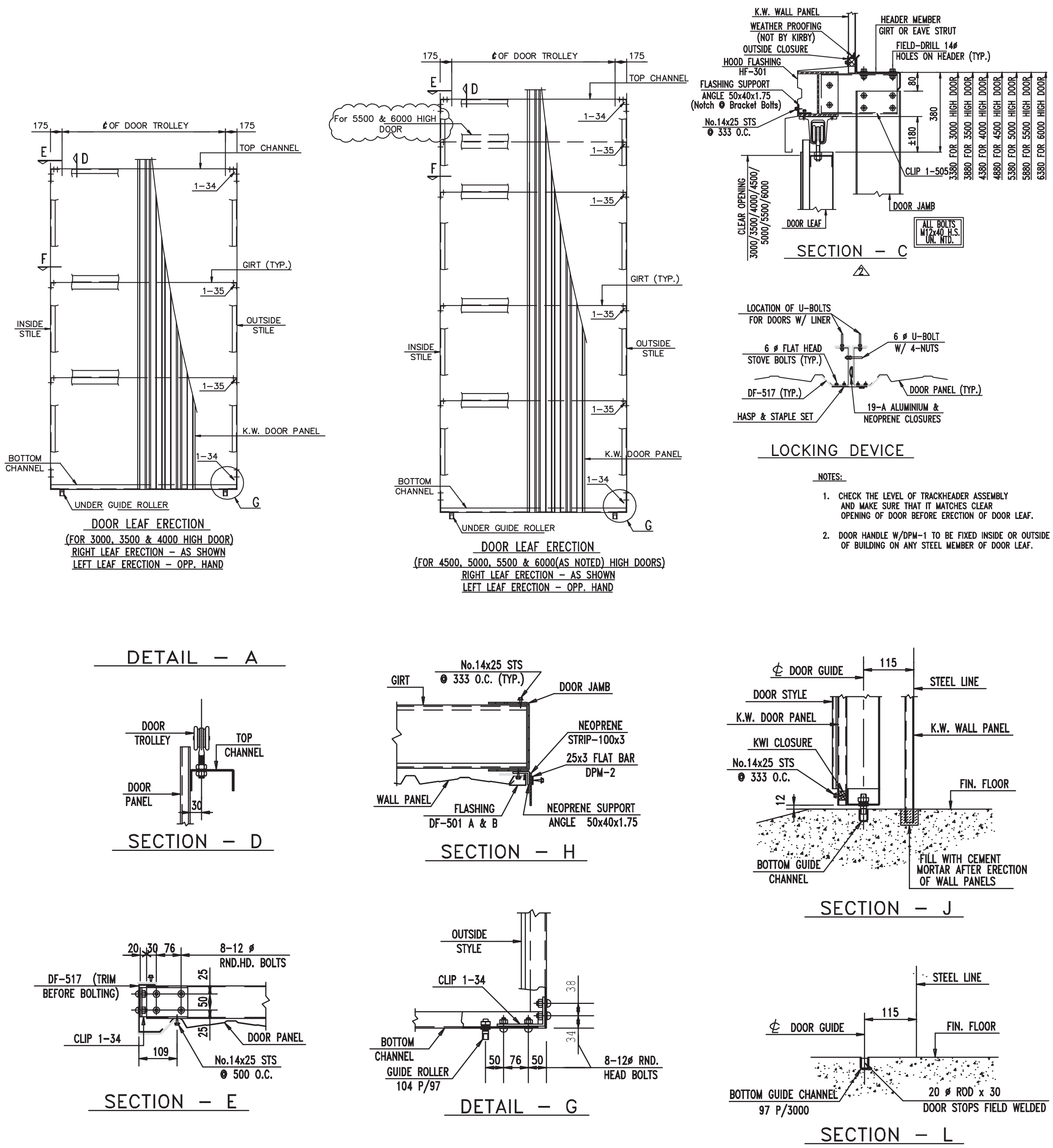




SECTION – B



SECTION – K



DOOR JAMB SCHEDULE	
DOOR HEIGHT	DOOR JAMB
3000	6-3x0
3500	6-3x5
4000	6-4x0
4500	6-4x5
5000	6-5x0
5500	6-5x5
6000	6-6x0

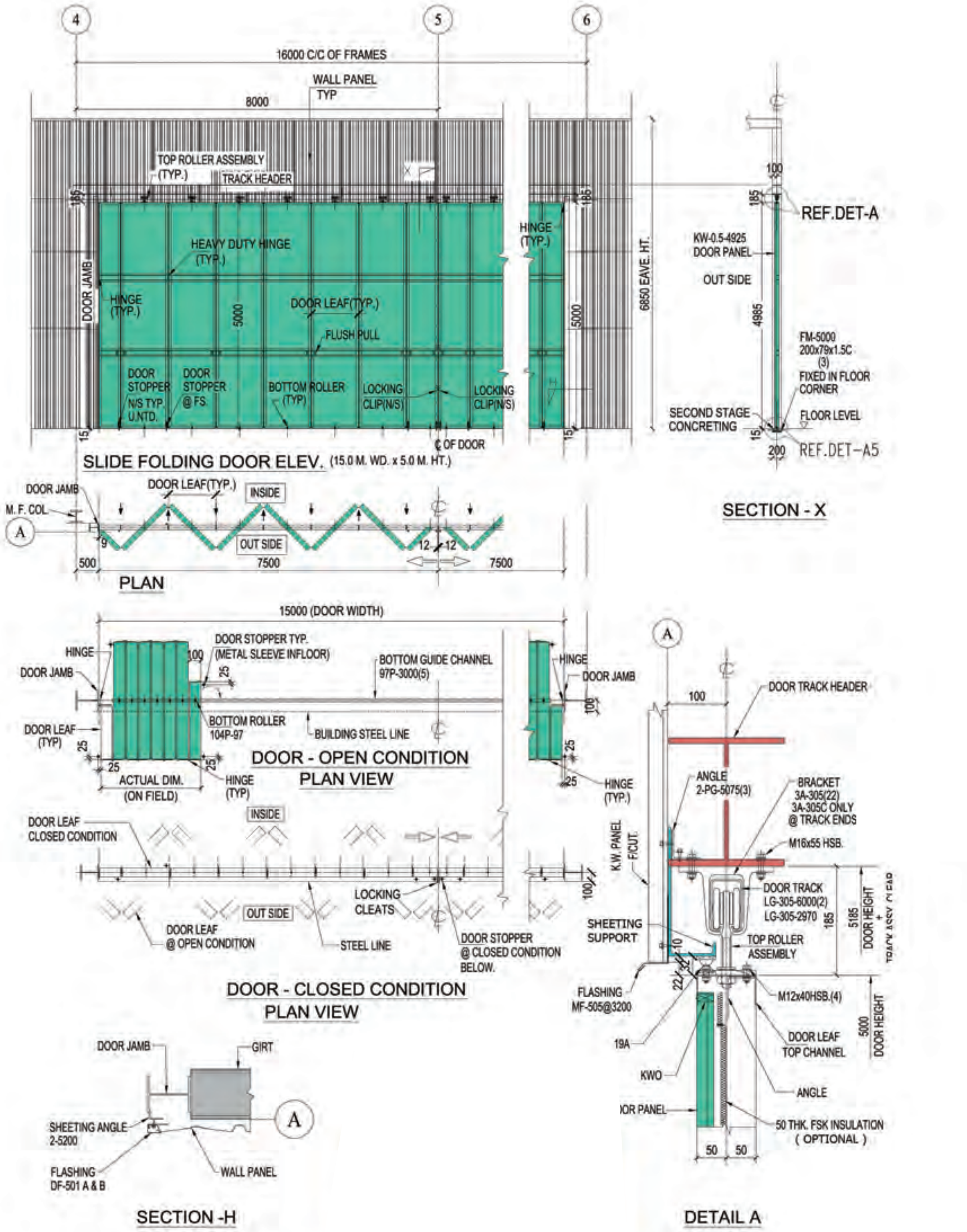
DOOR STILE SCHEDULE				
DOOR HEIGHT	LEFT LEAF		RIGHT LEAF	
	OUTSIDE STILE	INSIDE STILE	INSIDE STILE	OUTSIDE STILE
3000	10x-110 L	10x-111 R	10x-111 L	10x-110 R
3500	10x-112 L	10x-113 R	10x-113 L	10x-112 R
4000	10x-114 L	10x-115 R	10x-115 L	10x-114 R
4500	10x-116 L	10x-117 R	10x-117 L	10x-116 R
5000	10x-118 L	10x-119 R	10x-119 L	10x-118 R
5500	10x-120 L	10x-121 R	10x-121 L	10x-120 R
6000	10x-122 L	10x-123 R	10x-123 L	10x-122 R

STANDARD DOOR WIDTH = 3000, 4000, 5000 & 6000

DOOR TRACK & BRACKET SCHEDULE				
DOOR WIDTH	DOOR TRACK (LG-305)		BRACKET	
	LENGTH	QTY.	3A-305C	3A-305
3000	6000	ONE	2	6
4000	6000+2000	ONE EACH	2	11
5000	6000+4000	ONE EACH	2	12
6000	6000	2	2	14

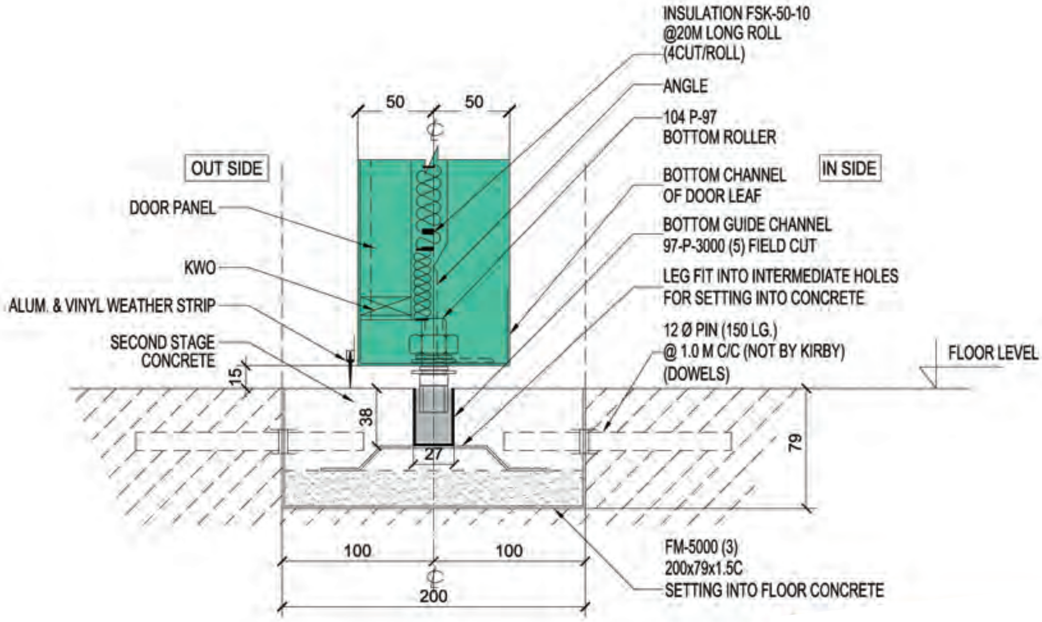
Kirby BUILDING SYSTEMS

7.11 SLIDING FOLDING DOOR DETAILS



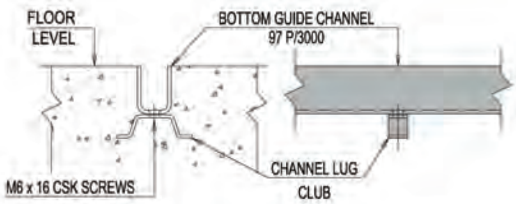
NOTE :

Door to be assembled on a level surface all corners to be 90' after completion door leaves to be sheeted in position

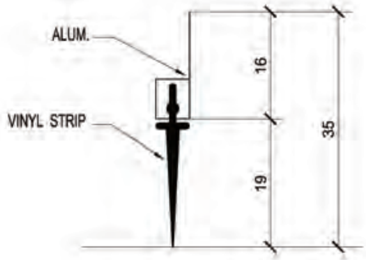


DETAIL OF DOOR LEAF W/ BOTTOM GUIDE
DETAIL A-5

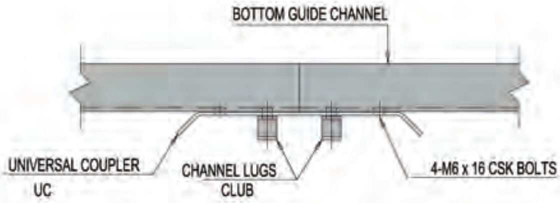
Position all doors (leaf) accurately lined & then second stage of conc. Tobe Done (to have botiom guide in lined after alignment)



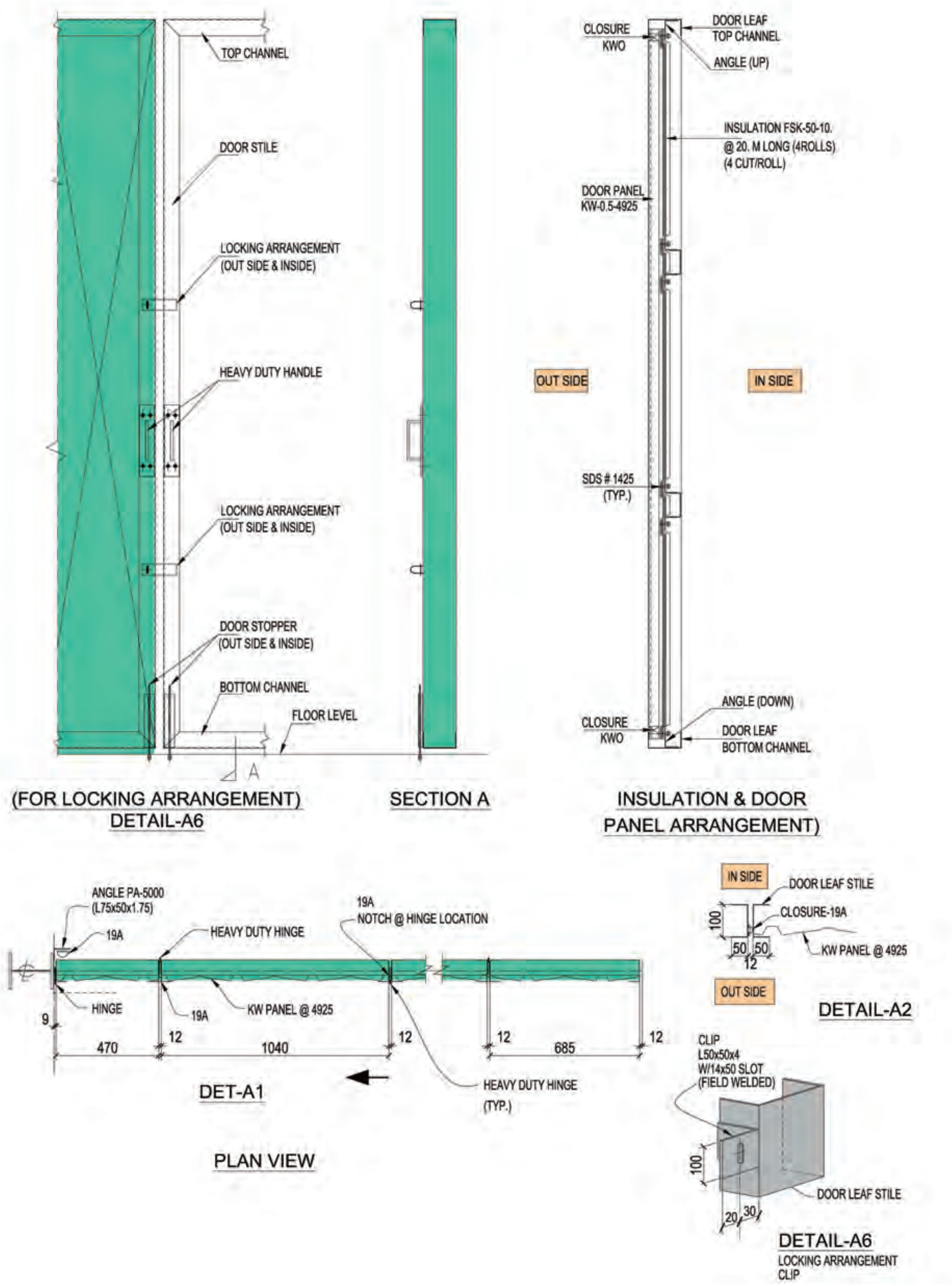
GUIDE CHANNEL ANCHORING DETAIL

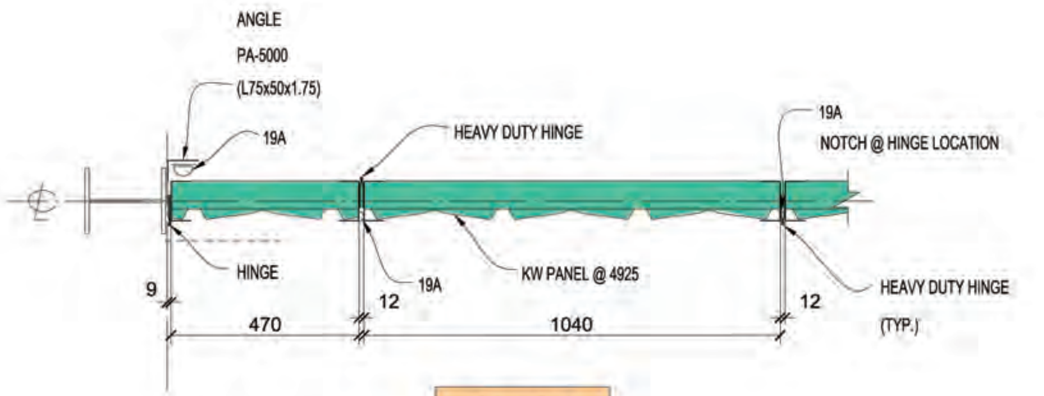


WEATHER STRIP



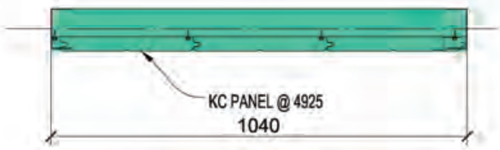
GUIDE CHANNEL SPLICE DETAIL


TOP CHANNEL
DOOR STILE
LOCKING ARRANGEMENT
(OUT SIDE & INSIDE)
HEAVY DUTY HANDLE
LOCKING ARRANGEMENT
(OUT SIDE & INSIDE)
DOOR STOPPER
(OUT SIDE & INSIDE)
BOTTOM CHANNEL
FLOOR LEVEL
A
(FOR LOCKING ARRANGEMENT)
DETAIL-A6
SECTION A
CLOSURE
KWO
DOOR LEAF
TOP CHANNEL
ANGLE (UP)
INSULATION FSK-50-10.
@ 20. M LONG (4ROLLS)
(4 CUT/ROLL)
DOOR PANEL
KW-0.5-4925
OUT SIDE
IN SIDE
SDS # 1425
(TYP.)
ANGLE (DOWN)
CLOSURE
KWO
DOOR LEAF
BOTTOM CHANNEL
INSULATION & DOOR
PANEL ARRANGEMENT)
ANGLE PA-5000
(L75x50x1.75)
19A
HEAVY DUTY HINGE
19A
NOTCH @ HINGE LOCATION
HINGE
19A
KW PANEL @ 4925
9
470
12
1040
12
12
685
12
DET-A1
HEAVY DUTY HINGE
(TYP.)
PLAN VIEW
IN SIDE
DOOR LEAF STILE
CLOSURE-19A
100
50
50
12
KW PANEL @ 4925
OUT SIDE
DETAIL-A2
CLIP
L50x50x4
W/14x50 SLOT
(FIELD WELDED)
100
DOOR LEAF STILE
20
30
DETAIL-A6
LOCKING ARRANGEMENT
CLIP

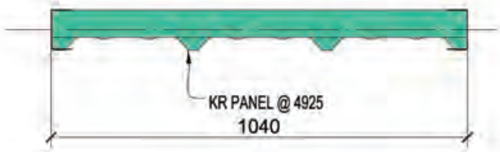


WITH WALL PANEL

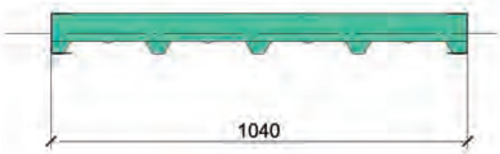
DETAIL - A1
FOLDING SLIDE DOOR LEAF



WITH CONSEALED PANEL

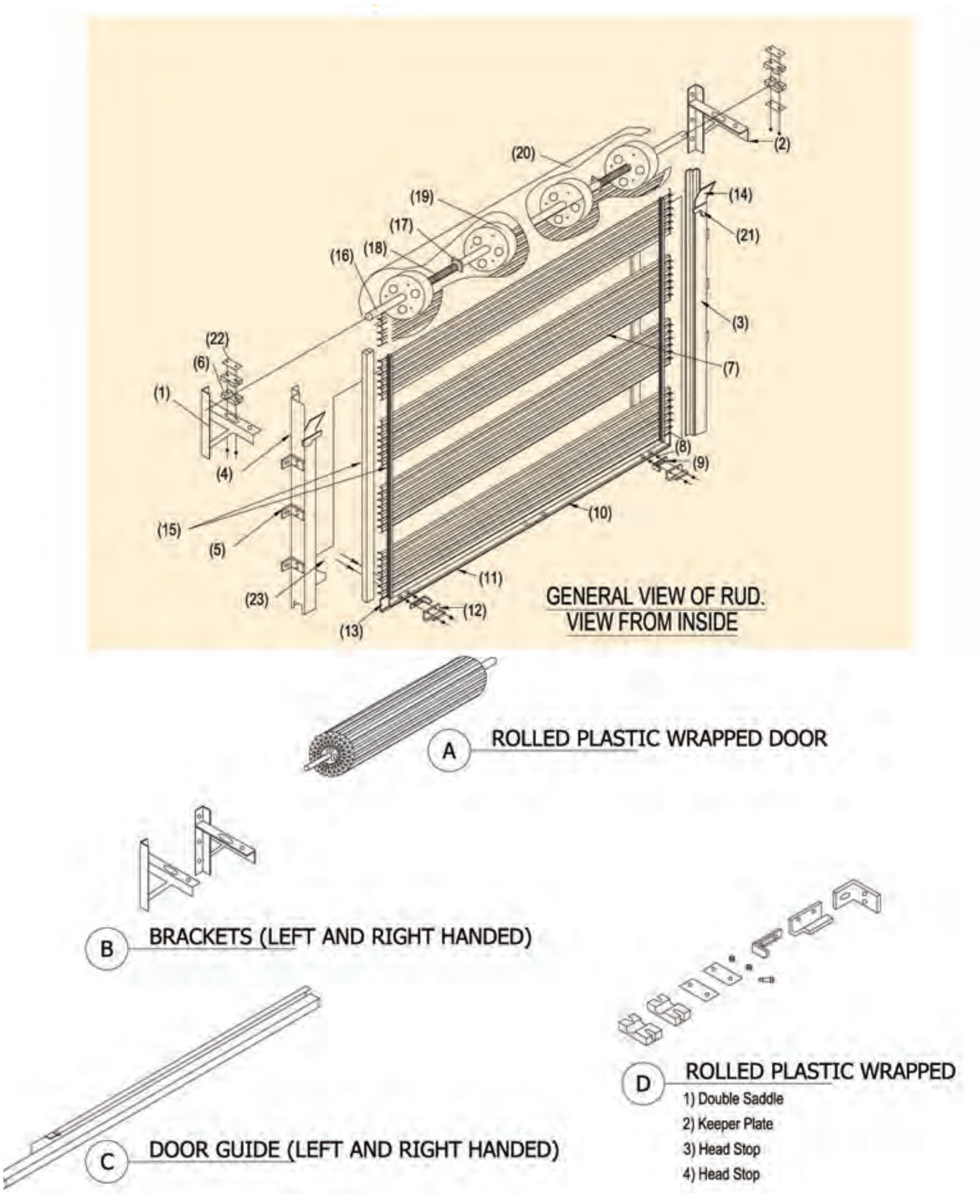


WITH KR PANEL



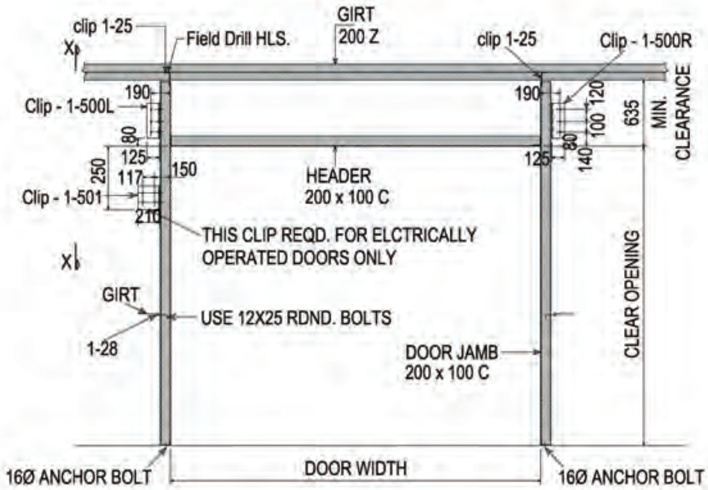
WITH KW PANEL

7.12 ROLL-UP DOOR DETAILS

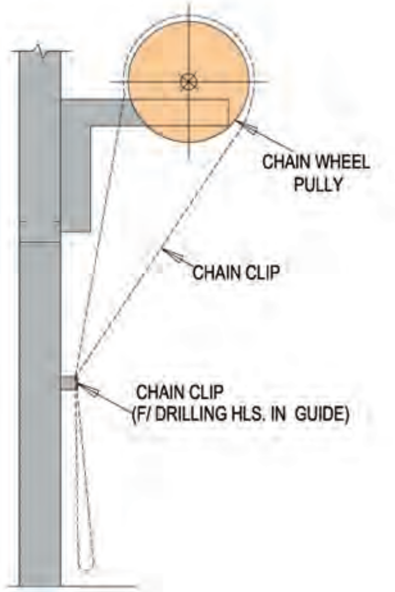


Part list:

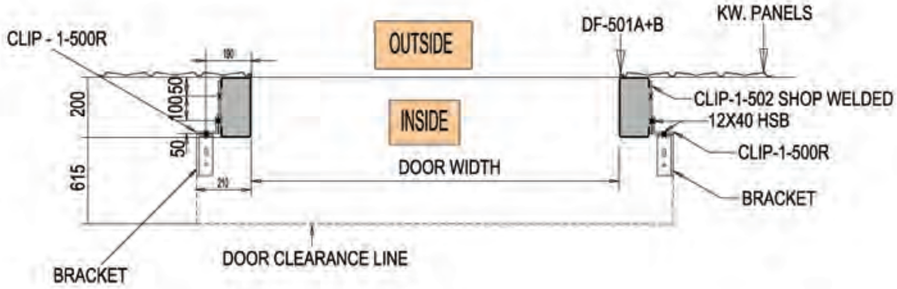
1-2	Left & Right Brackest	10	Bottom Bar Angle
3-4	Right & Left Door Guide	11	WEATHER STRIP
5	Guide Brackets	12	HEAD STOP
6	Double Saddle	13	ALUM. STRIP
I	Door curtain	16-20	Axle- Spring BKT.
8-9	Locking Assembly	21	CUSHION HEAD STOP
9A-9B	Outside & Inside Locking Bar	22	KEEPER PLATE
		23	JAMB



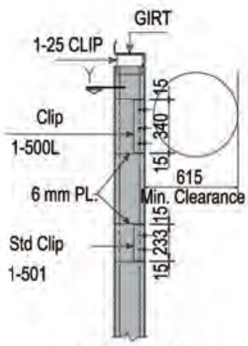
ELEVATION (VIEW FROM INSIDE BLDG.)
ROLL UP DOOR
(USE 12 X 30 MS BOLTS. FOR F.O.) (U. NTD.)



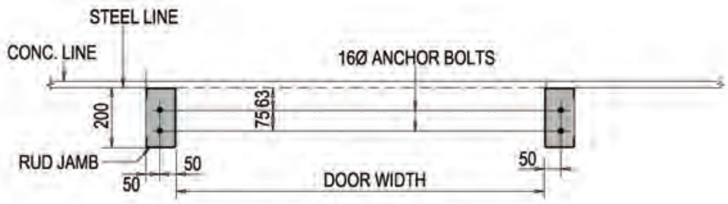
View X1
Showing Drive Chain



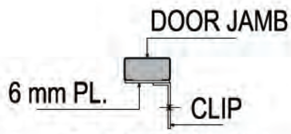
PLAN



VIEW X-X



ANCHOR BOLT PLAN

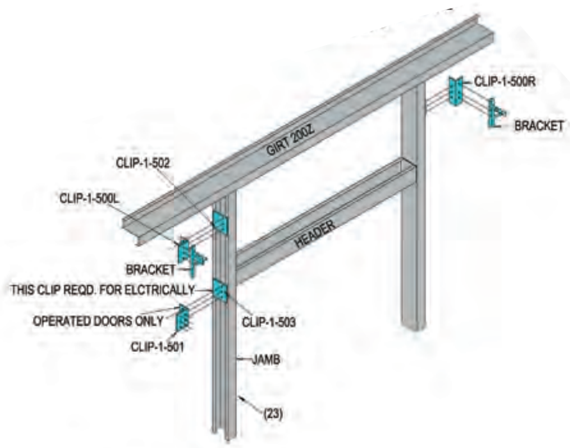


SECTION Y

7.12 ROLL-UP DOOR DETAILS

Step-1 bracket fixing:

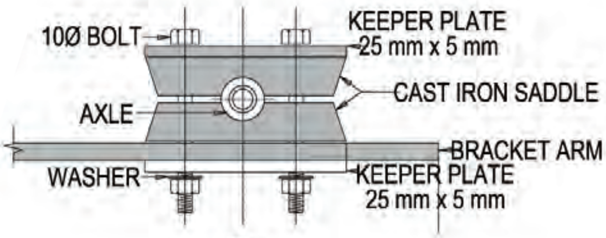
1. Fix left & right bracketto the clip 1-500l & 1-500r respectively
2. General tolerance for rud. Framing dimension shall not exceed+/- 2 mm for vertical & horizontal level.
3. Check all dimension and make sure that the dimension are within tolerance limits before assembling door.



Step-2 position door on bracket:

With the door correct way round (the curtain rolls down rear of the opening) carefully lift door onto the brackets, using block and tackles attached to the door axles, or other suitable lifting equipments.

A. Do not cut the band that holds the door in a roll.
B. Rest axle between two cast iron saddles and loosely secure to bracket arms with keeper plate, bolts, nuts and washer provided. See sketch b below. If chain gear is fitted, ensure that the chain is placed around the chain wheel and hangs down freely. As shown in view x1

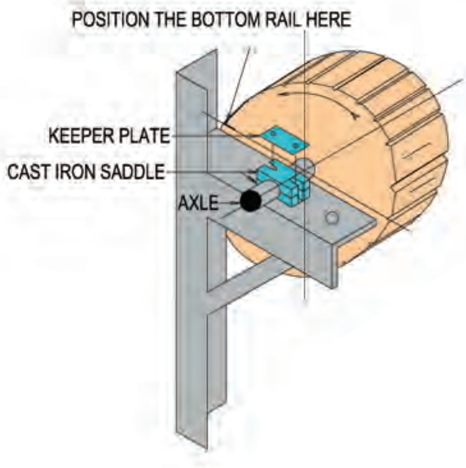


(B)

Before tightening saddle bolts, position the door

1. So that it overlaps the opening evenly both side.
2. So that the axle is positioned on the bracket arm slots as far forward

Possible, while still allowing the bottom rail to pass the lintel or header when the door roll is rotated. See sketch a. 3) Rotate both the door and the axle so that bottom rail is level with bracket arm . See sketch a.

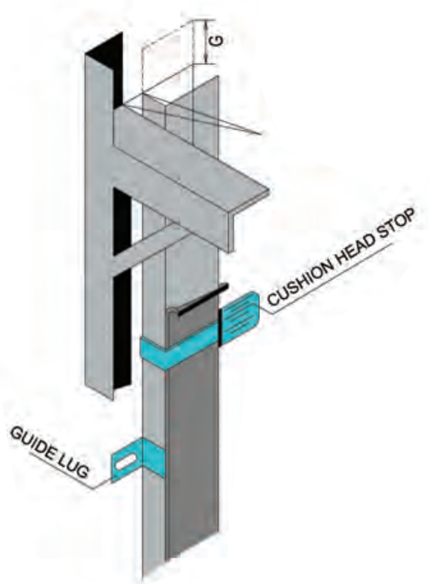


(A)

Fixing or above the bracket arm
by dimension 'G' for restricted headroom

Door height	dimension 'G'
upto4200mm	65mm
4200mm to 5100 mm	45mm

Step 3 Install guide:

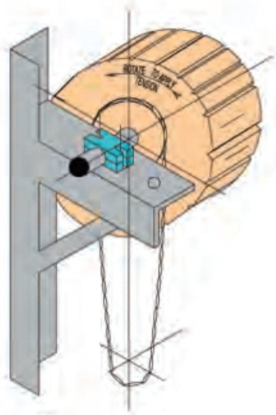


Guide must be the correct length, top of the guide should be level with top of bracket arm for door height. If guides need to be shortened cut from the bottom of guide.

Position the guide true and plumb of each side of the opening allowing 3-4 mm of working clearance between the door and the inside of each guide, mark, drill and fix both the guides with coach screw and washer supplied.

Step 4 Spring tensioning and bottom rail sto:

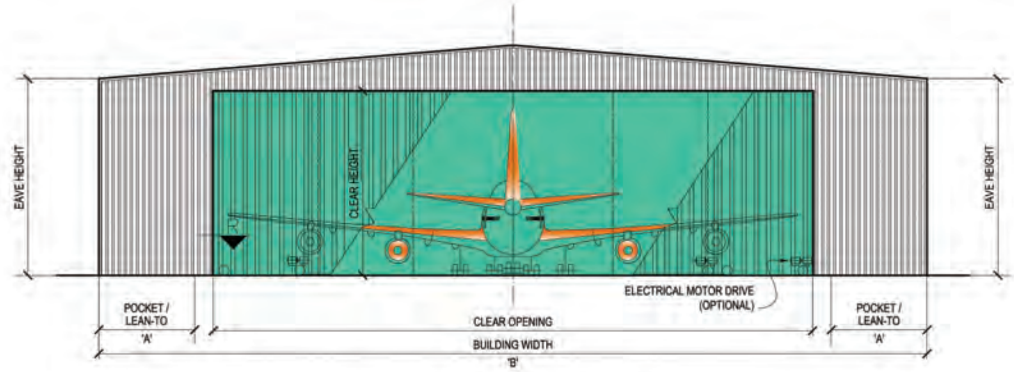
Check top of the guide-in to ensure that the door does not make contact when rotated apply tension to spring by rotating door approximately two complete turn in a forward direction (see arrow on sketch a) after ensuring axle is securely clamped. The amount of tension required for satisfactory operation may vary with individual doors, depending on size. Hold the door firmly cut the bands, feed the door down into guides below the head stop. Fit bottom rail stop using self locking nuts provided. Allow the door to rise and to rest against head stop.
(See sketch b)
Operate door up and down a number of times to check the operation.



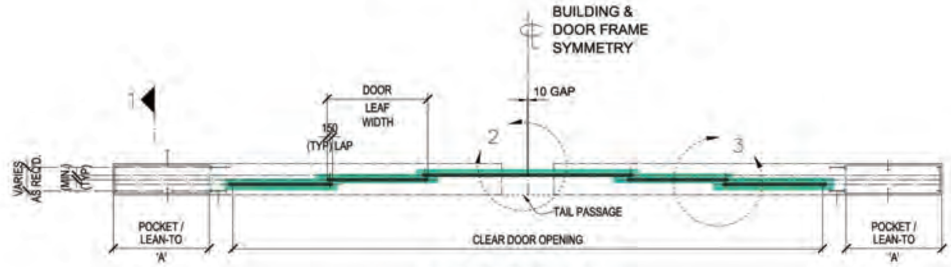
(A)

(B)

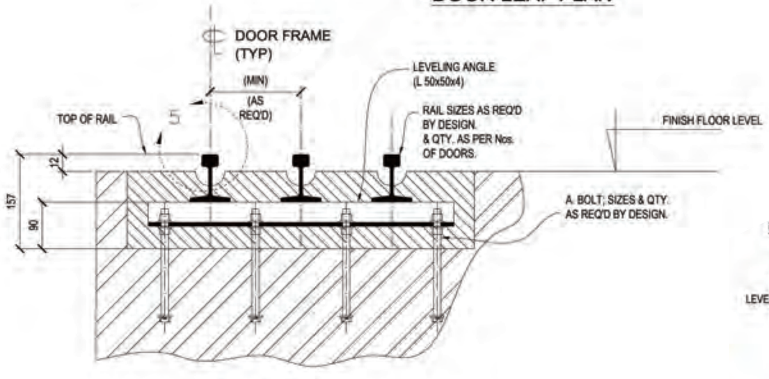
7.13 HANGAR DOOR DETAILS



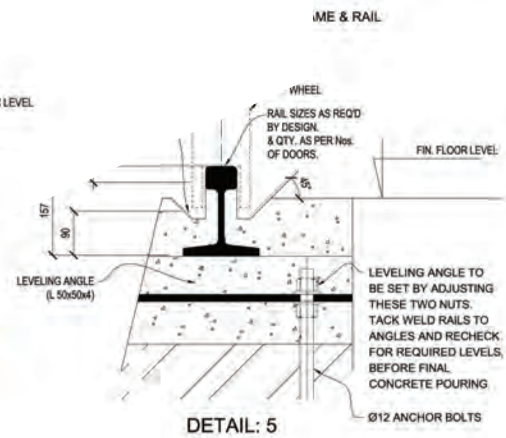
HANGAR DOOR ELEVATION



DOOR LEAF PLAN



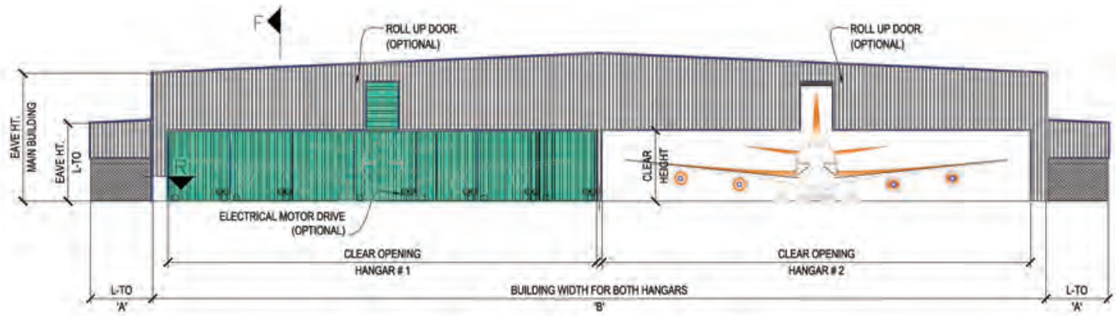
SECTION: 1



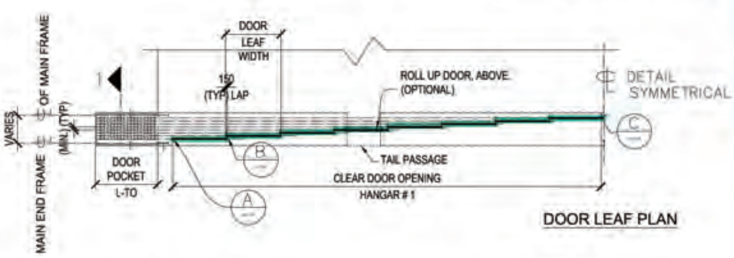
DETAIL: 5

NOTE :

1. Clear height & clear opening are customers' option.
2. Dimensions 'a' & 'b' are determined by type of doors, cladding etc.
3. For common usage customer is required to specify the range of aircraft to be considered.



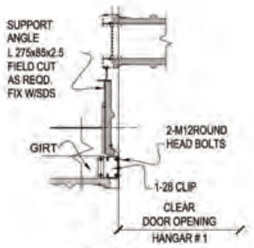
HANGAR DOOR ELEVATION



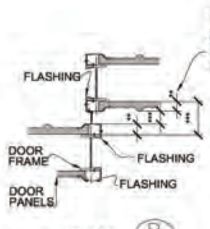
DOOR LEAF PLAN

1. Clear height & clear opening are customers' requirement.
2. Dimensions 'a' & 'b' are detirmined by type of doors, cladding etc.
3. For common usage customer is required

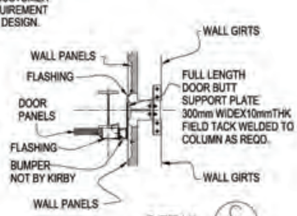
To specify the range of aircraft to be considered.



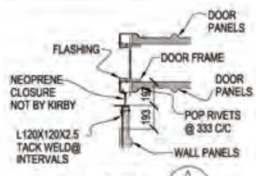
SECTION: R



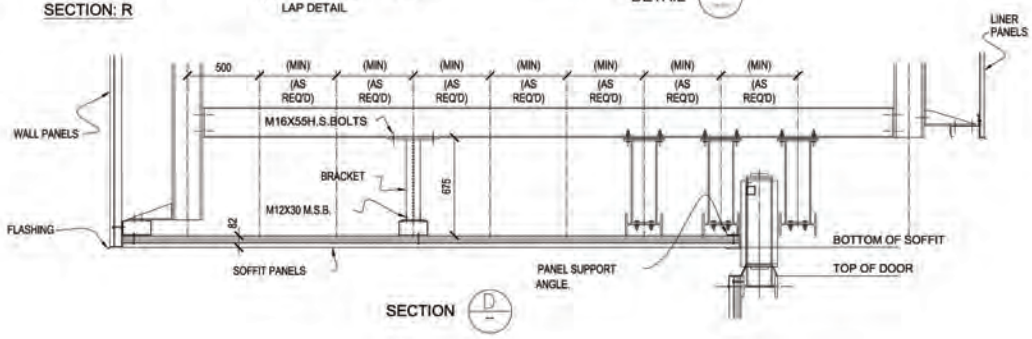
DETAIL B
(TYP) DOOR LEAF LAP DETAIL



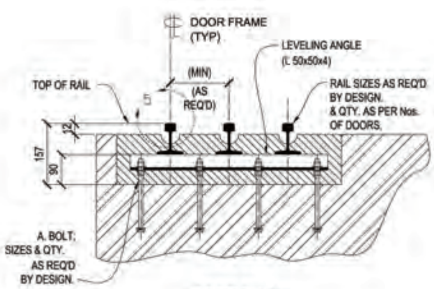
DETAIL C



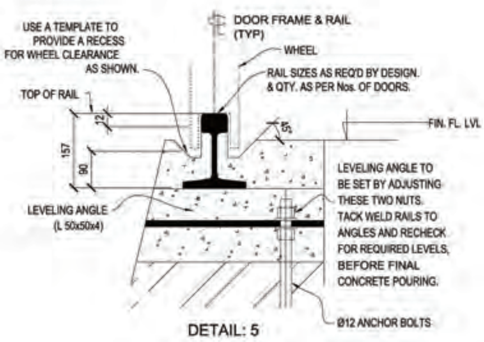
DETAIL A



SECTION D

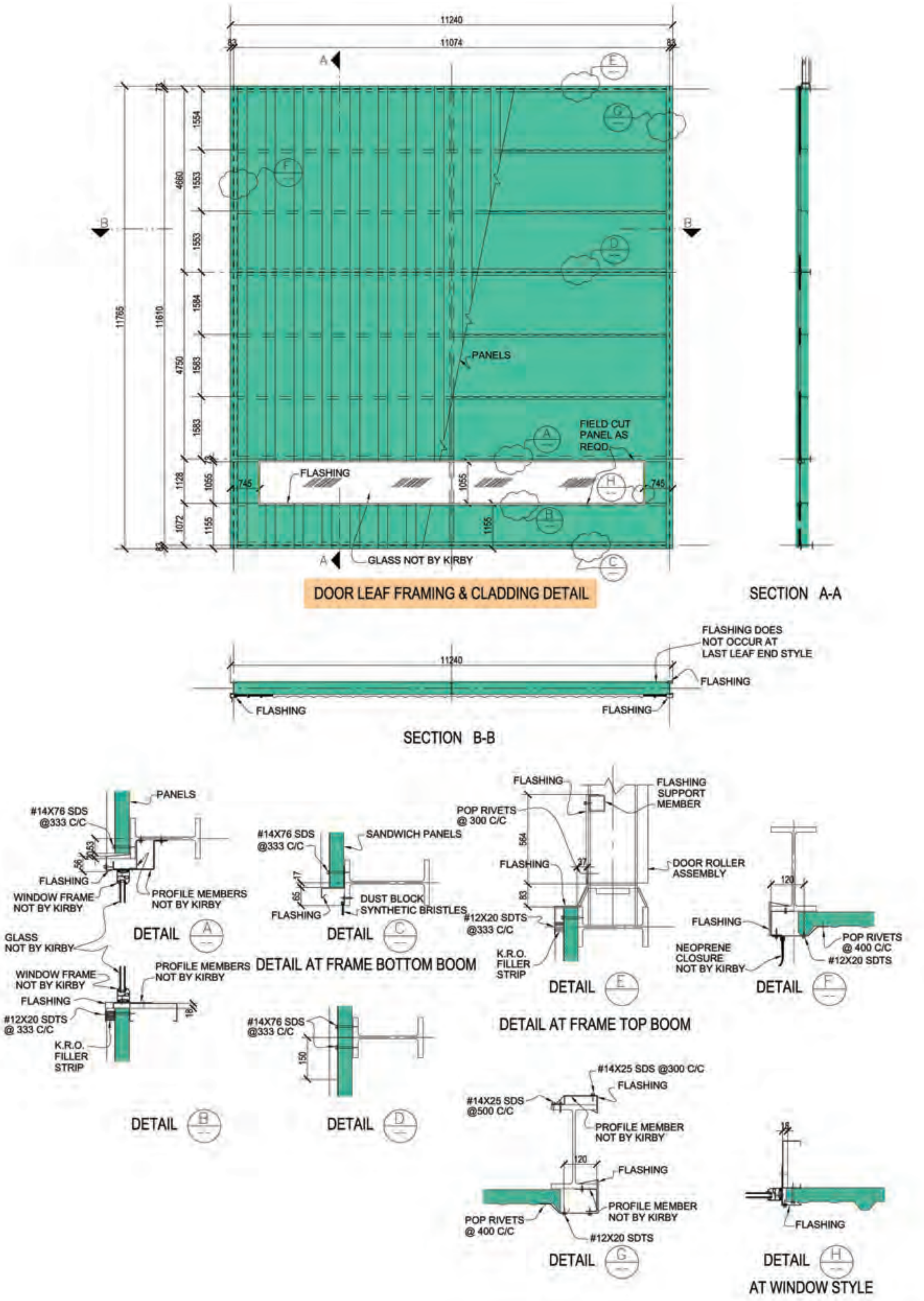


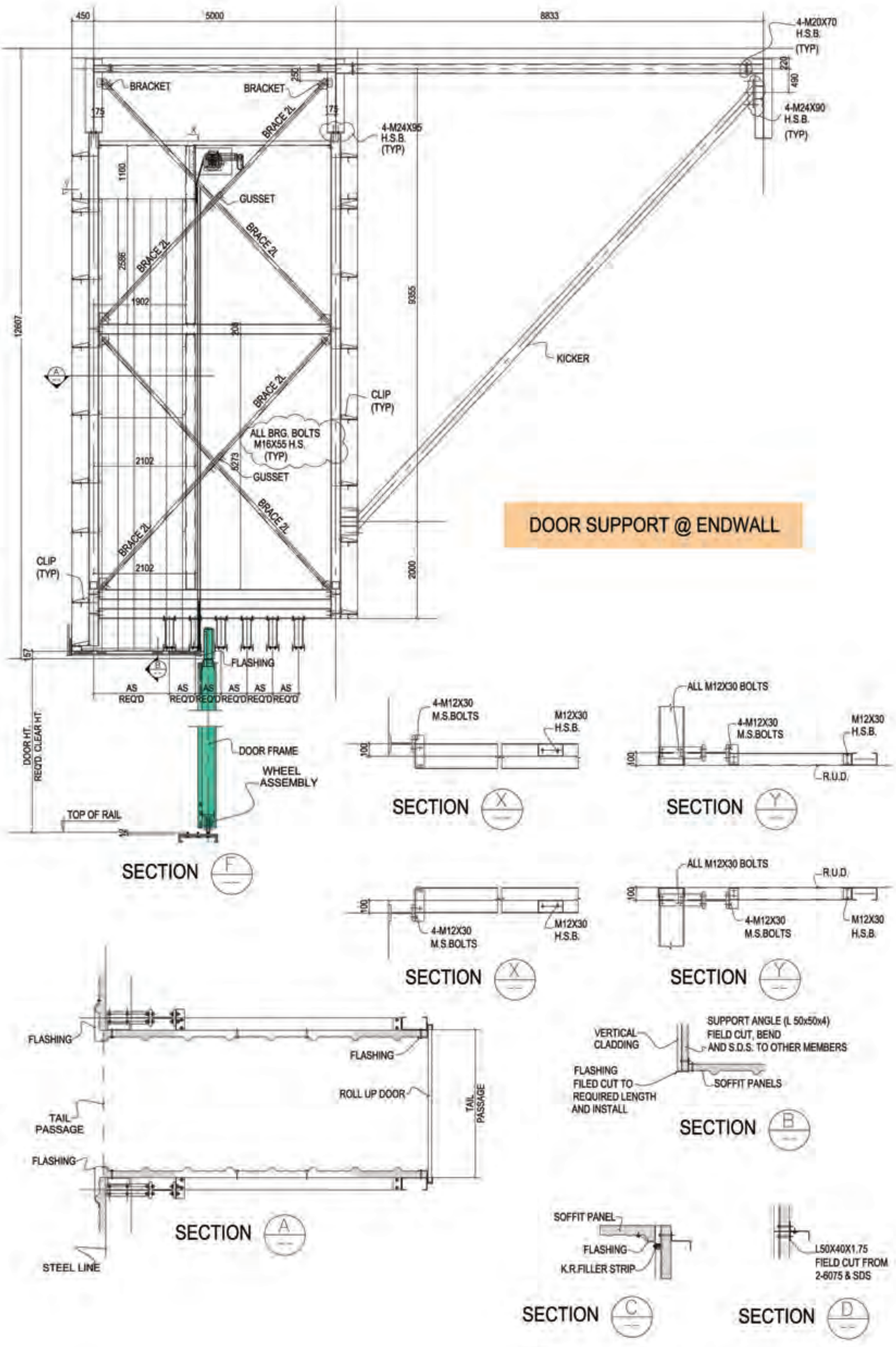
SECTION: 1



DETAIL: 5

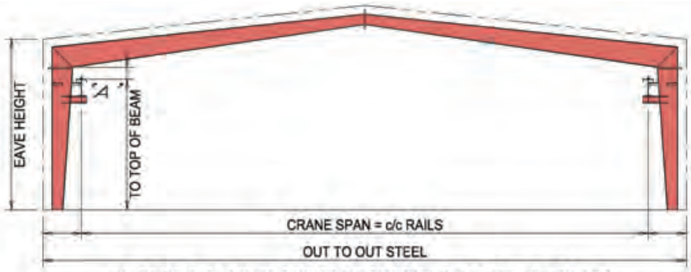
7.13 HANGAR DOOR DETAILS



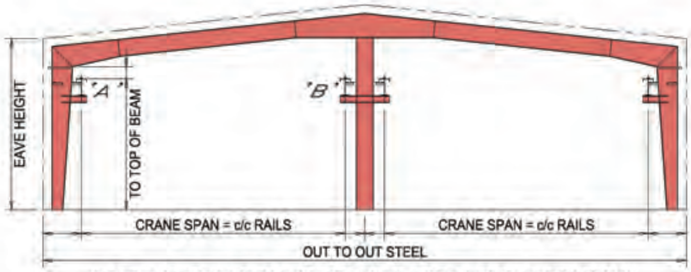


DOOR SUPPORT @ ENDWALL
BRACKET
BRACE 2L
GUSSET
KICKER
CLIP (TYP)
ALL BRG. BOLTS M16X55 H.S. (TYP)
4-M20X70 H.S.B. (TYP)
4-M24X90 H.S.B. (TYP)
4-M24X95 H.S.B. (TYP)
FLASHING
DOOR FRAME
WHEEL ASSEMBLY
TOP OF RAIL
DOOR HT. REQ'D CLEAR HT.
AS REQ'D
SECTION F
4-M12X30 M.S.BOLTS
M12X30 H.S.B.
SECTION X
ALL M12X30 BOLTS
R.U.D.
SECTION Y
FLASHING
TAIL PASSAGE
ROLL UP DOOR
STEEL LINE
SECTION A
VERTICAL CLADDING
SUPPORT ANGLE (L 50x50x4) FIELD CUT, BEND AND S.D.S. TO OTHER MEMBERS
FLASHING FILED CUT TO REQUIRED LENGTH AND INSTALL
SOFFIT PANELS
SECTION B
SOFFIT PANEL
K.R.FILLER STRIP
SECTION C
L50X40X1.75 FIELD CUT FROM 2-6075 & SDS
SECTION D

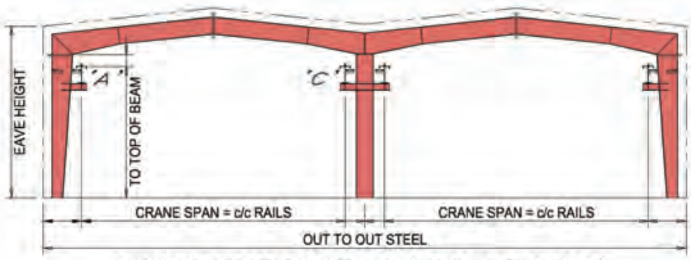
7.14 CRANE SYSTEM DETAILS



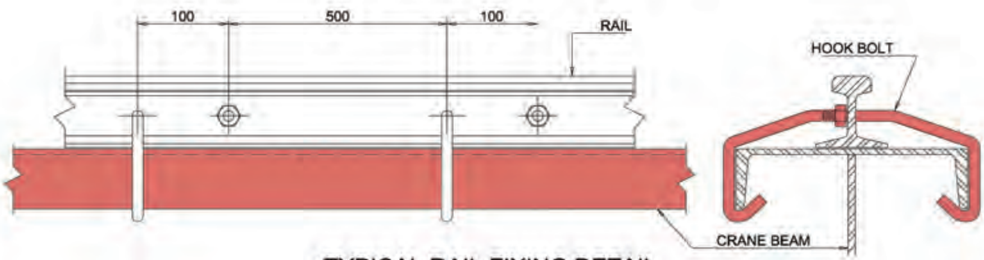
CROSS SECTION AT CRANE (RIGID FRAME)



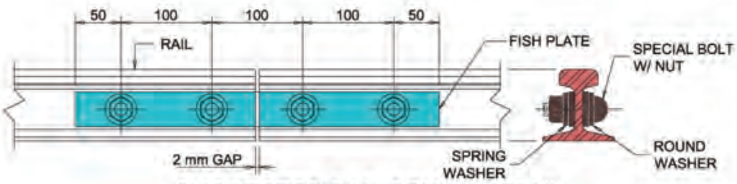
CROSS SECTION AT CRANE (BEAM & COLUMN)



CROSS SECTION AT CRANE (MULTI-SPAN)

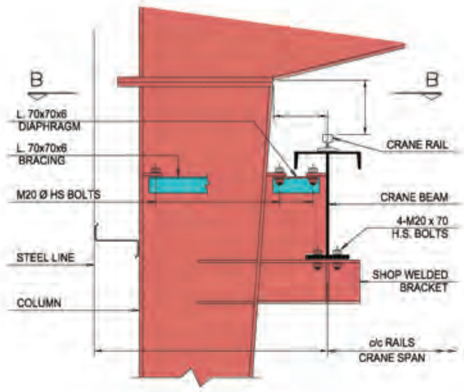


TYPICAL RAIL FIXING DETAIL

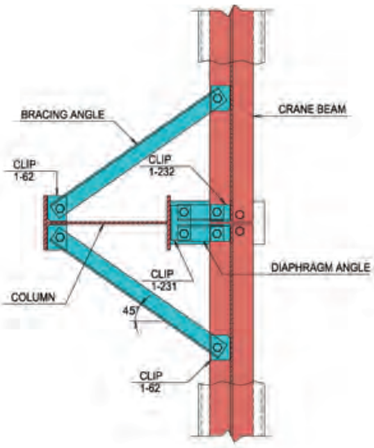


SUGGESTED RAIL SPLICE DETAIL

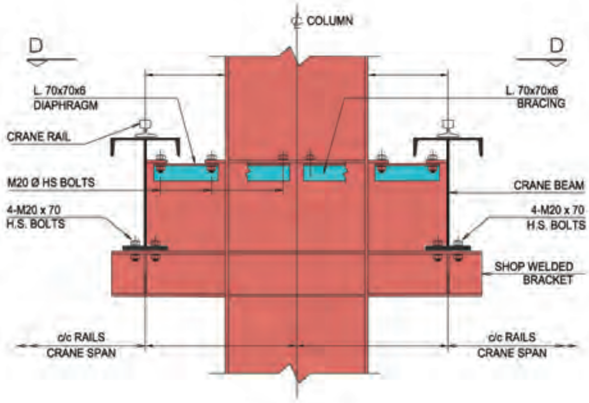
7.14 CRANE BEAM & RAIL DETAILS



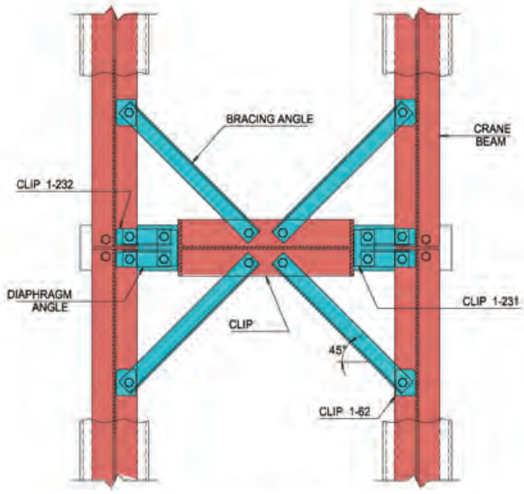
DETAIL 'A'

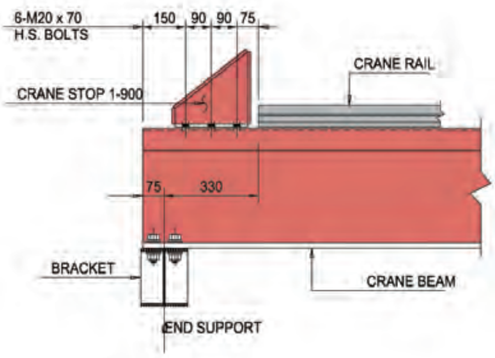


PLAN B-B



DETAIL 'C'



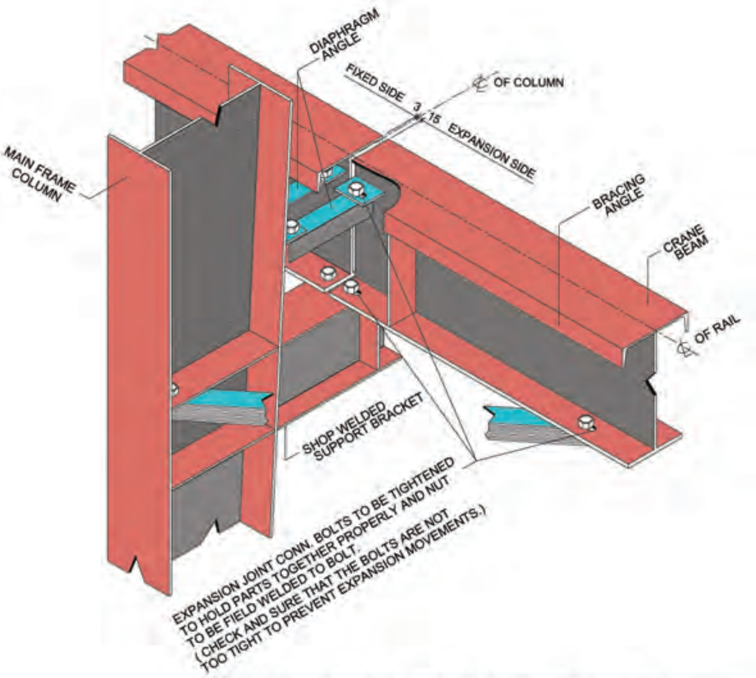


DETAIL AT CRANE STOP

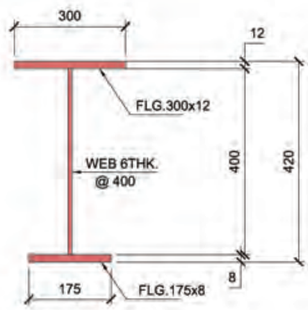
NOTE :

Crane beam support bracket is provided with slotted holes for easy assembly of bracing and diaphragm angles. Adjustment of rail centers are to be carried out by hook bolts. Where welded bar rails are used, the adjustment of rail centers are carried out by cranebeam. After aligning, if the bracing and diaphragm angles does not fit properly, weld them at the column end to their Respective clips. Scrapepaint at welding area. Repaint all field welds.

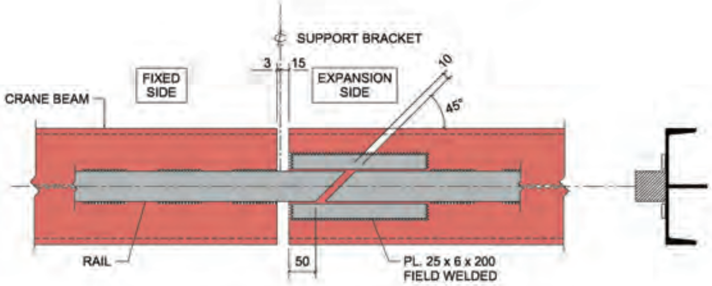
7.14 CRANE BEAMS & RAILS- EXPANSION JOINT DETAILS



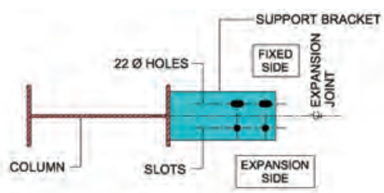
CRANE BEAM EXPANSION JOINT DETAILS



DETAIL OF CRANE BEAM

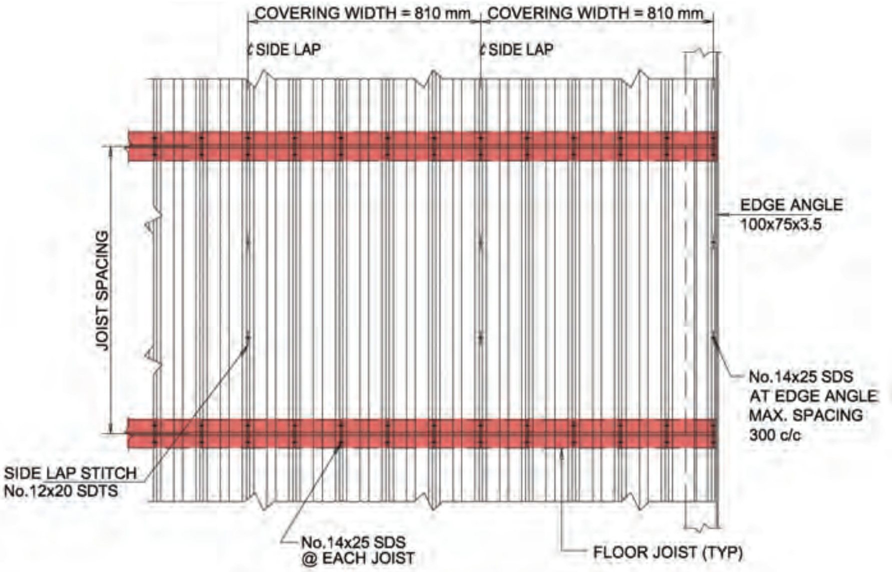


CRANE RAIL EXPANSION JOINT DETAILS
RAIL BY OTHERS

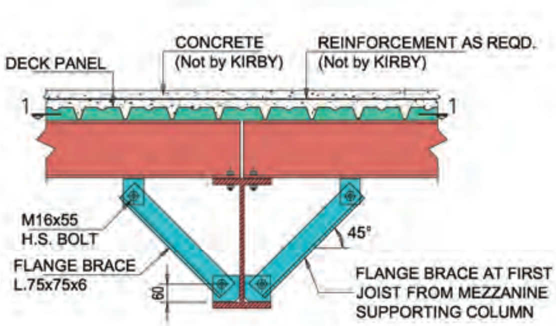


DETAIL OF SUPPORT BRACKET
AT EXPANSION JOINT

7.15 MEZZANINE DETAILS

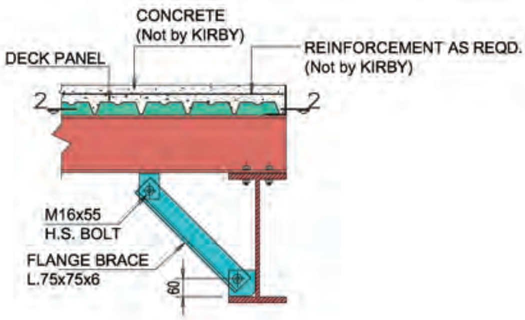


DECK PANEL FASTENER LAYOUT



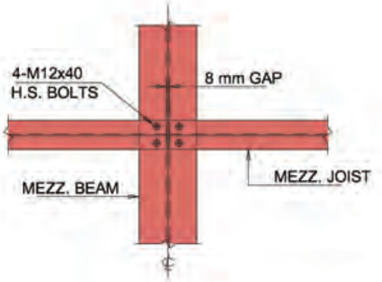
DETAIL - A

AT INTERMEDIATE BEAM

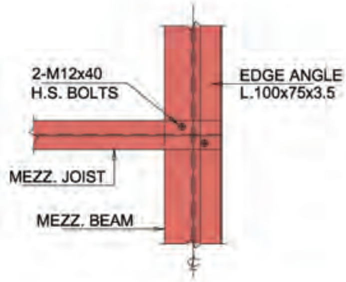


DETAIL - B

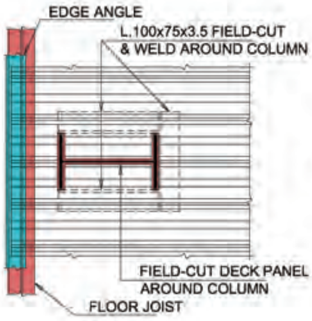
AT END BEAM



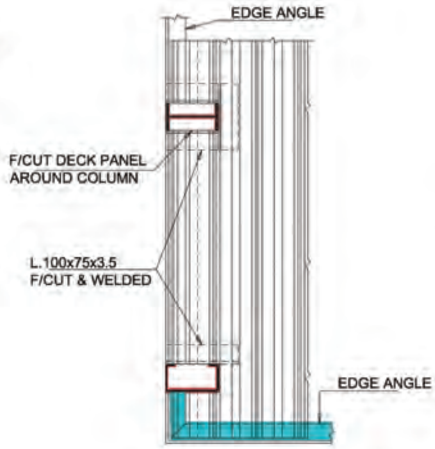
PLAN 1-1



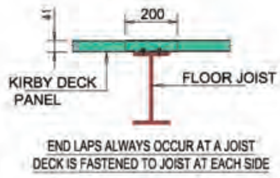
PLAN 2-2



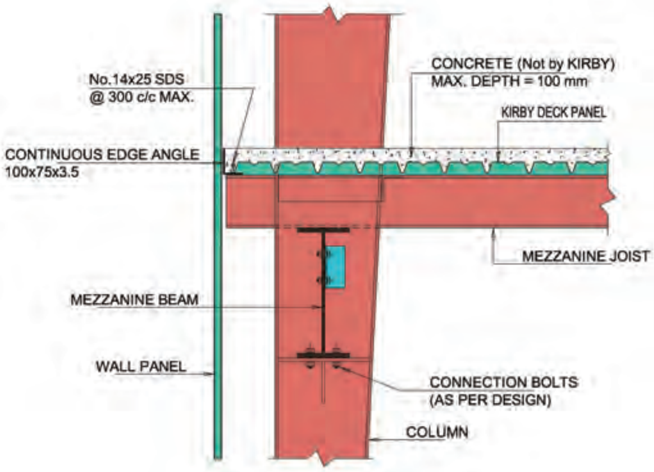
DETAIL - E
PLAN AT RIGID FRAME COLUMNS



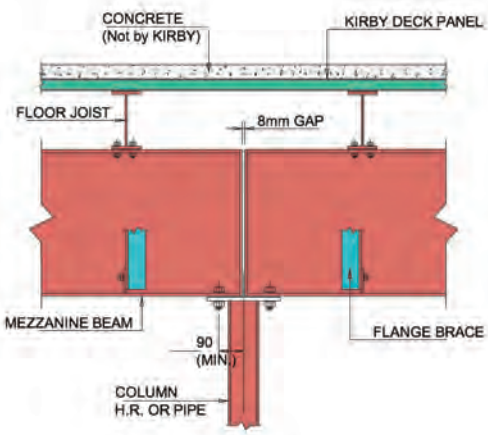
DETAIL - F
PLAN AT WIND COLUMNS



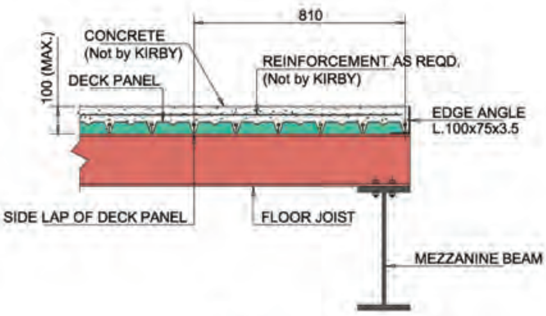
DETAIL - G
DECK PANEL END LAPS



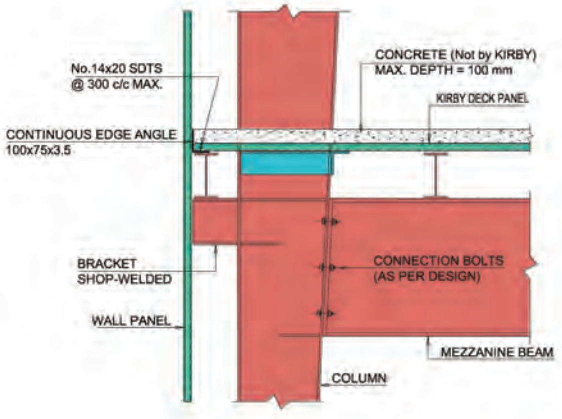
DETAIL - D
MEZZANINE BEAM FRAMING TO COLUMN WEB



DETAIL - H
MEZZANINE SUPPORT COLUMN

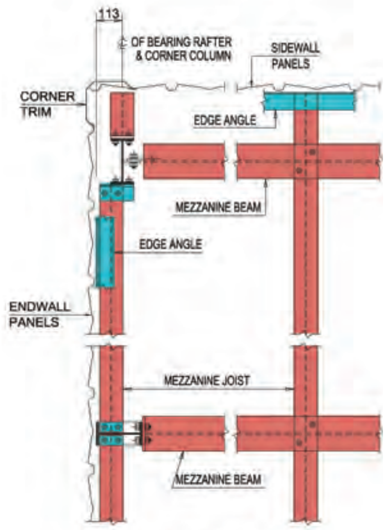


DETAIL - J
PANEL SIDE LAPS



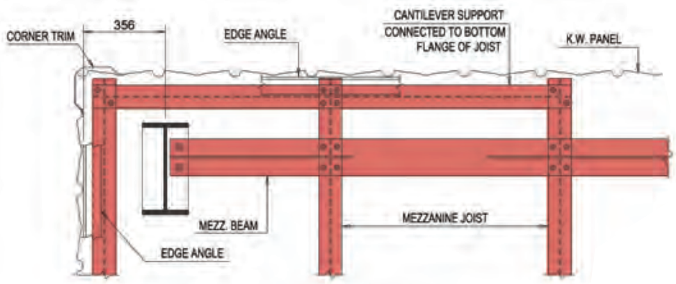
DETAIL - C

MEZZANINE BEAM FRAMING TO COLUMN FLANGE



DETAIL - K

MEZZANINE FRAMING PLAN
AT BEARING FRAME ENDWALL



DETAIL - L

MEZZANINE FRAMING PLAN
AT MAIN FRAME ENDWALL

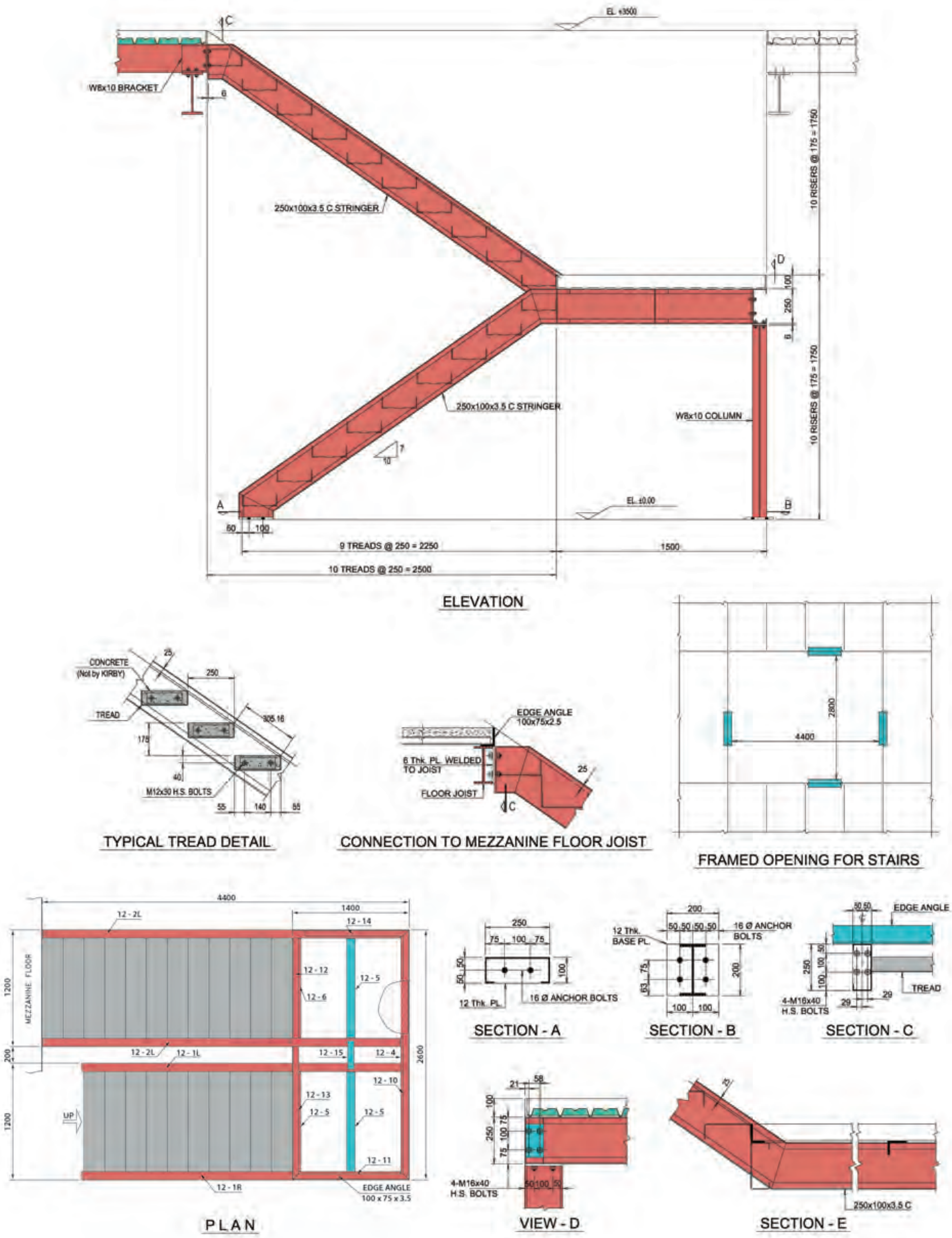
Design data:

1. Large openings in the mezzanine slab which require the partial removal of steel joists must be specified in size and location to 'kirby' and will require steel framed openings. Any loading, from staircase, for example, on the steel framed openings must be defined in magnitude and location. The supply of staircase by 'kirby' is limited to only when top of concrete is at 3.5 And 4.0 M from bottom of base plate.
2. Mezzanine i flat roof live load must be specified in addition to any loadings from floor finishes, suspended ceiling, mechanical ducts, piping, etc.
3. Top elevation of concrete or clearance under steel Joists i beams must be specified.
4. Depth of mezzanine construction varies between 60 em And 100 em depending on loading support column Spacing and other design criteria.

