

**TATA STEEL**

#WeAlsoMakeTomorrow

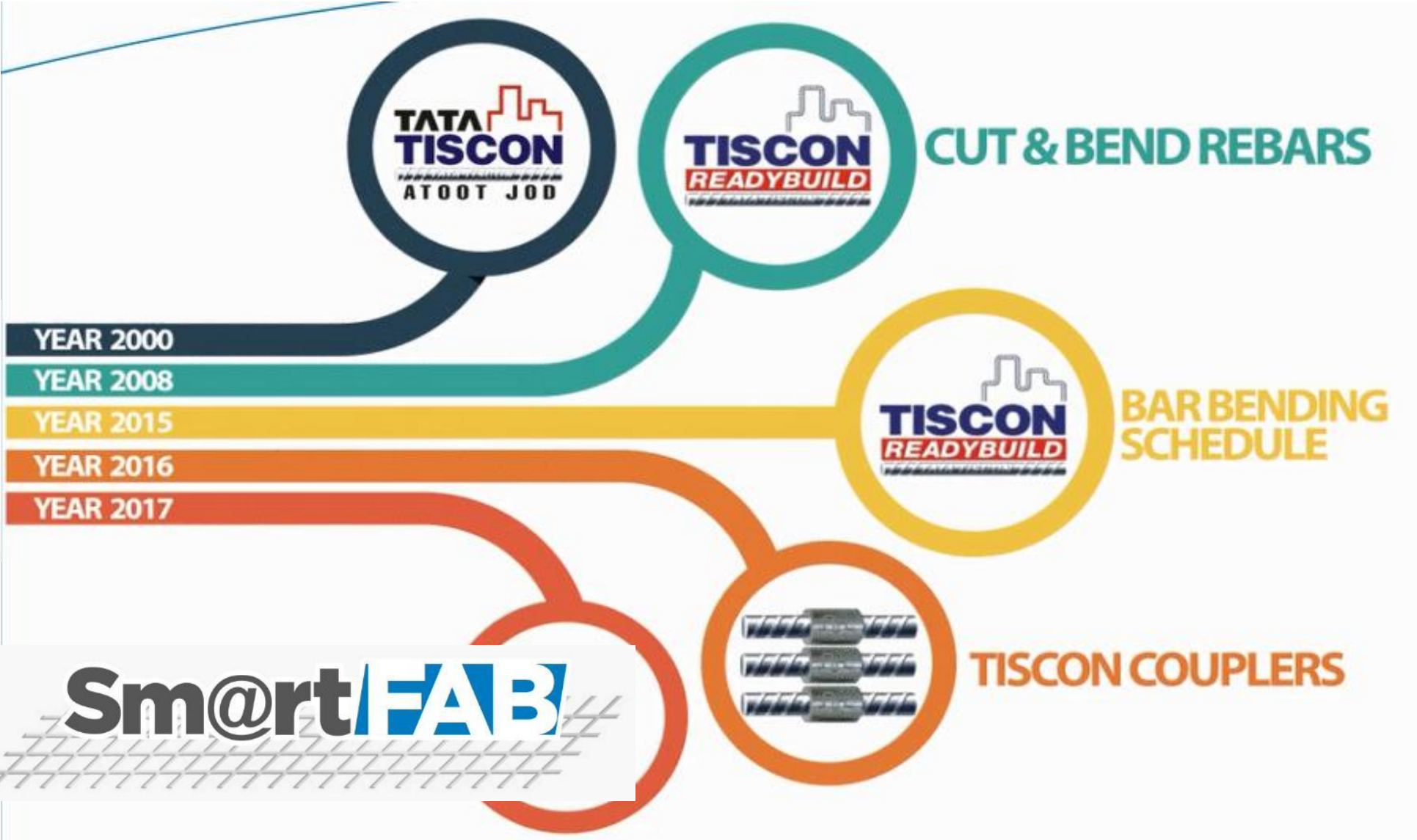
# **BUILD SMART** **BUILD EASY**

**INDIA'S FIRST BRANDED WELDED WIRE FABRIC**



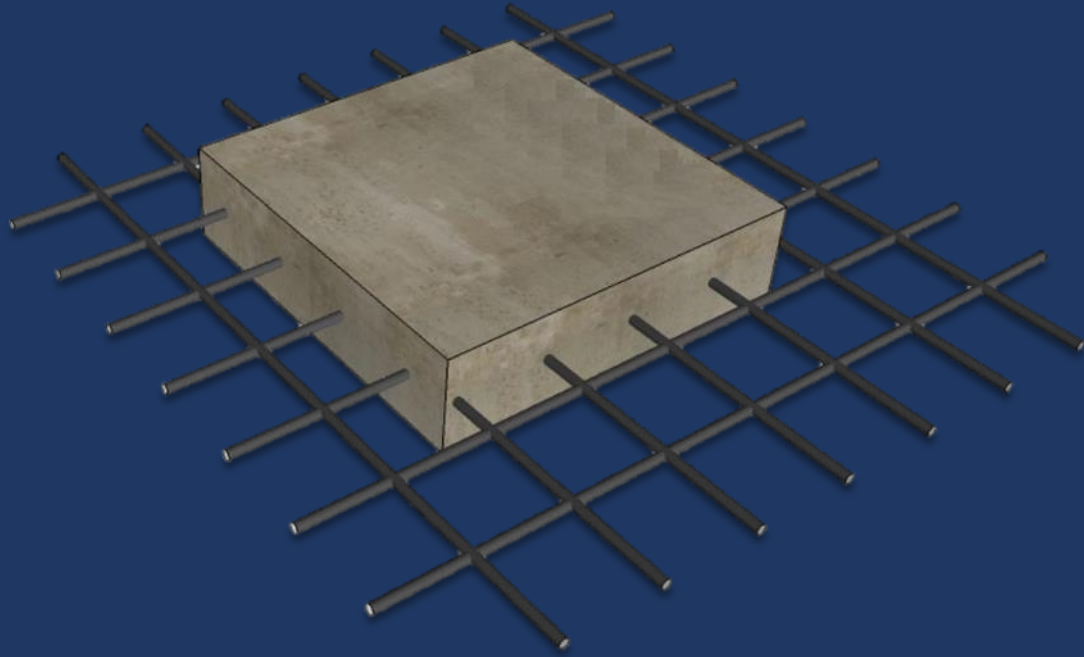
# Journey of Tiscon & reinforcement related products

**TATA STEEL**  
Continuously innovating  
in construction solutions





# Welded Wire Fabric (WWF)



- Cold-drawn ribbed wire with electric resistance fusion welding
- In square or rectangular grids made from small diameter wires
- Bonding with concrete is by mechanical anchorage at each welded wire intersection plus anchorage due to ribbing.
- Standards : IS 1566- Hard drawn steel wire fabric for concrete reinforcement with steel complying to IS 432--2

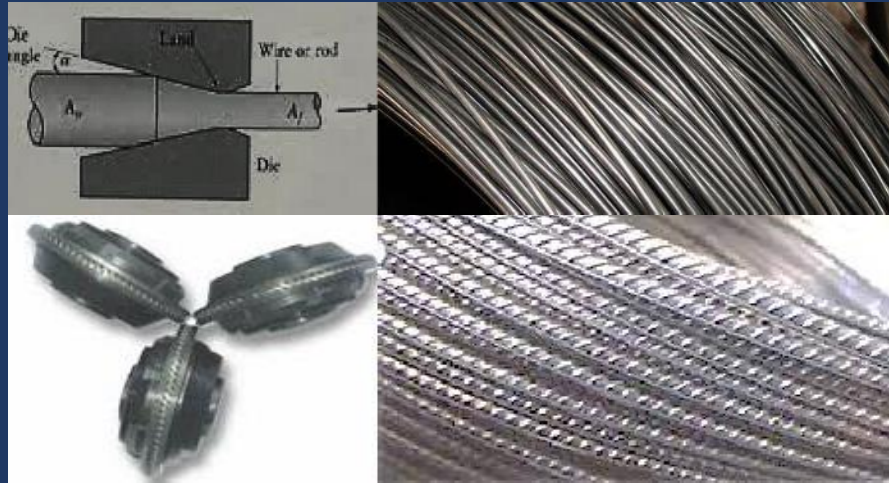
# Welded Wire Fabric (WWF) – Made from Wire not TMT



## Why not TMT

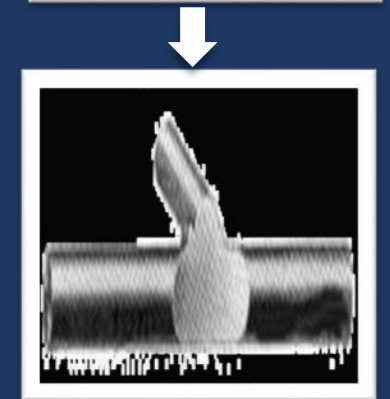
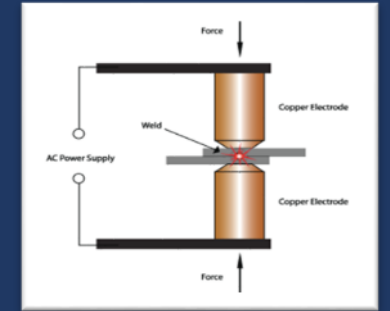
TMT has dual core cross-section. The outer tempered martensite layer gives required tensile strength to the TMT while the inner ferrite –pearlite core give ductility property.

