南達 Southern Steel Mesh

PRODUCT CATALOGUE

SSM FABRIC

STANDARD SHEET STEEL FABRIC
CUT-TO-SIZE STEEL FABRIC
ENGINEERED STEEL FABRIC
INDUSTRIAL STEEL FABRIC

MS SIRIM

MS144:2014

MS145:2014

MS146:2014

SIRIM ECO-LABEL

SIRIM ECO 032: 2020

CIDB MALAYSIA

MALAYSIA MyHIJAU

SOUTHERN STEEL MESH PLANT LOCATIONS

CONTENTS

1.0 THE COMPANY

Founded in 1980, Southern Steel Mesh Sdn. Bhd. (SSM) is a leading steel fabric manufacturer in the country, with strategically positioned production facilities in Klang and Prai. Leveraging our extensive industry experience, SSM Fabric has become a widely recognised choice in the construction sectors of Malaysia and Singapore.

The company is known for its strong technical support paired with effective and innovative solutions, offering competitive pricings and reliable after-sales service.

We strive to become an effective solutions-driven manufacturer by staying attuned to the challenges contractors encounter in the construction industry and delivering the necessary solutions to address them effectively.

Through continuous innovation and a forward-thinking approach, SSM excels in delivering both cost-effective cut-to-size steel fabric solutions and customised steel fabric tailored to the specific needs of reinforced concrete structures. This is further enhanced by the usage of our SSM Engineered Mesh series, which offers valuable benefits to the end-user by helping them achieve savings be it in reducing material usage or shortening construction time.

With our highly flexible production facilities, we manage to meet requirements of projects of various complexities. The company adheres to stringent product quality control in accordance with ISO 9001:2015 standards set by SIRIM.

2.0 PRODUCTS AND SERVICES

The distinctive cost and technical benefits of welded steel fabric stems from its flexibility and precise manufacturing to meet various structural needs, whether in flat sheets or custom shapes have led to its widespread adoption among professionals in the Malaysian construction industry.

2.1 Description and Properties

SSM Fabric is a steel welded mesh, in which the high strength, cold rolled longitudinal and cross wires are electrically resistance-welded together in square or rectangular grids by a continuous automatic welder. The electric welding process, which is electronically controlled, employs the principle of fusion combined with pressure, which actually fuses the intersecting wires into a homogeneous section without any loss of tensile strength of area.

The two Malaysian Standards prepared by SIRIM relevant to steel welded wire mesh are MS146:2014 and MS145:2014 for specification of steel fabric respectively. The hard drawn or cold rolled steel wires used in the manufacturing of SSM Fabric complies to MS146:2014 or BS4482:2005, stipulates a minimum specified characteristic yield strength (0.2% proof stress) of 500N/mm^2. This standard also prescribes the requirement for the preferred sizes and manufacturer's routine test method for specified characteristic strength.

These hard drawn or cold rolled steel wires are welded together by an auto-electro welding machine where a kind of projection welding is performed. The resulting fabric complies to the MS145:2014 or BS4483:2005. Among other things, the standard prescribes the strength of weld, which must be at least:

$$0.25 \times R_e \times A_n$$

Where R_e is the specified characteristic yield strength; and A_n is the nominal cross-sectional area of the larger bar at the welded joint.

For standard fabrics B1131 (B12) and above, and C785 (C10) and above, the minimum shear force required shall be calculated using the nominal cross-sectional area of the smaller bar of the welded joint, unless otherwise agreed at the time of enquiry, in which case, the minimum shear force required may be calculated using the nominal cross-sectional area of the larger bar.

This property is important to ensure sufficient mechanical anchorage to develop the tensile stress in the wire when the fabric is embedded in the concrete. The weld shear strength plays a very important role, especially where the lapping of the fabric is necessary.

The properties of deformed high yield bars are stated in Table 2.1.1 below:

Table 2.1.1

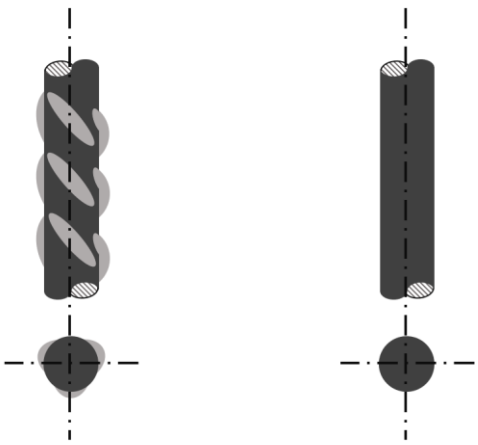
Description	Nominal Sizes (mm)	Specified Characteristic Yield Strength of Reinforcement (N/mm^2)
Hot-Rolled High Yield Bars	T10 to T20	500
Cold-Worked High Yield Bars	5mm to 13mm	500
Hard Drawn or Cold Rolled Steel Wire	4mm to 12mm	500

2.2 Ribbed Fabric

Ribbed fabric has been widely used as reinforcement for concrete structures in Malaysia and many developed countries.

Advantages of ribbed fabric are:

- Higher bond and anchorage characteristics of its ribbed wire.
- Ribbed wire is cold-rolled produced – the rolling process gives rise to uniform plastic flow in the material. This results in more consistent properties and better ductility.
- Cracked width in concrete elements are controlled to the minimum because force is well distributed through bond effect of ribbed wire as compared to plain wire.



Ribbed Profile ***Plain Profile***

2.3 Rust

> *"Rust, seams, surface irregularities or mill scale shall not be the cause for rejection provided the mass, dimensions, cross-sectional area and the mechanical properties of a hand wire brushed test specimen are not less than the requirements of this standard."*
>
> MS146:2014 clause 7.2.2

Loose rust is removed during handling and shaking of reinforcement. Striking the reinforcement is not recommended.

Any surface rust which remains in the fabric is not harmful and will increase the bond and anchorage properties of the fabric. Wire brushing is unnecessary and may reduce the bond on plain steel wire.

2.4 Standard Fabric References

The term "standard fabric reference" refers to the specific spacing and diameter of wires as shown in Table 2.4.1.

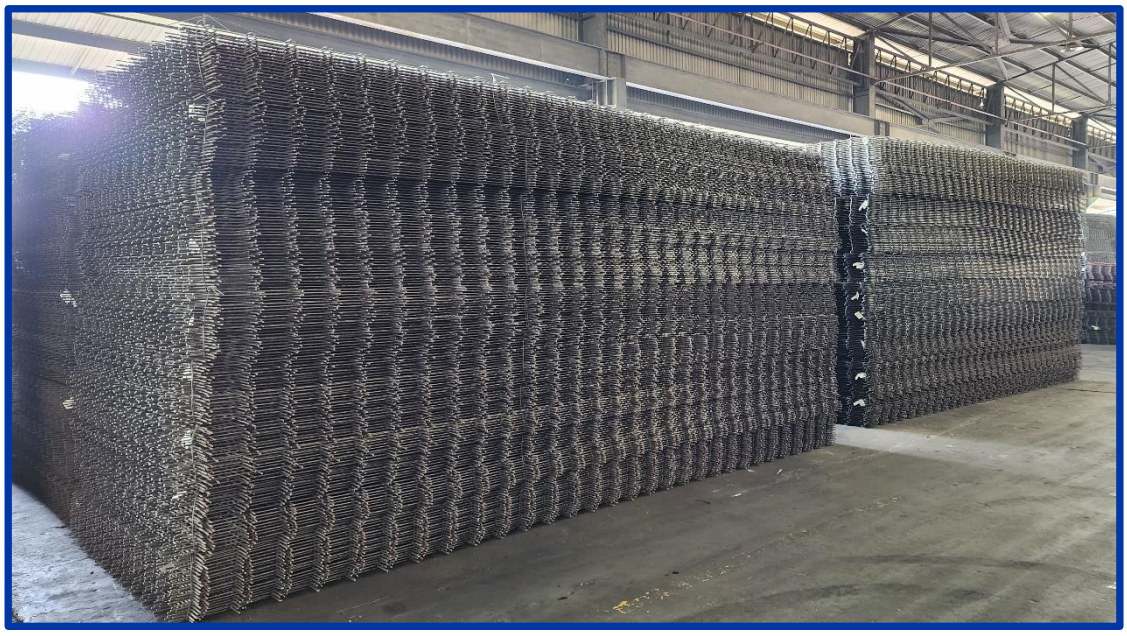


Figure 2.4.1: SSM standard sheet steel fabric

Table 2.4.1: SSM Standard Sheet Steel Fabric Specification

SSM Fabric Reference		Nominal Wire Diameter (mm)		Wire Spacing (mm)		Cross Sectional Area (mm^2/m)		Nominal Mass (kg/m^2)
		Main	Cross	Main	Cross	Main	Cross	
Square Mesh (A-Series)								
A664	A13	13	13	200	200	664	664	10.42
A565	A12	12	12	200	200	565	565	8.88
A475	A11	11	11	200	200	475	475	7.46
A393	A10	10	10	200	200	393	393	6.16
A318	A9	9	9	200	200	318	318	4.99
A252	A8	8	8	200	200	252	252	3.95
A193	A7	7	7	200	200	193	193	3.02
A142	A6	6	6	200	200	142	142	2.22
A98	A5	5	5	200	200	98	98	1.54
Structural Mesh / Rectangular Mesh (B-Series)								
B1328	B13	13	10	100	200	1,328	393	13.51
B1131	B12	12	8	100	200	1,131	252	10.85
B950	B11	11	8	100	200	950	252	9.44
B785	B10	10	8	100	200	785	252	8.14
B636	B9	9	8	100	200	636	252	6.97
B503	B8	8	8	100	200	503	252	5.93
B385	B7	7	7	100	200	385	193	4.53
B283	B6	6	7	100	200	283	193	3.73
B196	B5	5	7	100	200	196	193	3.05
Long Mesh (C-Series)								
C1328	C13	13	8	100	400	1,328	126	11.41
C1131	C12	12	8	100	400	1,131	126	9.87
C950	C11	11	8	100	400	950	126	8.44
C785	C10	10	6	100	400	785	71	6.72
C636	C9	9	6	100	400	636	71	5.55
C503	C8	8	6	100	400	503	71	4.51
C385	C7	7	6	100	400	385	71	3.58
C283	C6	6	6	100	400	283	71	2.78
C196	C5	5	5	100	400	196	49	1.93
Wrapping Mesh / Small Square Mesh (DA-Series)								
D1328	DA13	13	13	100	100	1,328	1,328	20.85
D1131	DA12	12	12	100	100	1,131	1,131	17.76
D950	DA11	11	11	100	100	950	950	14.92
D785	DA10	10	10	100	100	785	785	12.32
D636	DA9	9	9	100	100	636	636	9.98
D503	DA8	8	8	100	100	503	503	7.90
D385	DA7	7	7	100	100	385	385	6.04
D283	DA6	6	6	100	100	283	283	4.44
D196	DA5	5	5	100	100	196	196	3.08

2.5 Standard and Cut-to-Size Dimensions

The term “standard dimension” refers to SSM Fabric manufactured in sheet form which is 6.00 meters length (L) by 2.20 meters width (W).

