



JSL
JINDAL STAINLESS

Himalaya Stainless Steel Foot Over Bridge,
CSMT Station, Mumbai

STAINLESS STEEL FOR BRIDGES, TUNNELS & ROADS

JINDAL INFINITY
INFRA SOLUTIONS
THAT LASTS FOR CENTURIES

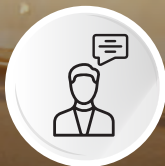
A LEGACY BUILT ON SAFETY & TRUST

Founded by Shri O.P. Jindal in 1970, Jindal Stainless is one of the largest stainless steel conglomerates in India and ranks amongst the top 10 stainless steel conglomerates in the world. Jindal Stainless Group has an annual crude steel capacity of 2.9 MTPA and an annual turnover of \$ 4.2 Billion USD (as on Mar'2023).

Our growth has been backed by the excellence of our people, value driven business operations, customer centricity, adoption of one of the best safety practices in the stainless steel industry and a commitment for social responsibility.



JINDAL INFINITY INFRASTRUCTURE SOLUTIONS



Advisory

Grade Selection, Approvals,
Policy Framework Support,
Adhering & Developing
Standards, Training,
Design and more



Raw Material Supplier

Stainless Steel Plate,
Stainless Steel
Reinforcement Bars,
Stainless Steel
Chequered Plate



Customization

Cutting, Slitting,
Fabrication, Welding,
Drilling



Fabricated Components

Girders, Facade,
Railing, Bus Shelter,
Built-up Sections,
Angle & Channels

ABOUT STAINLESS STEEL

Stainless steel is the common name for all steel grades containing at least 10.5% chromium. chromium improves the corrosion resistance of stainless steels. In addition to iron and chromium, stainless steels contain other alloying metals, of which the most important are nickel and molybdenum. The combination of chromium and oxygen leads to the formation of a chromium-rich passive layer on the surface of the steel. This layer protects the steel, and re-forms over time if damaged.

On the basis of their microstructure, Stainless steels are divided into Austenetic, Ferritic, Duplex and Martensitic types. More than 100 different stainless steel grades have been developed for various applications.

The alloying metals influence the corrosion resistance, durability, strength and formability of the steel.





STRENGTH TO PROTECT LIFE

Advantages of Stainless Steel Bridges are:



DESIGN FLEXIBILITY

CARBON STEEL

The section type and structural configuration are influenced by the corrosion mitigation, thereby limiting the choices available to the designer while optimising the design.

STAINLESS STEEL

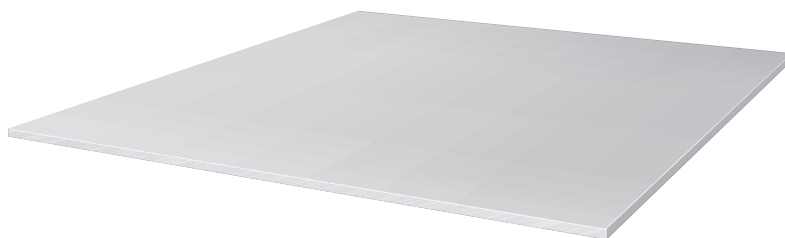
In view of superior corrosion resistance, the structural engineer is free to select the most aesthetic and economical structural configuration with closed sections and any other combination, purely based on strength and serviceability parameters.



JINDAL INFINITY INFRA SOLUTIONS FOR STRUCTURAL APPLICATIONS

A. Plates

- i. Thickness - 3 mm - 80 mm
- ii. Width - 1500 mm max
- iii. Length - 12000 mm max

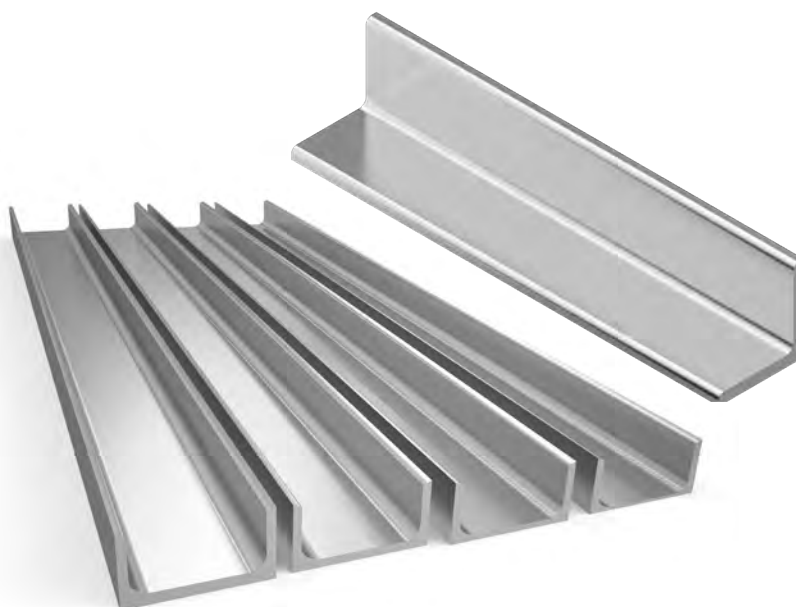


B. Fabricated Girders

- i. JSL offers welded stainless-steel I-beams, H-beams, hollow-section tubes and bent profiles for load-bearing structures.
- ii. These products are available in lengths of up to 12 m without length splicing.
- iii. As per the approved drawing.

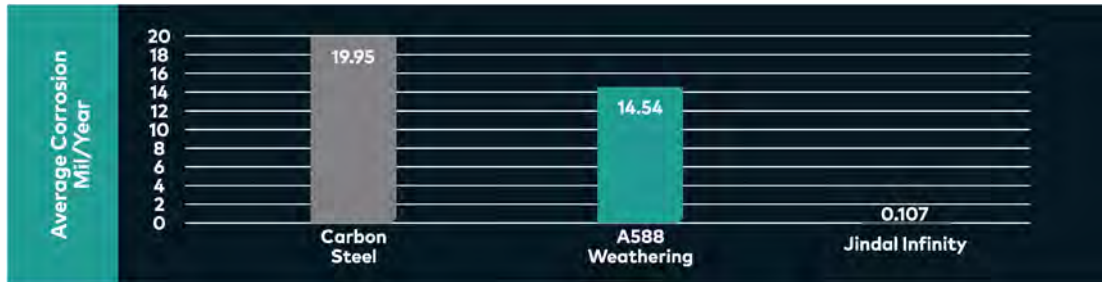
C. Angles & Channels

Cold Rolled formed /
press sections



JINDAL INFINITY PROPERTIES

Upto 186x better corrosion resistance



Corrosion performance as per SAE J2334 test consists of alternating wet/dry cycles with salt for 8 weeks, leads to low maintenance.