On welding the strong external layer of martensite loses its high strength.



## Why Wire Rods

Wire Rods have uniform microstructure. It is further cold drawn by pulling through triplex sets of tungsten carbide rolls to increase the yield strength to the desired value. The process ensures proper weldability.





# PRODUCT MANUFACTURING FLOW

## COLD WORKING

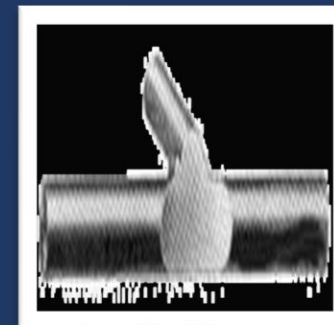
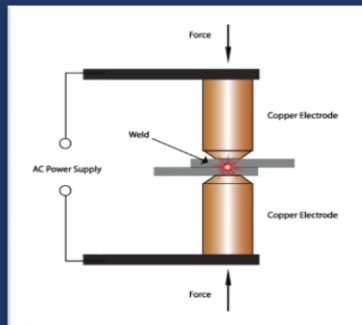
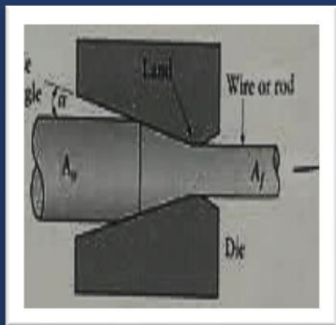
Increases tensile strength with wire rods made of low carbon steel SAE1008 to 1015 (IS7887 Grade 3-7)

## RIBBING

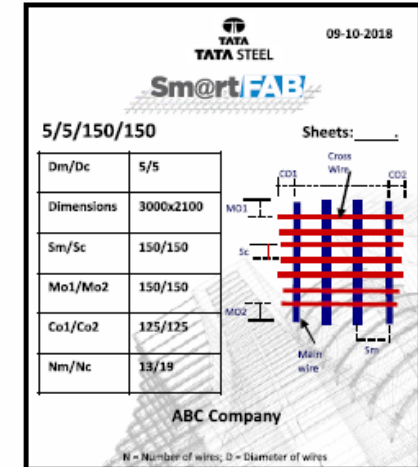
Better bond with concrete and controls cracks. Ribbing benefit is mostly for overhang regions of a weldmesh

## ELECTRIC FUSION WELDING

A semi-automatic and precise welding machine is capable of delivering welds at calculated joints with electrical resistance that generate ample amounts of heat to create the weld.



## PACKAGING



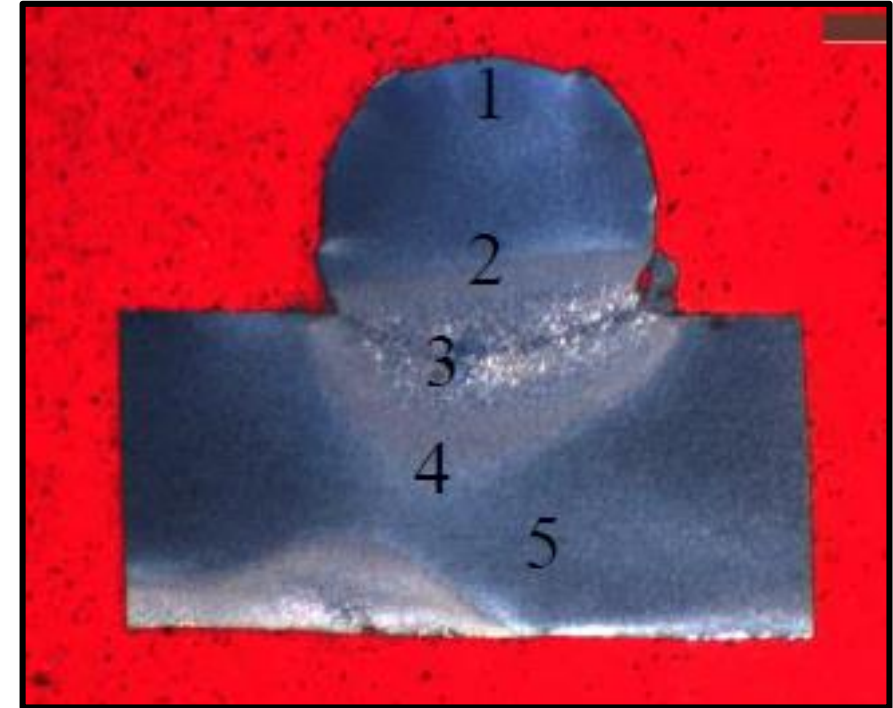
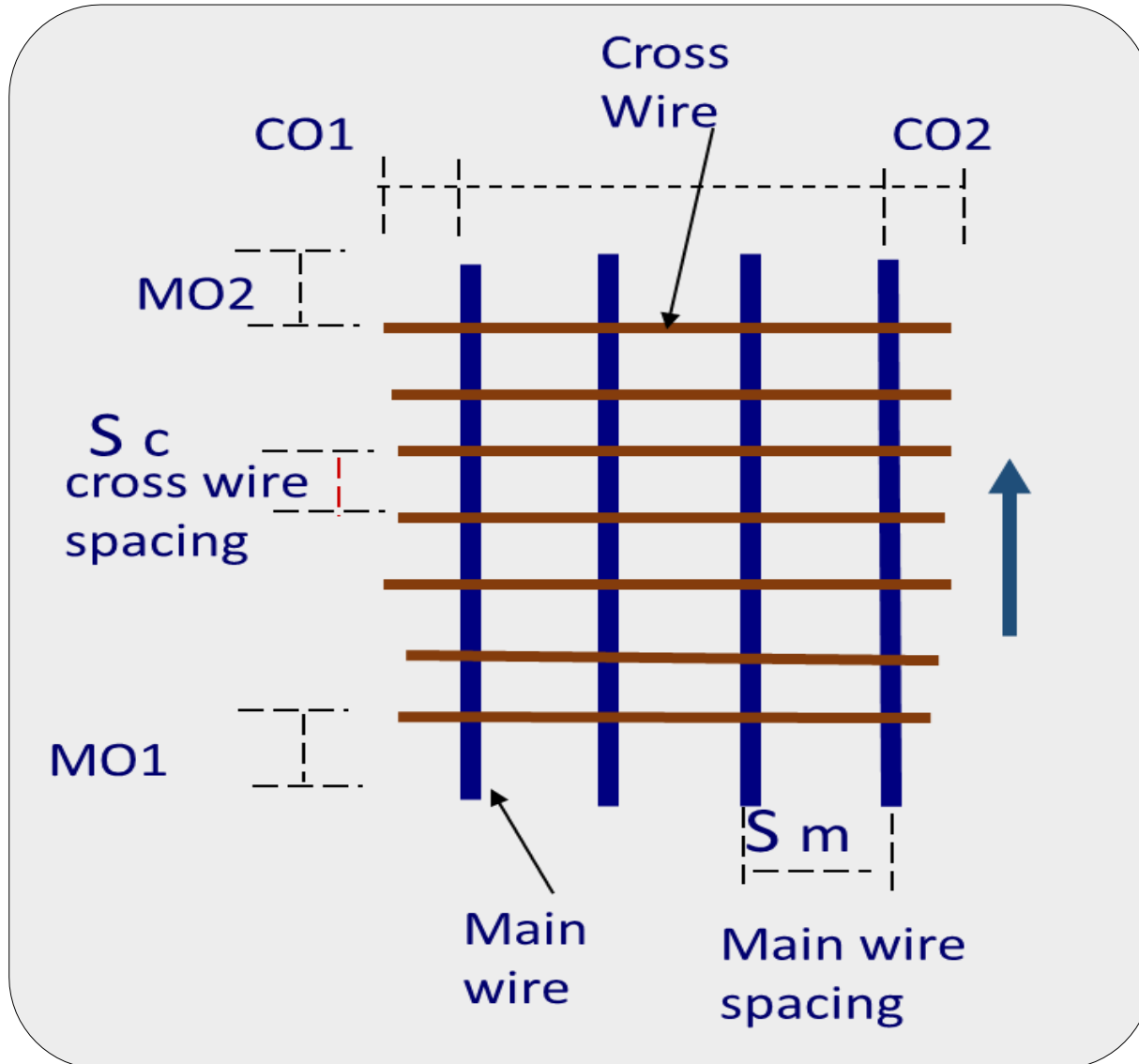
Every bundle is provided with tags for easy identification and traceability