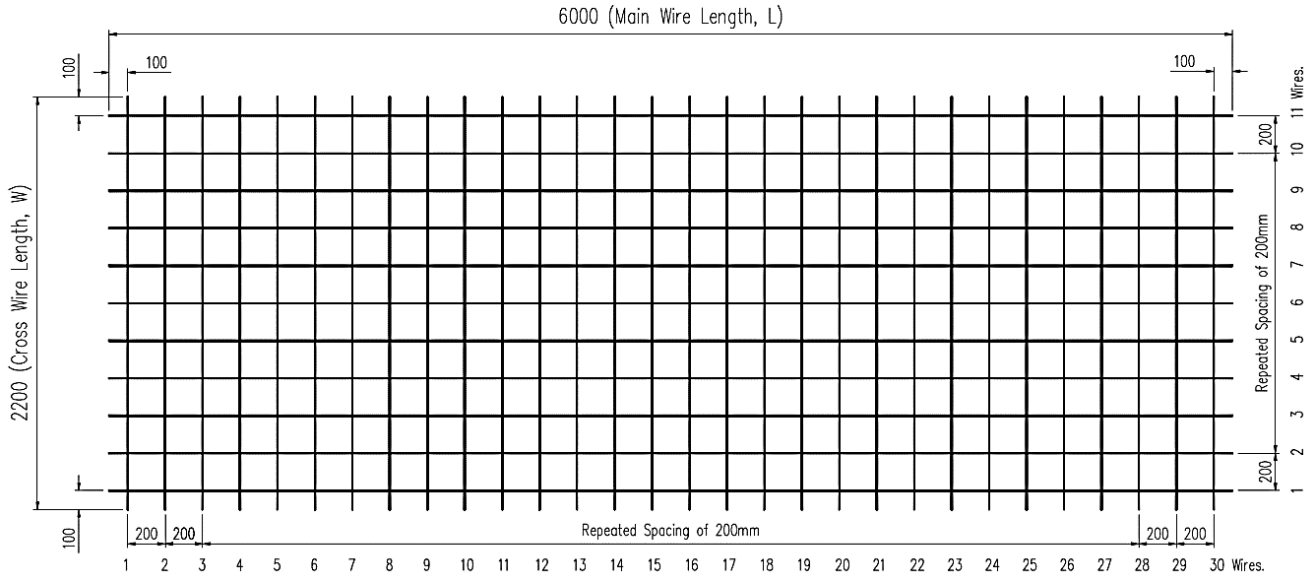


Figure 2.5.1: SSM A-Series Fabric Dimensions, Pitch, Overhang & Provided Number of Wires.

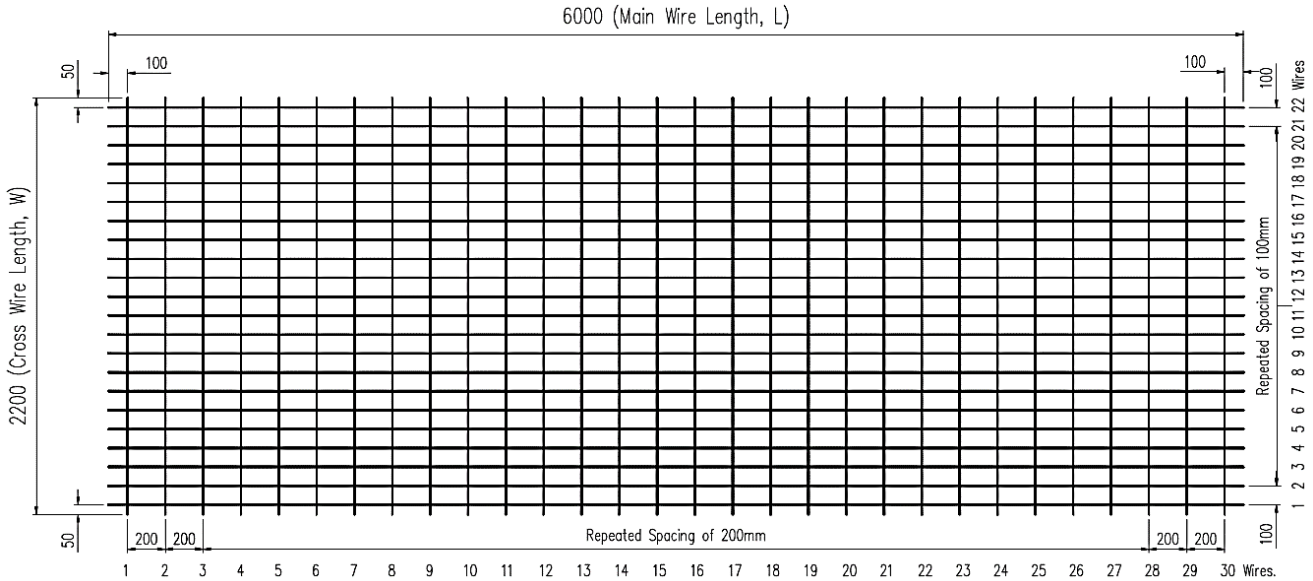


Figure 2.5.2: SSM B-Series Fabric Dimensions, Pitch, Overhang & Provided Number of Wires.

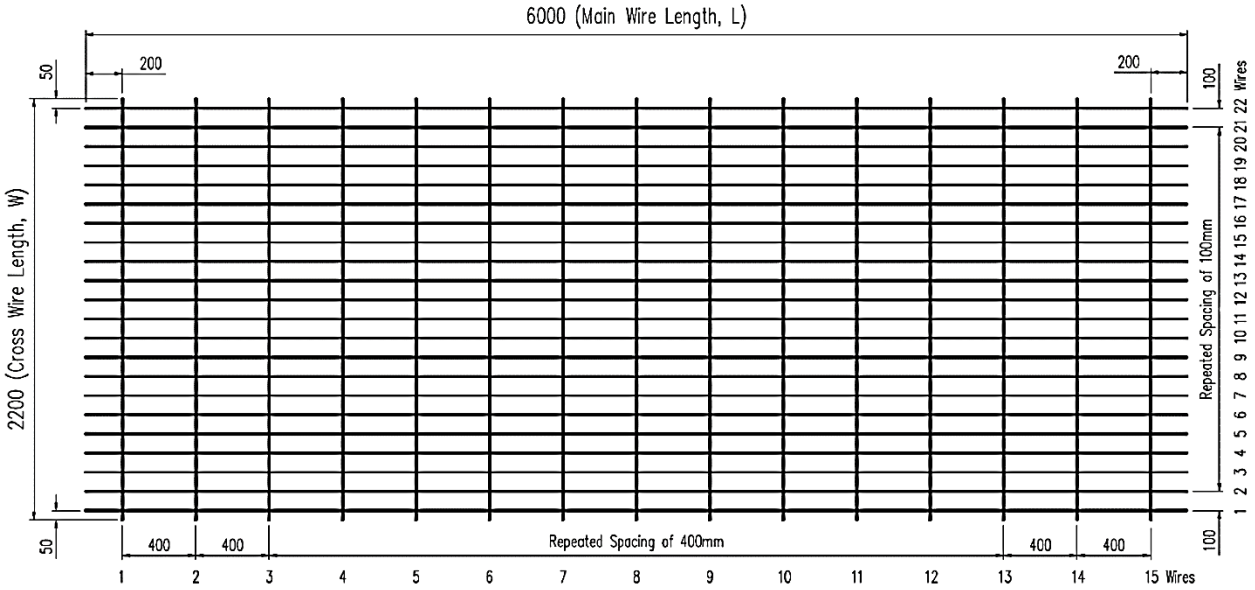


Figure 2.5.3: SSM C-Series Fabric Dimensions, Pitch, Overhang & Provided Number of Wires.

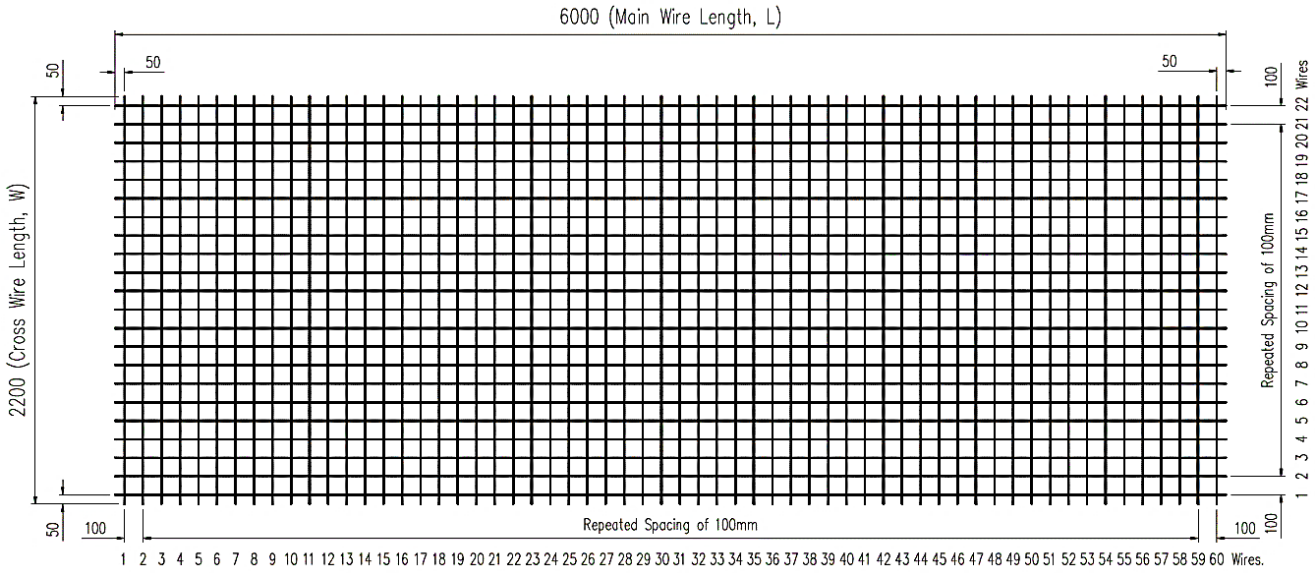


Figure 2.5.4: SSM DA-Series Fabric Dimensions, Pitch, Overhang & Provided Number of Wires.