Mechanical Properties

Grade	Yield Strength	Tensile Strength	% Elongation	Impact
IRS 350 CR	350 MPA min	485 MPA min	18 min	34 J min
IRS 450 CR	450 MPA min	585 MPA min	18 min	27 J min

Physical Properties	Values
Density (kg/m3)	7750
Modulus of Elasticity (N/mm2)	2×10^6
Poisson's Ratio	0.3
Thermal Conductivity (W/mK)	24.6
Mean Coefficient of Thermal Expansion /°C	10.4×10^{-6}

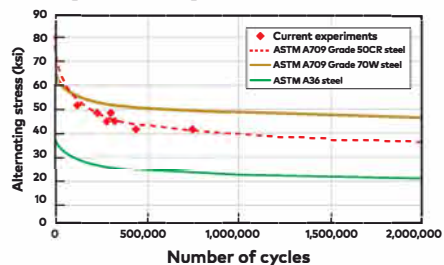
Chemical Composition

Jindal Infinity confirms to ASTM A1010 and RDSO specification BS-S-7.5.3.1-9

Element	C	Mn	Si	S	P	Ni	Mo	Cr	N	Other
Min. %							0.10-	10.5-		-
Max. %	0.03	1.5	1	0.01	0.04	1.5	0.75	12.5	0.03	

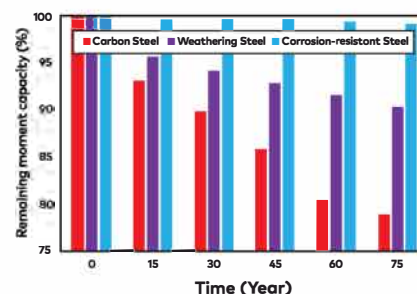
*Maximum, unless range or minimum is indicated

Fatigue Strength



Fatigue behavior ASTM A709 Grade 50CR steel in comparison to the other conventional structural steels (1 ksi = 6.9 MPa).

Courtesy: W. Shi and B. Phares.



Percentage of drop in the moment capacity as a function of age

RECOMMENDED FASTENERS DETAILS FOR FABRICATION OF JINDAL INFINITY

Item	Code	Grade
Bolt	ASTM A193	GR B8 Class 2
Nut	ASTM A194	GR 8
Washer		Type 303

All types of nuts & bolts domestically available.

Visit www.makestainless.com for suppliers of consumables, fasteners and fabricated components.

Weldability of Jindal Infinity

It is recommended to use ER308L, ER309L, ER316L, and their higher silicon content counterparts, however ER309L has by far been the most widely used filler wire for welding of the plate girders fabricated with Jindal Infinity. Suitable flux should be used with filler wires. For FCAW, ER 309L and for GMAW – ER 309L/ER 309LMO with Gas mixture Ar-98% are recommended. However, any other suitable welding consumable permissible by AWS D1.6 may also be used.

LCC Analysis:

- A. Initial cost increase is 20-25% over existing carbon steel.
- B. Low maintenance over carbon steel. For aesthetics purpose, paint is recommended for utility Ferritic stainless steel. Addresses the current challenges of maintaining bridges like safety, accessibility, shutdowns, additional cost for upkeeping and channelizing dedicated resources for the repeated jobs.
- C. Weight reduction of more than 25-30% achieved due to higher yield strength and light weight design.
- D. Payback period is less than 20 years.
- E. Stainless steel is green material and helps in reducing carbon foot print.
- F. Service life of stainless steel is more than 100 years.

STANDARDS AND CODES

Standard	Corresponding Design Code	Corresponding Construction / Fabrication Code
EN 10088 (Part 1 – List of stainless steel) (Part 2 – TDC for sheets/plates and strips of corrosion resisting steels for general purposes) (Part3- TDC for semi-finished products, bars, rods, wire, sections & bright products of corrosion resisting steels for general purposes) (Part4-TDC for sheet/plate and strip of corrosion resisting steels for construction purposes)	EN 1993-1-1(General Design Rules),EN 1993-2 (Steel Bridges) & EN 1993-1-4 (Supplementary Rules for Stainless Steel	EN 1090-2: Execution of steel structures (Technical Requirements for Steel Structures)
ASTM A1010/A1010M (standard specification for higher-strength martensitic stainless steel plate, sheet, and strip ASTM A709/A709M (standard specification for structural steel for bridges) ASTM 240 (standard specification for chromium and chromium-nickel stainless steel plate, sheet, and strip for pressure vessels and for general applications	AASTHO LRFD Bridge Design Specifications	AASTHO LRFD Bridge Construction Specifications
BS-S-7.5.3.1-9 (Specification for higher-strength martensitic stainless steel for bridge and associated structural applications IRS 350 CR)	AASTHO LRFD Bridge Design Specifications	AASTHO LRFD Bridge Construction Specifications

Jindal Infinity confirms to ASTM A1010 and RDSO specification BS-S-7.5.3.1-9



APPROVED BY INDIAN RAILWAYS AND MUNICIPAL CORPORATION

Indian Railways and Municipal bodies have approved the use of stainless in structural applications of bridges in line with global success stories of using modern technologies in construction.