Each tag carries the Tata Steel and SmartFab logo and details and dimensions of the fabric

Sm@rtFAB

# UNDERSTANDING Sm@rtfab

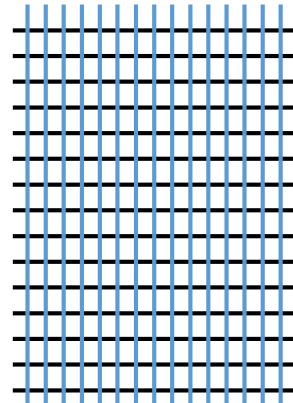
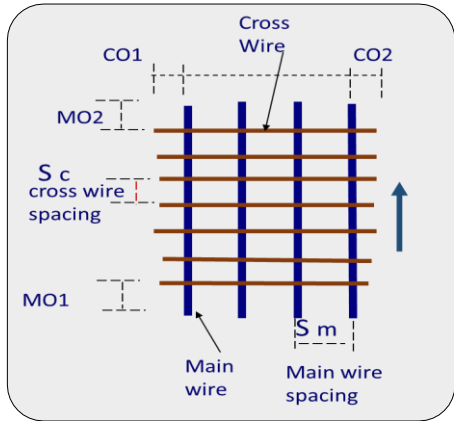
## Nomenclature:



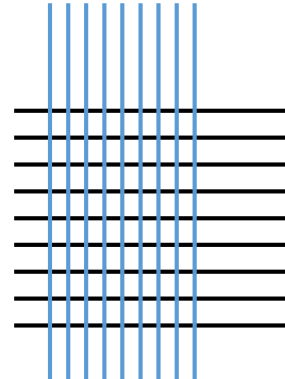
1. Transverse Zone
2. Transverse (Heat affected Zone)
3. Welding Zone
4. Longitudinal (Heat affected Zone)
5. Longitudinal Zone
6. Weld penetration: 10% to 15%

# CHARACTERISTICS OF SMARTFAB

## Dimensional Configuration of Welded Wire Fabric

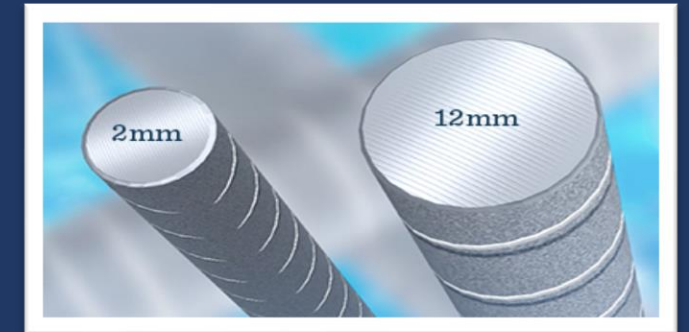


**STANDARD**



**VARIABLE OVERHANGS**

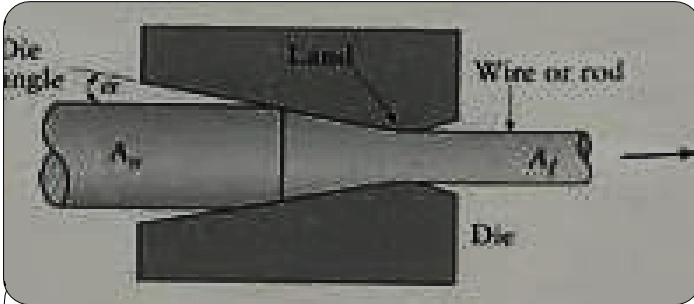
Wire diameter available at an interval of 0.5 mm



Only 5mm and above in ribbed form

Type A	Square	200mm x 200mm
Type B	Rectangular	100mm x 200mm
Type D	Small Square	100mm x 100mm
Type E	Square	150mm x 150mm
Spacing available at interval of 5mm		

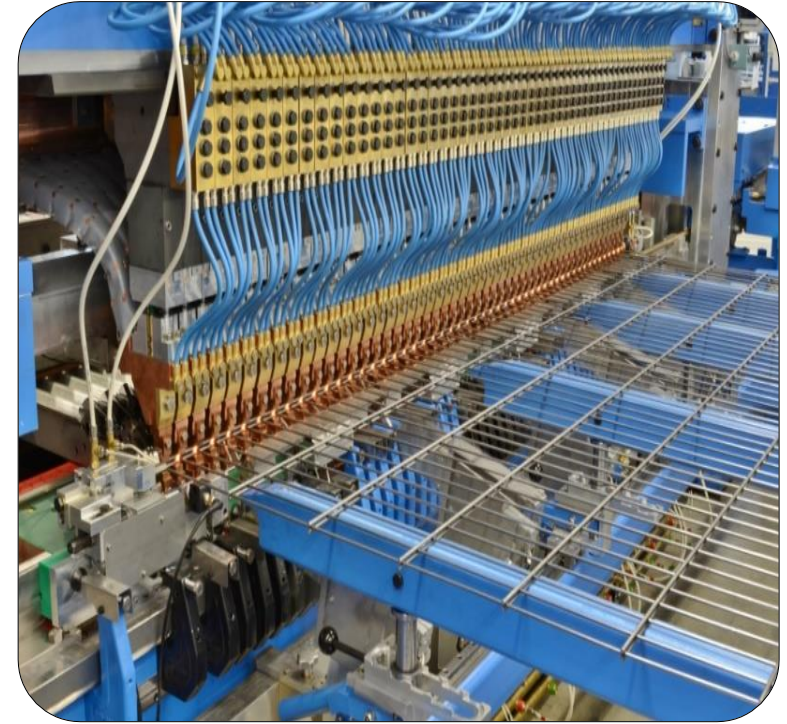
## Manufacturing steps of Welded Wire Fabric



Cold Drawing through Dies / cold rolling And  
Cold Ribbing ( Pulling through  
Triplex sets of Tungsten Carbide  
Rolls



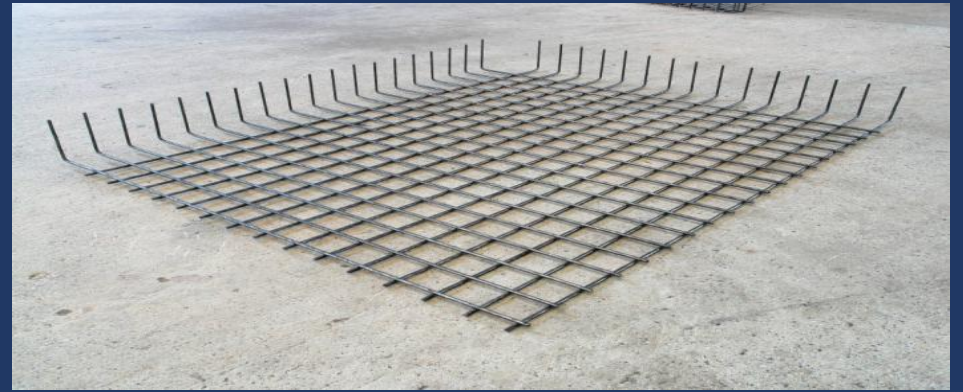
Straightening and cutting



Fabrication into Welded Wire Fabric  
with controlled spacing



# Bent Mesh along with our present offer of only Flat Mesh



# Features of Sm@rtFAB

## Available in:

- a. **Wire Diameter:** From 2mm to 12mm at an interval of 0.5mm
  - i) From 2mm to 5 mm (plain WWF in roll form)
  - ii) From 5mm to 12 mm (ribbed WWF in flat customized shapes)
- b. **Spacing interval:**
  - i) For wire dia 2mm to 5mm: In rectangular grids from 25mm to 600mm.
  - ii) For wire dia 5mm and more: In rectangular grids from 75mm to 600mm.
- c. **Fabric Size:** Up to 2.4 meter (width) x 6 meter (length)

## Features:

- a. **Better Concrete Bonding:** The mechanical anchorage at each welded wire intersection, and the ribbing pattern provide better bonding and stress transfer from concrete to steel.
- b. **Better Crack Resistance:** The thinner wires with closer spacing ensure homogeneity in the section and eliminate the chance of displacement or omission of steel bars during concreting, thereby enhancing the structural integrity.
- c. **Quality Check:** Each batch of WWF goes through thorough scrutiny and tests and is certified with a Test Certificate.
- d. **Controlled Manufacturing:** Our wide range of wire diameters and spacing between wires makes it possible to match the exact cross sectional steel area required, thereby allowing customization and flexibility to suit different structures.