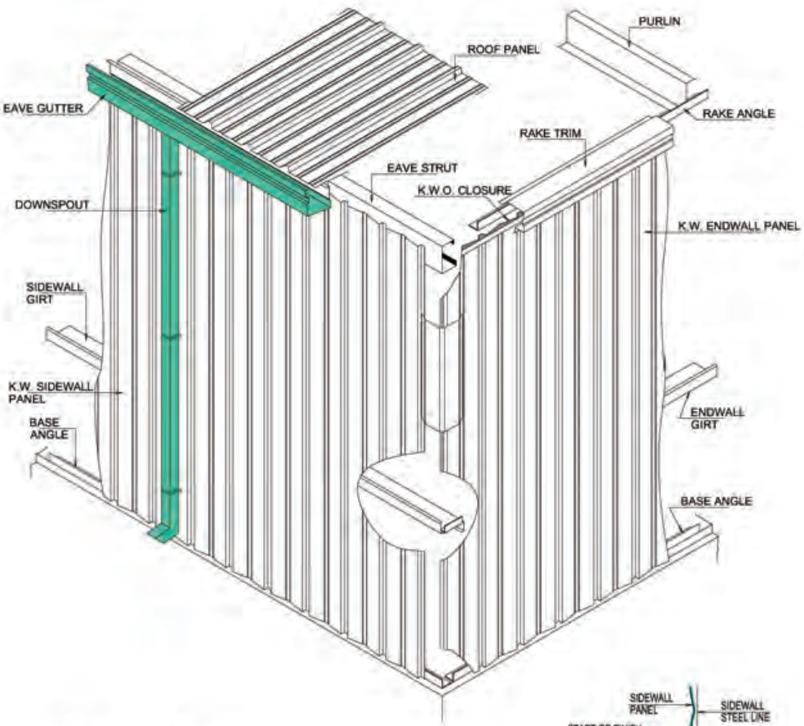
General notes:

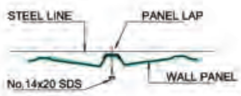
1. Mezzanine floors and flat roofs are designed for concrete slab of a maximum thickness of 100mm including the thickness of corrugated 'kirby' deck panel.
2. Concrete is not the responsibility of kirby building systems and must be designed by a qualified civil engineer.
3. Reinforcing steel or wire mesh shall be placed in the concrete as required by the design and in accordance with the concrete compressive strength and recognized Building codes.
4. Live load deflection of structural members are limited to L/240 unless otherwise required or specified.
5. The mezzanine deck panel is considered to carry only the Weight of the concrete (100mm maximum thickness).
6. The concrete slab should be designed to carry the full Live load and any additional floor finishes.
7. Concentrated loads due to storage of materials and Placing of concrete should be avoided.
8. Mezzanine deck panels must be fastened at every Corrugation to mezzanine joist using s.O.S. Fasteners.
9. Openings in the mezzanine slab between steel joists May be made without affecting the steel mezzanine Framing, provided proper reinforcement around the Openings is considered in the design of the slab.

7.15 STAIRCASE DETAILS



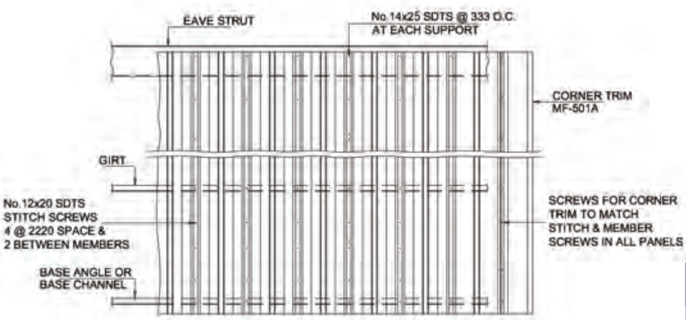
7.16 WALL PANEL & DOWNSPOUT DETAILS





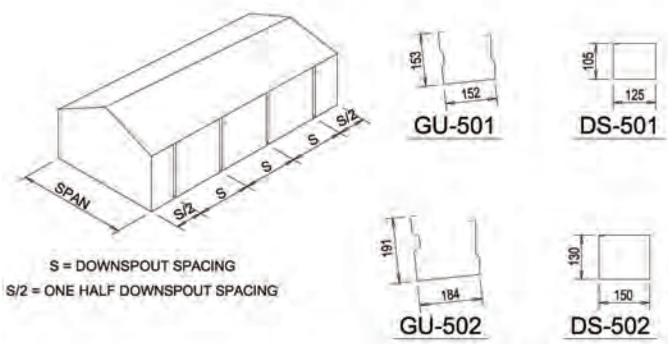
SECTION AT VERTICAL LAP

CORNER DETAIL



K.W. WALL PANEL FASTENER LAYOUT

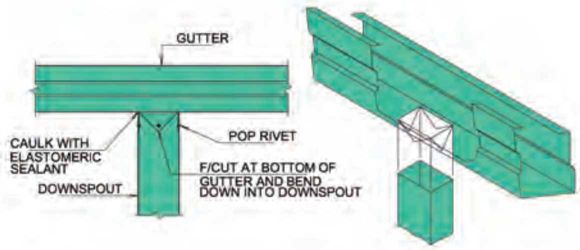
SDS I SOTS TABLE		
INSULATION SIZE	PANEL TO STRUCTURE	PANEL TO PANEL
0 to 60	No. 14 x 25	No. 12 x 20
75 to 100	No. 14 x 50	No. 12 x 20
110 to 150	No. 14 x 76	No. 12 x 20



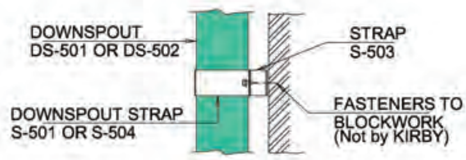
GUTTER & DOWNSPOUT REQUIREMENTS

Span	Down-spout spacing
6,9&12m	24.0 m O.C.
15m	22.0 m O.C.
18m	19.0 m O.C.
20m	17.5 m O.C.
24m	15.0 m O.C.
30m	13.0 m O.C.
36m	11.0mo.C.
42 m	10.0 m O.C.
45 m	9.5mO.C.

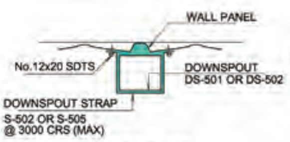
Span	Down-spout Spacing
48 m	13.5 m O.C.
54m	12.5 m O.C.
60 m	11.5mo.C.
72 m	10.0 m O.C.
84m	8.5mo.C.
96 m	8.0mo.C.



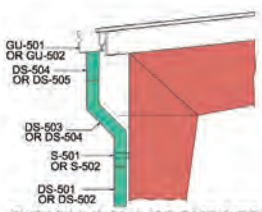
GUTTER & DOWNSPOUT ASSEMBLY



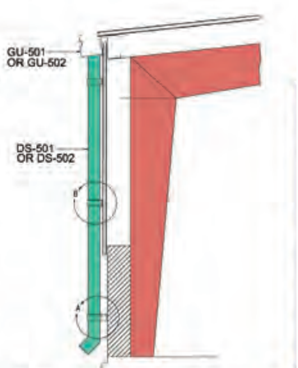
DETAIL `A'



DETAIL `B'



TYPICAL DOWNSPOUT DETAIL
AT FULLY OPEN SIDEWALL

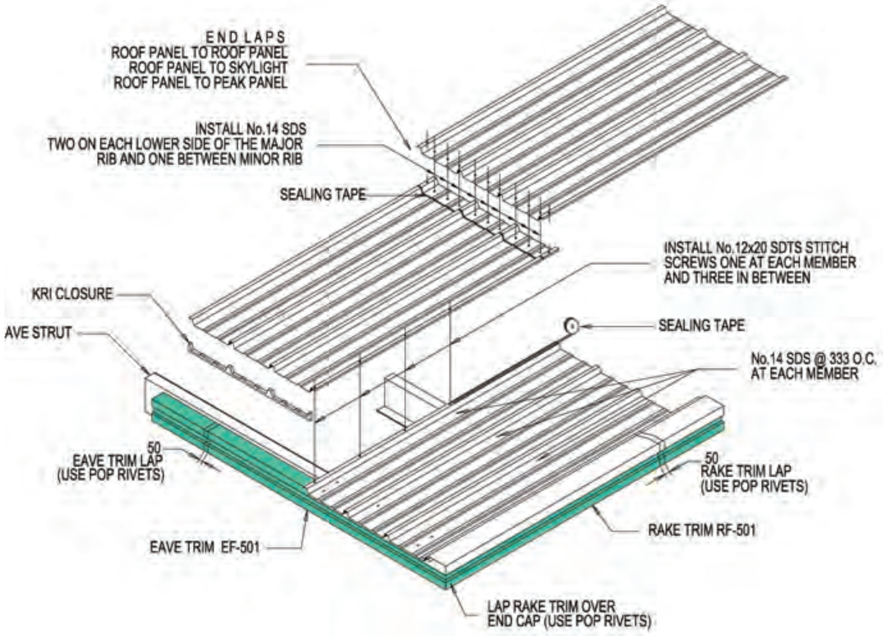


TYPICAL DOWNSPOUT DETAIL
AT PARTIALLY OPEN SIDEWALL

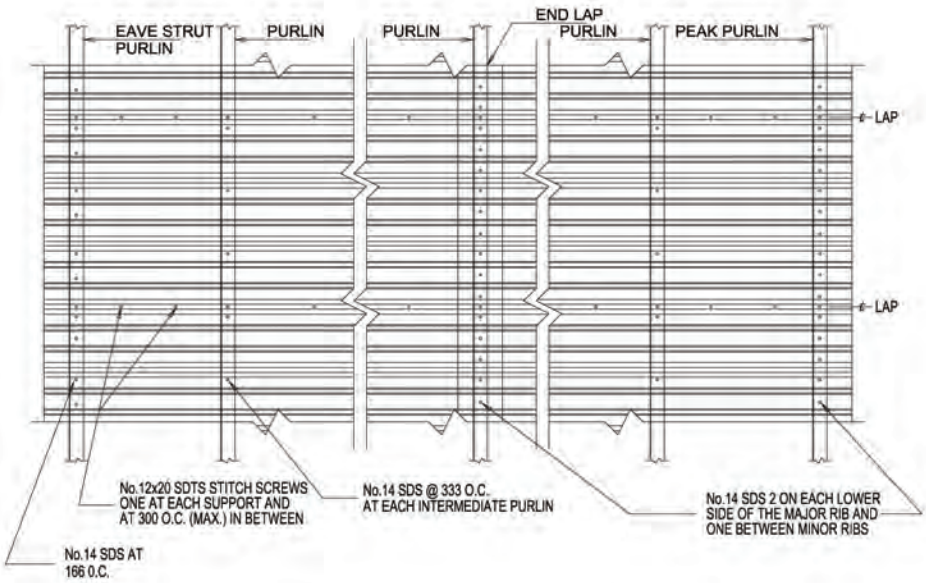
General notes

1. Panel module- there is a plus or minus tolerance Bull t into K.W. Panel.
   Measure and mark *1000 O.C. (Begining on the Steel line for endwalland '167 from steel Line for sidewall) along base angle to check Any dimensional gain or loss during installation.
   *Dimensions are applicable for buildings having 333 Increments. Refer building installation drawings for others.
2. Foundation must be square, level and of correct Out to out dimensions for the required building.
3. Building must be tight and plumb before Sheeting begins.
4. Installation of panels should always Be as showm in section 'a-a'.
5. Building installation crew is to clean all wall panels Before leaving job site.

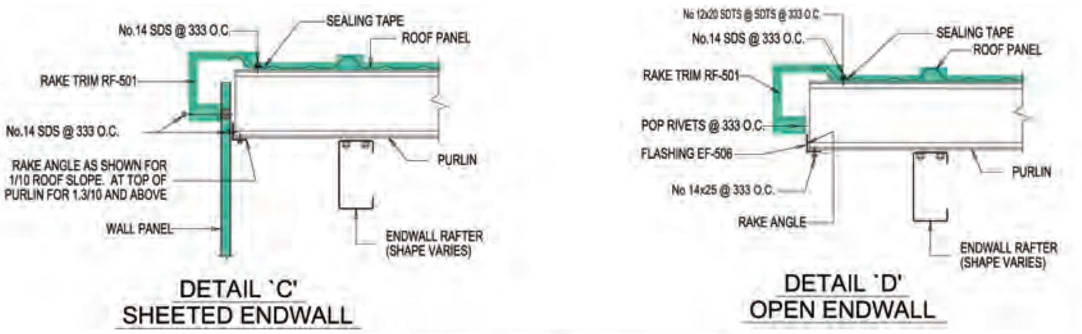
7.16 WALL PANEL DETAILS WITH EAVE TRIM



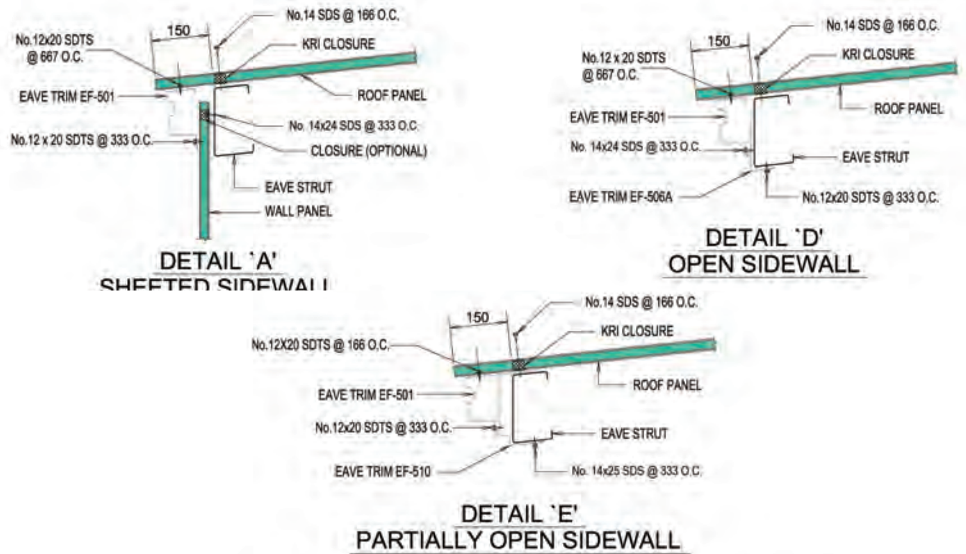
ROOF PANEL INSTALLATION



ROOF PANEL FASTENER LAYOUT



RAKE SECTIONS



SIDE WALL EAVE SECTIONS

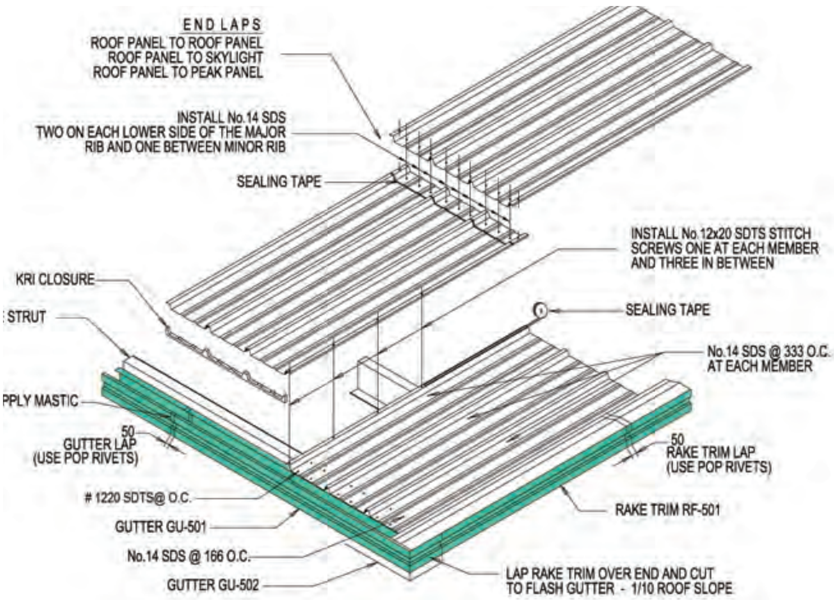
General sheeting notes

1. The building is to be tight and plumb before sheeting is to begin.
2. Sheeting is to begin at the leeward end of building so that all Panel laps will be away from prevailing wind.
3. Skylights receive same screw pattern as roof panels except Skylight to skylight stitch. Use grommet screws at this Condition.
4. After building installation, fill all unused screw holes in the roof with No. 17X20 self tapping screws.
5. Building installation crew is to sweep roof panels clear of all metal shavings.

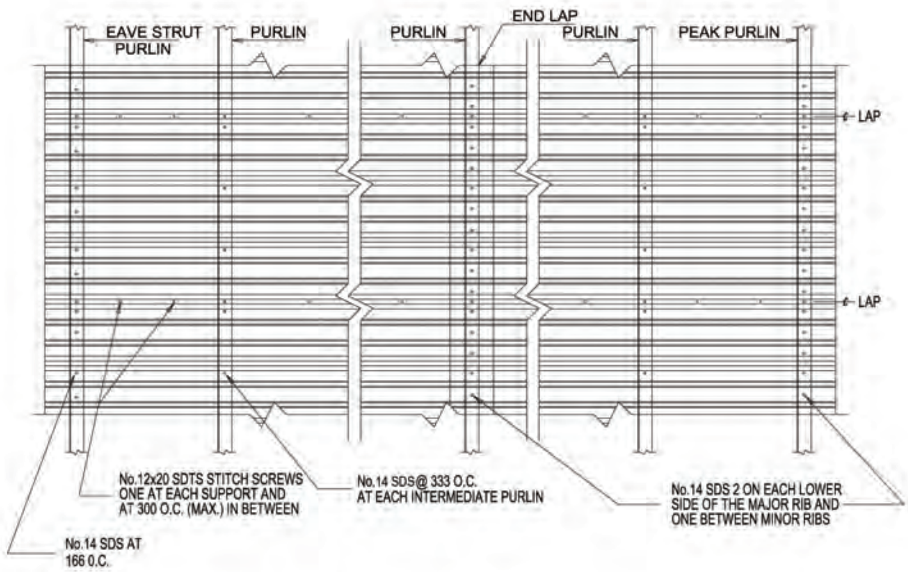
6. All dimensions are in millimeters.

SDS I SOTS TABLE		
INSULATION SIZE	PANEL TO STRUCTURE	PANEL TO PANEL
0 to 60	No. 14 x 25	No. 12 x 20
75 to 100	No. 14 x 50	No. 12 x 20
110 to 150	No. 14 x 76	No. 12 x 20

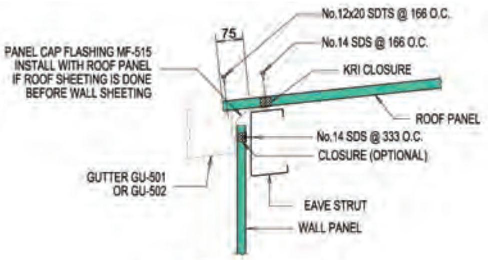
7.16 WALL PANEL DETAILS WITH EAVE GUTTER



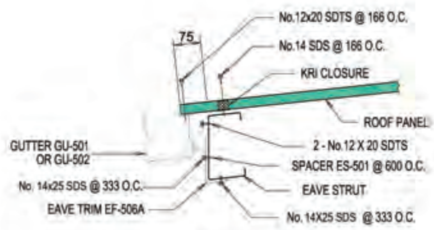
ROOF PANEL INSTALLATION



ROOF PANEL FASTENER LAYOUT

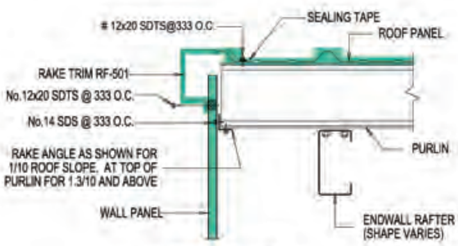


DETAIL 'A'
SHEETED SIDEWALL

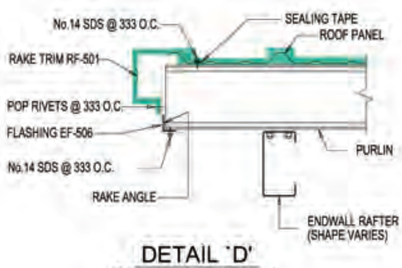


DETAIL 'B'
OPEN SIDEWALL

SIDE EAVE SECTIONS

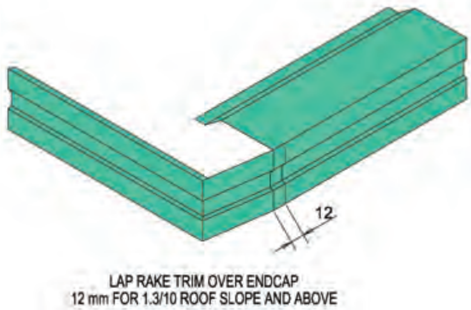


DETAIL 'C'
SHEETED ENDWALL



DETAIL 'D'
OPEN ENDWALL

RAKE SECTIONS



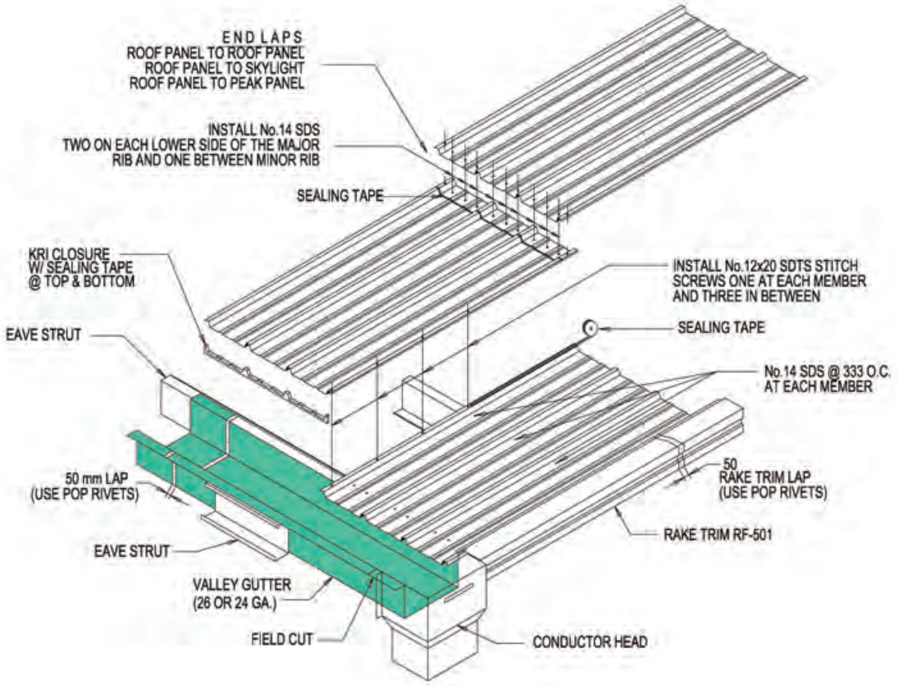
DETAIL 'E'

SDS I SOTS TABLE		
INSULATION SIZE	PANEL TO STRUCTURE	PANEL TO PANEL
0 to 60	No. 14 x 25	No. 12 x 20
75 to 100	No. 14 x 50	No. 12 x 20
110 to 150	No. 14 x 76	No. 12 x 20

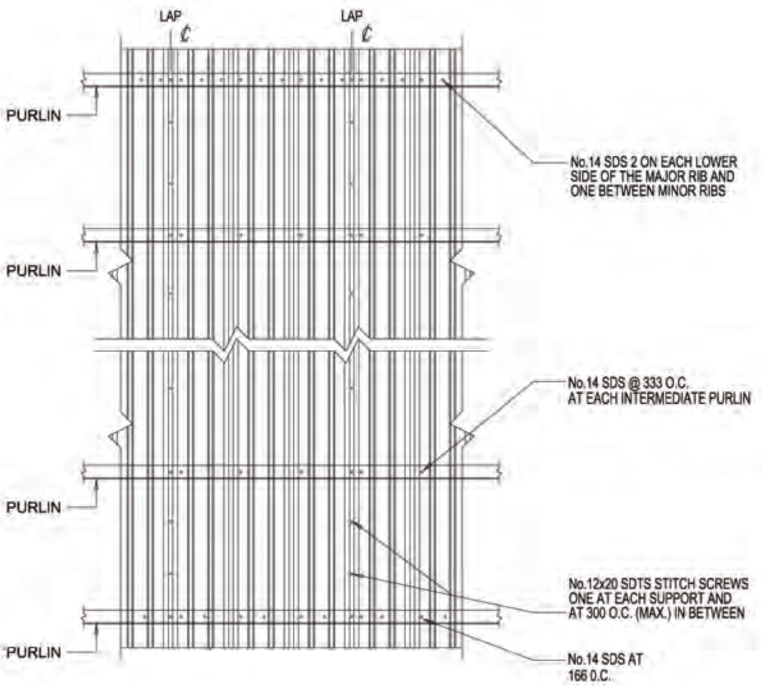
General sheeting notes:

1. The building is to be tight and plumb before sheeting is to begin.
2. Sheeting is to begin at the leeward end of building so that all Panel laps will be away from prevailing wind.
3. Skylights receive same screw pattern as roof panels except Skylight to skylight stitch. Use grommet screws at this Condition.
4. Building installation crew is to sweep roof panels clear of all metal shavings.
5. All dimensions are in millimeters.

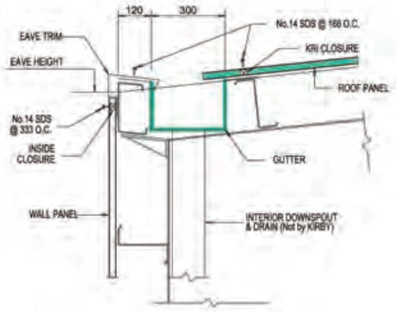
7.16 ROOF PANEL DETAILS WITH VALLEY GUTTER



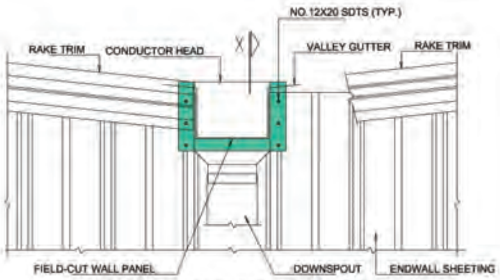
ROOF PANEL INSTALLATION



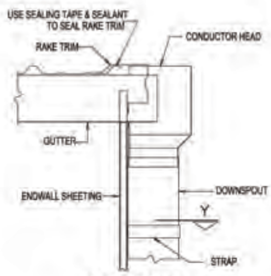
ROOF PANEL FASTENER LAYOUT



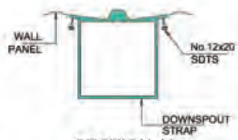
VALLEY GUTTER AT FLUSH WALL



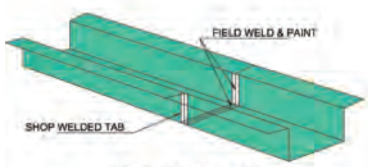
VALLEY GUTTER WITH OPEN END



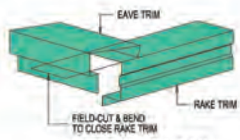
SECTION X



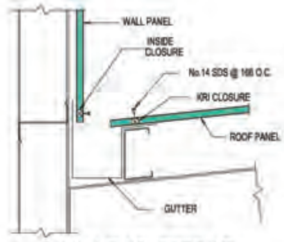
SECTION Y



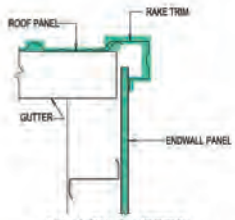
FIELD SPLICE FOR
1.0 mm Thk. OR HEAVIER GUTTERS



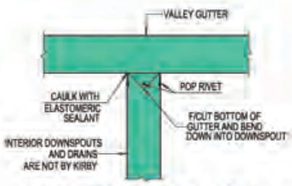
CORNER DETAIL



VALLEY GUTTER AT
HIGH-LOW ROOF TRANSITION



VALLEY GUTTER
WITH CLOSED END



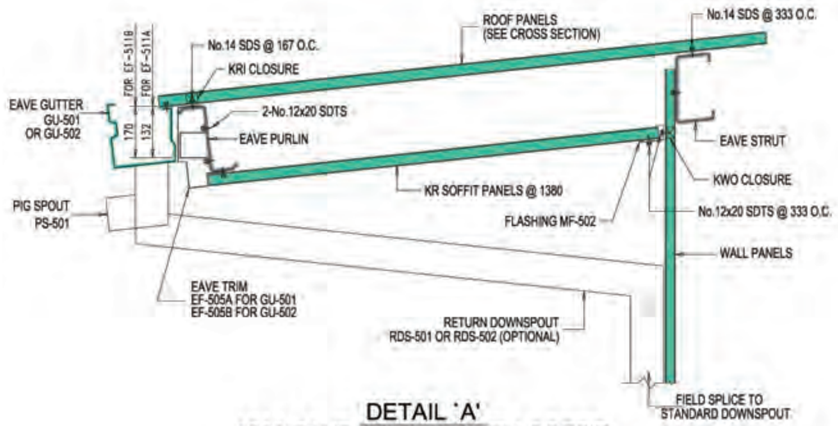
DOWNSPOUT INSTALLATION

SDS I SOTS TABLE		
INSULATION SIZE	PANEL TO STRUCTURE	PANEL TO PANEL
0 to 60	No. 14 x 25	No. 12 x 20
75 to 100	No. 14 x 50	No. 12 x 20
110 to 150	No. 14 x 76	No. 12 x 20

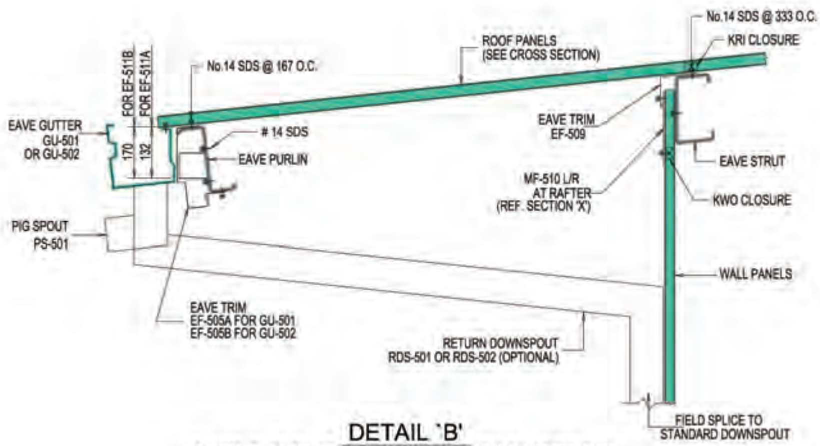
General sheeting notes:

1. The building is to be tight and plumb before sheeting is to begin.
2. Sheeting is to begin at the leeward end of building so that all Panel laps will be away from prevailing wino.
3. Skylights receive same screw pattern as roof panels except Skylight to skylight stitch. Use grommet screws at this Condition.
4. Afitr building installation. Fill all unused screw holes in the roof with No. 17X20 self tapping screws.
5. Building installation crew is to sweep roof panels clear of all metal shavings.

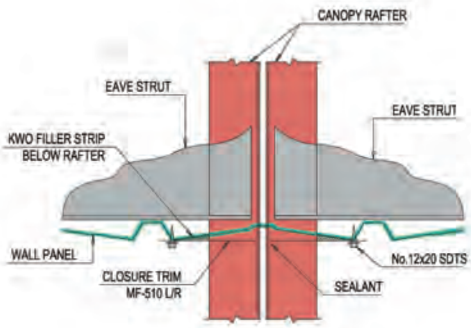
7.16 PANEL & TRIMS FOR EAVE & PUR LIN EXTENSION CANOPIES



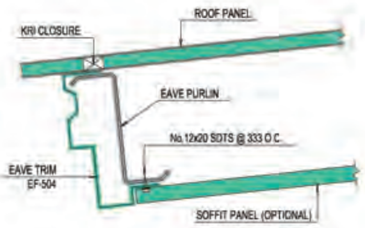
DETAIL 'A'
1500 EAVE CANOPY WITH SOFFIT



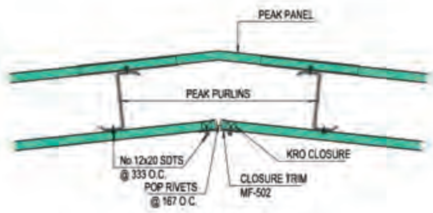
DETAIL 'B'
1500 EAVE CANOPY WITHOUT SOFFIT



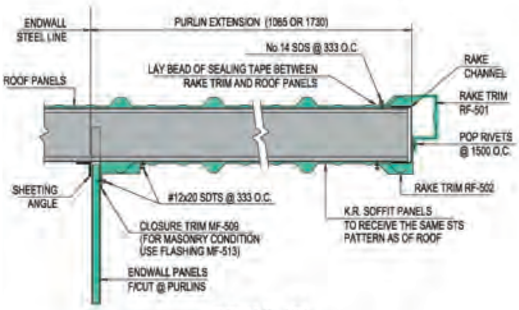
SECTION 'X'
AT CANOPY RAFTER



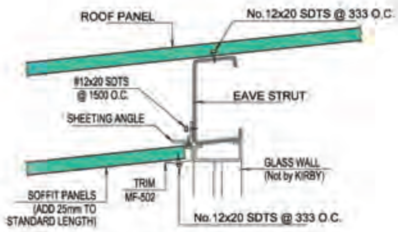
DETAIL `C'
SECTION THRU' EAVE CANOPY
WITHOUT GUTTER



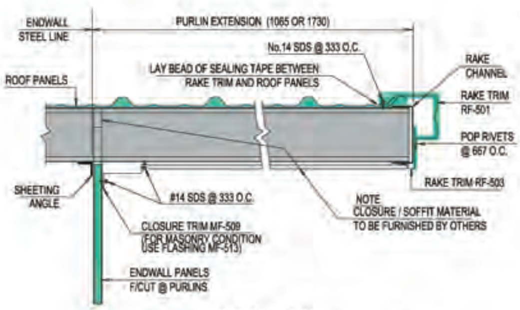
DETAIL `F'
SECTION THRU' PEAK



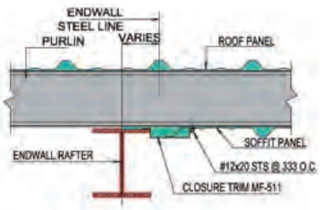
DETAIL `D'
PURLIN EXTENSION CANOPY
WITH SOFFIT



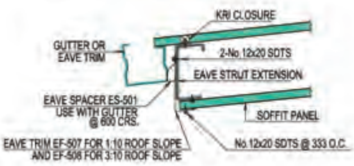
DETAIL `G'
EAVE CANOPY WITH
SOFFIT & GLASS WALL



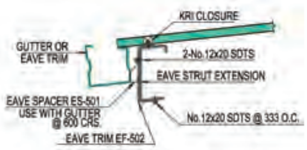
DETAIL `E'
PURLIN EXTENSION CANOPY
WITHOUT SOFFIT



DETAIL `H'
OPEN ENDWALL FRAME WITH
PURLIN EXTENSION CANOPY

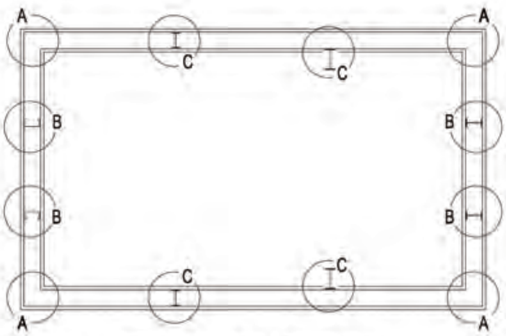


DETAIL `J'
SECTION THRU' EAVE OF
PURLIN EXTENSION WITH SOFFIT

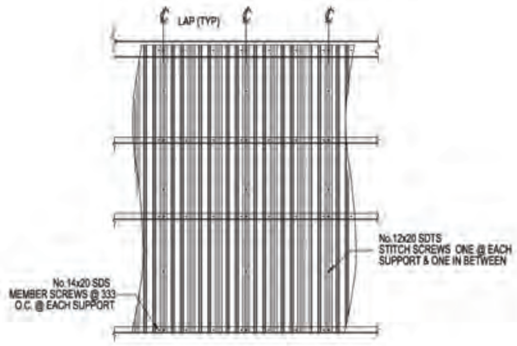


DETAIL `K'
SECTION THRU' EAVE OF
PURLIN EXTENSION WITHOUT SOFFIT

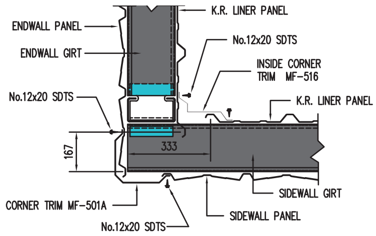
7.17 WALL LINER PANEL DETAILS



TYPICAL LINER LAYOUT PLAN

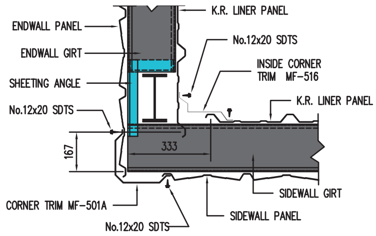


SCREW LAYOUT FOR LINER PANELS



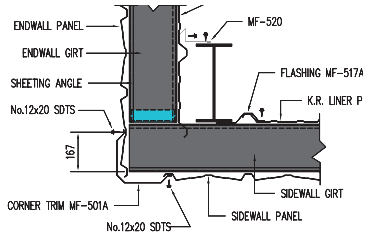
DETAIL "A1"

BEARING FRAME C CORNER COLUMN



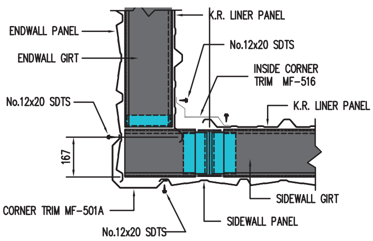
DETAIL "A2"

BEARING FRAME H.R. CORNER COLUMN



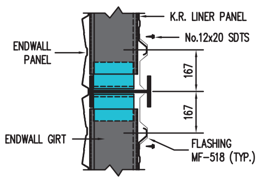
DETAIL "A3"

BY-FRAME MAIN END CORNER COLUMN



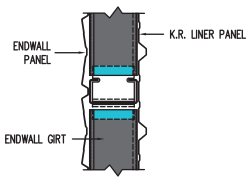
DETAIL "A4"

FLUSH FRAME MAIN END CORNER COLUMN



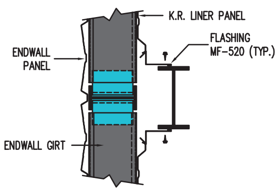
DETAIL "B1"

FOR INTERMEDIATE ENDWALL COLUMN DEPTH OVER 250 mm



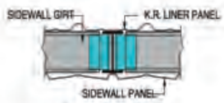
DETAIL "B2"

FOR INTERMEDIATE ENDWALL COLUMN DEPTH UP TO 200 mm



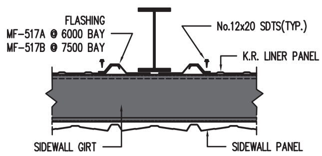
DETAIL "B3"

FOR INTERMEDIATE ENDWALL COLUMN AND INTERIOR COLUMN



DETAIL 'C1'

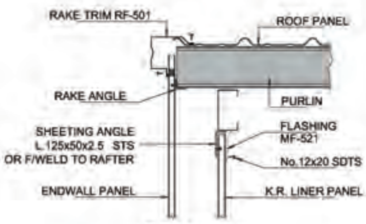
AT FLUSH FRAME SIDEWALL COLUMNS



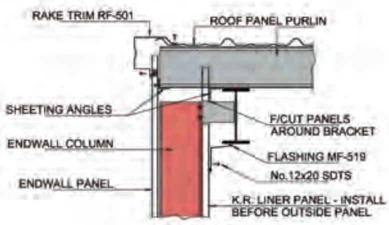
DETAIL "C2"

AT BY-FRAME SIDEWALL COLUMNS

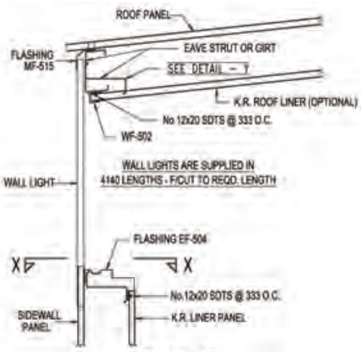
- Panel to Structure use SDS
- Panel to Panel & Trims use STDS



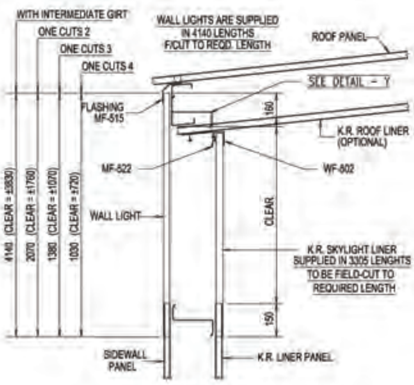
DETAIL `D'
SECTION AT BEARING FRAME
ENDWALL RAFTER



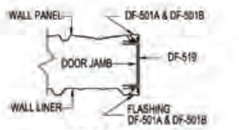
DETAIL `E'
SECTION AT MAIN FRAME
ENDWALL RAFTER



DETAIL `F'
SECTION AT SIDEWALL
WITH WALL LIGHT



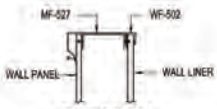
DETAIL `G'
SECTION AT SIDEWALL WITH
WALL LINER & SKYLIGHT LINER



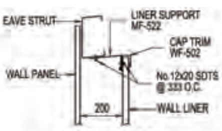
DETAIL `H'
SECTION AT JAMBS FOR
FRAMED OPENINGS/DOORS

DETAIL `J'
SECTION AT HEADER FOR
FRAMED OPENINGS/DOORS

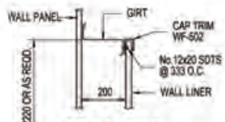
DETAIL `K'
SECTION AT HEADER
FOR OPEN CONDITION



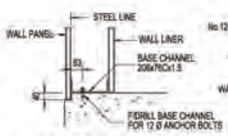
DETAIL `L'
SECTION AT SILL
FOR FRAMED OPENINGS



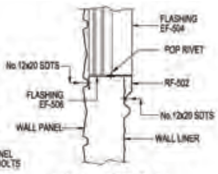
DETAIL `M'
SECTION AT EAVE



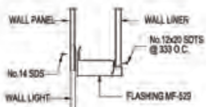
DETAIL `N'
SECTION AT GIRT



SECTION AT BASE



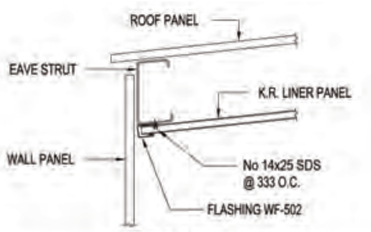
SECTION X-X
REFER DETAIL `F'



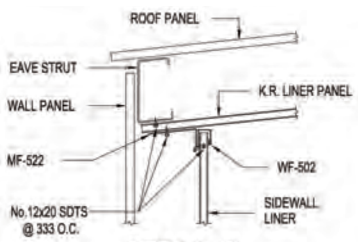
DETAIL `Y'
REFER DETAILS `F' & `G'

NOTE :

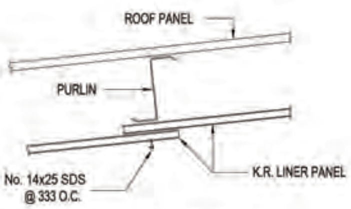
1. Details shown on this drawing may not Occur all together in one building. Use those details which comply with the Structural framing. Refer to building installation Drawing.
2. Refer sheet no. For roof and wall liner Combination.
3. All dimensions are in millimeters.



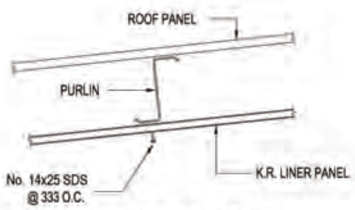
DETAIL A
AT EAVE - WITHOUT WALL LINER



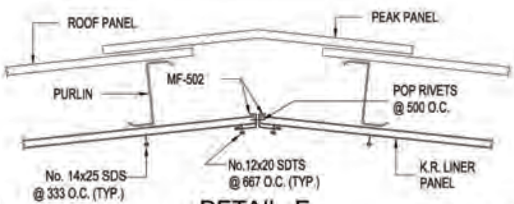
DETAIL B
AT EAVE - WITH WALL LINER



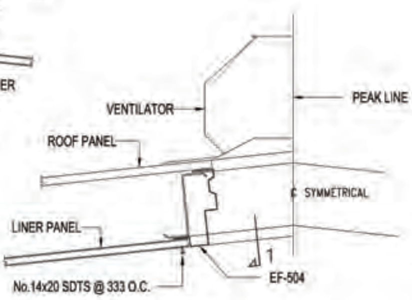
DETAIL C
AT PURLINS - WITH END LAP



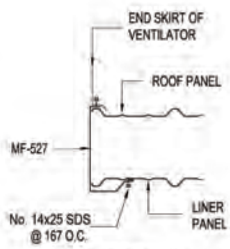
DETAIL D
AT PURLINS



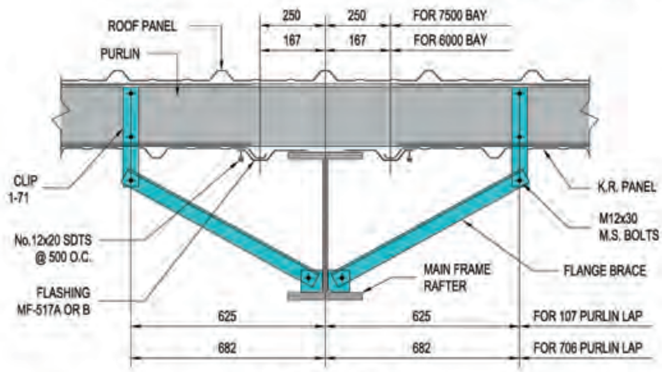
DETAIL E
AT PEAK



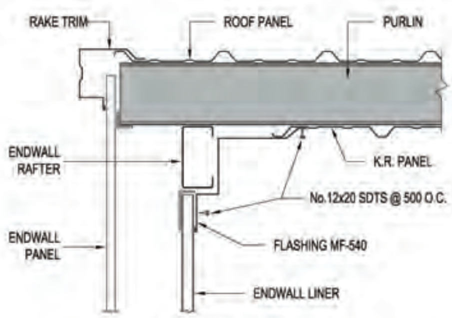
DETAIL F
AT PEAK - WITH VENTILATOR



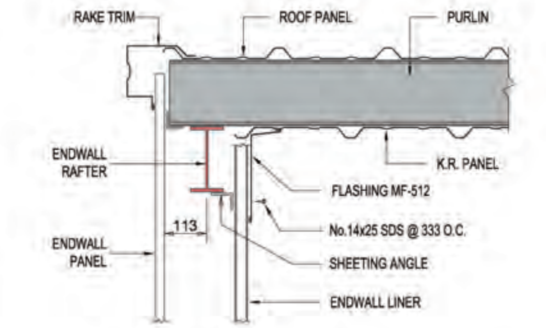
SECTION 1



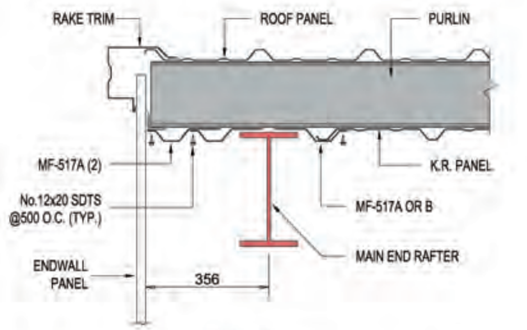
DETAIL G
AT INTERIOR RAFTERS



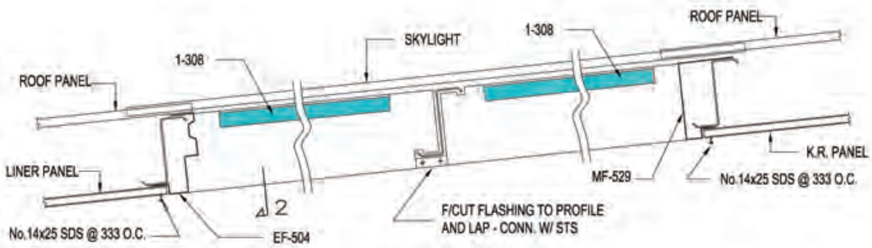
DETAIL H
AT LIGHT ENDWALL 'C' RAFTERS



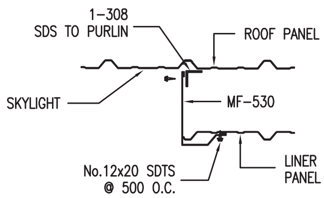
DETAIL K
AT LIGHT ENDWALL H.R. RAFTERS



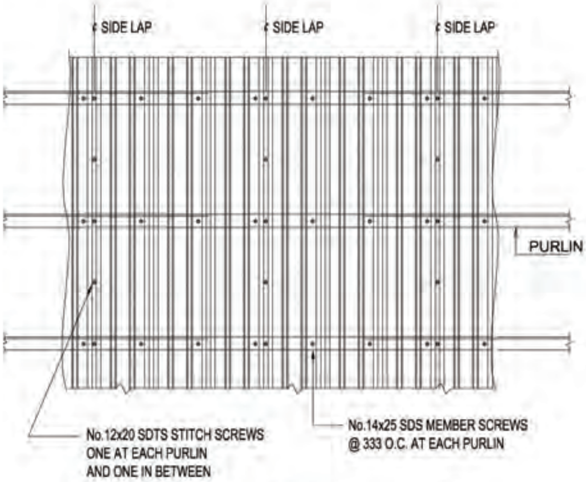
DETAIL L
AT MAIN END WITHOUT WALL LINER



DETAIL M
AT SKYLIGHT

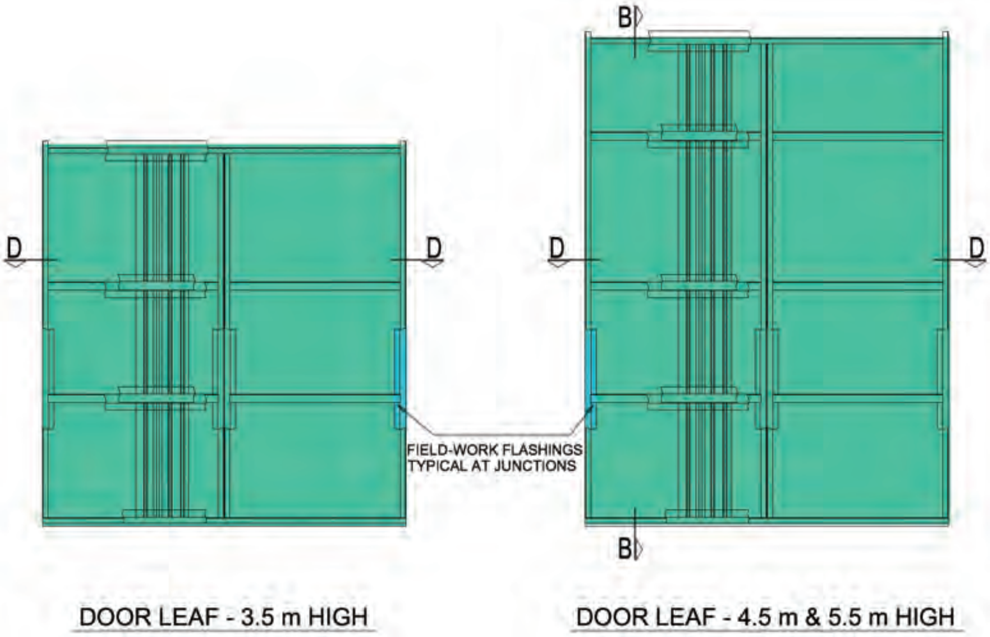


SECTION "2"

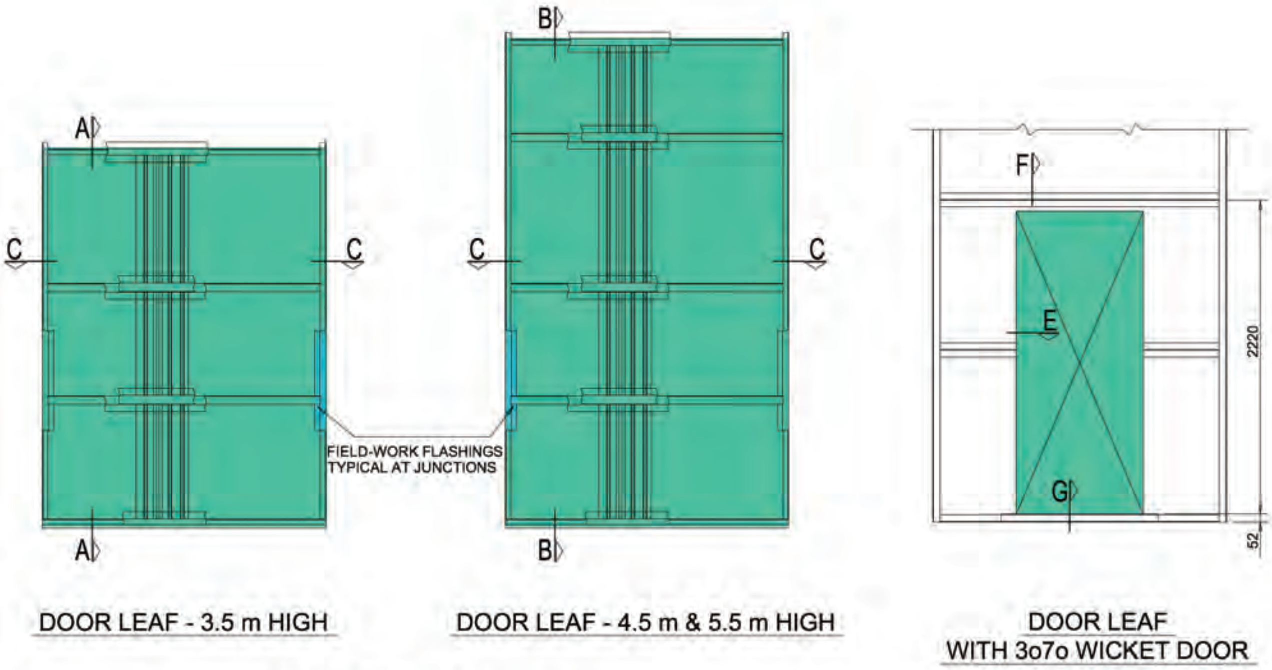


TYPICAL SCREW LAYOUT
ROOF LINER PANELS

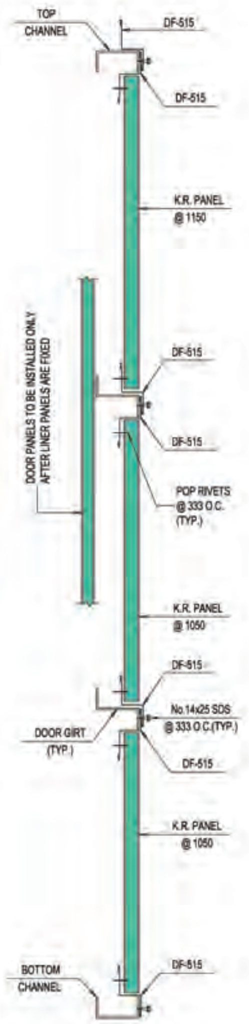
7.17 LINER PANEL DETAILS FOR SLIDE DOORS



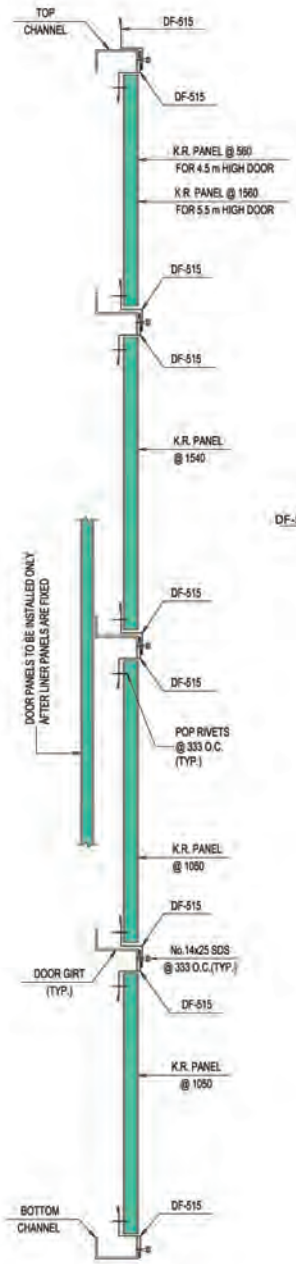
SINGLE SLIDE DOORS



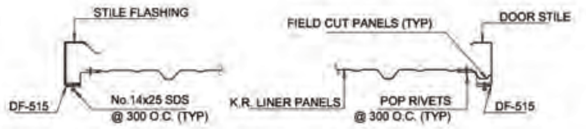
DOUBLE SLIDE DOORS



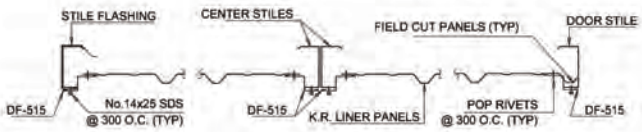
SECTION A-A



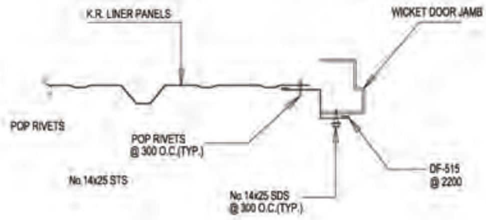
SECTION B-B



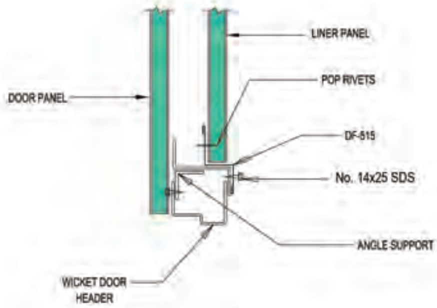
SECTION C-C



SECTION D-D



SECTION - E



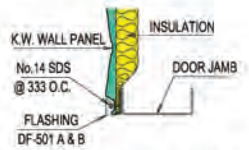
SECTION - F

NOTE:

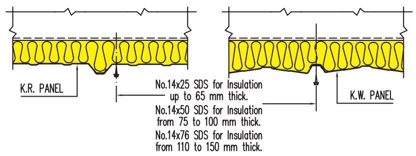
Keep girt connection bolt head direction facing upward and use round head bolts at flashings.

7.18 INSULATION DETAILS

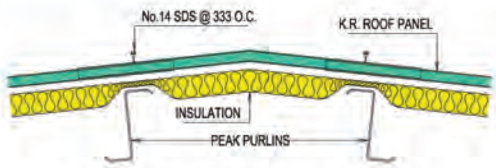
PANEL TO PANEL STITCH



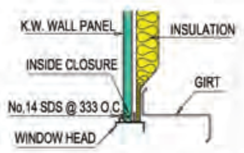
SECTION THRU' JAMB



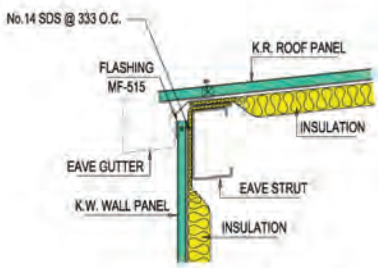
PANEL TO STRUCTURE STITCH



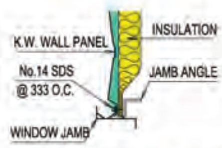
SECTION AT PEAK



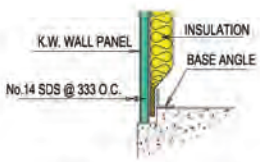
SECTION THRU' WINDOW HEAD



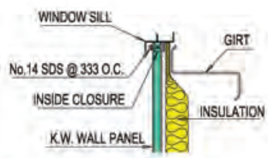
SECTION AT EAVE



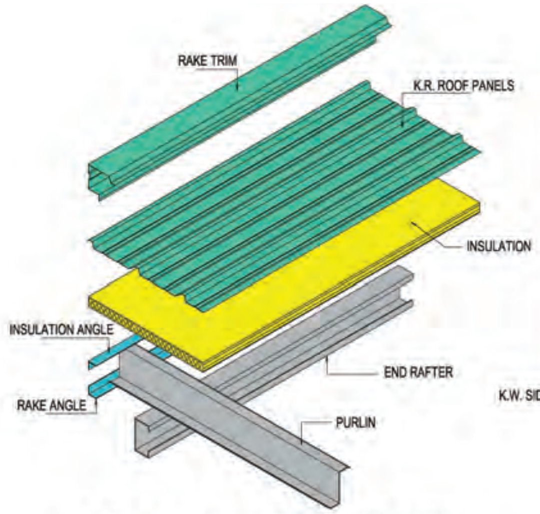
SECTION THRU' WINDOW JAMB



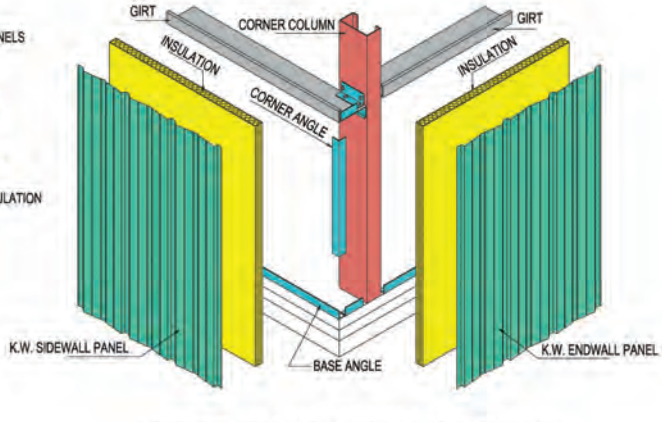
SECTION AT BASE



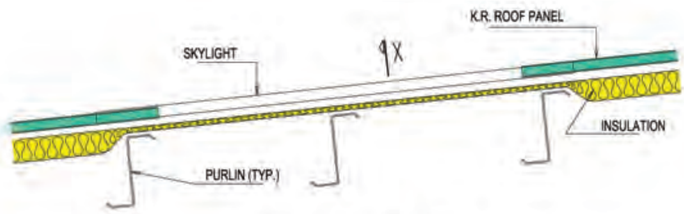
SECTION THRU' WINDOW SILL



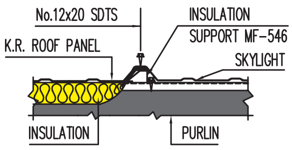
RAKE DETAIL - INSULATED ROOF



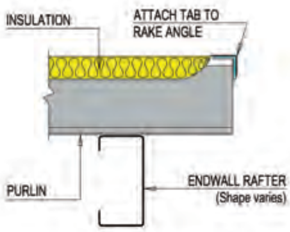
CORNER DETAIL - INSULATED WALLS



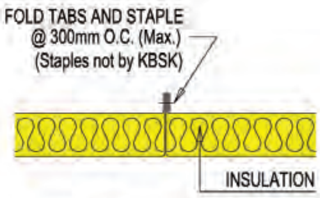
SECTION THRU' SKYLIGHT



SECTION - X



SECTION THRU' RAKE

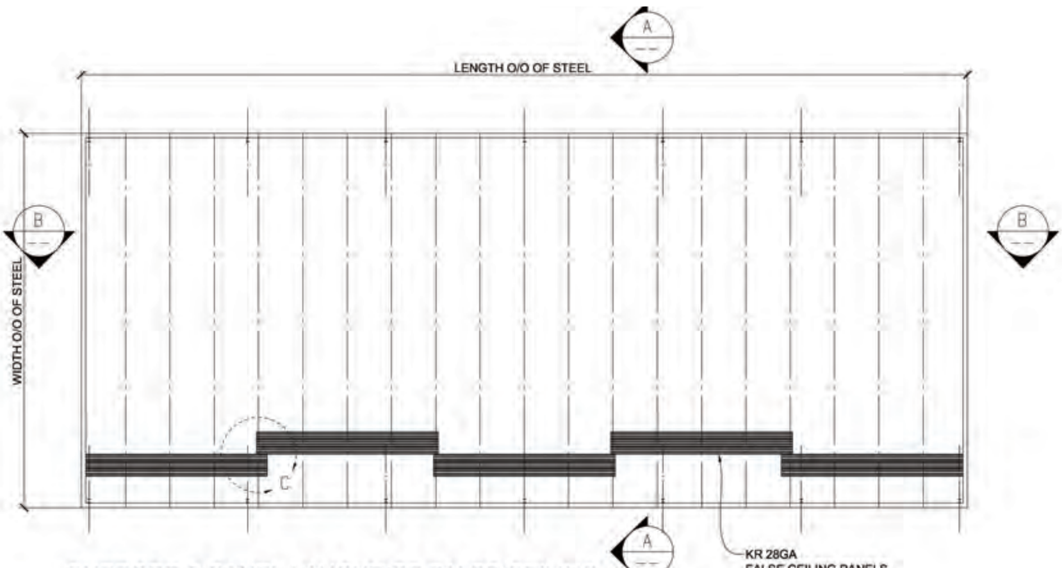


INSULATION SIDE LAP

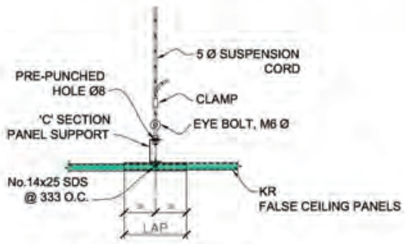
NOTE:

1. An additional rake angle (on 1:10 bldg. Only) andacorner Angle will be furnished by k.B.S. When customer specifies That building is to be insulated (see details)
2. For building having insulation of 50 & 75 mm thick blanket Type, use# 15x25 sds to fasten panel to structure and Panel to panel.
3. For building having insulation of 80 & 150 mm thick blanket Type, use# 14 x 50 sds to fasten panel to structure and 12 X 20 sdts panel to panel.
4. Slide doors are to be insulated if waiuls have insulation
5. All dimensions are in millimeters.
6. Patching tape is provided for patching of torn vinyl facing.

