LEAST CO_2 FOOTPRINT

JSL JINDAL STAINLESS | JINDAL INFINITY STAINLESS STEEL REBARS

JINDAL INFINITY
STAINLESS STEEL REBARS
THAT LAST FOR CENTURIES

SUPERIOR CORROSION RESISTANCE

LOW LIFECYCLE COST

DURABLE

SUSTAINABLE CHOICE

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 3 MTPA and an annual turnover of (40,182 cr. as on March 2025)/ 4.6 Billion USD.

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 to social responsibility.

PRODUCT SPECIFICATIONS

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/mm²	500	550	600	650
2	Percentage elongation after fracture (A_5), Min, on gauge length 5.65√A	16	14.5	10	10
3	Tensile strength (Rm), Min, N/mm²	10% more than the actual 0.2 percent proof stress but not less than 565 MPa	10% more than the actual 0.2 percent proof stress but not less than 600 MPa	10% more than the actual 0.2 percent proof stress but not less than 660 MPa	10% more than the actual 0.2 percent proof stress but not less than 715 MPa
4	Percentage total elongation at Maximum force (Agt), Min, on gauge length 5.65√A	5	5	5	5

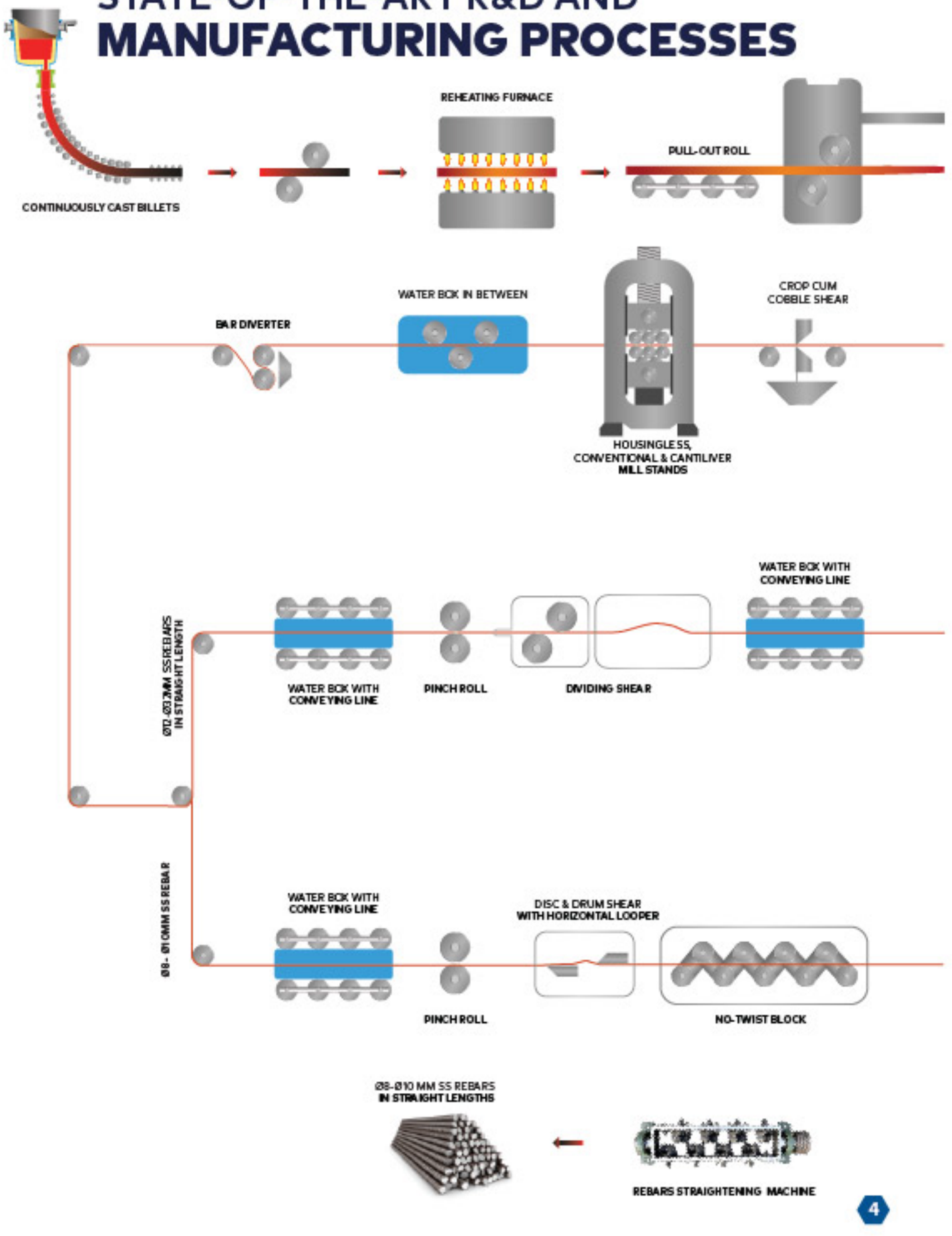
SS600 CAN BE DEVELOPED WITH ENHANCED ELONGATION OF 14.5% UPON CUSTOMER REQUIREMENT.