## Splicing:

- a. **Cross wire Pitch +100mm:** IS 456: 2000 (26.2.5.1 (f) at Page 45.)

**f) When splicing of welded wire fabric is to be carried out, lap splices of wires shall be made so that overlap measured between the extreme cross wires shall be not less than the spacing of cross wires plus 100 mm.**



1

Revision in IS Code: Equivalent to Rebar Code

IS:1786-2008 (Rebar) **Superior Physical properties (UTS-**

**V/s**

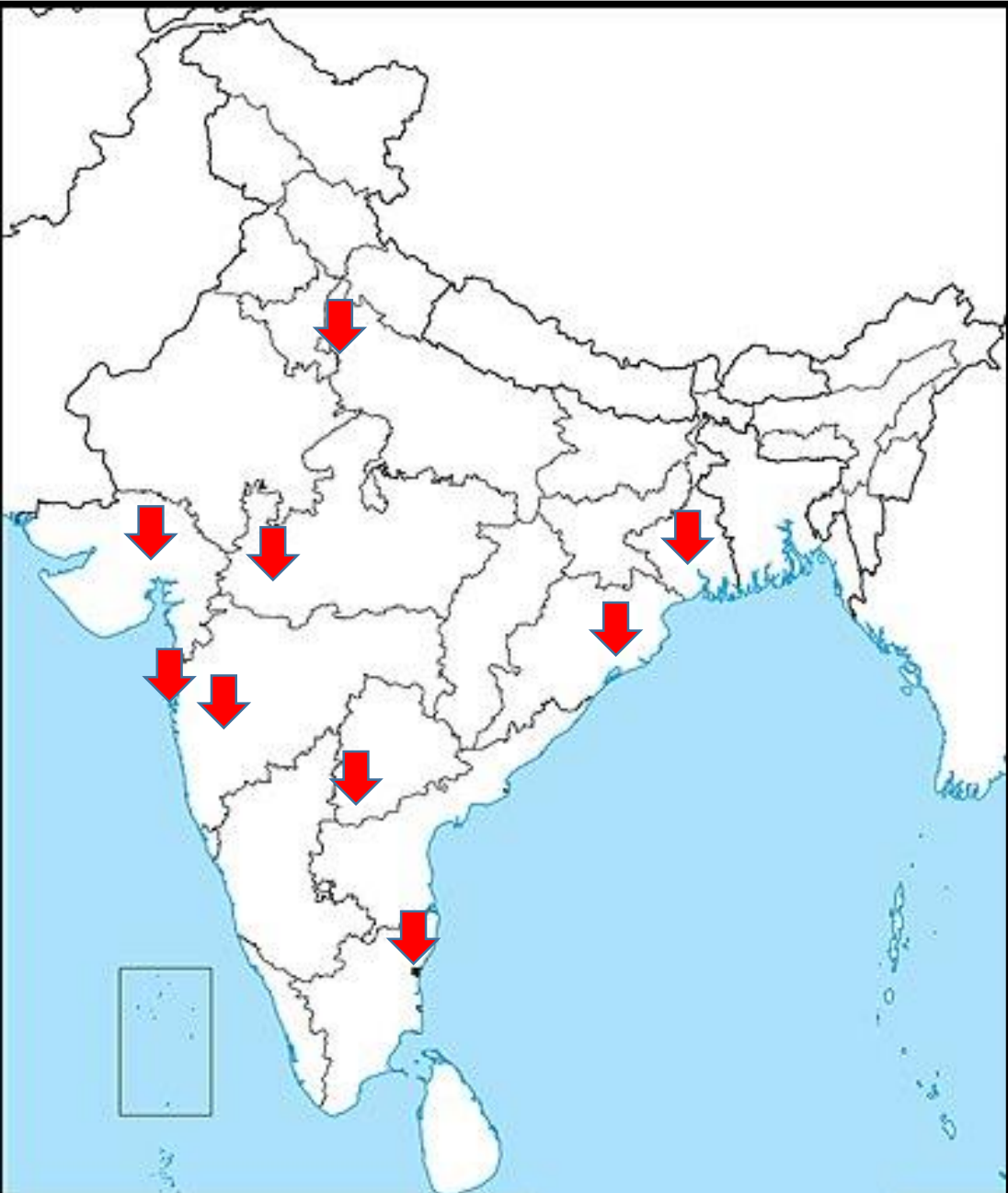
IS: 1566-1982 & IS: 432-1982 Part-2 (Welded wire mesh & Wire) **Inferior Physical properties.**

Properties	IS: 1786	IS: 1566 referring IS:432 Part-2	Sm@rtFAB
Min. UTS	585	570	585
Min. YS	550	480	550
Weld shear strength		0.25 times value of Ys with test method of IS:432 Part 2	~0.40 times

**... Properties of Rebar Fe550 with Sm@rtFAB**

**30% savings in Tunnel reinforcement used for shotcrete jobs**

# PRESENCE of Sm@rtFAB



Sl. No.	Location
1	Hyderabad, Telangana
2	Chennai, Tamil Nadu
3	Indore, Madhya Pradesh
4	Mumbai (Wada), Maharashtra
5	Pune, Maharashtra
6	Kolkata, West Bengal
7	Delhi NCR
8	U.P. West
9	Ahmedabad, Gujarat
10	Bhubaneswar, Odisha



# Identified Sm@rtFAB Segments & Micro Segments



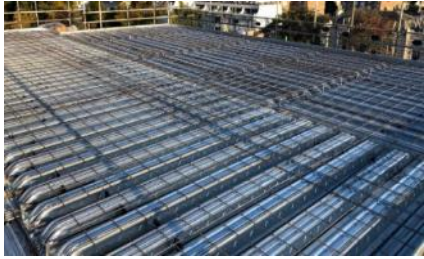
Shotcrete works done for protection of linings in **Tunnels**



Screed flooring for slabs made of Precast girders in **Metro Projects**



Continuously reinforced concrete pavements (CRCP) in **Roads**



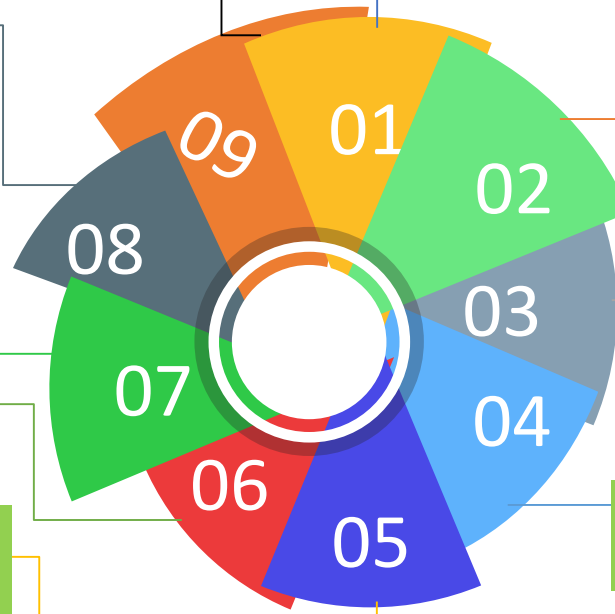
Slabs and Floors for **Pre-Engineered Buildings (PEB)**



Flooring for **Warehouses**



Wall and roof protection for underground **Mines**



Slabs & Shear Walls in **Housing & commercial**



Precast Reinforced earth (RE) walls in **Bridges**



Concrete Precast **Hume Pipes**

**New Segments**



# ADDITIONAL SERVICES OF SMARTFAB

Design consultancy through dedicated structural consultants contracted by Tata Steel