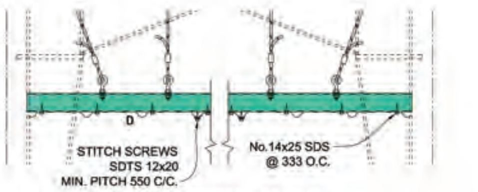
7.19 ‘KR’ FALSE CEILING DETAILS



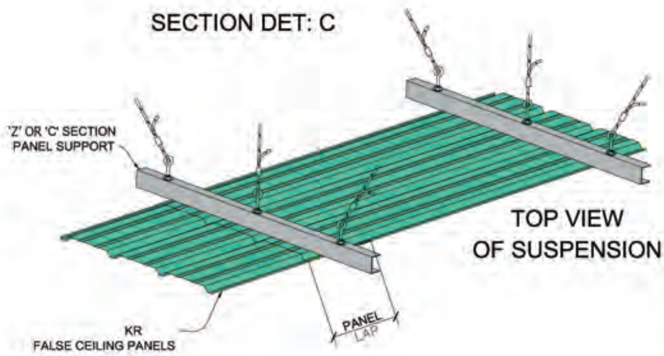
SUPPORT & PANEL LAYOUT OF FALSE CEILING



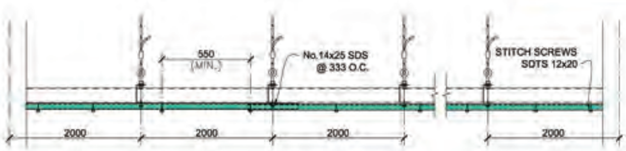
SECTION DET: C



SECTION:A-A



TOP VIEW OF SUSPENSION

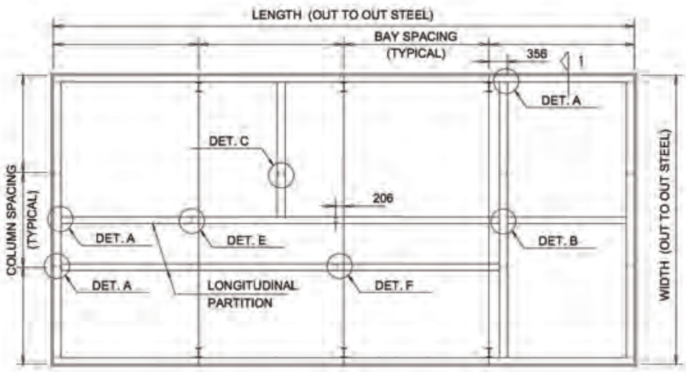


SECTION:B-B

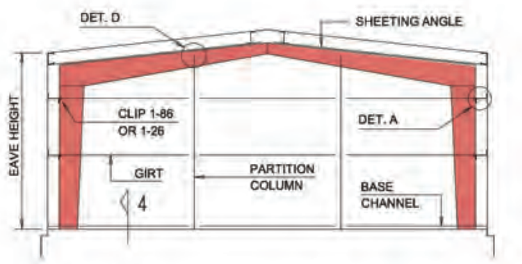
NOTE:

1. The building is to be tight and plumb before Panel-support is erected; however, it is preferred To be done after external sheeting is completed.
2. Panel-supportto be checked for constant level Througholt before panel fixing begins.
3. Alignment of cutouts and misc. Fixings; (lighting, Ducts, etc.) Are the responsibility of the building installers.
4. F.C. Panels shall be installed in the sequence shown.
5. Protective measures are to be taken to prevent Personnel damaging the panels.
6. Do not punch holes or make marks with permanent Ink or paint on the visible face.
7. Building installation crew is to clear off all metal shavings and No sharp edges to be left projecting hazardously.

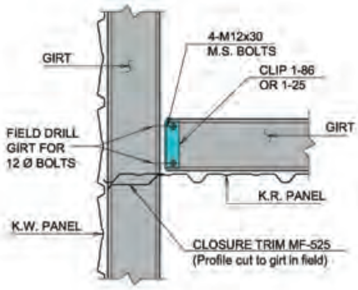
7.20 SINGLE SHEETED PARTITION DETAILS



PARTITION WALL PLAN



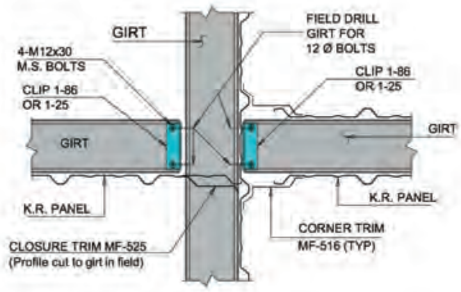
SECTION -1 (TRANSVERSE PARTITION)



DETAIL 'A'

PLAN SHOWING PARTITION GIRT

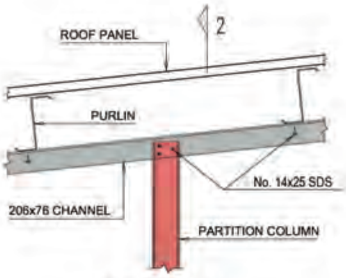
CONNECTION & CLOSURE FLASHING



DETAIL 'B'

PLAN SHOWING INTERSECTION OF

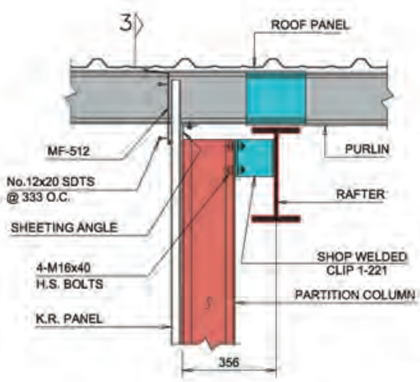
TRANSVERSE & LONGITUDINAL PARTITION WALLS



DETAIL 'C'

TRANSVERSE SECTION SHOWING COLUMN & GIRT

CONNECTION AT ROOF BETWEEN TWO FRAMES

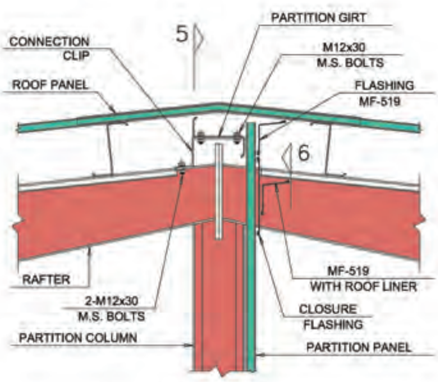


DETAIL 'D'

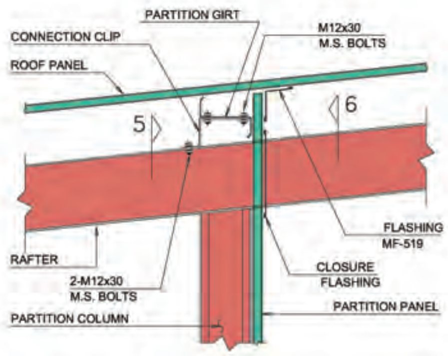
LONGITUDINAL SECTION SHOWING

PARTITION COLUMN CONNECTION

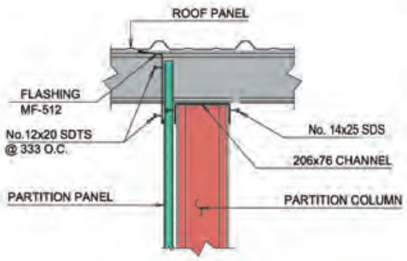
TO RAFTER & FLASHING AT ROOF



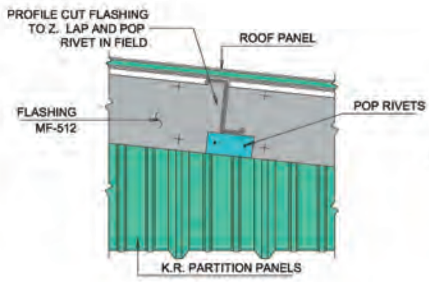
DETAIL 'E'
TRANSVERSE SECTION SHOWING
PARTITION SUPPORT & SHEETING AT PEAK



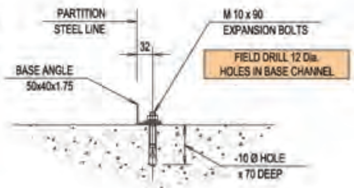
DETAIL `F'
TRANSVERSE SECTION SHOWING PARTITION
SUPPORT & SHEETING BETWEEN EAVE AND PEAK



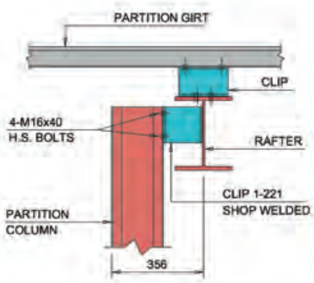
SECTION - 2



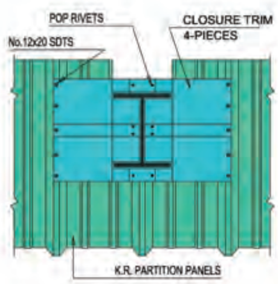
SECTION - 3



SECTION - 4



SECTION - 5

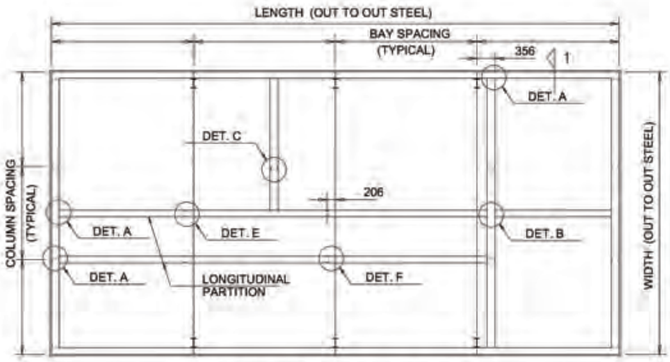


SECTION -6

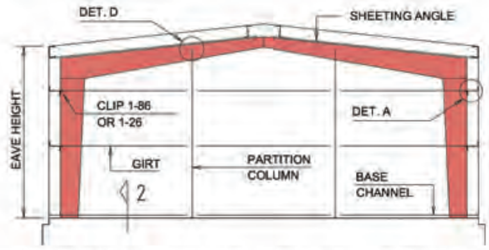
NOTE :

1. Details shown on this drawing may not occur all together in One building. Use those details which comply with the Structural framing, refer building installation drawing.
2. Column and girt spacing for partition walls is same as that Required end wall.
3. All column and girt connections (unless noted) are same As standard girt connections.
4. All dimensions are in millimeters.

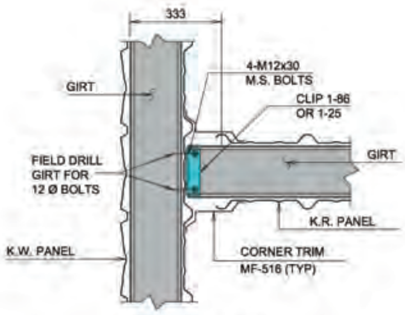
7.20 DOUBLE SHEETED PARTITION DETAILS



PARTITION WALL PLAN

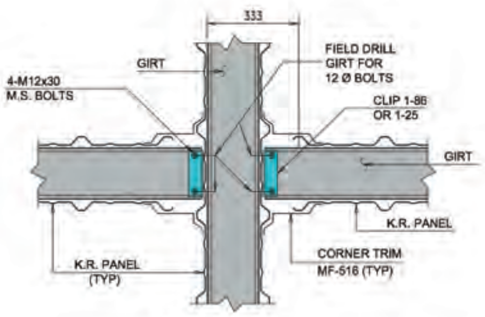


SECTION -1 (TRANSVERSE PARTITION)



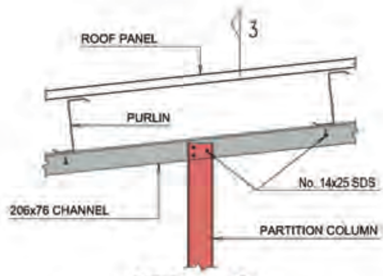
DETAIL 'A'

PLAN SHOWING PARTITION GIRT CONNECTION & CORNER FLASHING



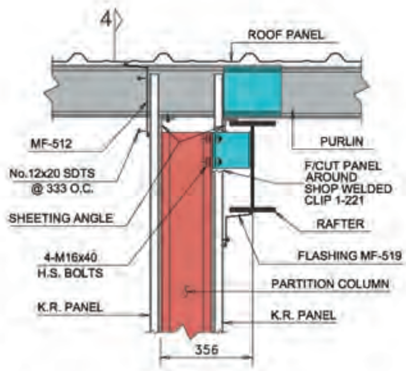
DETAIL 'B'

PLAN SHOWING INTERSECTION OF TRANSVERSE & LONGITUDINAL PARTITION WALLS



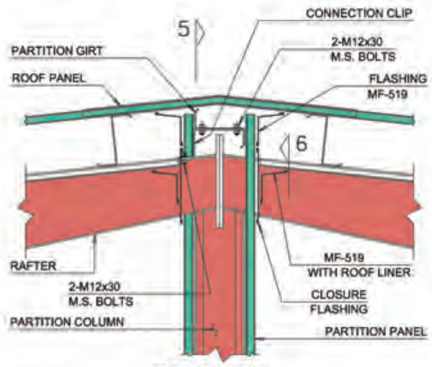
DETAIL 'C'

TRANSVERSE SECTION SHOWING COLUMN & GIRT CONNECTION AT ROOF BETWEEN TWO FRAMES

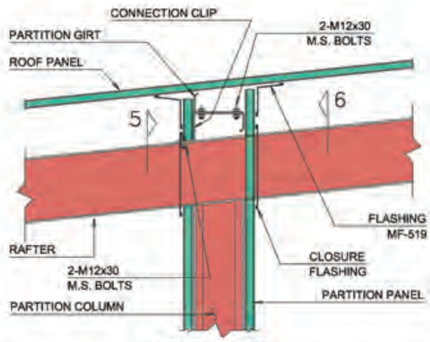


DETAIL 'D'

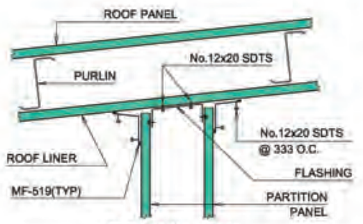
LONGITUDINAL SECTION SHOWING PARTITION COLUMN CONNECTION TO RAFTER & FLASHING AT ROOF



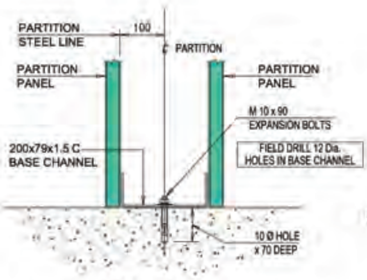
DETAIL 'E'
TRANSVERSE SECTION SHOWING
PARTITION SUPPORT & SHEETING AT PEAK



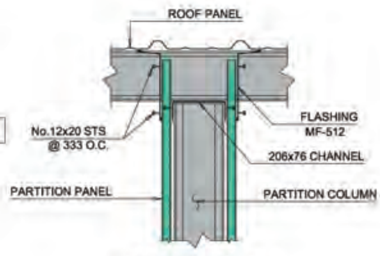
DETAIL 'F'
TRANSVERSE SECTION SHOWING PARTITION
SUPPORT & SHEETING BETWEEN EAVE AND PEAK



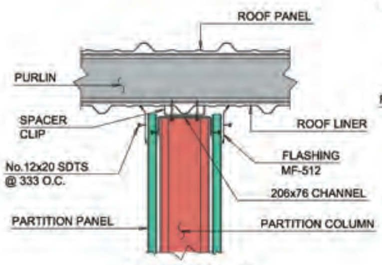
DETAIL 'G'
TRANSVERSE SECTION SHOWING
LONGITUDINAL PARTITION CONNECTION
TO ROOF WITH LINER



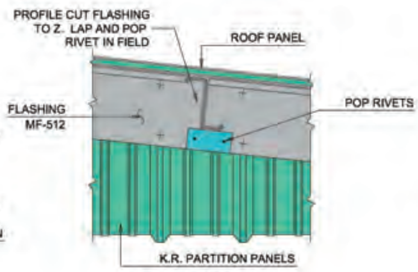
SECTION - 2



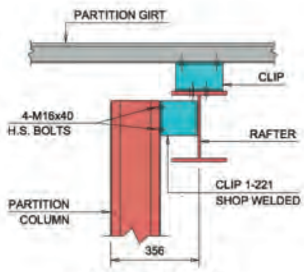
SECTION - 3



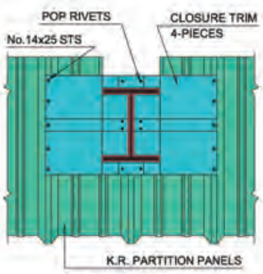
SECTION - 3
(WITH ROOF LINER)



SECTION - 4



SECTION - 5

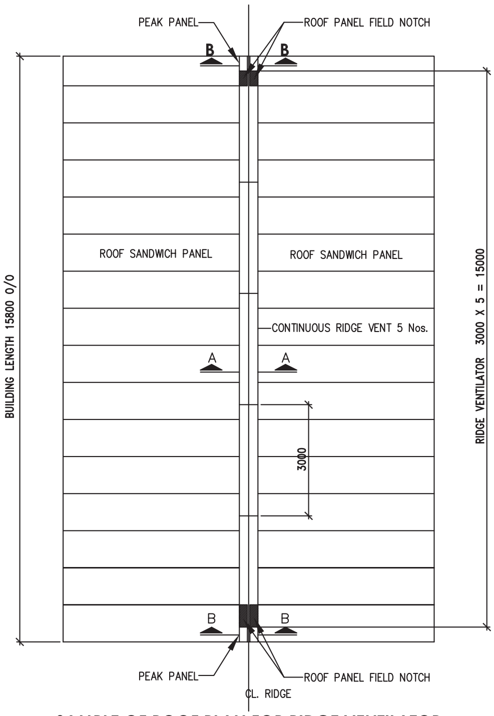


SECTION -6

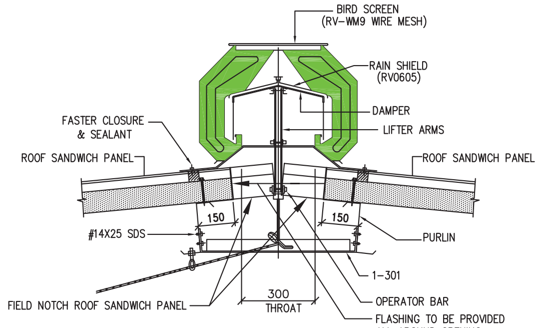
NOTE :

1. Details shown on this drawing may not occur all together in One building. Use those details which comply with the Structural framing, refer building installation drawing.
2. Column and girt spacing for partition walls is same as that Required end wall.
3. All column and girt connections (unless noted) are same As standard girt connections.
4. All dimensions are in millimeters.

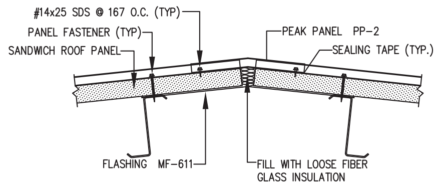
7.21 RIDGE VENTILATOR (300MM THROAT W/DAMPER)



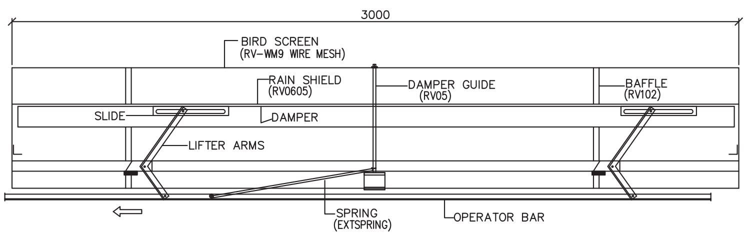
SAMPLE OF ROOF PLAN FOR RIDGE VENTILATOR
(FOR INDICATION ONLY)



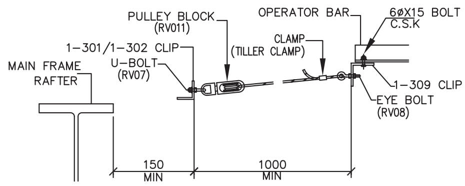
SECTION ON - A A
(SECTION THRU RIDGE VENTILATOR)



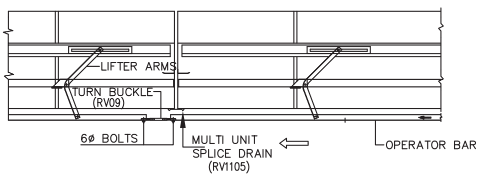
SECTION ON - B B
(SECTION THRU PEAK PANEL)



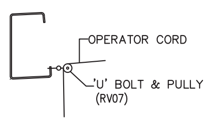
SECTIONAL ELEVATION



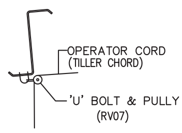
CORD ATTACHMENT DETAIL
BET. OPERATOR BAR & 1-301 CLIP



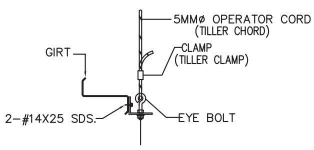
OPERATOR BAR CONN. AT MULTI UNITS



OPERATOR CORD ATTACHMENT
TO EAVE STRUT

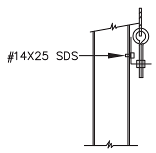


OPERATOR CORD ATTACHMENT
TO PURLIN

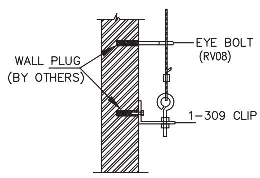


OPERATOR CORD ATTACHMENT
TO GIRT

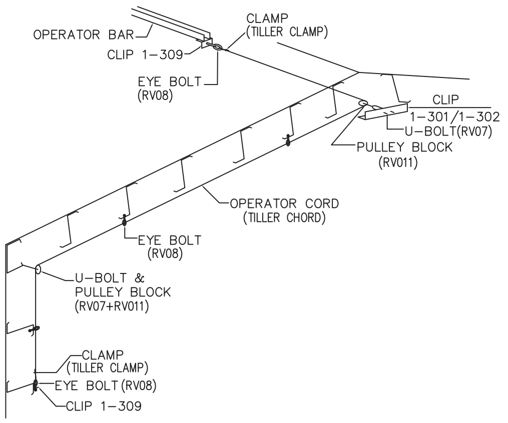
OPERATOR CORD ATTACHMENT
TO PIPE COL.



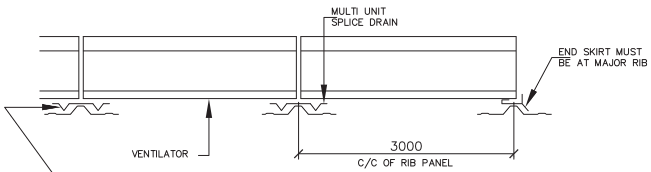
OPERATOR CORD ATTACHMENT
TO WIND COL



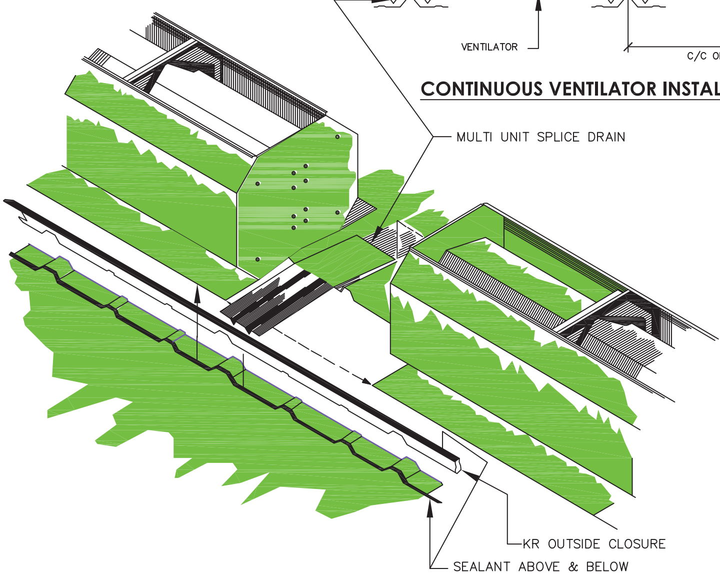
OPERATOR CORD ATTACHMENT
TO MASONARY WALL



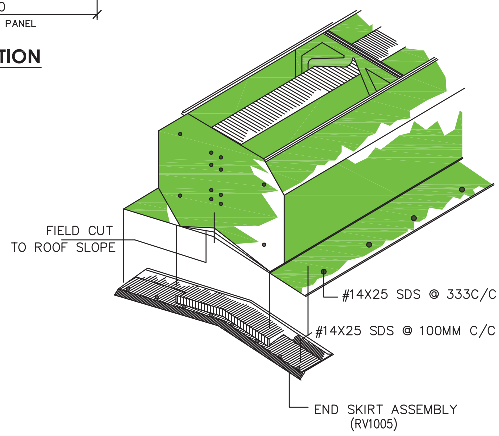
OPERATOR CORD ATTACHMENT SCHEMATIC



CONTINUOUS VENTILATOR INSTALLATION



CONTINUOUS VENTILATOR INSTALLATION



SINGLE AND/OR END UNIT INSTALLATION

(1) VENTILATORS:

SINGLE AND CONTINUOUS VENTILATORS ARE SHIPPED WITH END CAPS INSTALLED. EACH VENT PACKAGE CONTAINS TWO END SKIRT ASSEMBLIES AND ONE MULTI–UNIT SPLICE DRAIN.

TO INSTALL SINGLE UNIT,"POP RIVET" END SKIRT ASSEMBLY TO EACH END CAP AND LOCATE VENT OVER MAJOR RIBS.

WHEN INSTALLING A CONTINUOUS RUN OF VENTILATORS, "POP RIVET" END SKIRT ASSEMBLY TO FIRST AND LAST VENT AND LOCATE MULTI–UNIT SPLICE DRAIN UNDER BUTT JOINT OF MIDDLE UNITS

(2) OPERATOR PACKAGES:

SINGLE VENTILATORS:

ONE OPERATOR PACKAGE IS SUPPLIED WITH EACH VENTILATOR
EACH PACKAGE CONTAINS:
1 – PULLEY ATTACHMENT ANGLE (1–301)
2 – EYE BOLT CLIPS (1–309)
2 – 'U' BOLTS, PULLEY BLOCKS AND TILLER CLAMPS
8 – EYE BOLTS
2 – 6mmøX15 MS BOLTS WITH 2 NUTS EACH

CONTINUOUS VENTILATORS:

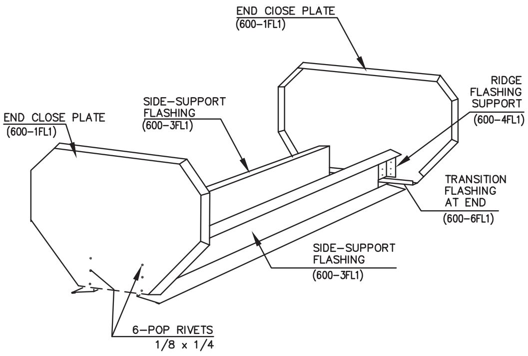
ONE OPERATOR PACKAGE IS SUPPLIED WITH EVERY TWO VENTILATORS.
EACH PACKAGE CONTAINS:
1 – PULLEY ATTACHMENT ANGLE (1–301)
2 – EYE BOLT CLIPS (1–309)
2 – 'U' BOLTS, PULLEY BLOCKS AND TILLER CLAMPS.
8 – EYE BOLTS
1 – TURN BUCKLE WITH 2 EYE BOLTS
4 – 6mmøX15 MS BOLTS WITH 2 NUTS EACH.

PULLEY ATTACHMENT ANGLE 1–301 IS FOR 1:10 ROOF SLOPE BUILDINGS, FOR 3:10 USE 1–302

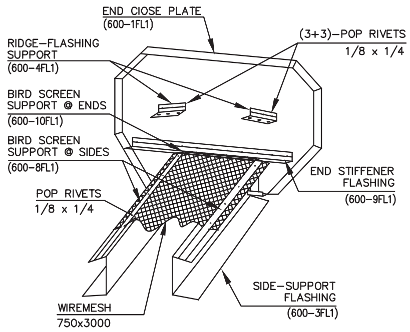
NOTE: OPERATOR CORD SCHEMATIC IS SHOWN FOR R.F. & SV TYPE BUILDING FOR BC BUILDING OPERATOR CORD IS TO BE RUN, ALONG THE NEAREST INTERIOR COLUMN.

1. ROOF SANDWICH PANELS SHALL BE SUPPLIED UP TO PEAK
2. FIELD NOTCH SANDWICH PANELS @ PEAK AS SHOWN IN SECT. A A

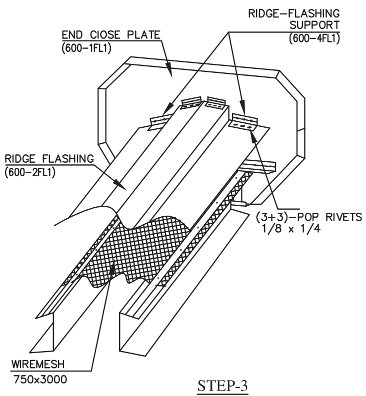
7.21 RIDGE VENTILATOR (600MM THROAT W/O DAMPER)



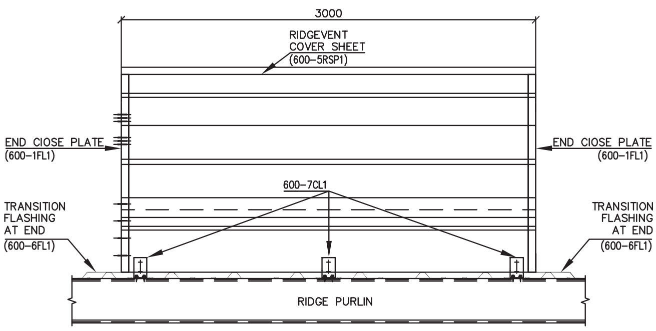
STEP-1



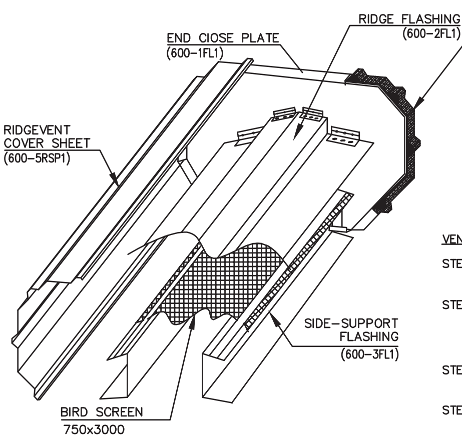
STEP-2



STEP-3



SIDE VIEW (SINGLE UNIT)



STEP-4

VENTILATORS (KRV-600):

SINGLE AND CONTINUOUS VENTILATORS ARE SHIPPED IN KNOCK-DOWN CONDITION. EACH VENT PACKAGE CONTAINS TWO END CLOSE PLATES AND IS PROVIDED WITH GALVANIZED BIRD SCREEN.

TO INSTALL SINGLE UNIT,"POP RIVET" SIDE SUPPORT FLASHINGS TO EACH END CLOSING PLATES AND LOCATE VENT OVER MAJOR RIBS.

WHEN INSTALLING A CONTINUOUS RUN OF VENTILATORS, "POP RIVET" END CLOSING PLATES TOGETHER AND PROVIDE 100MM PANEL LAP AT INTERMEDIATE LOCATIONS.

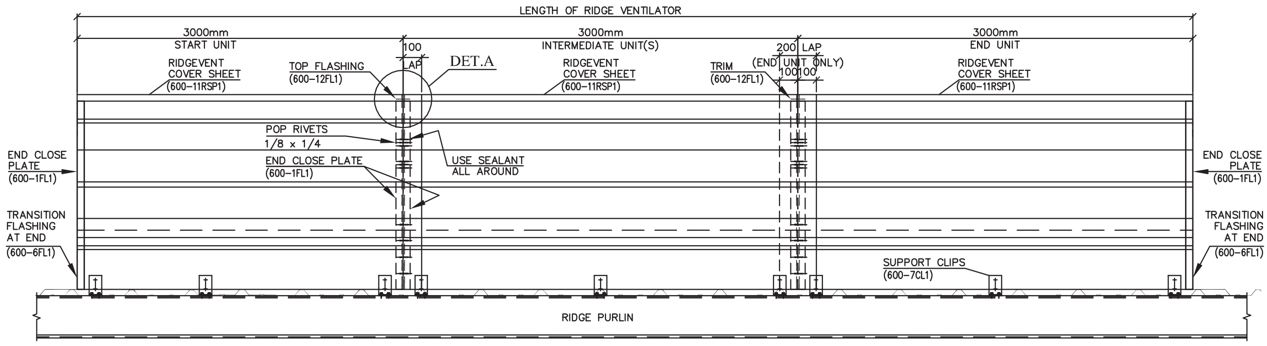
VENTILATOR ASSEMBLY

STEP 1 – POSITION 2 SIDE FLASHING SUPPORTS AND FIX EACH END WITH POP RIVETS AND CLIPS AT THE END CLOSING PLATES.

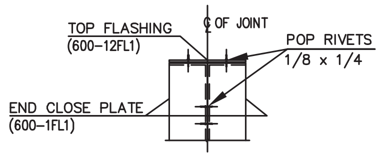
STEP 2 – FIX THE END STIFFENER FLASHING AT THE END CLOSE PLATES. SECURE THE BIRD SCREEN OR WIRE MESH ON TOP OF THE SIDE FLASHING SUPPORTS WITH BIRD SCREEN SUPPORTS AT SIDES AND ENDS.

STEP 3 – PLACE THE RIDGE FLASHING AND POP RIVET THRU THE CLIPS PROVIDED AND TO THE END CLOSE PLATES.

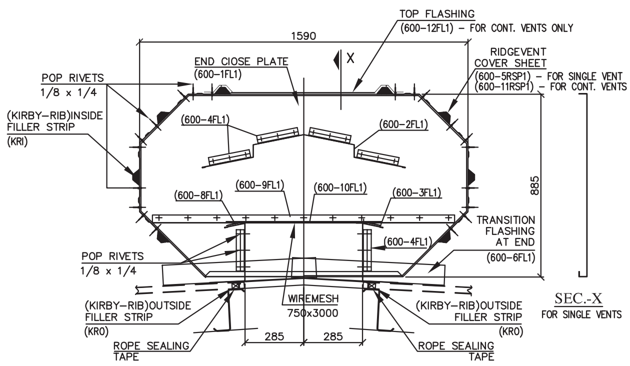
STEP 4 – INSERT THE INNER PANEL CLOSURE ALONG THE PERIMETER OF THE END CLOSE PLATES AT BOTH ENDS. SECURE THE KR PANELS WITH POP RIVETS. CONTINUOUS VENTS SHALL HAVE A TRIM ON TOP OF END CLOSING PLATES TO SEAL THE GAP BETWEEN THE END CAPS.



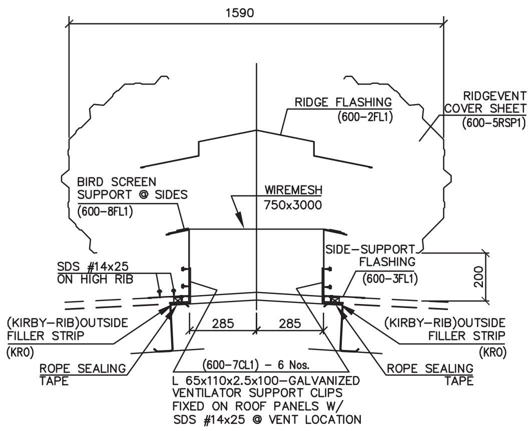
SIDE VIEW (CONTINUOUS RIDGE VENTILATORS)



DETAIL A

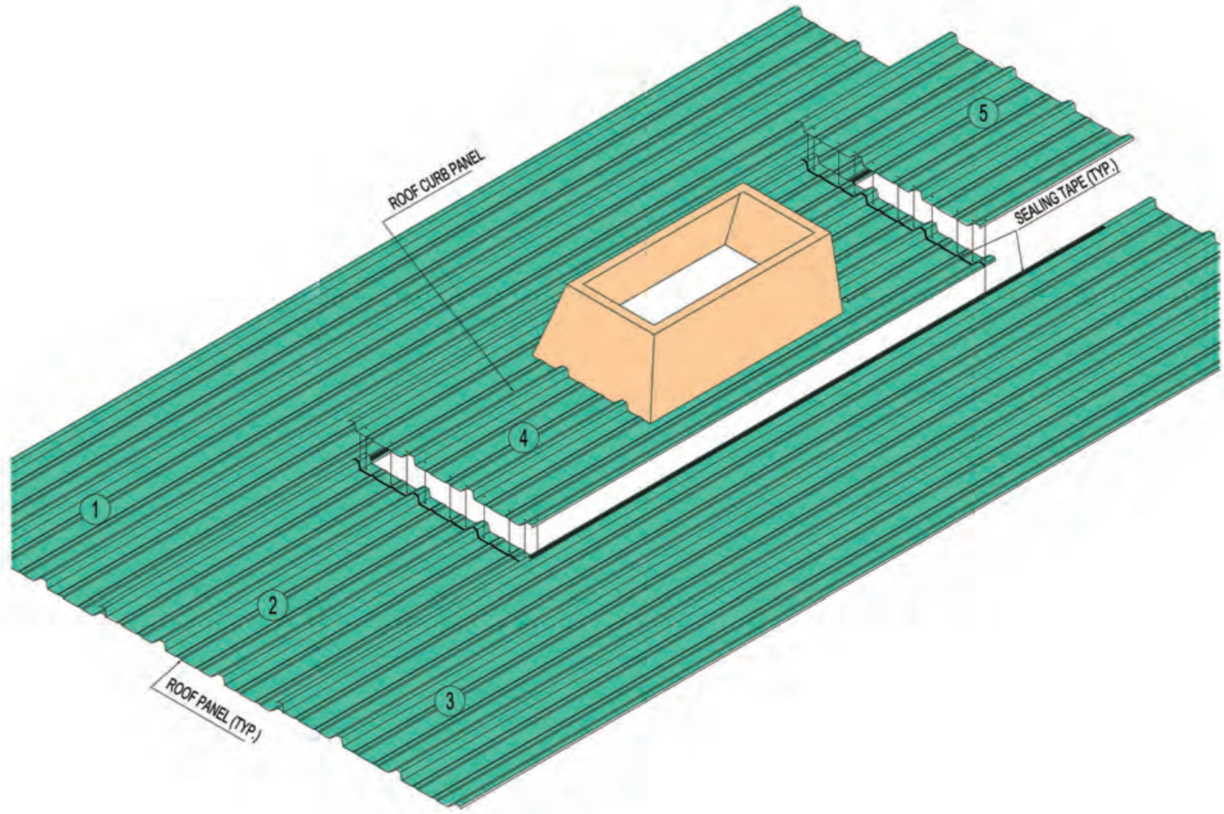


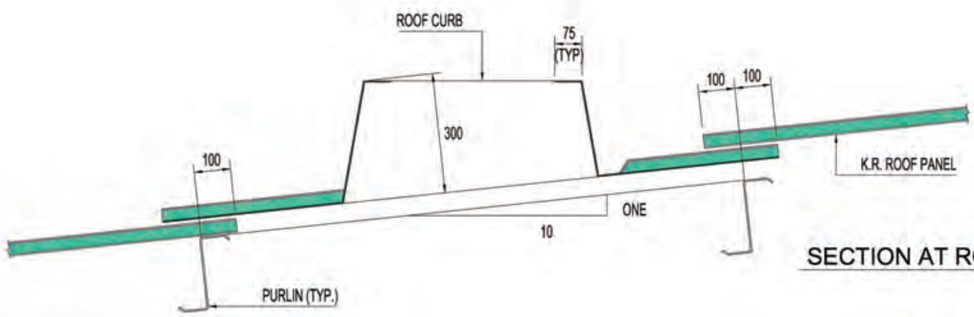
RIDGE VENT. ASSEMBLY



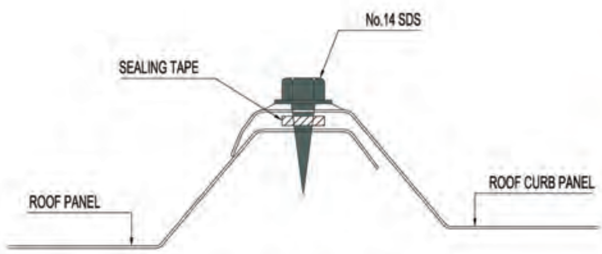
RIDGE VENT. FIXING DETAIL

7.22 ROOF CURB DETAILS





SECTION AT ROOF CURB



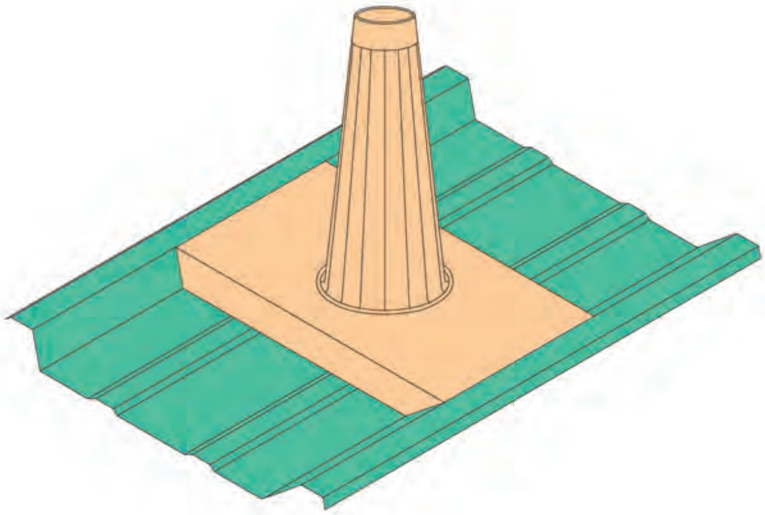
SIDE LAP DETAIL

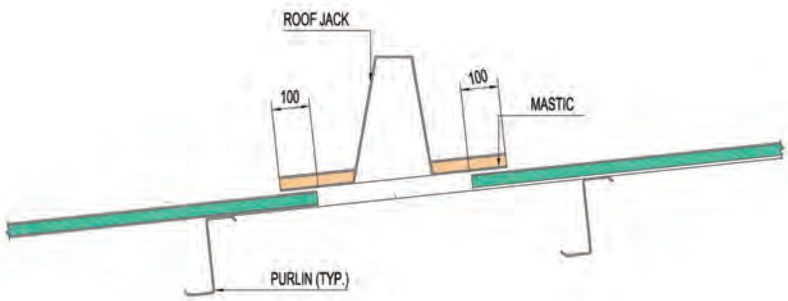
NOTE:

Roof curb shall be installed as roof is sheeted and in the sequence shown.

Protective measures are to be taken to prevent personnel damaging the roof curb. Do not walk on the roof curb.

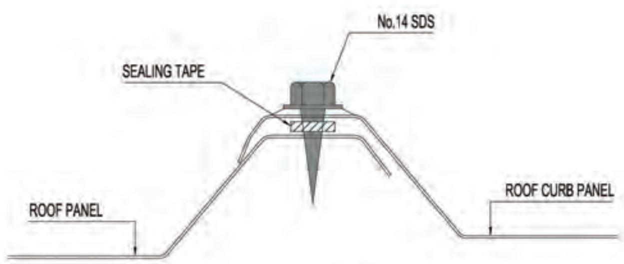
7.22 ROOF JACK DETAILS





SECTION AT ROOF JACK

ROOF JACK ADAPTOR PANEL SHOULD BE LOCATED WITHIN A ROOF PANEL WHICH IS SUPPORTED ON AT LEAST TWO PURLINS ON EITHER SIDE OF THE ROOF JACK



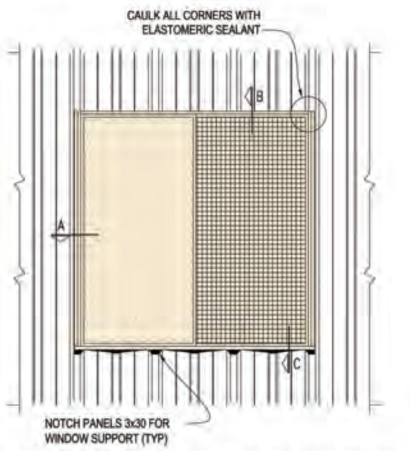
SIDE LAP DETAIL

NOTE:

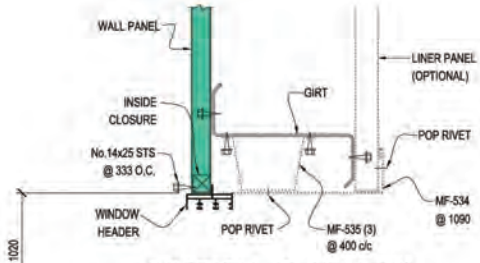
Roof jack shall be installed as roof is sheeted Field cut appropriate opening for roof jack in Roof panel.

Protective measures are to be taken to prevent Personnel damaging the roof jack.

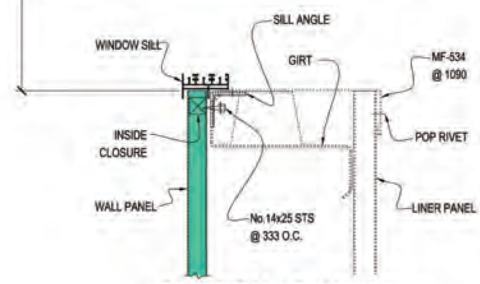
7.23 WINDOW DETAILS



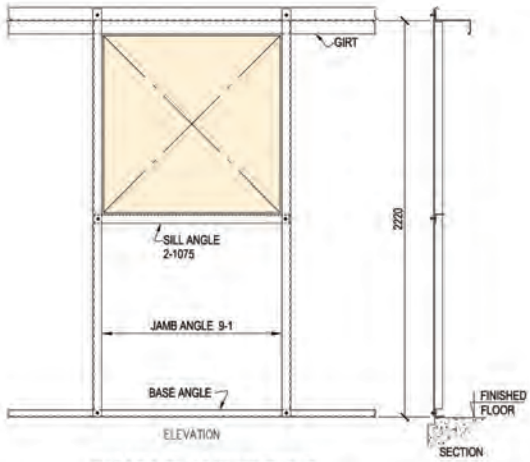
SINGLE WINDOW INSTALLATION



SECTION - B (At Head)

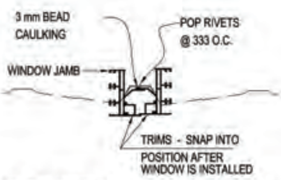


SECTION - C (At Sill)

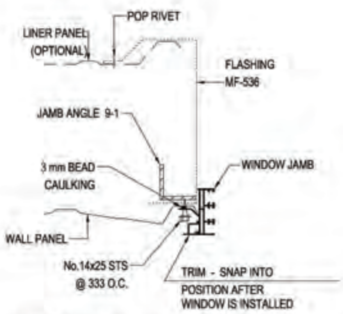


SINGLE WINDOWS

(WITH OR WITHOUT LINER PANELS)

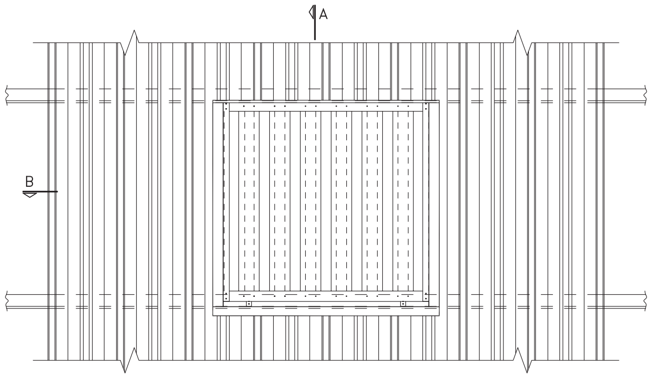


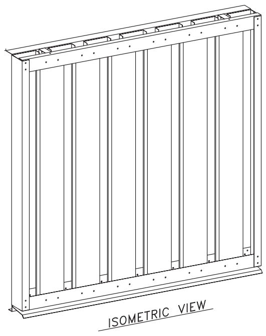
SECTION - D (At Jamb)



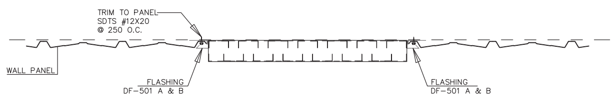
SECTION - A (At Jamb)

7.23 SANDTRAP LOUVERS (FIXED TYPE).

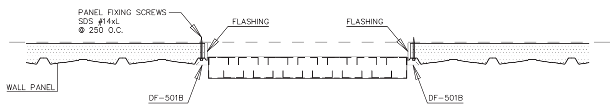




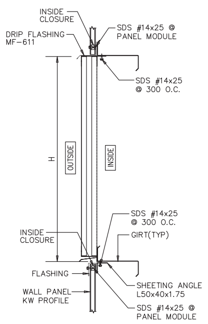
SAND TRAP LOUVER
EXTERIOR ELEVATION



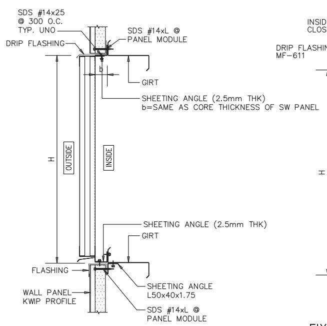
SECTION-B
FOR SINGLE SKIN WALL PANEL



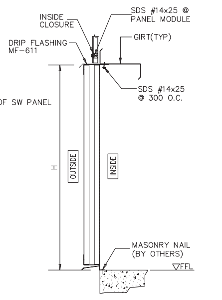
SECTION-B
FOR SANDWICH WALL PANEL



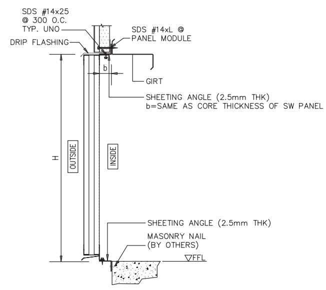
FIXING DETAIL BET. GIRTS
FOR SINGLE SKIN WALL PANEL
SECTION – A



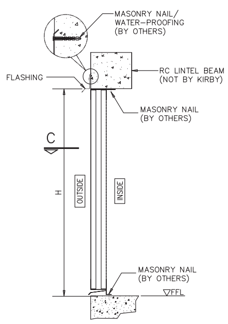
FIXING DETAIL BET. GIRTS
FOR SANDWICH WALL PANEL
SECTION – A



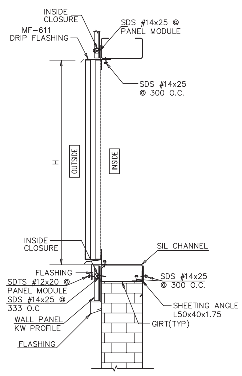
FIXING DETAIL @ BASE
FOR SINGLE SKIN WALL PANEL



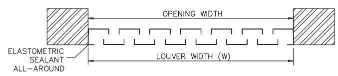
FIXING DETAIL @ BASE
FOR SANDWICH WALL PANEL



FIXING DETAIL @ BLOCKWALL

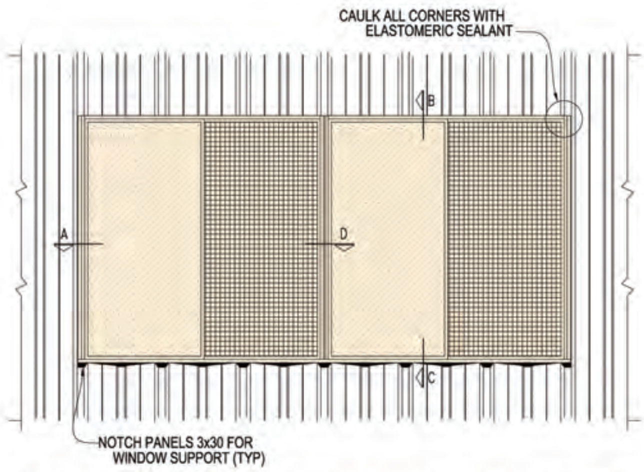


LOUVERS FIXING DETAIL
BET. GIRTS W/ FRAMED OPENING
FOR SINGLE SKIN WALL PANEL

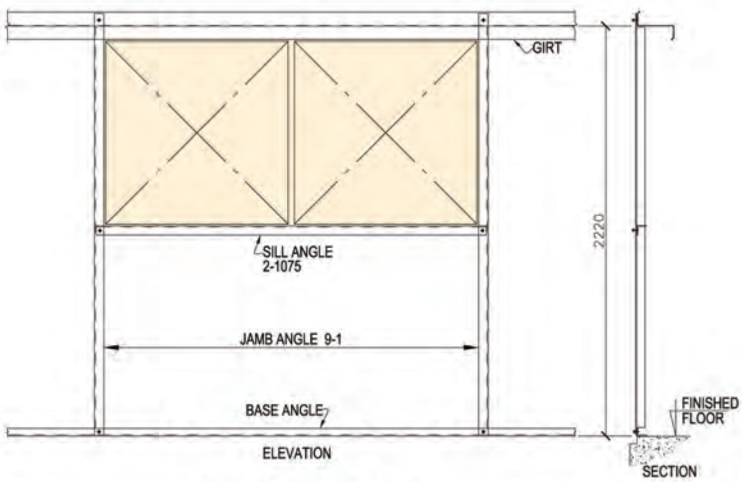


SECTION-C

S/N	PIECEMARK	SIZE OF LOUVER	MATERIAL
1	STL1-1000	1000W X 1000H	STEEL
2	STL1-2000	1000W X 2000H	STEEL
3	STL2-1000	2000W X 1000H	STEEL
4	STL1-1000 AL	1000W X 1000H	ALUMINIUM

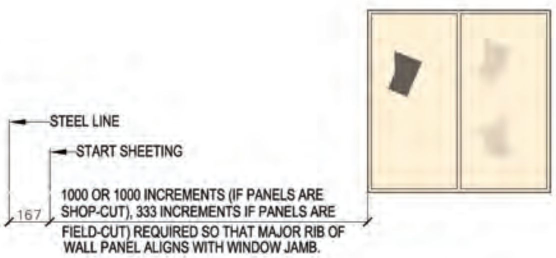


DOUBLE OR MULTIPLE WINDOW INSTALLATION



DOUBLE WINDOWS

(WITHOUT LINER PANELS)



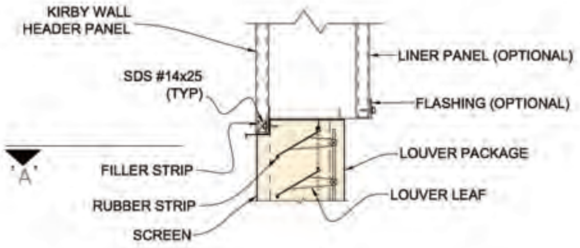
STANDARD LOCATIONS

NOTE:

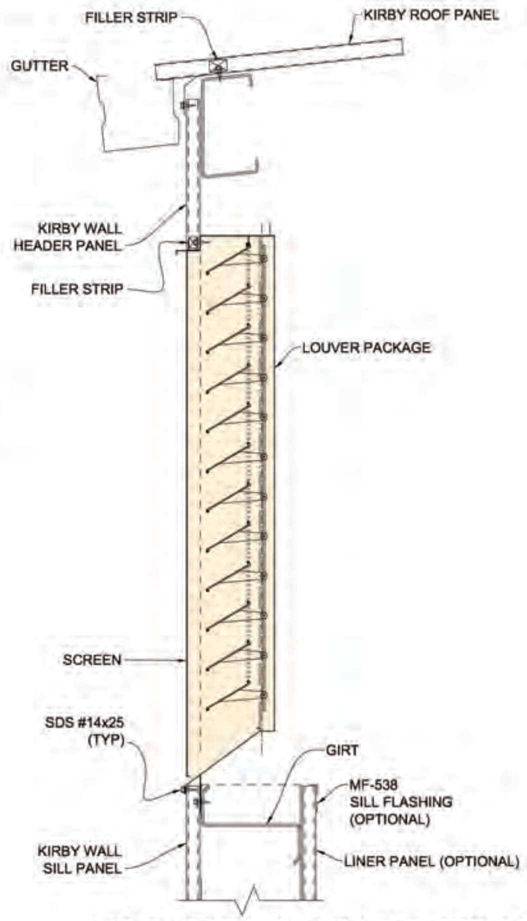
1. Opening for windows are field cut unless otherwise noted on building installation drawings furnished with the building.
2. Details shown are for windows at standard locations.
3. Windows are self flashing when rtted at standard locations.
4. Double windows in way of liner panels should have a sill girt also.

7.23 ADJUSTABLE LOUVER DETAILS

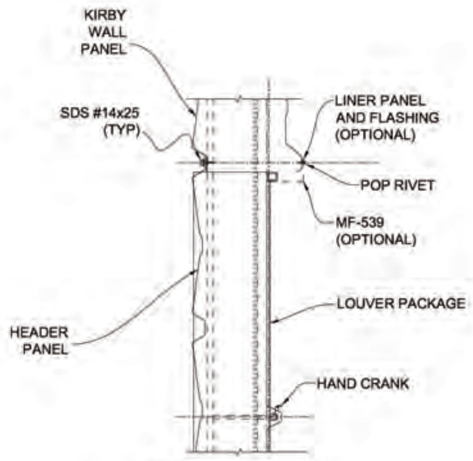
Louver details:



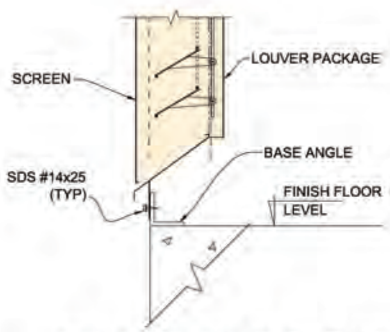
HEAD SECTION -NORMAL



HEAD SECTION -AT EAVE STRUT

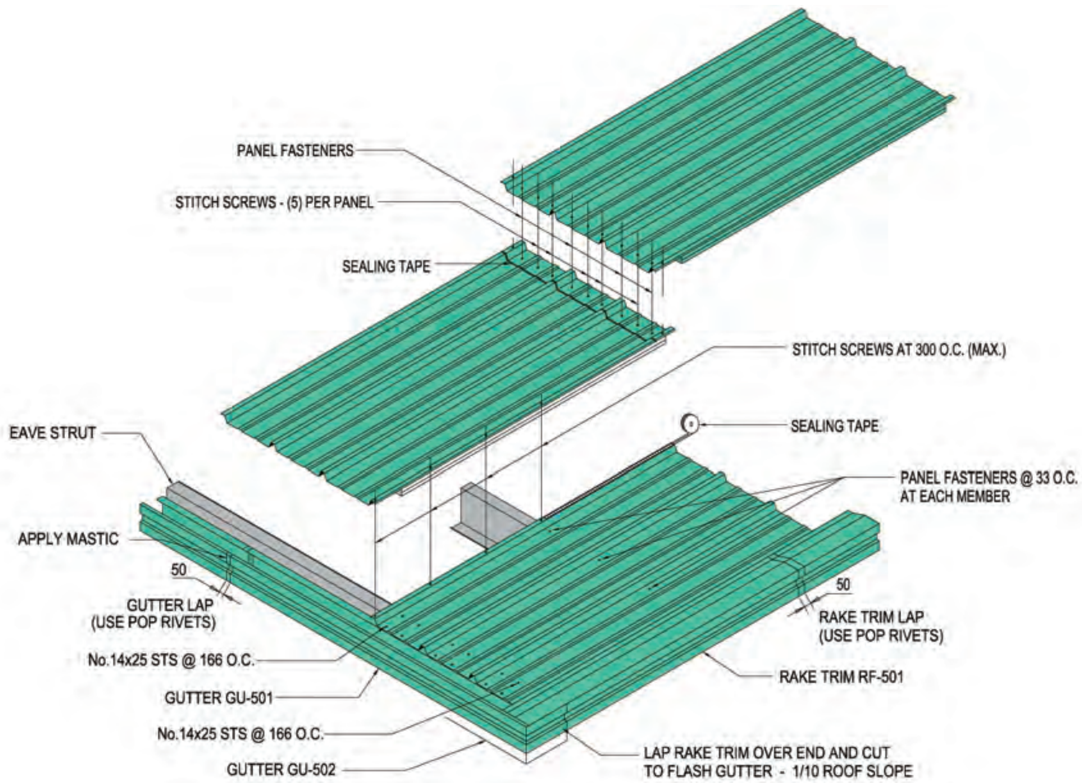


SECTION - 'A'

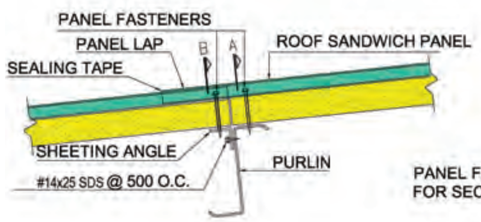


SILL SECTION -FLOOR POSITION

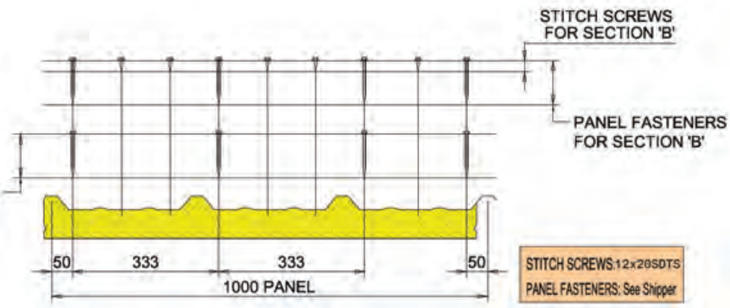
7.24 ROOF SANDWICH PANEL DETAILS



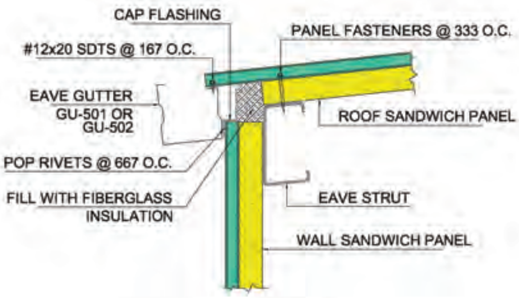
SANDWICH ROOF PANEL INSTALLATION



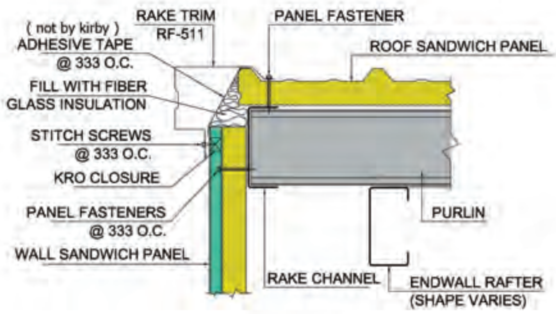
DETAIL 'D'
SANDWICH PANEL END LAP
(STANDARD)



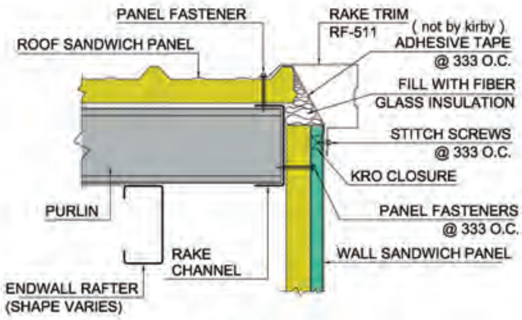
SECTIONS A & B



DETAIL 'A'
SECTION AT EAVE



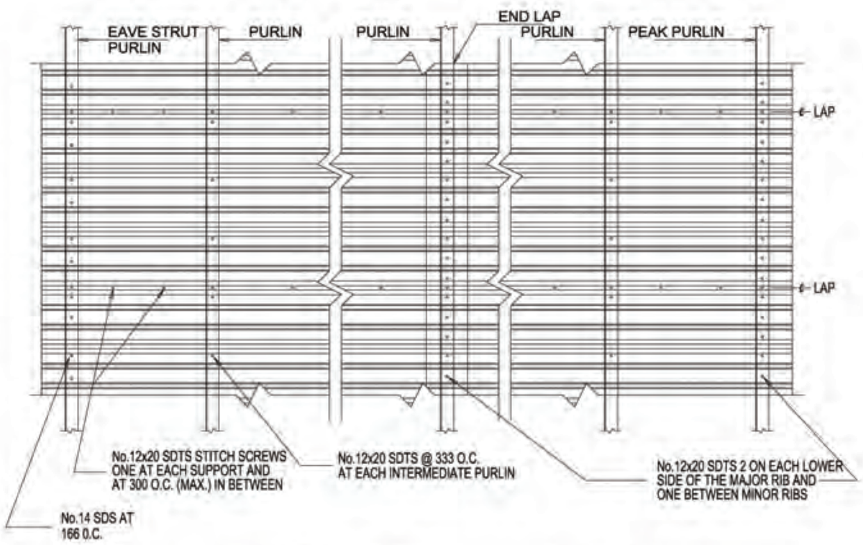
DETAIL 'B'
SECTION AT RAKE (LEFT END)



DETAIL 'C'
SECTION AT RAKE (RIGHT END)

General sheeting notes

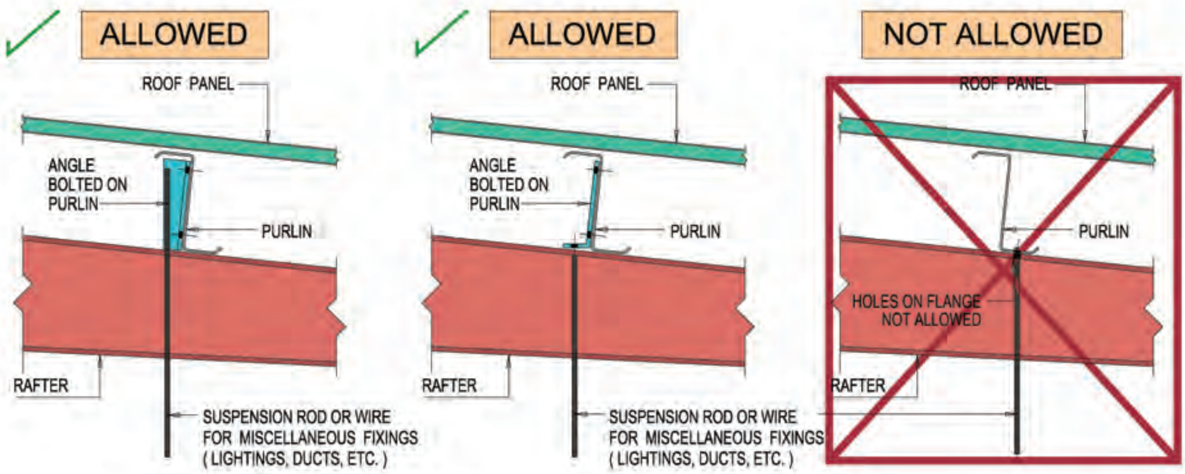
1. The building is to be tight and plumb before sheeting is to begin.
2. Sheeting is to begin at the leeward end of building so that all Panel laps will be away from prevailing wind.
3. Fiberglass insulation for filling the gaps to be fixed With adhesive tape to prevent it from flying. (Tape not supplied by kirby.)
4. Building installation crew is to sweep roof panels clear of all metal shavings.