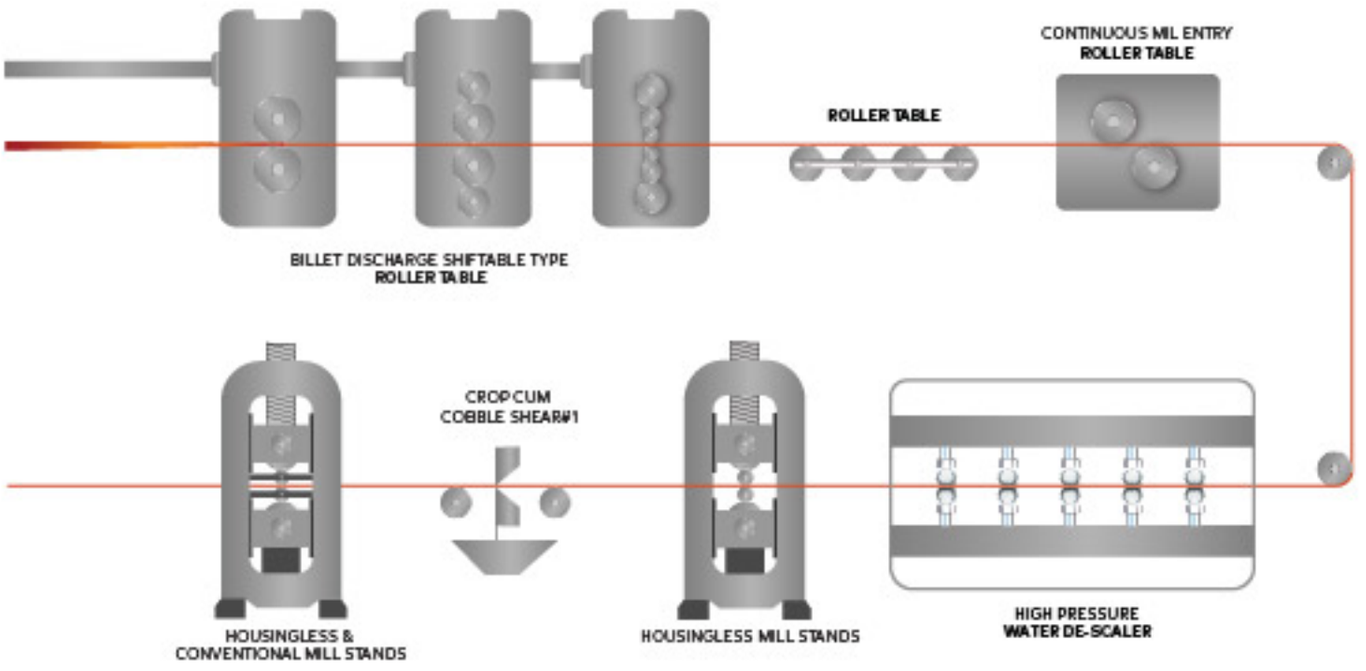
Product Offering:

