ESSEN

Giving Shape to Steel

Bailey Type Expandable Bridge

Essen Fabricators Pvt. Ltd.

INDEX

COMPANY

ESSEN FABRICATORS PRIVATE LIMITED (EFPL) is a company located at Kharagpur, West Bengal, 120 Kms from the Capital city of Kolkata and 104 Kms from the port town of Haldia in West Bengal, India.

The company started under the leadership of Late Shri. S. K. Nayak in the year 1999 to cater to the requirements of Infrastructure Sector, Steel Plants, Power Plants, Refineries and Heavy Engineering Units.

Certified with an ISO 9001: 2008 certification from DNV and accredited by UKAS, **ESSEN FABRICATORS PRIVATE LIMITED** is committed to deliver quality products and services and has received **INTERNATIONAL AWARD & RECOGNITION** along with **INDIAN AWARD** for its outstanding quality and performance. Some of the awards are:

1. Golden Eagle for Prestige and Quality Europe 2010, from **ACTUALIDAD**, Madrid, Spain.
2. World Business Leader Award at The BIZZ 2011 from **WORLD CONFEDERATION OF BUSINESSES**, Orlando, USA.
3. Indian Leadership Award for Industrial Development from **ALL INDIA ACHIEVERS FOUNDATION**

ESSEN FABRICATORS PRIVATE LIMITED is equipped with all modern machineries and highly skilled manpower where products like pressure vessels, Bailey Type Expandable Bridges, Steel Flyover Structures, Gantries, Pressure Parts along with equipments for Boilers and Furnaces are manufactured strictly to the Indian and international standards and specifications, catering to the industrial requirements both in India and abroad.

PROFILE OF THE DIRECTORS

Souvik Nayak

He is one of the founder directors of the company. He has more than 15 years of experience in the field of steel fabrication. Over and above the capacity as a director he heads the marketing department of the company and through his leadership and vision the company is spear heading in the field of steel fabrication in the sectors of Infrastructure, Steel, Power, Process Plants and Heavy Engineering Industries.

Graduated in the field of commerce in the year 1997 he started with his strong belief and hard-work which helped the company cross various milestones. His hard-work and achievements have been recognized and he has been awarded by national and international organizations from European and The USA.

Soumik Nayak

He is one of the founders of the company. Having vast experience in the field of engineering and through his long association has given him a cutting edge in executing time bound green & brown field projects. Over and above the capacity as a director of the company he heads the entire production and finance of the company. He has been leading various projects for steel plants and refineries which has been executed by the company.

Lately in the year 2010 he was awarded with INDUSTRIAL LEARDERSHIP AWARD for his contribution to the industry and in 2011 by the World Confederation of Industries USA.

DNV·GL

MANAGEMENT SYSTEM CERTIFICATE

Certificate No:
73997-2010-AQ-IND-UKAS

Initial certification date:
22, March, 2010

Valid:
22, March, 2016 - 15, September, 2018

This is to certify that the management system of

Essen Fabricators Pvt. Ltd.

Plot No. 349(P), Gopali, P.O. Salua, West Medinipur, Kharagpur – 721 145,
West Bengal, India

has been found to conform to the Quality Management System standard:
ISO 9001:2008

This certificate is valid for the following scope:
Manufacture of bailey bridge & bailey bridge components, bridge girders, pressure vessels, air receivers, self-supporting stacks, hoppers, chutes, ducts and technological structures

Place and date:
Chennai, 17, March, 2016

UKAS MANAGEMENT SYSTEMS
0013

For the issuing office:
DNV GL – Business Assurance
ROMA, No. 10, GST Road, Alandur,
Chennai - 600 016, India

Sivadasan Madiyath
Management Representative

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TEL:+44(0) 207 357 6080. assurance.dnvgl.com

AWARDS

The President
of **Publicaciones de Comercio Internacional, S.A.**

ACTUALIDAD

certifies that

ESSEN FABRICATORS PRIVATE LIMITED

has been granted the
INTERNATIONAL AWARD
GOLDEN EAGLE FOR PRESTIGE AND QUALITY EUROPE 2010
in recognition of its management performance.

Madrid - SPAIN, March 2010

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MADRID - SPAIN

Román Carrasco
Director

Francisco J. Abello
Presidente

Luis Abello
Director General

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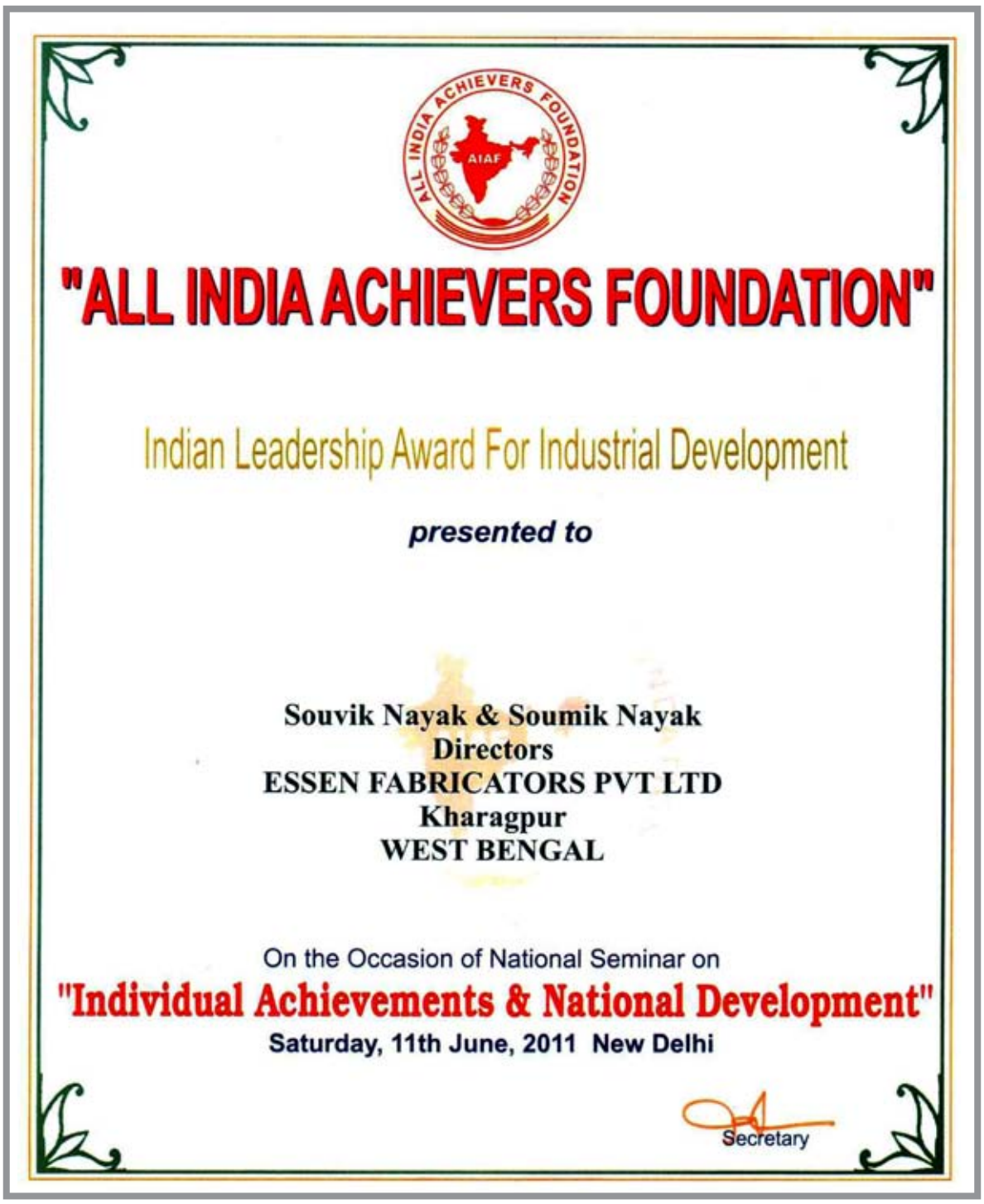