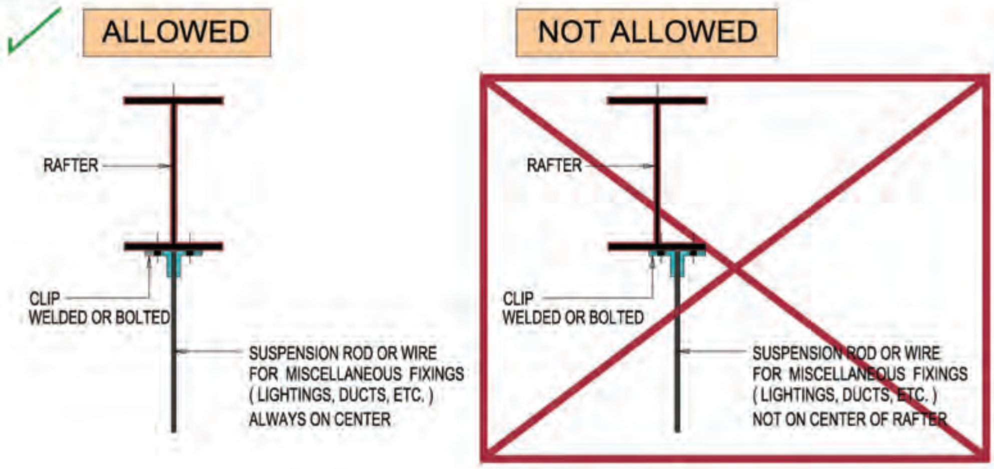
ROOF PANEL FASTENER LAYOUT

7.25 SUSPENSION OF LOADS FROM MAIN & SECONDARY MEMBERS

FROM PURLIN



FROM RAFTER



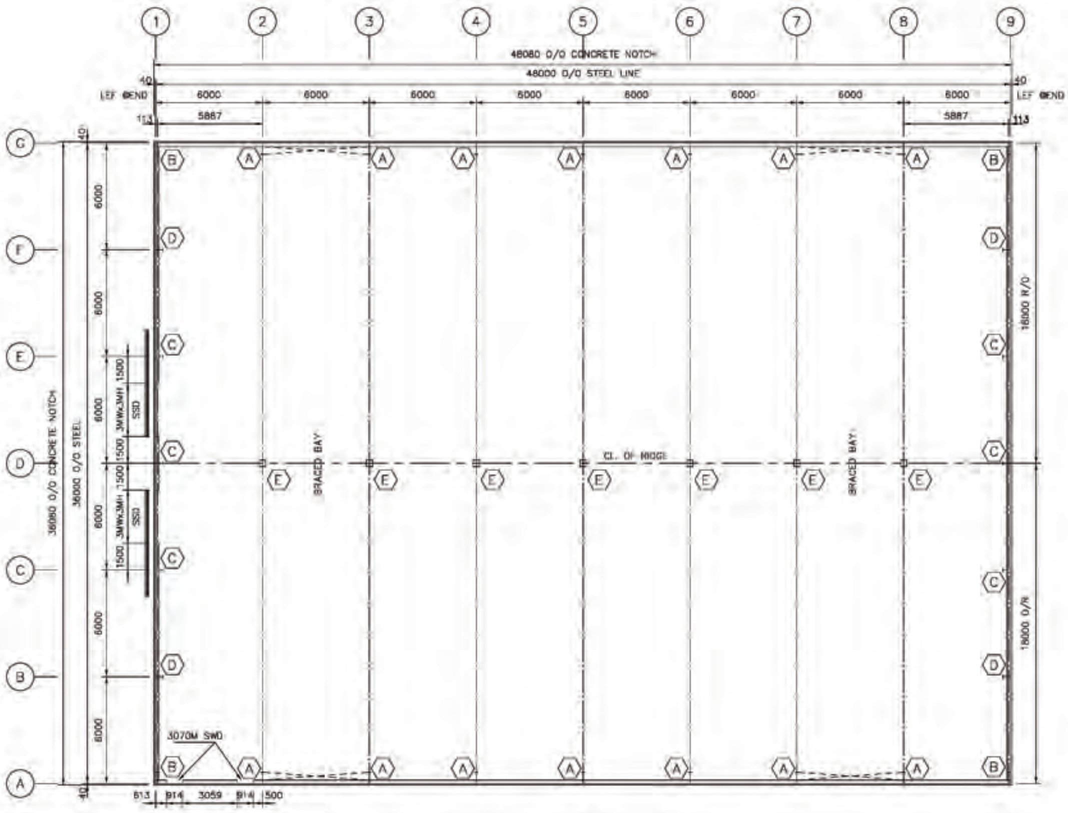
NOTE :

1. Drawing details shows the proper methods of suspending Loads from purlins & rafters.
2. The total load suspended from purlin & rafter shall not Exceed the value of collateral load indicated on this Drawing. If in doubt, please contact kirby's nearest Representative for confirmation.

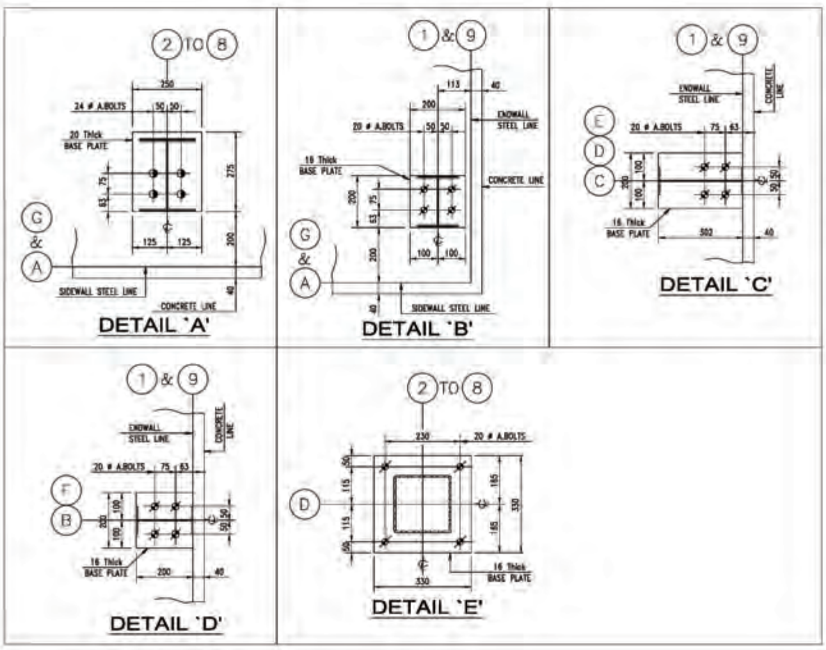
7.25 STANDARD BUILDINGS ERECTION DRAWINGS (CONTINUATION FROM CHAPTER 3.3)

Index for standard buildings:

3.3 STANDARD BUILDINGS - BC-36660

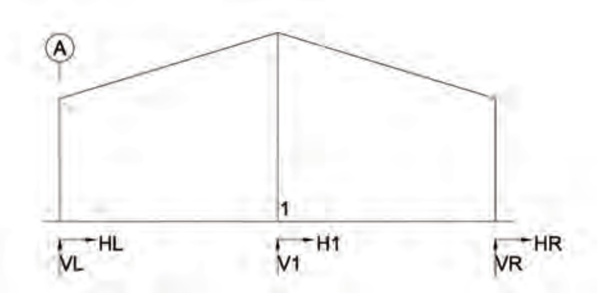


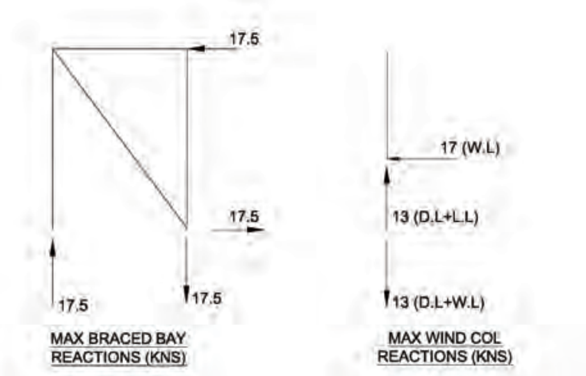
ANCHOR BOLT PLAN



Main frame column reactions:

Sign convensions:
Positive hor.Reaction : to the right
Positive ver.Reaction : upward
Positive moment : counter clockwise

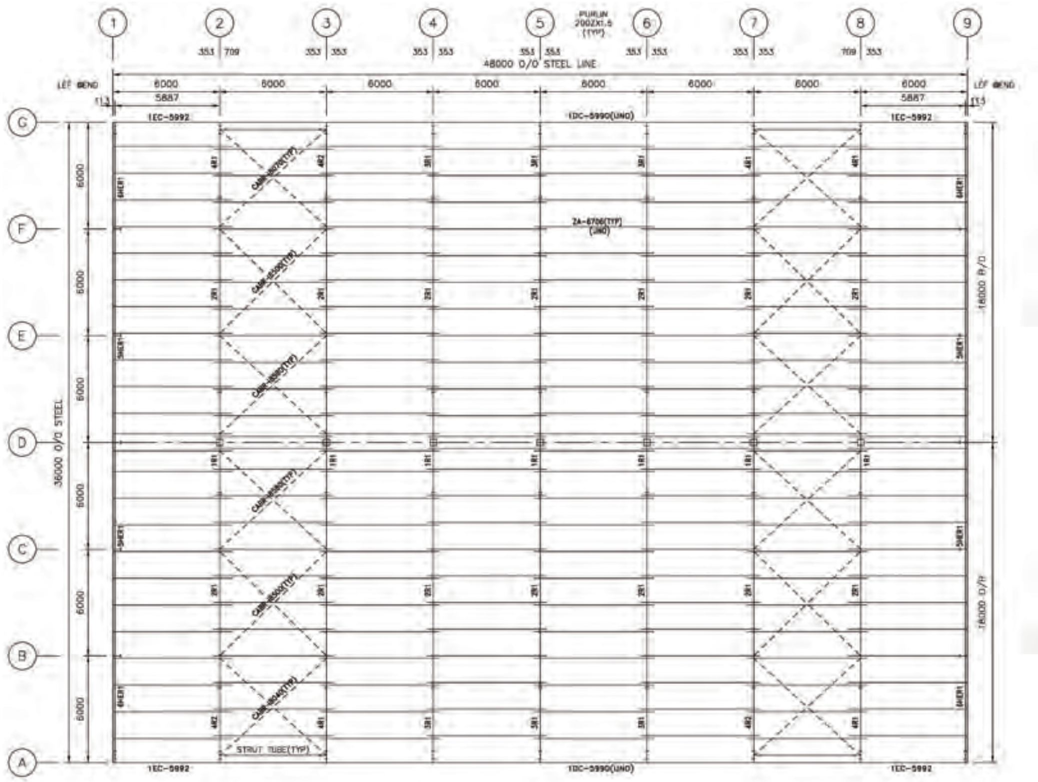




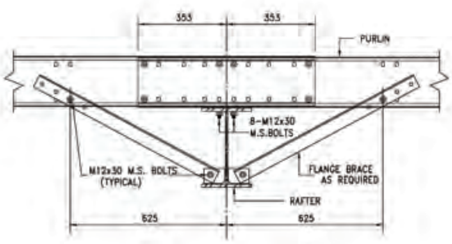
Mainframe- 2-8

Reaction For Combined Loads:

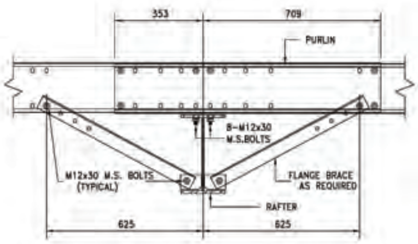
Description	Horz KN	Vert KN	Momt KN-m	Load combination
INT. COL. 1	0.0	88.9	KN-M	1DL+1LL
INT. COL. 1	0.0	-30.9	0.0	1DL+1WLL
INT. COL. 1	0.0	-30.9	0.0	1DL+1WLR
INT. COL. 1	0.0	18.4	0.0	1DL+1SEI
LEFT COL.	13.2	37.9	0.0	1DL+1LL
LEFT COL.	-10.3	-19.1	0.0	1DL+1WLL
LEFT COL.	2.7	-6.7	0.0	1DL+1WLR
LEFT COL.	0.1	7.6	0.0	1DL+1SEI
RIGT COL.	-13.2	37.9	0.0	1DL+1LL
RIGT COL.	-2.7	-6.7	0.0	1DL+1WLL
RIGT COL.	10.3	-19.1	0.0	1DL+1WLR
RIGT COL.	-5.1	9.2	0.0	1DL+1SEI



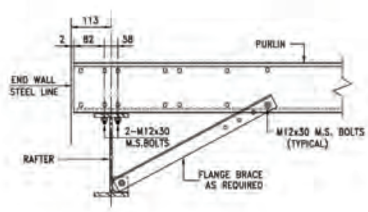
ROOF FRAMING PLAN



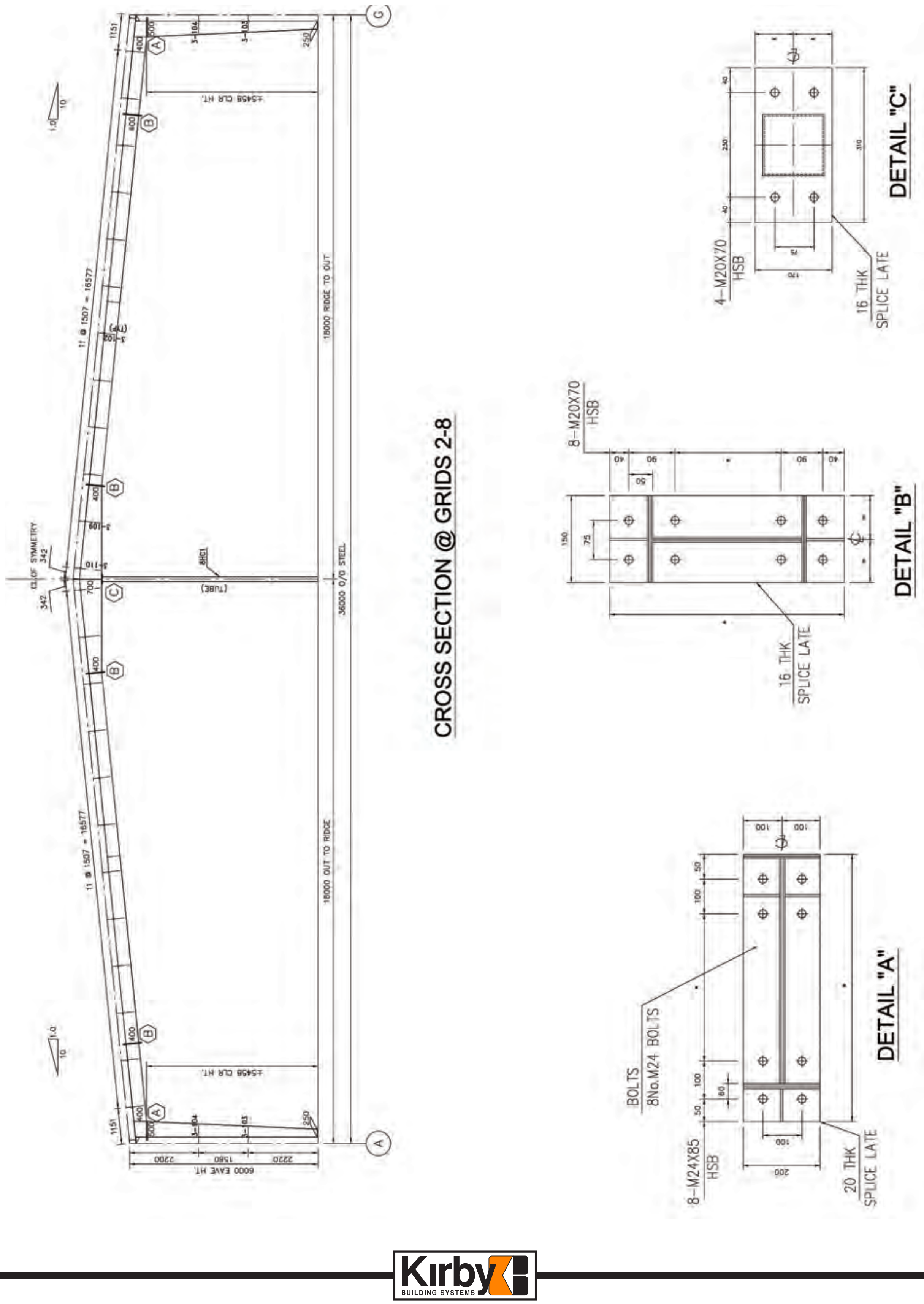
PURLIN CONNECTION DETAIL
FROM GRID LINE 3 - 7



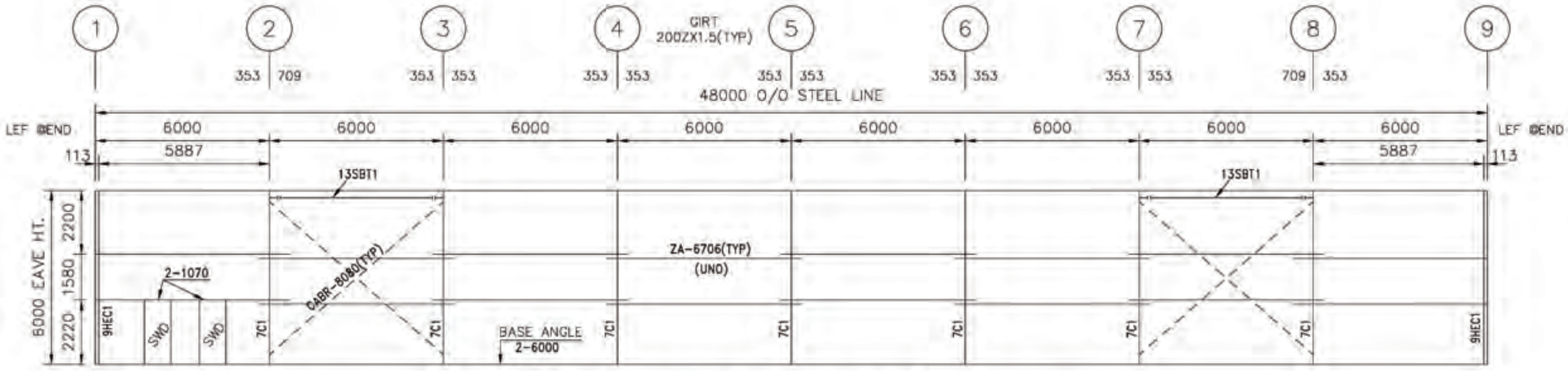
PURLIN CONNECTION DETAIL
At Lines 2 & 8



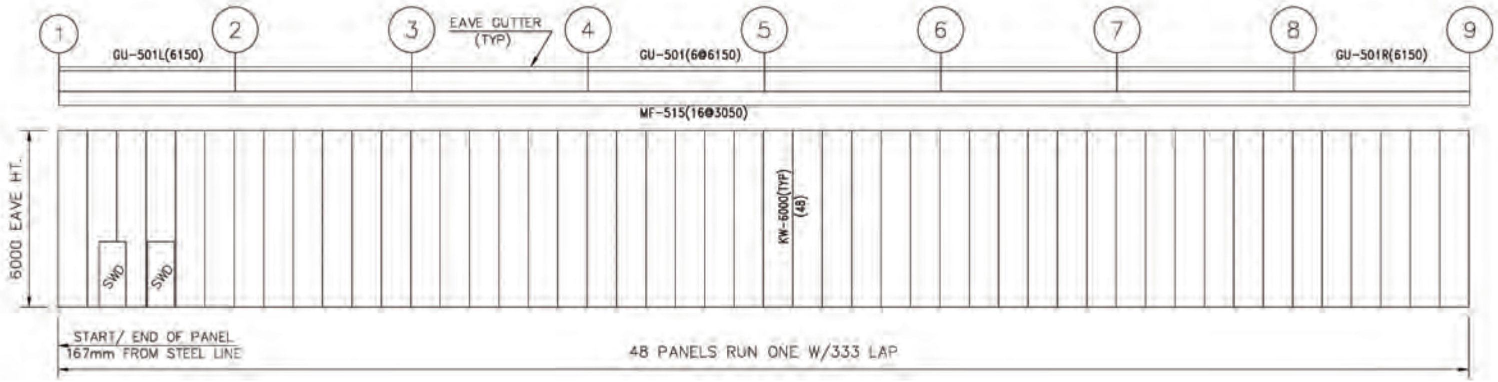
PURLIN CONNECTION DETAIL
AT GRID LINE 1 & 9



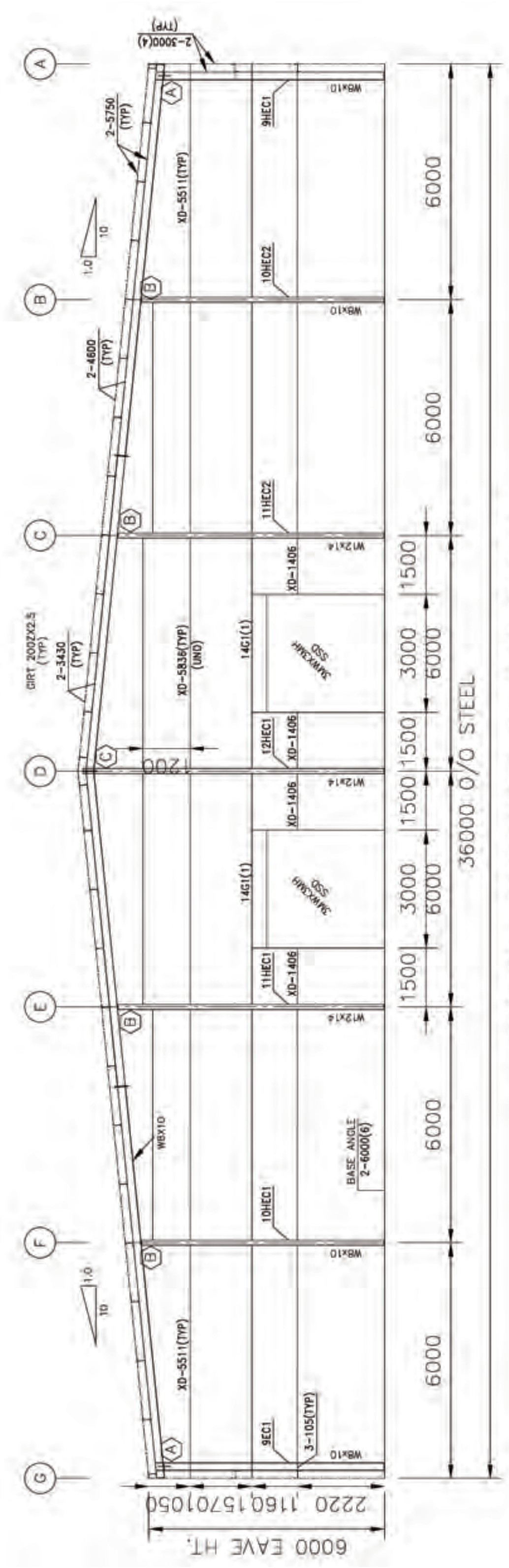
CROSS SECTION @ GRIDS 2-8
11 @ 1507 = 16577
11 @ 1507 = 16577
CL OF SYMMETRY
5458 CLR HT.
6000 EAVE HT.
18000 OUT TO RIDGE
18000 RIDGE TO OUT
36000 O/O STEEL
DETAIL "A"
8-M24X85
HSB
BOLTS
8No.M24 BOLTS
20 THK
SPLICE LATE
DETAIL "B"
8-M20X70
HSB
16 THK
SPLICE LATE
DETAIL "C"
4-M20X70
HSB
16 THK
SPLICE LATE



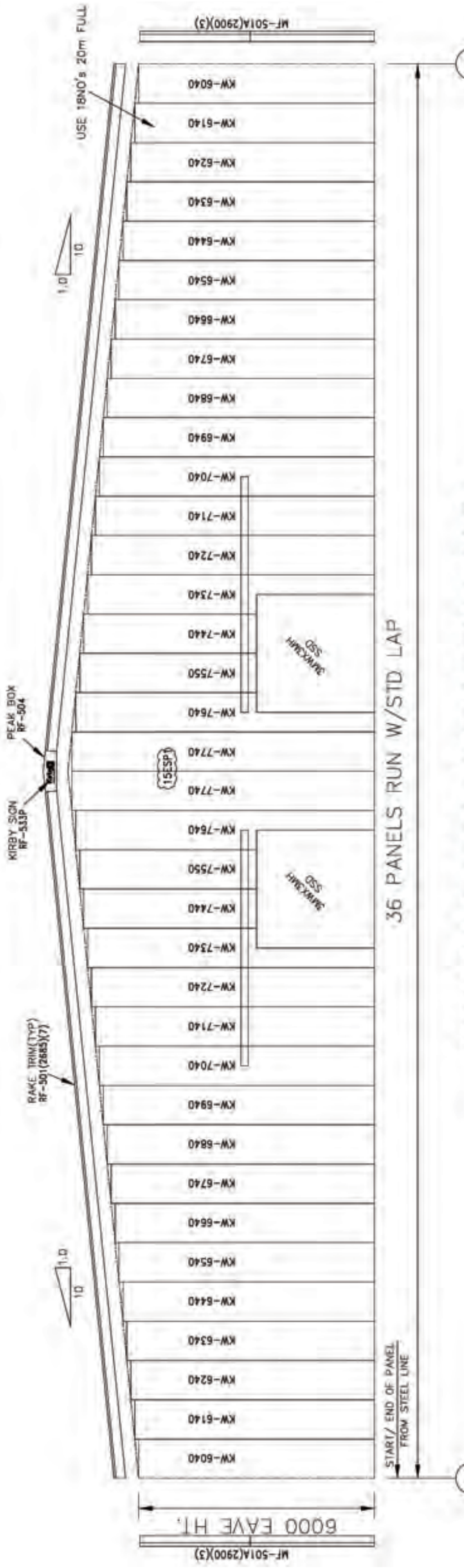
SIDE WALL FRAMIMNG ELEVATION @ GL A (AS DRAWN)
SIDE WALL FRAMIMNG ELEVATION @ GL G (OPP HAND)
S.W.D @ GL-A ONLY



SIDE WALL SHEETING ELEVATION @ GL A (AS DRAWN)
SIDE WALL SHEETING ELEVATION @ GL G (OPP HAND)
S.W.D @ GL-A ONLY



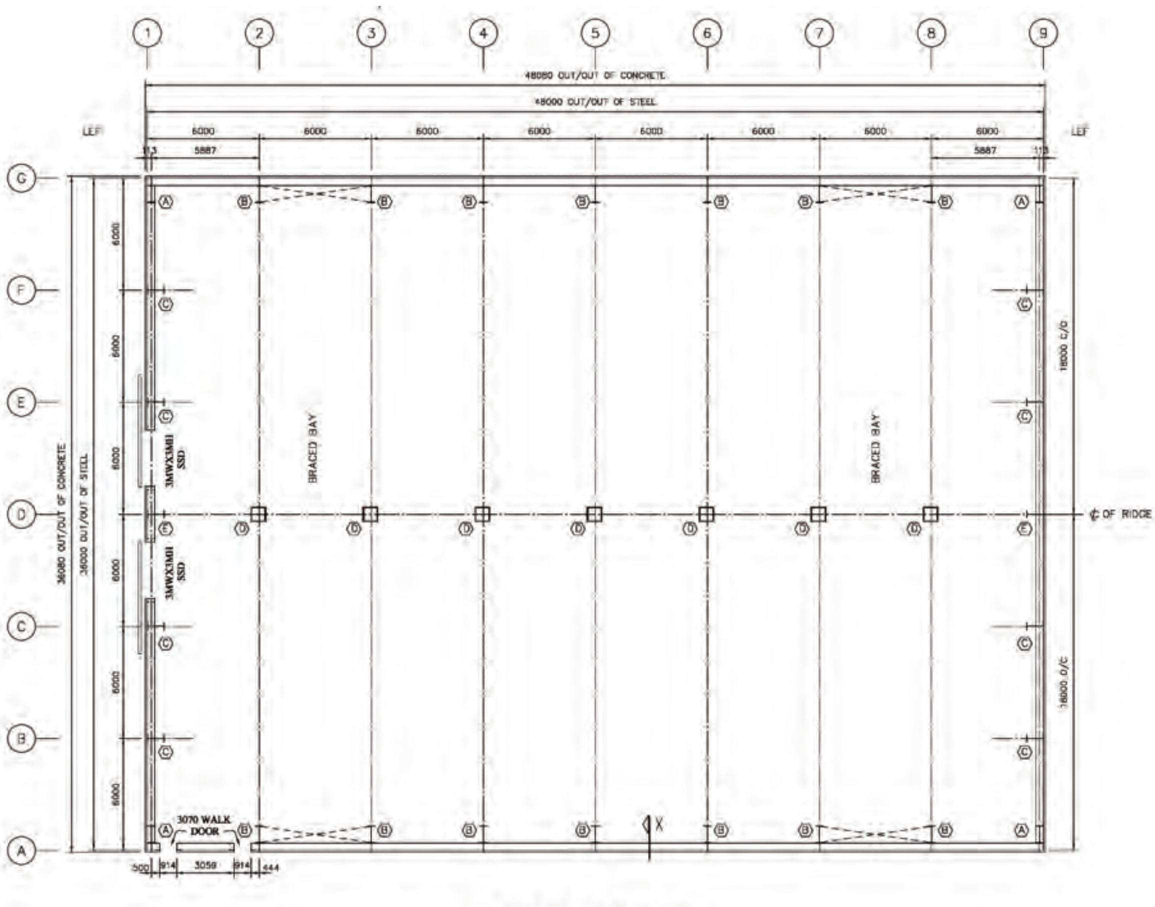
END WALL FRAMING ELEVATION @ GRID 1



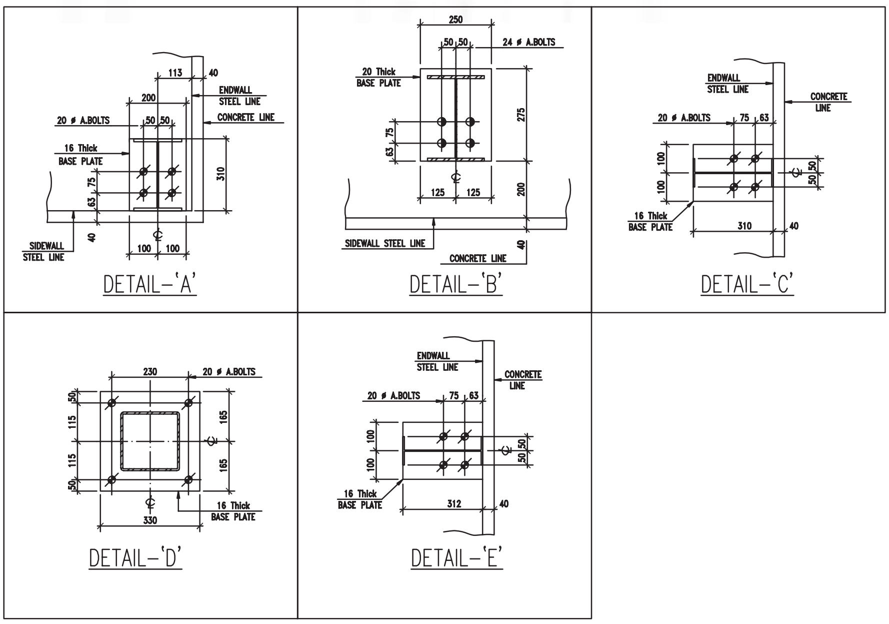
END WALL SHEETING ELEVATION @ GRID 1

USE INSULATION 13 ROLLS

3.3 STANDARD BUILDINGS - BC-36685

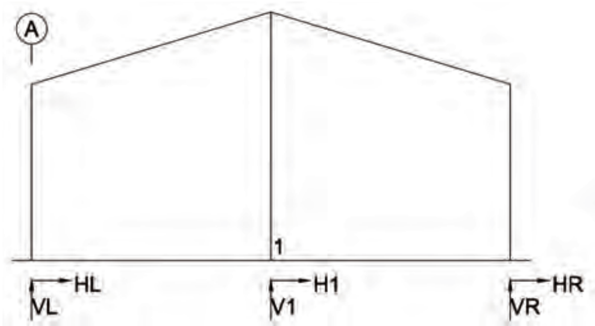


ANCHOR BOLT PLAN



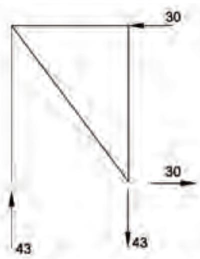
Main frame column reactions:

Sign convensions:
Positive hor.Reaction : to the right
Positive ver.Reaction : upward
Positive moment : counter clockwise

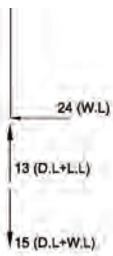


Mainframe- 2-8
Reaction For Combined Loads:

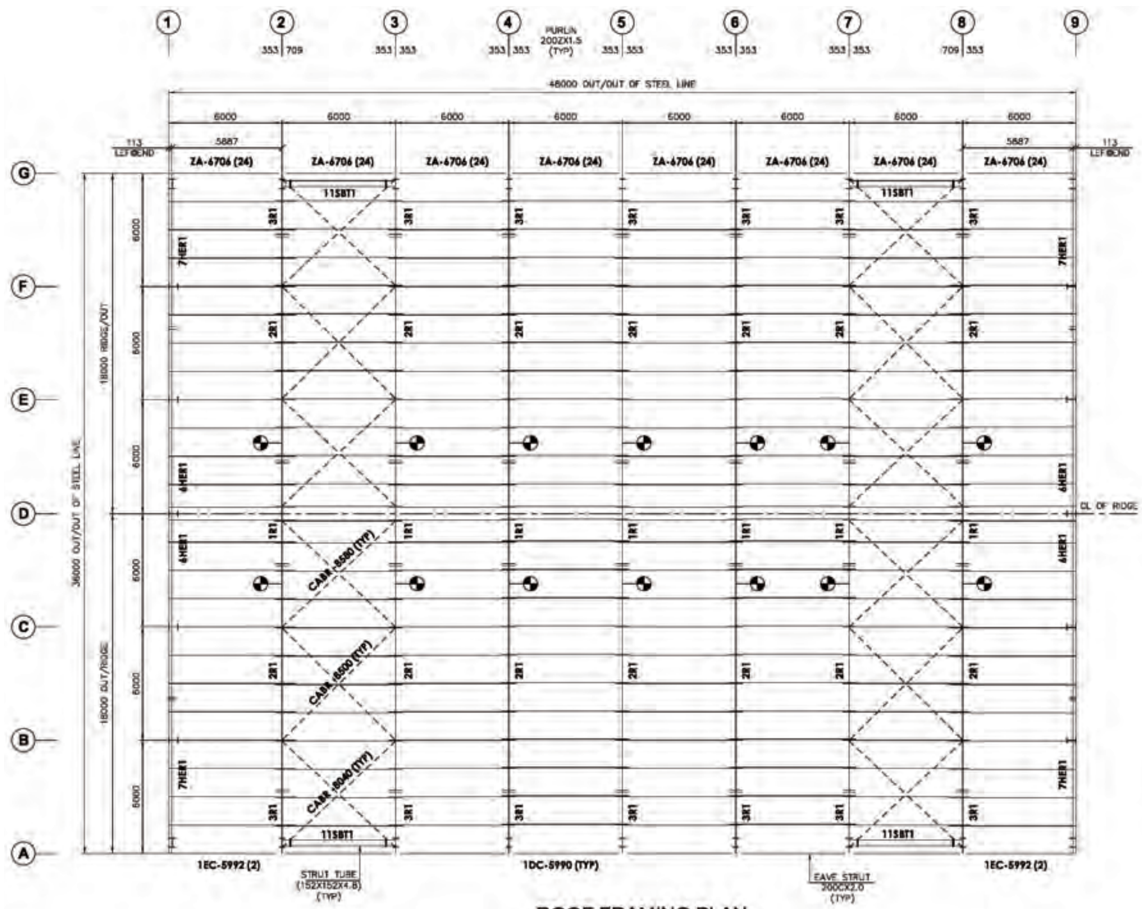
Description	Horz KN	Vert KN	Momt KN-M	Load combination
INT. COL. 1	0.0	88.9	0.0	1DL+1LL
INT. COL. 1	0.0	-30.9	0.0	1DL+1WLL
INT. COL. 1	0.0	-30.9	0.0	1DL+1WLR
INT. COL. 1	0.0	18.4	0.0	1DL+1SEI
LEFT COL.	13.2	37.9	0.0	1DL+1LL
LEFT COL.	-10.3	-19.1	0.0	1DL+1WLL
LEFT COL.	2.7	-6.7	0.0	1DL+1WLR
LEFT COL.	0.1	7.6	0.0	1DL+1SEI
RIGT COL.	-13.2	37.9	0.0	1DL+1LL
RIGT COL.	-2.7	-6.7	0.0	1DL+1WLL
RIGT COL.	10.3	-19.1	0.0	1DL+1WLR
RIGT COL.	-5.1	9.2	0.0	1DL+1SEI



MAX BRACED BAY REACTIONS (KNS)

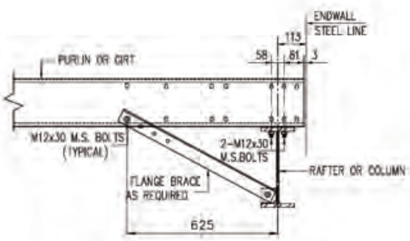


MAX WIND COL REACTIONS (KNS)



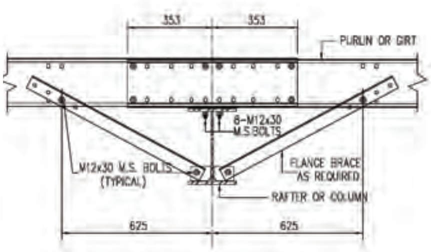
ROOF FRAMING PLAN

ERECTION MARK



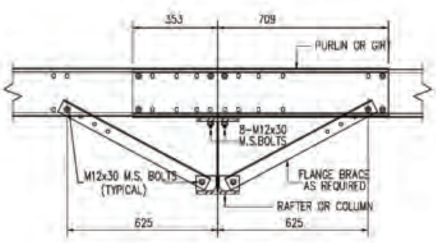
PURLIN CONNECTION DETAIL

At Lines 1 & 9



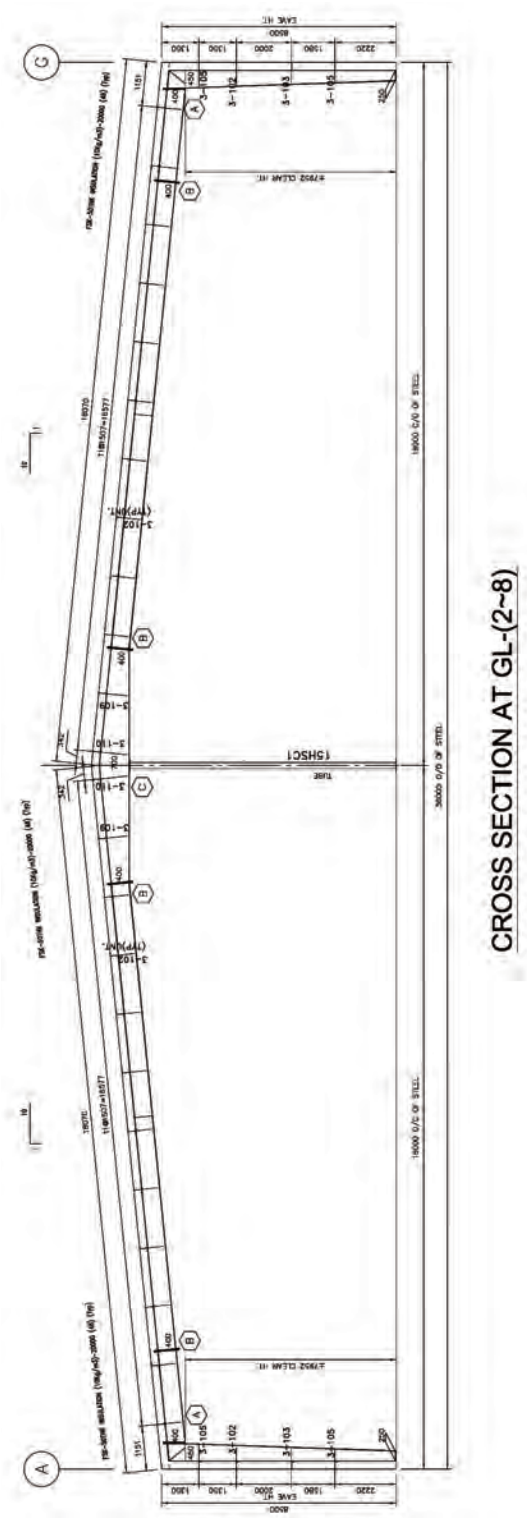
PURLIN CONNECTION DETAIL

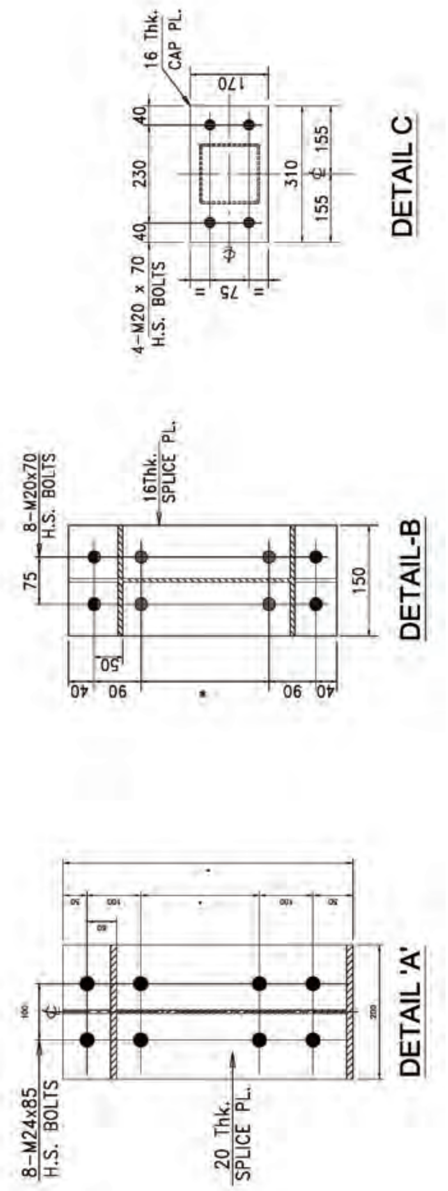
At Lines 3 ~ 7

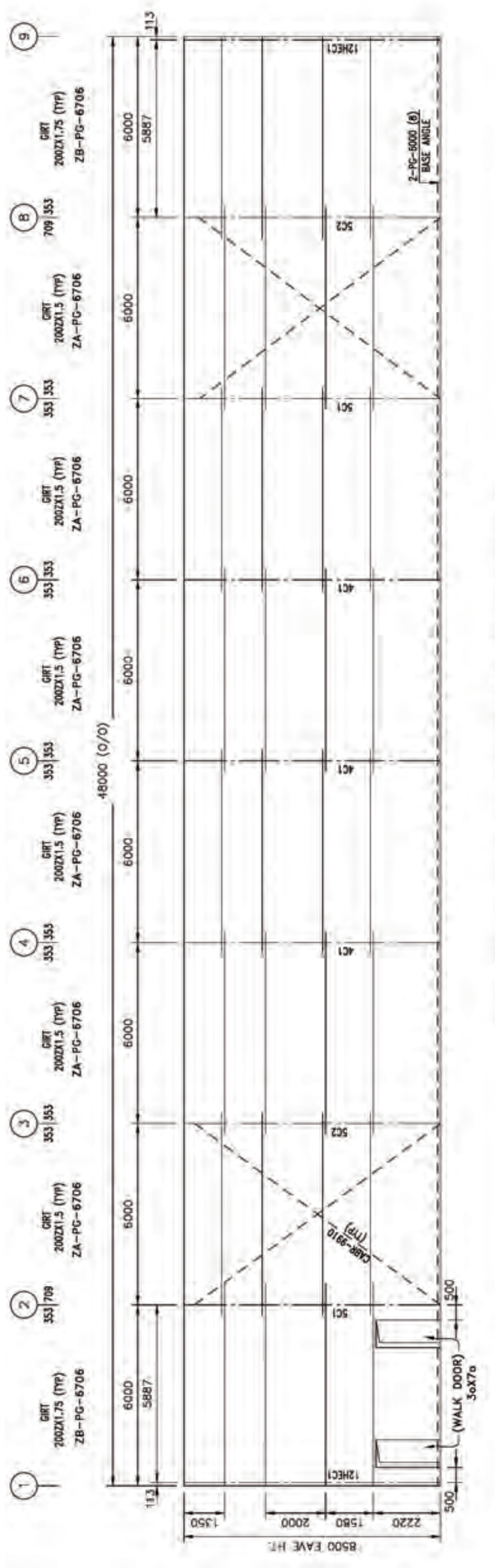


PURLIN CONNECTION DETAIL

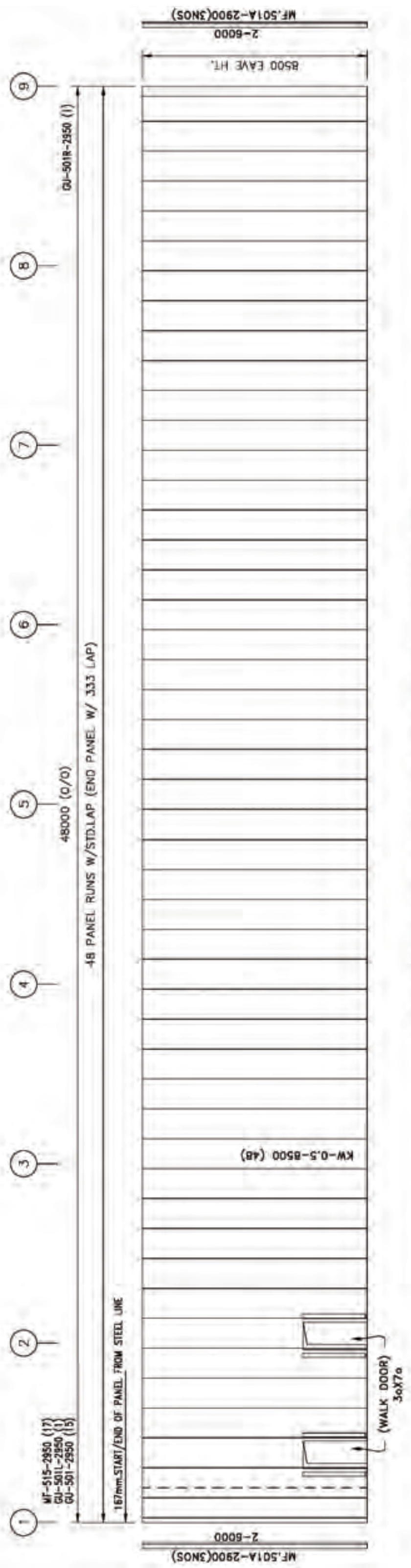
At Lines 2 & 8


CROSS SECTION AT GL-(2~8)

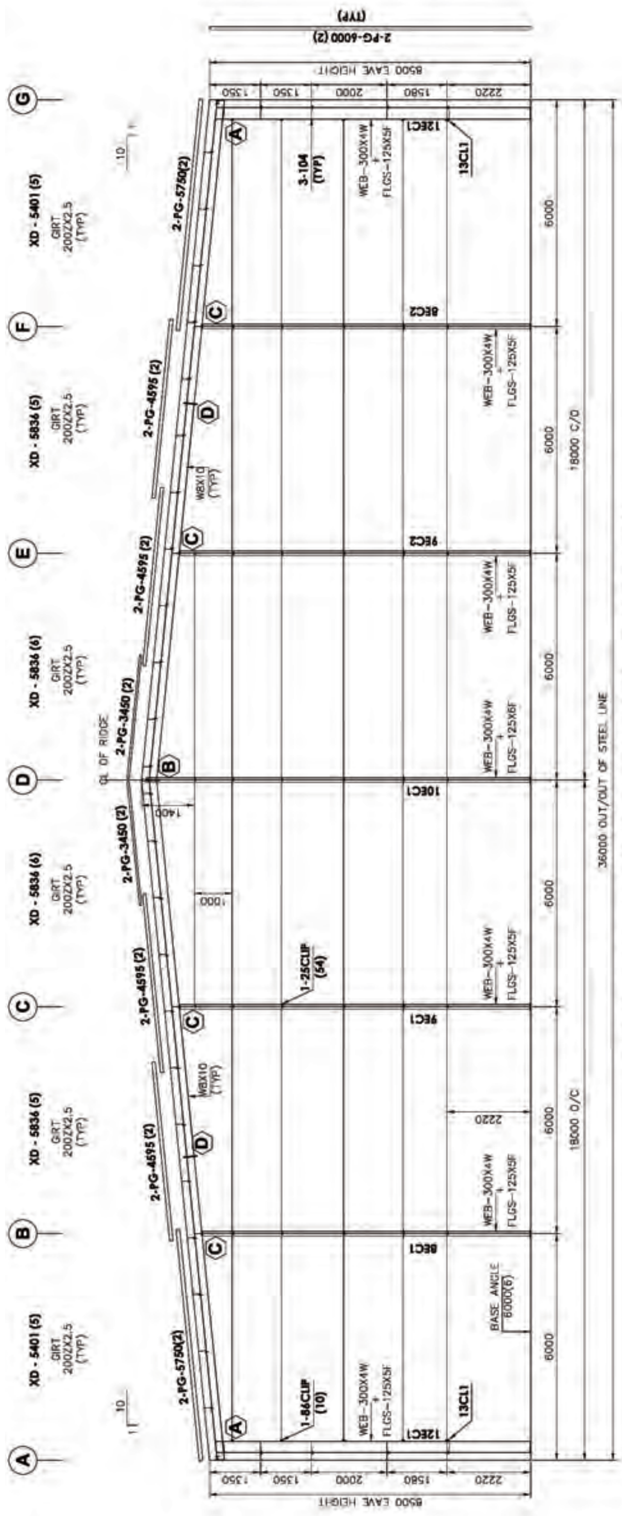

8-M24x85 H.S. BOLTS
20 Thk. SPLICE PL.
DETAIL 'A'
8-M20x70 H.S. BOLTS
16Thk. SPLICE PL.
DETAIL-B
4-M20 x 70 H.S. BOLTS
16 Thk. CAP PL.
DETAIL C



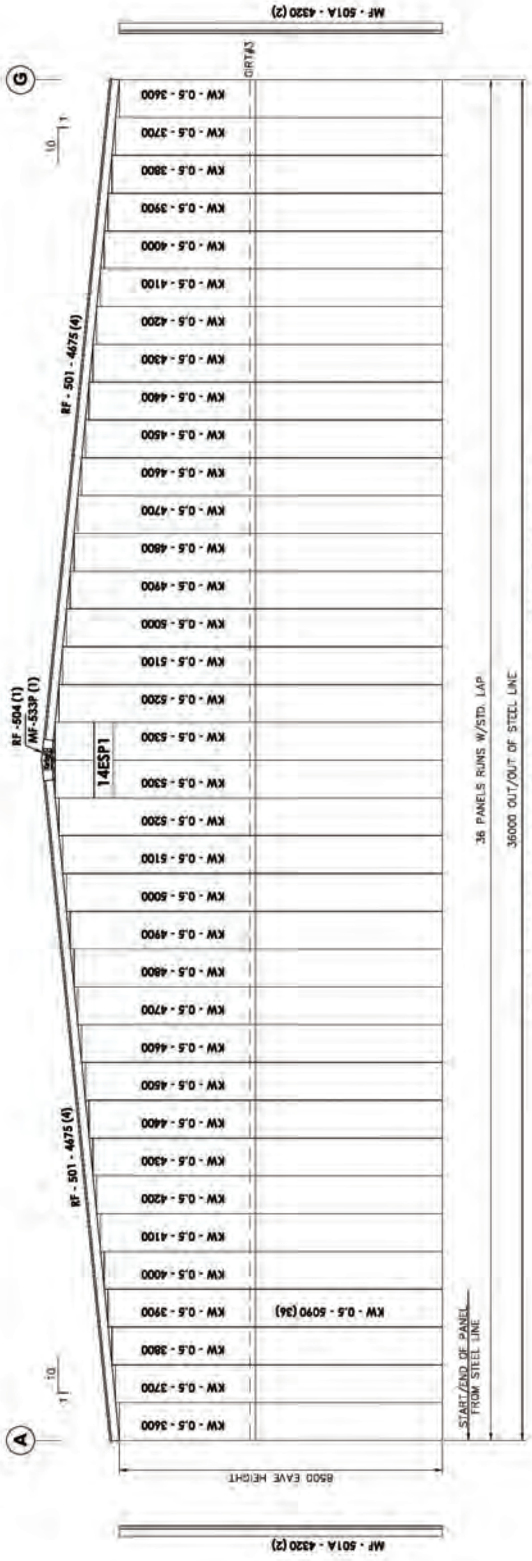
SIDE WALL FRAMING ELEVATION @ GL-A(AS DRAWN)
SIDE WALL FRAMING ELEVATION @ GL-G(OPP HAND)



SIDE WALL SHEETING ELEVATION @ GL-A(AS DRAWN)
SIDE WALL SHEETING ELEVATION @ GL-G(OPP HAND)



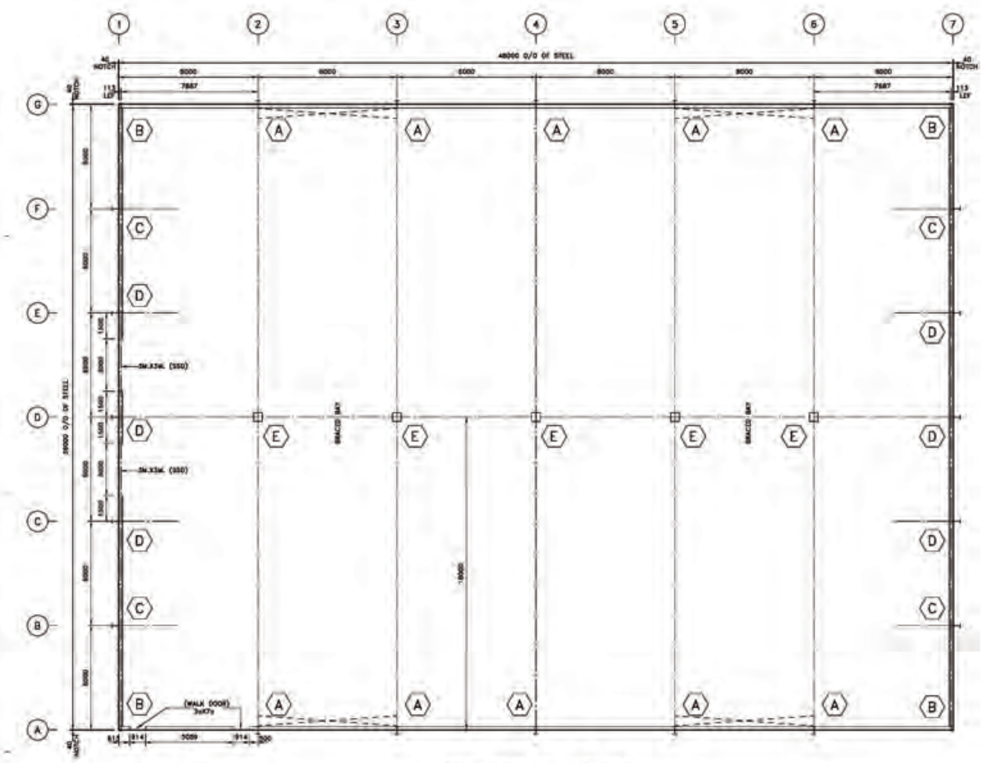
END WALL FRAMING ELEVATION @ GRID - 9



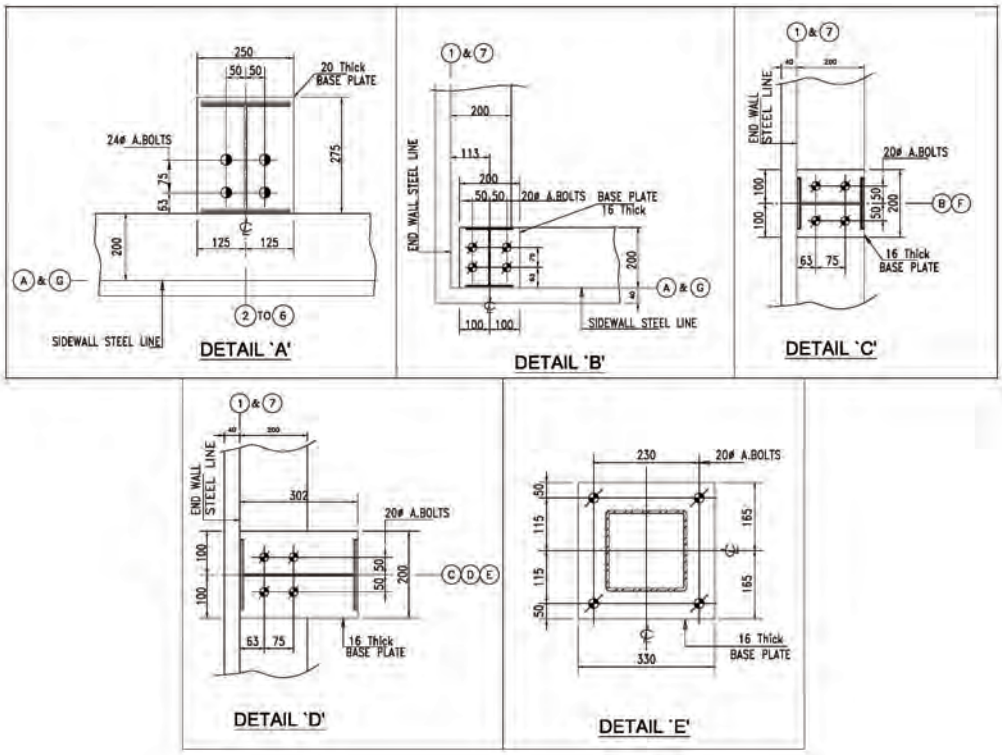
END WALL SHEETING ELEVATION @ GRID - 9

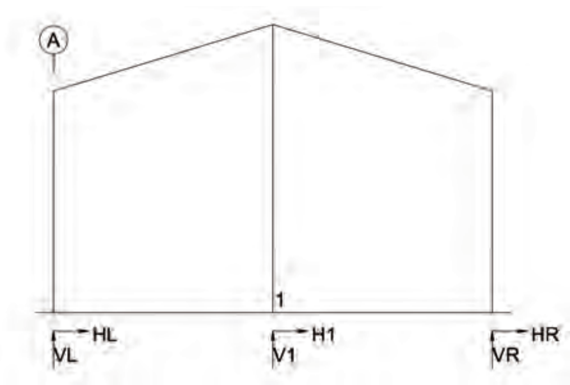
KW-0.5THK. ARCTIC WHITE PANELS
FSK-50THK-W/20000LENGTH. (18 ROLLS)

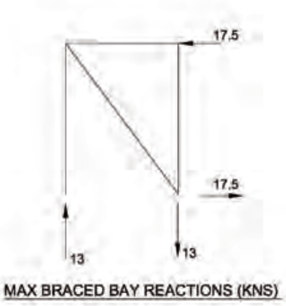
3.3 STANDARD BUILDINGS - BC-36860

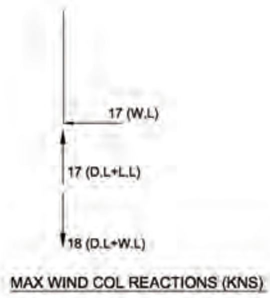


ANCHOR BOLT PLAN



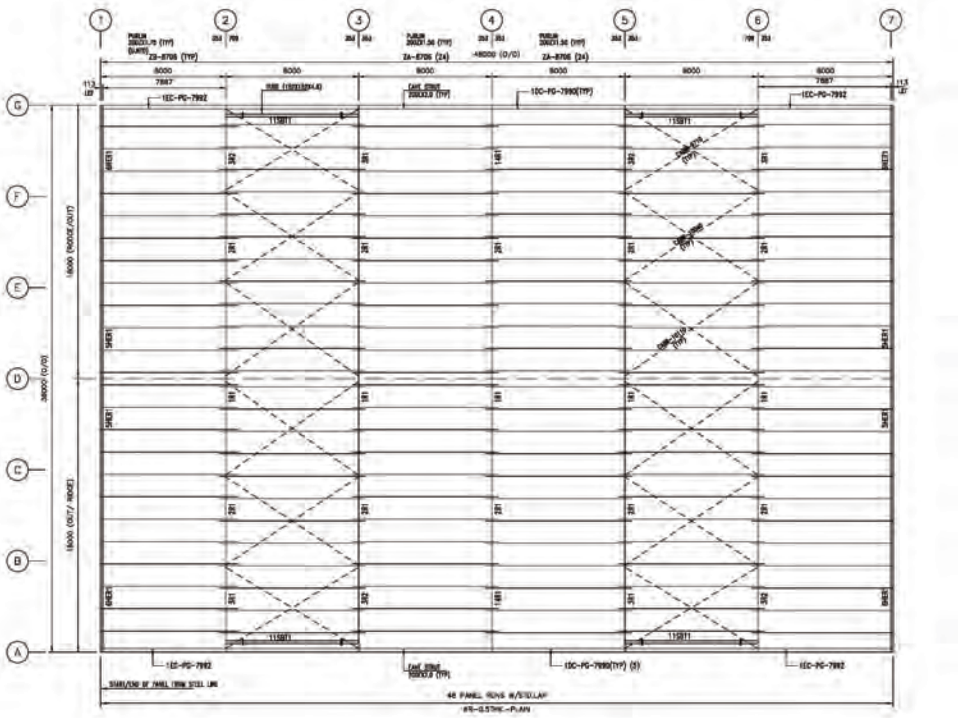




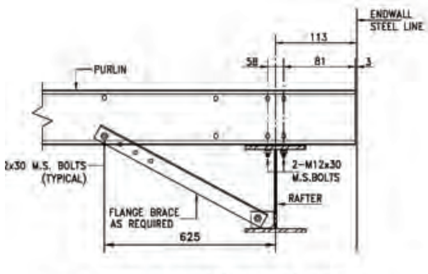


Mainframe- 2-8
Reaction For Combined Loads:

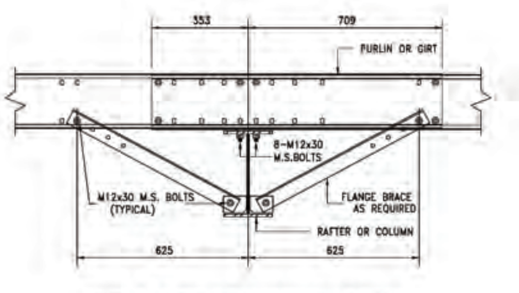
Description	Horz KN	Vert KN	Momt KN-M	Load combination
INT. COL. 1	0.0	92.8	0.0	1DL+1LL
INT. COL. 1	0.0	-35.7	0.0	1DL+1WLL
INT. COL. 1	0.0	-35.7	0.0	1DL+1WLR
INT. COL. 1	0.0	19.5	0.0	1DL+1SEI
LEFT COL.	7.6	36.7	0.0	1DL+1LL
LEFT COL.	-11.9	-21.6	0.0	1DL+1WLL
LEFT COL.	9.0	-5.7	0.0	1DL+1WLR
LEFT COL.	-1.1	7.4	0.0	1DL+1SEI
RIGT COL.	-7.6	36.7	0.0	1 DL+1LL
RIGT COL.	-9.0	-5.7	0.0	1DL+1WLL
RIGT COL.	11.9	-21.6	0.0	1DL+1WLR
RIGT COL.	-4.1	9.8	0.0	1DL+1SEI



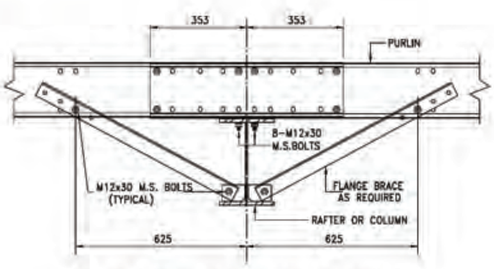
ROOF FRAMING PLAN



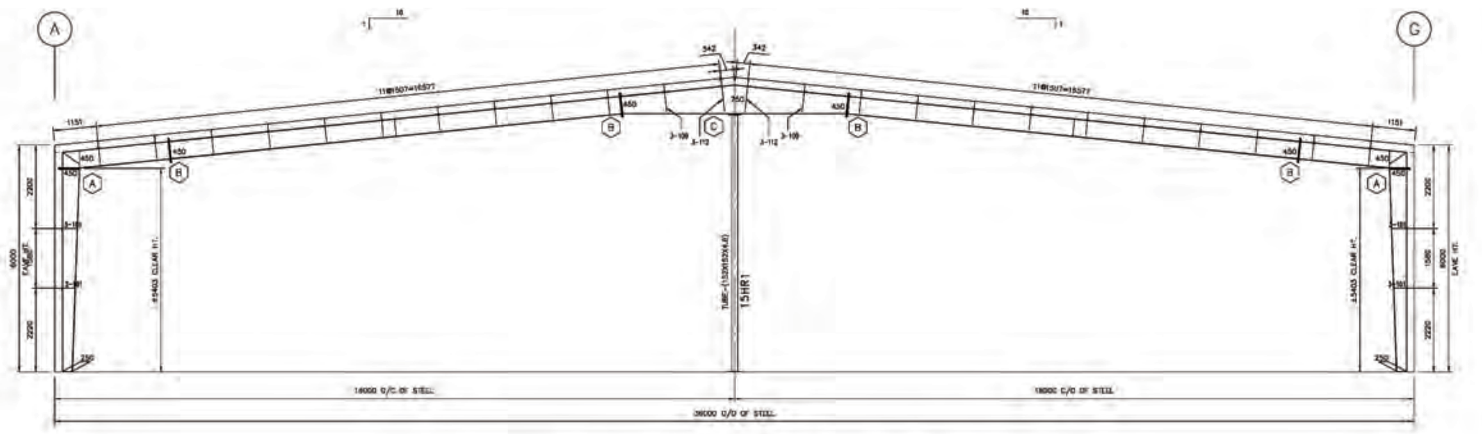
PURLIN CONNECTION DETAIL
At Lines 1 & 7



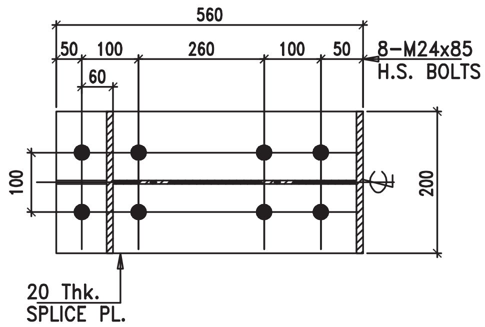
PURLIN/GIRT CONNECTION DETAIL
At Lines 2 & 6



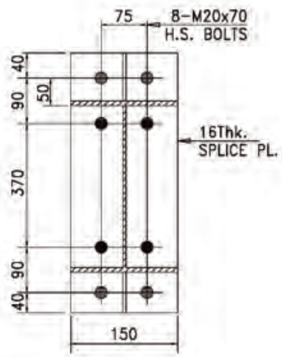
PURLIN/GIRT CONNECTION DETAIL
At Lines 3 ~ 5



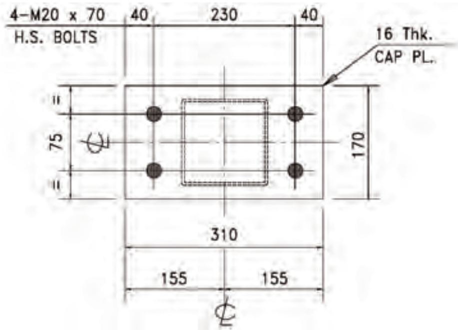
CROSS SECTION AT GL-(2~6)



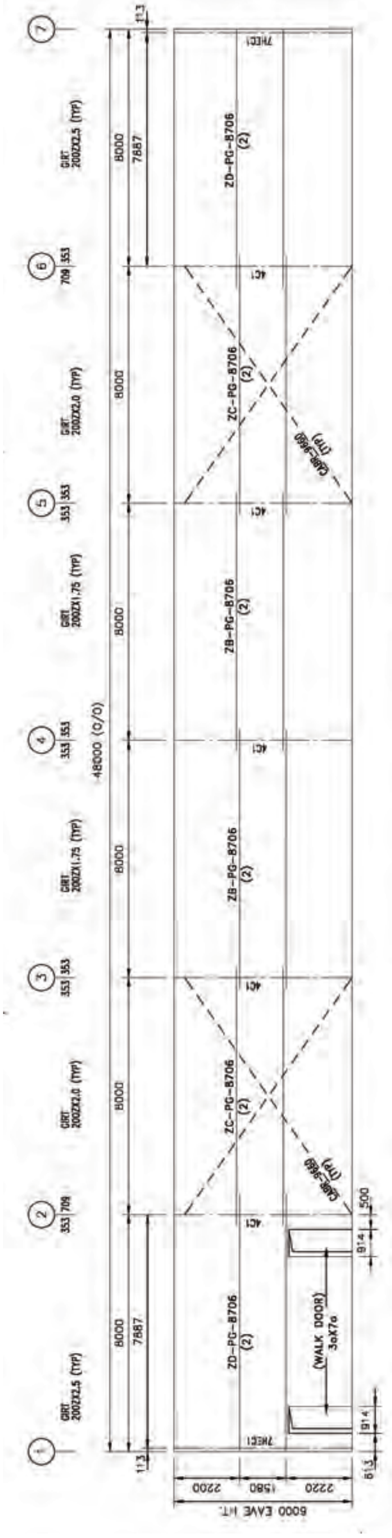
DETAIL-'A'