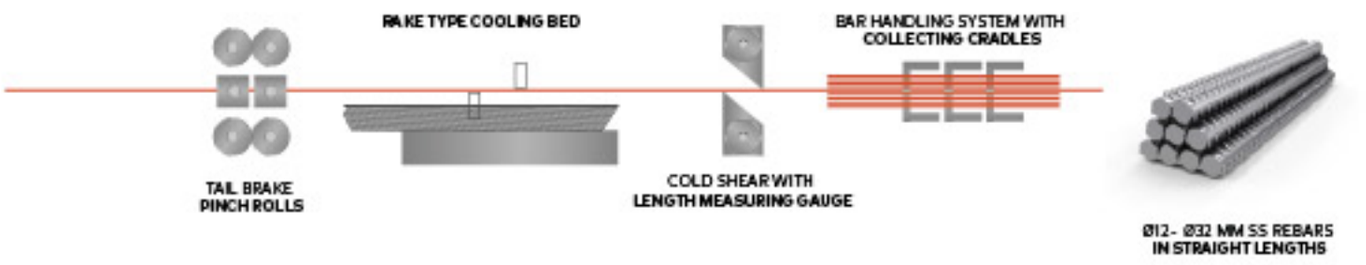
Diameter (mm)	8 mm to 32 mm
Standard Length	12 mtrs.

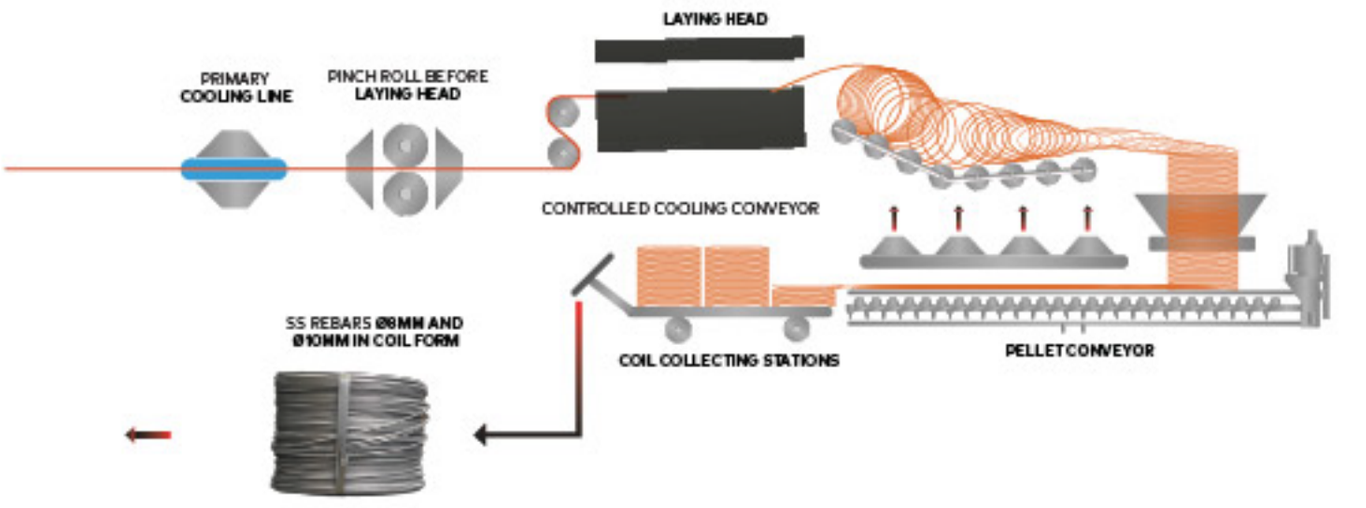
PLANT CAPACITY – 1,80,000TPA

STATE-OF-THE-ART R&D AND
MANUFACTURING PROCESSES




CONTINUOUS MIL ENTRY
ROLLER TABLE
ROLLER TABLE
BILLET DISCHARGE SHIFTABLE TYPE
ROLLER TABLE
CROP CUM
COBBLE SHEAR#1
HOUSINGLESS &
CONVENTIONAL MILL STANDS
HOUSINGLESS MILL STANDS
HIGH PRESSURE
WATER DE-SCALER


RAKE TYPE COOLING BED
BAR HANDLING SYSTEM WITH
COLLECTING CRADLES
TAIL BRAKE
PINCH ROLLS
COLD SHEAR WITH
LENGTH MEASURING GAUGE
Ø12- Ø32 MM SS REBARS
IN STRAIGHT LENGTHS