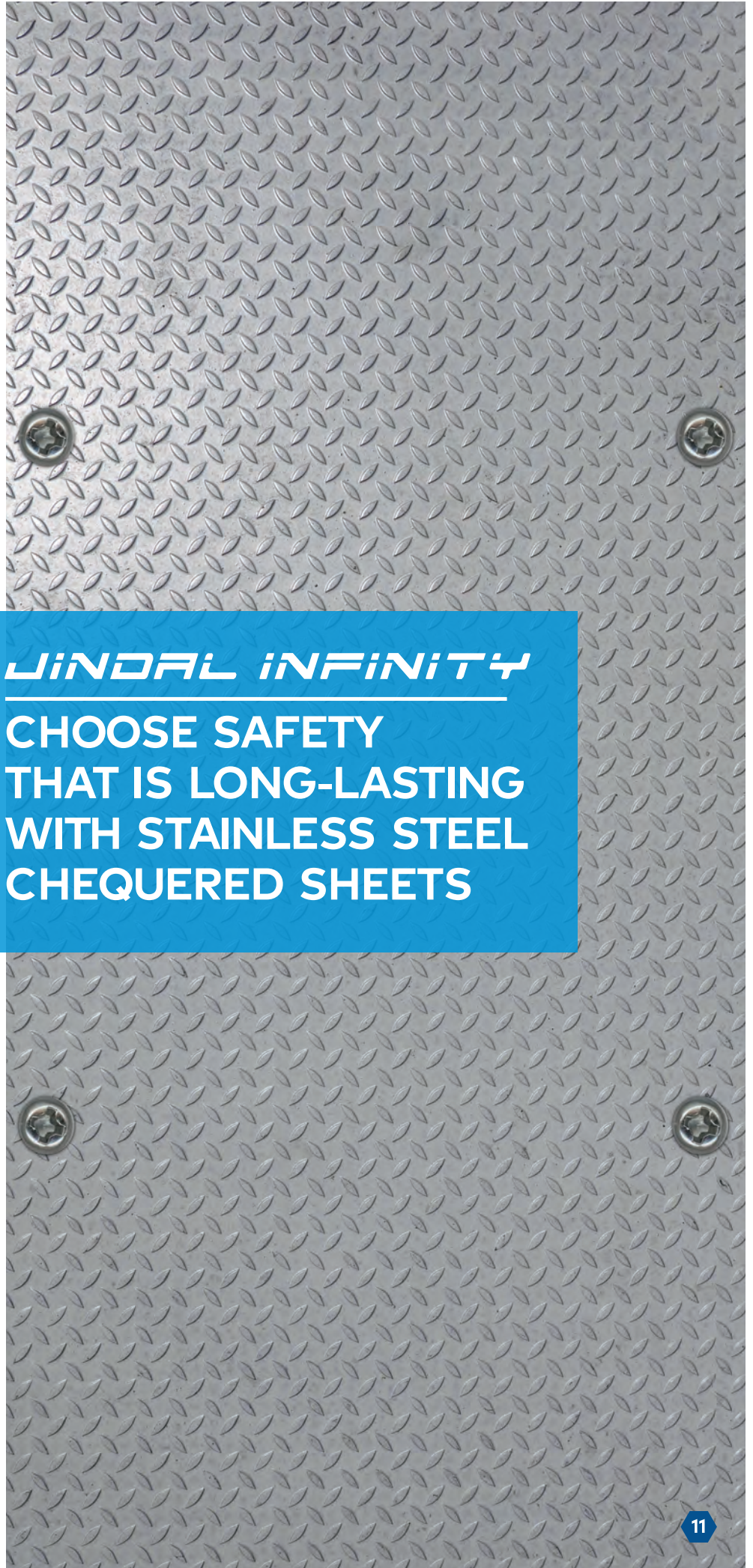
Recognised by RDSO & Indian Railways

Stainless steel specification for structural applications in line with RDSO Specification

1. Material Specification: BS-S-7.5-3.1-9
2. Grade Name: IRS 350 CR
 - i. Span 33.55 x 3 mtr - Drawing no - RC 5036
 - ii. Span 15.7 x 10 meter - Drawing number RC - 5032
 - iii. Span 35.21 x 6 mtr - Drawing no - UG-2203014-FOB-SG-001
 - iv. Span 43.86 x 3.5 mtr - RVNL/SCR/GRIL/KCK/FOB/SPF/440
3. RDSO standard stainless steel drawings
 - A. Foot Over Bridge (FOB)
 - i. Span 25-30m length x 6m wide; drawing no. RDSO/B-10424
 - ii. Span 20-25m length x 6m wide; drawing no. RDSO/B-10426
 - B. Road Over Bridge (ROB)
 - i. Span 36m length x 11m wide; drawing no. - CBS 0048
 - ii. Span 30m length x 11m wide; drawing no. - CBS 0050

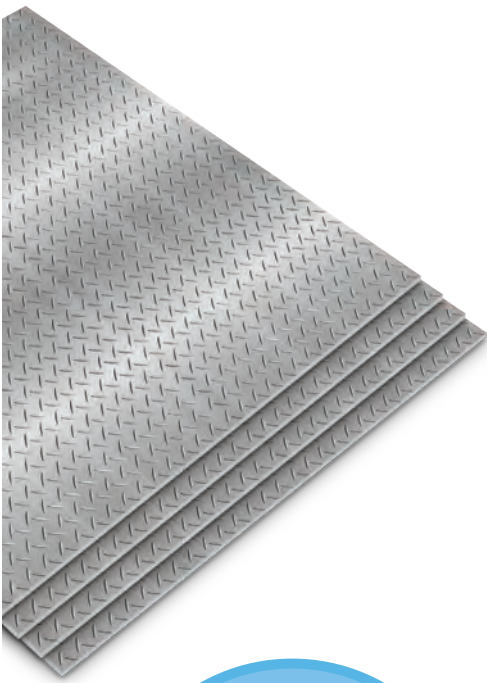
BMC, Municipal Corporation of Mumbai as approved grade IRS 450 CR

NHAI adopts RDSO specification (BS-S-7.5-3.1-9) for Stainless Steel ROB - Bowstring girder of standard span 72m



JINDAL INFINITY

**CHOOSE SAFETY
THAT IS LONG-LASTING
WITH STAINLESS STEEL
CHEQUERED SHEETS**



STAINLESS STEEL CHEQUERED PLATES

PATTERNED ALONG THE BEST GLOBAL STANDARDS

The pattern of this Stainless Steel Chequered Plate is in accordance with IS 3502 Pattern 1A.

Dimensions of Bead*

Length – 27mm

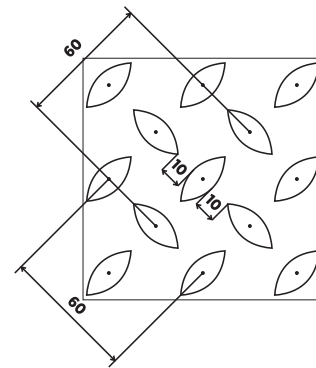
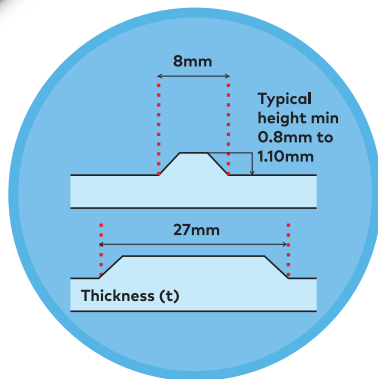
Width – 8mm