The term “cut-to-size dimension” refers to SSM Fabric manufactured to any required dimension to suit the intended purpose, subject to the dimensional limitations of the fabricating machine and transportation.

This approach minimizes material waste and simplifies the installation process of steel fabric to prevent potential mix-up. Kindly reach out to our technical sales team for any cut-to-size project inquiry.

2.6 SSM Staggered Mesh

Curtailed reinforcement can be provided within a sheet of fabric by staggered arrangement of wires.

This curtailment of reinforcement as provided under clause 3.12.10 of BS8110, can contribute to significant savings of steel.

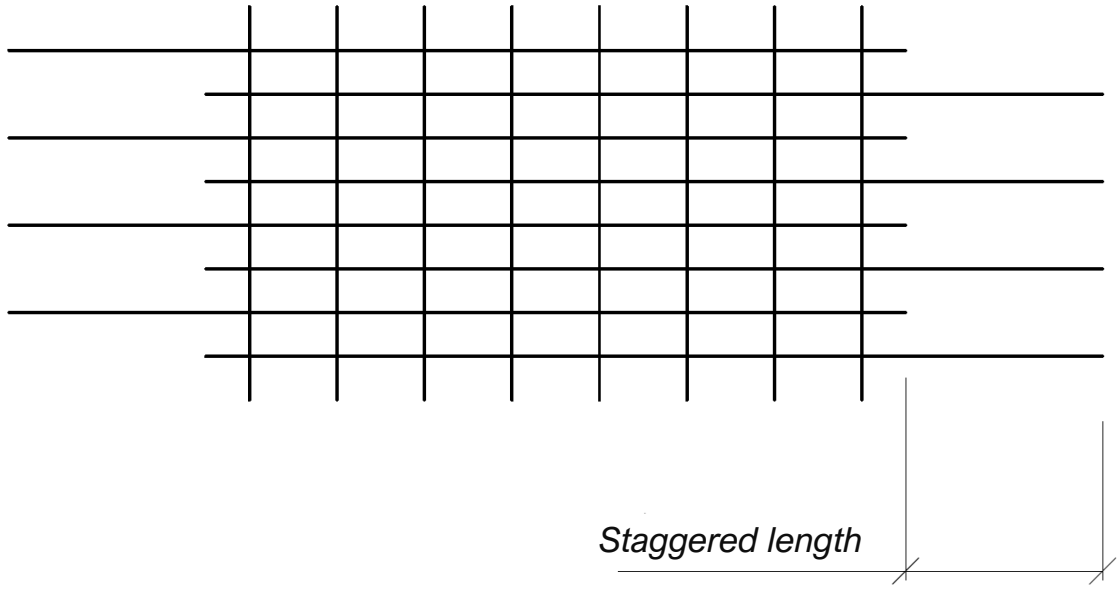


Figure 2.6.1: Staggered Mesh

In staggered mesh, main wires are arranged alternately in staggered manner. This arrangement of wires will give 100% of steel at the middle zone of the sheet and 50% area of steel at both ends.

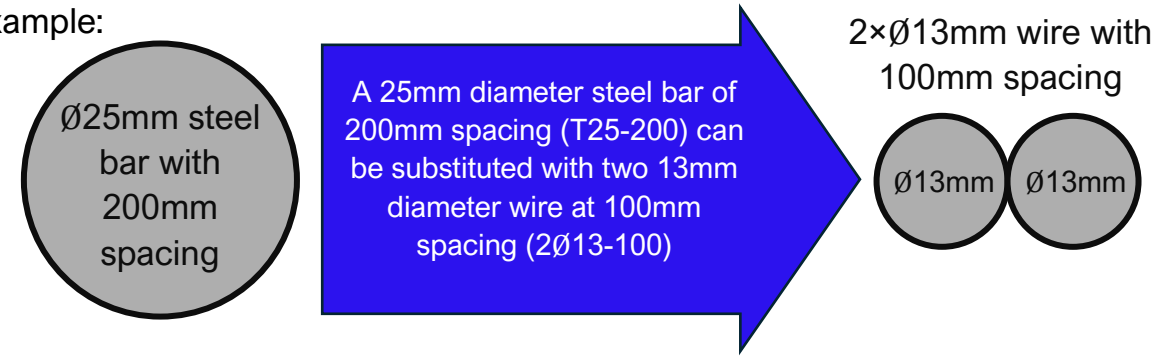
Staggered mesh is cost effective due to the following reasons:

- It offers great savings as its steel cross section area could be arranged in zone corresponding to the zone of the force direction.
- Curtailment of reinforcement can be readily manufactured in factory.
- One-layer large surface reinforcement sheet could be used instead of having two layers of standard fabric to achieve curtailment pattern. Placing speed of steel fabric is significantly faster.

2.7 SSM Twin Wire Mesh

Twin Wire fabric consists of two main wires placed side by side welded to a single cross wire. This fabric configuration gives a larger cross-sectional area of steel in the main direction.

Example:



Steel cross-sectional area, $A_{25} = \frac{\pi D^2}{4}$

$A_{25} = \frac{\pi \times 25^2}{4}$

$A_{25} = 490.87\ mm^2$

T25-200 will provide $2454\ mm^2/m$

Steel cross-sectional area, $2 \times A_{13} = 2 \times \frac{\pi D^2}{4}$

$2 \times A_{13} = 2 \times \frac{\pi \times 13^2}{4}$

$2 \times A_{13} = 265.46\ mm^2$

2Ø13 at 100mm spacing will provide $2655\ mm^2/m$ ($\geq 2454\ mm^2/m$)

Therefore, a twin wire mesh of diameter 13mm spaced at 100mm intervals in the main direction can be an alternative option for 25mm diameter steel bars spaced at 200mm intervals.

Figure 2.7.1: SSM Twin Wire Mesh

2.8 SSM Bar Mesh

Bar mesh involves the welding of steel bars with hard drawn wire, with the spacing of the main and secondary bars or wires customisable to meet project requirements.

Ideal for reinforced concrete walls and slabs, bar mesh reduces the need to rely solely on steel bars for concrete reinforcement. Utilising SSM Bar Mesh can significantly accelerate construction progress.

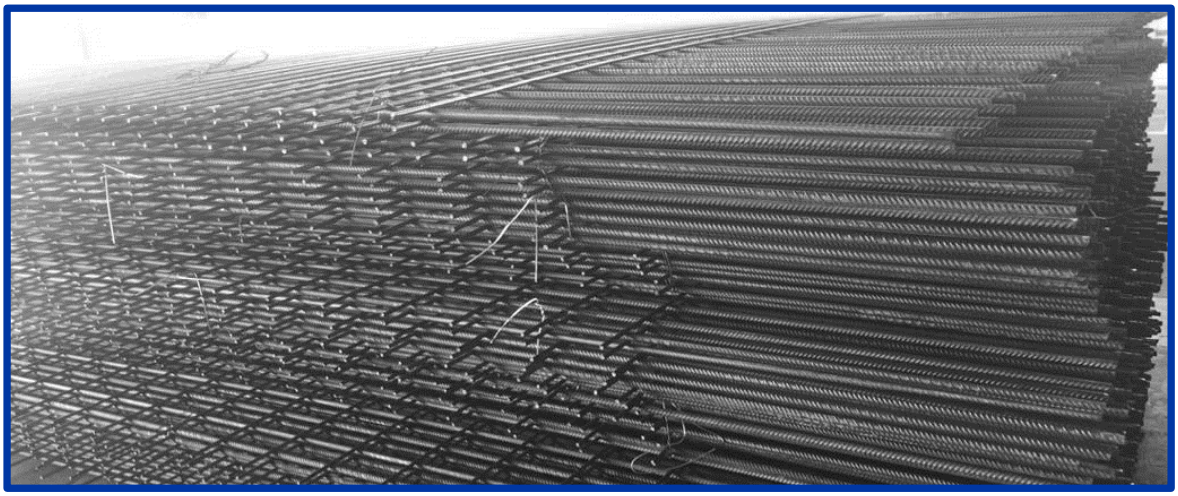


Figure 2.8.1: SSM Bar Mesh

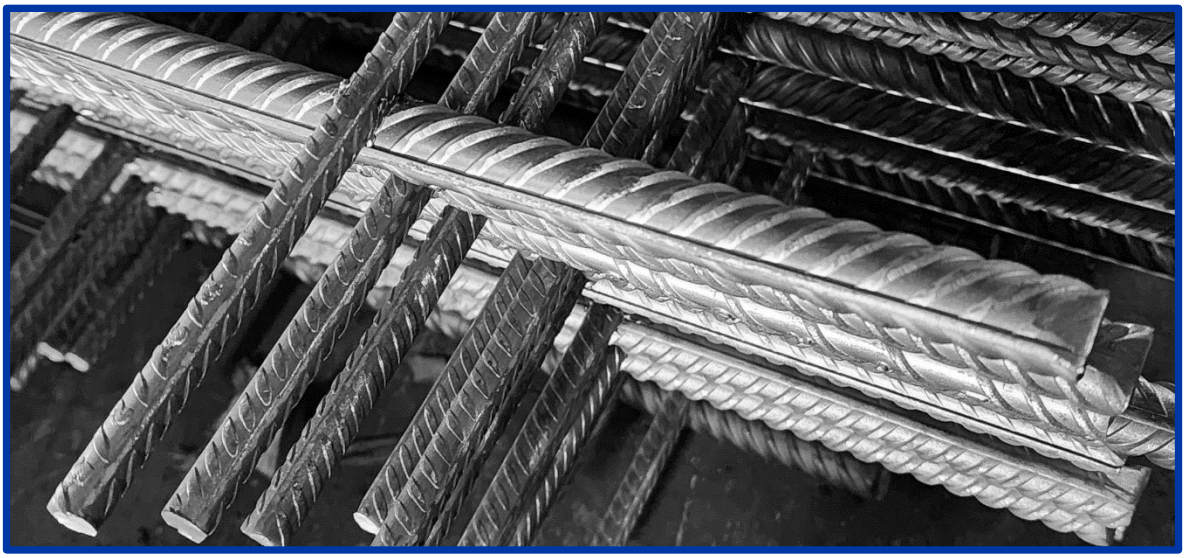


Figure 2.8.2: Up-close view on SSM Bar Mesh

2.9 SSM Bar Mat

Bar Mat is meant to expedite the steel reinforcement installation primarily for fast-track projects with straightforward layouts by enabling site to lay the steel fabric instantly covering large portions of area in a short period of time.