LAYING HEAD
PRIMARY
COOLING LINE
PINCH ROLL BEFORE
LAYING HEAD
CONTROLLED COOLING CONVEYOR
SS REBARS Ø8MM AND
Ø10MM IN COIL FORM
COIL COLLECTING STATIONS
PELLET CONVEYOR

NEED FOR
STAINLESS STEEL REBARS

Stainless steel rebars play a pivotal role in modern construction owing to their exceptional corrosion resistance and durability. Unlike conventional carbon steel rebars, stainless steel rebars offer extended service life in structures exposed to corrosive environments such as marine settings, chemical plants and infrastructure in coastal areas. Real estate buildings in metropolitan cities exposed to corrosive air pollutants where Stainless Steel Rebars also play critical role in underground structures where water table is high or soil has presence of chlorides. Their resistance to rust and corrosion helps maintain the structural integrity of buildings and bridges over time, significantly reducing maintenance costs and the need for frequent repairs. These rebars contribute to enhanced safety and reliability in construction, ensuring structures remain robust and stable for longer periods while minimizing environmental impact through their recyclability, making them a sustainable choice for infrastructure development worldwide.

KEY ADVANTAGES OF STAINLESS STEEL REBARS:

CORROSION RESISTANCE
Stainless steel rebars have a high concentration of chromium which forms a chromium oxide layer on the surface of the steel that prevents corrosion. This layer is extremely thin, only a few nanometer thick, but it is highly effective in protecting the underlying metal from further corrosion. It is highly resistant to corrosion from chloride ion which makes it ideal for use in environments exposed to moisture, chlorides and other corrosive agents.

HIGH STRENGTH & GOOD WELDABILITY
Stainless steel 410L grade rebars exhibit higher ultimate tensile strength. They also have good weldability due to low carbon content (i.e., 0.03% max), making them easier to work with during construction without compromising structural integrity.

DUCTILITY
The ductility of stainless steel rebars is very good and it comes from its unique chemical composition. With superior corrosion resistance and ductility, these rebars are perfect fit for bridges, seismic zones etc.

FIRE RESISTANCE
Stainless steel rebars perform better at high temperatures as compared to conventional rebars. They show better fire resistance at elevated temperatures (above 500°C) due to their high strength retention factor.

COST EFFECTIVE & SUSTAINABLE
Stainless steel reinforcement reduces maintenance and repair of structure, thus leading to a longer lifespan and lower life cycle costing. They are also 100% recyclable making them a sustainable choice for reinforcement.

OTHER ADVANTAGES
Concrete sealant, such as Silane, can be eliminated.

WHY USE STAINLESS STEEL **REINFORCEMENT BARS**

Higher Critical Chloride threshold value

Corrosion tests of reinforced beams with chloride exposure have been carried out in the laboratory of the University of Applied Sciences, Department of Civil Engineering, Munich, Germany. The results of the investigation shows average critical chloride content for 1.4003 (Indian equivalent 410L) is upto 4 times higher than B500B (Indian equivalent Fe500).

Average critical chloride content %/binder by mass

	B500B	1.4003 without mill scale
	Average critical chloride content %b by mass	
CEM I	1.25	4.90
CEM II	1.76	5.97

Excellent corrosion resistance

Pitting Resistance equivalent Number (PREN value) is a numerical tool used to estimate material's resistance to pitting corrosion.

PREN = %Cr + 3.3%Mo + 16%N. (PREN value is directly proportional to the % of Chromium content)

In Stainless Steel, %Chromium is minimum 10.5% while the same is not available in other reinforcement bars.

Stainless steel Rebar possess self-healing properties and no coating is thus required.

Earthquake resistant

Jindal Infinity Rebars are characterized by higher TS/YS Ratio due to which they are capable of absorbing more energy when stressed beyond yielding point. This feature makes rebar resist ultimate failure and provide higher safety to structures during an earthquake.

Higher Yield Strength of 600 with min. elongation of 14.5%

This unique combination can provided savings upto 6-10% due to reduction in rebar consumption, labor cost and construction time. This special and unique combination can be supplied upon mutual agreement.