DETAIL-B



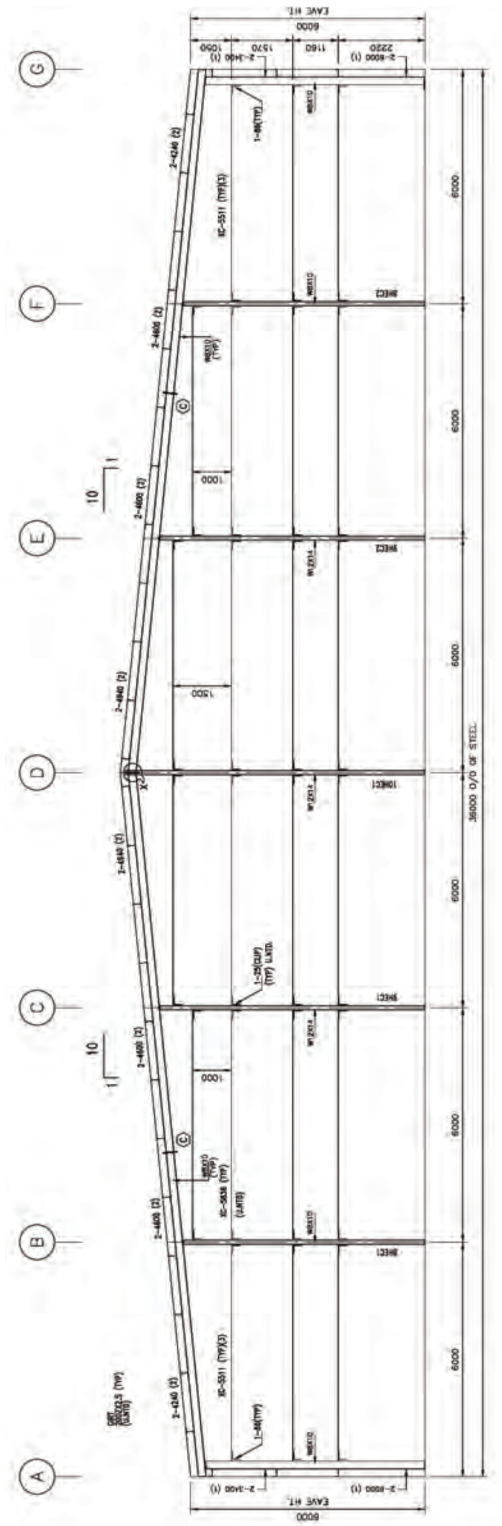
DETAIL C



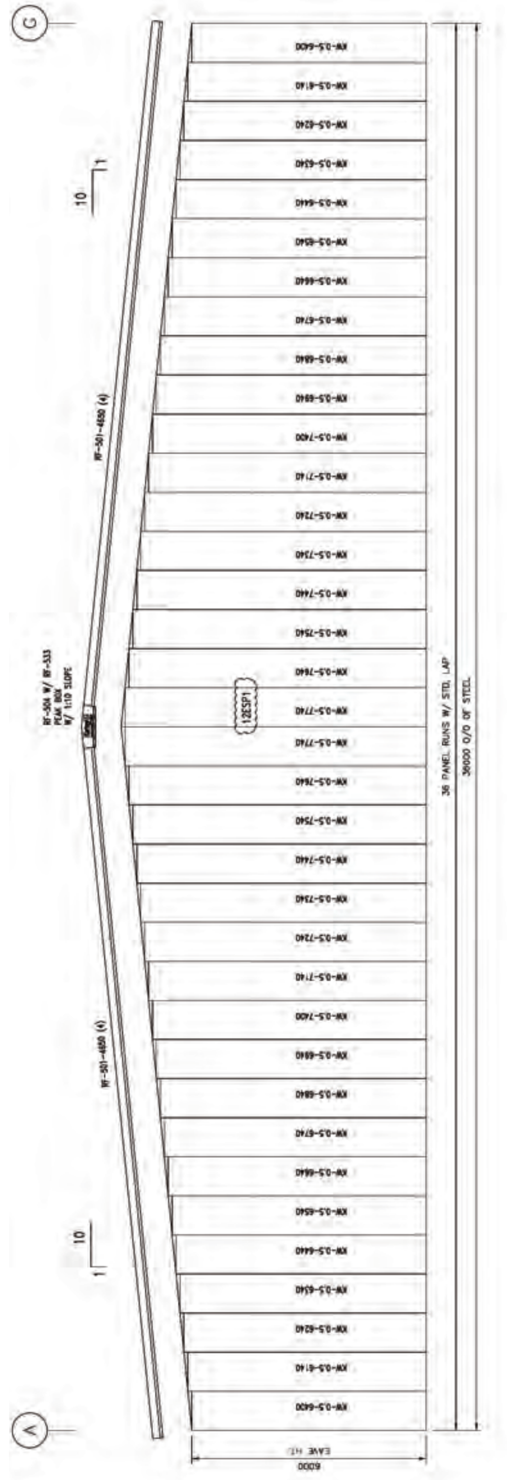
SIDE WALL FRAMING ELEVATION @ GL-A

SIDE WALL SHEETING ELEVATION @ GL-A

3.3 STANDARD BUILDINGS
BC-36860



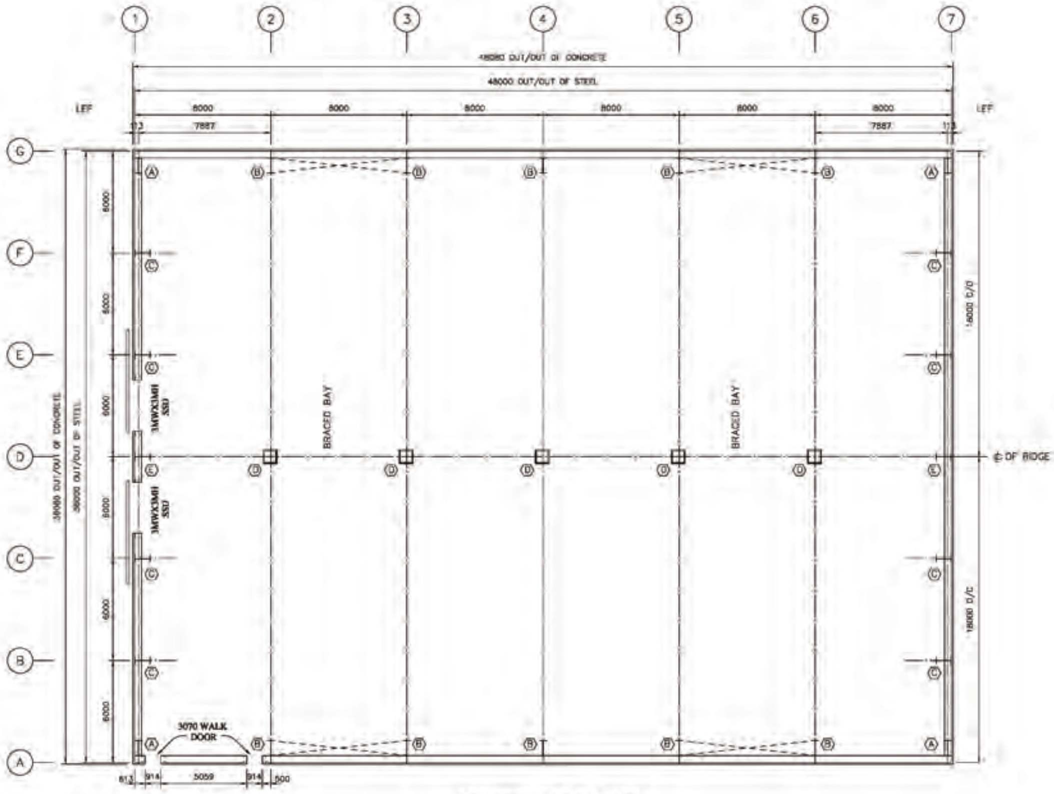
END WALL FRAMING ELEVATION @ GL-7



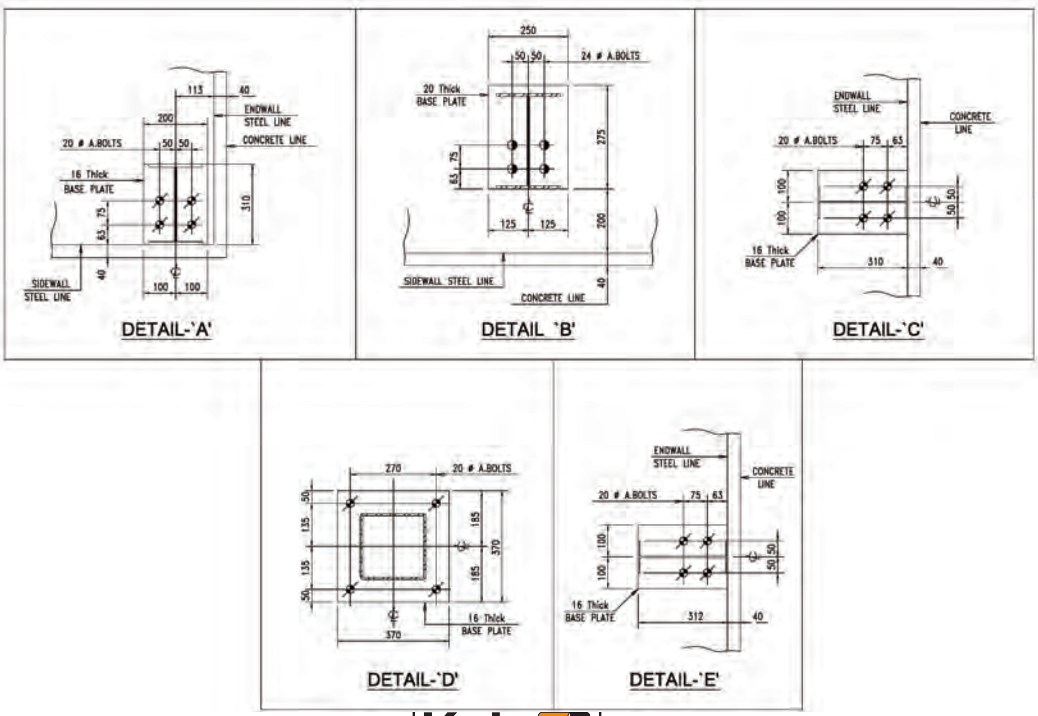
END WALL SHEETING ELEVATION @ GL-7

FSK-50THK INSULATION (10Kg/m3)-20000 (13) (Typ)

3.3 STANDARD BUILDINGS - BC-36885



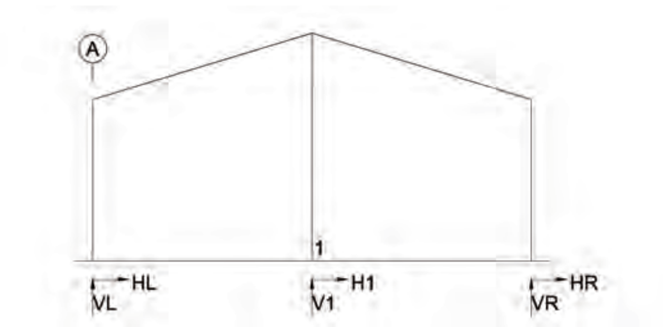
ANCHOR BOLT PLAN



DETAIL-'A' DETAIL 'B' DETAIL-'C' DETAIL-'D' DETAIL-'E'

Mainframe- 2-6
Reaction For Combined Loads:

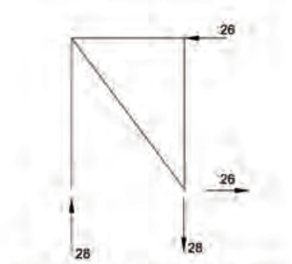
Description	Horz KN	Vert KN	Momt KN-M	Load combination
INT. COL. 1	0.0	124.1	0.0	1DL+1LL
INT. COL. 1	0.0	-48.2	0.0	1DL+1WLL
INT. COL. 1	0.0	-48.2	0.0	1DL+1WLR
INT. COL. 1	0.0	25.8	0.0	1DL+1SEI
LEFT COL.	9.1	47.6	0.0	1DL+1LL
LEFT COL.	-15.7	-29.7	0.0	1DL+1WLL
LEFT COL.	12.1	-8.4	0.0	1DL+1WLR
LEFT COL.	-1 .6	8.9	0.0	1DL+1SEI
RIGT COL.	-9.1	47.6	0.0	1DL+1LL
RIGT COL.	-12.1	-8.4	0.0	1DL+1WLL
RIGT COL.	15.7	-29.7	0.0	1DL+1WLR
RIGT COL.	-5.0	11.9	0.0	1DL+1SEI



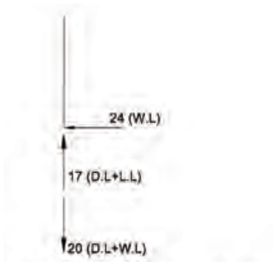
Main frame column reactions:

Sign convensions:

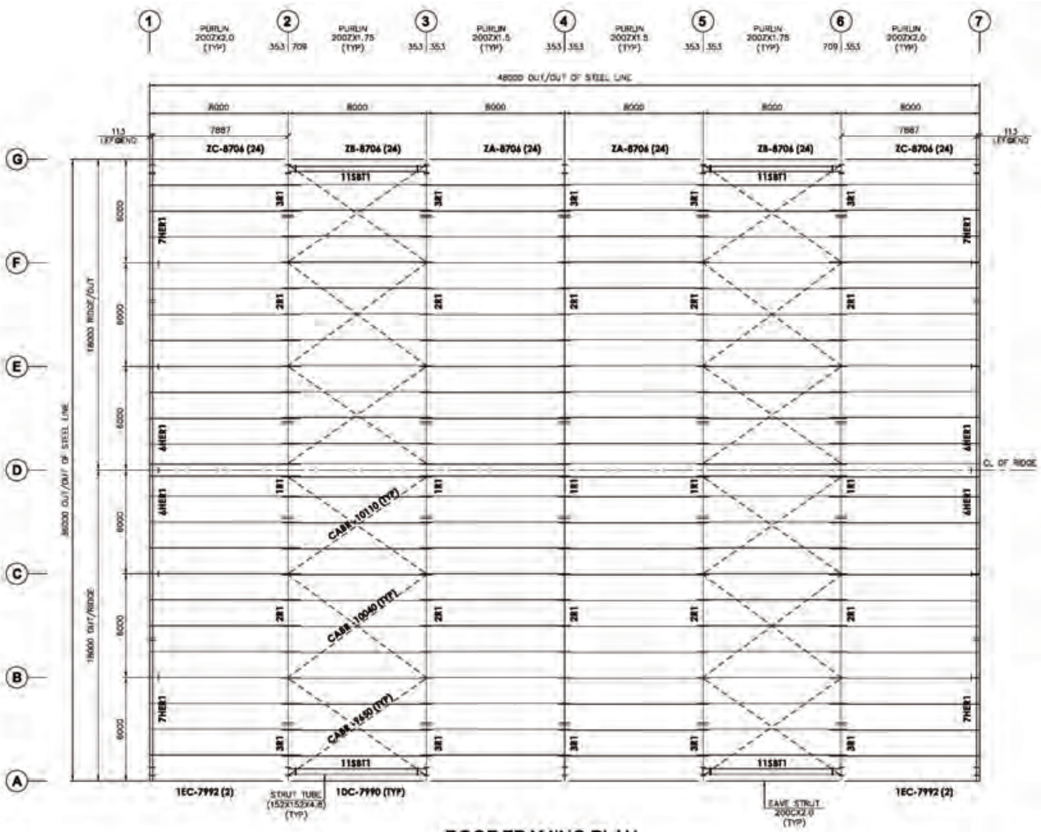
Positive hor.Reaction	: to the right
Positive ver.Reaction	: upward
Positive moment	: counter clockwise



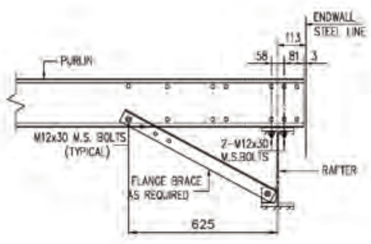
MAX BRACED BAY REACTIONS (KNS)



MAX WIND COL REACTIONS (KNS)

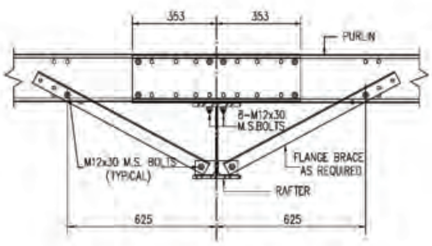


ROOF FRAMING PLAN



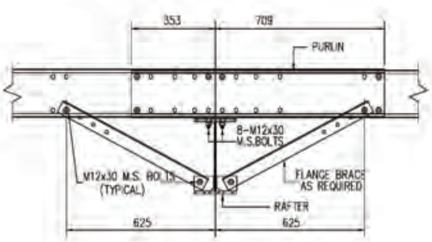
PURLIN CONNECTION DETAIL

At Lines 1 & 7



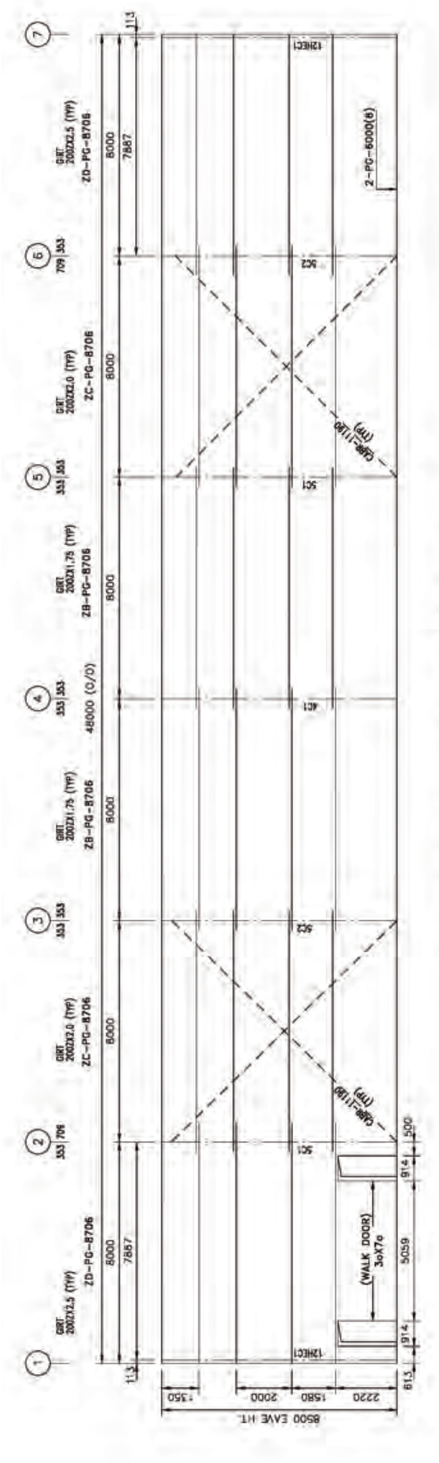
PURLIN CONNECTION DETAIL

At Lines 3 ~ 5

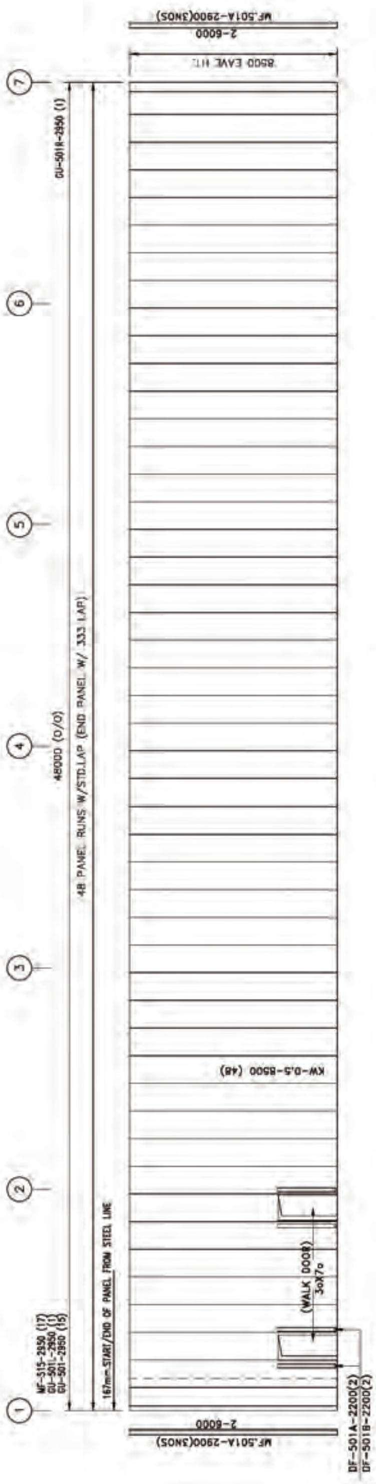


PURLIN CONNECTION DETAIL

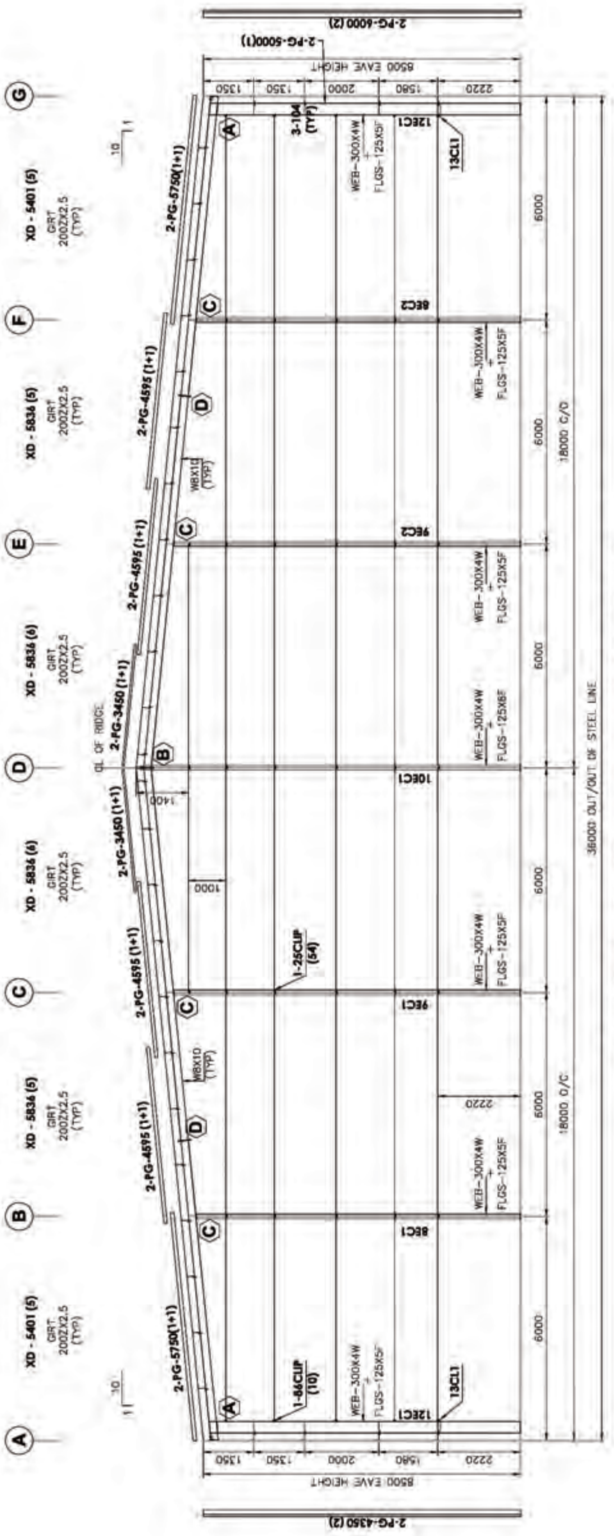
At Lines 2 & 6



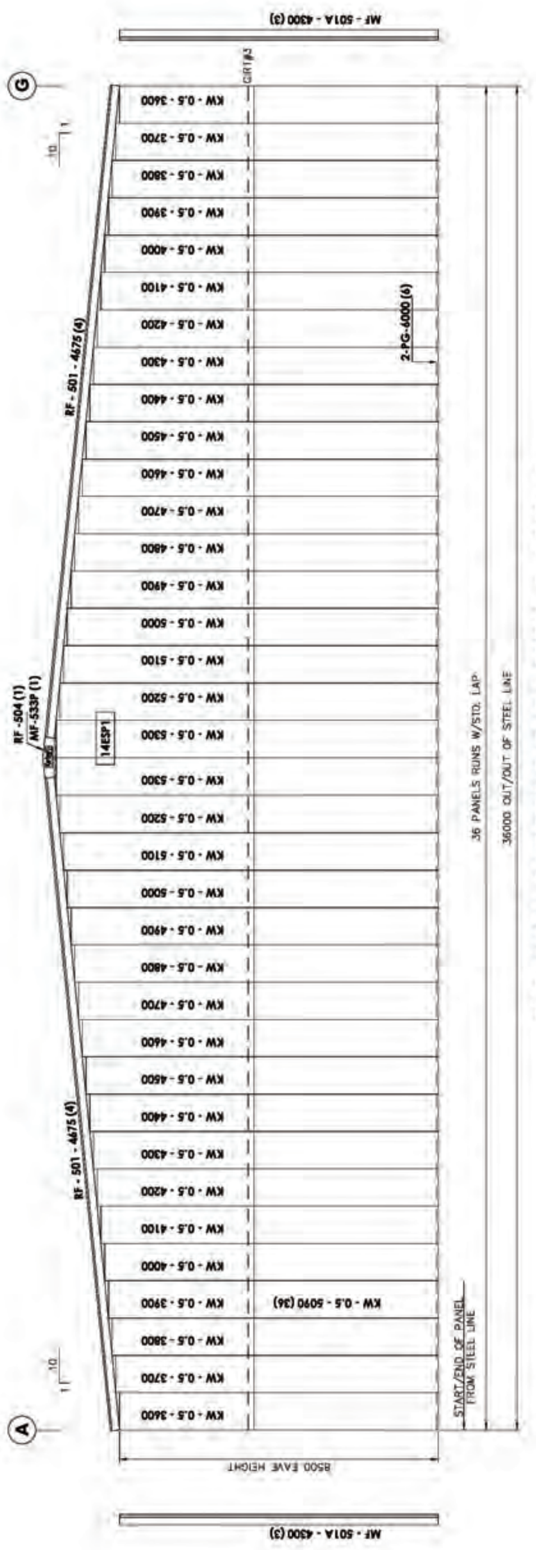
SIDE WALL FRAMING ELEVATION @ GL-A(AS DRAWN)
SIDE WALL FRAMING ELEVATION @ GL-G(OPP HAND)



SIDE WALL SHEETING ELEVATION @ GL-A(AS DRAWN)
SIDE WALL SHEETING ELEVATION @ GL-G(OPP HAND)



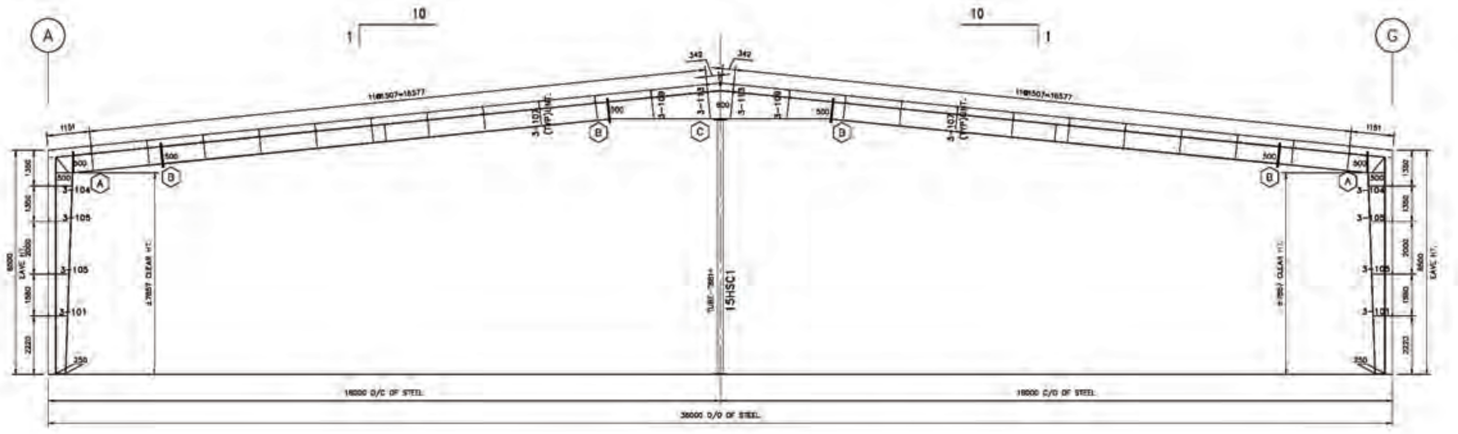
END WALL FRAMING ELEVATION @ GRID - 7



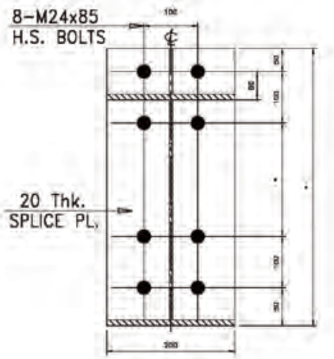
END WALL SHEETING ELEVATION @ GRID - 7

KW-0.5THK. ARCTIC WHITE PANELS

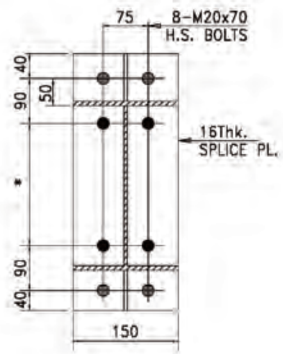
FSK-50THK-W/20000LENGTH. (18 ROLLS)



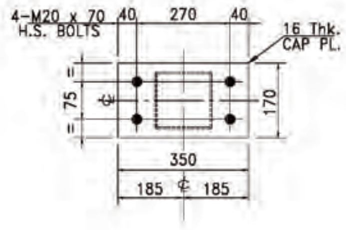
CROSS SECTION AT GL-(2~6)



DETAIL 'A'

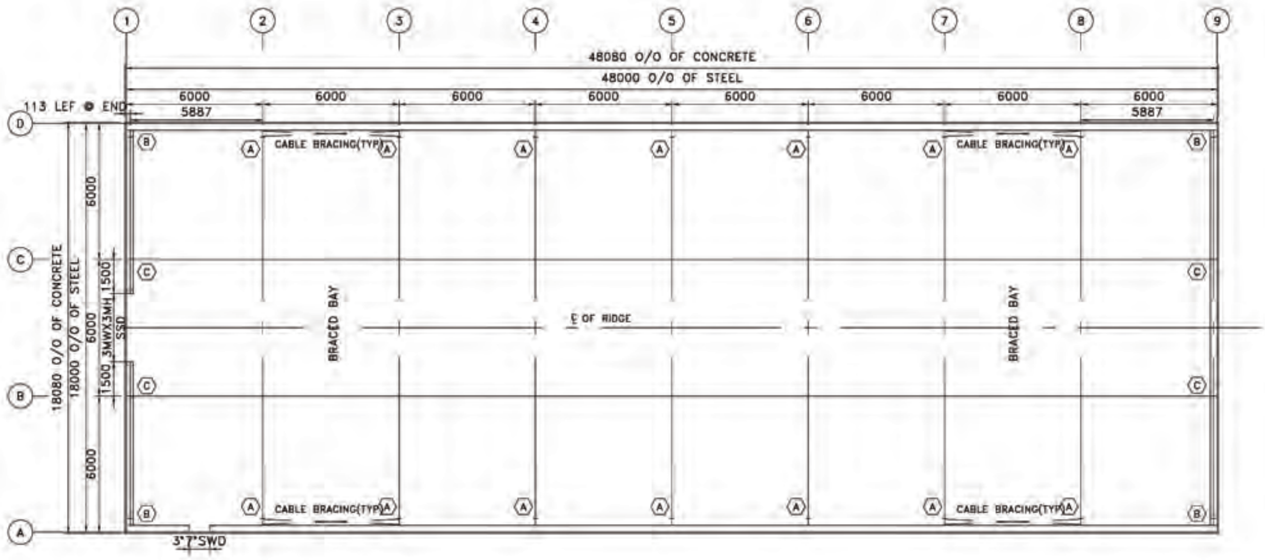


DETAIL-B

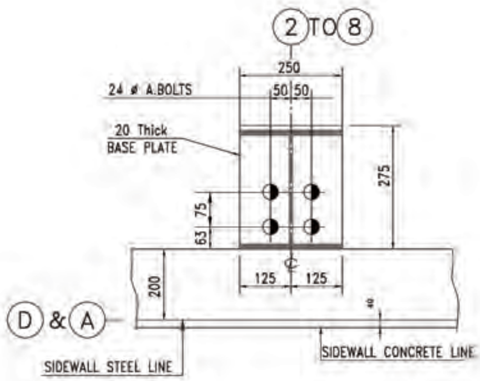


DETAIL C

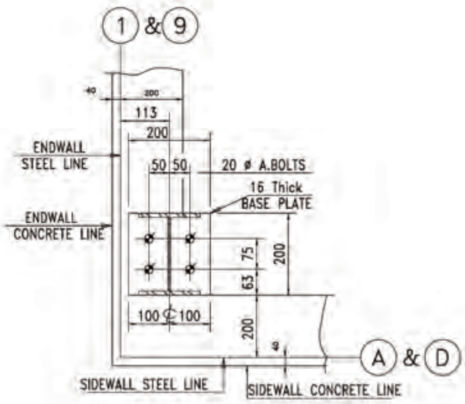
3.3 STANDARD BUILDINGS - RF-18660



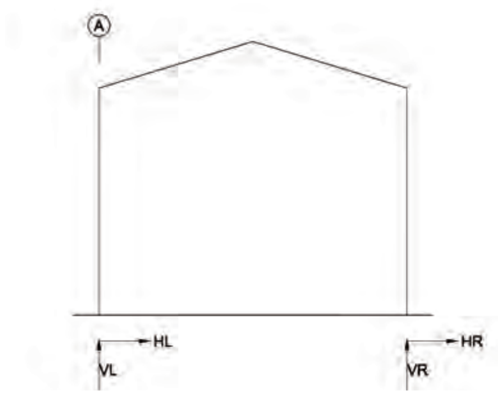
ANCHOR BOLT PLAN

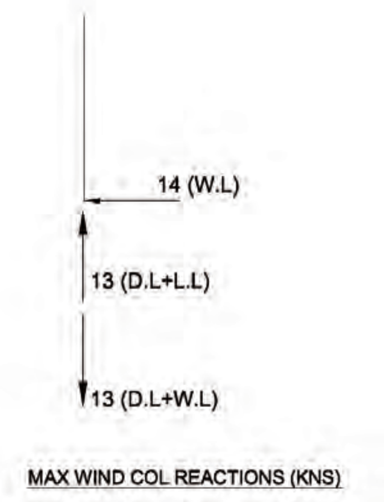


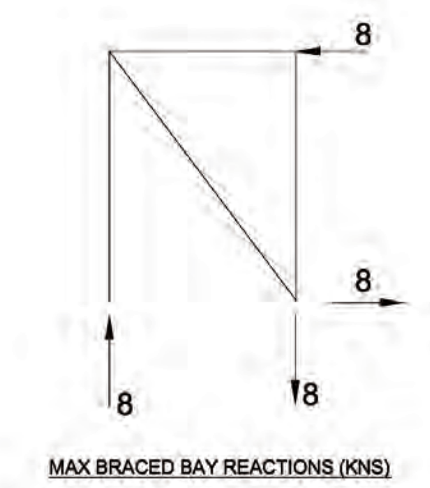
DETAIL `A'



DETAIL `B'







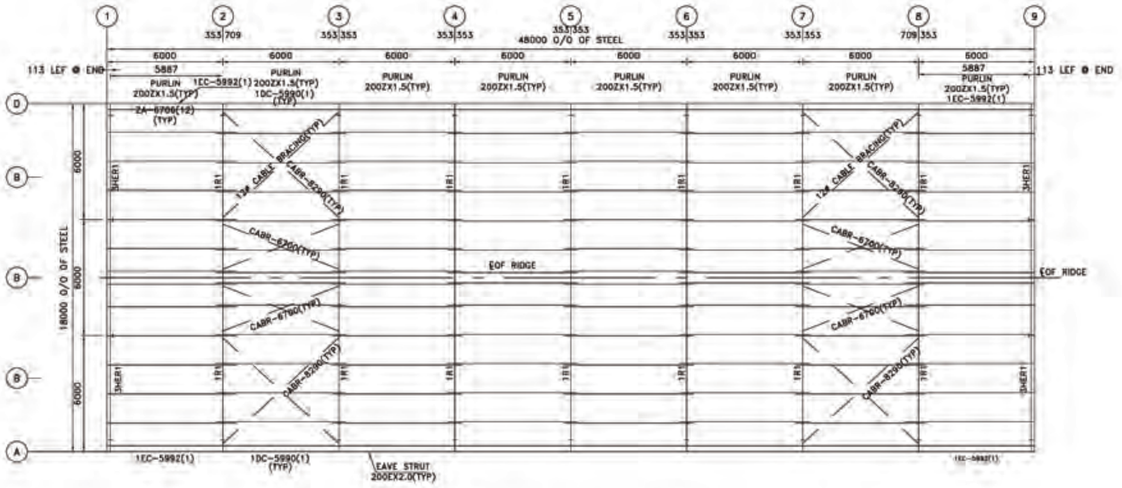
Main frame column reactions:

Sign convensions :

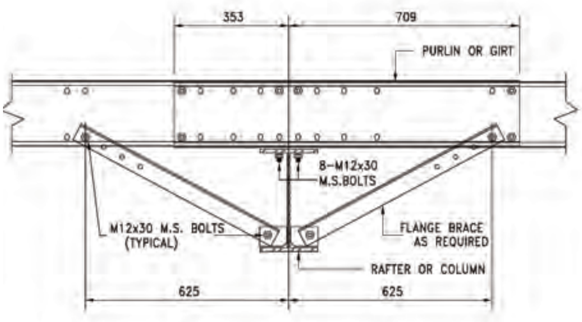
Positive hor.Reaction : to the right
Positive ver.Reaction : upward
Positive moment : counter clockwise

Mainframe- 2-8
Reaction For Combined Loads:

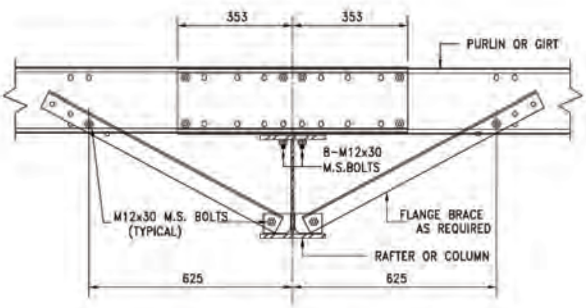
Description	Horz KN	Vert KN	Momt KN-M	Load combination
LEFT COL.	19.5	41.6	0.0	1DL+1LL
LEFT COL.	-13.0	-18.7	0.0	1DL+1WLL
LEFT COL.	0.8	-8.9	0.0	1DL+1WLR
LEFT COL.	2.4	8.4	0.0	1DL+1SEI
RIGT COL.	-19.5	41.6	0.0	1DL+1LL
RIGT COL.	-0.8	-8.9	0.0	1DL+1WLL
RIGT COL.	13.0	-18.7	0.0	1DL+1WLR
RIGT COL.	-5.0	10.0	0.0	1DL+1SEI



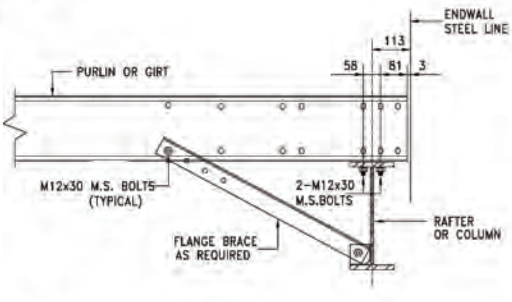
ROOF FRAMING PLAN



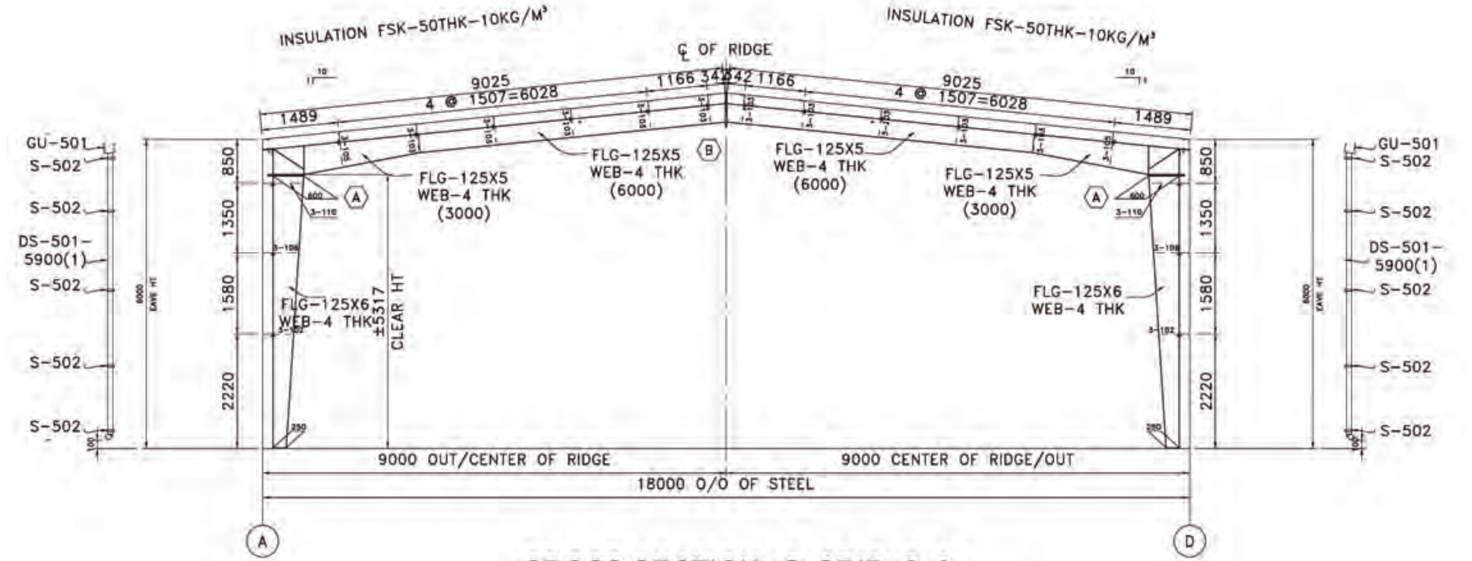
PURLIN CONNECTION DETAIL
At Lines 2 & 8



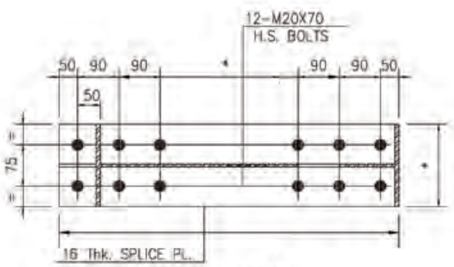
PURLIN CONNECTION DETAIL
At Lines 3 ~ 7



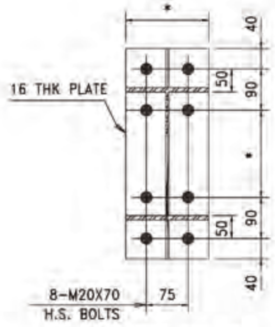
PURLIN/GIRT CONNECTION DETAIL
@ GRID 1&7



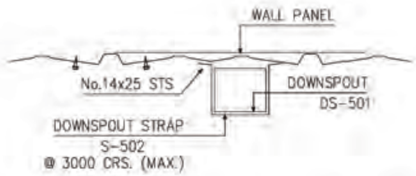
CROSS SECTION @ GRID -2~8



DETAIL 'A'

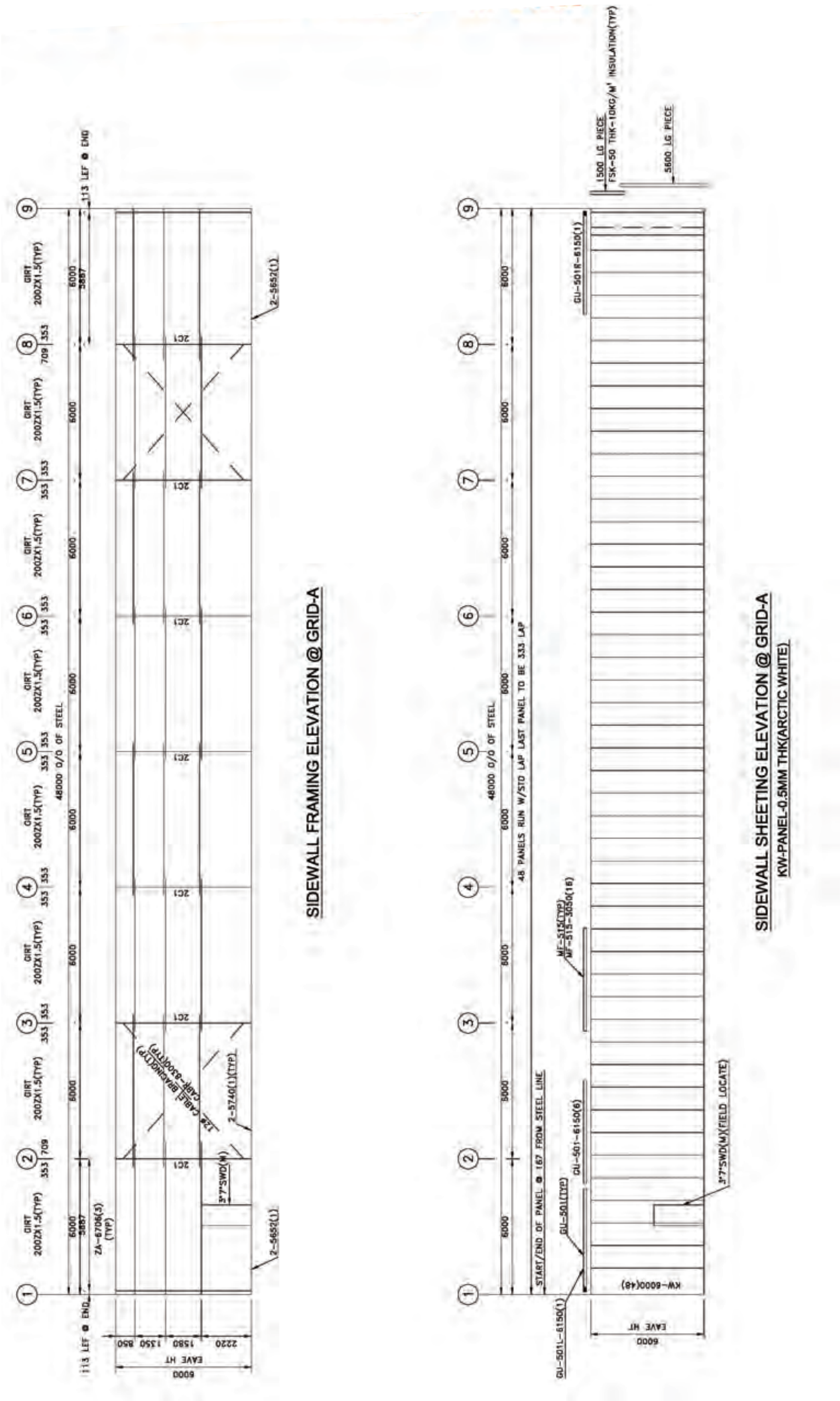


DETAIL 'B'

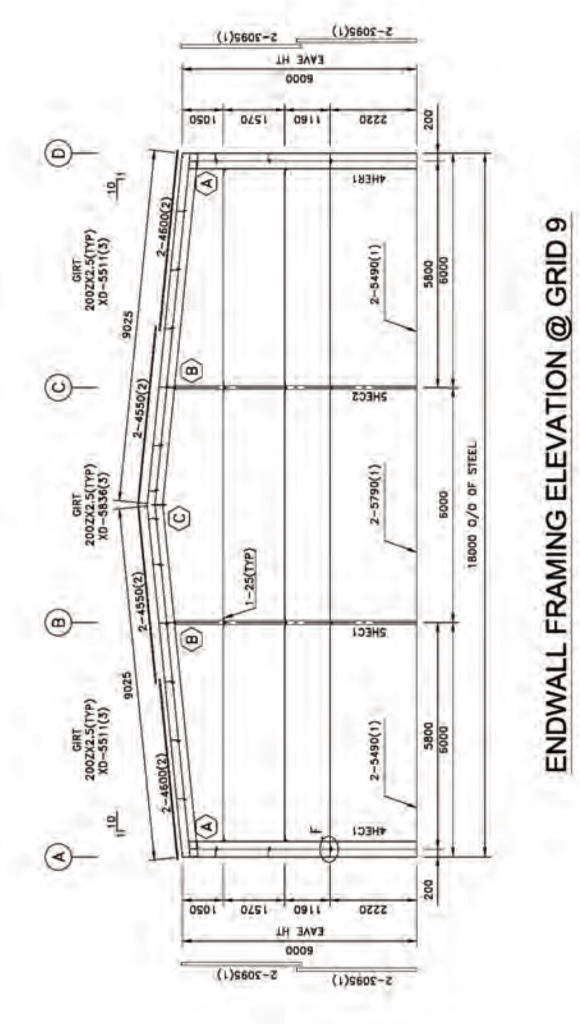


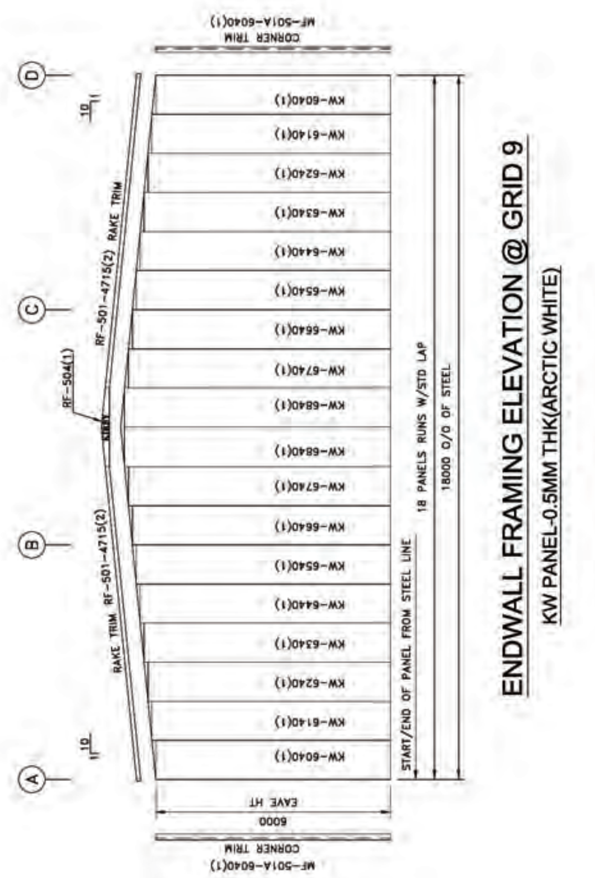
DOWNSPOUT STRAP FASTEN TO WALL PANEL

3.3 STANDARD BUILDINGS - RF-1866

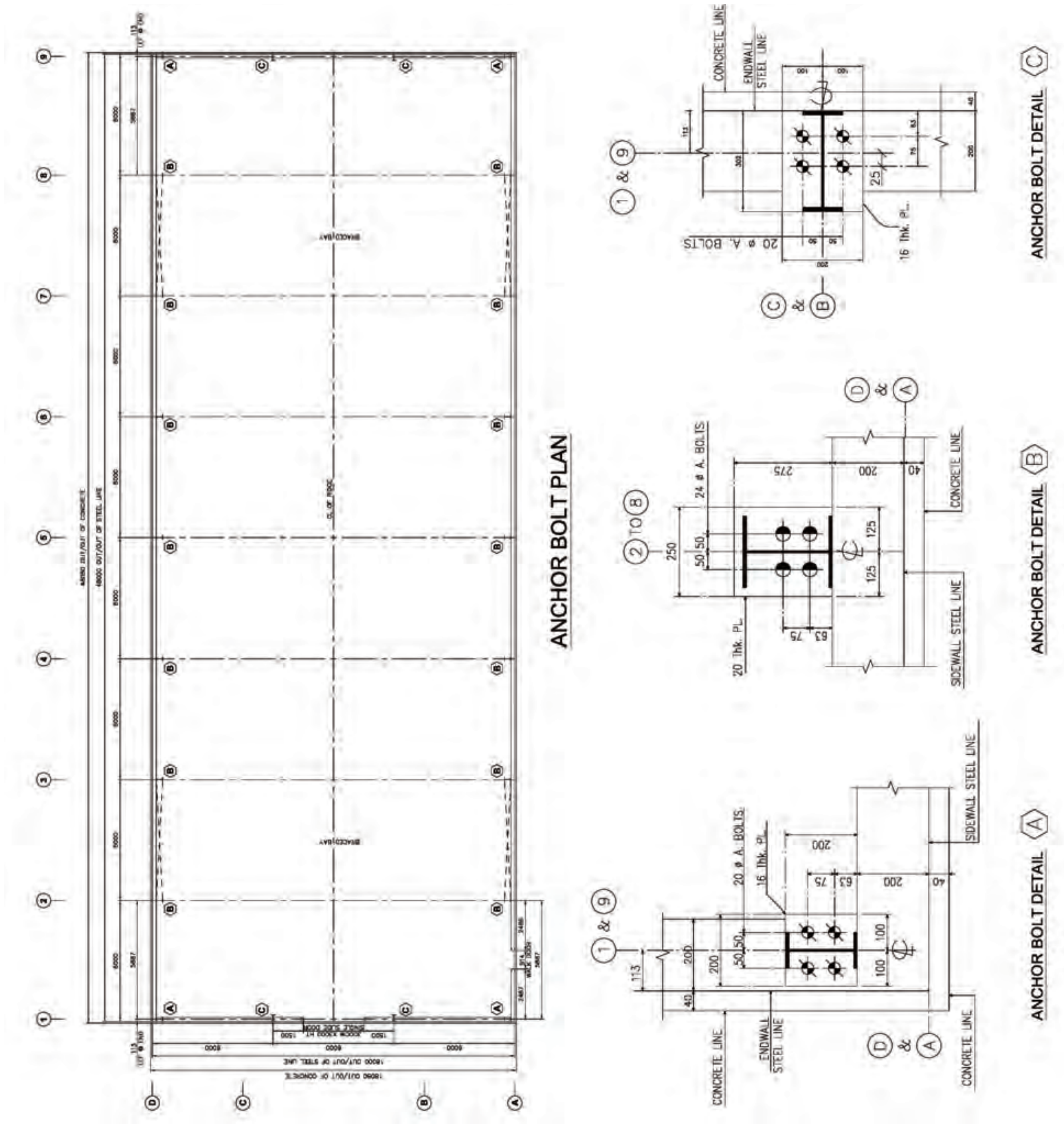


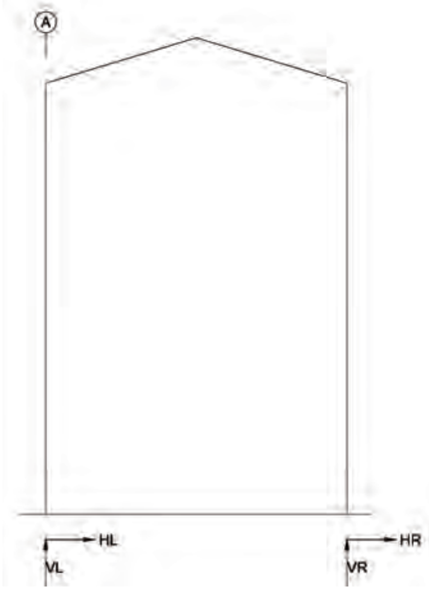
3.3 STANDARD BUILDINGS - RF-18660

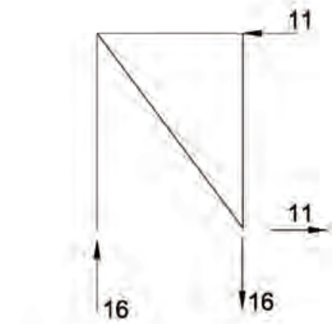




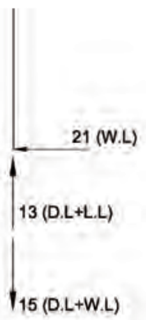
3.3 STANDARD BUILDINGS - RF-18685







MAX BRACED BAY REACTIONS (KNS)



MAX WIND COL REACTIONS (KNS)

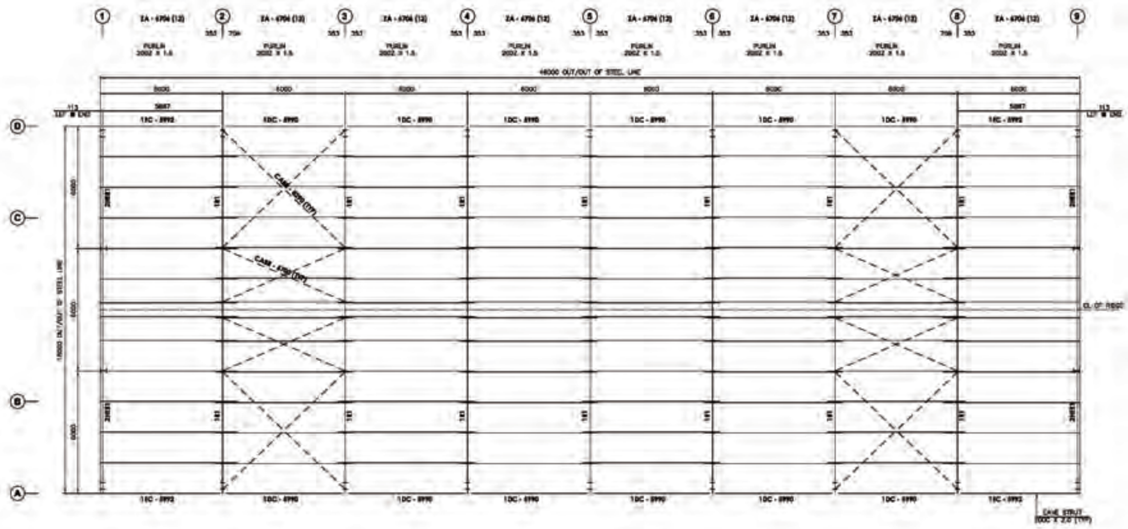
Main frame column reactions:

Sign convensions:

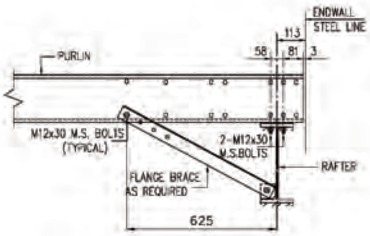
Positive hor.Reaction : to the right
Positive ver.Reaction : upward
Positive moment : counter clockwise

Mainframe- 2-8
Reaction For Combined Loads:

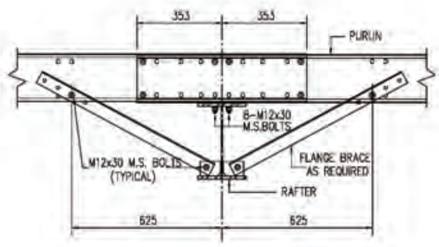
Description	Horz KN	Vert KN	Momt KN-M	Load combination
LEFT COL.	13.2	42.3	0.0	1DL+1LL
LEFT COL.	-13.2	-20.4	0.0	1DL+1WLL
LEFT COL.	6.8	-5.8	0.0	1DL+1WLR
LEFT COL.	1.1	8.6	0.0	1DL+1SEI
RIGT COL.	-13.2	42.3	0.0	1DL+1LL
RIGT COL.	-6.8	-5.8	0.0	1DL+1WLL
RIGT COL.	13.2	-20.4	0.0	1DL+1WLR
RIGT COL.	-3.9	11.2	0.0	1DL+1SEI



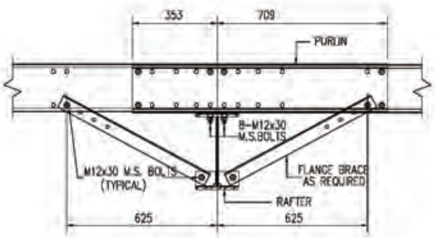
ROOF FRAMING PLAN



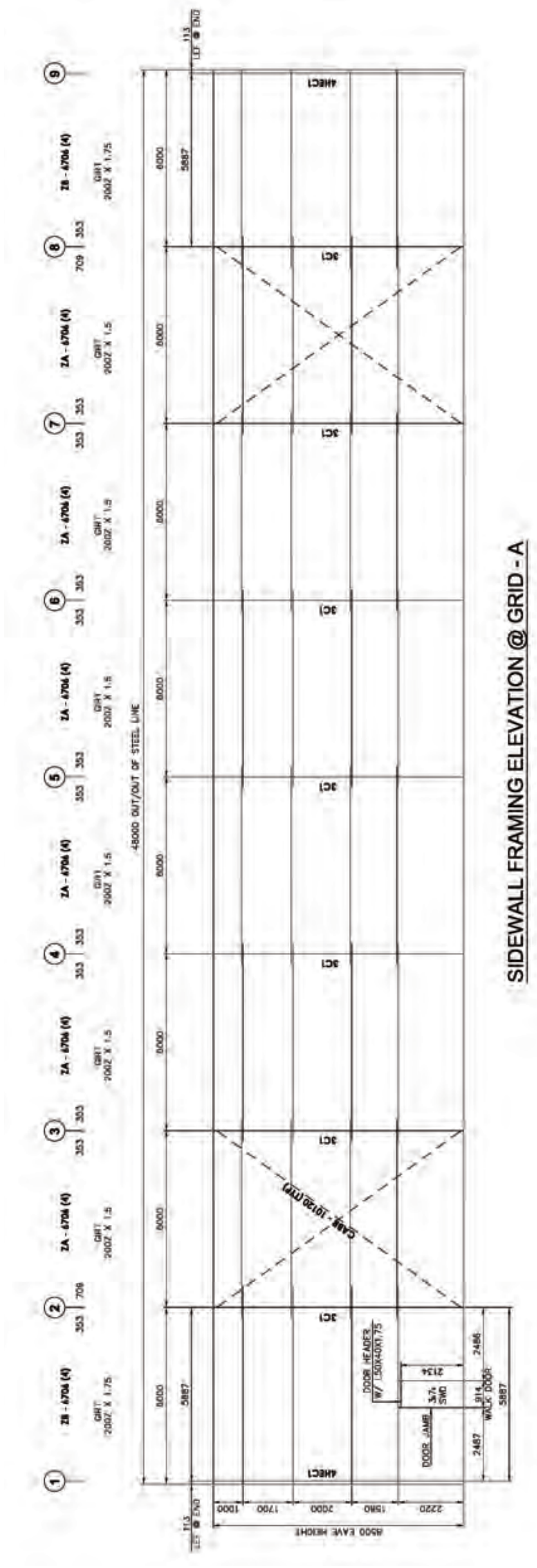
PURLIN CONNECTION DETAIL
At Lines 1 & 9

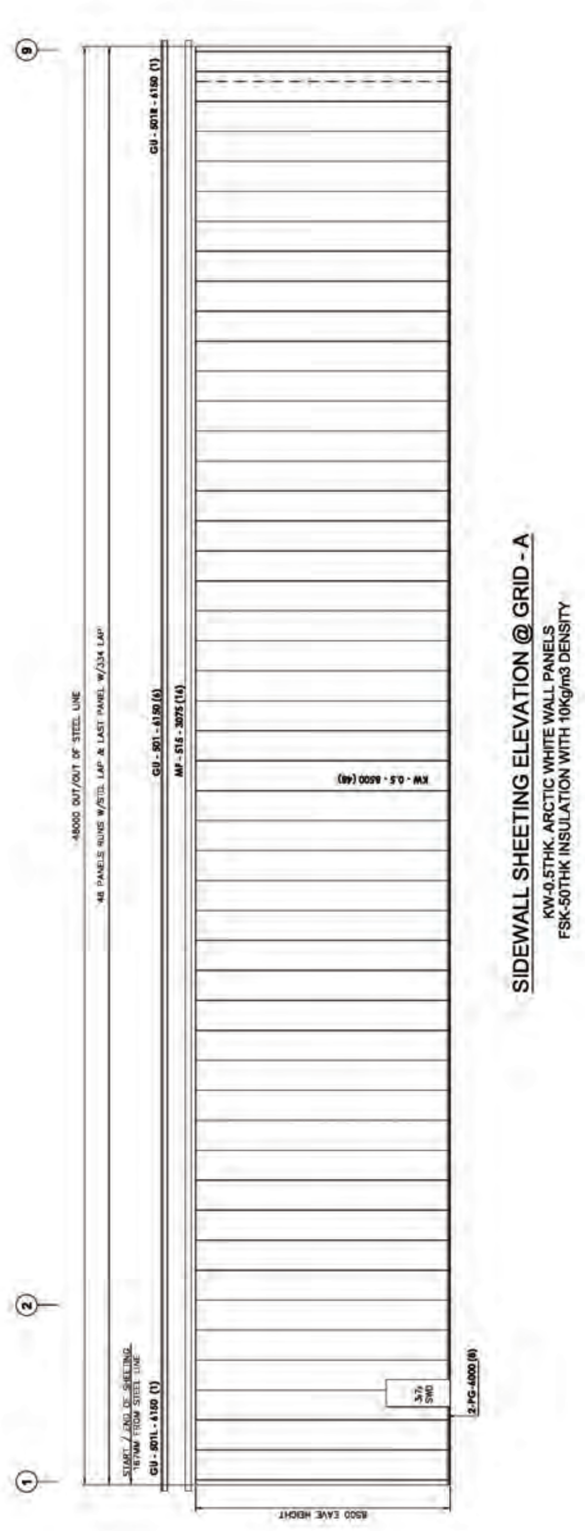


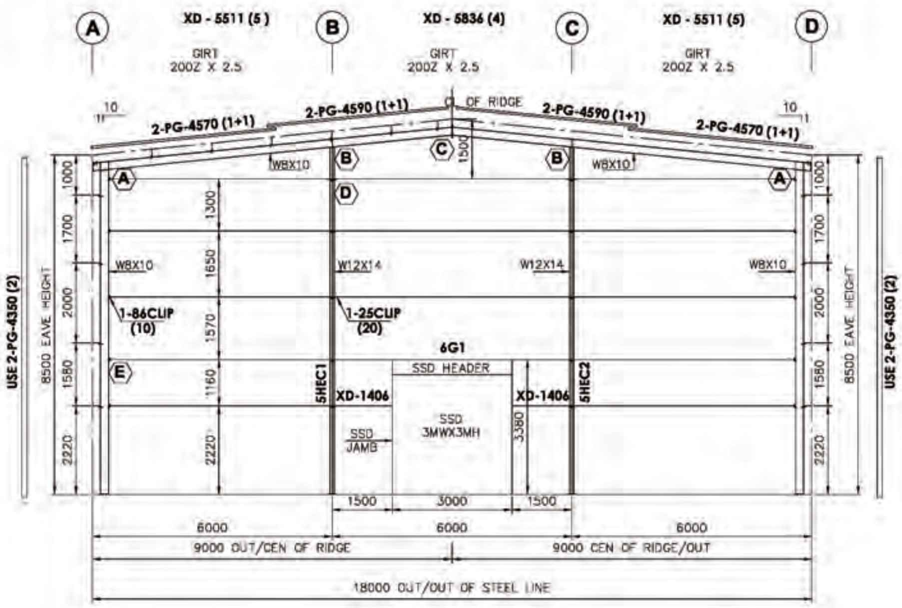
PURLIN CONNECTION DETAIL
At Lines 3 ~ 7



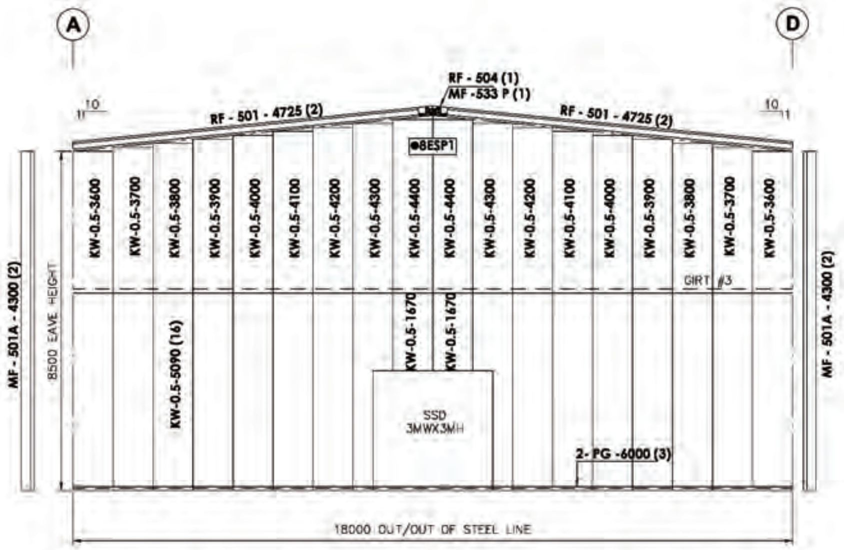
PURLIN CONNECTION DETAIL
At Lines 2 & 13


SIDEWALL FRAMING ELEVATION @ GRID - A
48000 OUT/OUT OF STEEL LINE
8500 EAVE HEIGHT


SIDEWALL SHEETING ELEVATION @ GRID - A
KW-0.5THK. ARCTIC WHITE WALL PANELS
FSK-50THK INSULATION WITH 10Kg/m3 DENSITY
48000 OUT/OUT OF STEEL LINE
8500 EAVE HEIGHT