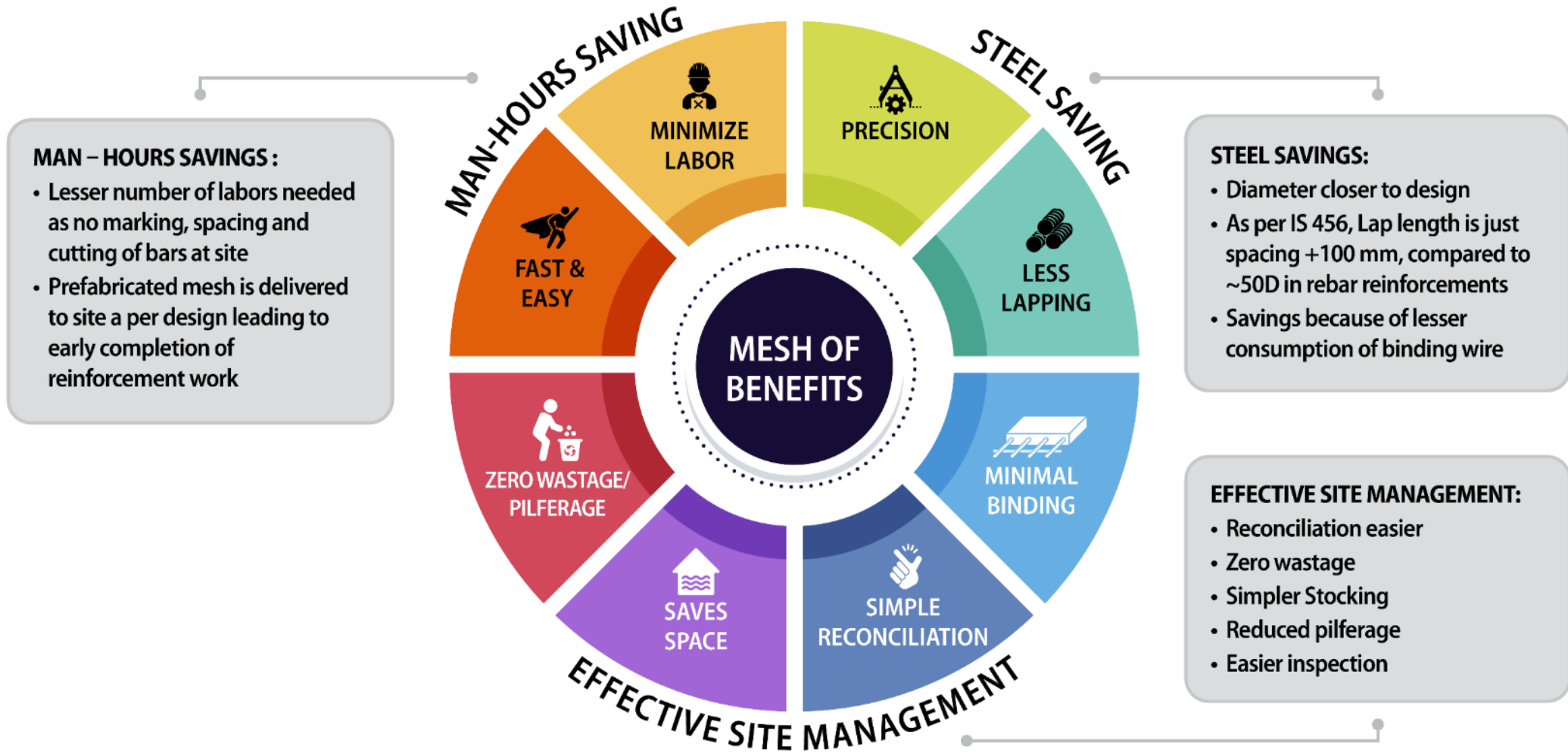
After sales support e.g. – Placement drawing

Complete supply chain solution from wire rod to mesh at site

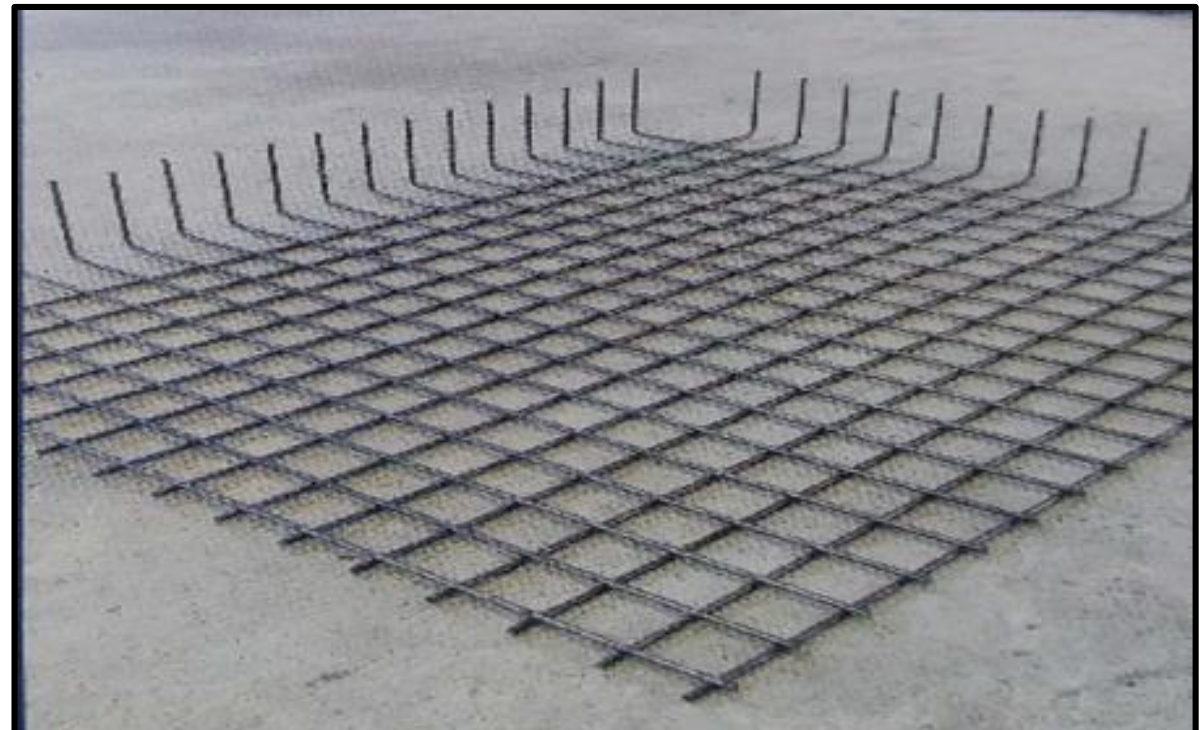
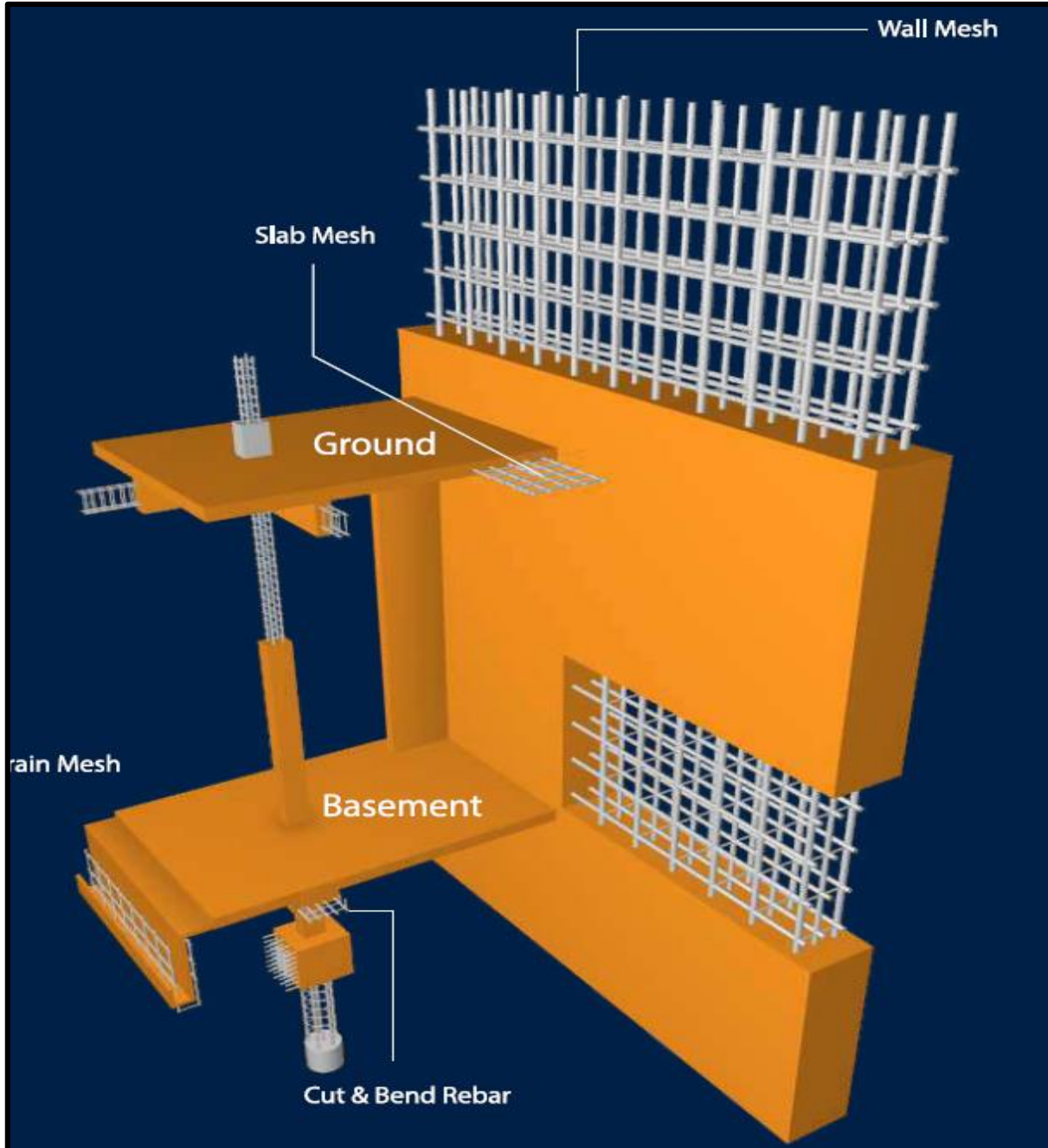
Test certificate along with each a Consignment