Higher fire resistance

Stainless steel inherently possess higher resistance to fire at elevated temperatures as compared to carbon steel, thus provides enhanced safety to reinforcement structures.

Reduced Concrete cover

With Stainless steel reinforcement, concrete cover can be reduced by upto 10mm, as per IRC:112-2011 guidelines. As per British standard, cover can be reduced to 30mm where stainless steel reinforcement is used irrespective of the concrete quality or exposure condition.

USAGE OF
STAINLESS STEEL REBARS IN INDIA

There exists a diverse array of stainless steel alloy options for choosing rebars, designed to fulfill specific mechanical design requirements and anticipated environmental corrosiveness. Stainless steels encompasses primarily five main groups: Austenitic, Ferritic, Duplex, Martensitic, and Precipitation-hardened steels. The selection of SS REBAR GRADE G Stainless Steel as a preferred material depends on various factors, including its corrosion resistance, expected longevity and life cycle cost, ensuring it aligns well with the intended application and structural demands.

SS REBAR GRADE - G(410L) Confirming to IS 16651:2017 is currently used by different Govt. bodies in India including :

- **INDIAN RAILWAYS**
- **NHAI**
- **PWDs**
- **MMRDA**
- **MCGM**
- **MRIDCL**
- **NHSRCL**
- **MRVC**
- **RLDA**
- **NHIDCL**

STAINLESS STEEL REBAR GRADE - Confirming to IS 16651:2017, have strengthened various Iconic projects in India including:

- **CSMT Railway station & Buildings.**
- **MAHSR - Mumbai - Ahmedabad High Speed Rail Corridor**
- **RDSO – High Speed Rail Test Track**
- **Statue of Oneness (Adi Shankaracharya)**
- **Pamban Bridge**
- **Dr. Balasaheb Ambedkar Memorial and many more**
- **Whiteland Residences by Whiteland, Gurgaon**
- **NESCO project, Mumbai**
- **VJTI Hostel, Mumbai**
- **Shivaji Maharaj Statue, Maharashtra**

RAILWAY BOARD CIRCULAR FOR STAINLESS STEEL REBARS

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.

2.05

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 (MORTH) POLICY FOR STAINLESS STEEL REBARS

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.

P.T.O

APPLICATION AREAS OF
STAINLESS STEEL REBARS IN REAL ESTATE BUILDINGS

Diaphragm Wall/Retaining wall

Diaphragm walls are versatile structures used for retaining soil and ground water during excavation and acts as a barrier, thereby supporting foundation of buildings. D-wall is constructed from reinforced concrete, which is susceptible to corrosion of steel reinforcement when exposed to aggressive environments like coastal areas or locations with high and contaminated water table or having presence of chlorides and sulphates.

Corrosion in Diaphragm wall is a serious concern as it reduces wall's load bearing capacity and overall stability. Stainless steel reinforcement is thus strongly recommended in this critical application.

Pile foundation

Pile foundations are critical for transferring structural loads to deeper, stable soil layers, often in aggressive or corrosive environments such as coastal, marine, or industrial areas. Stainless steel rebars provide unmatched corrosion resistance, ensuring the structural integrity of piles over extended periods. Unlike traditional rebars, stainless steel eliminates premature deterioration caused by chloride or chemical exposure, significantly reducing maintenance and repair needs. Using stainless steel rebars in pile foundations ensures durability, safety, and sustainability, making it a smart investment for long-lasting, resilient infrastructure.

Raft Foundation

Raft foundations demand exceptional strength, durability, and corrosion resistance due to their extensive ground contact and load-bearing role. Stainless steel rebars are an ideal choice for such applications, offering superior corrosion resistance, especially in aggressive environments. By choosing stainless steel rebars for raft foundations, engineers invest in sustainable, long-lasting, and cost-effective infrastructure solutions that stand the test of time.

Columns and beams

Stainless steel rebar posses better ductility than conventional steel rebar, hence they are recommended for entire building superstructure including columns and beams as higher TS/YS ratio of stainless steel makes it suitable for construction in seismic areas.

Additionally,

- Corrosive air pollutants like PM 2.5 and PM10 can affect the health of the building, special outer columns and exterior walls.
- Carbonation induced corrosion is a major problem in metropolitan cities owing to urban infrastructure development, increased mobility and increasing pollution rate.
- Chloride induced corrosion is a major concern with buildings in coastal cities due to presence of air borne chlorides. In all such situations, Stainless steel rebars outshines other reinforcement solutions and becomes the material of choice for modern construction having excellent corrosion resistive properties.