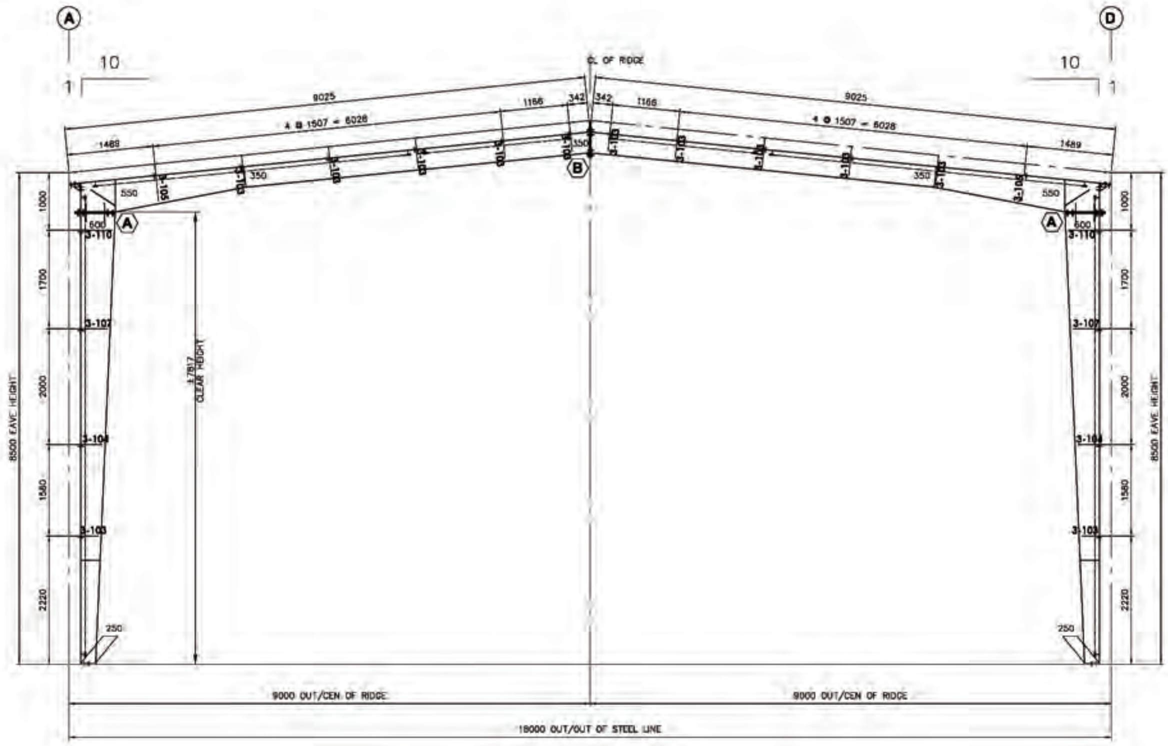


END WALL FRAMING ELEVATION @ GRID - 9

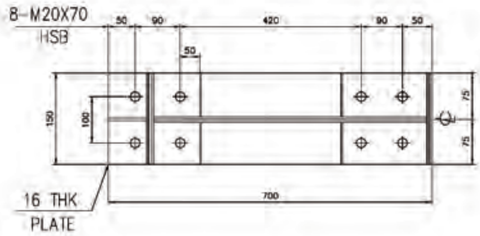


END WALL SHEETING ELEVATION @ GRID - 9

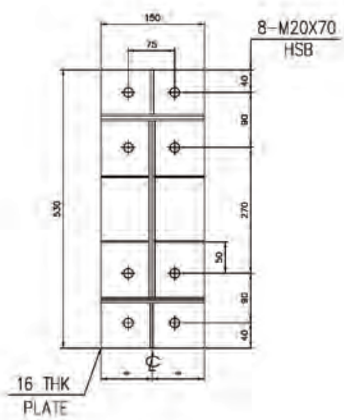
KW-0.5THK. ARCTIC WHITE WALL PANELS
USE 8 ROLLS W/20M LENGTH FSK-50THK INSULATION WITH 10Kg/m3 DENSITY



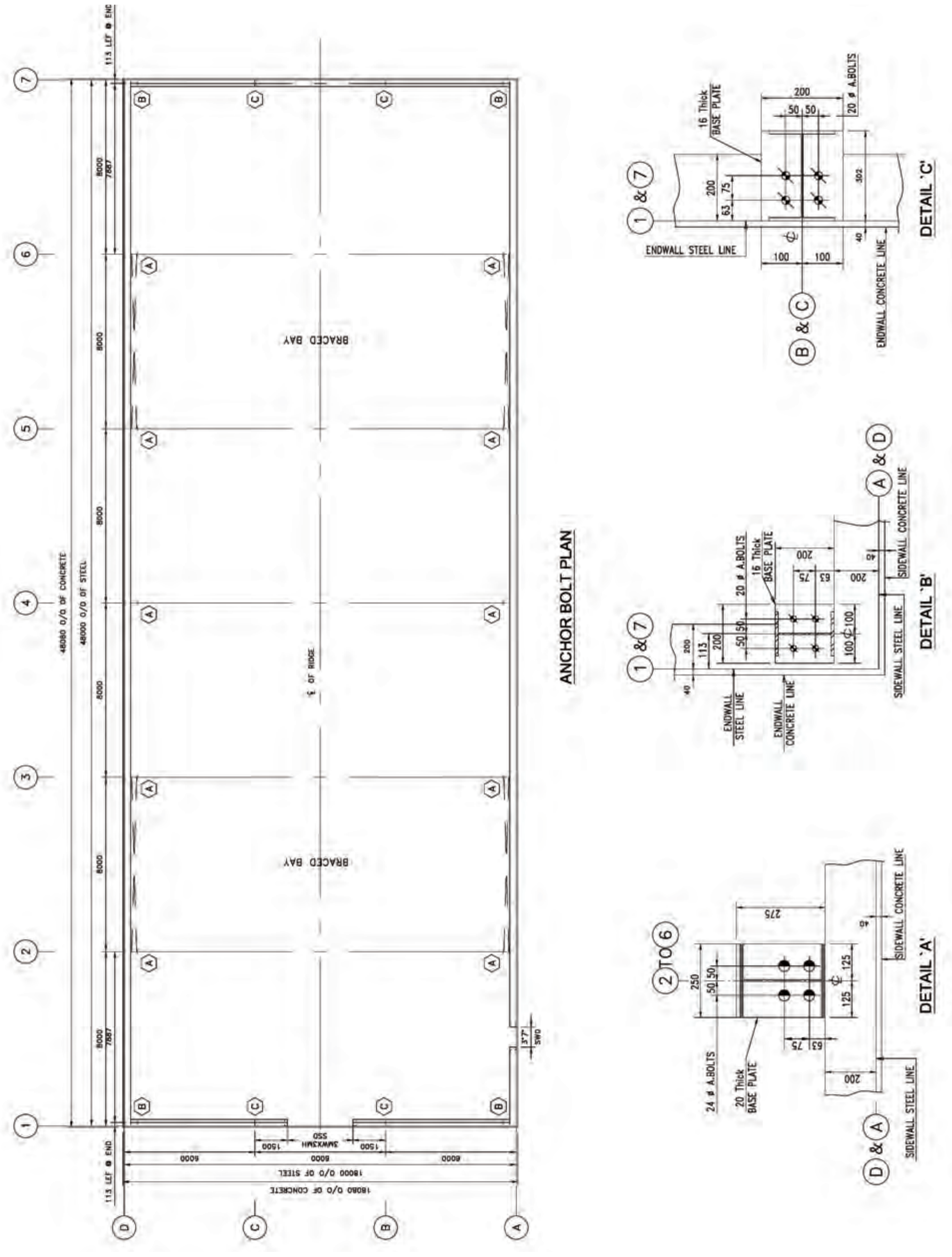
CROSS SECTION @ GRID - 2~8

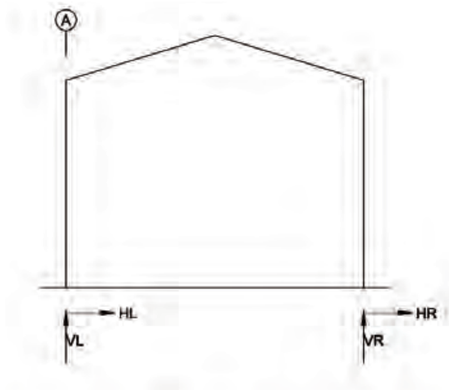


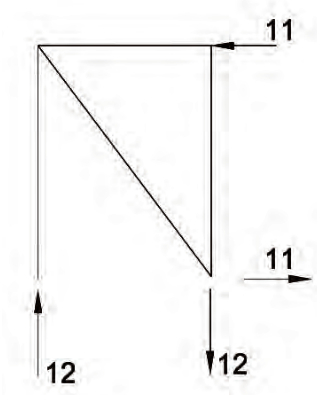
DETAIL (A)

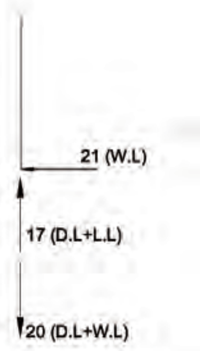


DETAIL (B)


ANCHOR BOLT PLAN
BRACED BAY
BRACED BAY
48080 O/O OF CONCRETE
48000 O/O OF STEEL
18000 O/O OF STEEL
18080 O/O OF CONCRETE
DETAIL 'A'
DETAIL 'B'
DETAIL 'C'
24 ø A.BOLTS
20 Thick BASE PLATE
20 ø A.BOLTS
16 Thick BASE PLATE
ENDWALL STEEL LINE
ENDWALL CONCRETE LINE
SIDEWALL STEEL LINE
SIDEWALL CONCRETE LINE





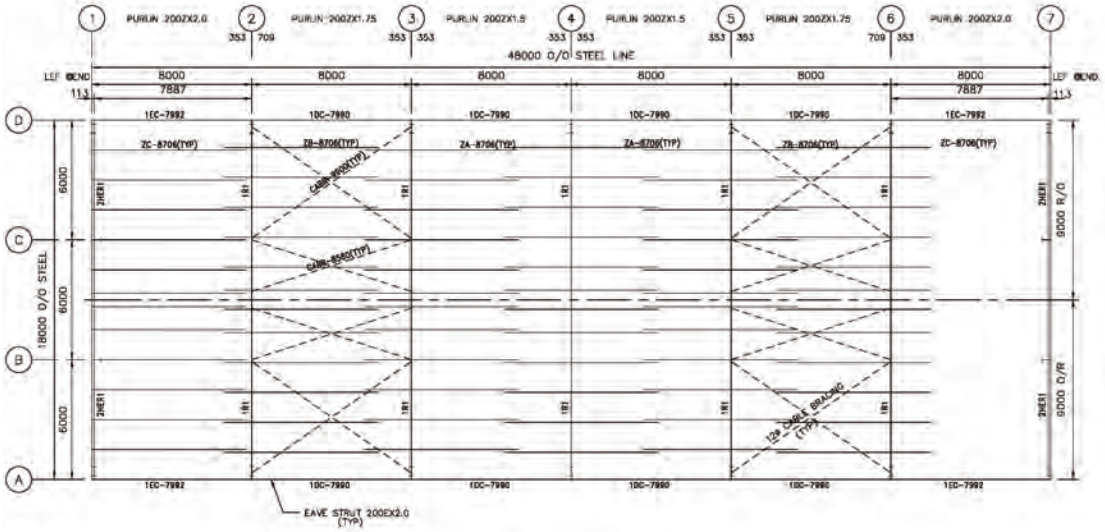


Main frame column reactions:

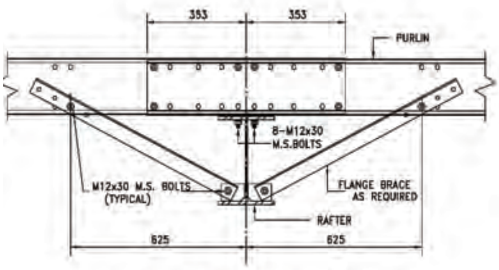
Sign convensions:

Positive hor.Reaction : to the right
Positive ver.Reaction : upward
Positive moment : counter clockwise

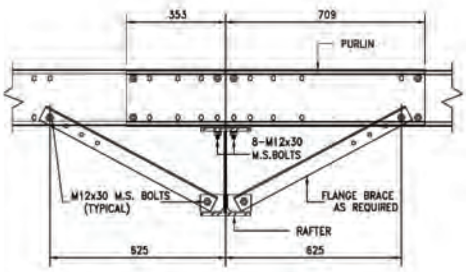
Description	Horz KN	Vert KN	Momt KN-M	Load combination
LEFT COL.	17.9	55.6	0.0	1DL+1LL
LEFT COL.	-17.7	-28.0	0.0	1DL+1WLL
LEFT COL.	8.9	-8.6	0.0	1DL+1WLR
LEFT COL.	1.7	10.8	0.0	1 DL+1SEI
RIGT COL.	-17.9	55.6	0.0	1DL+1LL
RIGT COL.	-8.9	-8.6	0.0	1DL+1WLL
RIGT COL.	17.7	-28.0	0.0	1DL+1WLR
RIGT COL.	-5.1	14.0	0.0	1DL+1SEI



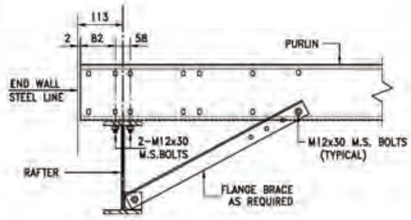
ROOF FRAMING PLAN



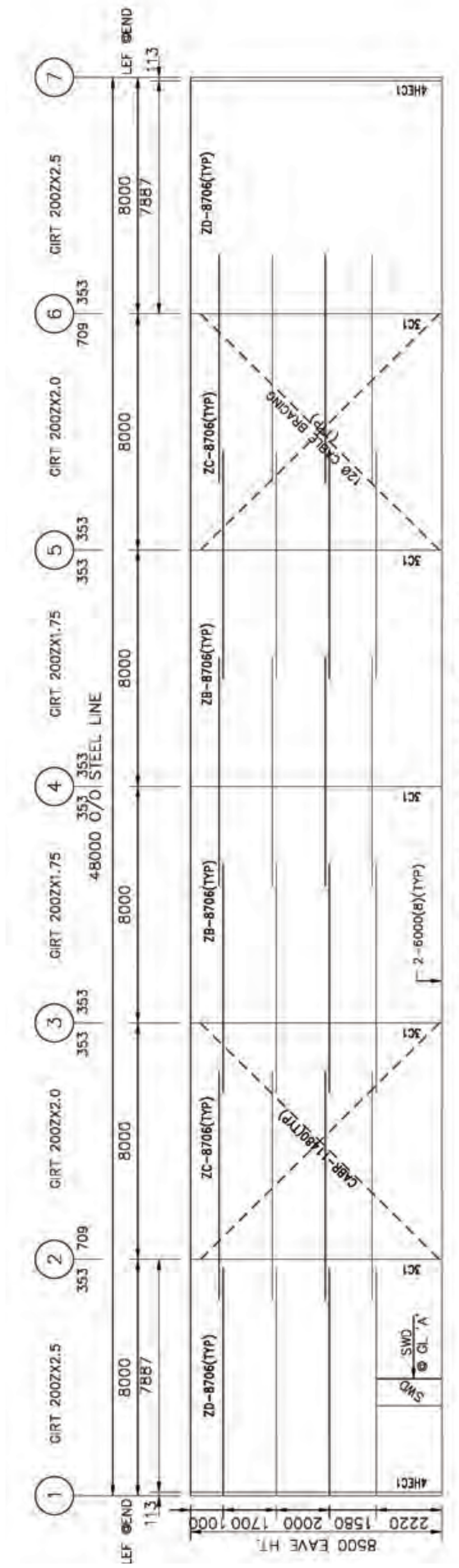
PURLIN CONNECTION DETAIL
FROM GRID LINE 3 - 5



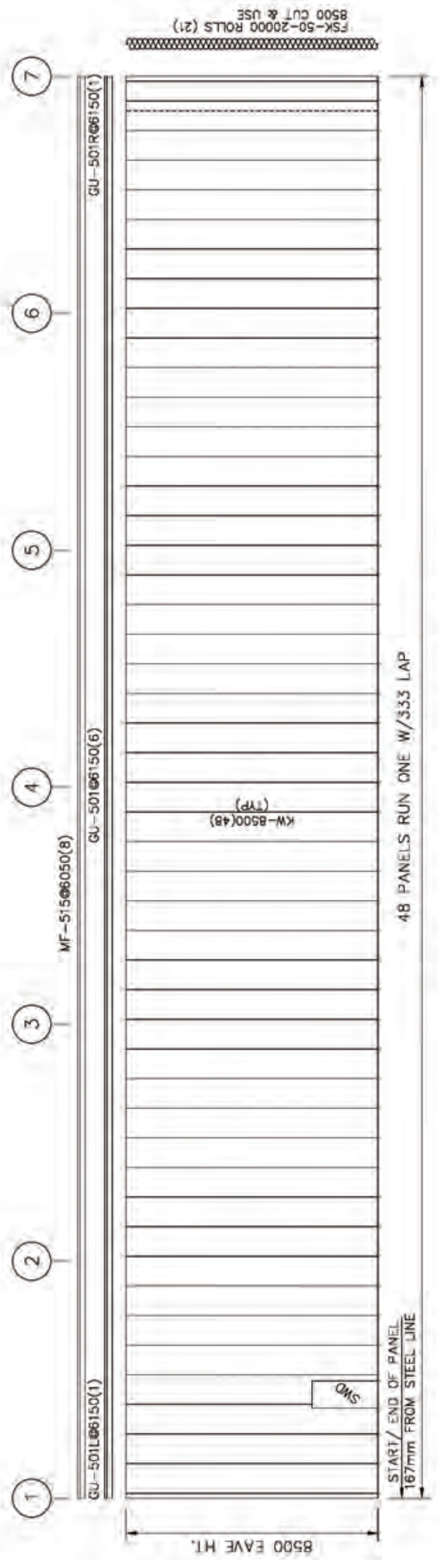
PURLIN CONNECTION DETAIL
At Lines 2 & 6



PURLIN CONNECTION DETAIL
AT GRID LINE 1 & 7

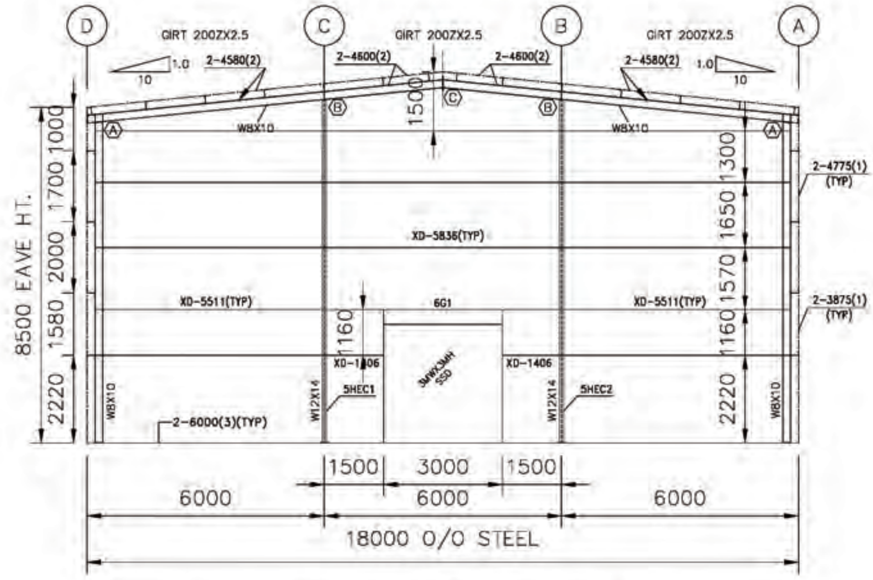


SIDE WALL FRAMING ELEVATION @ GL A

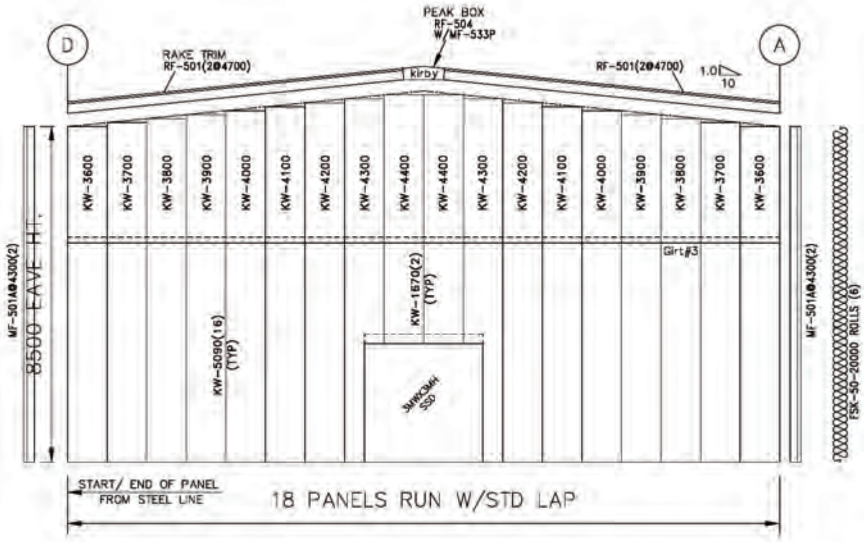


SIDE WALL SHEETING ELEVATION @ GL A

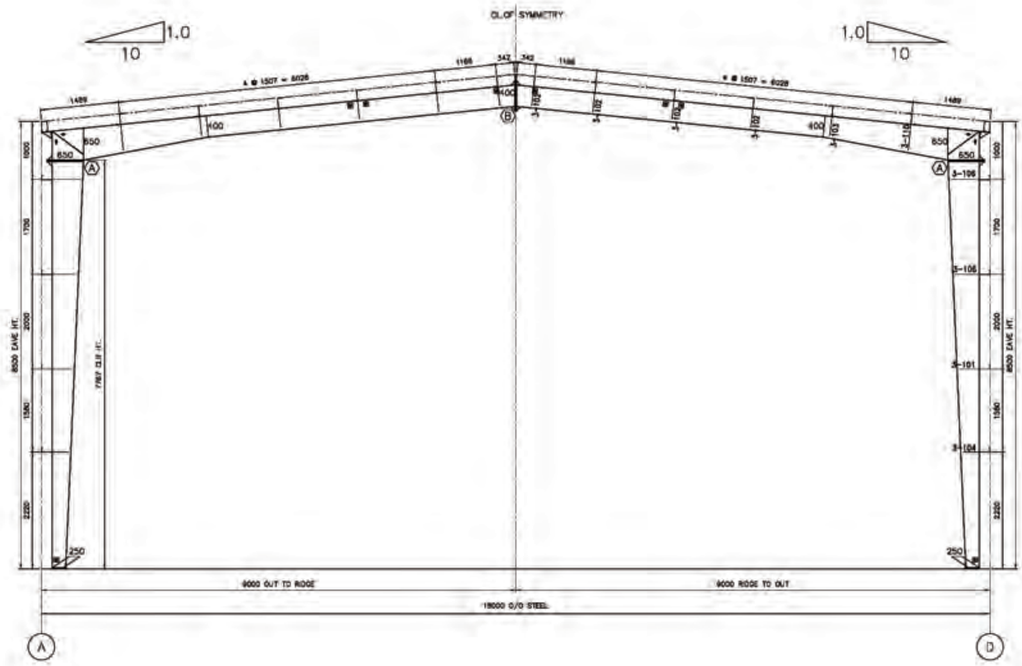
Kirby BUILDING SYSTEMS



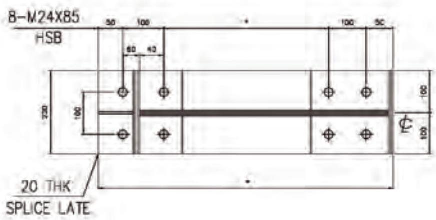
END WALL FRAMING ELEVATION @ GRID 1



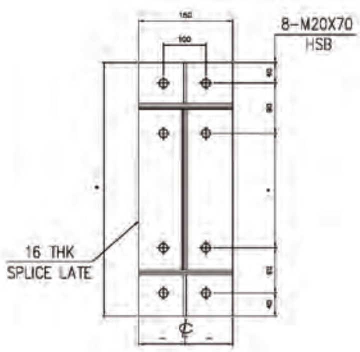
END WALL SHEETING ELEVATION @ GRID 1



CROSS SECTION @ GL.(2~6)

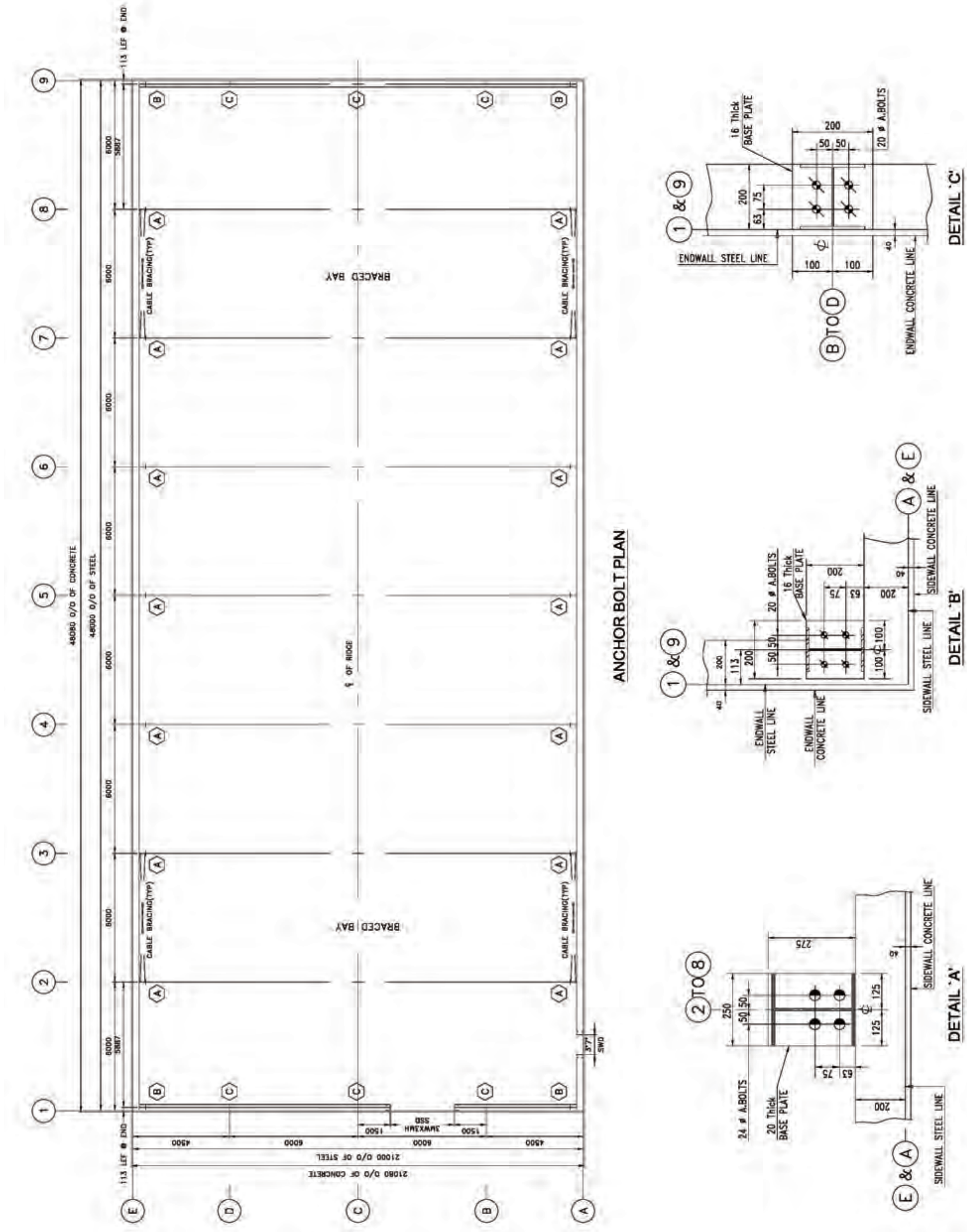


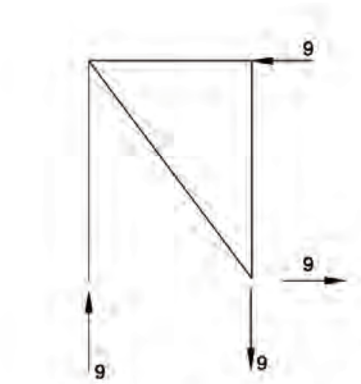
DETAIL "A"



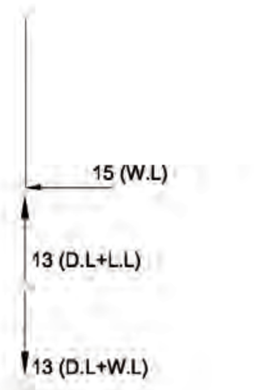
DETAIL "B"

3.3 STANDARD BUILDINGS - RF-21660



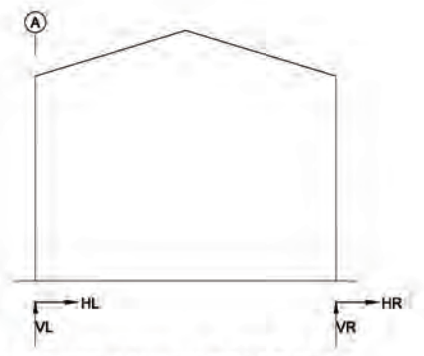


MAX BRACED BAY REACTIONS (KNS)



MAX WIND COL REACTIONS (KNS)

Main frame column reactions:

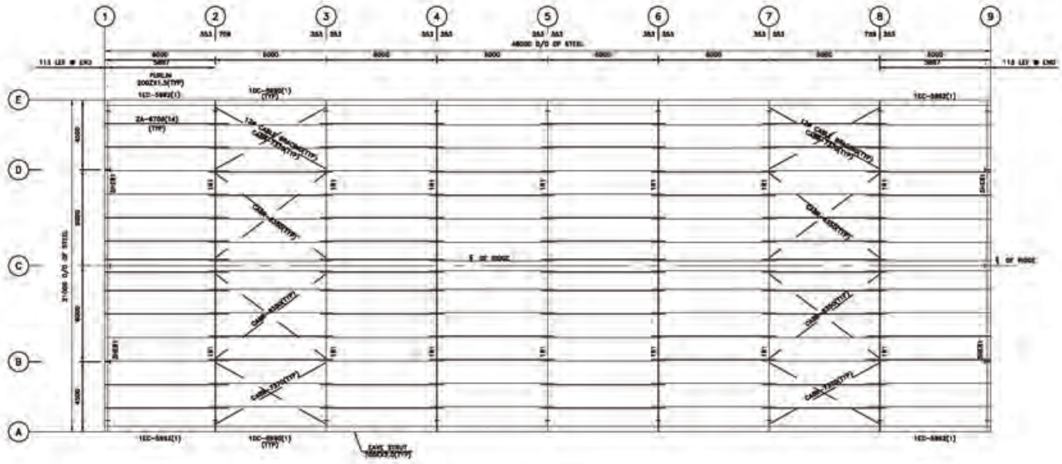


Sign convensions:

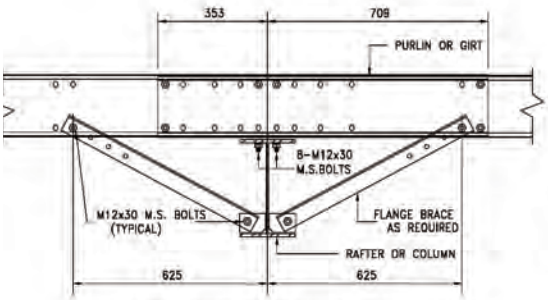
Positive hor.Reaction : to the right
Positive ver.Reaction : upward
Positive moment : counter clockwise

Mainframe- 2-8
Reaction For Combined Loads:

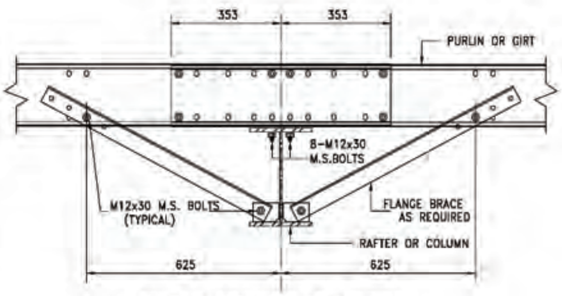
Description	Horz KN	Vert KN	Momt KN-M	Load combination
LEFT COL.	27.3	48.6	0.0	1DL+1LL
LEFT COL.	-15.6	-21.0	0.0	1DL+1WLL
LEFT COL.	-2.1	-11.1	0.0	1DL+1WLR
LEFT COL.	3.8	10.0	0.0	1DL+1SEI
RIGT COL.	-27.3	48.6	0.0	1DL+1LL
RIGT COL.	2.1	-11.1	0.0	1DL+1WLL
RIGT COL.	15.6	-21.0	0.0	1DL+1WLR
RIGT COL.	-6.8	11.6	0.0	1DL+1SEI



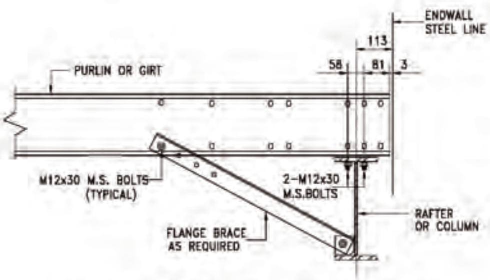
ROOF FRAMING PLAN



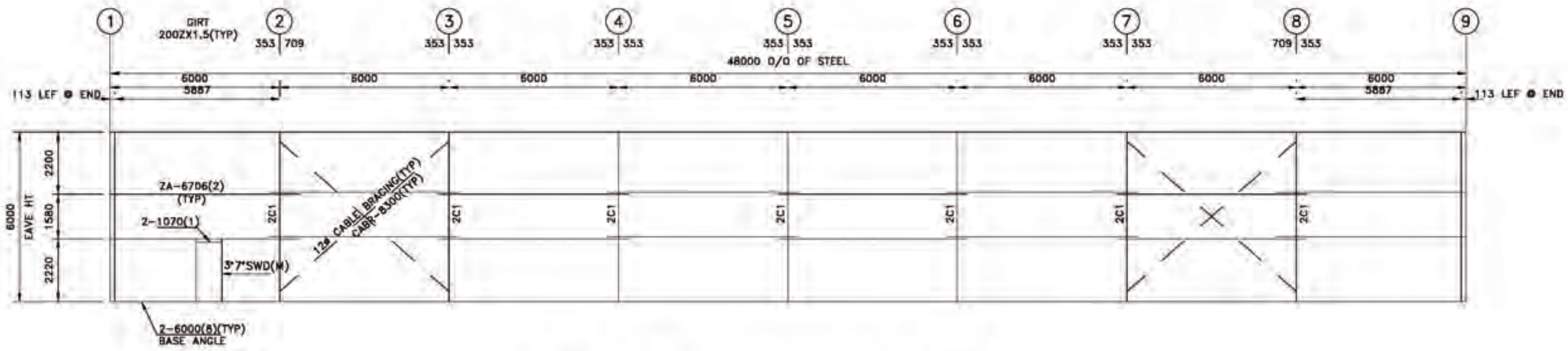
PURLIN CONNECTION DETAIL
At Lines 2 & 8



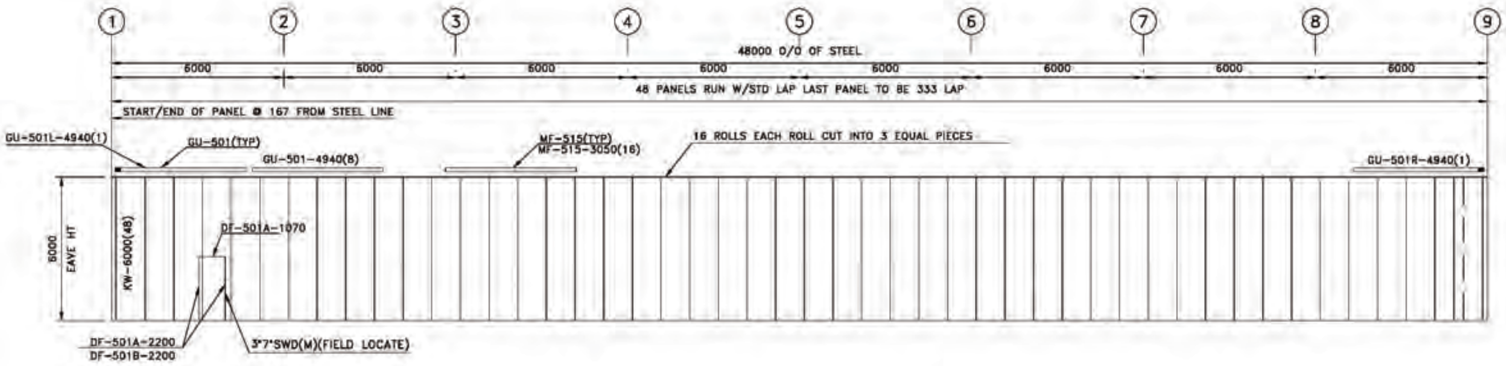
PURLIN CONNECTION DETAIL
At Lines 3 ~ 7



PURLIN/GIRT CONNECTION DETAIL
@ GRID 1&7

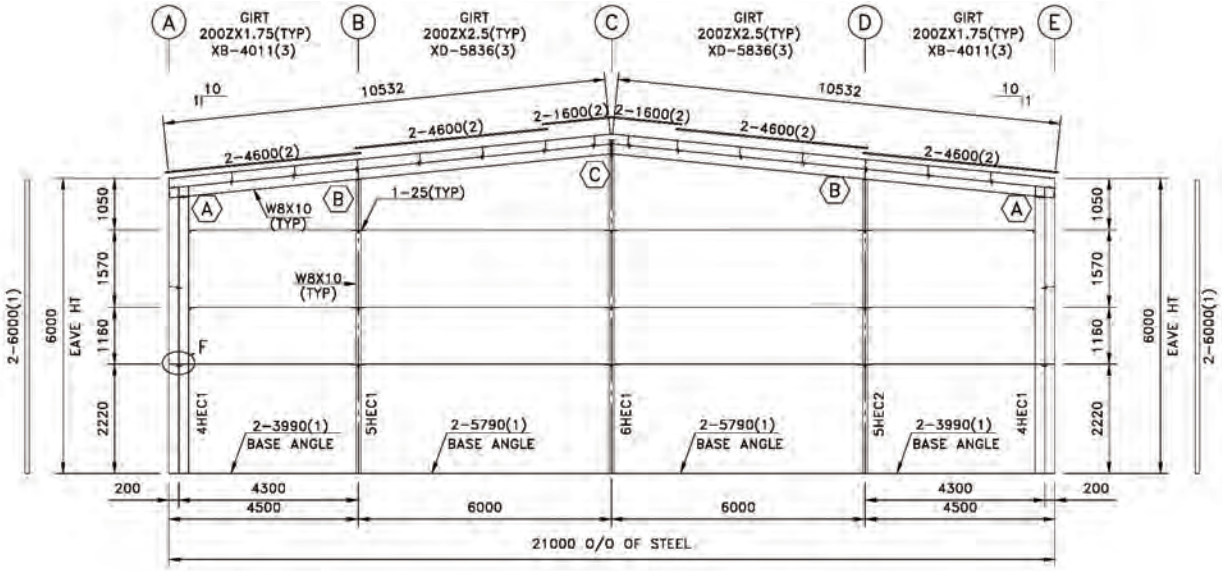


SIDEWALL FRAMING ELEVATION @ GRID-A

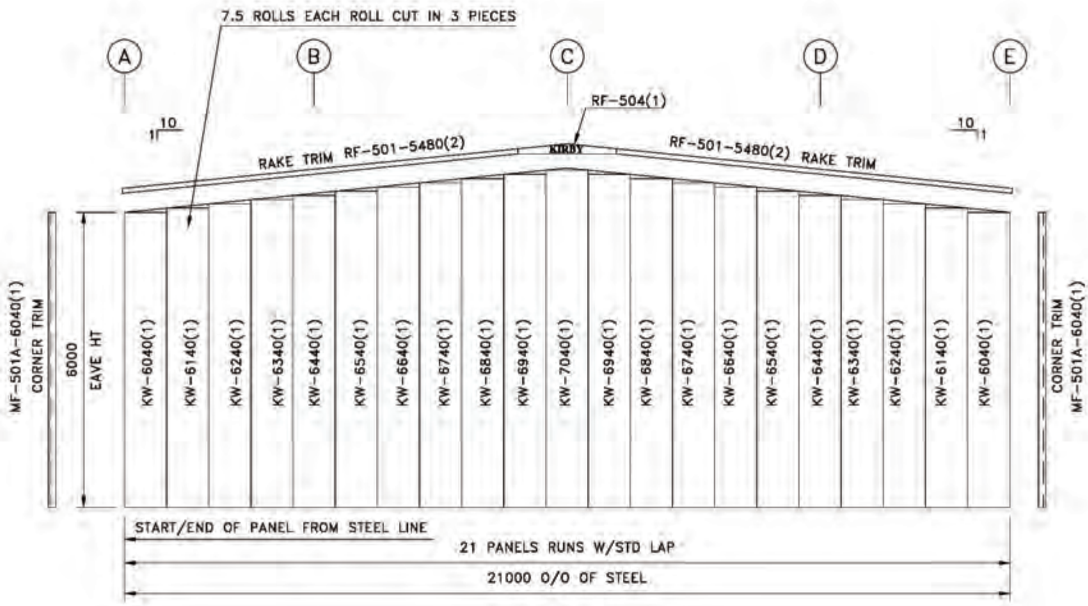


SIDEWALL SHEETING ELEVATION @ GRID-A

KW-PANEL-0.5MM THK(ARCTIC WHITE)

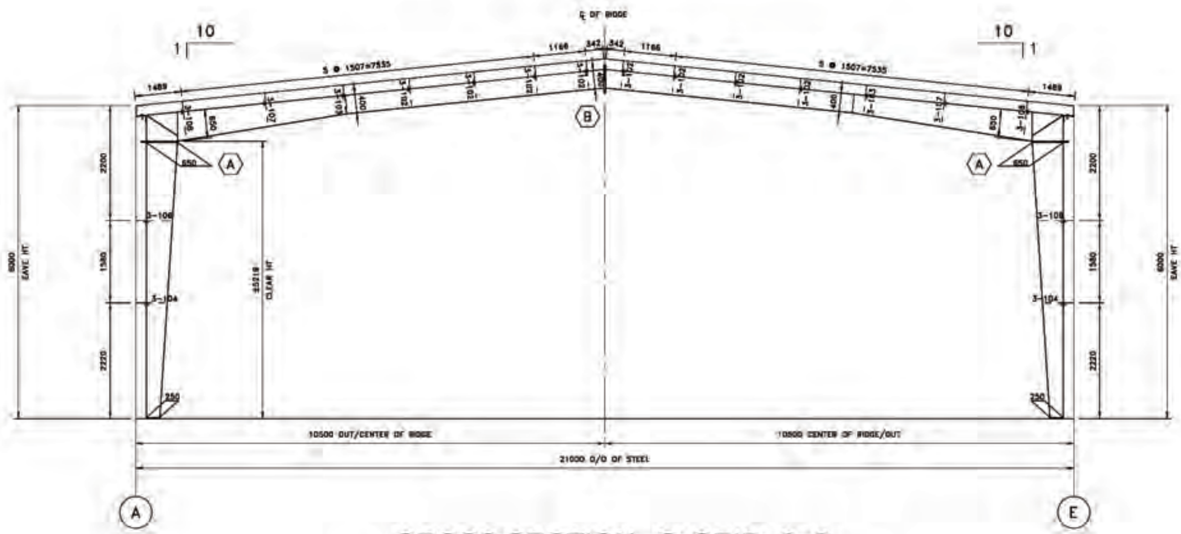


ENDWALL FRAMING ELEVATION @ GRID 9

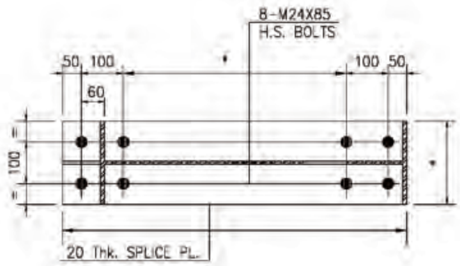


ENDWALL SHEETING ELEVATION @ GRID 9

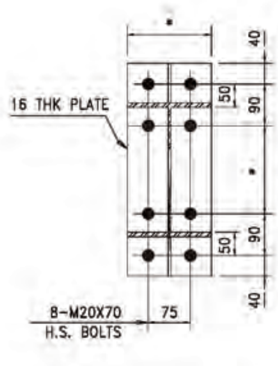
KW PANEL-0.5MM THK(ARCTIC WHITE)



CROSS SECTION @ GRID -2~8

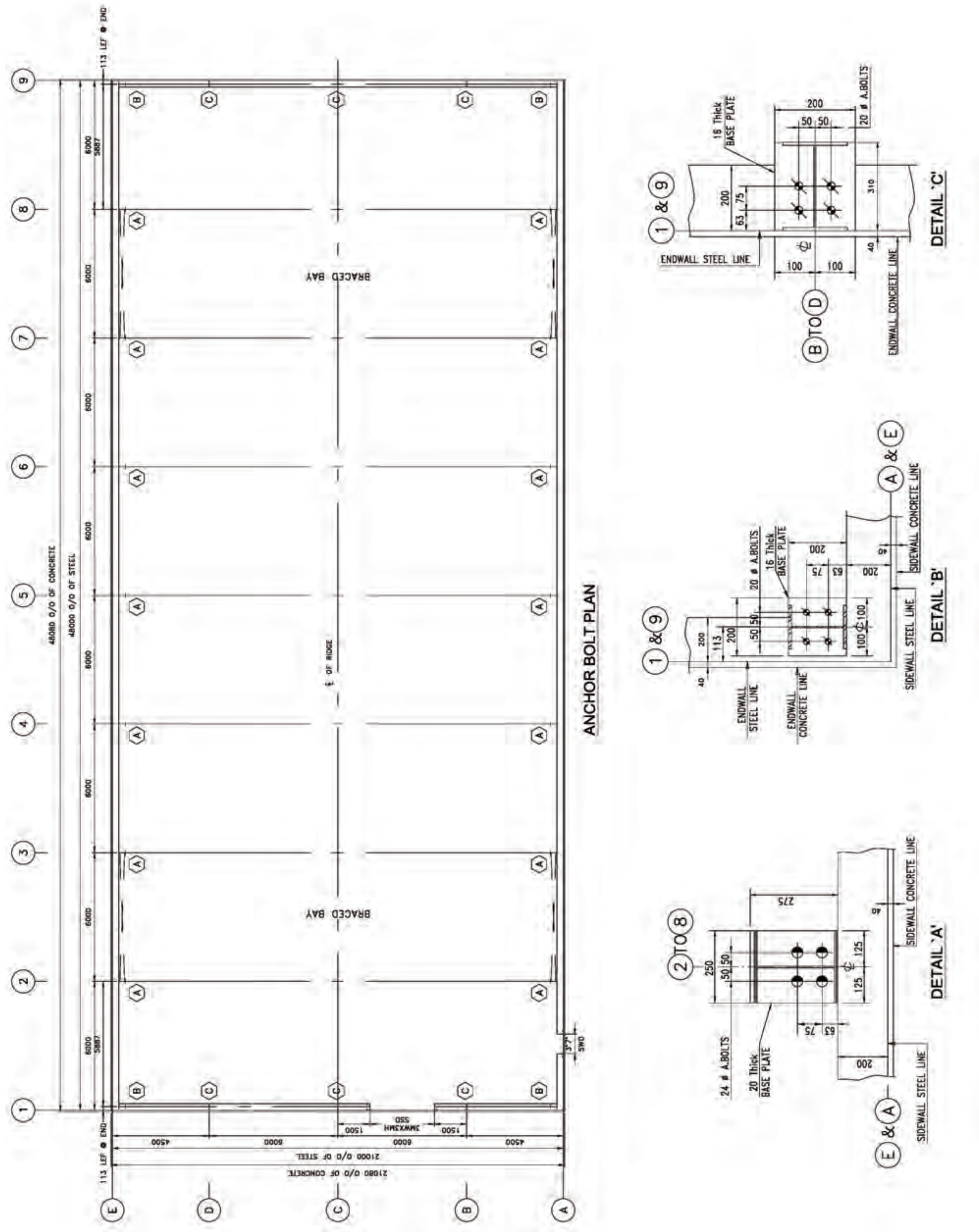


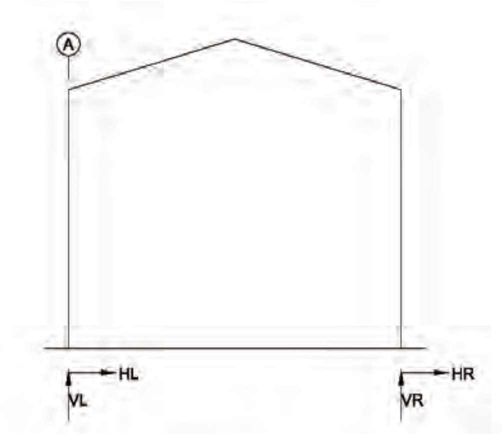
DETAIL 'A'

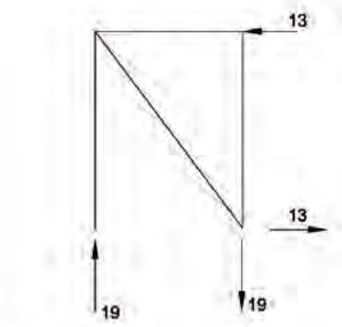


DETAIL 'B'

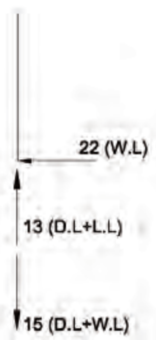
3.3 STANDARD BUILDINGS - RF-21685







MAX BRACED BAY REACTIONS (KNS)



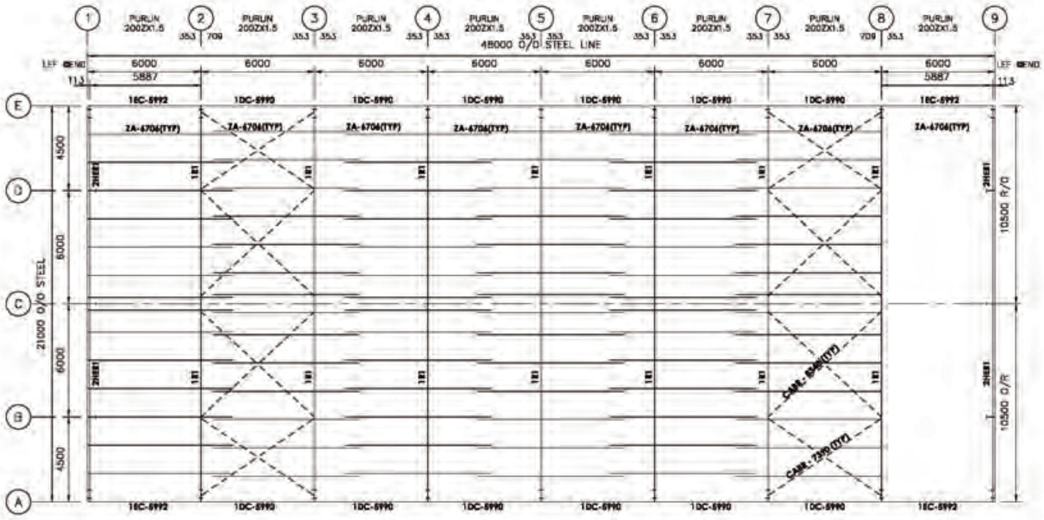
MAX WIND COL REACTIONS (KNS)

Main frame column reactions:

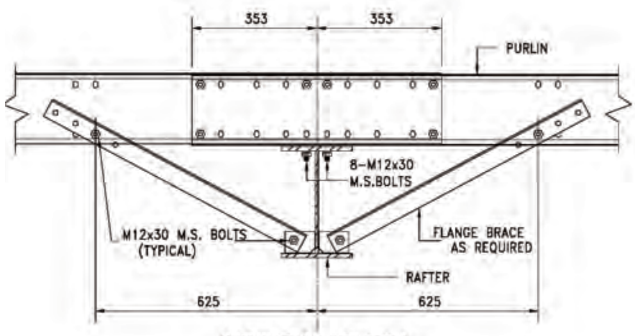
Signconvensions:
Positive hor.Reaction : totheright
Positive ver.Reaction : upward
Positive moment : counter clockwise

Mainframe- 2-8
Reaction For Combined Loads:

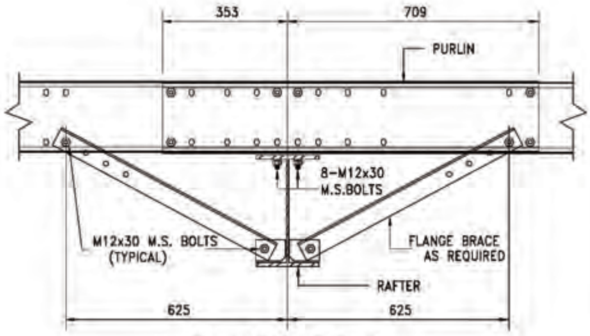
Description	Horz KN	Vert KN	Momt KN-M	Load combination
LEFT COL.	19.2	49.8	0.0	1DL+1LL
LEFT COL.	-16.6	-24.6	0.0	1DL+1WLL
LEFT COL.	4.8	-9.5	0.0	1DL+1WLR
LEFT COL.	2.1	10.7	0.0	1DL+1SEI
RIGT COL.	-19.2	49.8	0.0	1DL+1LL
RIGT COL.	-4.8	-9.5	0.0	1DL+1WLL
RIGT COL.	16.6	-24.6	0.0	1DL+1WLR
RIGT COL.	-5.5	13.3	0.0	1DL+1SEI



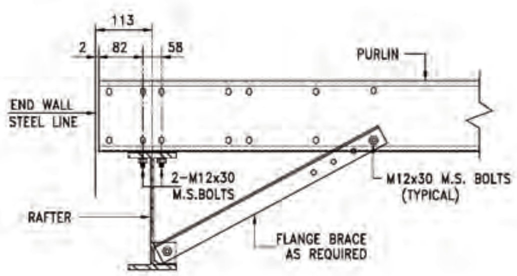
ROOF FRAMING PLAN



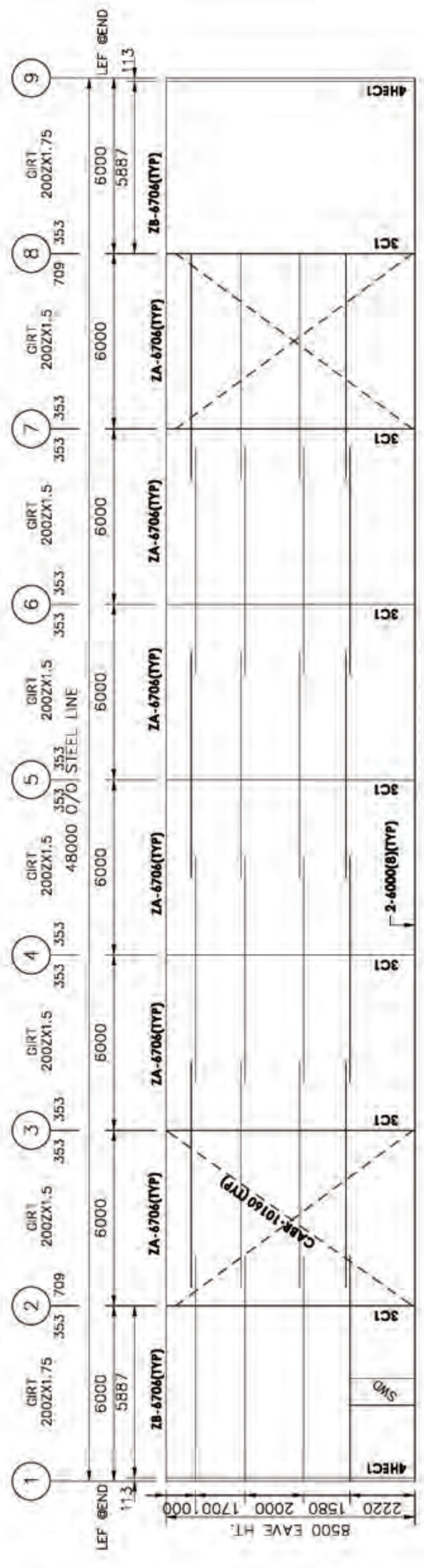
PURLIN CONNECTION DETAIL
FROM GRID LINE 3-7



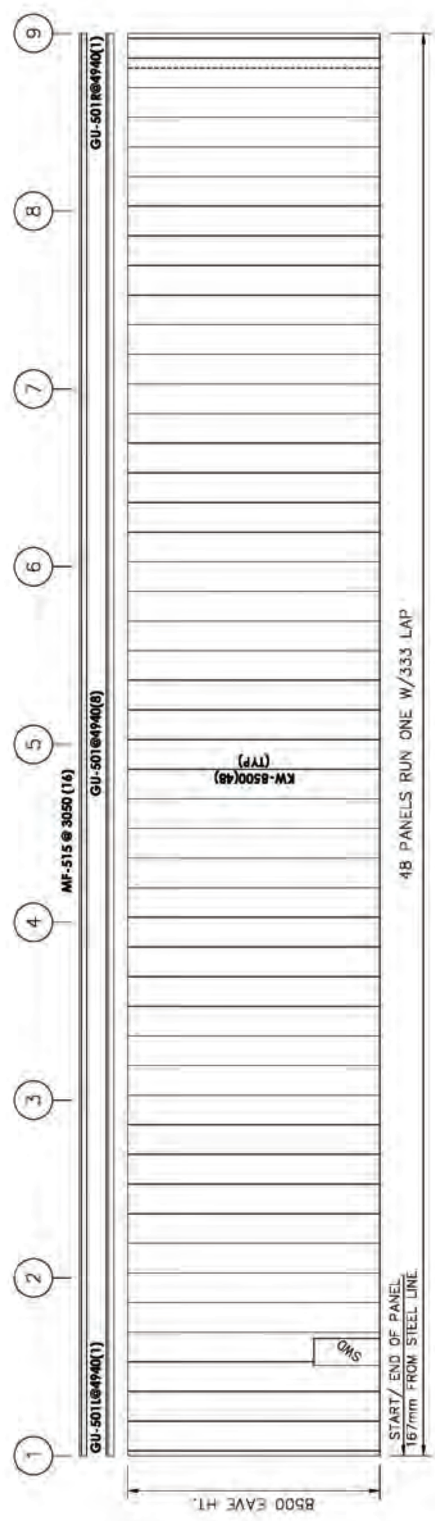
PURLIN CONNECTION DETAIL
At Lines 2 & 8



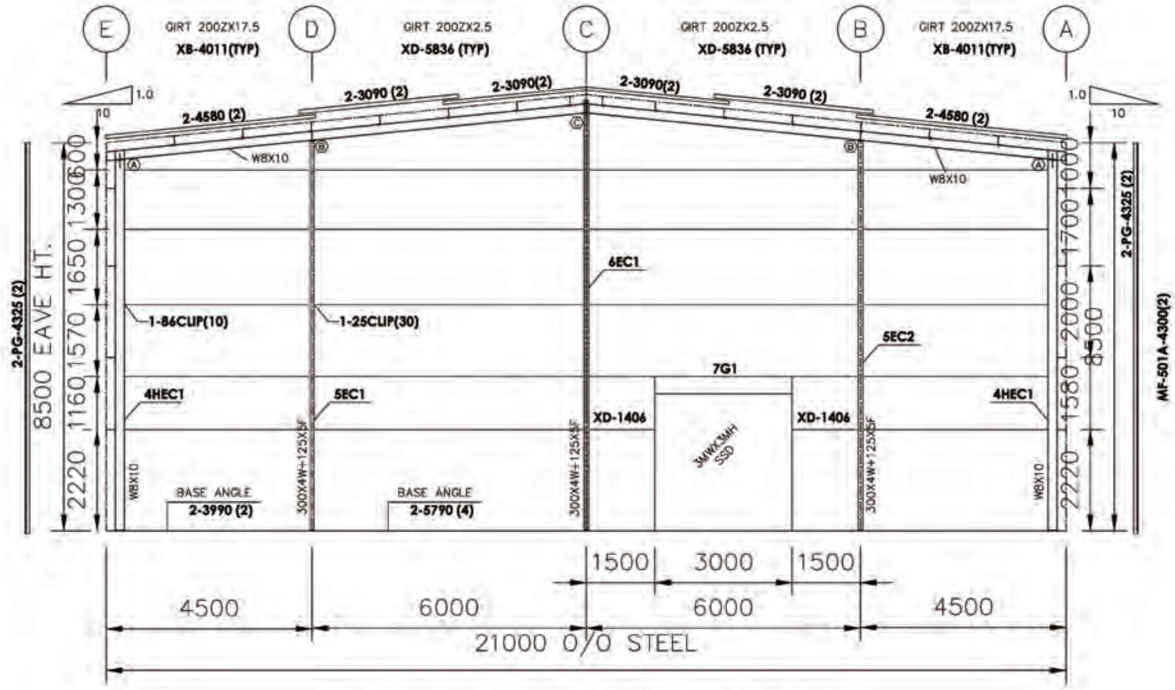
PURLIN CONNECTION DETAIL
AT GRID LINE 1 & 9



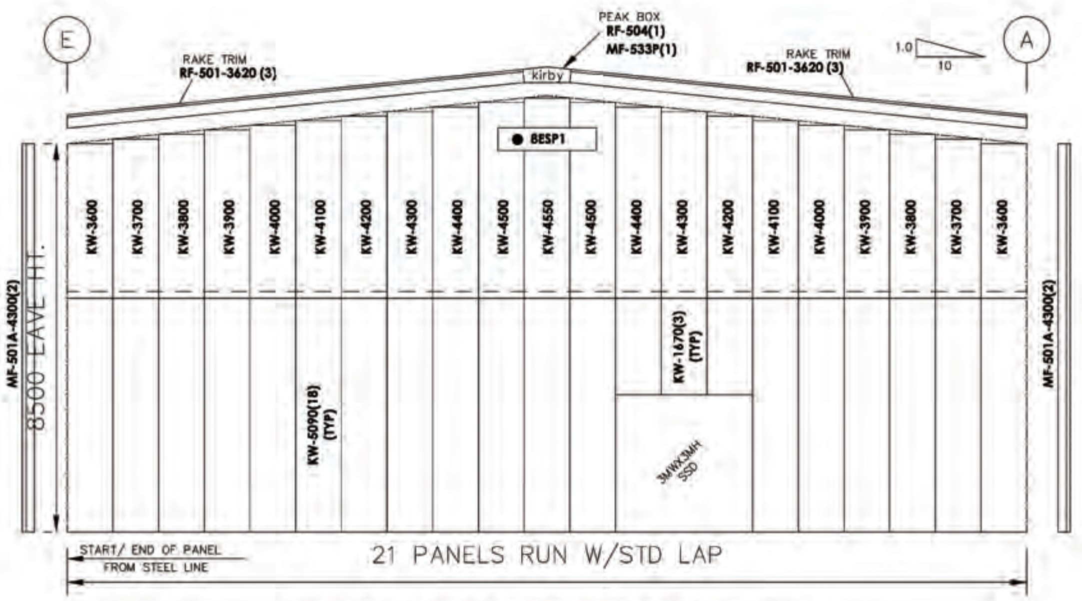
SIDE WALL FRAMIMNG ELEVATION @ GL A



SIDE WALL SHEETING ELEVATION @ GL A

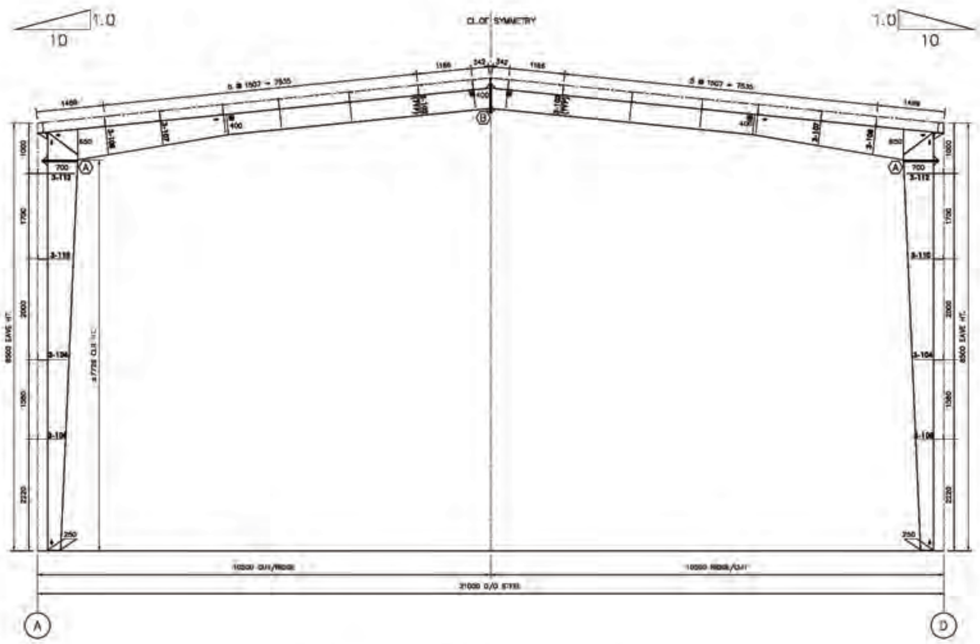


END WALL FRAMING ELEVATION @ GRID 1

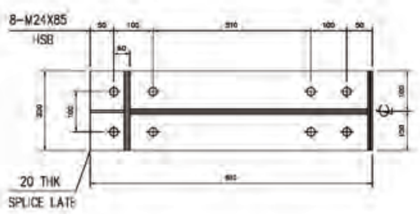


END WALL SHEETING ELEVATION @ GRID 1

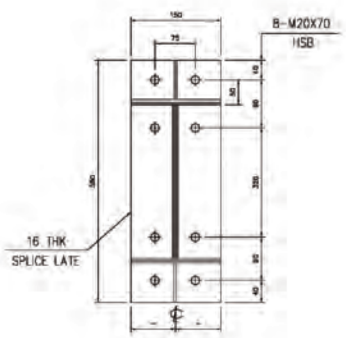
FSK-50THK. (10) ROLLS W/20000 LENGTH



CROSS SECTION @ GRIDS 2-8

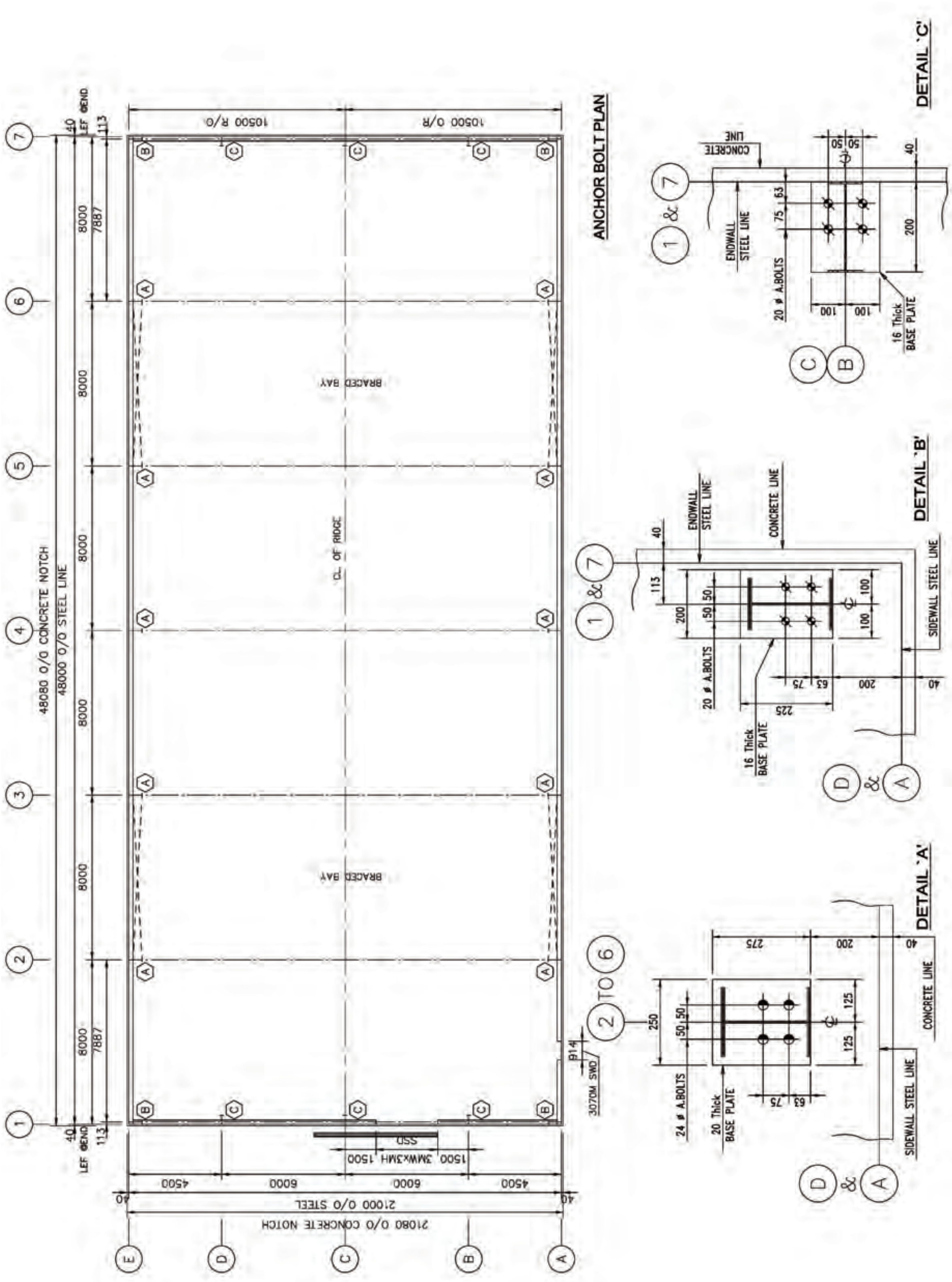


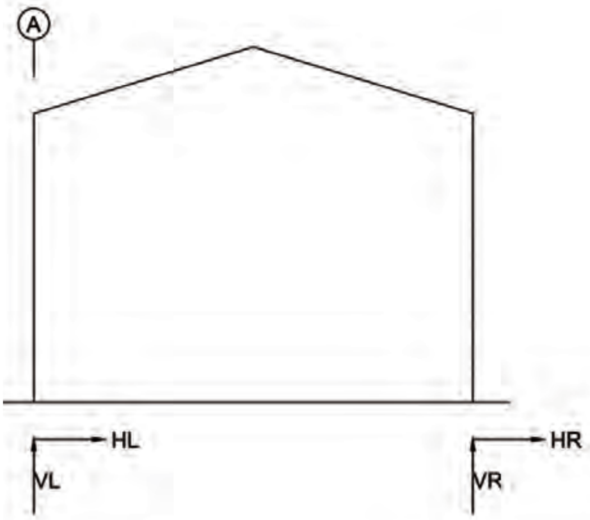
DETAIL "A"