"ALL INDIA ACHIEVERS FOUNDATION"

Indian Leadership Award For Industrial Development

presented to

Souvik Nayak & Soumik Nayak
Directors
ESSEN FABRICATORS PVT LTD
Kharagpur
WEST BENGAL

On the Occasion of National Seminar on

"Individual Achievements & National Development"

Saturday, 11th June, 2011 New Delhi

Secretary

AWARDS


THE BIZZ 2011
REACHING THE STARS
WORLD BUSINESS LEADER
Awarded to
ESSEN FABRICATORS
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For being a successful leader who works in an innovative,
knowledgeable and systematic manner.
Given in the city of Orlando, on June 25th
of the year two thousand and eleven.
PRESIDENT
JESUS J. MORAN
VICE PRESIDENT
MICHAEL L. BELLIDO

AWARDS


THE BIZZ


INTERNATIONAL AWARD
GOLDEN EAGLE FOR
PRESTIGE AND QUALITY
EUROPE 2010
Essen Fabricators
Private Limited

INTRODUCTION

BAILEY TYPE EXPANDABLE BRIDGE

ESSEN FABRICATORS PRIVATE LIMITED (EFPL) "BAILEY TYPE EXPANDABLE BRIDGE" is designed on a unit construction principle. It is based on the original concept of Sir Donald Bailey in the year 1941 and was extensively used during the Second World War. The Bailey Type Expandable Bridge is made up of Panels, the basic unit of the bridge, which is 3.048 M (10') long and 1.448 M (4'9") in height between the pin hole centres and is made up of high tensile steel. Multiples of Panels along with other components / accessories constitute a bridge upto a length of 200' in a single span depending on the requirements of the project.

Rows of Panels form the main two girders of the bridge and are connected cross-wise by Transoms which carry the bridge roadway. Each Panel is connected end to end with pins made of alloy steel. The load carrying capacity of the bridge can be increased with additions of extra panels based on engineering designs and practices.

Bridge is described by the number of trusses and storey which form the main girder and as such there are five combinations of girders, viz., single Single, double single, triple single, double double and triple double. The above constr-uctions are abbreviated as S.S., D.S., T.S., D.D. and T.D. . These constructions can further be reinforced by addition of Chord Reinforcement both at the top and at the bottom of the trusses. These are abbreviated as S.S.R. , D.S.R., T.S.R., D.D.R. and T.D.R. . Different forms of these constructions are represented in the following Figure 1:-

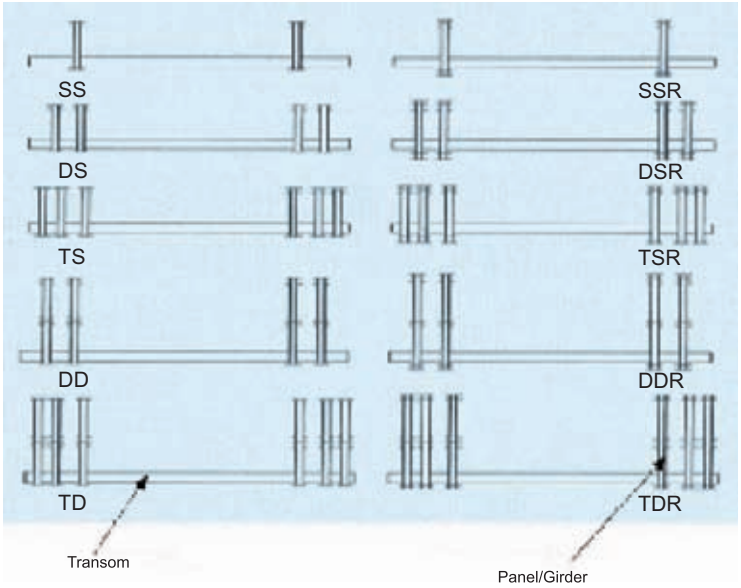


Fig- 1

Transoms are made from high tensile steel ISMB. The Panel trusses are tied with the Transoms by Transom Clamps which fix and position the trusses at the required distance apart. Two diagonal braces termed as Sway Braces are connected with the girders at each Panel bay. Decks rest on the Transoms fitted with Steel Deck Clamps and thereby form the carriage roadway.

End Posts are fixed at the end of each truss of the bridge griders. End Posts are supported on Bearings which are placed over Base Plates placed on the ground at each end of the bridge span.

The Bailey Type Expandable Bridges are manufactured in standard road width of 3.337 M and extra wide road width of 4.250 M. Distance between the inside edge of inner most trusses for standard width is 3.76 M and for extra wide is 4.775 M .

The general arrangement with its components and accessories of a typical Standard Wide Double Single Reinforced (D.S.R.) and Extra Wide Double Single Reinforced bridges are illustrated in Figures 2 & 3 :-

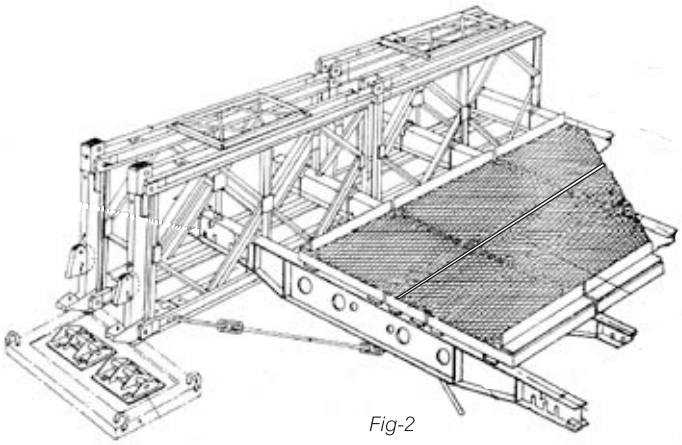


Fig-2

STANDARD-WIDE DOUBLE SINGLE REINFORCED BRIDGE WITH STEEL DECKING

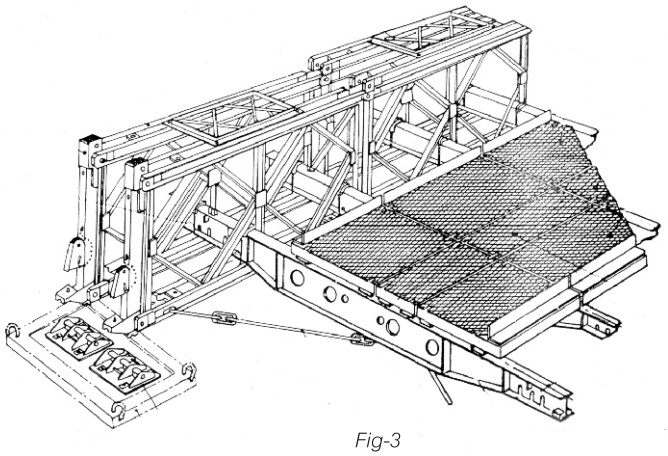


Fig-3

EXTRA-WIDE DOUBLE SINGLE REINFORCED BRIDGE WITH STEEL DECKING

These are further illustrated in Figure 4, Figure 5, Figure 6 and Figure 7

Typical General Arragement of EFPL Bailey Type Expandable Bridge Pertaining To Two Constructions Are Given Below