# BENEFITS OF SMARTFAB



# Mesh in Typical Building





# APPLICATION AREAS

## Infrastructure



Gabions – Stone walls



Highways & Bridges Pavements



## Housing & Commercial



Building -Slabs



Modern formwork –Walls



Metros – Higher dia F- WWF or Carpet reinforcement



Tunnel Guniting



Slope Guniting

## Industrial



Flooring



## Precast



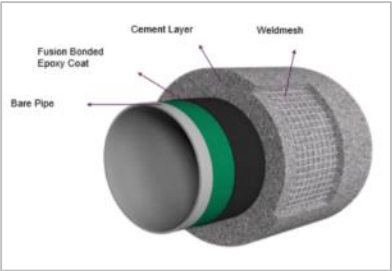
Welded wire mesh with rock bolt used on mine roof



Canal - Lining



Side walk



Water Pipeline Application



WELDED WIRE MESH WITH ROCK BOLT USED ON MINE ROOF

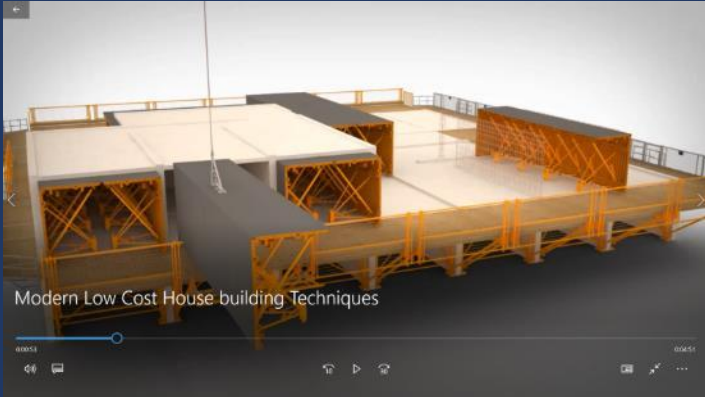




Actual supplies



# MODERN LOW COST HOUSING FOR WELDMESH APPLICATION



USING TUNNEL FORMWORK



PRECAST 3D VOLUMETRIC  
CONSTRUCTION



COMPONENTS PRECAST  
CONCRETE CONSTRUCTION



STAY IN PLACE FORMWORK  
WITH PVC PANELS



LIGHT GAUGE STEEL  
STRUCTURAL SYSTEM



# DETAILS FOR CONSULTANTS

Type	Wire Spacing		Wire Diameter		Cross-sectional Area		Nominal Mass
	(mm)		(mm)		(mm <sup>2</sup> /m)		(kg/m <sup>2</sup> )
	Main	Cross	Main	Cross	Main	Cross	Sheet
<b>A</b>	200	200	7	7	<b>192</b>	192	3.021
	200	200	8	8	<b>251</b>	251	3.946
<b>B</b>	100	200	7	7	385	192	4.532
	100	200	8	8	503	251	5.919
<b>C</b>	150	200	7	7	257	193	3.525
	150	200	8	8	335	252	4.603
<b>D</b>	100	100	7	7	385	385	6.042
	100	100	8	8	503	503	7.892
<b>E</b>	150	150	7	7	257	257	4.028
	150	150	8	8	335	335	5.261

**23.4%  
Savings  
in steel**

## STEEL REINFORCEMENT

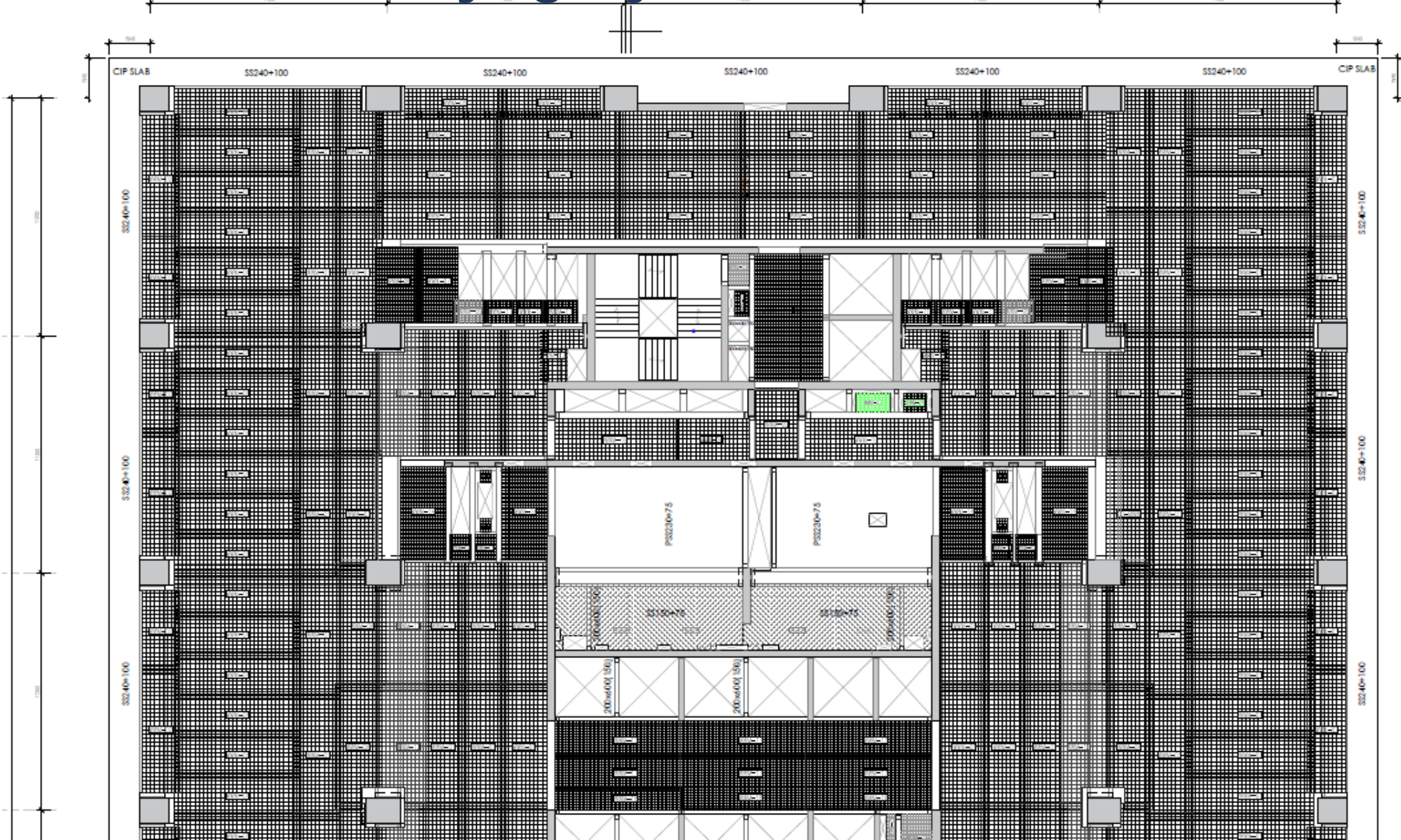
5.22	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level.		
5.22.1	Mild steel and Medium Tensile steel bars	kg	88.95
5.22.2	Hard drawn steel wire	kg	87.50
5.22.3	Cold twisted bars	kg	89.65
5.22.4	Hot rolled deformed bars	kg	89.65
5.22.5	Hard drawn steel wire fabric	kg	94.10
5.22.6	Thermo-Mechanically Treated bars of grade Fe-500D or more.	kg	89.65
5.22A	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete above plinth level.		
5.22A.1	Mild steel and Medium Tensile steel bars	kg	88.95
5.22A.2	Hard drawn steel wire	kg	87.50
5.22A.3	Cold twisted bars	kg	89.65
5.22A.4	Hot rolled deformed bars	kg	89.65
5.22A.5	Hard drawn steel wire fabric	kg	94.10
5.22A.6	Thermo-Mechanically Treated bars of grade Fe-500D or more.	kg	89.65