It is also more cost efficient when savings are achieved through the reduction of lapping, manpower and behind-the-scenes planning.

The use of scheduled or detailed types of mats can offer further economies in material quantities.

Figure 2.9.1: Laying of SSM Bar Mat for slab

Figure 2.9.2: SSM Bar Mat

2.10 SSM Special Mesh

SSM Special Mesh offers designers a wider range of fabric selection to match closely to the area of steel required in design, providing a more economical solution.

SSM Special Mesh comes with customisable combinations of main and cross wire diameters which are not in the range of the standard fabric.

Figure 2.10.1: SSM Special Mesh main and cross wire can be customised to the desired wire diameter.

Notation for special mesh:

Spacing/Pitch Code	Wire Spacing/Pitch	
	Main	Cross
A	200	200
B	100	200
DA	100	100

For example: B10/7 denotes special mesh of

- 10mm diameter wire at 100mm spacing (main direction)
- 7mm diameter wire at 200mm spacing (cross direction)

How to select special mesh?

Example:

Area of steel required in a slab design		B10	B10/7
Main direction (mm^2/m)	769	785	785
Distribution direction (mm^2/m)	192	252	192

The designer could specify B10/7 (7.68 kg/m^2), which is more economical than B10 (8.14 kg/m^2)

Table 2.10.1: SSM Special Mesh Specification: SSM A-Series

SSM Fabric Reference	Nominal Wire Diameter (mm)		Wire Spacing (mm)		Cross Sectional Area (mm^2/m)		Nominal Mass (kg/m^2)
	Main	Cross	Main	Cross	Main	Cross	
A6.5	6.5	6.5	200	200	166	166	2.60
A7/6	7	6	200	200	192	142	2.62
A7/6.5	7	6.5	200	200	192	166	2.81
A7.5	7.5	7.5	200	200	221	221	3.47
A7.5/6	7.5	6	200	200	221	142	2.84
A7.5/6.5	7.5	6.5	200	200	221	166	3.04
A7.5/7	7.5	7	200	200	221	192	3.24
A8/6	8	6	200	200	252	142	3.08
A8/6.5	8	6.5	200	200	252	166	3.28
A8/7	8	7	200	200	252	192	3.48
A8/7.5	8	7.5	200	200	252	221	3.71
A9/6	9	6	200	200	318	142	3.61
A9/6.5	9	6.5	200	200	318	166	3.80
A9/7	9	7	200	200	318	192	4.01
A9/8	9	8	200	200	318	252	4.47
A10/6	10	6	200	200	393	142	4.19
A10/6.5	10	6.5	200	200	393	166	4.39
A10/7	10	7	200	200	393	192	4.59
A10/8	10	8	200	200	393	252	5.06
A10/9	10	9	200	200	393	318	5.58
A11/6	11	6	200	200	475	142	4.84
A11/6.5	11	6.5	200	200	475	166	5.03
A11/7	11	7	200	200	475	192	5.24
A11/8	11	8	200	200	475	252	5.70
A11/9	11	9	200	200	475	318	6.23
A11/10	11	10	200	200	475	393	6.81
A12/7	12	7	200	200	565	192	5.95
A12/8	12	8	200	200	565	252	6.41
A12/9	12	9	200	200	565	318	6.94
A12/10	12	10	200	200	565	393	7.52
A12/11	12	11	200	200	565	475	8.17
A13/8	13	8	200	200	664	252	7.18
A13/9	13	9	200	200	664	318	7.71
A13/10	13	10	200	200	664	393	8.29
A13/11	13	11	200	200	664	475	8.94
A13/12	13	12	200	200	664	565	9.65

Table 2.10.2: SSM Special Mesh Specification: SSM B-Series

SSM Fabric Reference	Nominal Wire Diameter (mm)		Wire Spacing (mm)		Cross Sectional Area (mm^2/m)		Nominal Mass (kg/m^2)
	Main	Cross	Main	Cross	Main	Cross	
B5/6	5	6	100	200	196	142	2.65
B5/6.5	5	6.5	100	200	196	166	2.84
B6/6	6	6	100	200	283	142	3.33
B6/6.5	6	6.5	100	200	283	166	3.52
B6/7.5	6	7.5	100	200	283	221	3.95
B6/8	6	8	100	200	283	252	4.19
B6.5/7	6.5	7	100	200	332	192	4.12
B6.5/6	6.5	6	100	200	332	142	3.71
B6.5/6.5	6.5	6.5	100	200	332	166	3.91
B6.5/7.5	6.5	7.5	100	200	332	221	4.34
B6.5/8	6.5	8	100	200	332	252	4.58
B7/6	7	6	100	200	385	142	4.13
B7/6.5	7	6.5	100	200	385	166	4.32
B7/7.5	7	7.5	100	200	385	221	4.76
B7/8	7	8	100	200	385	252	4.99
B7/9	7	9	100	200	385	318	5.52
B8/6	8	6	100	200	503	142	5.06
B8/6.5	8	6.5	100	200	503	166	5.25
B8/7	8	7	100	200	503	192	5.46
B8/7.5	8	7.5	100	200	503	221	5.68
B8/9	8	9	100	200	503	318	6.44
B8/10	8	10	100	200	503	393	7.03
B9/6	9	6	100	200	636	142	6.10
B9/6.5	9	6.5	100	200	636	166	6.30
B9/7	9	7	100	200	636	192	6.50
B9	9	8	100	200	636	252	6.97
B9/9	9	9	100	200	636	318	7.49
B9/10	9	10	100	200	636	393	8.08
B10/6	10	6	100	200	785	142	7.28
B10/6.5	10	6.5	100	200	785	166	7.47
B10/7	10	7	100	200	785	192	7.68
B10/7.5	10	7.5	100	200	785	221	7.90
B10/9	10	9	100	200	785	318	8.66
B10/10	10	10	100	200	785	393	9.25
B10/11	10	11	100	200	785	475	9.90
B10/12	10	12	100	200	785	565	10.6
B10/13	10	13	100	200	785	664	11.38
B11/7	11	7	100	200	950	192	8.97
B11/7.5	11	7.5	100	200	950	221	9.19
B11/9	11	9	100	200	950	318	9.96
B11/10	11	10	100	200	950	393	10.54

Table 2.10.2: SSM Special Mesh Specification: SSM B-Series (Continued)

SSM Fabric Reference	Nominal Wire Diameter (mm)		Wire Spacing (mm)		Cross Sectional Area (mm^2/m)		Nominal Mass (kg/m^2)
	Main	Cross	Main	Cross	Main	Cross	
B11/11	11	11	100	200	950	475	11.19
B11/12	11	12	100	200	950	565	11.90
B11/13	11	13	100	200	950	664	12.67
B12/7	12	7	100	200	1131	192	10.39
B12/7.5	12	7.5	100	200	1131	221	10.61
B12/9	12	9	100	200	1131	318	11.38
B12/10	12	10	100	200	1131	393	11.96
B12/11	12	11	100	200	1131	475	12.61
B12/12	12	12	100	200	1131	565	13.32
B12/13	12	13	100	200	1131	664	14.09
B13/8	13	8	100	200	1327	252	12.39
B13/9	13	9	100	200	1327	318	12.92
B13/11	13	11	100	200	1327	475	14.15
B13/12	13	12	100	200	1327	565	14.86
B13/13	13	13	100	200	1327	664	15.63

Table 2.10.3: SSM Special Mesh Specification: SSM DA-Series

Fabric Reference	Nominal Wire Diameter (mm)		Wire Spacing (mm)		Cross Sectional Area (mm^2/m)		Nominal Mass (kg/m^2)
	Main	Cross	Main	Cross	Main	Cross	
DA6/5	6	5	100	100	283	196	3.76
DA6.5	6.5	6.5	100	100	332	332	5.21
DA6.5/6	6.5	6	100	100	332	283	4.82
DA7/5	7	5	100	100	385	196	4.56
DA7/6	7	6	100	100	385	283	5.24
DA7/6.5	7	6.5	100	100	385	332	5.63
DA7.5	7.5	7.5	100	100	442	442	6.94
DA7.5/7	7.5	7	100	100	442	385	6.49
DA7.5/6.5	7.5	6.5	100	100	442	332	6.07
DA7.5/6	7.5	6	100	100	442	283	5.69
DA7.5/5	7.5	5	100	100	442	196	5.01
DA8/5	8	5	100	100	503	196	5.49
DA8/6	8	6	100	100	503	283	6.17
DA8/6.5	8	6.5	100	100	503	332	6.55
DA8/7	8	7	100	100	503	385	6.97
DA9/6	9	6	100	100	636	283	7.21
DA9/6.5	9	6.5	100	100	636	332	7.60
DA9/7	9	7	100	100	636	385	8.01
DA9/8	9	8	100	100	636	503	8.94
DA10/6	10	6	100	100	785	283	8.38
DA10/6.5	10	6.5	100	100	785	332	8.77
DA10/7	10	7	100	100	785	385	9.19
DA10/7.5	10	7.5	100	100	785	442	9.63
DA10/8	10	8	100	100	785	503	10.11
DA10/9	10	9	100	100	785	636	11.16
DA11/7	11	7	100	100	950	385	10.48
DA11/8	11	8	100	100	950	503	11.41
DA11/9	11	9	100	100	950	636	12.45
DA11/10	11	10	100	100	950	785	13.63
DA12/7	12	7	100	100	1131	385	11.9
DA12/7.5	12	7.5	100	100	1131	442	12.35
DA12/8	12	8	100	100	1131	503	12.82
DA12/9	12	9	100	100	1131	636	13.87
DA12/10	12	10	100	100	1131	785	15.04
DA12/11	12	11	100	100	1131	950	16.34
DA13/8	13	8	100	100	1327	503	14.37
DA13/9	13	9	100	100	1327	636	15.41
DA13/10	13	10	100	100	1327	785	16.58
DA13/11	13	11	100	100	1327	950	17.88
DA13/12	13	12	100	100	1327	1131	19.30

2.11 SSM Customised Pitch Mesh

SSM Customised Pitch Mesh is a type of steel fabric designed with specific spacing (pitch) to meet particular design requirements. The spacing can be configured according to the end-user's needs.