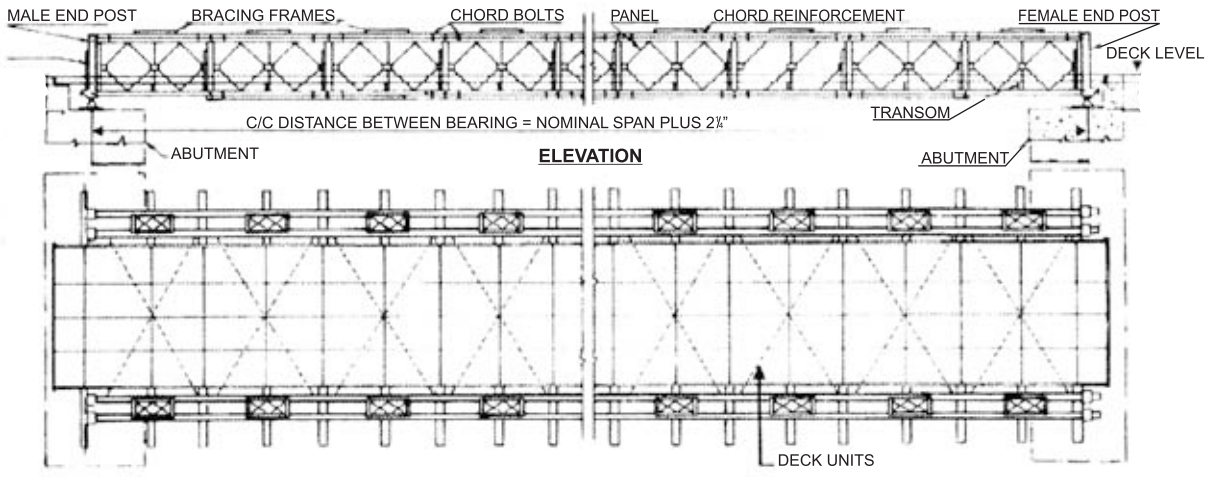


Fig 4

DOUBLE SINGLE REINFORCED CONSTRUCTION

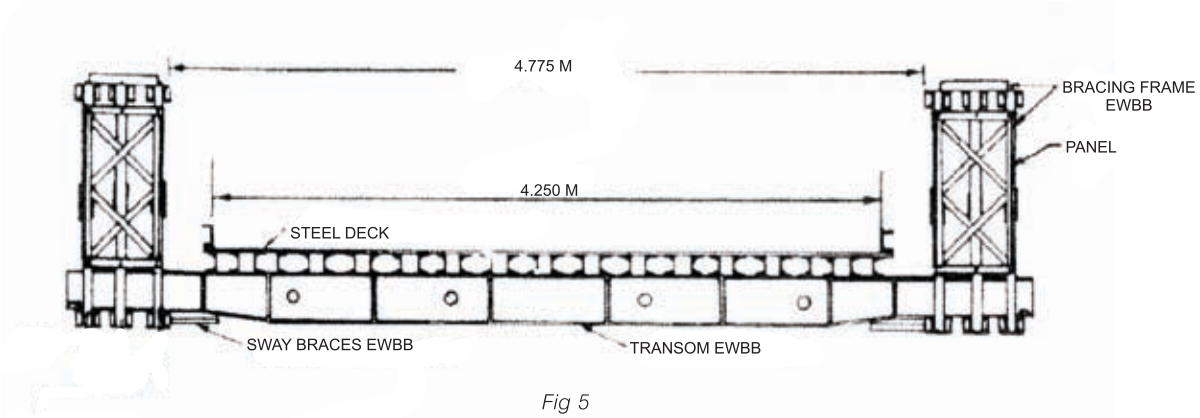


Fig 5

CROSS SECTION OF EXTRA WIDE EFPL BAILEY TYPE EXPANDABLE BRIDGE TRIPLE SINGLE CONSTRUCTION

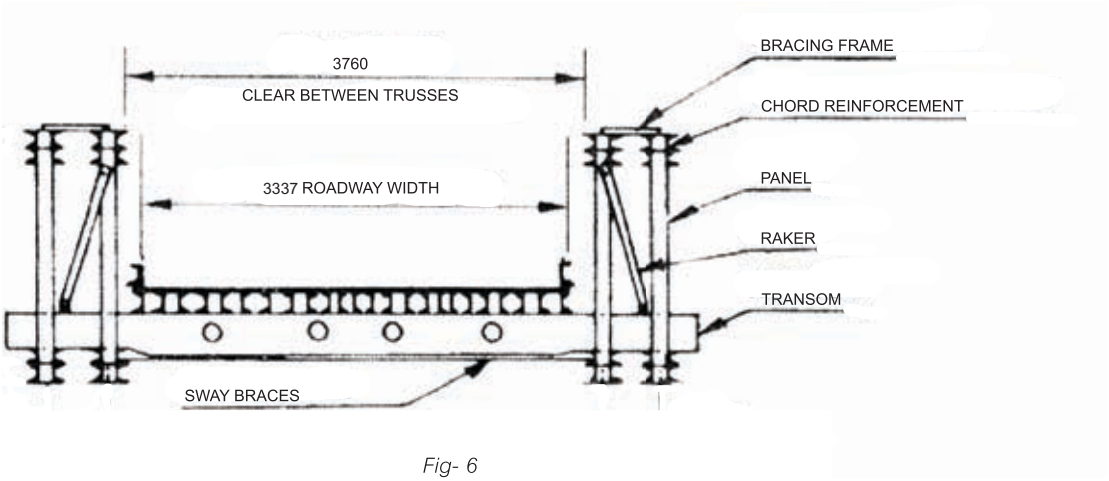


Fig- 6

CROSS-SECTION OF STANDARD WIDE **EFPL** DOUBLE SINGLE REINFORCED CONSTRUCTION

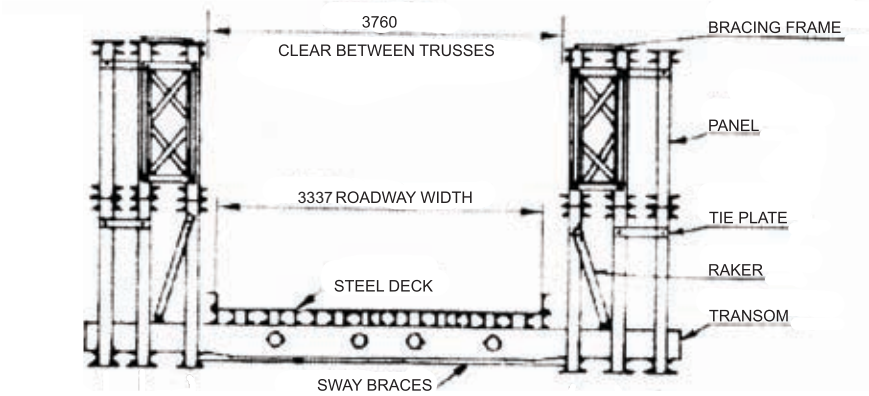


Fig- 7

CROSS-SECTION OF STANDARD WIDE **EFPL** TRIPLE DOUBLE CONSTRUCTION

Details of Major Components for Bailey Type Expandable Bridge

PANEL : BTEB–BB-1

The Panel (Figure 8) is the main member of the bridge and is made up of high tensile steel. There are vertical, horizontal and diagonal members which are welded together to form the Panels. One end of the top and bottom chord of the panel is fitted with Male Eye Lugs and other end both at the top and bottom with Eye Plates which are forged items. Welding of the Male Eye Lugs and Eye Plates with the structural members of the chord are radiographicaly tested to confirm soundness of the welds. There are holes in the Eye Lugs and Eye Plates by which corresponding panels can be joined with the help of Panel Pins. Holes are also provided in top and bottom chords and in end verticals for fixing Bracing Frames and also to facilitate fixing of Panels one over the