Height – Min. 0.80mm

Number of Beads*

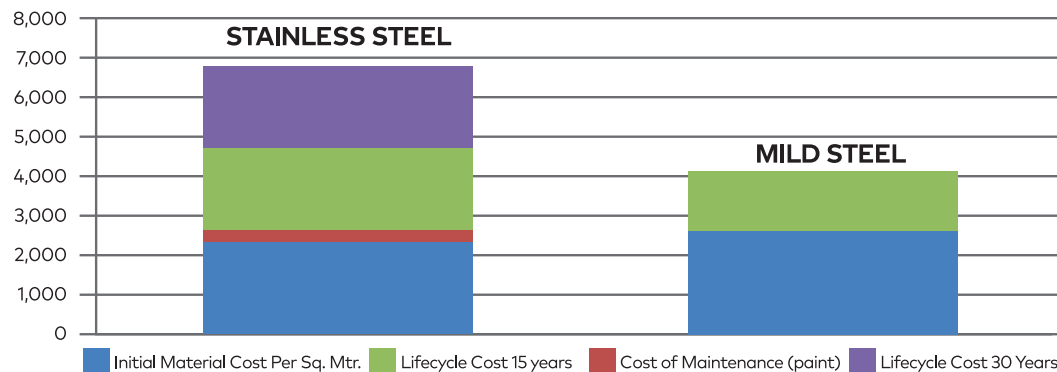
(100mm x 100mm):11

*Standard tolerance applies



LOWER LIFECYCLE COST FOR A LIFETIME OF GROWTH

LCC OF SS 409M HRAP CHEQUERED VS MILD STEEL HF CHEQUERED OVER 30 YEARS LIFE

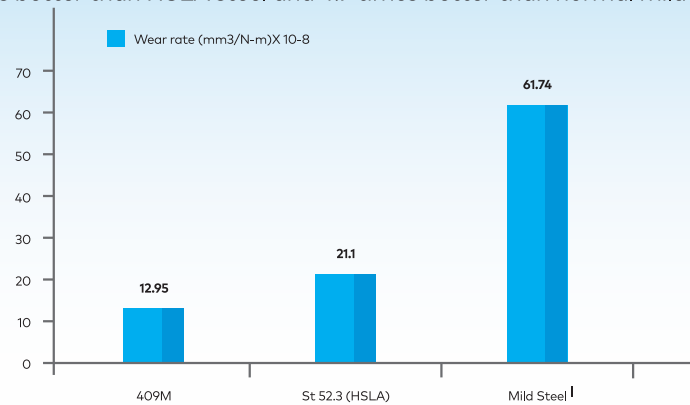


Supplying of anti-skid chequered plates for gangway, trolley refuge, man refuge, side pathway, etc. shall be confirming to latest IS 6911, ISS Symbol 409 M, Minimum 6mm thick (excluding bead height) with flat bottom and top pattern confirming to IS 3502, 1A For, coastal/corrosive areas, thickness may be suitably increased depending upon severity of corrosion.

Appropriate matching stainless steel grade fasteners as recommended by manufacturer shall be used.

UP TO 5 TIMES HIGHER WEAR RESISTANCE FOR HIGHER COST SAVINGS

Grade 409M is known for its high wear resistance. Under the sliding wear test condition grade 409M is 1.6 times better than HSLA steel and 4.7 times better than normal mild steel.



INNOVATED FOR A STRONG & LONG-LASTING FUTURE PRODUCT RANGE



THE PROMISE OF PROGRESS

STRENGTHENED BY SAFETY AND RELIABILITY

Railway Bridge Pathway:
Ensuring safety & convenience during maintenance and inspections.



JINDAL STAINLESS CHEQUERED SHEETS

Architectural Stairs & Flooring with a lustrous finish and high aesthetic appeal.

THE PERFECT BLEND OF STRENGTH & DURABILITY TO COMPLEMENT PROGRESS

INTRODUCING *JINDAL INFINITY* REBARS

Chemical Composition of SS Rebar Grade G (410 L) as per IS 16651:2017:

Chemical	C	Ni	Mn	Si	P	S	Cr	N
Min %							11	-
Max %	0.03	0.6	1	1	0.04	0.03	13.5	-

Mechanical Properties of High Strength Deformed Stainless Steel Bars and Wires as per IS 16651:2017:

S. No.	Properties	SS 500	SS 550	SS 600	SS 650
1	0.2 percent proof stress (Rp0.2), Min, N/mm ²	500	550	600	650
2	Percentage elongation after fracture (A5), Min, on gauge length 5.65 √A, where A is the cross-sectional area of the test piece	16	14.5	10	10

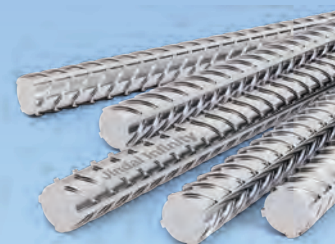
Product Offering:

Diameter (mm)	8 mm to 32 mm
Standard Length	12 mtrs.

Policy from Ministry of Road Transport and Highways:

Use of stainless steel in bridges on National Highways and other centrally sponsored projects to be constructed in marine environment susceptible to severe corrosion.

Policy No. RW/NH-34049/03/2020-S&R (B)



STAINLESS STEEL CABLE TRAYS

THAT LAST LONGEST FOR INFRA SOLUTIONS



Grade:	EN 1.4404	EN 304	EN 204CU	EN 430	EN 316L
Width:	300mm	Thickness	1.2mm	Length	300mm