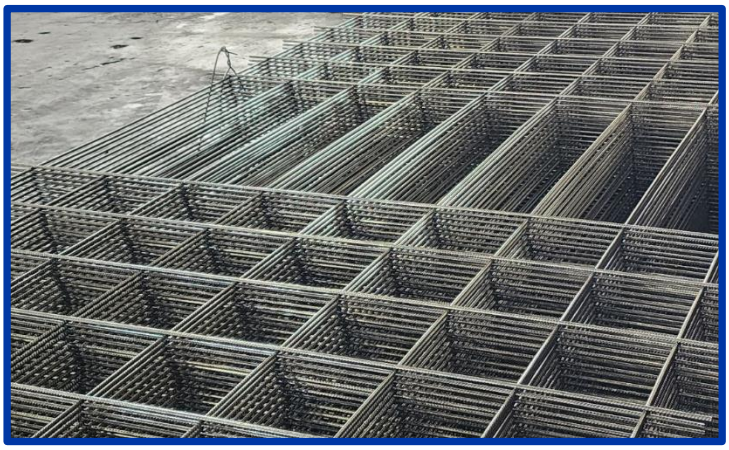


Figure 2.11.1: SSM Customised Pitch Mesh

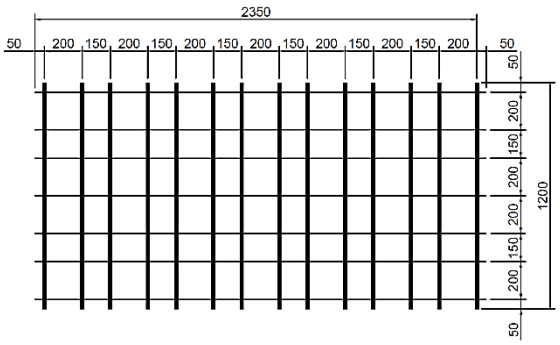


Figure 2.11.2: Customised Spacing with Alternate Consistent Odd Spacing

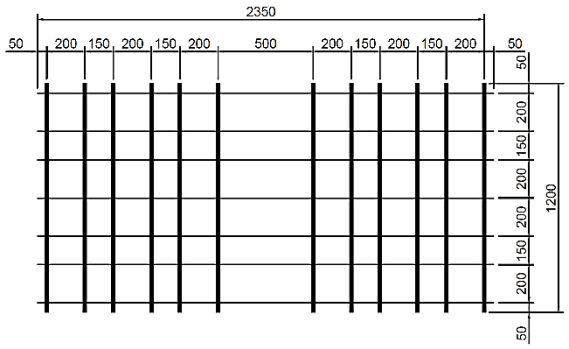


Figure 2.11.3: Customised Spacing with Jump Spacing

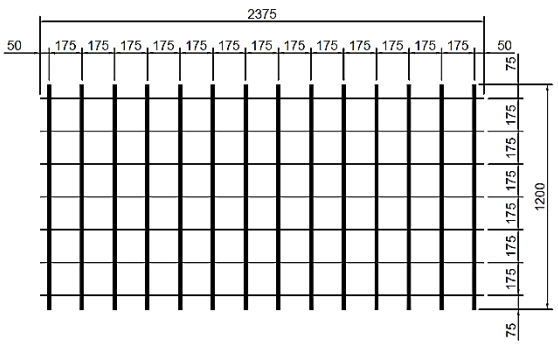


Figure 2.11.4: Customised Spacing with Consistent Odd Spacing

2.12 Industrial Mesh

In addition to construction, SSM Fabric also serves the non-construction sector in the form of industrial mesh. An example would be rack mesh. The fabricated mesh that are used for racking are subjected to the following standards:

No.	Inspection Details	Tolerance / Requirements
1	**Wire Diameter**	3.97mm to 4.06mm
2	**Mesh Dimension**	±1mm
3	**Wire Spacing**	±1mm
4	**Mesh Overhang Value**	±1mm
5	**Surface Condition**	No deep spiral marks No sharp protruded wire at welded intersection along perimeter of rack mesh
6	**Weld Shear Strength**	2kN to 2.5kN
7	**Warping of Mesh**	Not permitted

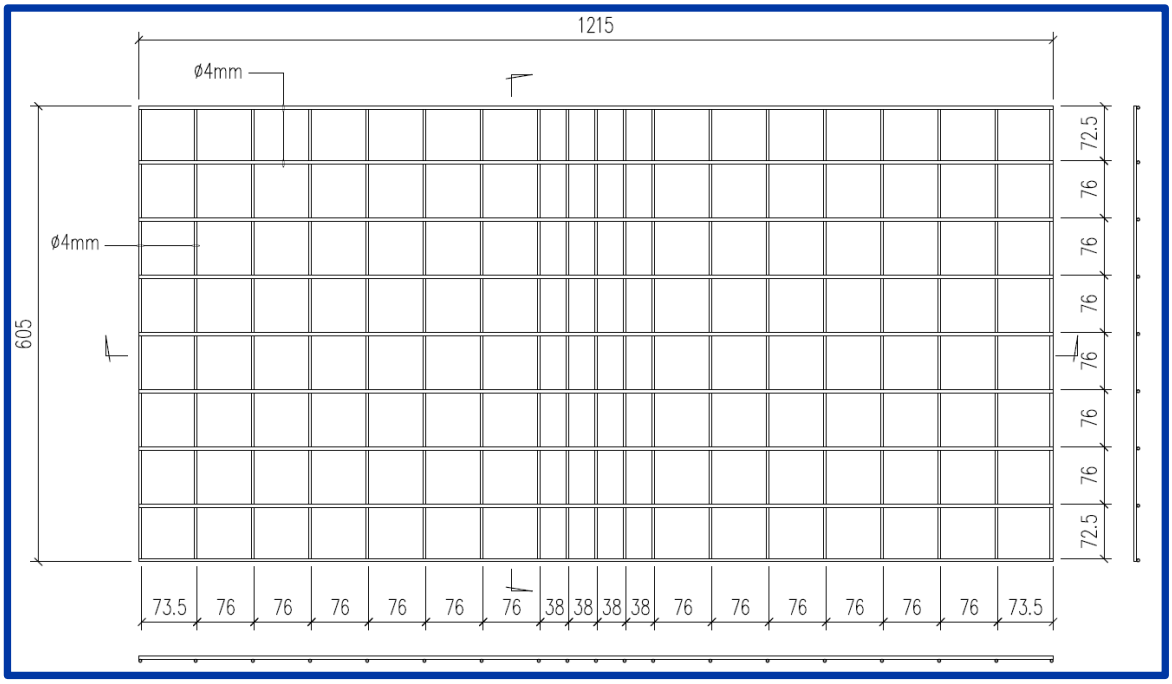
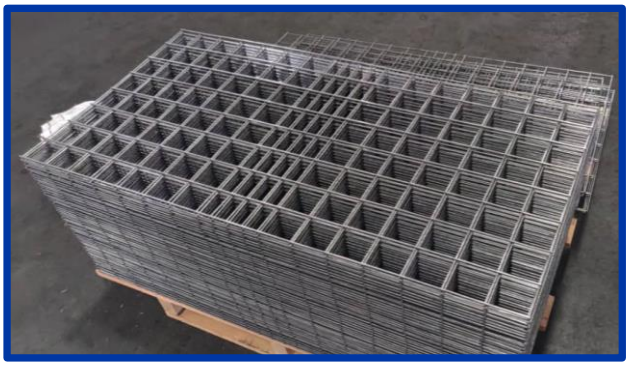


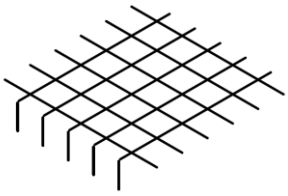
Figure 2.12.1 (above): An example of the rack mesh details that can be fabricated by SSM.

Figure 2.12.2 (right): Fabricated rack mesh as per details in figure 2.12.1.

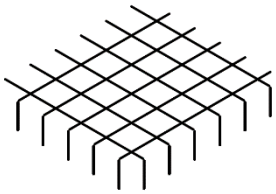


2.13 Mesh Bending

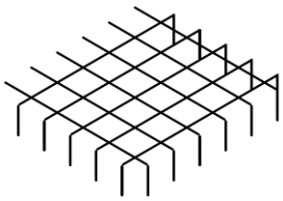
SSM can provide a variety of mesh bending services with great precision. Bending done by SSM in the plant will speed up progress at site as the mesh can be installed instantly without the need to bend the mesh manually at site. Larger diameter wires such as 9mm and above are difficult to bent manually at site.



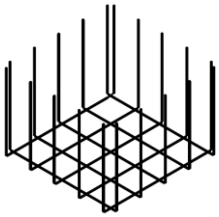
Single Bend



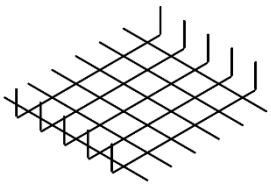
Double Bend



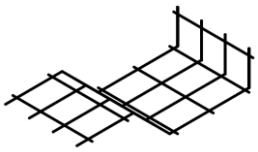
Three-Sided



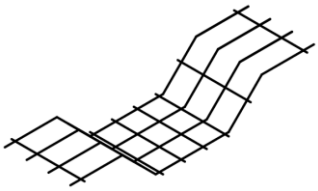
Four-Sided Bend



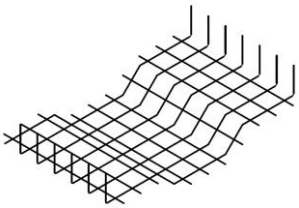
U-Bend



Crank & Bend



Double Crank



Double Crank & Double Bend

Customised bending is available by SSM. Kindly reach out to our representatives for more info.