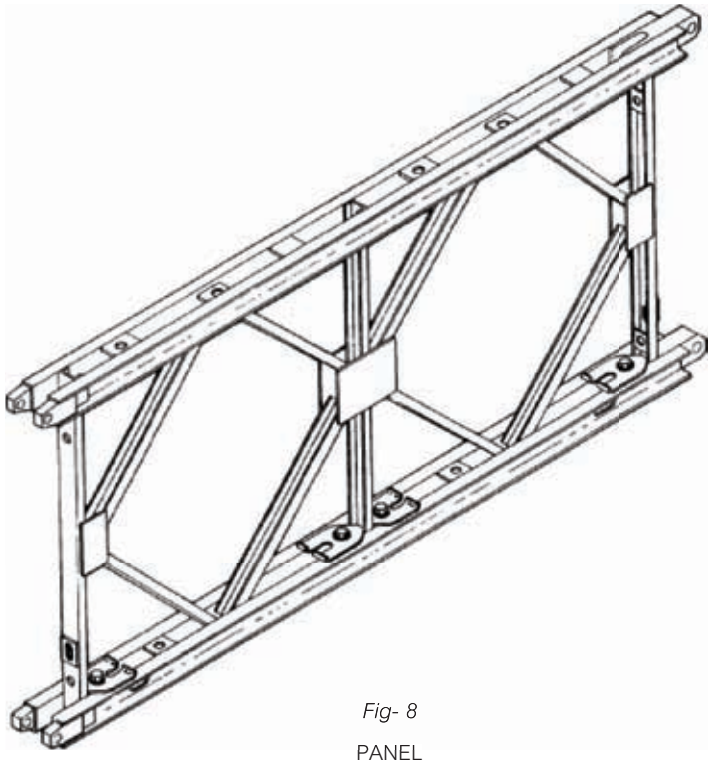


Fig- 8

PANEL

CHORD REINFORCEMENT : BTEB–BB-150

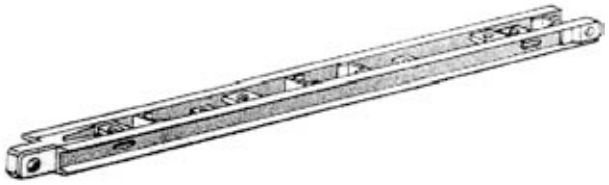


Fig- 9
CHORD REINFORCEMENT

It is similar to the chord of the Bailey Panel. Male Eye Lugs are fitted at one end and Eye Plates at the other end duly drilled. Like the Panels there are Chord Bolt, Sway Brace and Bracing Frame attachment points. The Sockets of the Chord Bolts are set back so that when attached to the panel, the heads of the Chord Bolts are housed inside the chord. So, when the Chord Reinforcement is attached to the bottom chord of the Panel it helps launching and when attached to the top chord of the panel it allows attachment of the Bracing Frame without interference.

PANEL PIN : BTEB–BB-4

Panel Pin is used to connect the Panels together. It is made up of steel of high yield strength and impact value. It is inserted through the holes provided in the Male Eye Lugs and Eye Plates and has a tapered end to facilitate the insertion. It has a hole at the tapered end to be secured with Split Pin. It is also used to connect two adjacent Chord Reinforcements. To avoid corrosion it is electro zinc plated.

Fig- 10
PANEL PIN

BRACING FRAME : BTEB -BB-2

Bracing Frame is a mild steel welded frame comprising of angles and flats with hollow conical dowel at each corner. It is used to connect Panels in multiple truss and storey construction of bridge girders in the following positions.

I. In a multiple truss single storey bridges, horizontally across the centre of the top chord of the inner row of Panels.

II. In a similar position horizontally across the top chord of the Panels and additionally in a vertical position across the rear verticals of second storey Panels of double storey bridges.

III. In double storey bridges, in the first bay at the head end of the bridge of the second storey Panels vertically across the front end verticals.

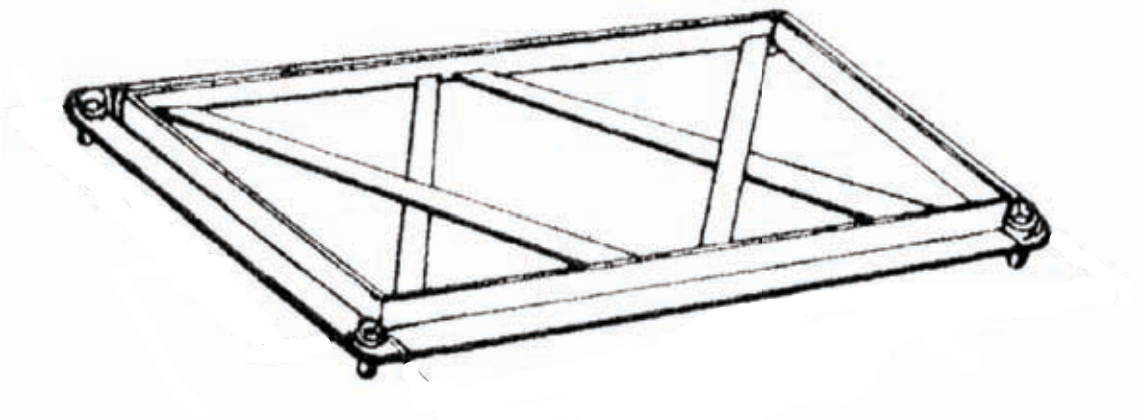


Fig- 11
BRACING FRAME

STANDARD STEEL DECK TRANSOM: BTEB-BB-C03

Transoms are made out of high tensile steel joist. Dowel holes are provided under side at each end which match with the dowels on the panel seating. This facilitates to fix the main girder of the bridge laterally. Transoms are held in position with Transom Clamps. Cleats and Saddles are fitted on the top flange for fixing Raker and for clamping Decks.

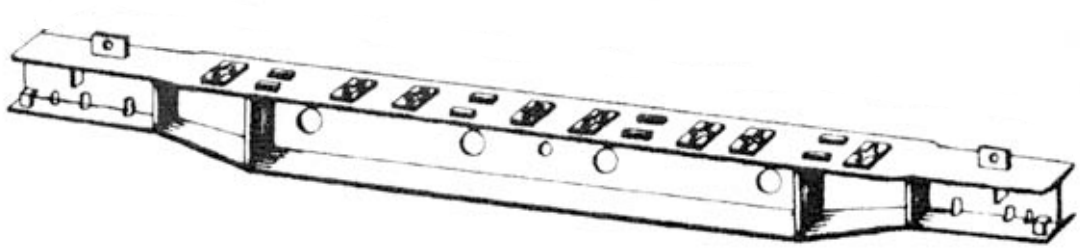


Fig- 12
TRANSOM

BASE PLATE : BTEB-BB-31

It is manufactured from mild steel plates and structurals. The Base Plate is so designed that it spreads the load from the Bearings evenly over an area of the ground. There are four Base Plates at the four corners which is sufficient whether the construction is of single, double or triple construction. Numbers, such as 1 , 2 , 3, are embossed on the edges of the base plates indicating the correct position for the centre line of the inner truss of the single , double and triple truss bridges respectively. The Bearing can move longitudinally on the base plate. This helps in erection for bridges and also allows expansion / contraction of the Bridge during

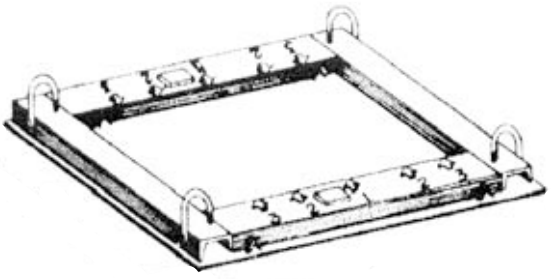


Fig- 13
BASE PLATE

BEARING : BTEB-BB-19

The load of the bridge to the Base Plate is spread through the bearings. It is a welded assembly having a round bar on which half round bearing of the End Post rests. The bar is divided into three lengths. In a single truss bridge the end post is arranged to bear the centre length. For double truss bridge, two bearings are used so that each truss rests on the centre of each Bearing. For triple truss bridge the inner truss rests on the centre of one Bearing and other truss rests on the two outer positions of the second Bearing as such it is not necessary to use more than two Bearings at each end of main girder of a bridge.