Corrosion
Resistant

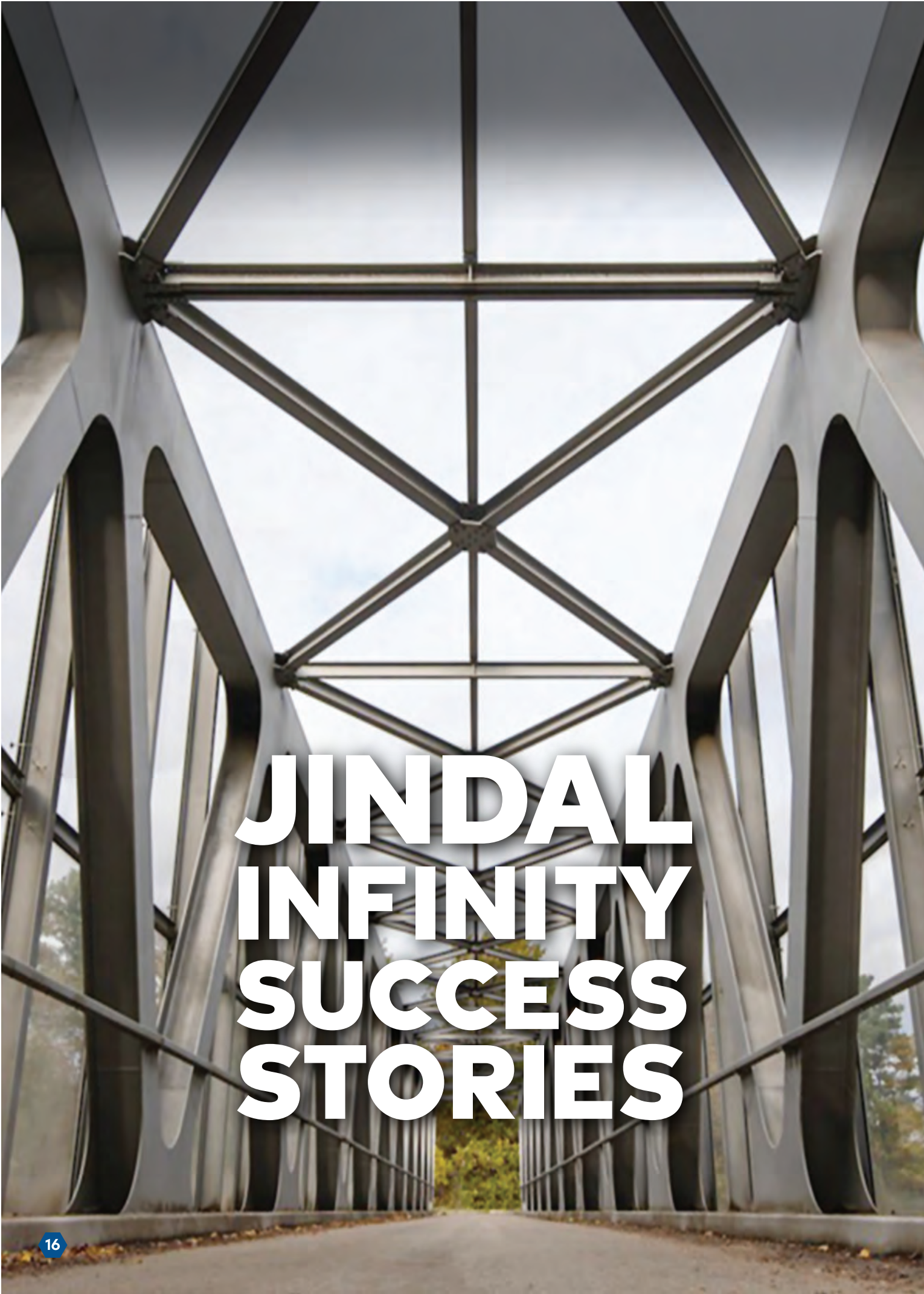


Lowest
Maintenance



Long-Lasting
Strength

*Load test certified by Govt. approved laboratory conforming to IEC 61537



JINDAL INFINITY SUCCESS STORIES

STAINLESS STEEL FOOT OVER BRIDGE

NAUPADA JUNCTION RAILWAY STATION,
WALT AIR DIVISION, EAST COAST RAILWAY

Project Details

Project	Naupada FOB, Waltair Division, East Coast Railway
Contractor	MD Jahageer, Visakhapatnam
Fabricator	Pennar Industries Ltd, Hyderabad
Stainless Steel Supplier	Jindal Stainless Ltd

Stainless Steel used in Project

Grade	Product	Application	Quantity (MT)
IRS350CR	HRAP plates/sheets (6mm to 40mm thickness)	Girders / columns/ hollow sections	116
X2CrNi12	HRAP chequered sheets (3.5mm & 4mm thickness)	Roof deck sheet	15
X2CrNi12	CRAP Sheets (2mm thickness)	Walkway side protective sheeting	4

STAINLESS STEEL FOOT OVER BRIDGE

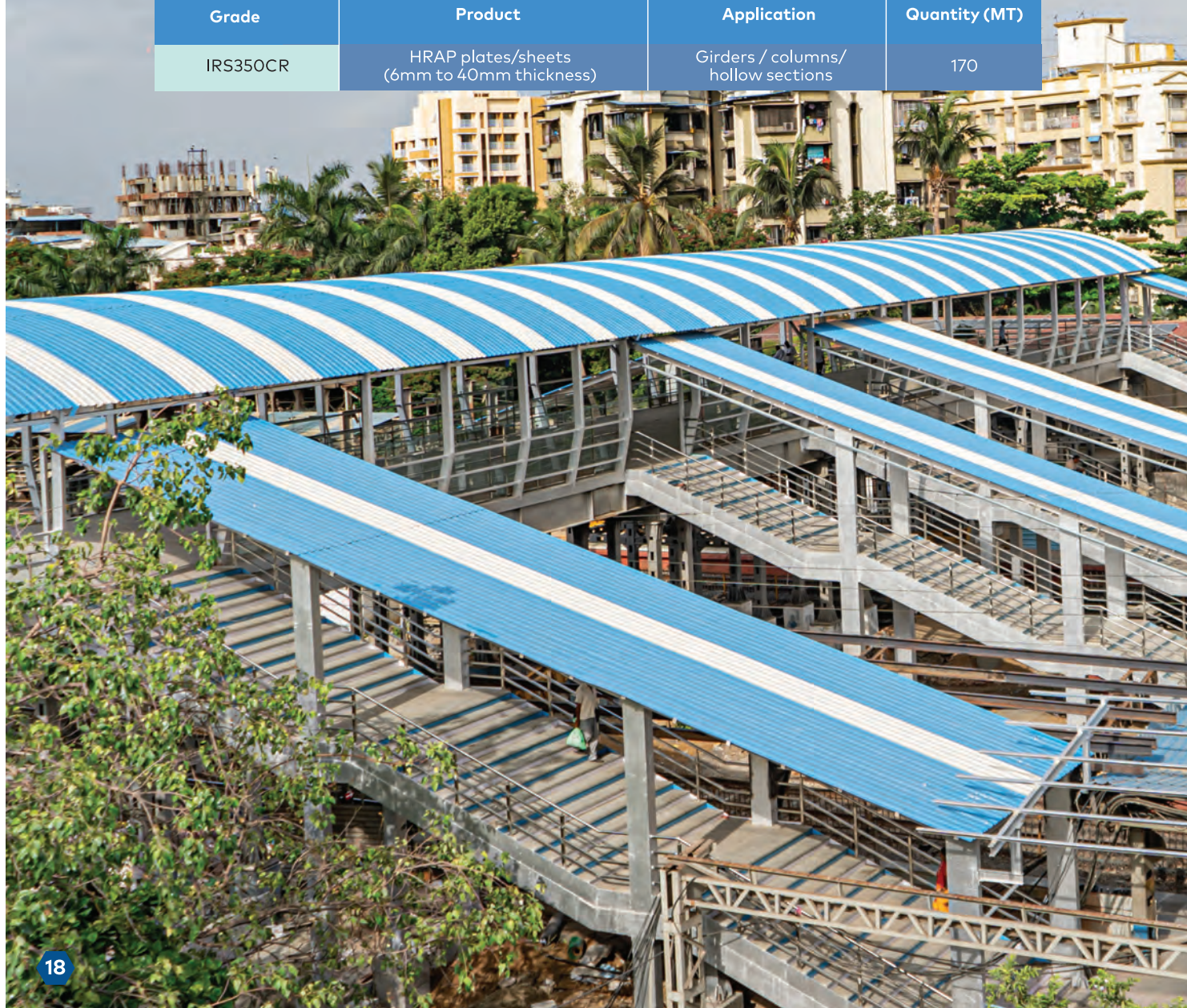
BHAYANDAR RAILWAY STATION, MUMBAI DIVISION, WESTERN RAILWAY

Project Details

Project	Bhayandar FOB, Western Railway
Contractor	Sai Projects Mumbai Pvt Ltd., Mumbai
Fabricator	Sai Projects Mumbai Pvt Ltd., Mumbai
Stainless Steel Supplier	Jindal Stainless Ltd.