Sewage Treatment plant (STP)

Sewage treatment plant in building processes wastewater to remove contaminants and pollutants, producing treated water fit for reuse. Such facility made of reinforced concrete is exposed to aggressive elements and environment, thus demands enhanced corrosion resistive reinforcement. Stainless steel engineered with higher chromium content perfectly addresses this concern in building projects.

STRONGLY RECOMMENDED FOR USE AT CRITICAL AREAS LIKE:

- D-wall and Foundation with high water table or wetlands
- Foundation work where Soil or water has high chlorides and chemical exposures
- Buildings in Seismic areas requiring enhanced elongation TS/YS ratio
- External Columns and walls of building structures in coastal cities
- Buildings columns exposed to carbonation induced corrosion due to high pollution

MYTH BUSTERS:

- Stainless Steel Rebar possess equivalent concrete bond strength similar to conventional TMT bars, no special treatment is required
- Like conventional reinforcing steel, no special handling on construction sites is required
- Stainless steel alloy composition makes it super ductile and hence it is not brittle at all. Low carbon content makes Stainless steel rebar ideal for use in construction, bending and welding workmanship.

APPLICATION AREAS OF **STAINLESS STEEL REBARS IN INFRASTRUCTURE**

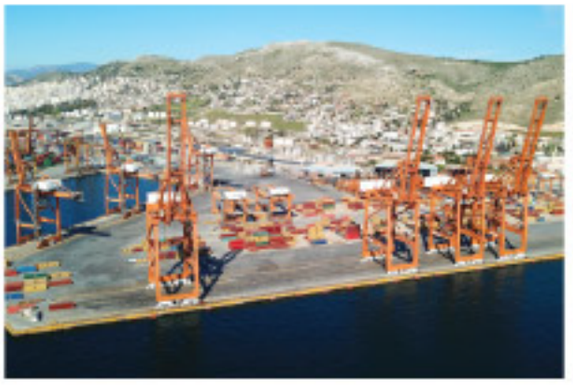
HIGHWAY INFRASTRUCTURE

Stainless steel reinforcement finds application in highway infrastructure where corrosion could lead to early degradation of the road system, potentially causing significant economic consequences for the local community. Utilizing stainless steel allows the builder to essentially complete the construction efficiently, avoid subsequent repairs, and ensure long-term durability. Employing stainless steel reinforcement substantially extends the useful lifespan of the infrastructure, minimizing the need for frequent repairs or replacements.

- **BRIDGE STRUCTURE ELEMENTS**
- **DECK PANELS**
- **BARRIER WALLS AND CURBS**
- **SIDEWALKS AND MEDIANS**
- **DECK JOINT BLOCKOUTS**
- **ABUTMENTS, ROOF SLABS, APPROACH SLABS AND WING WALLS**
- **BRIDGE PIERS AND PIER CAPS**
- **BARS PROJECTING FROM PRECAS**
- **ANCHORING SYSTEMS**
- **TUNNELS**
- **ALL OTHER CHLORIDE SPLASH ZONES**
- **HIGHWAY ELEMENTS**
- **LOAD TRANSFER DOWELS**
- **CONCRETE PAVEMENTS**

MARINE INFRASTRUCTURE

Stainless steel reinforcing is used for structures in a marine environment where corrosion could be an acute design challenge. By using stainless steel reinforcing, the useful life of marine structures is dramatically increased.