3.0 APPLICATION OF SSM FABRIC

The scope for the application of SSM Fabric is very wide as it can be used in almost any conceivable reinforced concrete structures. Kindly reach out to SSM's technical sales team to discuss your specific application solution for your projects. Among the structures where SSM Fabric can be incorporated include:

3.1 Foundations

Figure 3.1.1: SSM Engineered Fabric can be used for raft pile by replacing steel bars

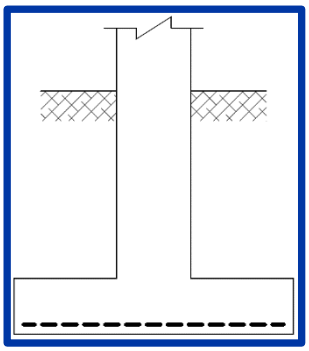


Figure 3.1.2: Strip Footing

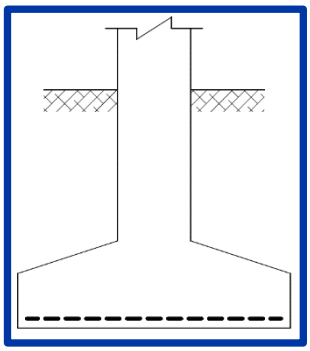


Figure 3.1.3: Pad Footing

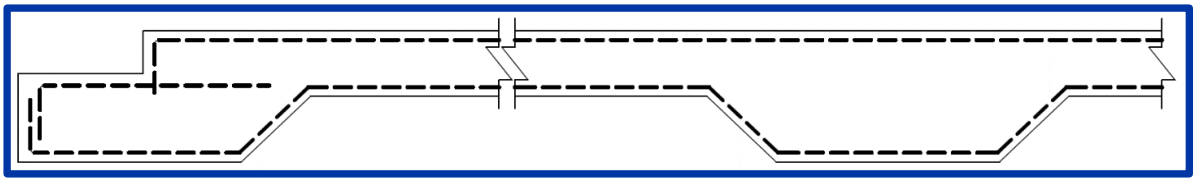


Figure 3.1.4: Raft Foundation

3.2 Anti Crack / Temperature / Topping Reinforcement

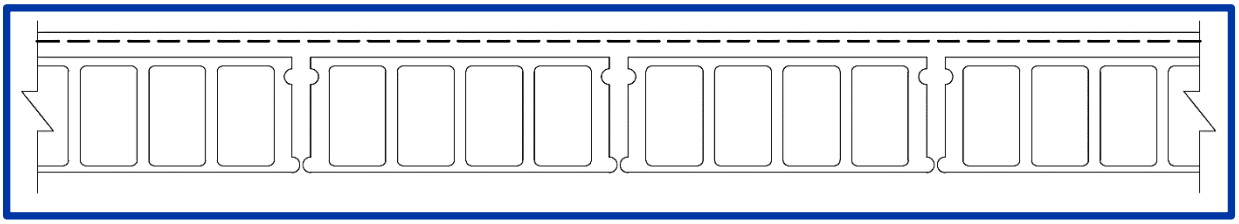


Figure 3.2.1: Topping Reinforcement

3.3 Floor Slabs

Figure 3.3.1: SSM Fabric can be used for reinforced concrete slabs

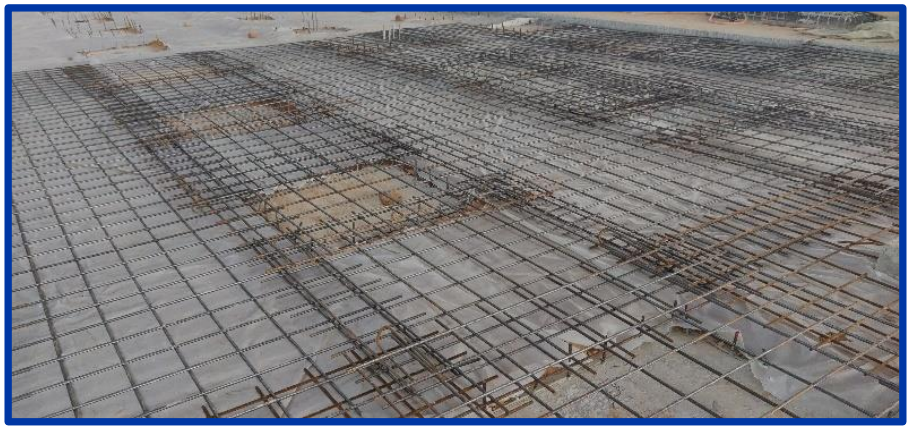


Figure 3.3.2: SSM Fabric can be used for reinforced concrete slabs which also includes conversion of large diameter steel bars into SSM Engineered Fabric to expedite site progress.

Figure 3.3.3: Non-suspended slab

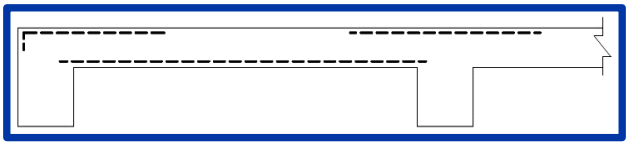


Figure 3.3.4: Suspended slab

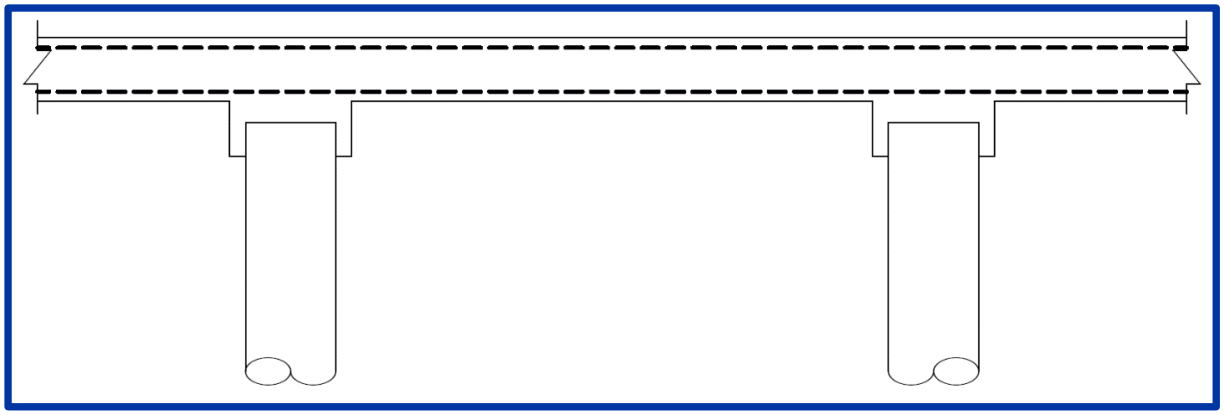


Figure 3.3.5: Flat slab

3.4 Reinforced Concrete Wall

Figure 3.4.1 (above) and 3.4.2 (right): SSM Fabric can be used for reinforced concrete wall which also includes conversion of large diameter steel bars into SSM Engineered Fabric to expedite site progress.