Stainless Steel used in Project

Grade	Product	Application	Quantity (MT)
IRS350CR	HRAP plates/sheets (6mm to 40mm thickness)	Girders / columns/ hollow sections	170



STAINLESS STEEL FOOT OVER BRIDGE

SRIKAKULAM ROAD RAILWAY STATION, WALTAIR DIVISION, EAST COAST RAILWAY

Project Details

Project	Srikakulam FOB, Waltair Division, East Coast Railway
Contractor	MD Jahageer, Visakhapatnam
Fabricator	Pennar Industries Ltd, Hyderabad
Stainless Steel Supplier	Jindal Stainless Ltd

Stainless Steel used in Project

Grade	Product	Application	Quantity (MT)
IRS350CR	HRAP plates/sheets (6mm to 40mm thickness)	Girders / ccolumns/ hollow sections	142
X2CrNi12	HRAP chequered sheets (3.5mm & 4mm thickness)	Roof deck sheet	18
X2CrNi12	CRAP sheets (2mm thickness)	Walkway side protective sheeting	5



STAINLESS STEEL VEHICULAR BRIDGE

MRINAL TAI, MUMBAI

Project Details

Project	MCGM (Municipal Corporation of Greater Mumbai)
Contractor	Relcon Infra
Duplex - 2205	450 MT of Stainless steel used
Stainless Steel Supplier	Jindal Stainless Ltd

STAINLESS STEEL

BRIDGES, BUILT TO LAST FOR CENTURIES

HIMALAYA FOOT OVER BRIDGE, MUMBAI

Project Details

Client	MCGM (MUNICIPAL CORPORATION OF GREATER MUMBAI)
Contractor	PINAKEE CONSTRUCTION
IRS -350 CR	116 MT OF STAINLESS STEEL USED
Stainless Steel Supplier	Jindal Stainless Ltd

RAILWAY BOARD CIRCULARS NOTIFICATIONS - SS FOB AND ROB

राजकीय 58
01/7/19

S.No-81

Rajeev Verma
राजीव वर्मा
Executive Director/B&S
कार्यकारी निदेशक/पुल एवं संरचना



भारत सरकार - रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ - 226011
Government of India Ministry of Railways
Research Designs & Standards Organisation
Lucknow-226011
Rly. : 032-42120 Phone / Fax : 0522-2450398
Email : edb@rdso@gmail.com

No. CBS/FOB

Dated: 01/07/2019

EDCE/B&S
Railway Board
Rail Bhawan
New Delhi

Sub: Stainless steel for structural application.

Ref: (i) Railway Board letter no. 2012/CE-II/BR/Presentation dated 10/05/2019.
(ii) Priorities Initiatives for financial year 2019-20 issued vide CRB Note No. 2019/E&R 10/10/7 dated 30/04/2019.

In reference to subject matter, Indian stainless steel development association made a presentation in Railway Board on 13/05/2019. The presentation was attended by Railway Board officials including PED/Bridges, EDCE/B&S/Railway Board, ED/B&S/RDSO, Director/CE-I& II/B&S, Railway Board, CBE/Northern Railway and officials from Northern Railway.

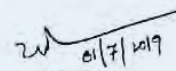
The key point noted from the presentation are as under:

1. The stainless steel is advantageous over the carbon steel and it is being used in many of the bridges all over the world due to its higher yield strength, corrosion resistance property and aesthetic appeal. It is an ideal material for bridges in high chloride exposures i.e. coastal areas as compared to carbon steel as the carbon steel has a high corrosion rate. In such conditions, stainless steel provides sufficient corrosion protection with lower maintenance during its design life.
2. The main advantages are;
 - (i) Resistance to Corrosion leads to very low maintenance.
 - (ii) Strength & Durability.
 - (iii) Sustainable-helps in reducing carbon foot print.
 - (iv) Though the initial cost increase is 20-25% over existing carbon steel, however, saving over service life of 60 years is 40%.
 - (v) Weight reduction due to higher yield strength leading to light weight design.

It was concluded by PED/Bridges that Indian Railways can go for field trial for FOBs manufactured using stainless steel. Further, Vide ref (ii) above, i.e. Priorities 30.04.2019, the possibility of use of stainless steel girder (FOB) in corrosion prone area is also to be examined.

In view of above, it is proposed that field trials may be ordered for four FOBs of stainless steel on Central Railway, Southern Railway, South Eastern Railway and East Coast Railway.

Railway Board is requested to consider the matter suitably.


(Rajeev Verma)
Executive Director/B&S

G/

Emailed on date.

C.N.S.

Rajeev Verma
राजीव वर्मा
Executive Director/B&S
कार्यकारी निदेशक/पुल एवं संरचना



भारत सरकार - रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
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Government of India-Ministry of Railways
Research Designs & Standards Organisation
Lucknow-226011
Rly. : 032-42120 Phone / Fax : 0522-2450398
Email : edbsrdso@gmail.com

No. CBS/Stainless Steel FOB

Dated: 04/07/2019

EDCE/B&S
Railway Board
Rail Bhawan
New Delhi.

Sub: Stainless steel for structural application.

Ref: This office letter no. CBS/FOB dated 01/07/2019.

In continuation to this office letter above, the following additional information is furnished below as discussed on date:

The design of stainless steel FOBs shall be done by Zonal Railways through reputed consultants and got proof checked from IITs. Thereafter, the duly proof checked design and drawings should be sent to RDSO for clearance. The design basis is attached at Annexure - I which has already been given to Western Railway vide this office letter dated 27/06/19. The general configuration of FOBs should be as per the RDSO standard drawing of FOB.

DA: As above.

24/07/19
(Rajeev Verma)
Executive Director/B&S

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(RAILWAY BOARD)

No. 2017/50/CE-III/BR/FOB

New Delhi, dt : 09.07.2019

Principal Chief Engineers
CR, ECoR, NR, SR, SER & WR

Instruction No.23/2019

Sub: Stainless Steel for Structural Application.

Ref: i) RDSO's letter no. CBS/FOB dt. 01.07.19
ii) RDSO's letter no. CBS/Stainless Steel FOB dt. 04.07.19

RDSO, vide letters referred (i) & (ii) above, proposed that Stainless Steel girder for FOB in corrosion prone area is useful and provide sufficient corrosion protection with lower maintenance. With a view to use of Modern Construction Techniques for longer life of structures, the following have been decided:

- Use of Stainless Steel will be carried out in CR, ECoR, NR, SR and SER for FOBs. In addition, WR is already using the same in one FOB.
- Each zone will select two FOBs — one FOB by Open Line and one by Construction Organization preferably (Targeted to be completed during 2019-20). CBE of the Zonal Railways will decide the FOBs depending upon the corrosion proneness of the area and will ensure that Stainless Steel girder issued for FOBs at most corrosive part of concerned Zonal Railways.
- Design of Stainless Steel FOBs shall be done by the Zonal Railways through reputed consultants and got proof checked from IITs. RDSO will finally approve the design.
- RDSO will be actively associated in the above and will provide all assistance to the Zonal Railways concerned with design.
- The above may be executed, by the concerned Zonal Railways, out of the available sanctions (of works) for the current Financial Year.

This item is in the list of priority initiative of Railway Board. Therefore, it should be completed at the earliest and monthly progress should be submitted to Board regularly.

This issues with the approval of Board (ME).