# Deliveries: 1. Savings calculations

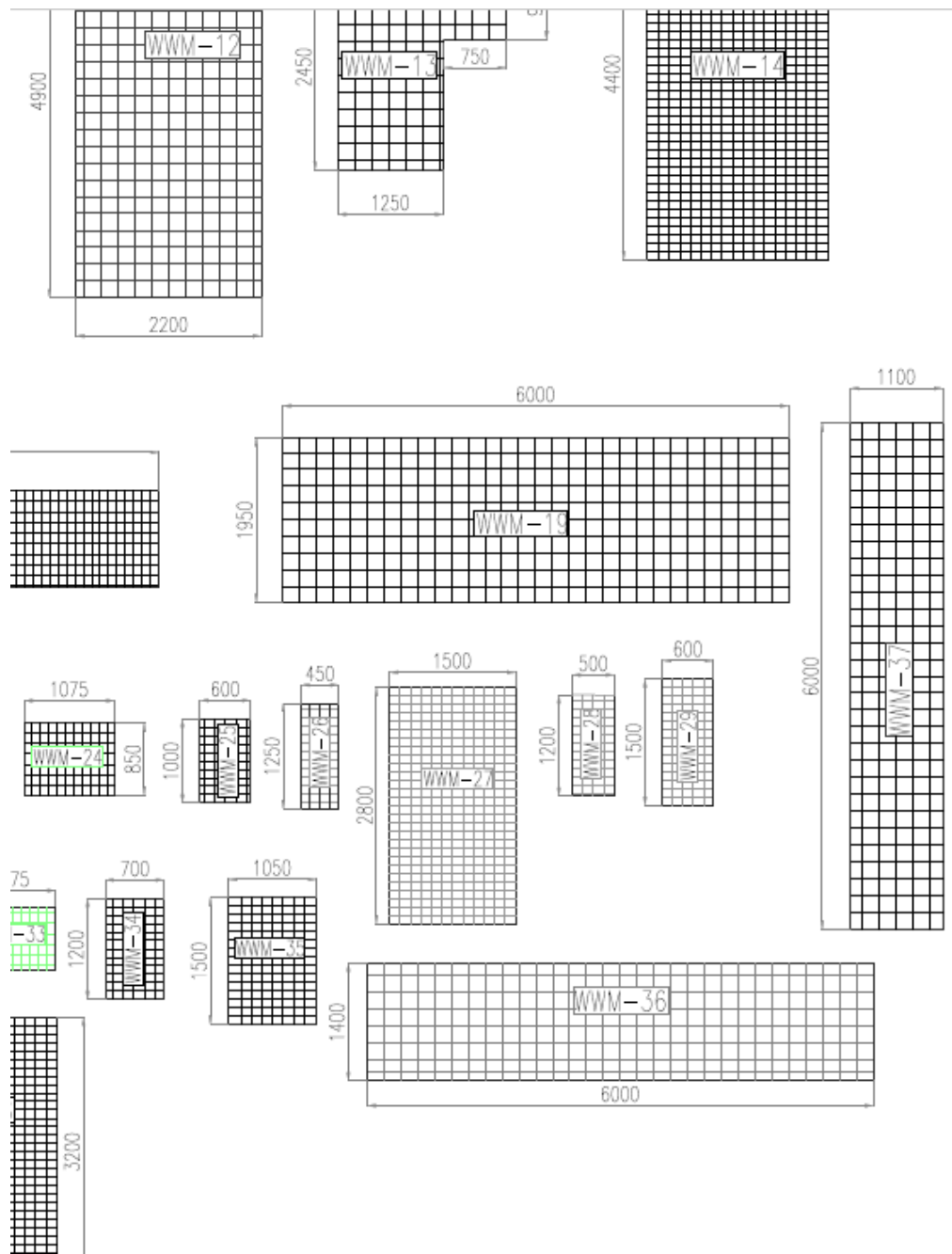
<b>Project Name :</b>				
<b>Project No :</b>				
<b>Name of the Sheet : Typical Floor Slab</b>				
<b>Drwg No :</b>				
<b>Conventional Grade of Concrete M30 Steel Fe-550</b>				
<b>Weldmesh Grade of Concrete M30 Steel Fe-550</b>				
		<b>SI No</b>	<b>Description of Item</b>	<b>Steel in MT</b>
		<b>Grade Slab</b>	<b>Conventional</b>	<b>23.54</b>
			<b>Weldmesh</b>	<b>16.71</b>
			<b>Saving in MT</b>	<b>6.83</b>
			<b>Percentage of Saving</b>	<b>41%</b>



# Deliveries: 2. Mesh laying layout

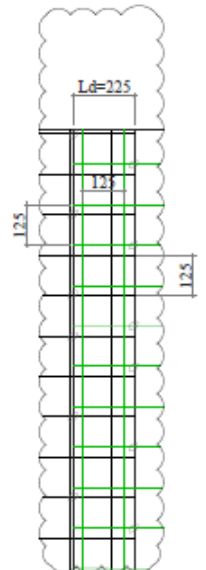


# Deliveries: 3. Mesh details



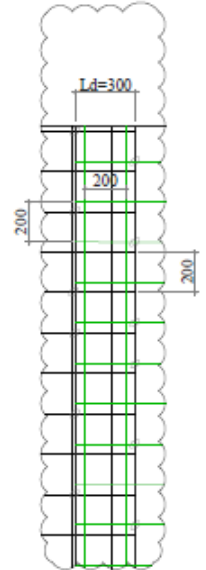
28	WWM-28 - 500X1200	1 Nos	Y9@100 C/C	Y9@125 C/C
29	WWM-29 - 600X1500	1 Nos	Y9@100 C/C	Y9@125 C/C
30	WWM-30 - 650X910	1 Nos	Y9@100 C/C	Y9@125 C/C
31	WWM-31 - 750X950	1 Nos	Y9@100 C/C	Y9@125 C/C
32	WWM-32 - 800X1645	1 Nos	Y9@100 C/C	Y9@125 C/C
33	WWM-33 - 750X1075	1 Nos	Y9@100 C/C	Y9@125 C/C
34	WWM-34 - 700X1200	1 Nos	Y9@100 C/C	Y9@125 C/C
35	WWM-35 - 1050X1500	1 Nos	Y9@100 C/C	Y9@125 C/C
36	WWM-36 - 1400X6000	1 Nos	Y7@200 C/C	Y7@200 C/C
37	WWM-37 - 1100X6000	1 Nos	Y9@100 C/C	Y9@125 C/C

Typical lapping of 225 mm



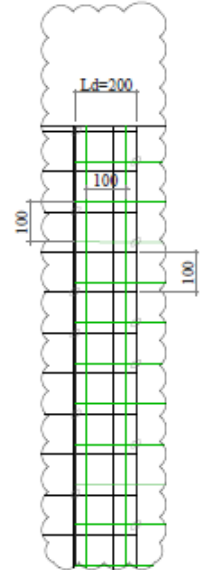
Details of (A)

Typical lapping of 300 mm



Details of (B)