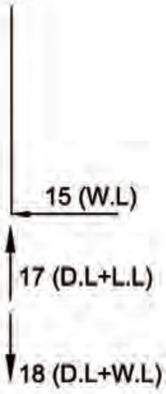


DETAIL "B"

3.3 STANDARD BUILDINGS - RF-21860



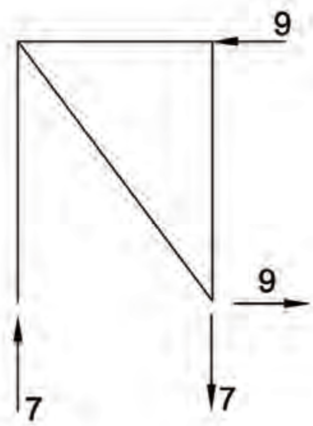




MAX WIND COL REACTIONS (KNS)

Main frame column reactions:

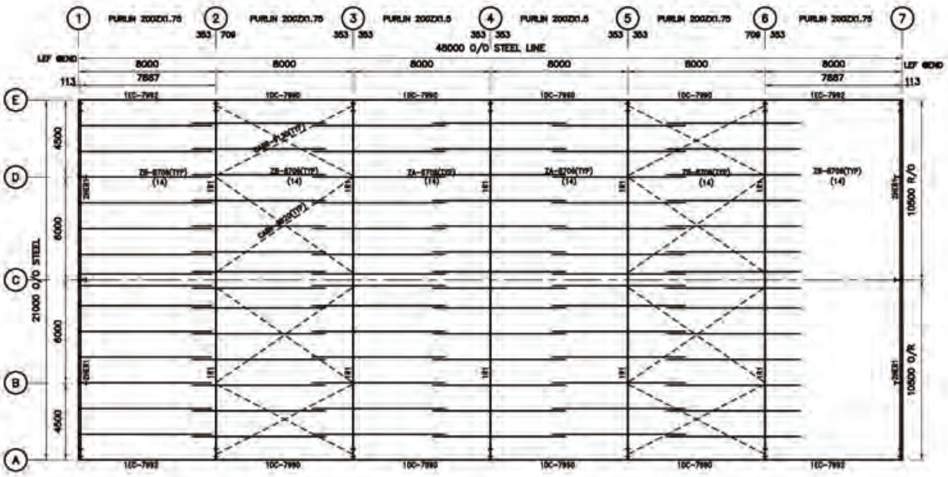
Sign convensions:
Positive hor.Reaction : to the right
Positive ver.Reaction : upward
Positive moment : counter clockwise



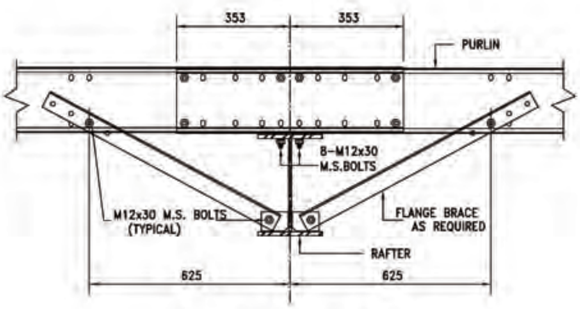
MAX BRACED BAY REACTIONS (KNS)

Mainframe- 2-6
Reaction For Combined Loads:

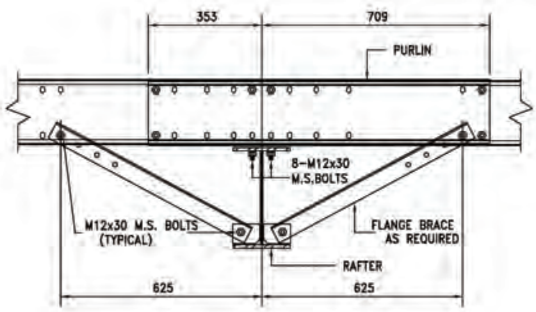
Description	Horz KN	Vert KN	Momt KN-M	Load combination
LEFT COL.	36.3	64.2	0.0	1DL+1LL
LEFT COL.	-21.1	-28.5	0.0	1DL+1WLL
LEFT COL.	-3.0	-15.4	0.0	1DL+1WLR
LEFT COL.	5.0	12.8	0.0	1DL+1SEI
RIGT COL.	-36.3	64.2	0.0	1DL+1LL
RIGT COL.	3.0	-15.4	0.0	1DL+1WLL
RIGT COL.	21.1	-28.5	0.0	1DL+1WLR
RIGT COL.	- 8.8	14.8	0.0	1DL+1SEI



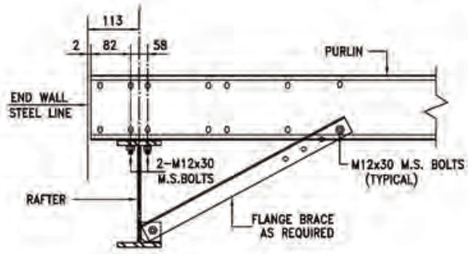
ROOF FRAMING PLAN



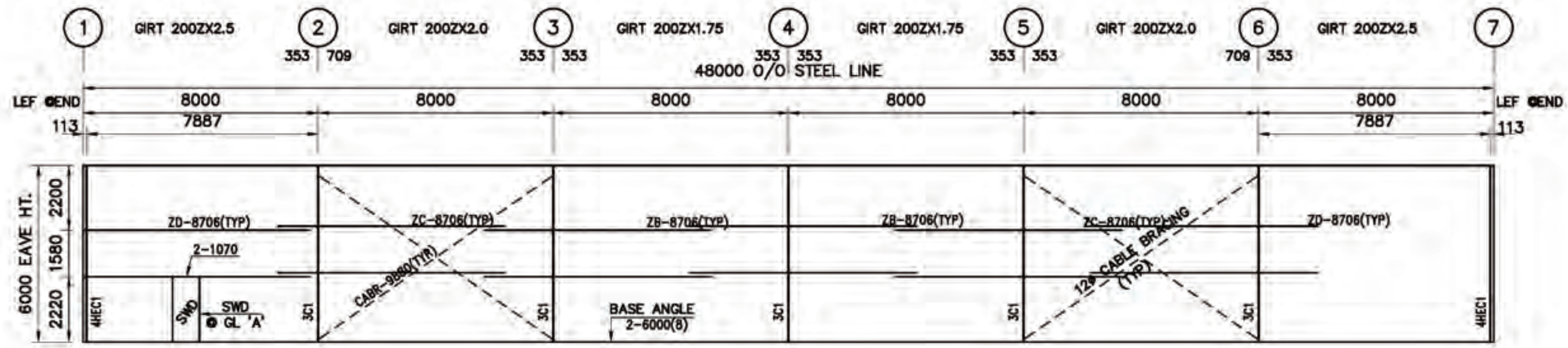
PURLIN CONNECTION DETAIL
FROM GRID LINE 3 - 5



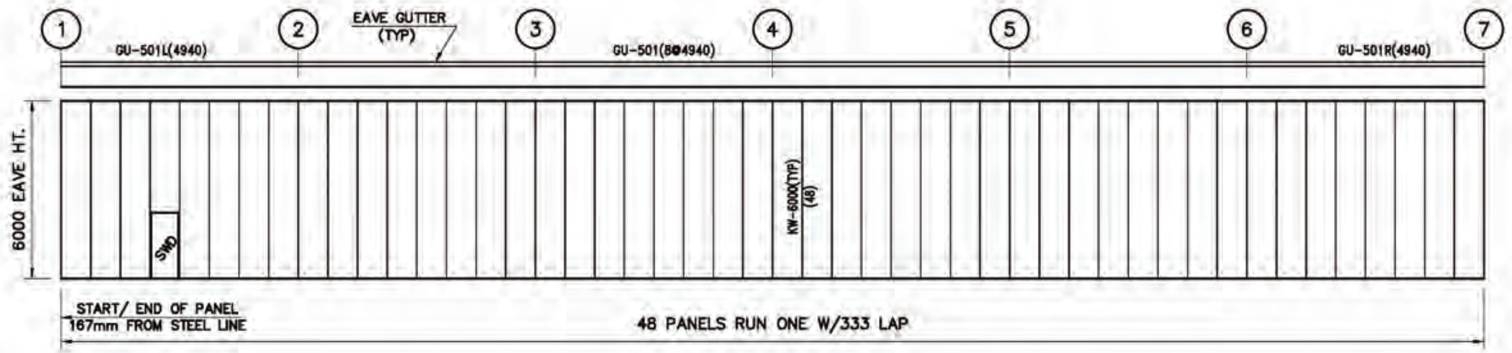
PURLIN CONNECTION DETAIL
At Lines 2 & 6



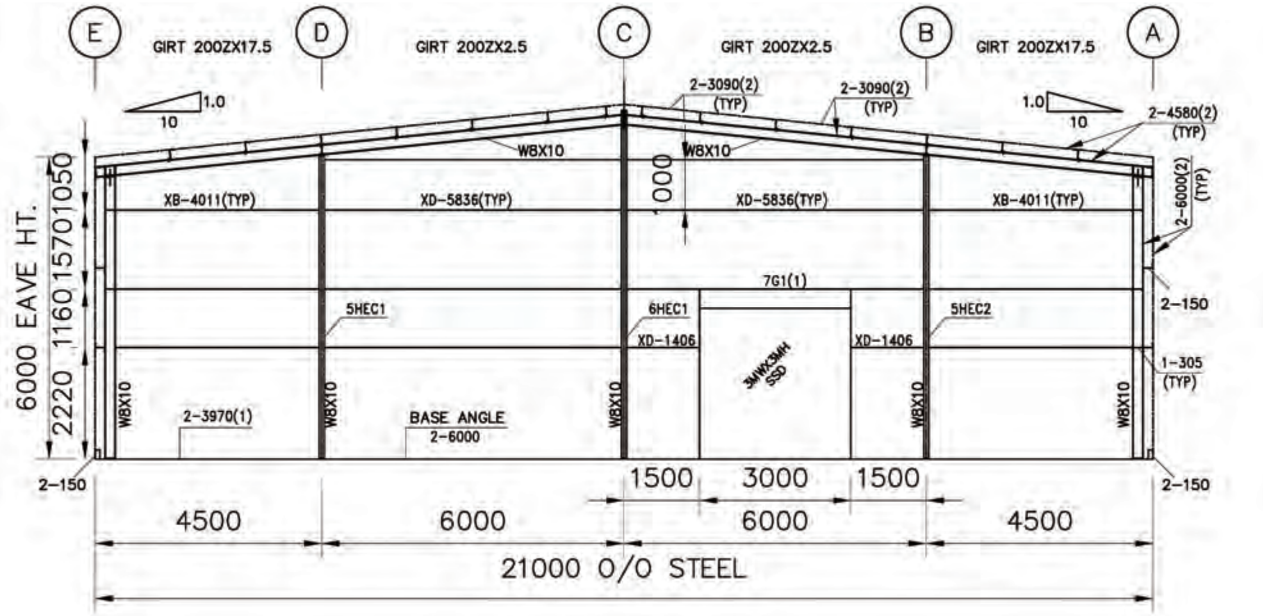
PURLIN CONNECTION DETAIL
AT GRID LINE 1 & 7



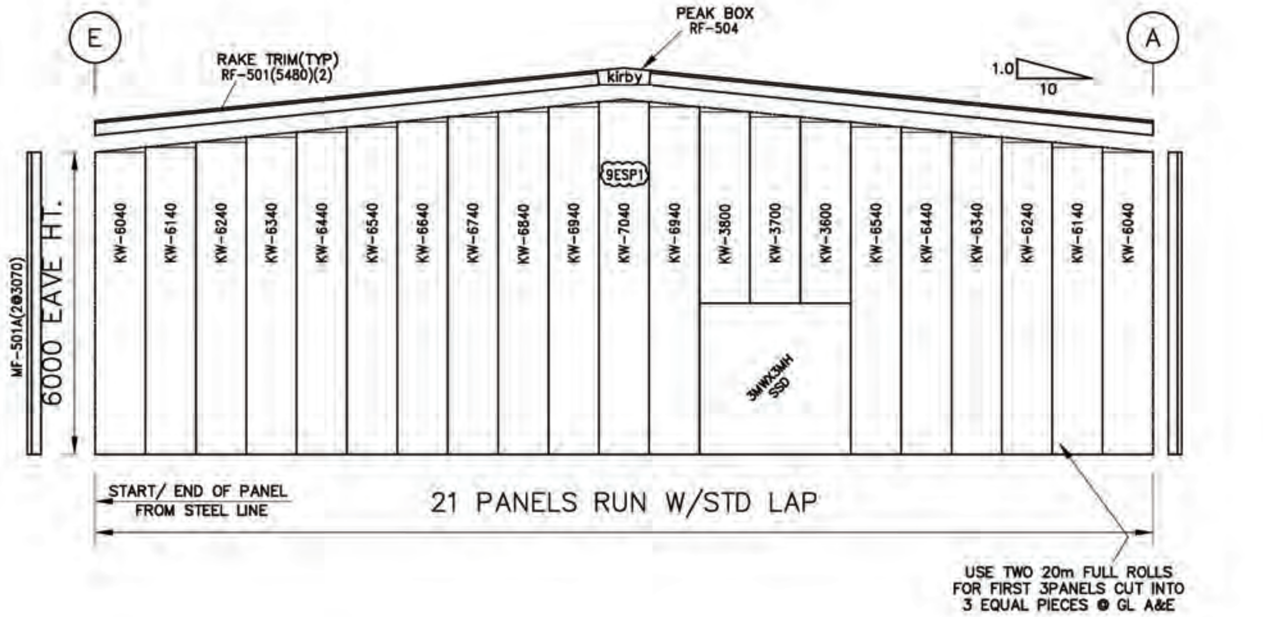
SIDE WALL FRAMIMNG ELEVATION @ GL A



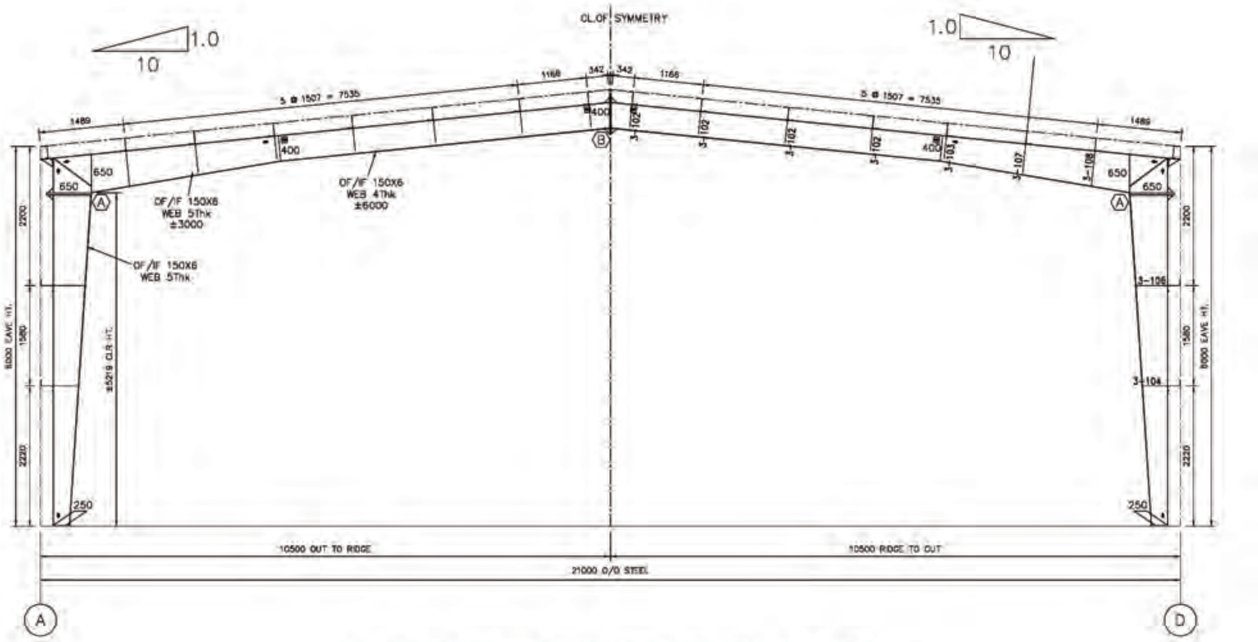
SIDEWALL SHEETING ELEVATION @ GL A



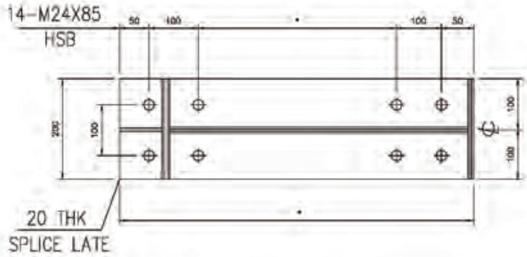
END WALL FRAMING ELEVATION @ GRID 1



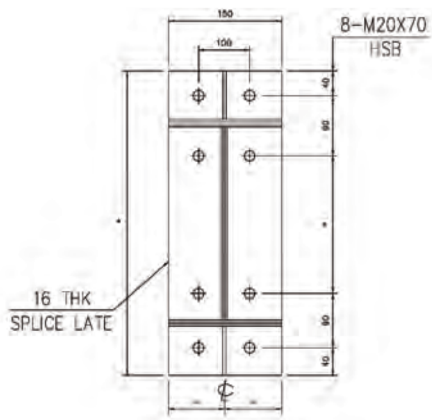
END WALL SHEETING ELEVATION @ GRID 1



CROSS SECTION @ GRIDS 2-6

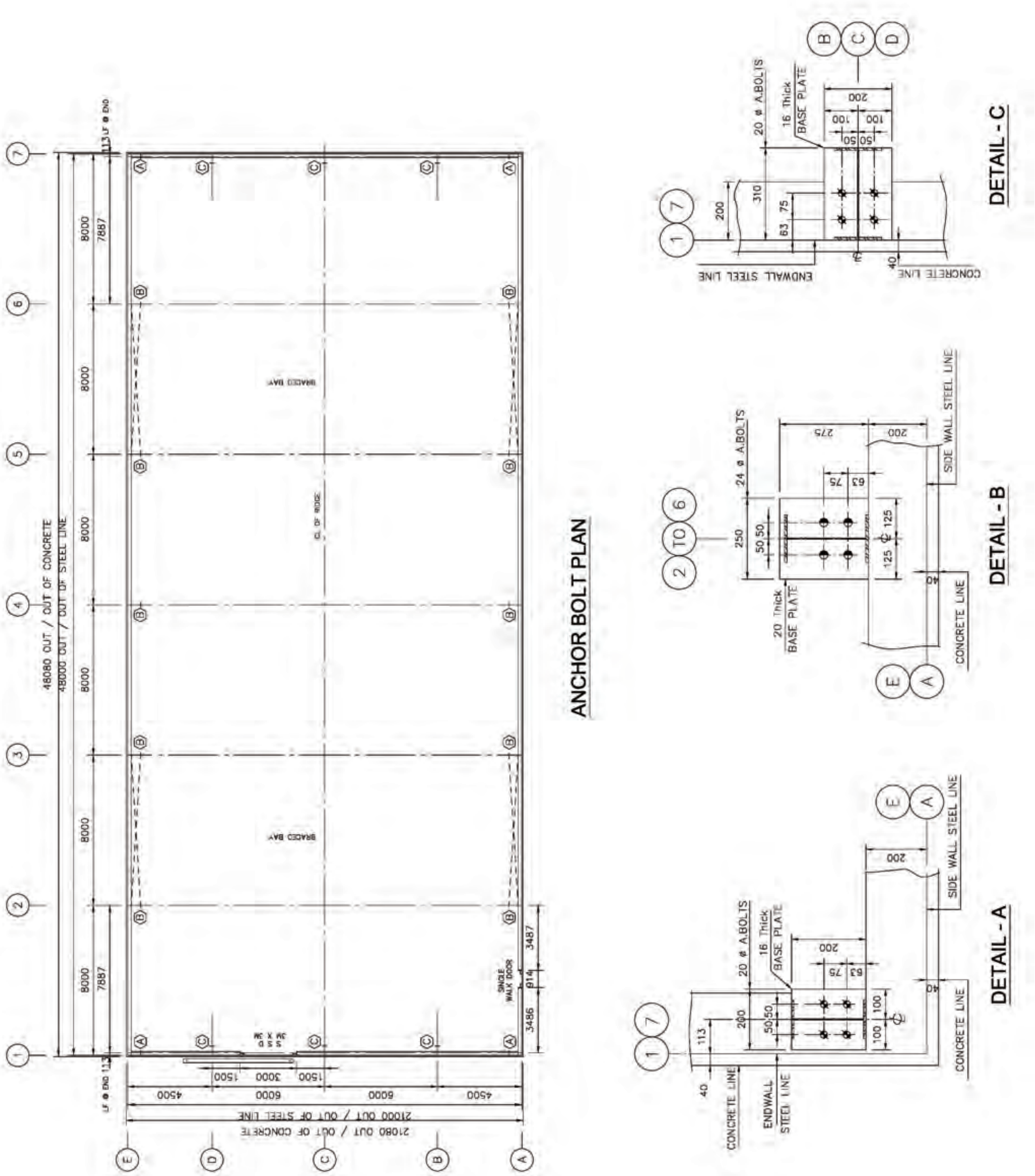


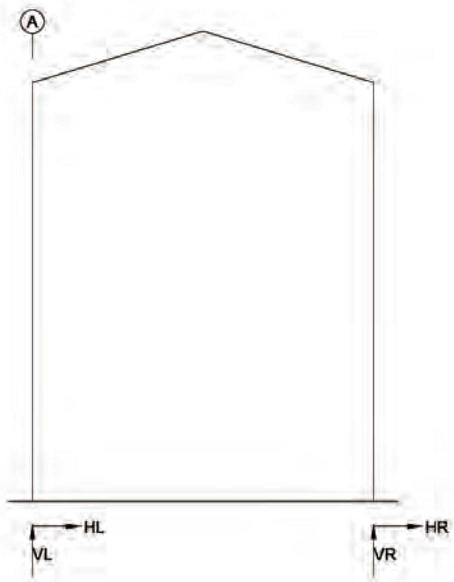
DETAIL "A"

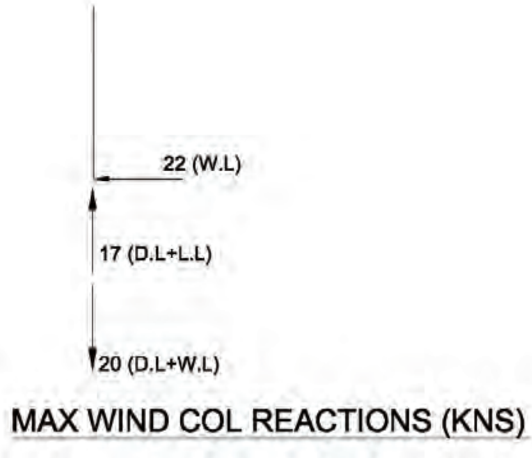


DETAIL "B"

3.3 STANDARD BUILDINGS - RF-21885



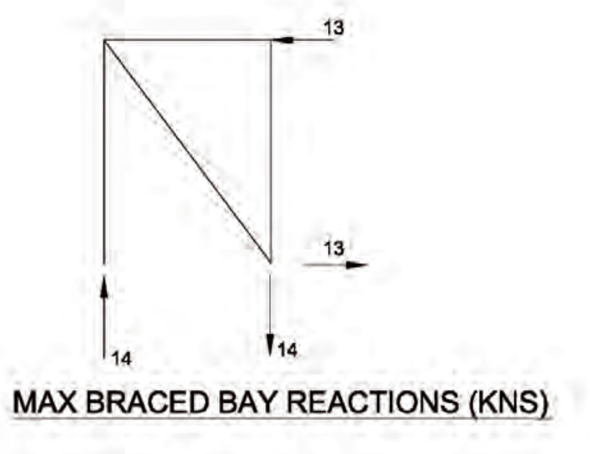




Main frame column reactions:

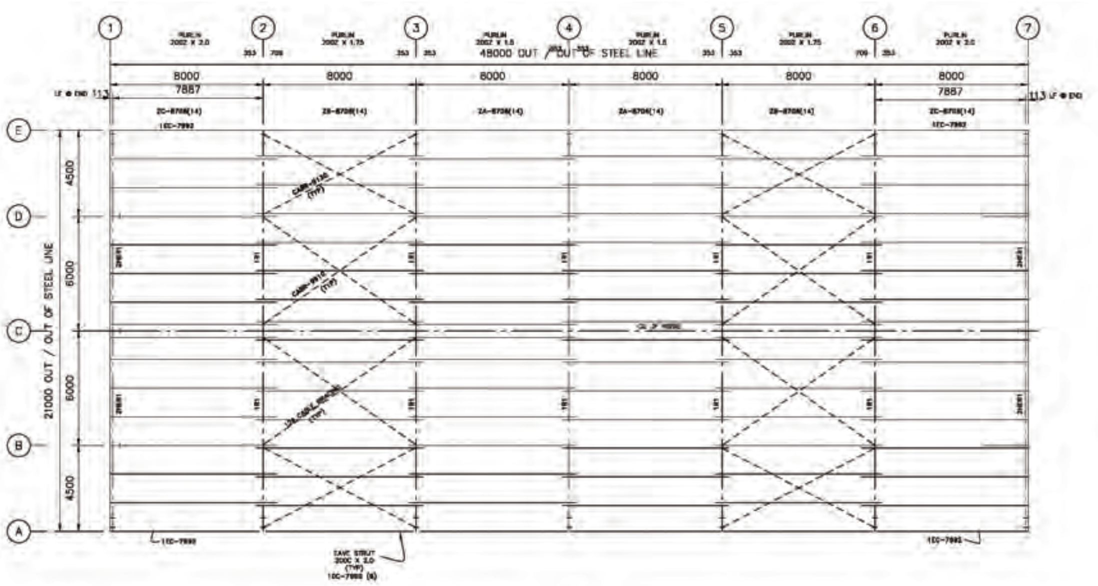
Sign convensions:

Positivehor.Reaction : to the right
Positive ver.Reaction : upward
Positivemoment : counter clockwise

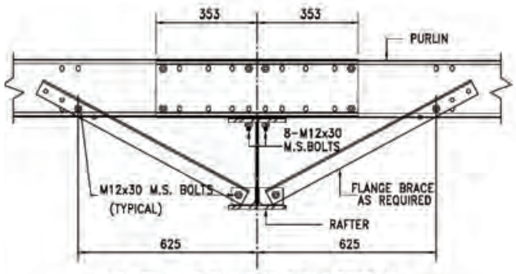


Mainframe- 2-6
Reaction For Combined Loads:

Description	Horz KN	Vert KN	Momt KN-M	Load combination
LEFT COL.	25.1	64.2	0.0	1DL+1LL
LEFT COL.	-22.2	-28.5	0.0	1DL+1WLL
LEFT COL.	6.3	-15.4	0.0	1DL+1WLR
LEFT COL.	6.3	12.8	0.0	1DL+1SEI
RIGT COL.	-25.1	64.2	0.0	1DL+1LL
RIGT COL.	-6.3	-15.4	0.0	1DL+1WLL
RIGT COL.	22.2	-28.5	0.0	1DL+1WLR
RIGT COL.	22.2	14.8	0.0	1DL+1SEI

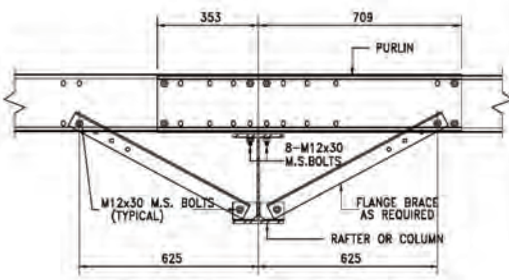


ROOF FRAMING PLAN



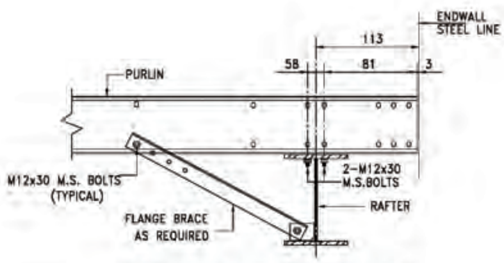
PURLIN CONNECTION DETAIL

At Lines 3 ~ 5



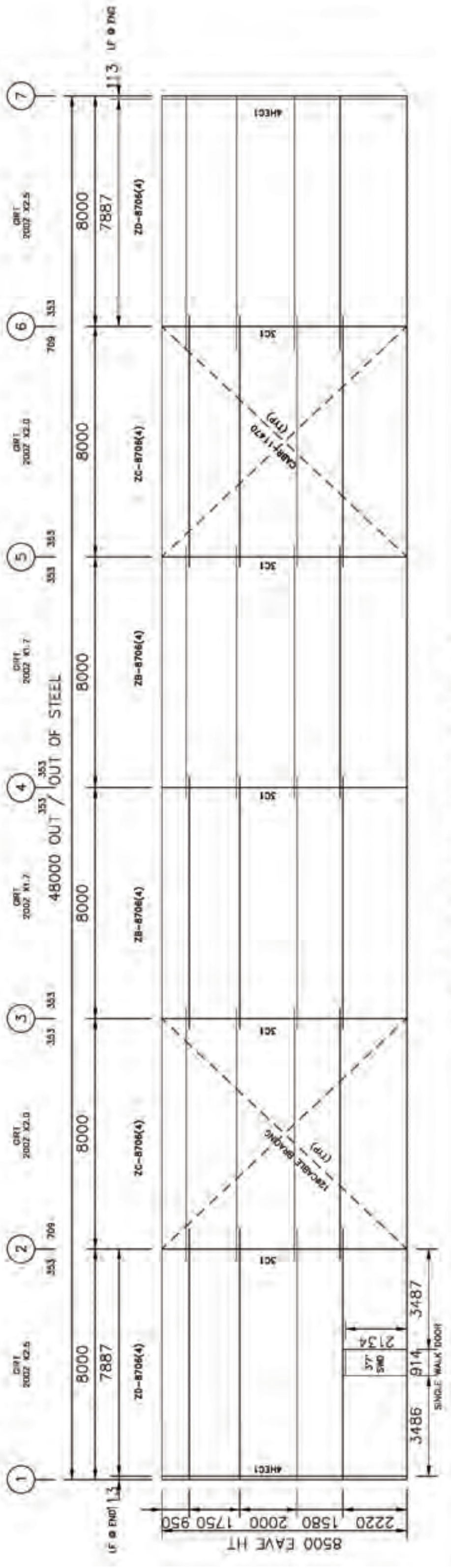
PURLIN CONNECTION DETAIL

At Lines 2 & 6

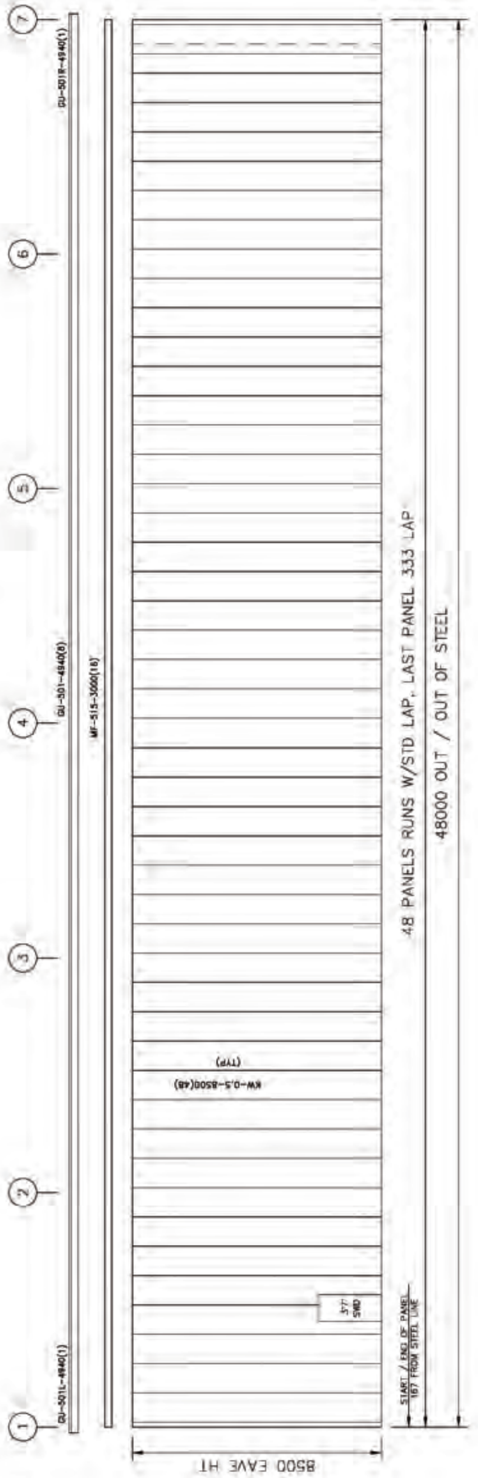


PURLIN CONNECTION DETAIL

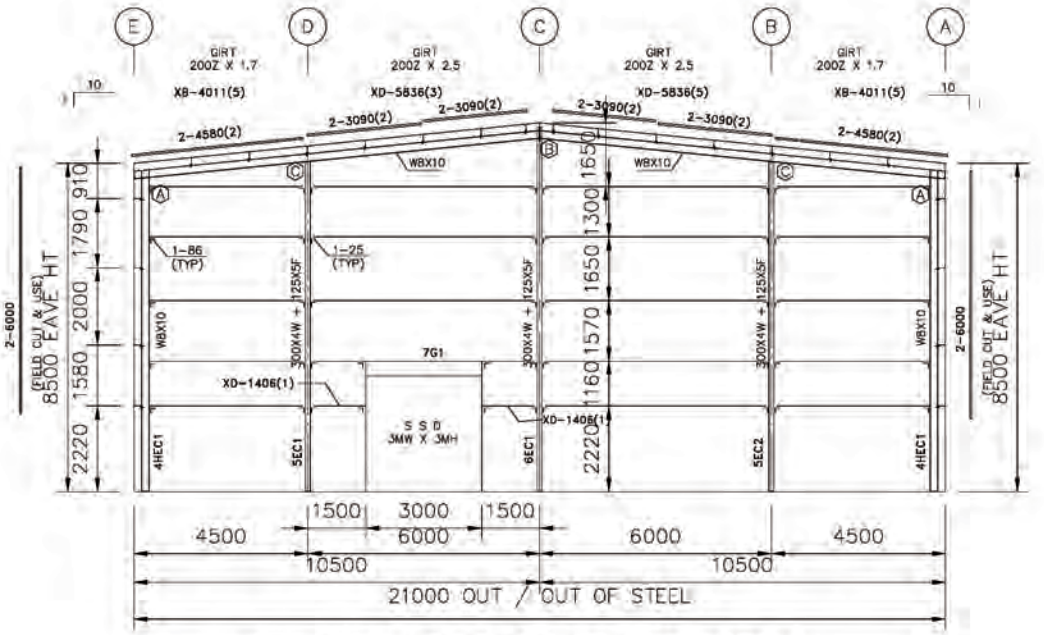
At Lines 1 & 7



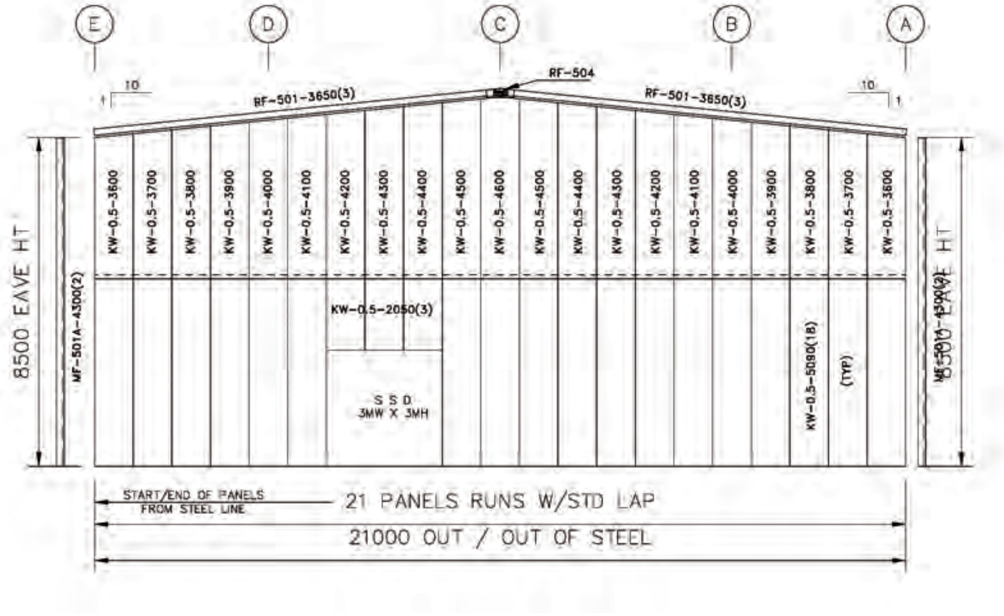
SIDEWALL FRAMING ELEVATION @ A



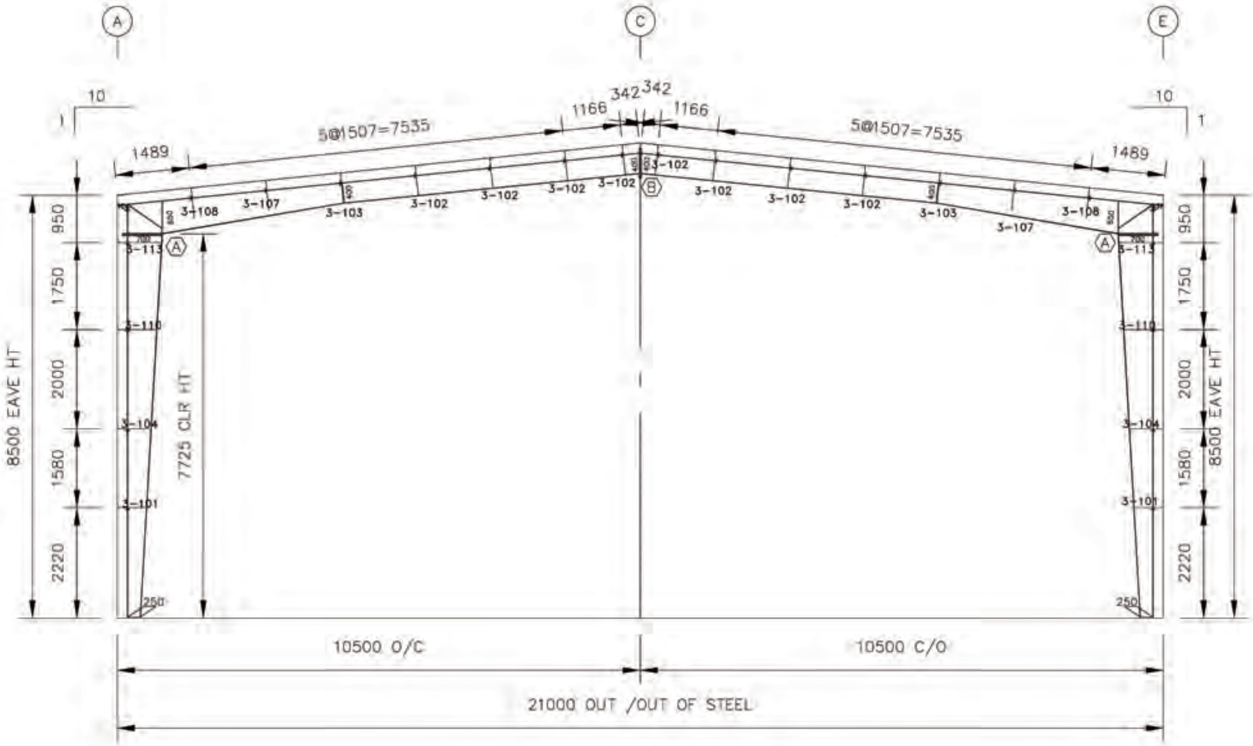
SIDEWALL SHEETING ELEVATION @ A



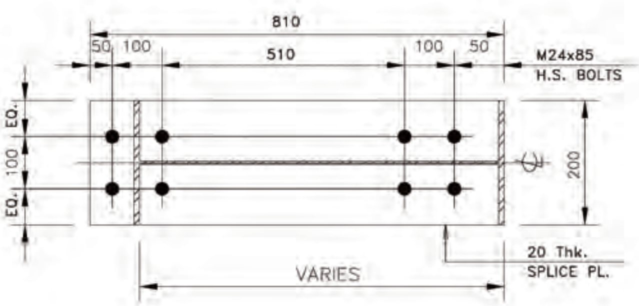
ENDWALL FRAMING ELEVATION @ GRID 1



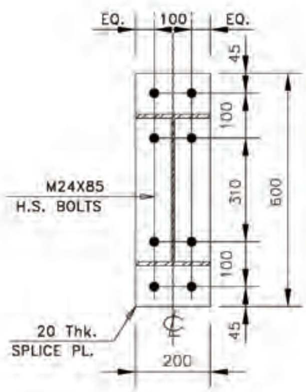
ENDWALL SHEETING ELEVATION @ GRID 1



CROSS SECTION @ 2-6

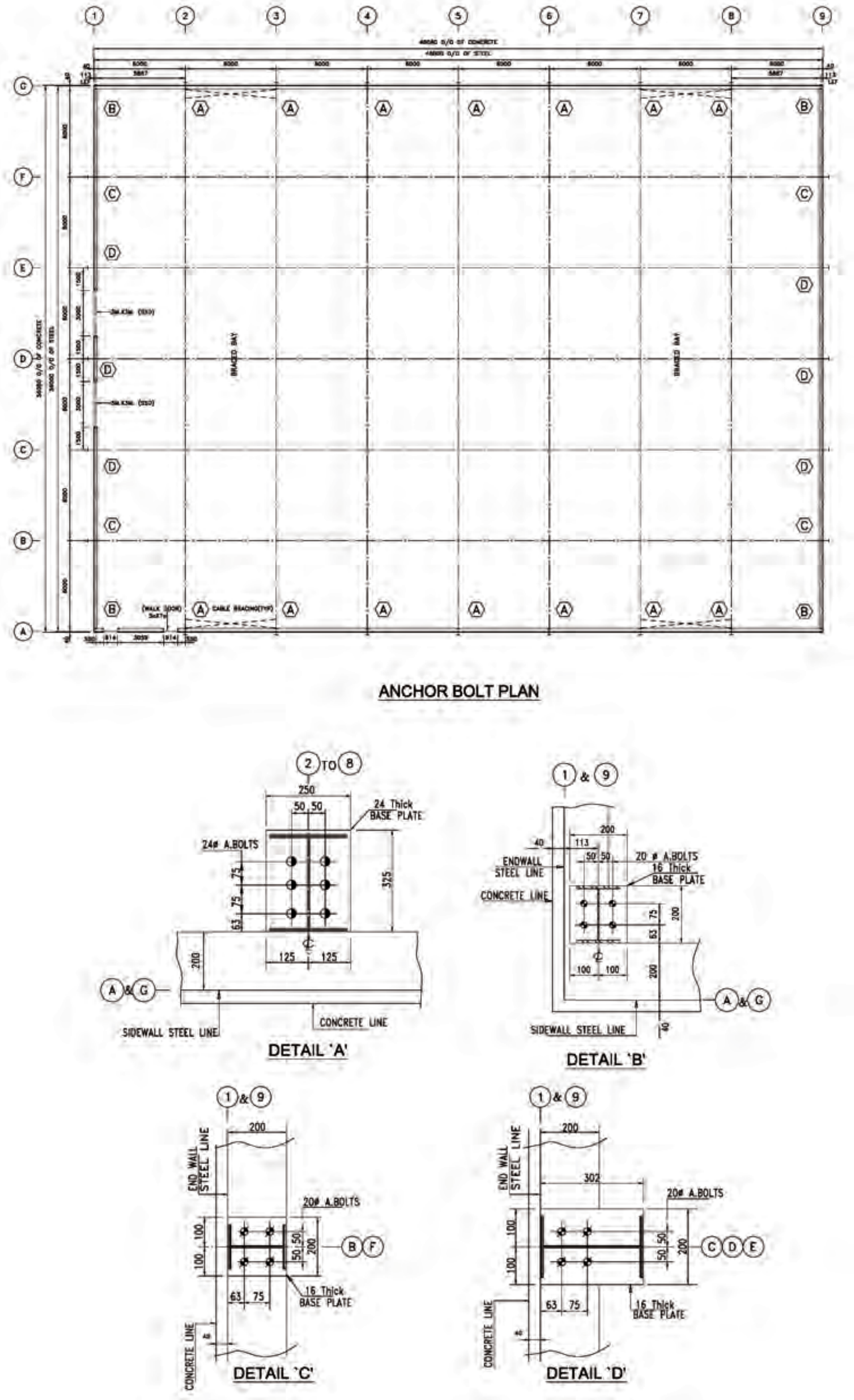


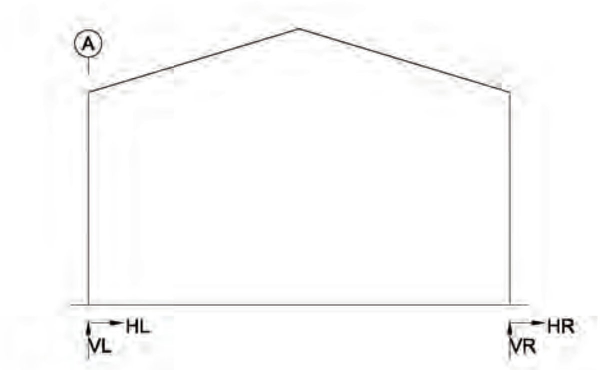
DETAIL A

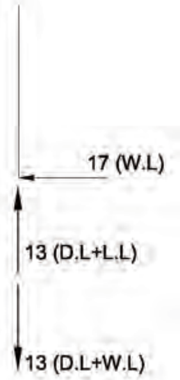


DETAIL B

3.3 STANDARD BUILDINGS - RF-36660





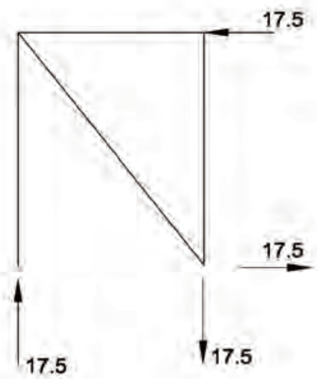


MAX WIND COL REACTIONS (KNS)

Main framecolumnreactions:

Sign convensions:

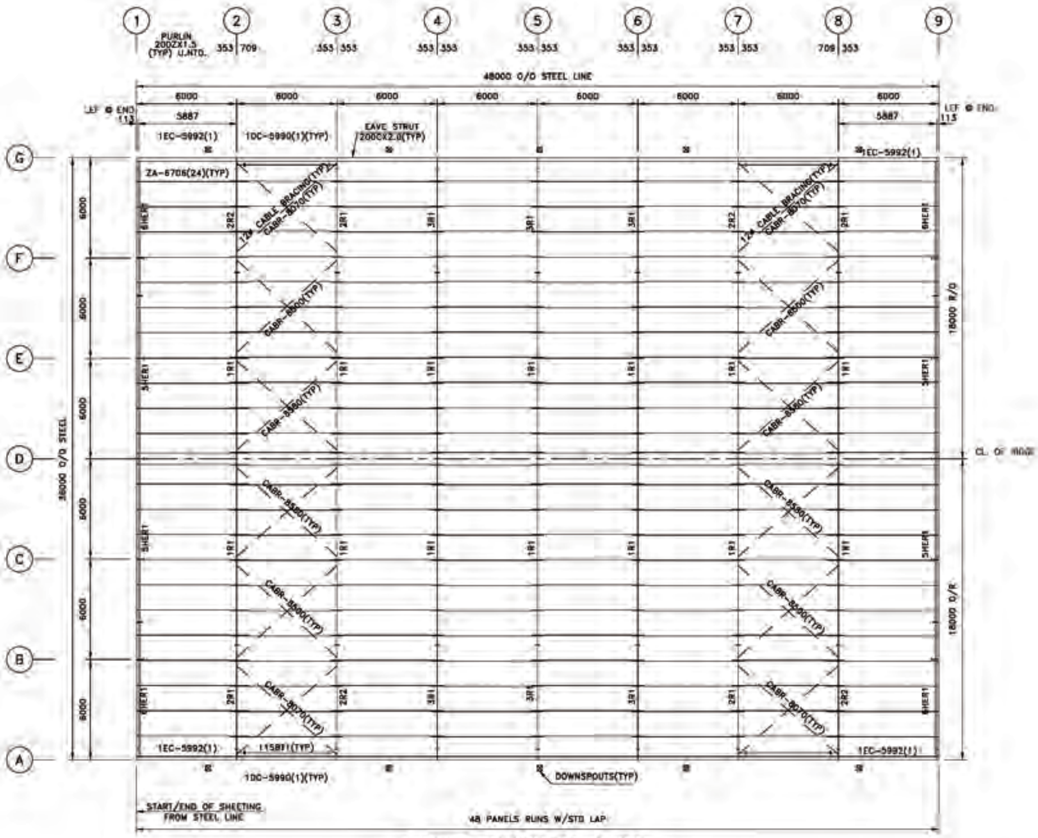
Positive hor.Reaction : to the right
Positivever.Reaction : upward
Positivemoment : counterclockwise



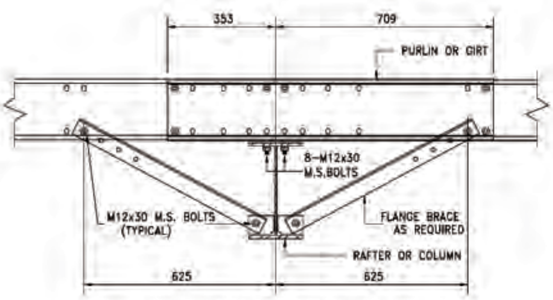
MAX BRACED BAY REACTIONS (KNS)

Mainframe- 2-8
Reaction For Combined Loads:

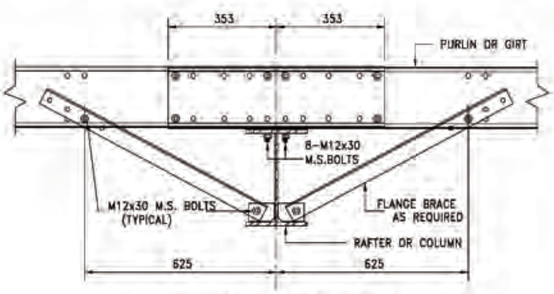
Description	Horz KN	Vert KN	Momt KN-M	Load combination
LEFT COL.	86.6	86.9	0.0	1DL+1LL
LEFT COL.	-32.5	-30.1	0.0	1DL+1WLL
LEFT COL.	-19.8	-17.8	0.0	1DL+1WLR
LEFT COL.	-16.5	21.2	0.0	1DL+1SEI
RIGT COL.	-86.6	86.9	0.0	1DL+1LL
RIGT COL.	19.8	-17.8	0.0	1DL+1WLL
RIGT COL.	32.5	-30.1	0.0	1DL+1WLR
RIGT COL.	-22.7	23.0	0.0	1DL+1SEI



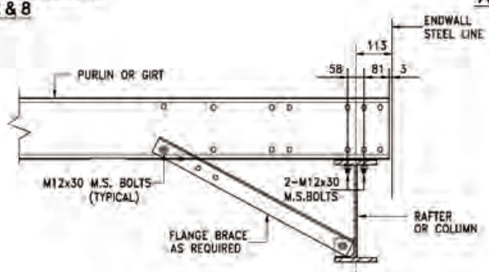
ROOF FRAMING ELEVATION



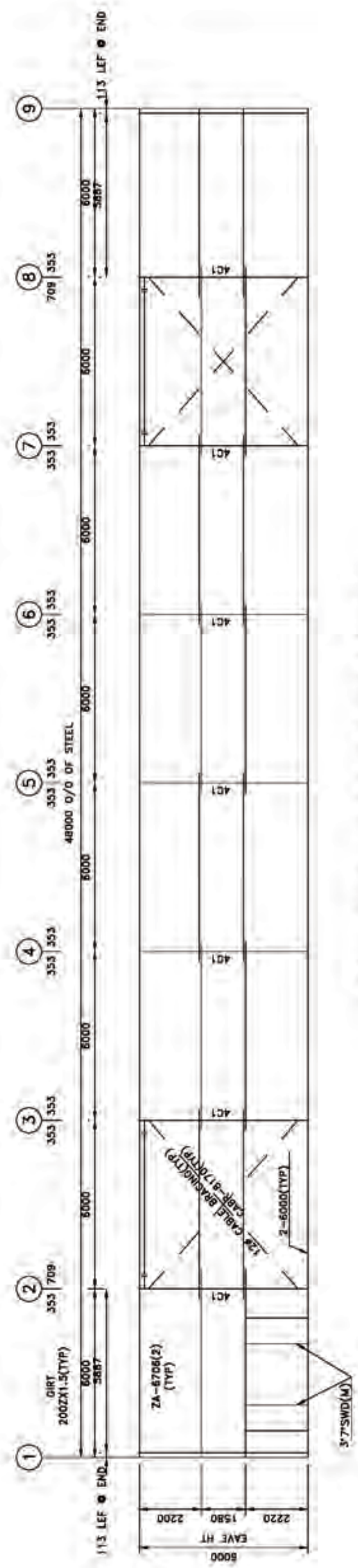
PURLIN CONNECTION DETAIL
At Lines 2 & 8



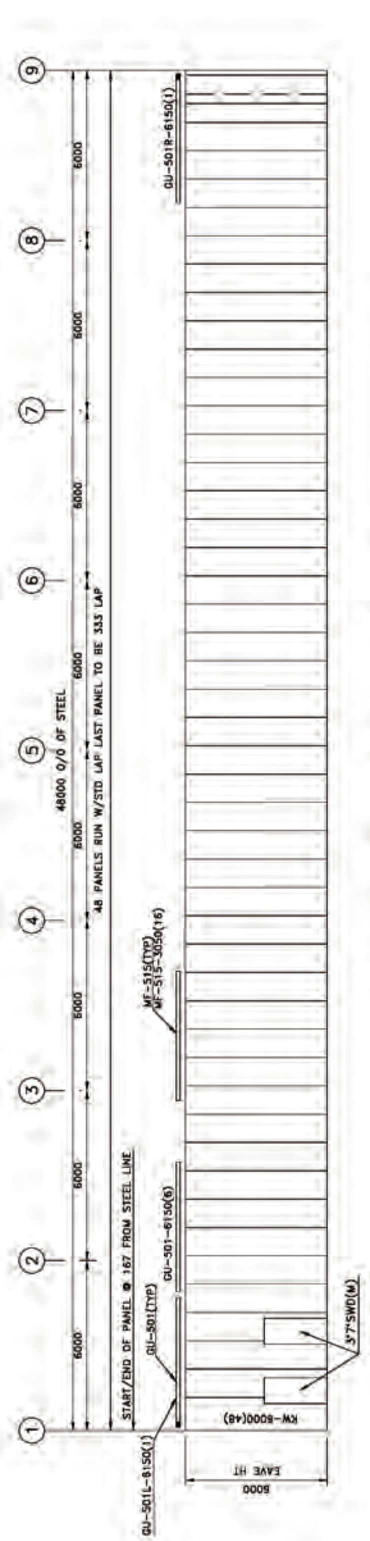
PURLIN CONNECTION DETAIL
At Lines 3 ~ 7



PURLIN/GIRT CONNECTION DETAIL
@ GRID 1&7

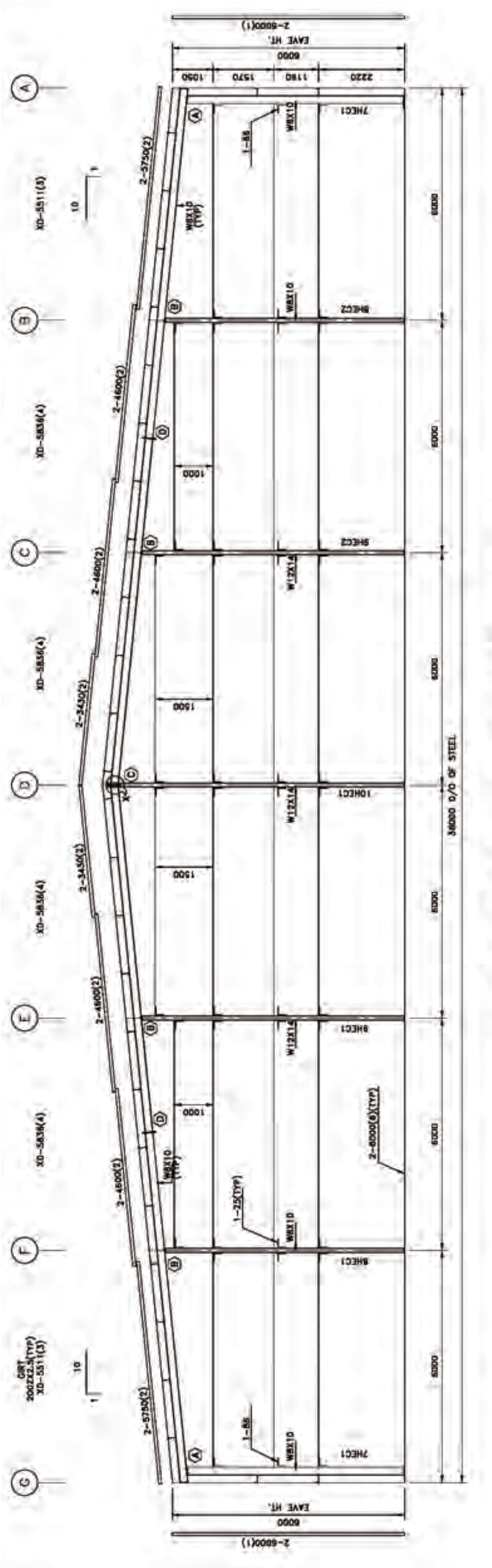


SIDEWALL FRAMING ELEVATION @ GRID-A

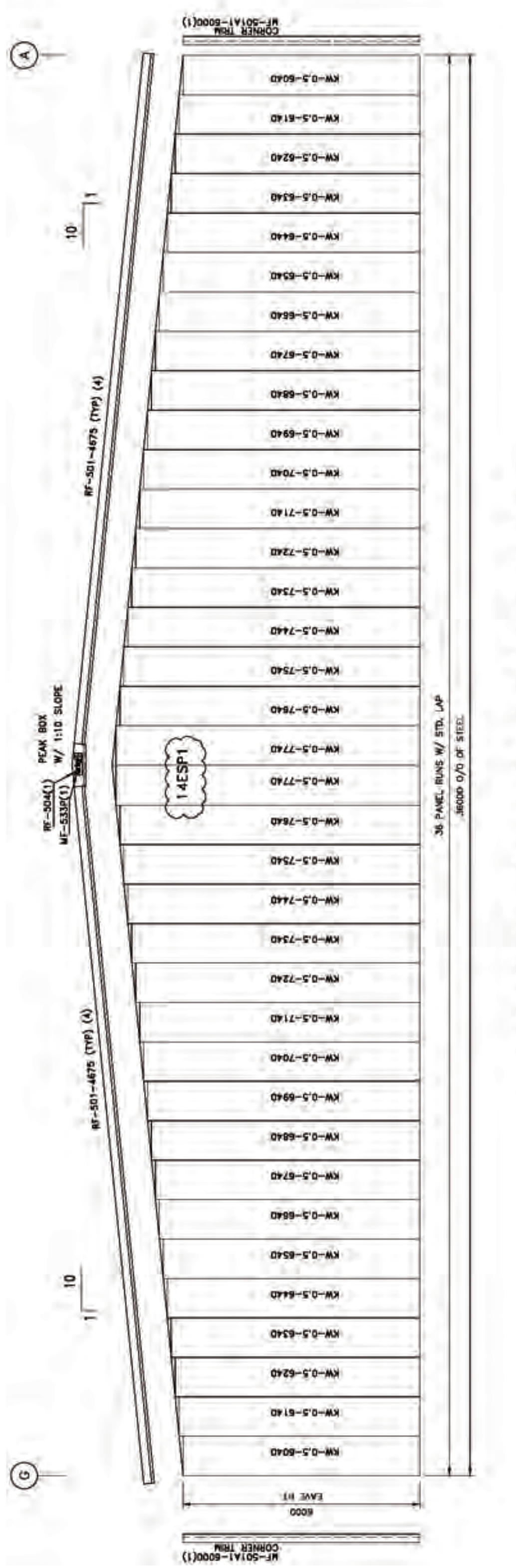


SIDEWALL SHEETING ELEVATION @ GRID-A

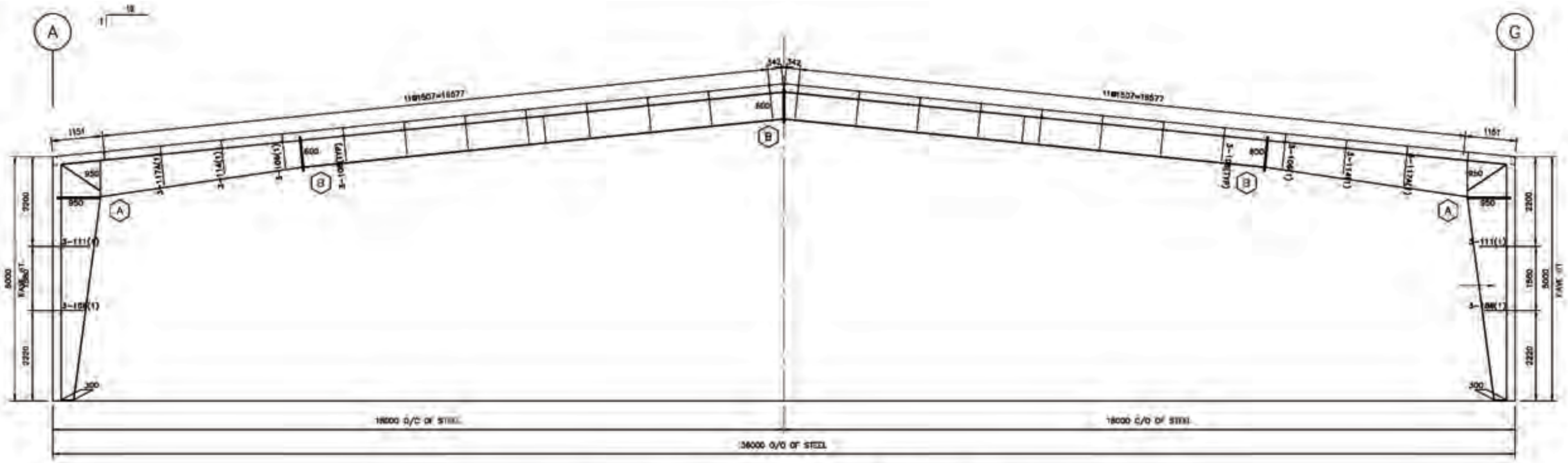
KW-PANEL-0.5MM THK(ARCTIC WHITE)



END WALL FRAMING ELEVATION @ GL-1

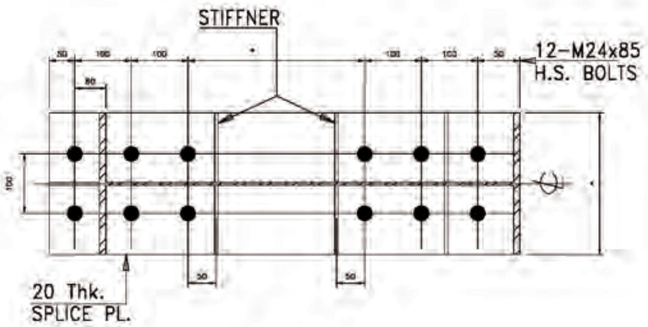


END WALL SHEETING ELEVATION @ GL-1

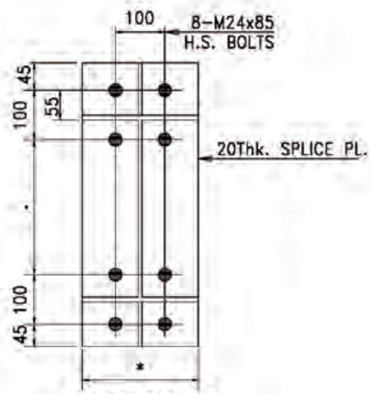


CROSS SECTION AT GL-(2~8)

FSK-50THK INSULATION (10Kg/m3)-(6666x3)=20000 Length &
-6000+6666+7333=20000 Length

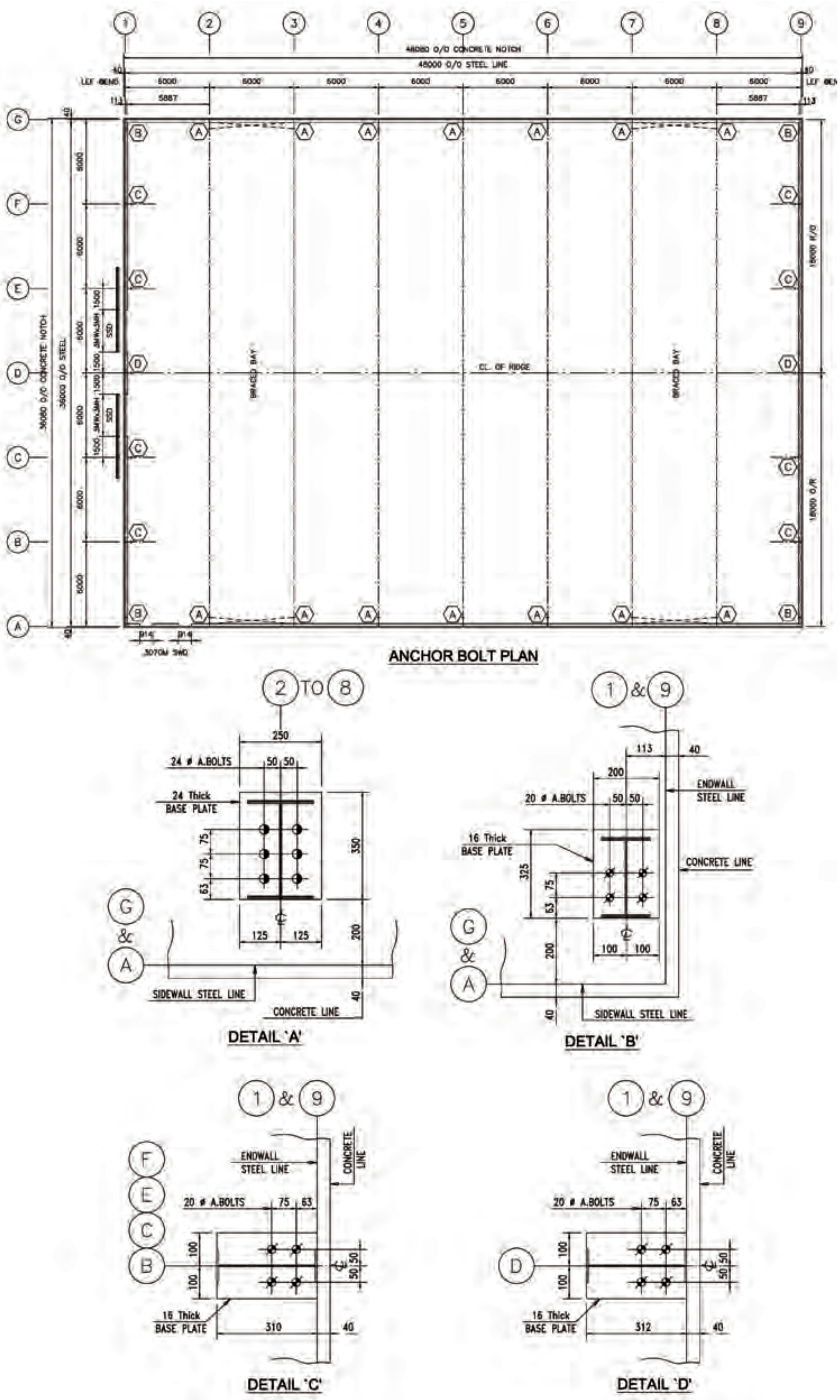


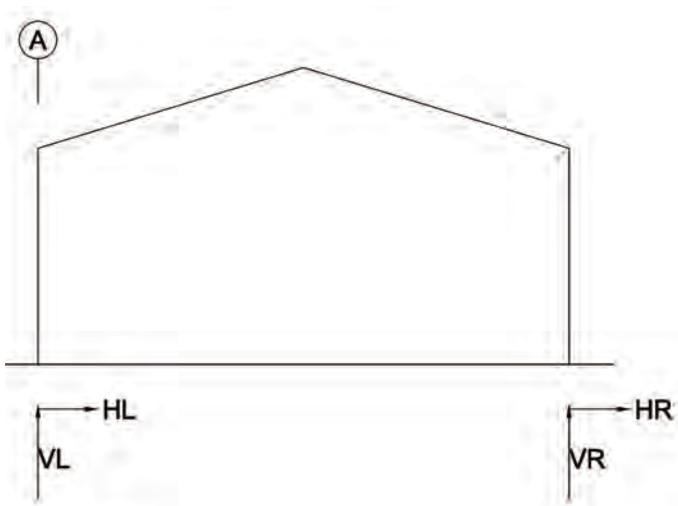
DETAIL 'A'