3.5 Infrastructures

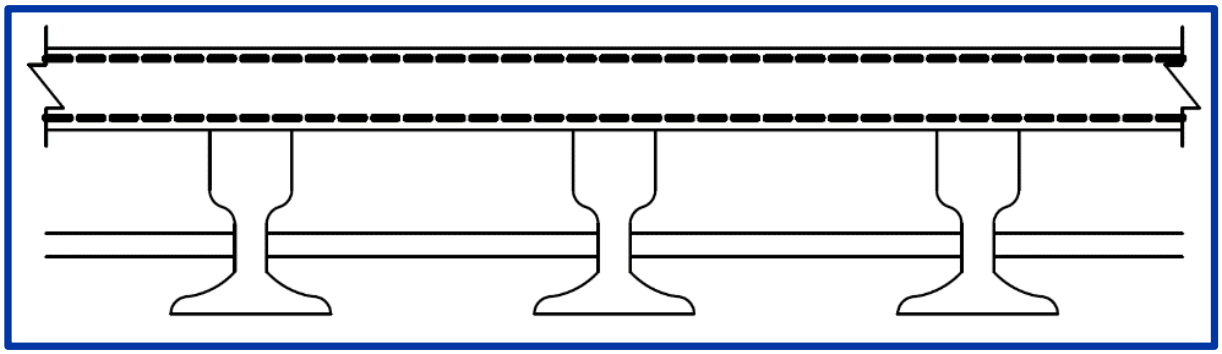


Figure 3.5.1: Bridge Decks

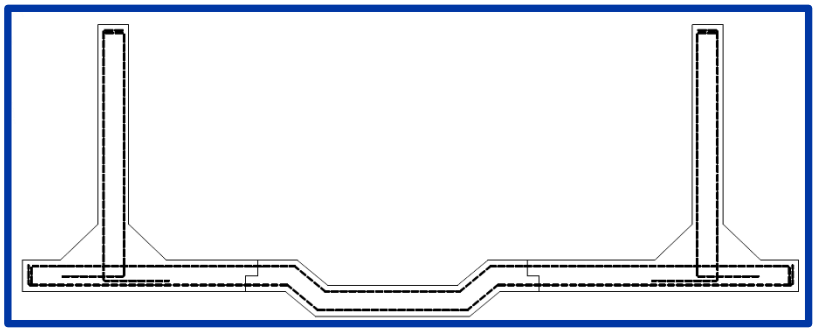


Figure 3.5.2: Open Channel

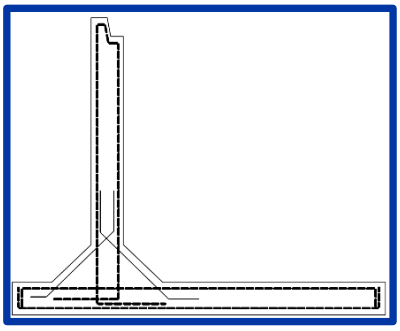


Figure 3.5.3: Retaining Wall

3.6 Precast Concrete Components & PPVC

Figure 3.6.1: SSM Fabric is suitable for precast components

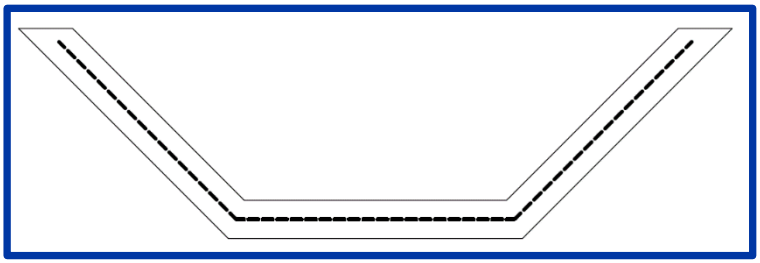


Figure 3.6.2: Drain Structure

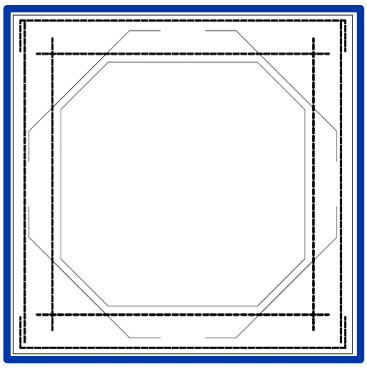


Figure 3.6.3 (left): Box Culverts

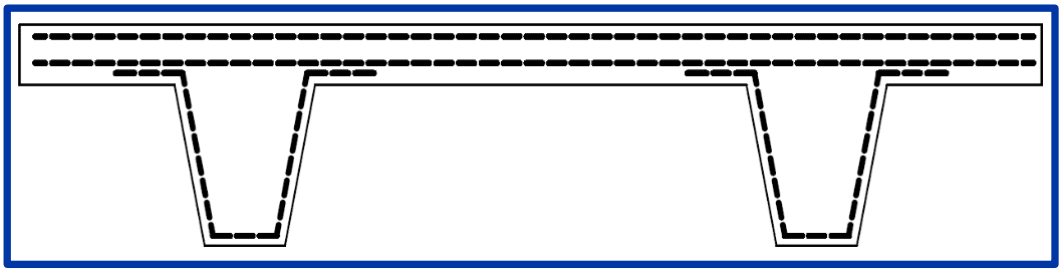


Figure 3.6.4: Double T-Beams

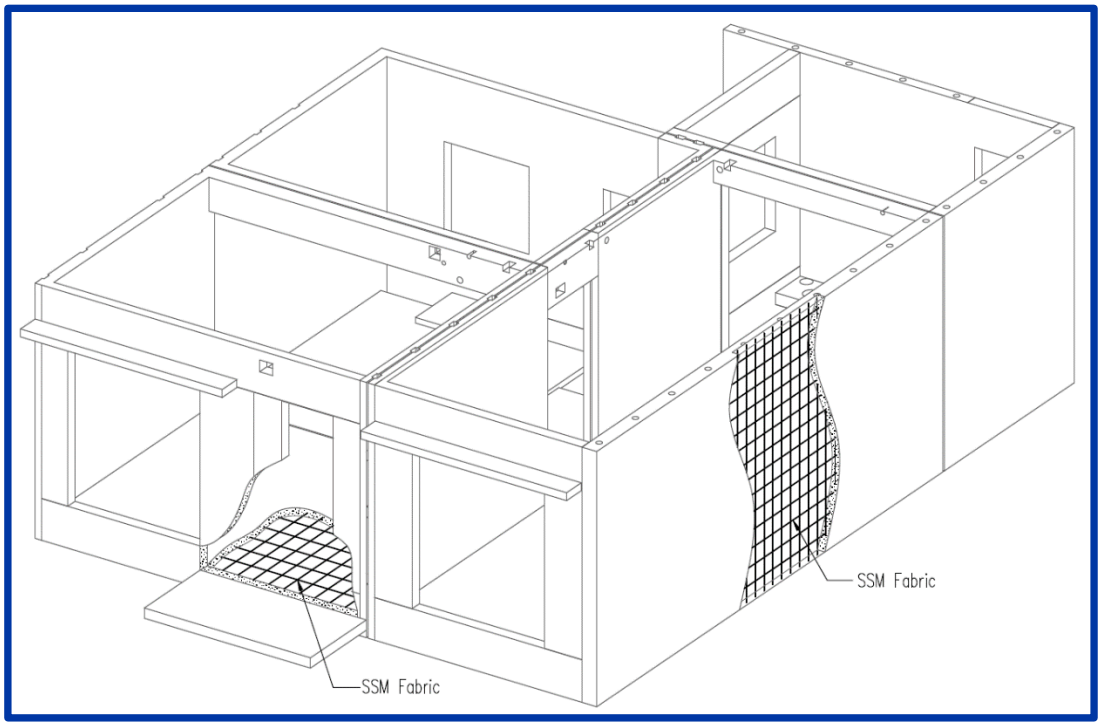


Figure 3.6.5: Prefabricated Prefinished Volumetric Construction (PPVC) Components

4.0 ADVANTAGES OF USING SSM FABRIC

4.1 Cost Advantage

Time & Labour Saved

Considerable amount of time is spent in sorting, cutting, spacing and tying of steel bars, which can be avoided with the use of SSM Fabric. This will also mean saving in labour cost. Early completion of projects will benefit stakeholders in terms of earlier sales or rental and saving in financial and administration charges.

Less Wastage and an Accurately Monitored Inventory

The SSM technical team will ensure the proposed cut-to-size steel fabric provision is optimised, considering the challenges encountered on-site during mesh sorting and installation. In addition, the quantity of SSM Fabric delivered to the site can be tracked and monitored by the end user, unlike standard sheets or standard-length bars, where waste must be factored into quantity estimates.

Easy Handling

Congestion problem at site due to limitation of storage space can be avoided as SSM Fabric can be arranged to deliver just in time for laying. Stock check is also made easier at site.

Alternative Technical Proposals

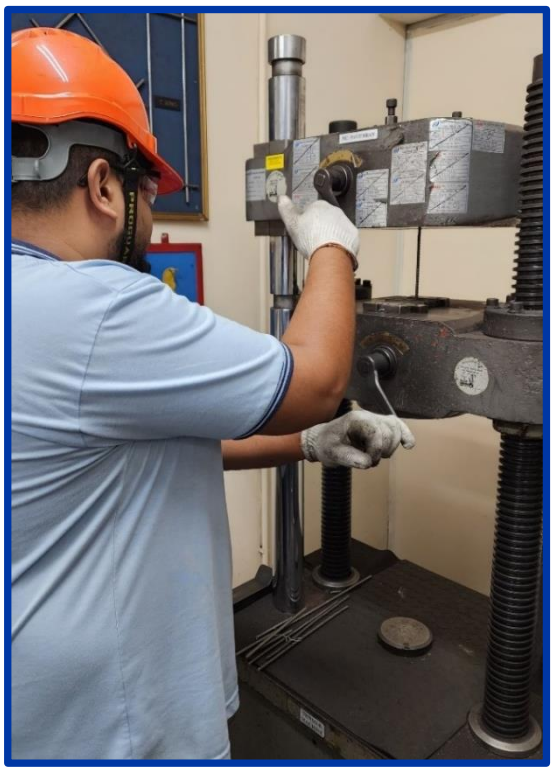
The SSM technical team can propose special customised steel fabric that are advantageous to the end user in terms of:

- Expediting site progress through the conversion of steel bars to SSM Fabric.
- Reduce lapping by utilising SSM Engineered Mesh and ultimately reduce quantity of steel reinforcement.
- Reduce congestion at lapping intersections by customising the steel fabric detailing and proposal of SSM Engineered Mesh.
- Optimising steel reinforcement provision according to design code requirements by having dedicated customised wire diameter and spacing for main and cross wires.

4.2 Technical Specification Advantages

Adaptability

SSM Fabric can easily be bent into the required shape of form. Due to its quality material, it will maintain its shape throughout.

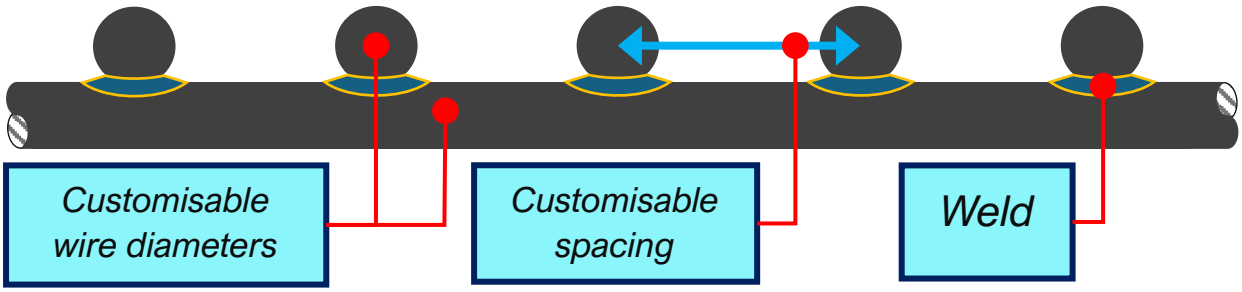


Controlled Quality

Our wire drawing process produces drawn wires of perfect roundness and consistent quality. This same roundness can never be achieved with hot-rolled bars. The fabrication process is also controlled to achieve consistency and accuracy in wire spacings. SSM Fabric is tested regularly in our well-equipped laboratory to ensure top quality products and strict adherence to the Malaysian Standards.