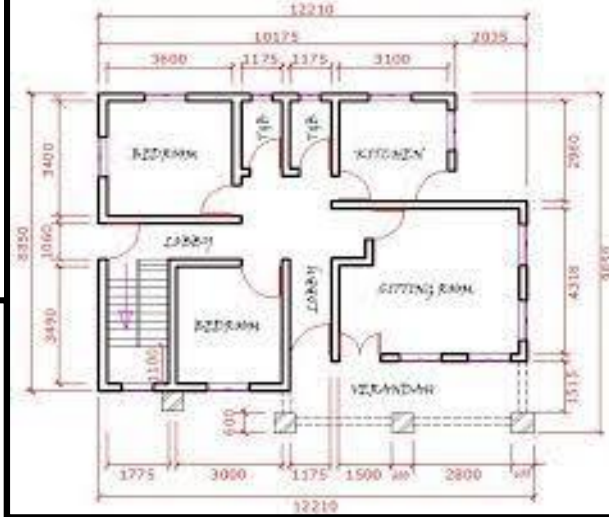
Typical lapping of 200 mm



Details of (C)

# Pre-requisite

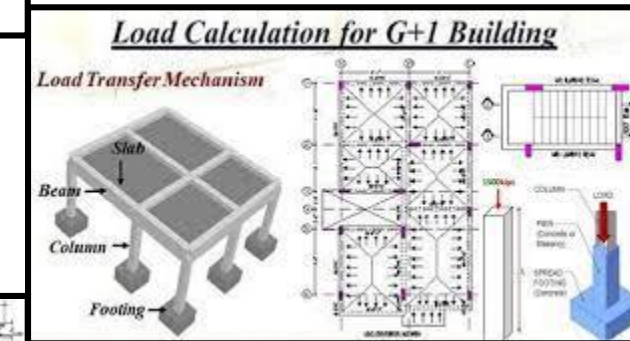
## 1. GA (General Arrangement) Drawings- Architectural layout



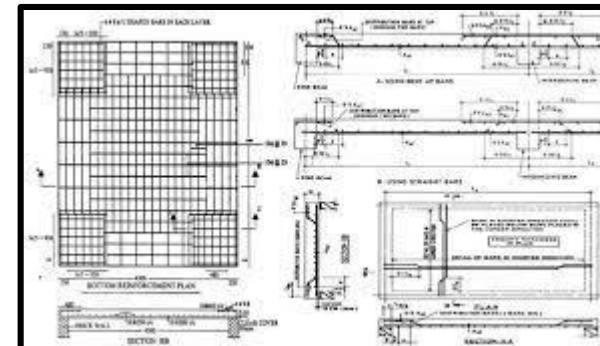
## 2. DBR (Design Basis report)



## 3. Load details



## 4. Current rebar details (if any, for comparison)



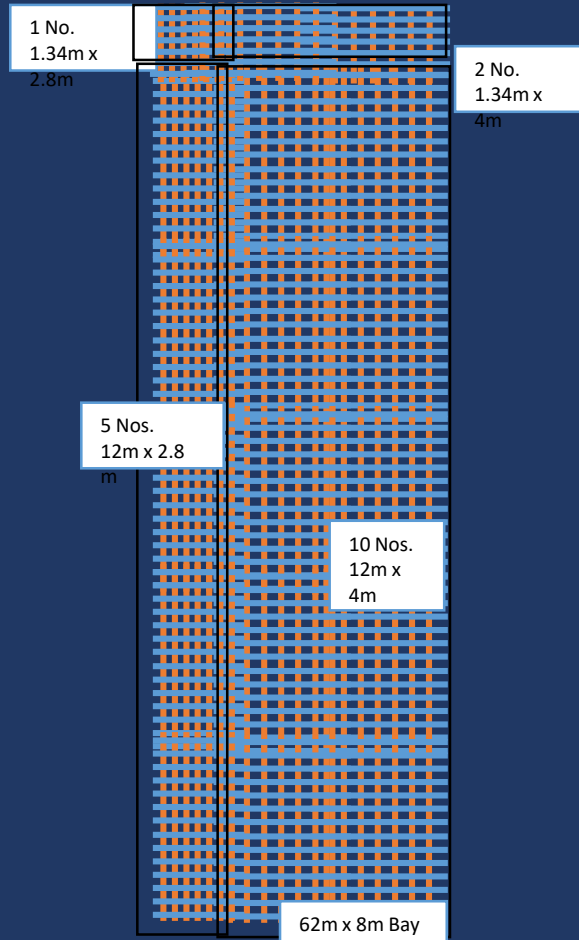


# PROJECT SNAPSHOT

**Project:** Flipkart Warehouse, Hosur; by AVS for TVS Logistics, Consulting Engineers: TCE

**Tech Used:** SMARTFAB flooring

**Benefit:** Time – 63%, Labour – 77%, Material Savings – 32%



62m x 8m Bay	Conventional TMT	Welded Wire Fabric	Savings
No. of people	16	10	
Time in Hrs.	8	3	63%
Man-Hrs.	128	30	77%
MT used	3.4	2.3	32%





# PROJECT SNAPSHOT

**Project:** KEF Infra – Vaishnavi Signature Commercial Building, Bangalore. (G + 10 + 2 Basement)

**Tech Used:** SMARTFAB and Precast Hollow Core Slab within thin cover slab

**Benefit:** 3-4 times faster construction (2.5 Lakh sq.ft. area completed in 6 months compared to 1.5-2 year average)





# PROJECT SNAPSHOT

**Project:** Sands Infra – IT Office Tower, Kochi SmartCity by Tata Projects Ltd.

**Tech Used:** SMARTFAB over decking sheet in 2 towers – 32 floors

**Benefit:** 30 - 40% faster construction



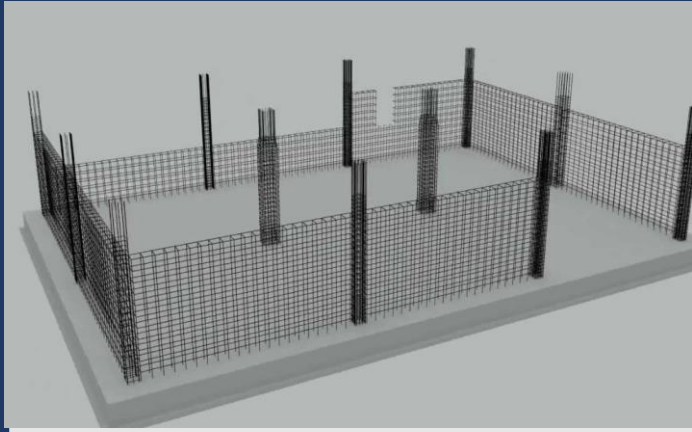


# PROJECT SNAPSHOT

**Project:** Mantri Energia Project, Bangalore

**Tech Used:** SMARTFAB with Tunnel Formwork

**Benefit:** Speed of Construction, Slab-to-slab time achieved in 4-6 days



Sheets with 11 different sizes were fabricated



# PROJECT SNAPSHOT

**Project:** Manipal Hospital, Jamshedpur

**Tech Used:** SMARTFAB

**Benefit:** Speed of Construction, Slab-to-slab time achieved in 4-6 days





# TESTIMONIALS

01



**Mr Venkat Naidu Puppala,**  
*Construction Manager, Tata Projects Ltd.*

We have been procuring SmartFab from Tata Steel since 2018 for faster reinforcement for flooring. This has helped in saving time by 30% - 40% over traditional means. Using prefabricated solutions is the way forward, especially when labour availability is a major challenge.



**Sands Infra – IT Office Tower**  
**Kochi SmartCity**

## Related codes and standards

Sl. No.	Standard No.	Description
1	IS 456-2000	Plain & Reinforced Concrete- Code of Practice
2	IS 432 (Part II)- 1982	Specification for Mild Steel and Medium Tensile steel Bars and Hard-Drawn Steel Wire for Concrete Reinforcement
3	IS 1566-1982	Specification for Hard-Drawn Steel Wire Fabric for Concrete Reinforcement
4	IS 1786-2008	High Strength Deformed Steel Bars and Wires for Concrete Reinforcement- Specification
5	IS 4948-2002	Welded Steel Wire Fabric for General Use- Specification
6	IS 16172- 2014	Reinforcement Couplers for Mechanical Splices of Bars in Concrete- Specification
7	ISO 6935-3	Steel for the reinforcement of concrete- Welded Fabric
8	SP 34	Handbook on Concrete Reinforcement and Detailing



Thank You !!!

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