09/7/19
(O. N. Sharma)
Director Civil Engineering/ B&S
Railway Board
Email: dcebsrb@gmail.com

Copy, for information and necessary action to:

- CAO/Cs, CR, ECoR, NR, SR, SER & WR
- CBEs/ CR, ECoR, NR, SR, SER & WR
- ED/B&S, RDSO, Lucknow

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(RAILWAY BOARD)

Instructions No. 31/2019

No.2017/50/CE-III/BR/FOB

New Delhi Dt: 04.11.2019

Principal Chief Engineers
Central Railway, Mumbai
Western Railway, Mumbai

Sub: Stainless Steel for Structural Application.

- Ref: (i) This office of even letter no. dated 09.07.2019.
(ii) ED/B&S/RDSO's letter no. CBS/Stainless Steel/FOB dt. 30.08.2019, 03.09.2019 & 22.10.2019.

Vide this officer letter referred (i) above, use of stainless steel for construction of FOB was permitted in some of the Zonal Railways including CR & WR. Further, RDSO vide letters referred (ii) above, proposed that stainless steel for ROB in corrosion prone area is useful and provide sufficient corrosion protection with lower maintenance. With a view to use of Modern Construction Techniques for longer life of structures, following have been decided:

- Use of stainless steel will be carried out in CR & WR for ROB.
 - Both the Railways will select one ROB of each design such as plate girder composite type with concrete deck on top, through girder type (truss type) and new design of multi cell box girder (pre-fabricated).
 - CBE of the Zonal Railways will decide the ROB depending upon the corrosion proneness of the area and will ensure that stainless steel for ROB are used at most corrosive part of concerned Zonal Railways.
 - Design of Stainless steel ROB shall be done by the Zonal Railways through reputed consultants and got proof checked from IITs. RDSO will finally approve the design.
 - Fabrication & inspection of these girders (ROBs) shall be governed as per Railways Board letter no. 2016/54/CE-III/BR/RDSO/Misc, dated 15.07.2019.
 - RDSO will be actively associated in the above and will provide all assistance to Zonal Railways concerned with design (as in 'd' above).
 - The above may be executed, by the concerned Zonal Railways, out of the available sanctions (of works).
- Zonal Railways are advised to take action at the earliest and monthly progress should be submitted to Board regularly.

This issues with the approval of Board(ME).


(O. N. Sharma)
Director Civil Engineering/B&S
Railway Board
Email: dcebrsb@gmail.com

Copy, for information and necessary action to:

- CAO/Cs, CR & WR
- CBEs, CR & WR
- ED/B&S/RDSO, Lucknow

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(RAILWAY BOARD)

No.2017/50/CE-III/BR/FOB

New Delhi, Date: 30.07.2020

Director General,
RDSO
Manak Nagar, Lucknow

Sub: Stainless Steel for Structural Application.

- Ref: (i) Board's letter No. 2017/50/CE-III/BR/FOB dated 09.07.2019
(ii) Minutes and Recommendations of PCEs Seminar issued by Director IRICEN letter No. 151/20307 dated 25.06.2020

In PCEs conference held on 19th and 20th June-2020 the issue of development of specification and standard drawings for various standard span configuration of stainless steel FOB was decided as under:

"FOB constructed using stainless steel structural members are aesthetically beautiful and having more resistance of corrosion. Hence, it is proposed to execute all new FOBs, duly adopting stainless steel structural members. Specifications and drawings for various standard span configurations need to be issued for execution of FOB, using stainless steel structural members."

In view of above, RDSO is requested to issue specifications and standard drawings for various configurations in next 3 months, which will be used by zonal railways in corrosion prone areas. Progress made in this regard should be submitted to Board every month.


30/7/2020
(O. N. Sharma)
Dir. CE/B&S

Copy to:

Principal Chief Engineer/All Zonal Railways - for information.
ED(B&S)Steel/RDSO - for necessary action.

RAILWAY BOARD - SS REBAR

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
RAILWAY BOARD

No. 2018/06/CE-III/BR/Stainless Steel

New Delhi, dt. 02.05.18

Principal Chief Engineers,
All Zonal Railways.

Chief Administrative Officers (Construction)
All Zonal Railways.

209

Sub: Use of Stainless steel reinforcement in various structures.

Ref: i) Board's letter no. 2016/4/CE-III/BR/BSC/84 Seminar dt. 28.07.17
ii) Board's letter no. 2017/51/CE-III/BR/CRB dt. 03.11.17
III) A&C slip – 6 dt. 27.07.17 of IRS Concrete Bridge Code

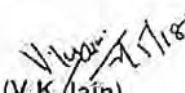
Vide reference above, instructions have been issued that stainless steel reinforcement conforming to IS 16651:2017 may be used in corrosion prone structures to prevent corrosion and ensure overall durability of structure. In continuation of same, a committee of SAG level officers was constituted by Board for specifying the corrosion prone structures where stainless steel reinforcement can be used and to also deliberate on cost implications. A copy of the committee's report is enclosed herewith.

2.0 Based on the recommendations of the aforesaid committee, Board (ME) has decided that Stainless steel reinforcement bars (Grade G (410L)- Ferritic conforming to IS 16651:2017) to be used for the following structures:

- Bridges in coastal area (up to 30 kms from coast): Railway bridges, FOB, ROB/RUB, Rail Flyover/Metro, Mono Rail crossings.
- Tunnels in coastal areas.
- C & W and Loco inspection pits, catwalks, washing aprons & water tanks at all places.
- Any other structure located in extremely adverse environmental conditions or where frequent inspection is not possible even if it is away from coastal area after due justification & with the personal approval of PCE.

The necessary action may be taken accordingly under intimation to Board.

DA: As Above


(V.K. Jain)
Director CE/B&S
Railway Board

Copy for information and necessary action to:

1. Director General/RDSO
2. CMD/RVNL, IRCON, RITES, New Delhi
3. CMD/KRCL, MRVC, Mumbai
4. ED/MTP, Railway Board

MINISTRY OF ROAD TRANSPORTATION & HIGHWAY - SS REBAR



RW/NH-34049/03/2020-S&R (B)
GOVERNMENT OF INDIA
MINISTRY OF ROAD TRANSPORT & HIGHWAYS
S&R -(Bridges)
Transport Bhawan, 1, Parliament Street, New Delhi-110001

Dated: 22.01.2021

To,

1. The Chief Secretaries of all the State Governments / UTs.
2. The Principal Secretaries / Secretaries of all States / UTs Public Works Department dealing with National Highways, other Centrally sponsored schemes.
3. The Engineers-in-Chief and Chief Engineers of Public Works Department of States/UTs dealing with National Highways, other Centrally sponsored schemes.
4. The Director General (Border Roads), Seema Sadak Bhavan, Ring Road, Delhi 110010.
5. The Chairman, National Highways Authority of India, Plot G-5 & 6, Sector-10, Dwarka, New Delhi 110075.
6. The Managing Director, NHIDCL, PTI Building, Parliament Street, New Delhi 110001.