- **MARINE STRUCTURES**
- **COASTAL BRIDGES**
- **PIERS**
- **WHARVES**
- **TUNNELS**

OTHER
APPLICATIONS

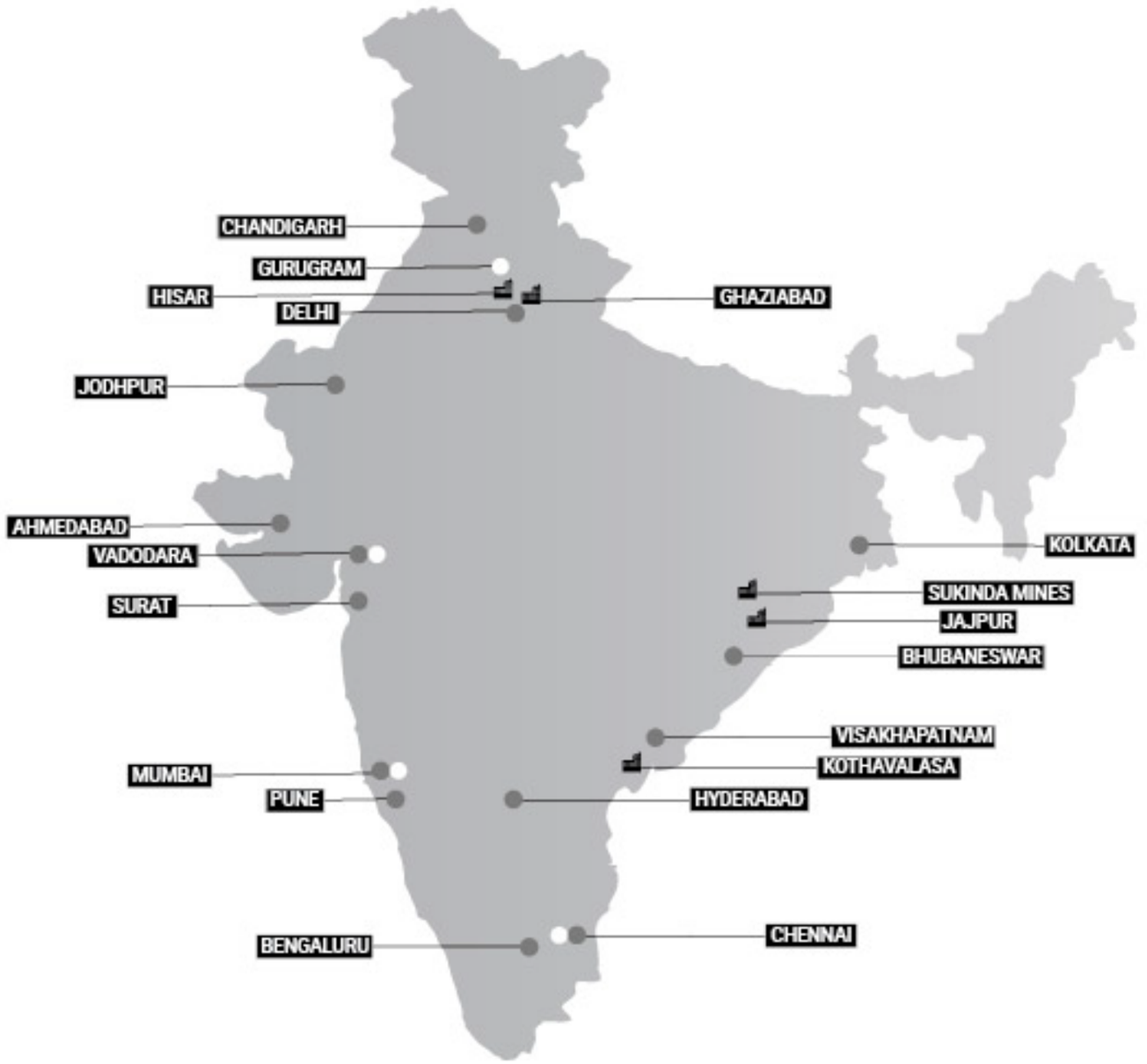
BRIDGES	DAMS	RAILWAY WASHING LINES
SEA WALLS	NUCLEAR WASTE STORAGE TANKS	DOCKYARDS
WASTE WATER TANKS	HIGH RISE BUILDINGS	RESIDENTIAL VILLAS








DOMESTIC NETWORK



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STAINLESS STEEL REBARS

CONTACT FOR ADVISORY/ ENQUIRIES:

Rohit Sahni - 99589 09292
Jaya Chawla - 99999 18534
Kunj Gupta - 80542 28667

Group Email ID - jsl.rebars@jindalstainless.com
Website: www.jindalstainless.com

FOR SPONSORSHIP & EVENTS
pranjali.singh@jindalstainless.com