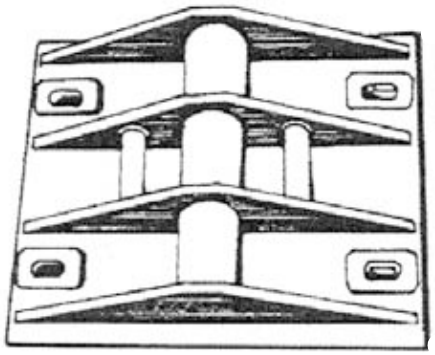


Fig- 14
BEARING

POST END FEMALE : BTEB-BB-62
POST END MALE : BTEB-BB-63

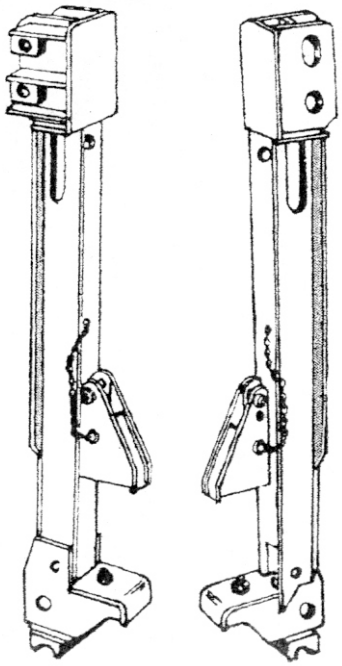


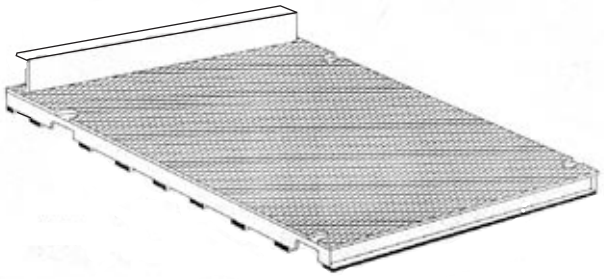
Fig- 15
POST END MALE / FEMALE

There are two kinds of end posts, such as, Post End Male & Post End Female. The Post End Male connects to the female end of the Panel whereas the Post End Female connects to the male end of the Panel. End Posts are fitted at both ends of each truss of the main girder. This helps to distribute the shear force occurring due to end reaction of the bridge to the Bearing. Two holes are provided at each Post End at the top wherein the upper one is for connecting the second storey Panel and lower one for connecting the top chord of the bottom storey Panel. Connections are made with Panel Pins. The Bottom end of the post has a half round bearing block which rest on the Bearing. A step with a locator at the lower end locates Transom. Transom is locked with a hinge bracket provided. The

STEEL DECK UNITS

STEEL DECK (LONG) :BTEB–BB-C02
STEEL DECK (SHORT) :BTEB–BB-C01

Steel Decks are made up of mild steel chequered plate welded with high tensile channels. Two decks are placed side-by-side and are positively fixed with the Saddle welded on Transom by Steel Deck Clamp units. One full length of 3.048m is not covered by a single length and the same is replaced by two decks mainly to keep individual Deck weight low. Chequered finish on the top side of the plate ensures better wheel grip. Kerb is integral with the Deck.



STEEL DECK (LONG)

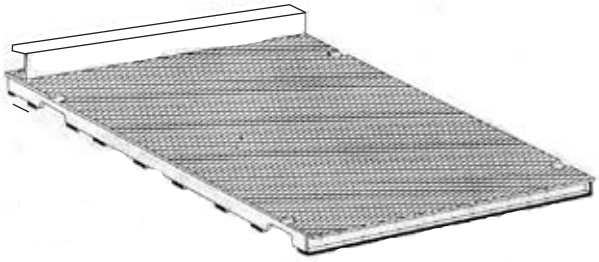


Fig- 16

STEEL DECK (SHORT)

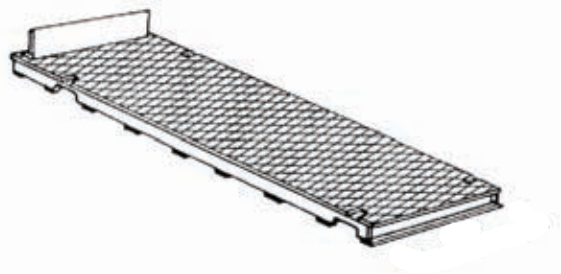


Fig- 17

END STEEL DECK

END STEEL DECK :BTEB–BB-C05

End Steel Deck is used at the ends of the bridge which connects the roadway with bridge deck. All the parameters of the deck are similar with other deck units but its length is shorter. However if desired, the standard Steel Deck (Short) and Steel Deck (Long) may be used with related modifications in the abutment.

RAKER: BTEB-BB-3

Raker is made up of channels and has hollow conical dowels at each end. To provide lateral stability to the truss, it connects the end of the Transom to the top of the inner truss by engaging its dowel in the top hole of the Panel vertical so that the Panels are in correct alignment. One Raker is used on each side of the bridge at every panel junction point. It is fastened by means of Bracing Bolt.

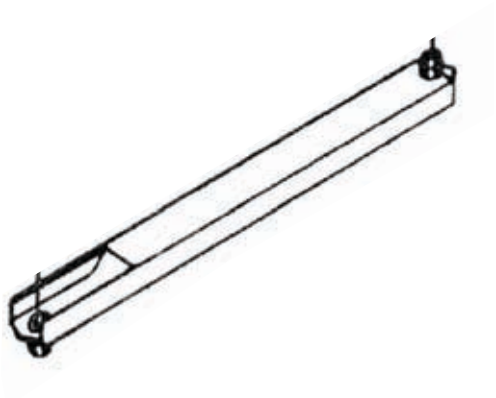


Fig- 18
RAKER

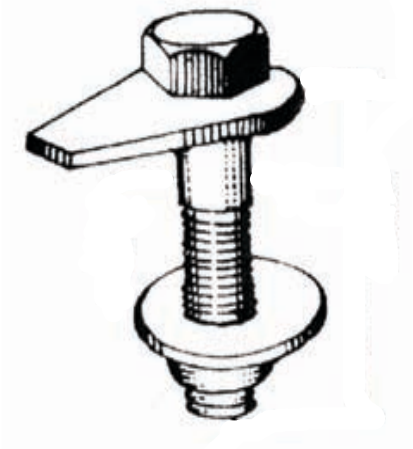


Fig- 19
BRACING BOLT

BRACING BOLT: BTEB-BB-11

It is a mild steel bolt fitted with a special lug in the bolt head with a combination of nut and washer. To secure Raker to the Panel and Transom, Tie plates to the Panels and Bracing Frames to the Panels, Bracing Bolt is used. It is electro zinc plated to avoid rust.

SWAY BRACE: BTEB-BB – 15

This provides diagonal bracing on the underside of the bridge and is connected to opposite ends of the two inner Panels in a bay. It is a combination of a mild steel rod, hinged at the center and a turn buckle for adjustment. It has chains at each end which terminates in an Eye Plate and a Pin for connecting to the Panel. The hinge is so placed that one arm is bigger than the other. Two Sway Braces are used in each bay.

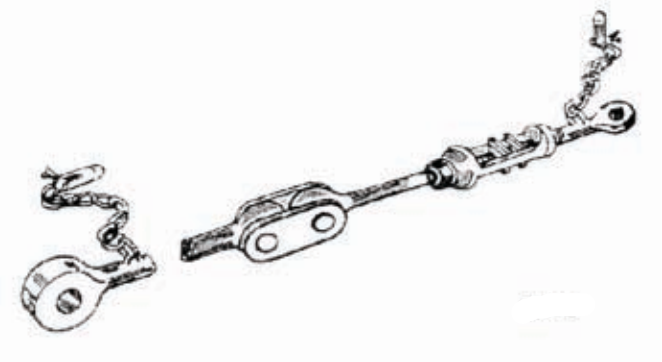


Fig- 20
SWAY BRACE

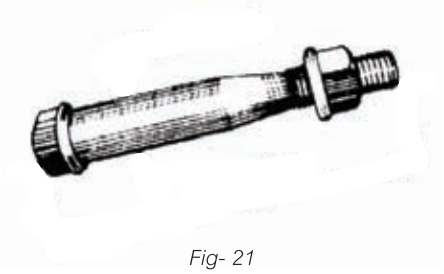


Fig- 21
CHORD BOLT

CHORD BOLT: BTEB-BB-9

These bolts are used to connect the Panels together when placed one above the other to form a multi storeyed bridge. It has tapered end which facilitates the Panels in correct alignments during assembly. It is made up of mild steel and is electro zinc plated to avoid rust.