Sub: Use of Stainless Steel in Bridges on National Highways and other centrally sponsored Projects to be constructed in marine Environment Susceptible to Severe Corrosion.

Sir,

Ministry vide circular No RW/NH/34041/44/91-S&R dated 14th March, 2000 prescribed use of Fusion Bonded Epoxy Coated Reinforcement in Bridges on National Highways and other centrally sponsored Bridge Projects in Marine Environment as detailed thereto. The various specifications, conditions etc. for use of Fusion Bonded Epoxy Coated Reinforcement have also been stipulated in the above said circular.

2. The instructions given hereby are now in supersession of the above circular in light of the further experience/knowledge gained and modifications/evolution of new standards/specifications.
3. It has been decided that the stainless steel conforming to the requirement stipulated in IS:16651:2017 shall be used for reinforced concrete bridges (superstructure and substructure) on National Highways located in Extreme Environment Exposure as defined in IRC:112:2020. In locations, where it is difficult to ascertain the environment exposure condition, a zone within 15 km from the sea or creek shall be considered as Extreme Environment.
4. The contents of this Circular may please be brought to the notice of all the Concerned in your Organization for strict implementation. This circular will be implemented from the date of its issuance.
5. This issues with the approval of the Competent Authority.

Yours faithfully,

(Jitendra Kumar),
Superintending Engineer, S&R - (Bridges),
For Director General (Road Development) & SS.

Copy to:

1. All Technical Officers in the Ministry of Road Transport & Highways.
2. All Joint Secretaries in the Ministry of Road Transport & Highways.
3. All ROs & ELOs of the Ministry of Road Transport & Highways.
4. The Secretary General, Indian Roads Congress.
5. The Director, IAHE, Noida
6. Technical circular file of S&R (B) Section.
7. NIC for uploading on Ministry's website under "what's new".

Copy for kind information to:

1. PS to Hon'ble Minister (RT&H, MS&ME) / PS to Hon'ble MOS (RT&H).
2. Sr. PPS to Secretary (RT&H).
3. PPS to DG (RD) & SS.
4. PPS to AS & FA/ADG-I/ADG II/ ADG III/ ADG IV

***** End *****

ADOPTION OF PRINCIPLES OF LIFECYCLE COST (LCC) ANALYSIS

No.F.1/37/2018-PPD
Government of India
Ministry of Finance
Department of Expenditure
Procurement Policy Division

512, Lok Nayak Bhavan,
New Delhi. Dated 2nd January, 2019

OFFICE MEMORANDUM

Subject :- Adoption of principles of Life Cycle Cost (LCC) Analysis.

Attention is invited to Rule 136(1)(iii) of GFR 2017 wherein it has been provided that no work shall be commenced or liability incurred in connection with it until a properly detailed design has been sanctioned; while designing the projects etc. principles of Life Cycle cost (LCC) may also be considered. It has been brought to the notice of this department by Ministry of Steel that the principles of LCC are not being adopted while preparing Detailed Project Report (DPR) or at the time of finalization of the tender terms. In this regard, it is again advised that provisions of GFR relating to LCC may be considered while designing the projects. Consulting engineers/ structural engineers/ metallurgists may be consulted wherever considered appropriate.


(K Narayana Reddy)

Under Secretary to the Govt. of India
Tel.: 24621305
Email: kn.reddy@gov.in

To,

Secretaries of All Central Government Ministries/ Departments

STAINLESS STEEL USAGE IN ARCHITECTURE, BUILDING & CONSTRUCTION

Claddings



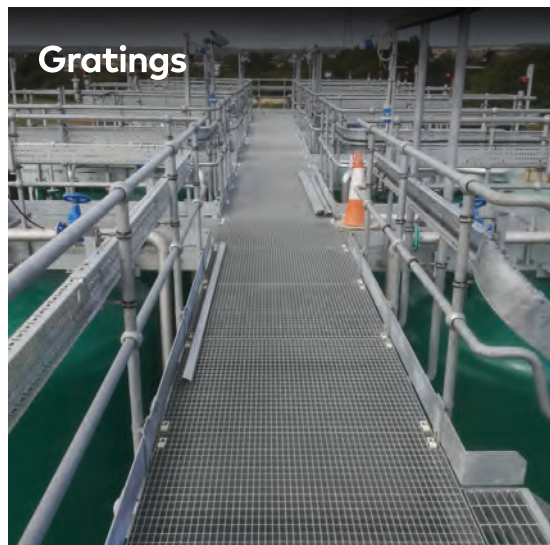
Roof Sheets



Facades



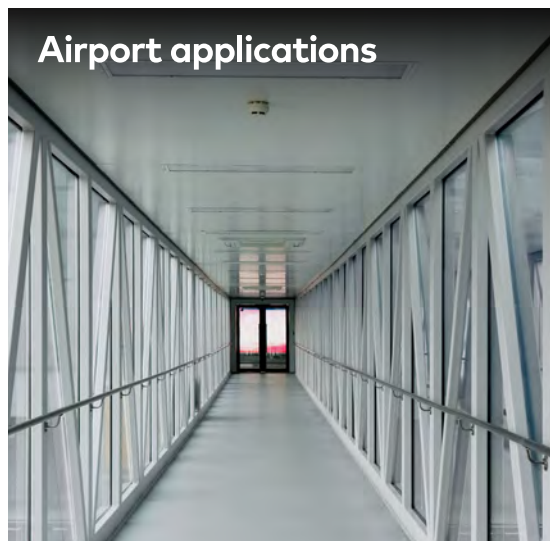
Gratings



Furniture



Airport applications



STAINLESS STEEL USAGE IN ARCHITECTURE, BUILDING & CONSTRUCTION



STAINLESS STEEL USAGE IN ARCHITECTURE, BUILDING & CONSTRUCTION



STAINLESS STEEL USAGE IN ARCHITECTURE, BUILDING & CONSTRUCTION



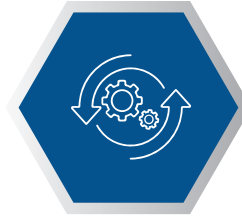
EDGE AHEAD WITH THE JSL EDGE



Regular Supplier
to Railways



Approved by
RDSO



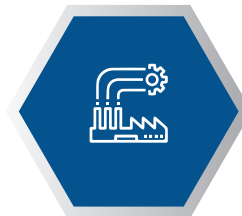
Wide
Manufacturing Range



State of the
Art Technology



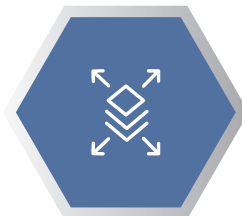
Largest
SS Manufacturer



Fully
Integrated Plant



Socially
Responsible Company



Flexibility :
50 MT Heat



Wide
Marketing Network



Environment
Friendly Company



Indian Railways'
Most Trusted
Fabrication Partner



Chain of
Service Centres



NOTES

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NOTES

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