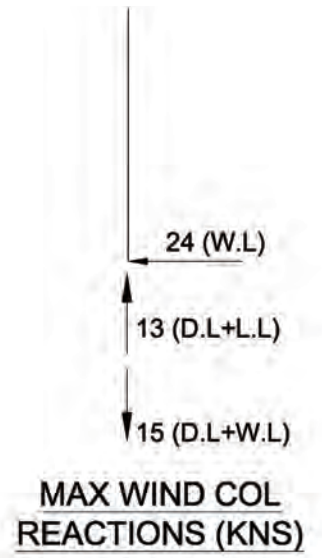


DETAIL-B

3.3 STANDARD BUILDINGS - RF-36685



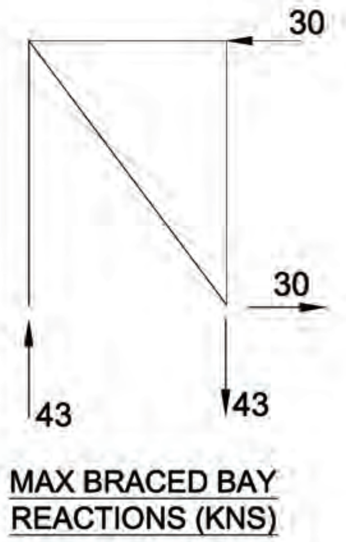




Main frame column reactions:

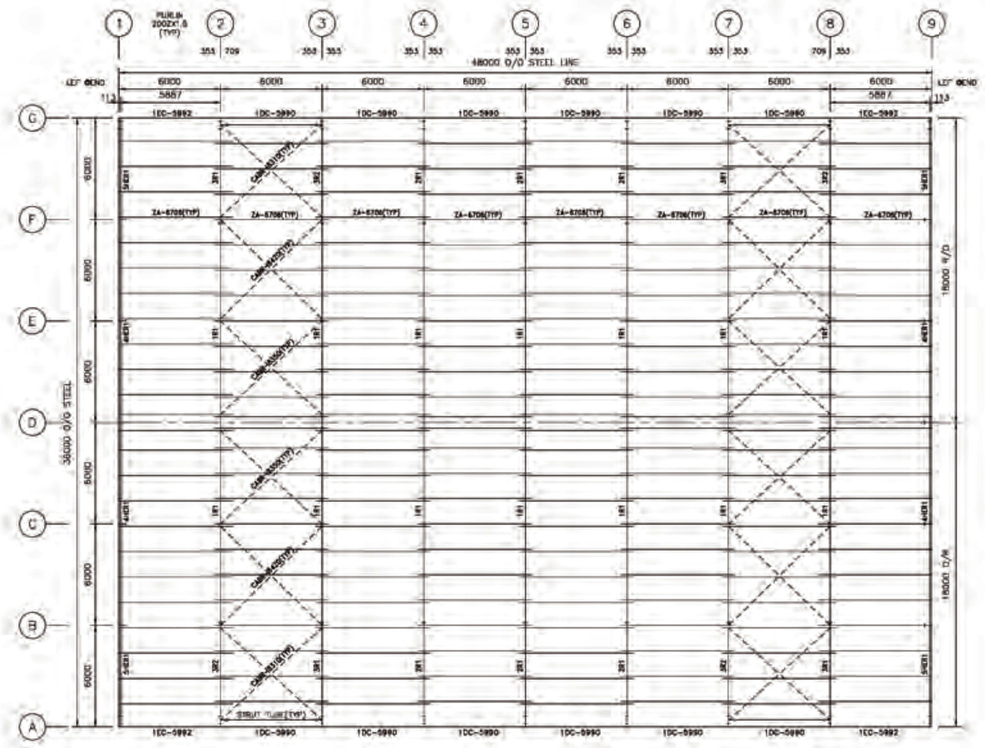
Sign convensions:

Positive hor.Reaction	: to the right
Positive ver.Reaction	: upward
Positive moment	: counter clockwise

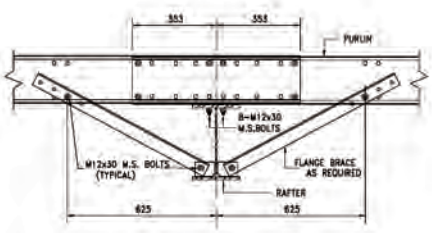


Mainframe- 2-8
Reaction For Combined Loads:

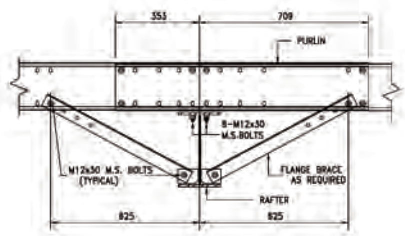
Description	Horz KN	Vert KN	Momt KN-M	Load combination
LEFT COL.	61.3	89.0	0.0	1DL+1LL
LEFT COL.	-30.1	-33.5	0.0	1DL+1WLL
LEFT COL.	-9.7	-17.8	0.0	1DL+1WLR
LEFT COL.	10.6	22.7	0.0	1DL+1SEI
RIGT COL.	-61.3	89.0	0.0	1DL+1LL
RIGT COL.	9.7	-17.8	0.0	1DL+1WLL
RIGT COL.	30.1	-33.5	0.0	1DL+1WLR
RIGT COL.	-17.4	25.7	0.0	1DL+1SEI



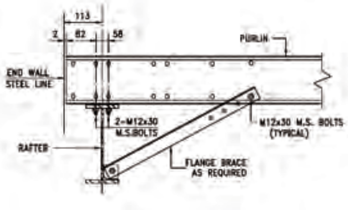
ROOF FRAMING PLAN



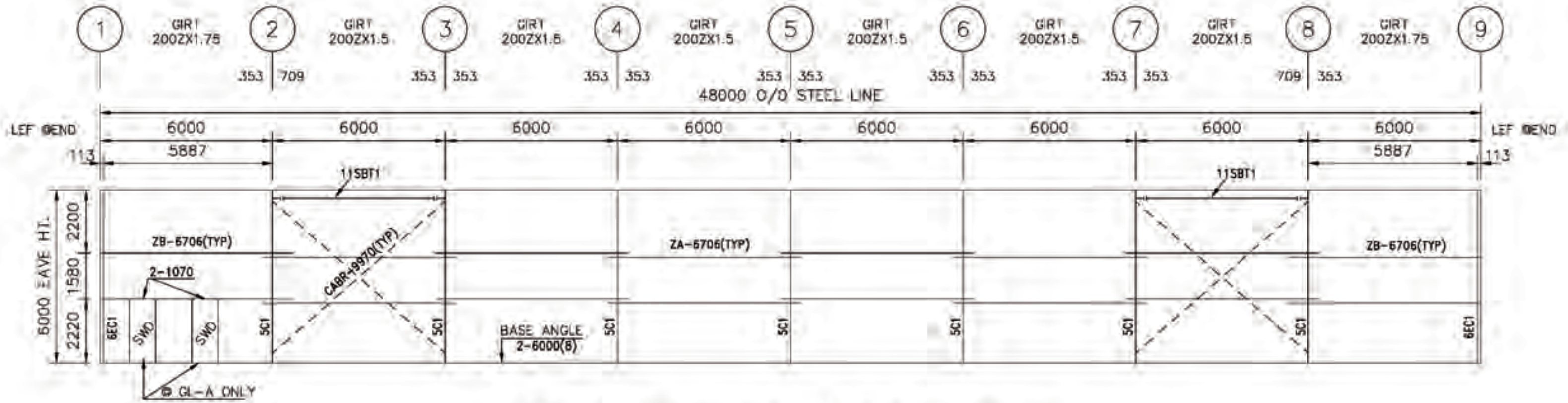
PURLIN CONNECTION DETAIL
FROM GRID LINE 3 - 7



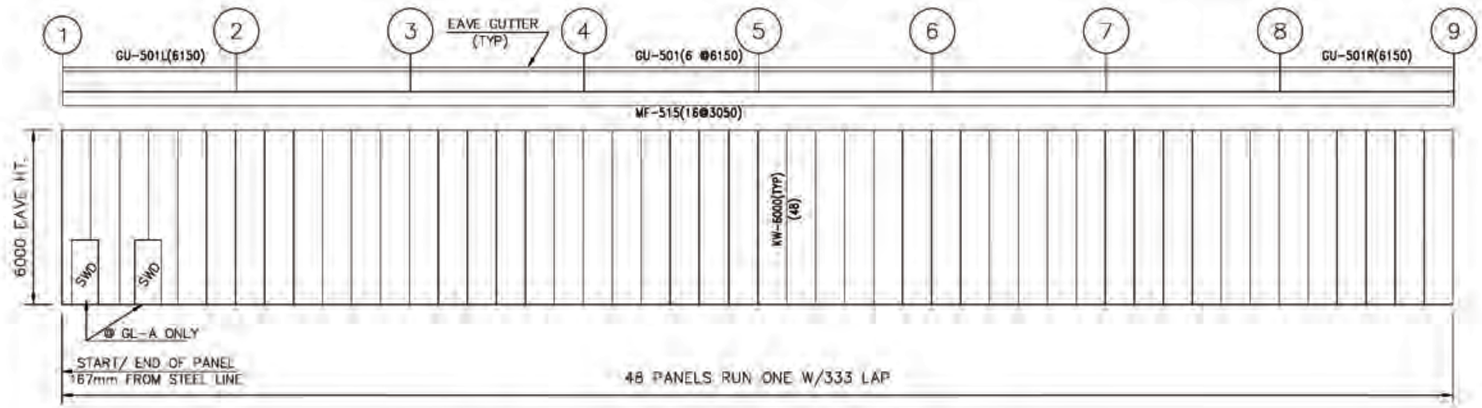
PURLIN CONNECTION DETAIL
At Lines 2 & 8



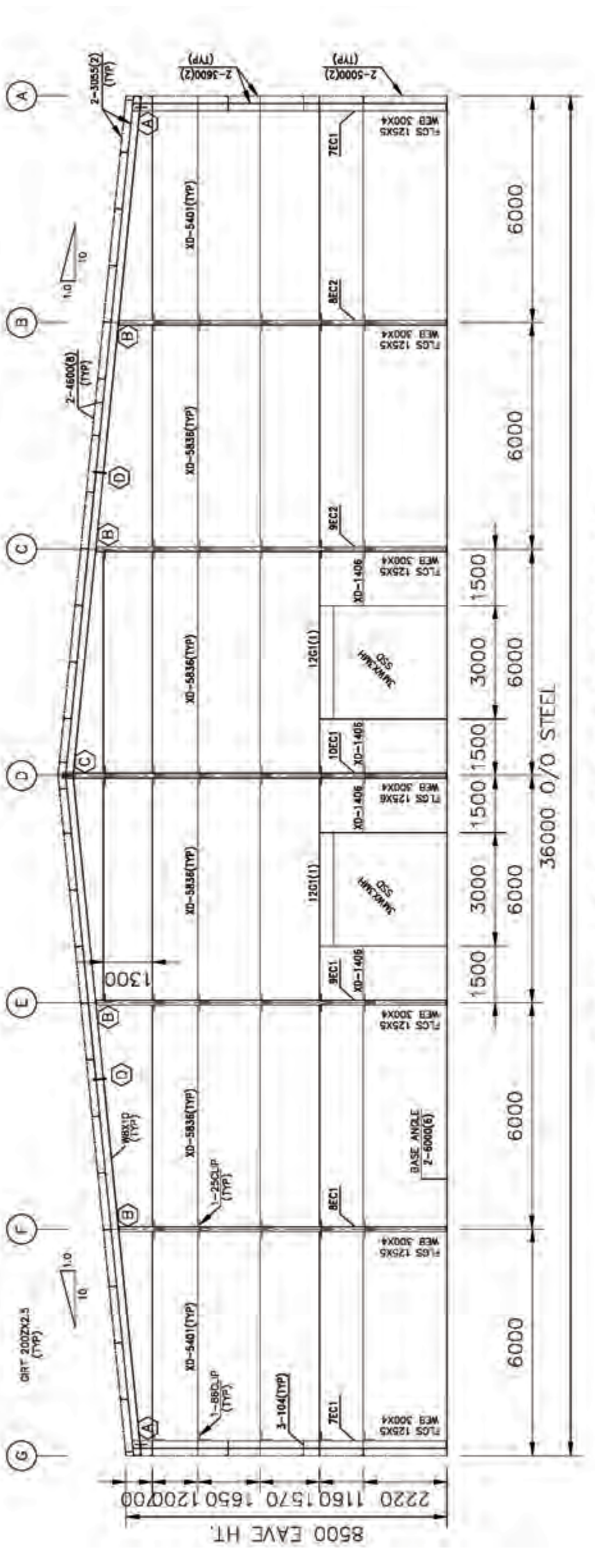
PURLIN CONNECTION DETAIL
AT GRID LINE 1 & 9



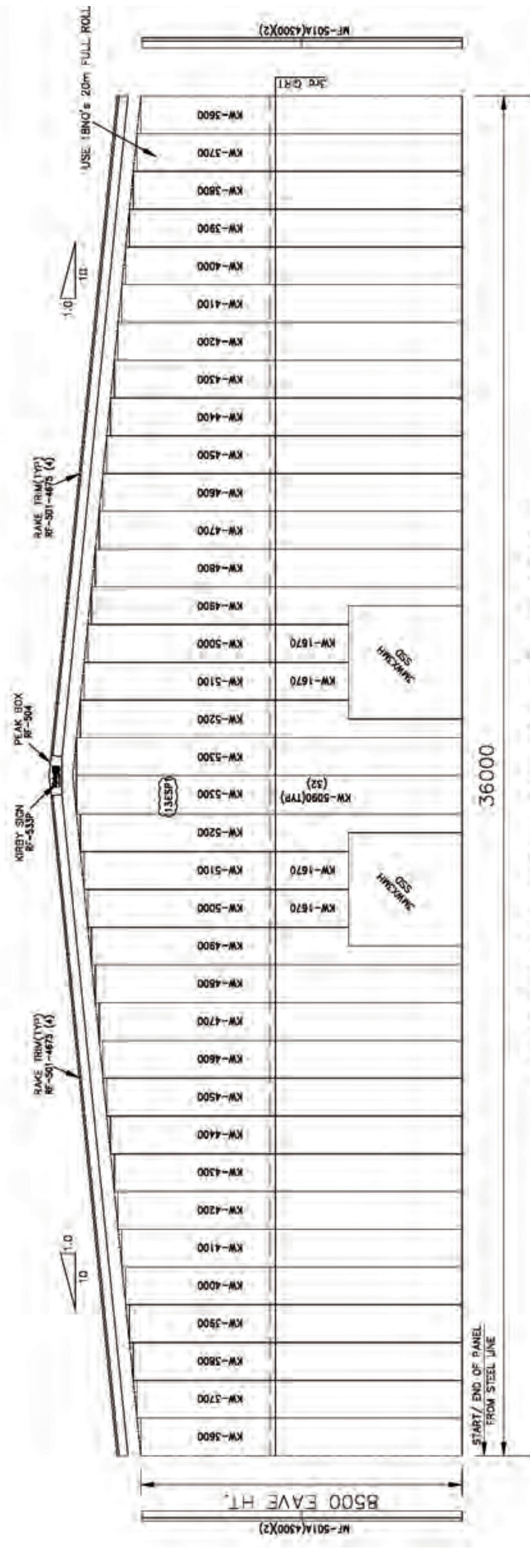
SIDE WALL FRAMING ELEVATION @ GL A (AS DRAWN)
SIDE WALL FRAMING ELEVATION @ GL G (OPP HAND)



SIDE WALL SHEETING ELEVATION @ GL A (AS DRAWN)
SIDE WALL SHEETING ELEVATION @ GL G (OPP HAND)

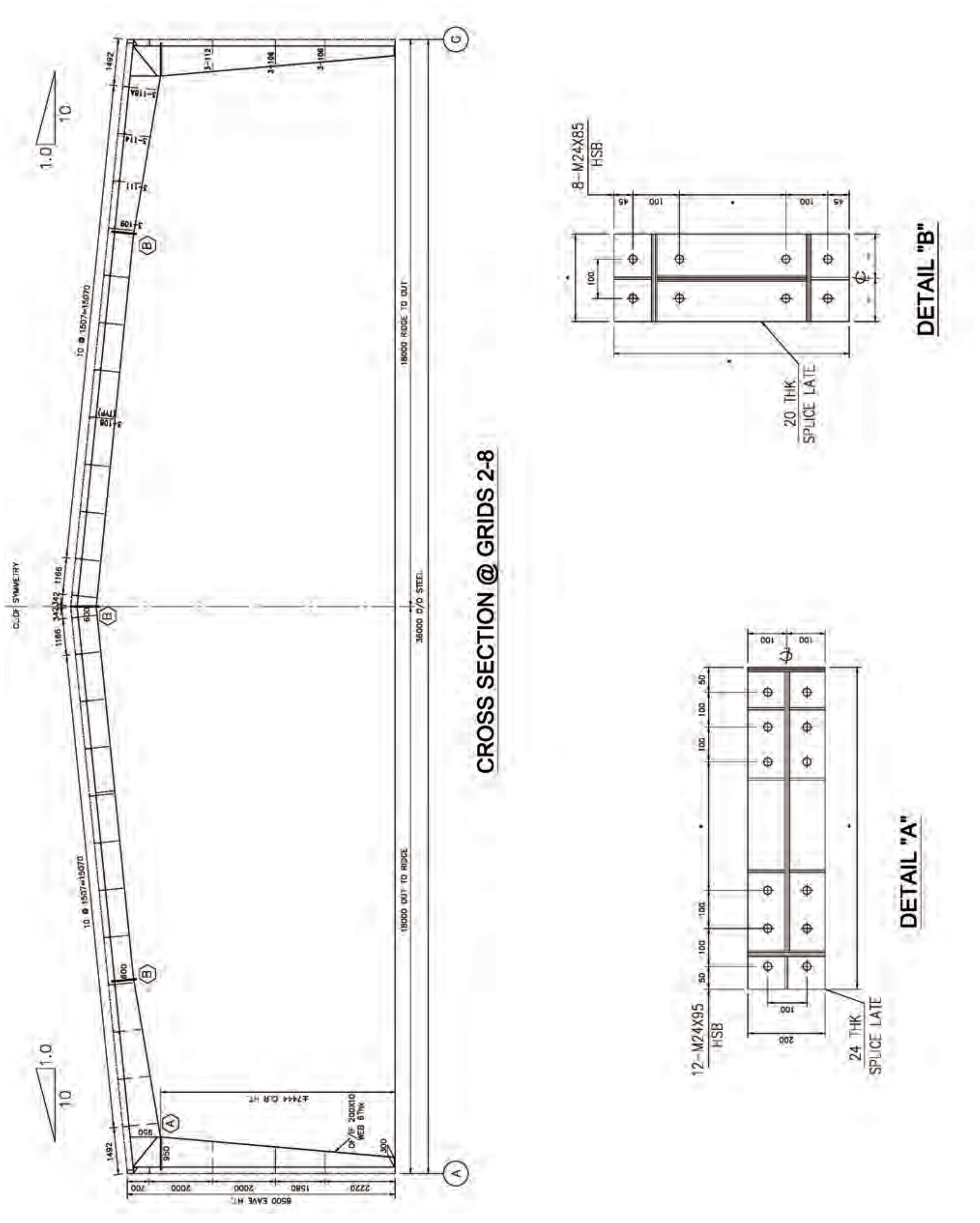


END WALL FRAMING ELEVATION @ GRID 1

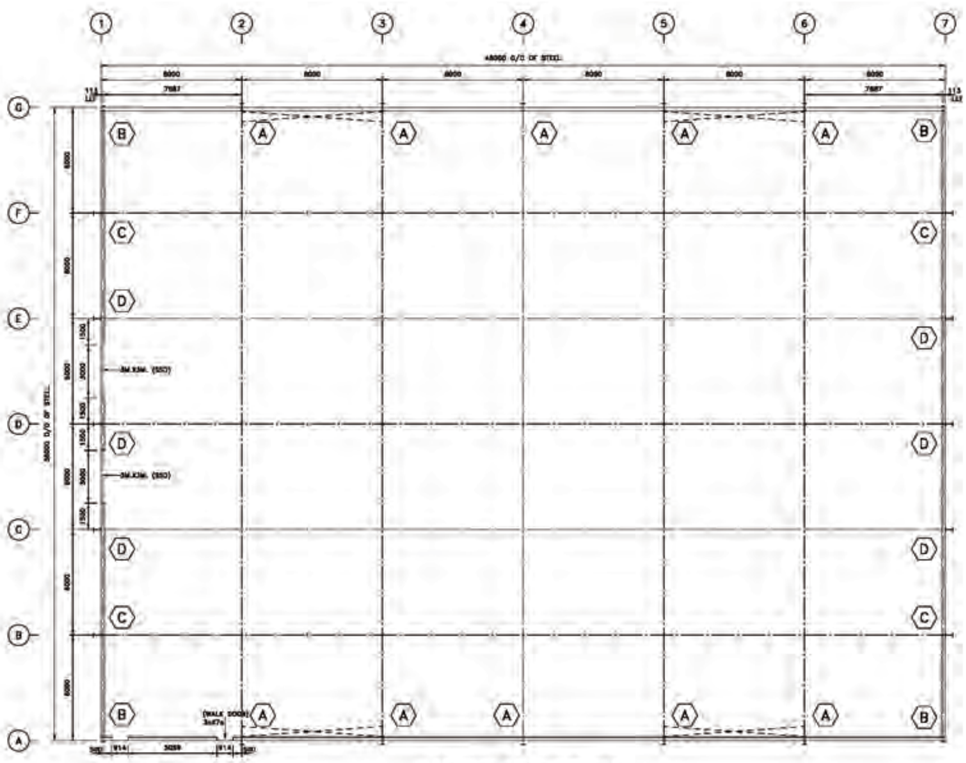


END WALL SHEETING ELEVATION @ GRID 1

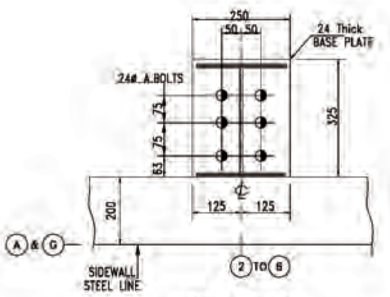
36 PANELS RUN W/STD LAP


CROSS SECTION @ GRIDS 2-8
6500 EAVE HT.
18000 OUT TO RIDGE
18000 RIDGE TO OUT
36000 O/O STEEL
10 @ 1507=15070
CL OF SYMMETRY
DETAIL "A"
12-M24X95 HSB
24 THK SPLICE LATE
DETAIL "B"
8-M24X85 HSB
20 THK SPLICE LATE

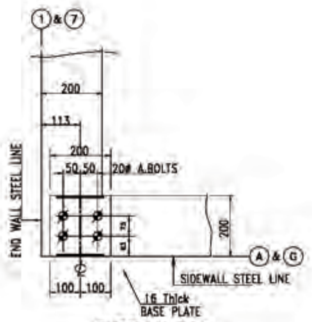
3.3 STANDARD BUILDINGS - RF-36860



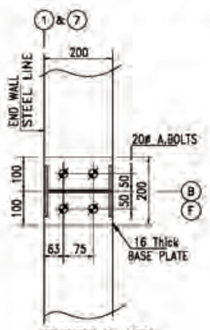
ANCHOR BOLT PLAN



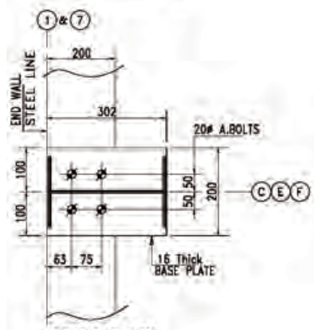
DETAIL 'A'



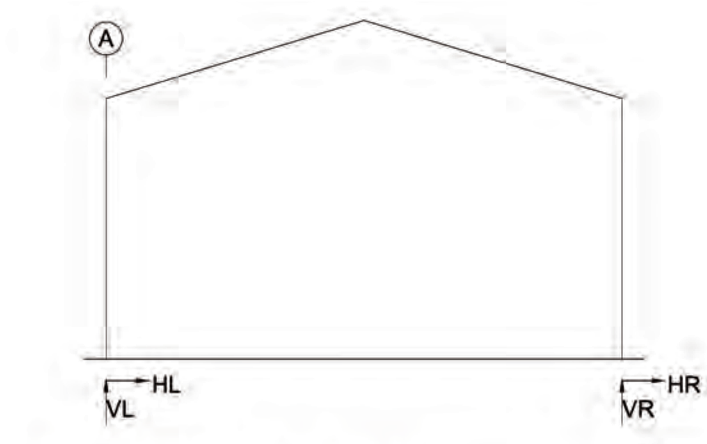
DETAIL 'B'

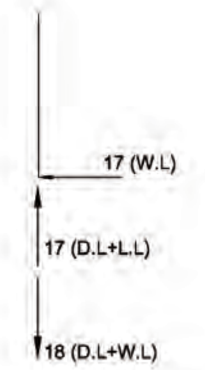


DETAIL 'C'



DETAIL 'D'



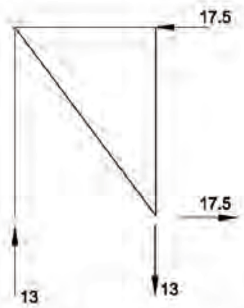


MAX WIND COL REACTIONS (KNS)

Main frame column reactions:

Sign convensions:

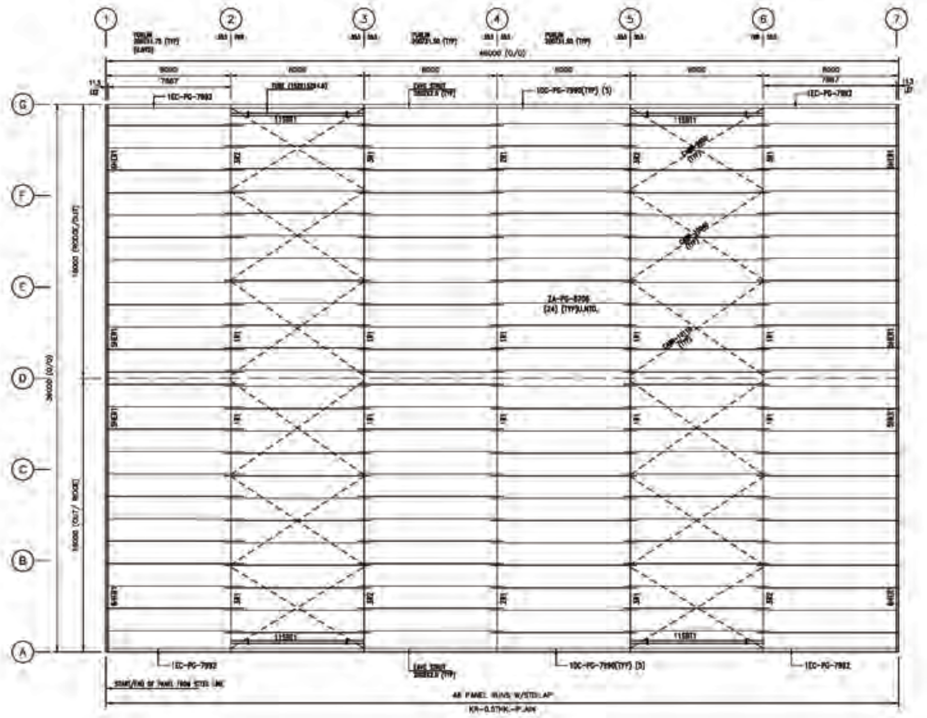
Positive hor.Reaction	: to the right
Positive ver.Reaction	: upward
Positive moment	: counter clockwise



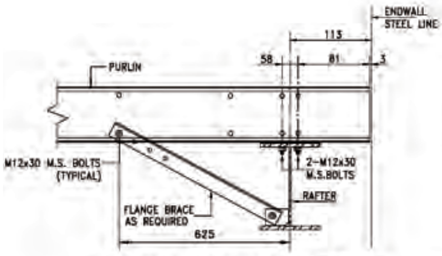
MAX BRACED BAY REACTIONS (KNS)

Mainframe- 2-6
Reaction For Combined Loads:

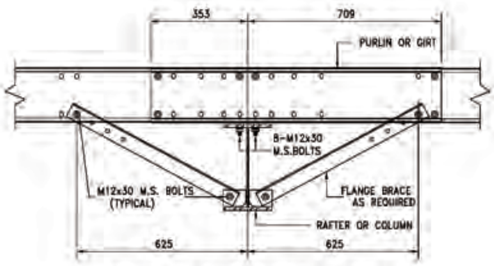
Description	Horz KN	Vert KN	Momt KN-M	Load combination
LEFT COL.	113.7	114.9	0.0	1DL+1LL
LEFT COL.	-43.9	-41.1	0.0	1DL+1WLL
LEFT COL.	-27.0	-24.6	0.0	1DL+1WLR
LEFT COL.	21.1	27.3	0.0	1DL+1SEI
RIGT COL.	-113.7	114.9	0.0	1DL+1LL
RIGT COL.	27.0	-24.6	0.0	1DL+1WLL
RIGT COL.	43.9	-41.1	0.0	1DL+1WLR
RIGT COL	-29.1	29.7	0.0	1DL+1SEI



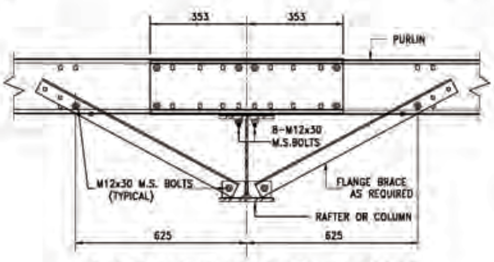
ROOF FRAMING PLAN



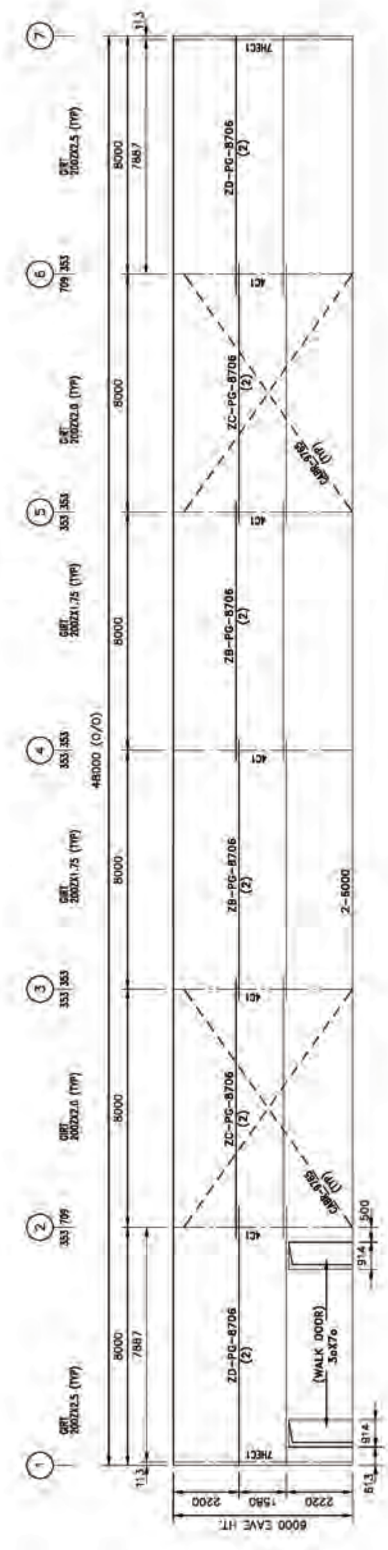
PURLIN CONNECTION DETAIL
At Lines 1 & 7



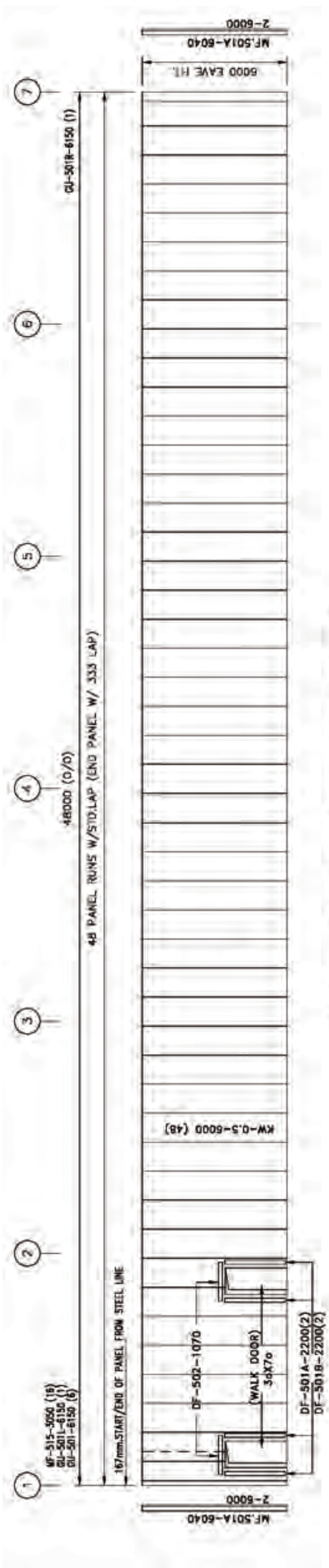
PURLIN/GIRT CONNECTION DETAIL
At Lines 2 & 6



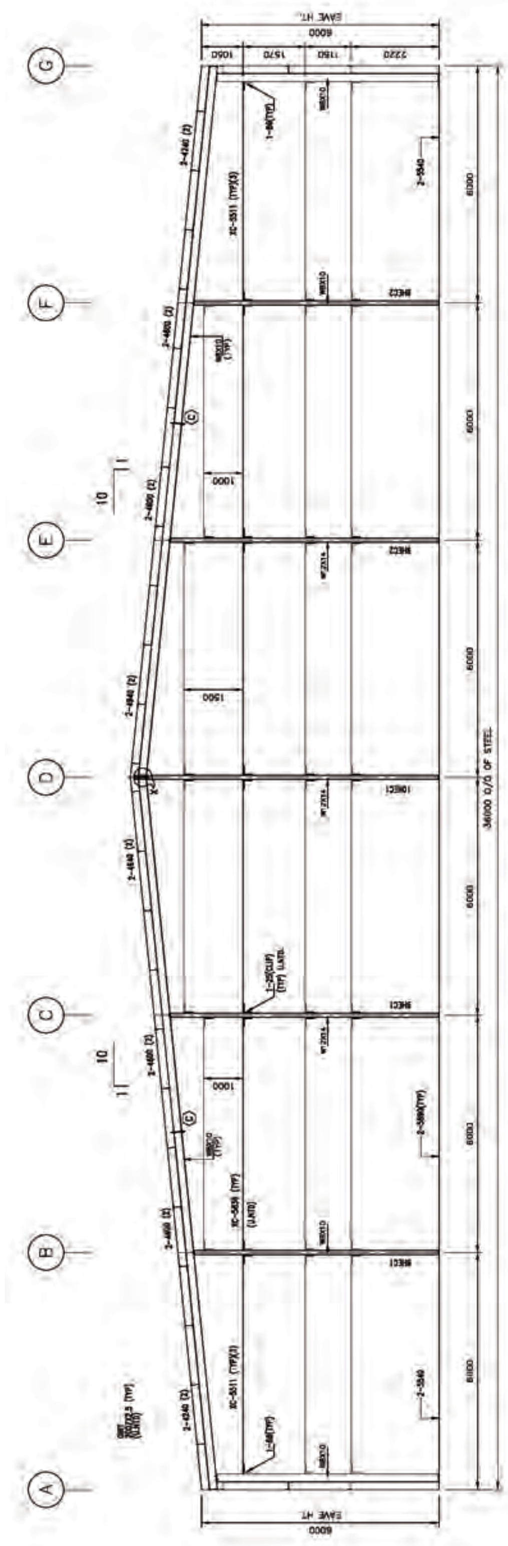
PURLIN/GIRT CONNECTION DETAIL
At Lines 3 ~ 5



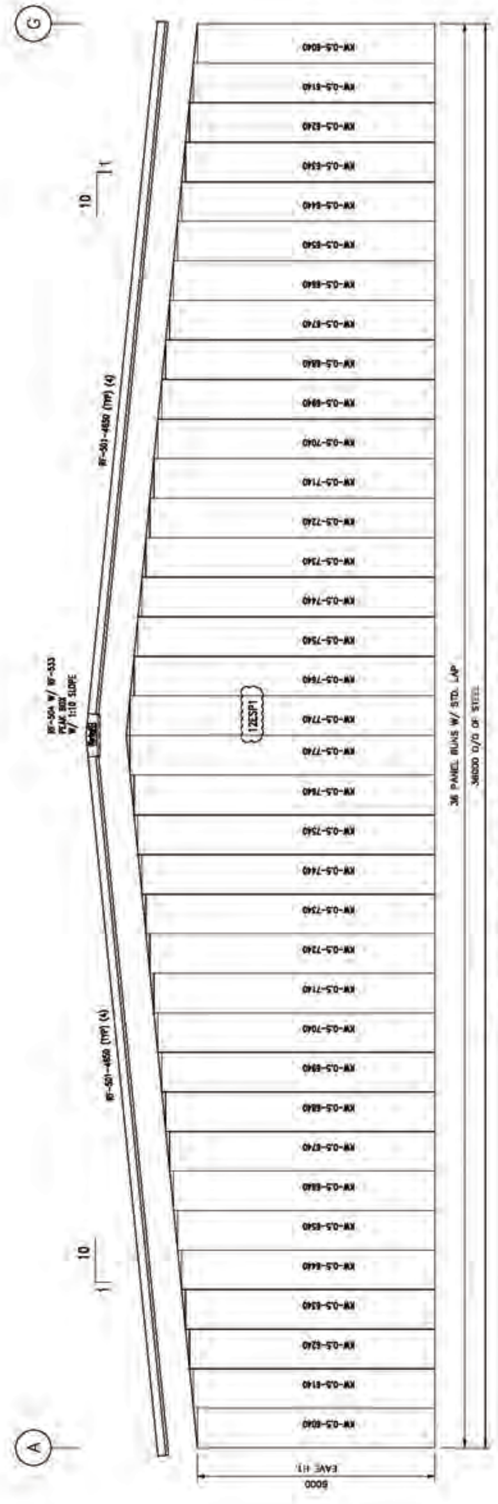
SIDE WALL FRAMING ELEVATION @ GL-A



SIDE WALL SHEETING ELEVATION @ GL-A

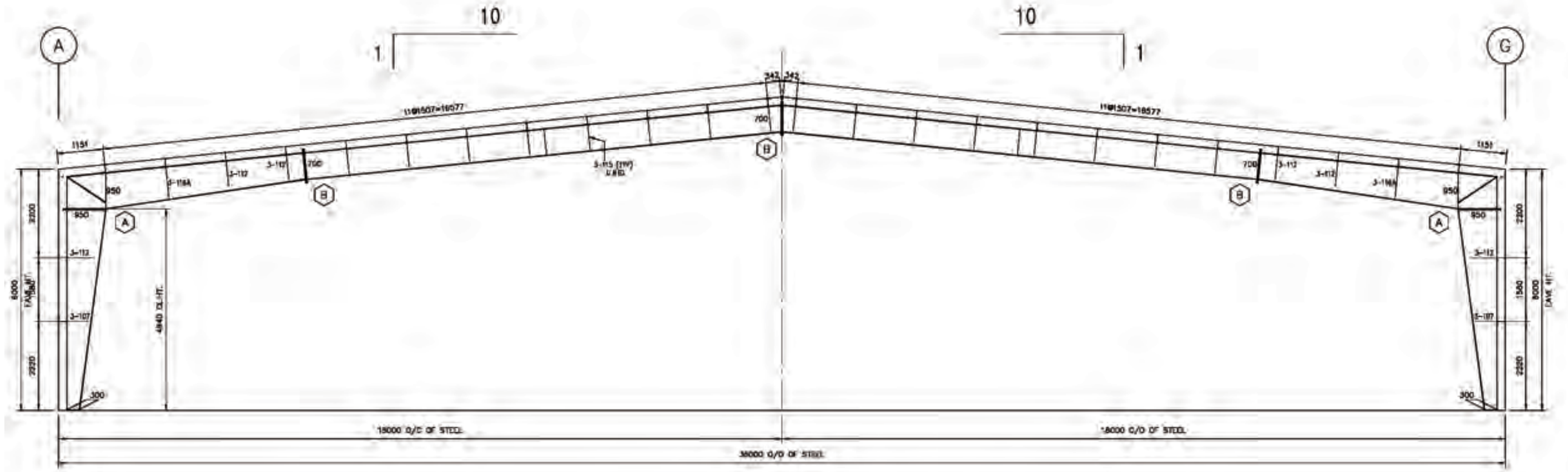


END WALL FRAMING ELEVATION @ GL-7

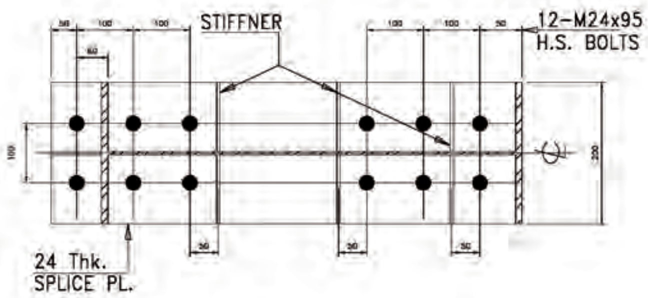


END WALL SHEETING ELEVATION @ GL-7

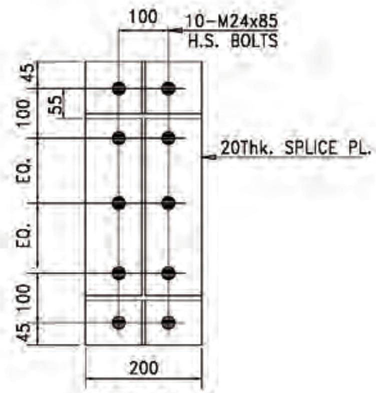
FSK-50THK INSULATION (10Kg/m3)-20000 (14) (Typ)



CROSS SECTION AT GL-(2~6)

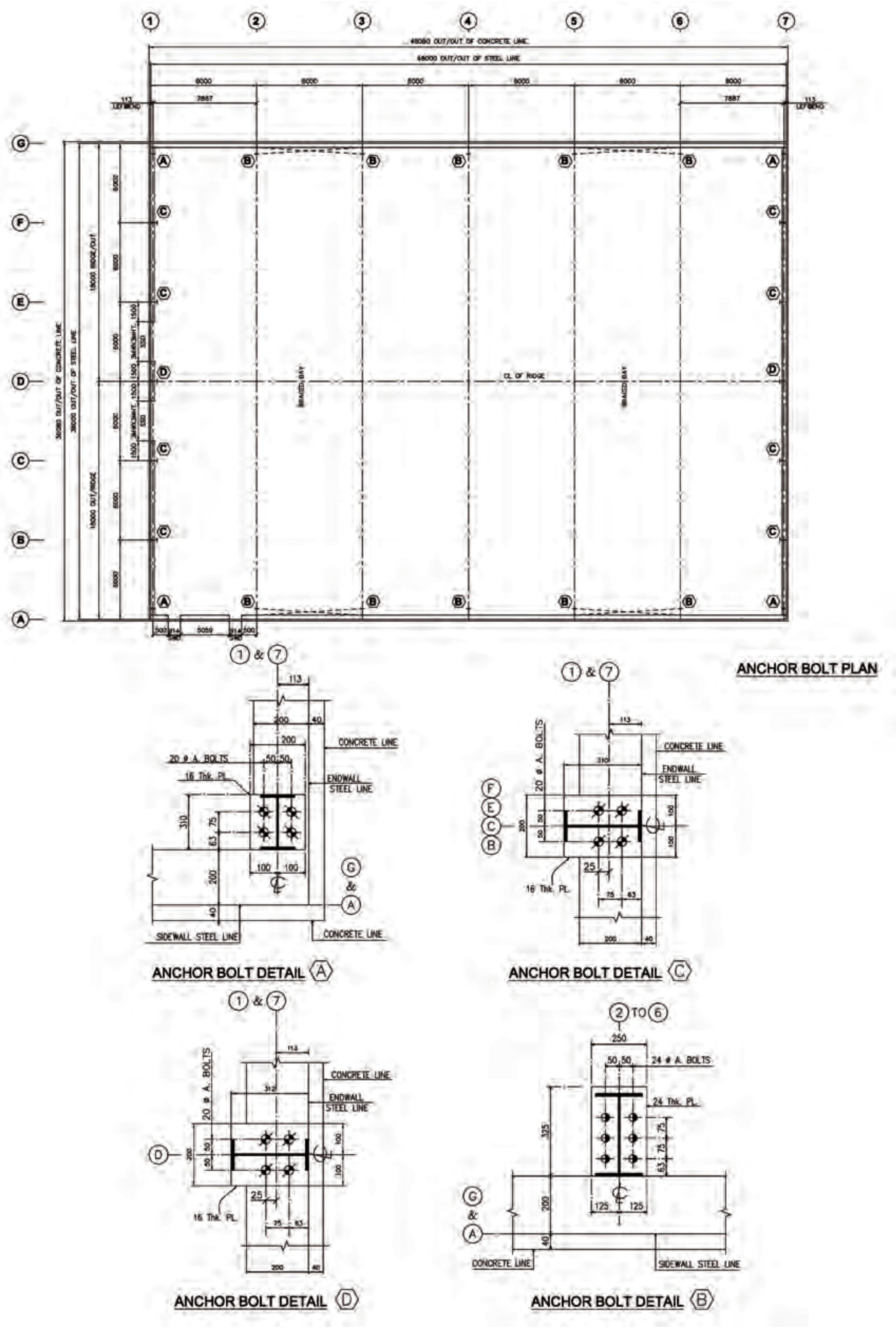


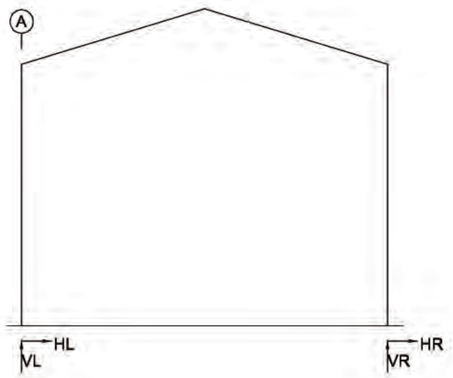
DETAIL 'A'



DETAIL-B

3.3 STANDARD BUILDINGS - RF-36885

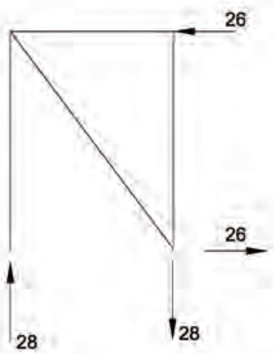




MAX WIND COL REACTIONS (KNS)

Main frame column reactions:
Sign convensions:

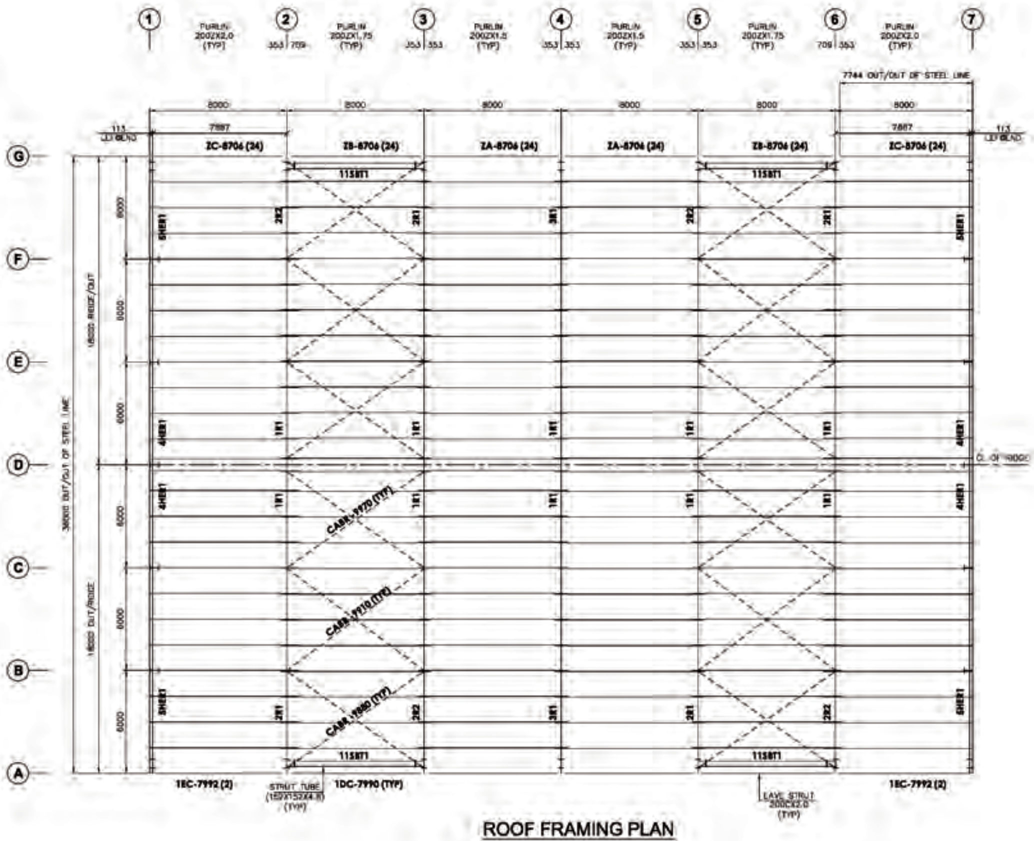
Positive hor.Reaction : to the right
Positive ver.Reaction : upward
Positive moment : counterclockwise



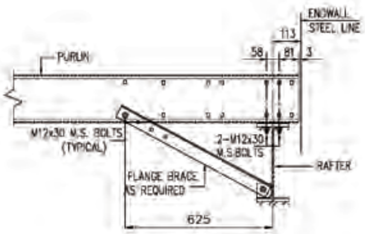
MAX BRACED BAY REACTIONS (KNS)

MAINFRAME - 2-8
REACTION FOR COMBINED LOADS:

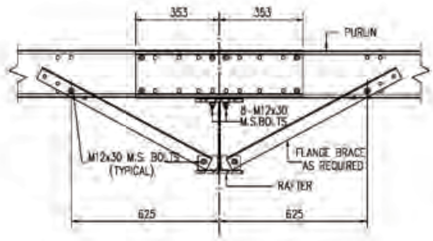
Description	Horz KN	Vert KN	Momt KN-M	Load combination
LEFT COL.	79.5	117.7	0.0	1DL+1LL
LEFT COL.	-40.0	-45.7	0.0	1DL+1WLL
LEFT COL.	-12.7	-24.6	0.0	1DL+1WLR
LEFT COL.	13.5	29.4	0.0	1DL+1SEI
RIGT COL.	-79.5	117.7	0.0	1DL+1LL
RIGT COL.	12.7	-24.6	0.0	1DL+1WLL
RIGT COL.	40.0	-45.7	0.0	1DL+1WLR
RIGT COL.	-22.3	33.2	0.0	1DL+1SEI



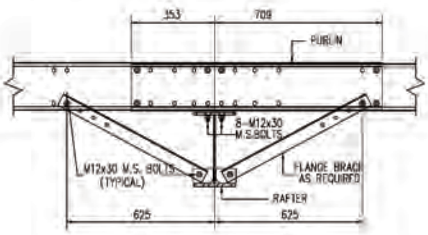
ROOF FRAMING PLAN



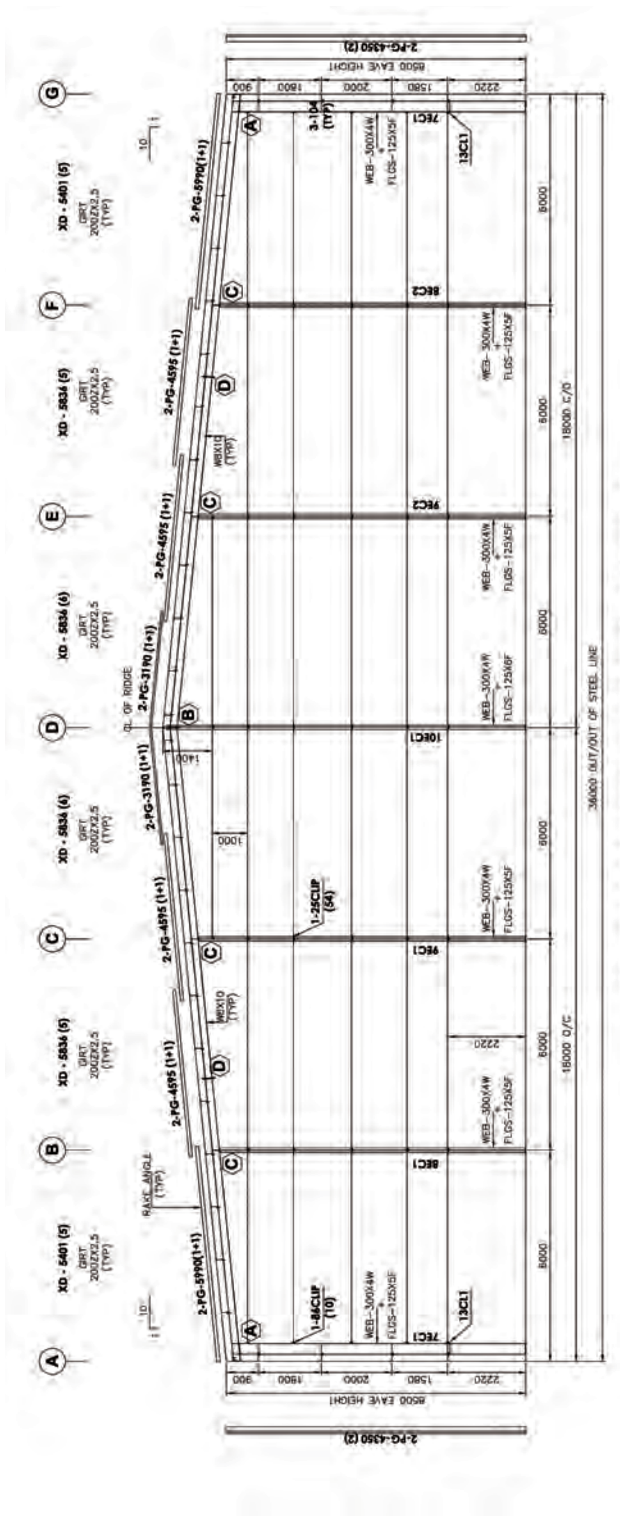
PURLIN CONNECTION DETAIL
At Lines 1 & 7



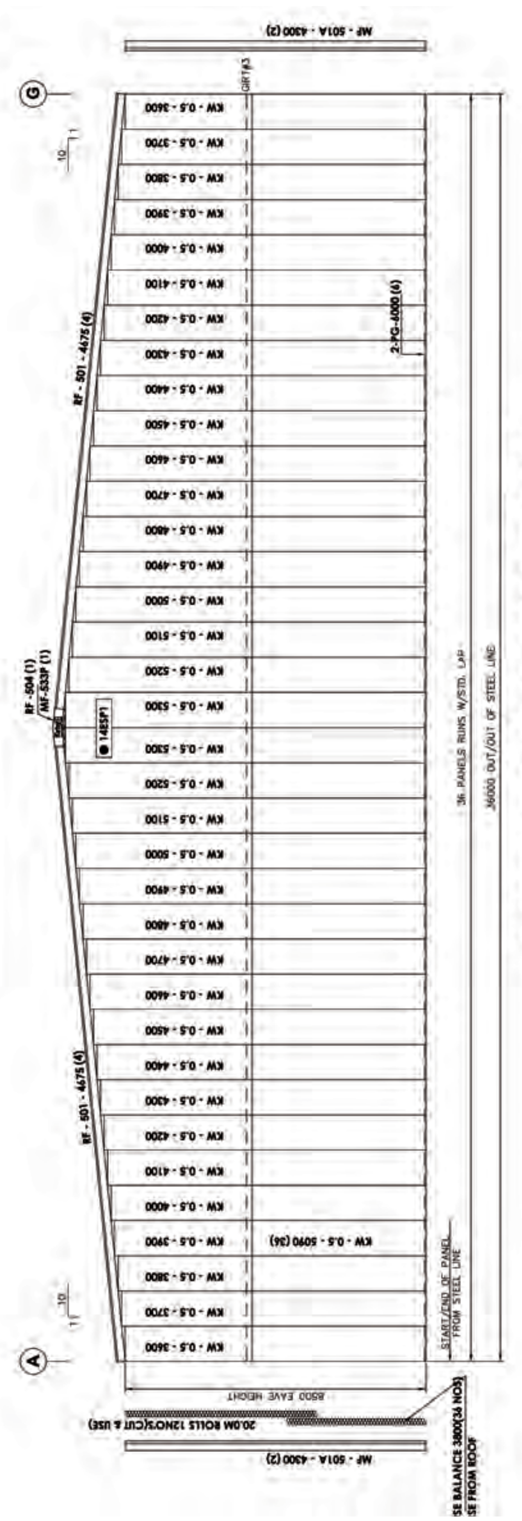
PURLIN CONNECTION DETAIL
At Lines 3 ~ 5



PURLIN CONNECTION DETAIL
At Lines 2 & 6



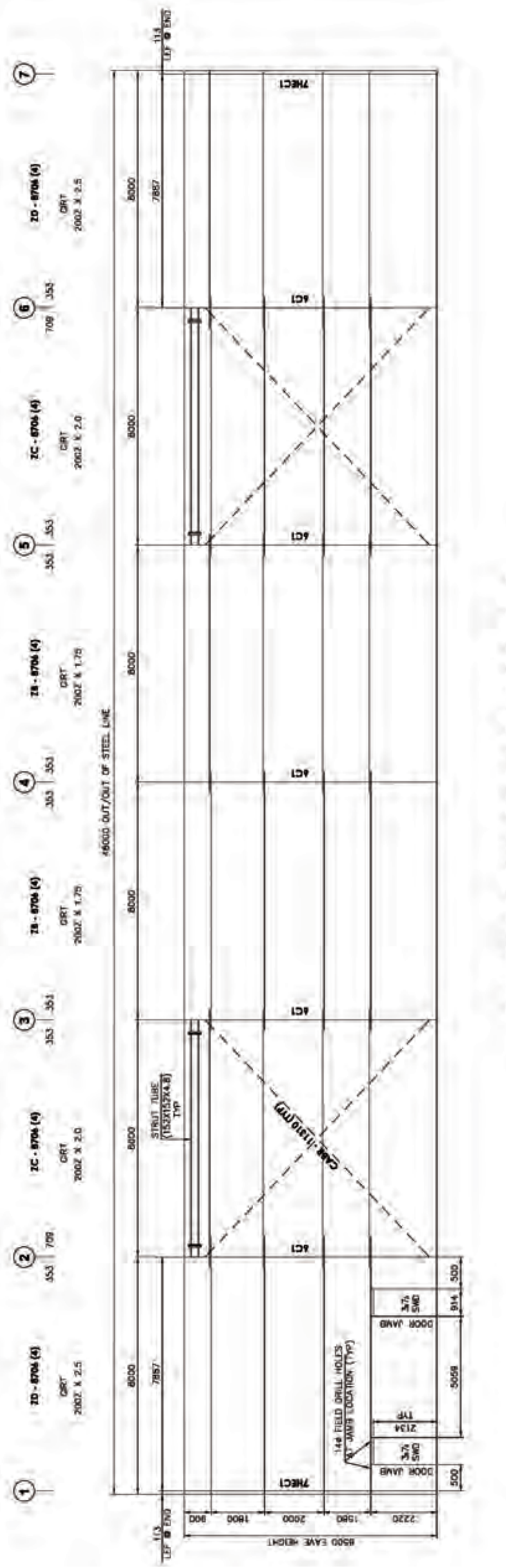
END WALL FRAMING ELEVATION @ GRID - 7



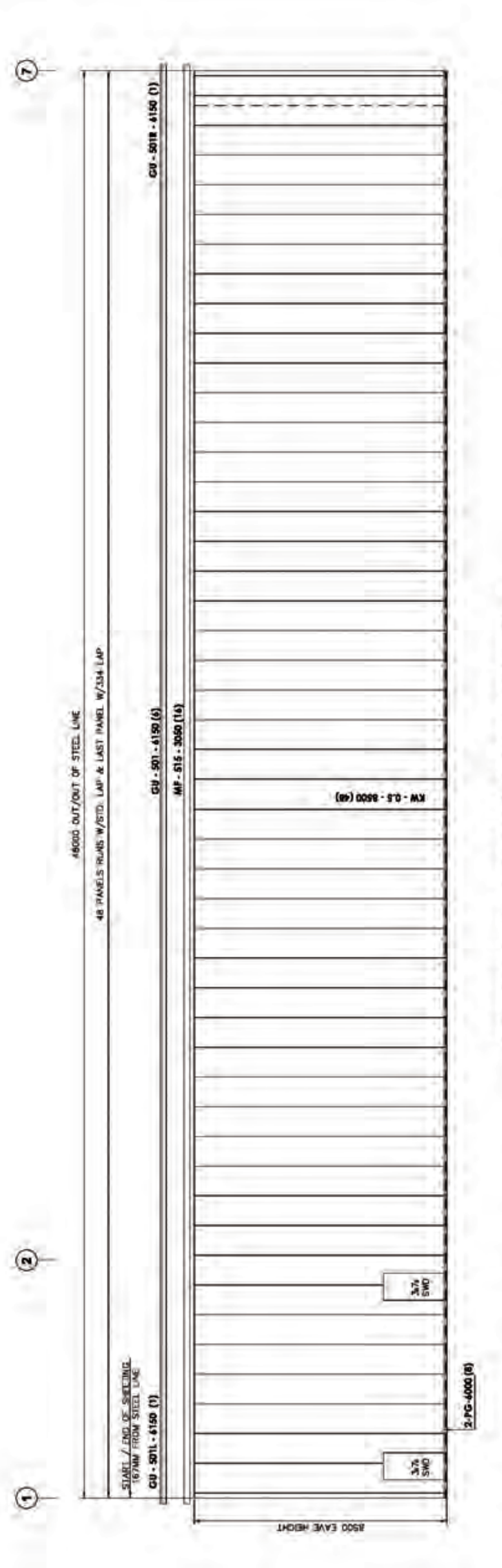
END WALL SHEETING ELEVATION @ GRID - 7

KW-0.5THK. ARCTIC WHITE PANELS

FSK-50THK-W/20000LENGTH. (18 ROLLS)



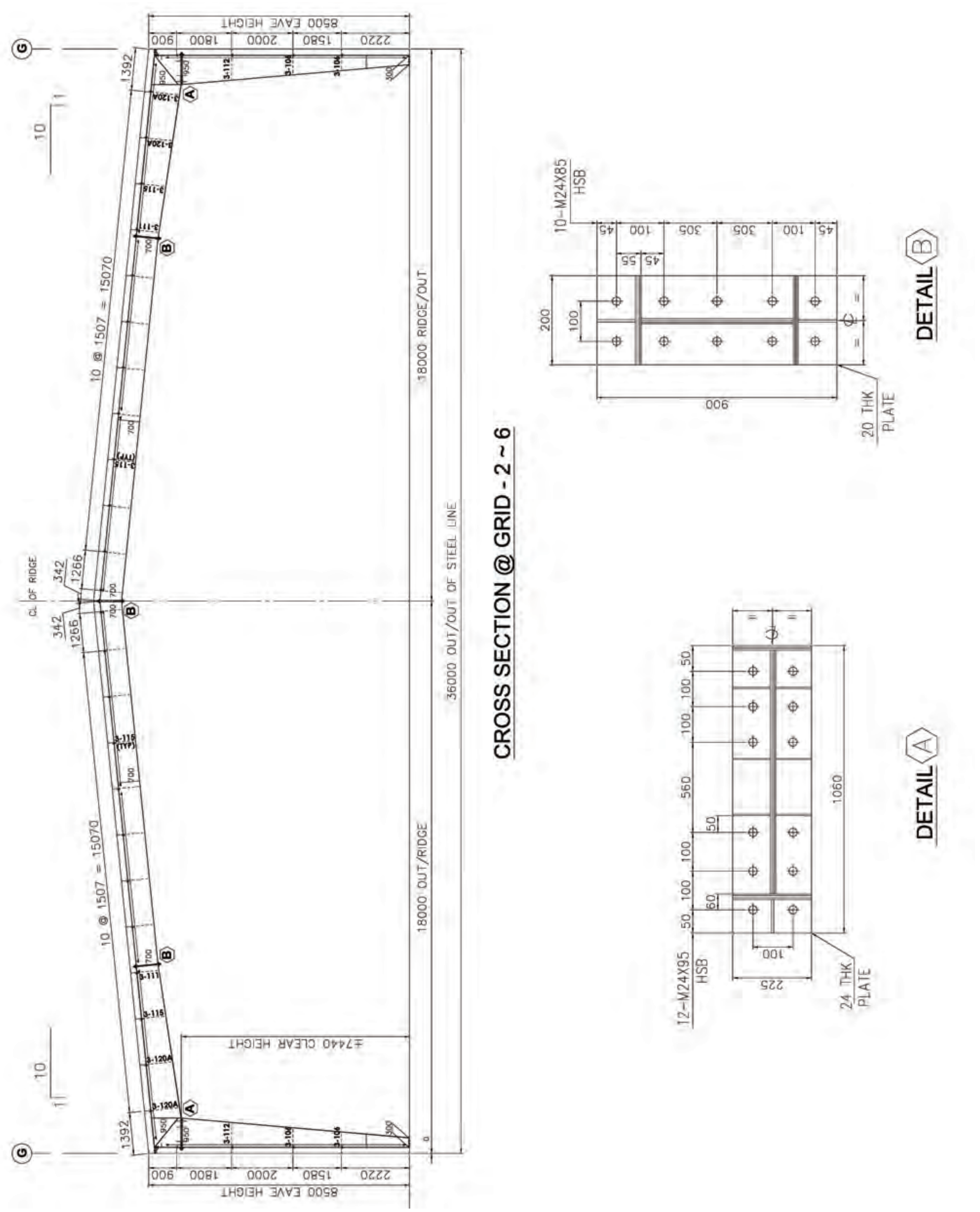
SIDEWALL FRAMING ELEVATION @ GRID - A



SIDEWALL SHEETING ELEVATION @ GRID - A

KW-0.5THK. ARCTIC WHITE WALL PANELS

FSK-50THK INSULATION WITH 10Kg/m3 DENSITY


CROSS SECTION @ GRID - 2 ~ 6
8500 EAVE HEIGHT
900
1800
2000
1580
2220
1392
10 @ 1507 = 15070
CL OF RIDGE
342
1266
18000 RIDGE/OUT
18000 OUT/RIDGE
36000 OUT/OUT OF STEEL LINE
±7440 CLEAR HEIGHT
DETAIL A
12-M24X95 HSB
24 THK PLATE
1060
225
100
DETAIL B
10-M24X85 HSB
20 THK PLATE
900
200
100
45
305
55

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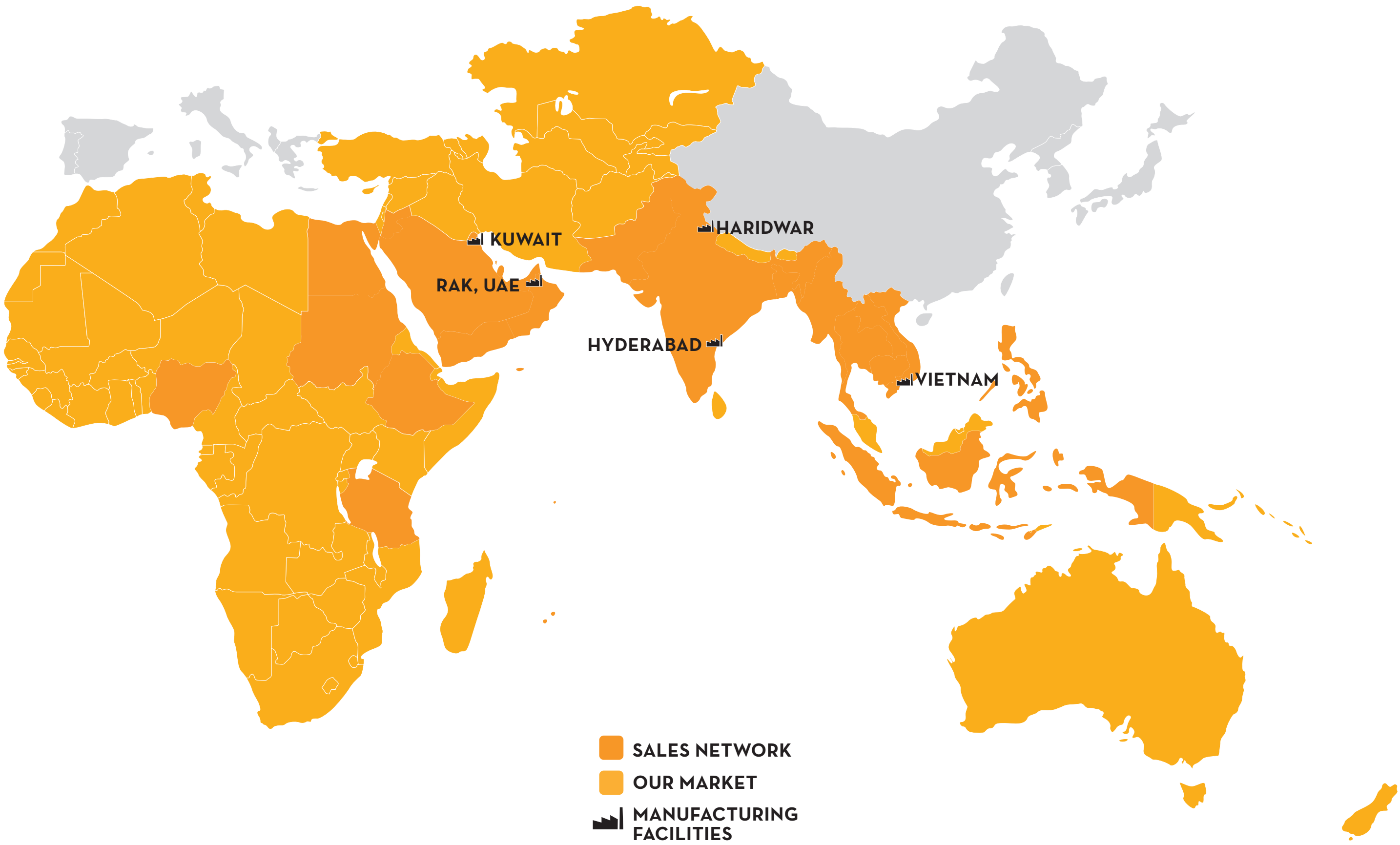

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