SHORT CHORD BOLT: BTEB-BB-9A

It is short in overall length but otherwise is identical in design and finish to Chord Bolt. To form a chord reinforced bridge it is used to connect Chord Reinforcement to the Panel chords. It is electro zinc plated to avoid rust.

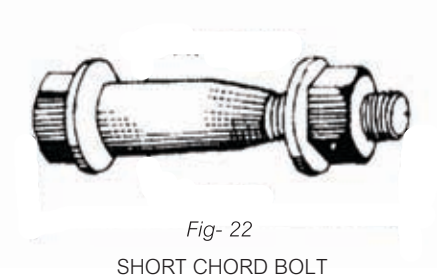


Fig- 22
SHORT CHORD BOLT

TRANSOM CLAMP: BTEB-BB-6

This is entirely a mild steel fabricated accessary consisting of an arm fitted with hinge bar, a vice type screw and a clamping bolt for clamping the Transom in position on the Panels. The nose type arm is inserted in

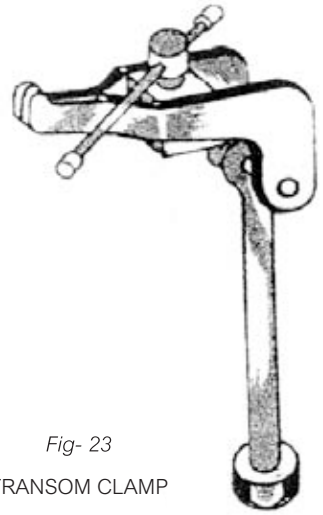


Fig- 23
TRANSOM CLAMP

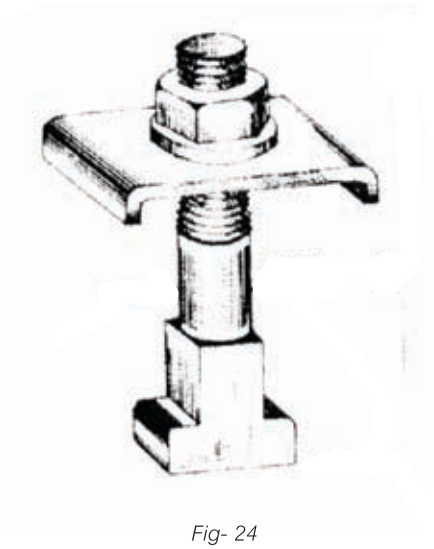


Fig- 24
STEEL DECK CLAMP UNIT

STEEL DECK CLAMP UNIT :BTEB-BB-C07

Tee bolts are made up of high tensile steel fitted with M.S. Plain Washer, Spring Washer and hex Nut. Steel Decks are fixed with Transom with the help of Bolt with nut and washer. Tee head of the bolt enters through the slot provided in the Saddle on the Transom and locates itself in the Saddle. The Deck unit is then locked in position with Plate Washer, Spring Washer and Nut.

TIE PLATE: BTEB-BB-29

In a triple truss bridge it secures the third truss to the second. It is a flat plate with conical hollow dowels at both ends. It is fixed with the help of Bracing Bolt.

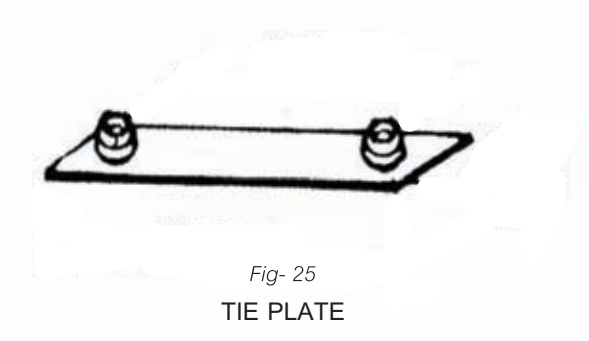


Fig- 25
TIE PLATE

HEADLESS PANEL PIN BTEB-BB-130

It is similar to the Panel Pin but the head is removed. It is made up of steel of high yield strength and impact value. It is used in places where it is difficult to insert the Panel Pin due to space constraint. It is electro zinc plated to avoid rust.

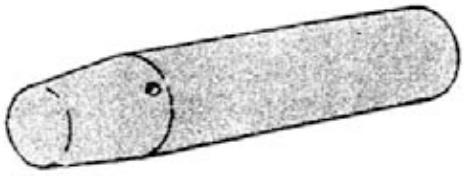


Fig- 26
HEADLESS PANEL PIN

SPLIT PIN BTEB-BB -4A

It is made up of spring steel and used to secure the Panel Pin or Headless Panel Pin.

Fig- 27
SPLIT PIN

Special Parts for Extra Wide Bailey Bridge

In cases where Extra Wide Bailey Bridges are used, certain additional parts are required due to its increase in width. These parts are of similar nature in construction like those of the Standard Width Bailey Bridge. The details are mentioned below :

EXTRA WIDE TRANSOM CLAMP: BTEB-BB-143

It is similar to the Transom Clamp BTEB-BB-6 but has a reduced nose which helps in inserting through the Panel vertical without fouling with the Bracing Frame which is attached to the end verticals in triple truss construction.

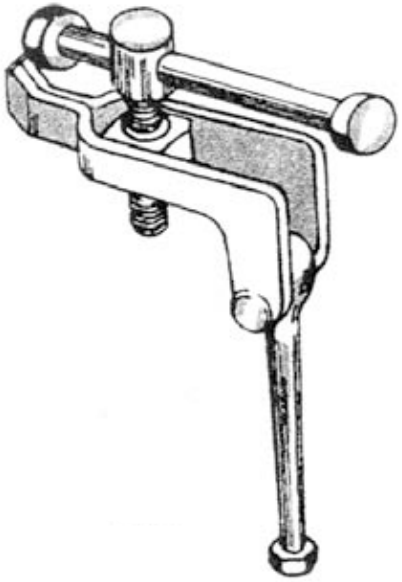


Fig- 28
EXTRA WIDE TRANSOM CLAMP

EXTRA WIDE BRACING FRAME: BTEB-BB-140

It is a fabricated item made of mild steel and is similar to Bracing Frame BTEB-BB-2. However it has 03 conical dowels at each end through which it is fastened with Bracing Bolt to Panel either horizontally across the top chords or vertically across the end verticals.

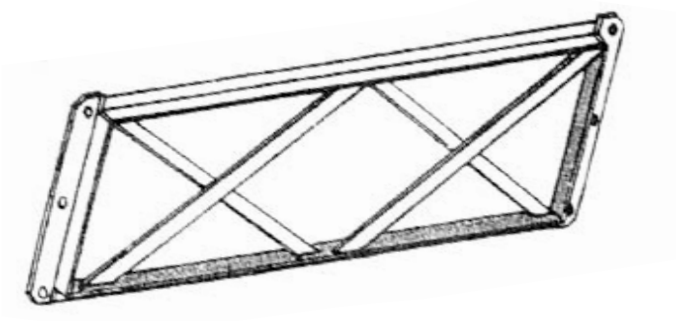


Fig- 29
EXTRA WIDE BRACING FRAME

EXTRA WIDE SWAY BRACE: BTEB-BB-134

The Sway Brace provides horizontal cross bracing to the EW bridge. There are 02 nos. of Extra Wide Sway Braces per bay and are fitted with the bottom chord of the Panel in the inner truss. The Extra Wide Sway Brace is similar to the Sway Brace but slightly longer in length.

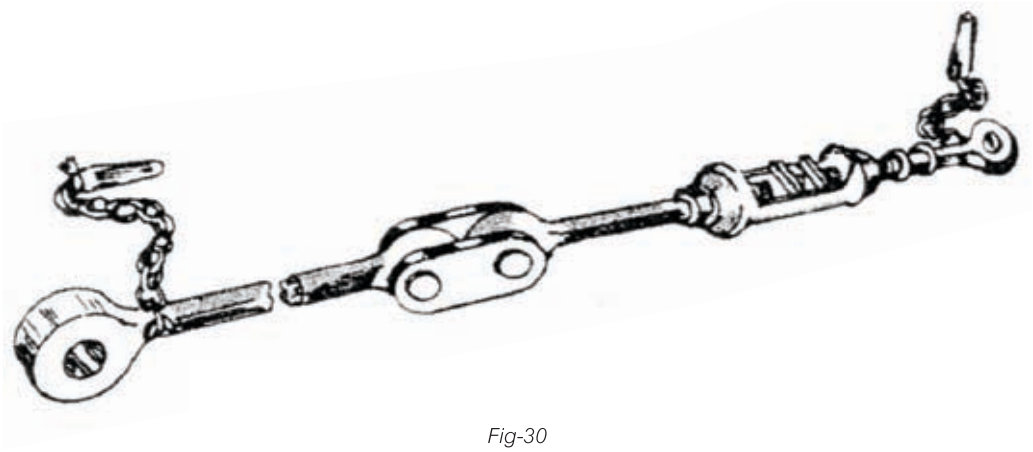


Fig-30
EXTRA WIDE SWAY BRACE

EXTRA WIDE STEEL DECK TRANSOM : BTEB–BB– C04

This is similar to BTEB-BB-C03 , however longer in length based on the requirement of Extra Wide Bailey Bridge.

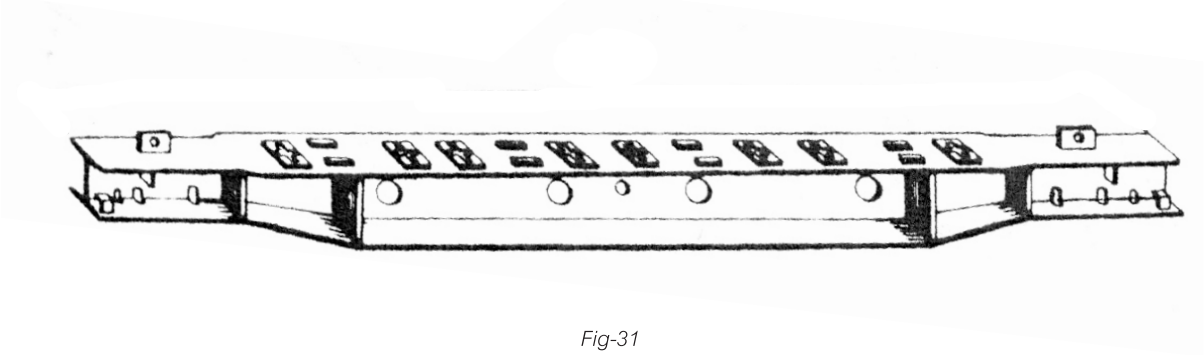


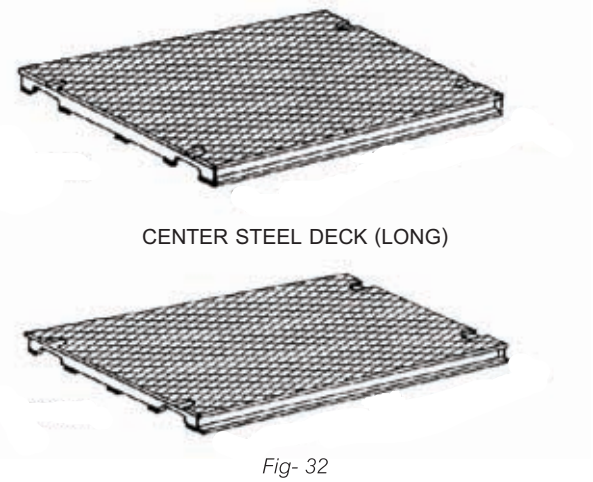
Fig-31
EXTRA WIDE TRANSOM

CENTER STEEL DECK

CENTER STEEL DECK (LONG) : BTEB-BB-C08

CENTER STEEL DECK (SHORT) : BTEB-BB-C09

To fill up the gap of Extra Wide bridge deck, Center Deck (Short) and Center Deck (Long) are used. These are placed between two standard Decks. Design is same as other Deck unit except the width and has no kerb.



CENTER STEEL DECK (LONG)

CENTER STEEL DECK (SHORT)

Fig- 32

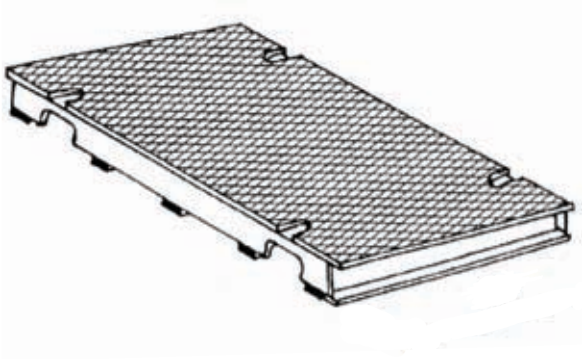


Fig- 33

END CENTER STEEL DECK

END CENTER STEEL DECK : BTEB–BB-C06

Purpose is same as Center Steel Deck units Long or Short, but is used in between End Deck units.

EXTRA WIDE POST END FEMALE : BTEB-BB-147

EXTRA WIDE POST END MALE : BTEB-BB-146

To enable Rakers to be fitted to the Transom in the End Post, Seat and Bracket is omitted. Basically it is similar to BTEB-BB-62 and BTEB-BB-63. Extra Wide End Posts are fitted only to the middle truss of a triple truss Extra Wide Bridge. All other trusses are fitted with normal End Posts.

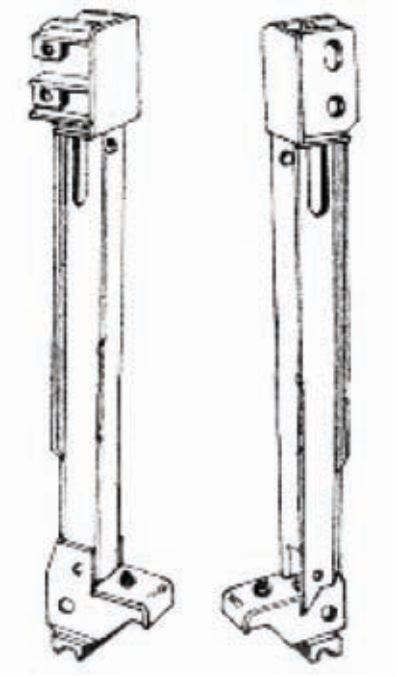


Fig- 34

EW POST END MALE EW POST END FEMALE

Inspection and Quality Assurance

Essen Fabricators Private Limited is an ISO 9001: 2008 certified company and has stringent quality control measures that are adopted during manufacturing process so that product manufactured meets the quality parameters as laid down in the standards and specifications.

All raw materials are regularly check tested in approved labs to ensure that right materials are being used. This is over and above the test certificates issued by the steel producers.

Fabrication is done through jigs and fixtures which ensures inter changeability of parts and thus eliminating human errors and achieve accuracy. Gauges are used during inspection to confirm dimensional accuracy.

Weldings are done by approved qualified welders duly certified by international houses like DNV & BVQI. Regular weld checks are carried out by process of MPT and Radiography to check the soundness of the weld.

Load Testing of Panels

All panels are load tested at the Load Test Rig. A load of 50 ton is applied, through a hydraulically operated jack, on a pair of panels for a period of 1 minute.

Fig- 35

LOAD TEST RIG

Preservation

All Pins and Fasteners are electro zinc plated followed by chromate passivation to ensure long life. All other components are blast cleaned and thereafter painted with primer paint followed by two coats of finish paint. If the purchaser so desires, based on the additional requirements, all components can be supplied duly hot-dip Galvanized.

Launching of Bailey Type Expandable Bridge

The normal method of launching of Expandable Bridge is by cantilever method with skeleton launching nose of calculated length. The bridge with launching nose is constructed on rollers and is pushed from the launching side of the gap until the tip of the launching nose is over the landing roller on the far bank before the point of balance is reached. A component called Launching Link is inserted in the bottom chord between the two Panels of the skeleton nose. This raises the skeleton nose up, overcoming the natural sag of the bridge.

When the nose has been lowered on to the landing Roller the whole bridge is pushed forward until the ends of the bridge proper are over the prepared Base Plate positions. The launching nose is dismantled side by side on the far bank. Finally the bridge is jacked up off the Rollers and lowered into its permanent Bearing on the abutments. (Figure 36)

Fig- 36

Maintenance of Bailey Type Expandable Bridge

Manual inspection of the bridges should be undertaken at regular intervals. We suggest the following frequencies :

Inspection on Weekly Basis

All Panel Pins (BTEB-BB-4), Headless Panel Pins (BTEB-BB-130), Split Pins (BTEB-BB-4A), Transom Clamps, (BTEB-BB-6), Steel Deck Clamp Units (BTEB-BB-C07) should be checked and replaced if found missing or damaged and tightened if found loose.

Inspection on Monthly Basis

All Bracing Bolts, Tie Plates, Chord Bolts, Short Chord Bolts should be checked and replaced if found missing or damaged and tightened if found loose.

Inspection on Half Yearly Basis

Base Plates & Bearings should be cleaned properly. Sway Braces should be checked and if found sagging should be tightened and replaced if missing or damaged.

Inspection on Yearly Basis

Checks to be carried out underneath the bridge, specially those parts below the Decks to rule out corrosion. If corrosion has taken place ,corroded parts to be wire brushed and two coats of suitable primer to be applied followed by two coats of finish paint.

General

It is recommended that suitable checks should be made to ensure that the live load does not exceed the design load class. Bailley Type Expandable Bridge in particular must not be overloaded beyond the design load class as per IRC standard and distance between two vehicles should be 30mtrs. minimum.

Depending on the environmental condition the bridge should be repainted every two years.

RECOMMENDED CONSTRUCTION OF STEEL DECK STANDARD WIDTH BAILEY TYPE EXPANDABLE BRIDGE (2 TRANSOM PER BAY)

CONFORMING TO IRC - 6

SPAN (FEET)	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
LOAD CLASS																		
CLASS-9R	SS	SS	SS	SS	SS	SS	SSR	SSR	SSR	SSR	TS	DSR	DSR	DD	DDR	DDR	DDR	DDR
CLASS-12R	SS	SS	SS	SS	SS	SSR	SSR	SSR	SSR	TS	TS	DSR	DD	DD	DDR	DDR	DDR	DDR
CLASS-18R	SS	SS	SS	SS	SSR	SSR	SSR	TS	DSR	DSR	DSR	DD	TSR	DDR	DDR	DDR	DDR	DDR
CLASS-24R	SS	SS	SS	SSR	SSR	DS	TS	TS	DSR	DSR	DD	TSR	TSR	DDR	DDR	DDR	DDR	DDR
CLASS-B	SS	SS	SS	SS	SSR	SSR	TS	DSR	DD	DD	DD	DDR	DDR	DDR	DDR	DDR	DDR	TDR

RECOMMENDED CONSTRUCTION OF STEEL DECK STANDARD WIDTH BAILEY TYPE EXPANDABLE BRIDGE (4 TRANSOM PER BAY)

	SPAN (FEET)	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
	LOAD CLASS																		
CONFORMING TO IRC - 6	CLASS-30R	SS	DS	DS	DS	DS	DS	DSR	DSR	DSR	DSR	TSR	TSR	TSR	DDR	DDR	DDR	TDR	TDR
	CLASS-40R	DS	DS	DS	DS	DSR	DSR	DD	DD	DDR	DDR	DDR	DDR	DDR	TDR	TDR	TDR	TDR	-
	CLASS-70R	TS	TS	TS	DD	DD	TD	TD	TDR	TDR	TDR	TDR	TDR	-	-	-	-	-	-
	CLASS- A	DS	DS	DS	DS	DSR	DSR	DD	DD	DDR	DDR	DDR	DDR	DDR	TDR	TDR	TDR	TDR	-

RECOMMENDED CONSTRUCTION OF STEEL DECK EXTRA WIDE BAILEY TYPE EXPANDABLE BRIDGE (2 TRANSOM PER BAY)

	SPAN (FEET)	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
	LOAD CLASS																		
CONFORMING TO IRC - 6	CLASS-9R	SS	SS	SS	SS	SS	SS	SSR	SSR	SSR	SSR	DSR	DSR	DD	DDR	DDR	DDR	DDR	DDR
	CLASS-12R	SS	SS	SS	SS	SS	SSR	SSR	SSR	SSR	TS	DSR	DSR	DD	DDR	DDR	DDR	DDR	DDR
	CLASS-18R	SS	SS	SS	SS	SSR	SSR	SSR	TS	DSR	DSR	DSR	DD	TSR	DDR	DDR	DDR	DDR	DDR
	CLASS-24R	SS	SS	SS	SSR	DS	DS	TS	TS	DSR	DSR	DD	DD	DDR	DDR	DDR	DDR	DDR	DDR
	CLASS-B	SS	SS	SS	SS	SSR	SSR	TS	DSR	DD	DD	DD	DDR	DDR	DDR	DDR	DDR	TDR	TDR

RECOMMENDED CONSTRUCTION OF STEEL DECK EXTRA WIDE BAILEY TYPE EXPANDABLE BRIDGE (4 TRANSOM PER BAY)

SPAN (FEET)		30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
LOAD CLASS																			
CONFORMING TO IRC - 6	CLASS-30R	DS	DS	DS	DS	DSR	DSR	DSR	DD	DD	DDR	DDR	DDR	DDR	DDR	TDR	TDR	TDR	TDR
	CLASS-40R	DS	DS	DS	DS	DSR	DSR	DD	DD	DDR	DDR	DDR	DDR	DDR	TDR	TDR	TDR	-	-
	CLASS-70R	TS	TS	TS	DD	DD	TD	TD	TDR	TDR	TDR	TDR	TDR	-	-	-	-	-	-
	CLASS- A	DS	DS	DS	DS	DSR	DSR	DD	DD	DDR	DDR	DDR	DDR	DDR	TDR	TDR	TDR	-	-

ALSO SPECIALIZED IN MANUFACTURING

- Equipments for Process Plants
- Equipments for Refineries
- Equipments for Steel Plants
- Equipments for Infrastructure Sector
- Equipments for Hydro Power Sector

Equipments for Process Plants

- All Kind of Pressure Receiver as per International Codes
- All Kind of Flash Tanks of various Design Pressure
- De-Aerator, Degasser, Sump and Tower, Anion & Cation Exchanger, Pressure Filter
- Storage Tanks for Inflammable and Non-Inflammable products.
- All kind of Pressure Vessel of CI-1, CI-2 and CI-3

Equipments for Steel Plants

- Gas Mixer
- Gas Holder and Allied Accessories
- Stack / Self Supporting Chimney
- Heavy Build-Up Girders and Technological Structures
- Bag House and Support Structure
- Base Frames for Heavy Gear Box
- Ductings
- Spark Arrestors
- Pre-Separators

Equipments for Refineries

- Heavy Technological Structure.
- Flare Stack / Chimney for Heaters
- Heaters along with Necessary Support Structure for Refineries
- Ductings Including Supporting Structure

Equipments for Infrastructure Projects

- Flyover Structure
- Railway Over Bridge
- Gantries
- Cribs, Shutters and Piers
- Bailey Type Expandable Bridge
- Pipe Bridge
- Bus Shelters

Equipments for Hydro Power Sector

- Tunnel Gantries and Form Work
- Tunnel Ribs

013

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Giving Shape to Steel

EFPL Bailey Type Expandable Bridge

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