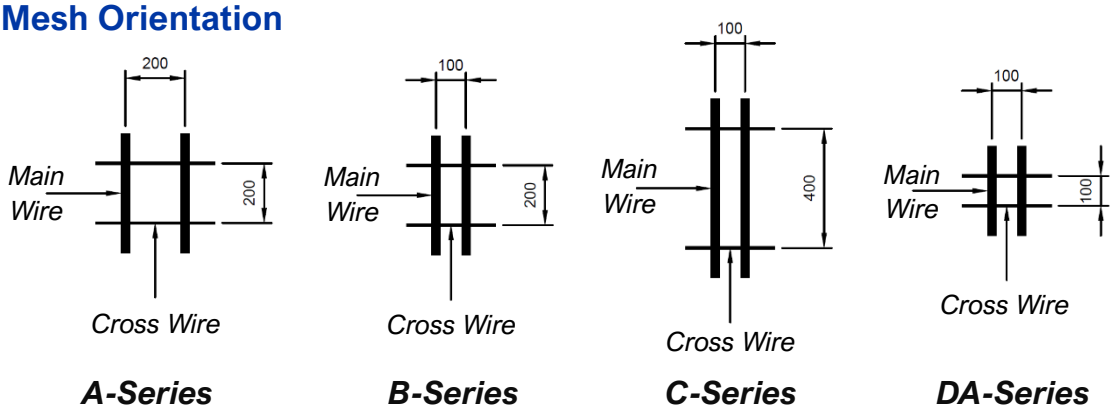
Good Anchorage and Crack Control

SSM Fabric enables positive mechanical anchorage through weld at regular intervals. This will control and limit any development of crack line. The use of SSM Fabric is advantageous in crack control due to its close and consistent spacing of smaller wires.

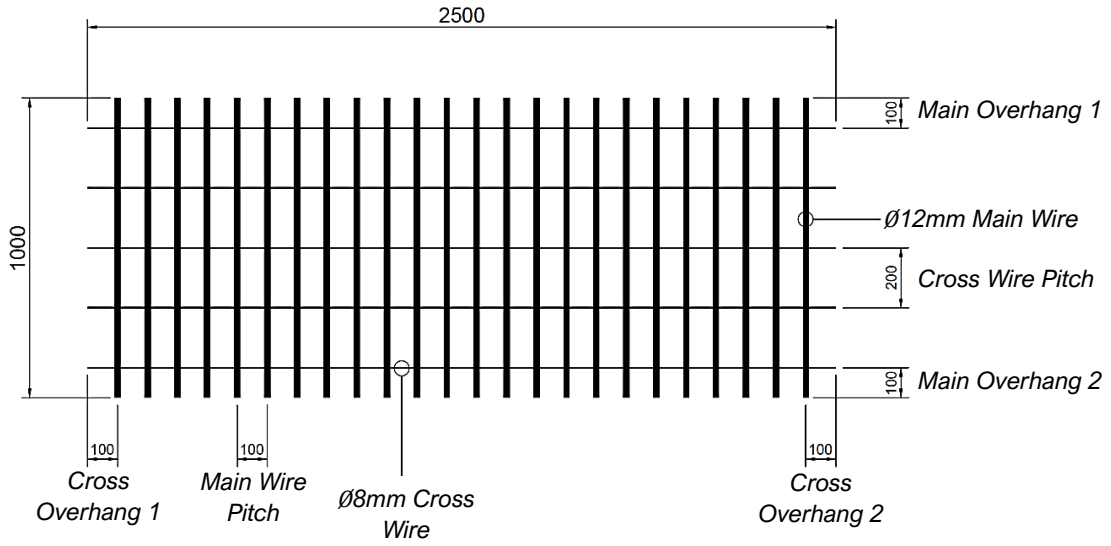


5.0 GENERAL TECHNICAL INFORMATION

5.1 Mesh Orientation



Example: SSM Mesh B-Series B12/8 of dimensions 1.00m × 2.50m



5.2 Pitch and Overhang

Pitch is the centre-to-centre spacing of wire in a fabric. For twin wire fabric, the spacing is measured between the tangent of the adjacent wires. The term “overhang” refers to the distance between the tip of the wire and the first weld joint. Other than the overall dimensions and spacings of the wires that determine the overhang to be provided, the usage location of the fabric also plays an important role in determining the suitable length of the overhangs.

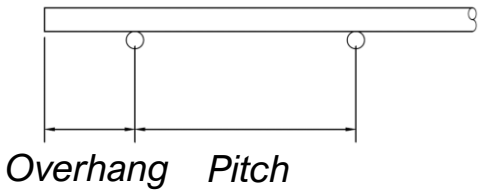


Figure 5.2.1: Pitch and Overhang for a Typical Steel Mesh

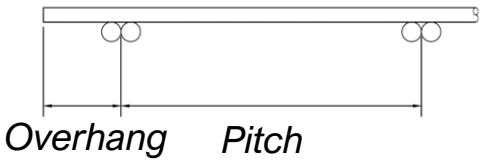


Figure 5.2.2: Pitch and Overhang for Twin Wire Mesh

5.3 Lapping

The full yield strength lap is characterised by the overlapping of 2 welds plus 25mm. The transfer of the stress (full yield strength) between 2 overlapping steel fabrics will be contributed by the anchorage from the embedment of the two welded perpendicular wires and the bond between the ribbed wire surface and concrete.

For half yield strength lap, the transfer of the stress (half yield strength) between 2 overlapping steel fabrics will be contributed by the anchorage from the embedment of one welded perpendicular wire and the bond between the ribbed wire surface and concrete.

Flying-end lap is based on the lap length as required by the structural design engineer.

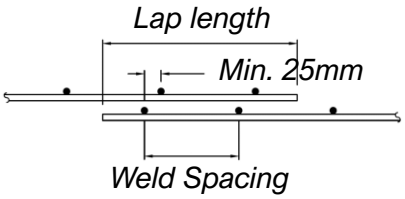


Figure 5.3.1: Full Yield Strength Lap

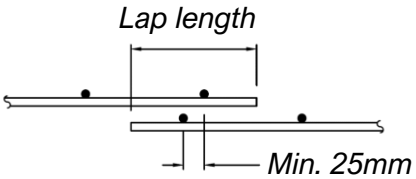


Figure 5.3.2: Half Yield Strength Lap

Lap length as specified by the structural design engineer

Figure 5.3.3: Flying-End Lap

Table 5.3.1

Type of RC Structure	Recommended Lap Type*		
	Full Yield Strength Lap	Half Yield Strength Lap	Flying-End Lap
a) Suspended RC Slabs			
i) Top Fabric		✓	
ii) Bottom Fabric	✓		
b) Non-Suspended RC Slabs			
i) 1 Layer of Top Fabric		✓	
c) Raft Foundations			
i) Top Fabric	✓		✓
ii) Bottom Fabric	✓		✓
d) Load-Bearing RC Walls			
i) Vertical Lap			✓
ii) Horizontal Lap	✓		✓
e) Non-Load-Bearing RC Walls		✓	
f) Strip Footing (1 layer of Bottom Fabric)	✓		
g) Topping Mesh for precast Slabs and Bridge Decks		✓	

*Subjected to structural consultant engineer's approval.

5.4 Mechanical Properties

Characteristic Tensile Properties:

Table 5.4.1

Grade	Yield Strength, R_e (MPa)	Tensile/Yield strength ratio (R_m/R_e)	Total Elongation at maximum force, A_{gt} (%)
B500A	500	1.05[a]	2.5[b]
B500B	500	1.08	5.0
B500C	500	≥1.15, <1.35	7.5

Notes:

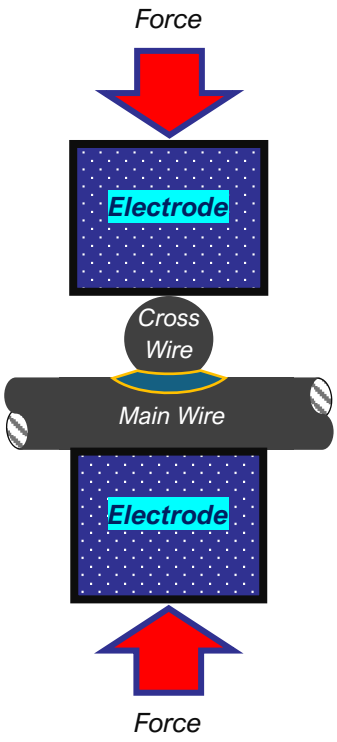
1. Values of R_e specified are characteristics with p = 0.95.
2. Values of R_m/R_e and A_{gt} specified are characteristics with p = 0.90.
3. Calculate the values of R_m and R_e using the nominal cross-sectional area.

[a] R_m/R_e characteristics is 1.02 for sizes below 8mm.

[b] A_{gt} characteristics is 1.0% for sizes below 8mm

The absolute maximum permissible value of yield strength is 650 MPa.

5.5 Anchorage & Weld



Anchorage is largely provided in the form of mechanical anchorage extended by the welds. MS145:2014 stipulates that the shear strength of welded joints in welded fabric shall not be less than $0.25 \times R_e \times A_n$ where R_e is the specified characteristic yield strength and A_n is the nominal cross-sectional area of the larger bar at the welded joint. For standard fabrics B1131 (B12) and above, and C785 (C10) and above, the minimum shear force required shall be calculated using the nominal cross-sectional area of the smaller bar of the welded joint, unless otherwise agreed at the time of enquiry, in which case, the minimum shear force required may be calculated using the nominal cross-sectional area of the larger bar. For SSM Fabric, the bond and anchorage between the steel reinforcement and concrete is contributed by both the rib on the welded wires and bars as well as the mechanical anchorage provided by the welds. The weld is formed by a controlled combination of pressure, intensity and duration of electric current to develop a fusion of the wires.

6.0 PRODUCTION PROCESS FLOW CHART

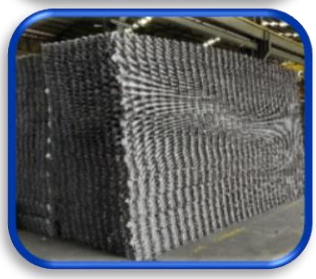
Wire Rod (Raw Material)

Cold Rolling Process

Wire Straightening & Cutting

Welding

Cutting and Bending of Mesh



Finished Mesh

7.0 OUTSTANDING IN QUALITY & PERFORMANCE

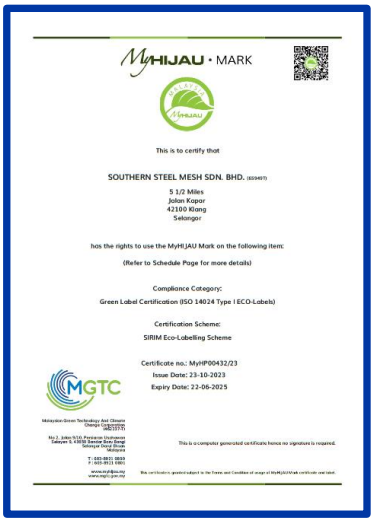
Southern Steel Mesh Sdn. Bhd. is committed to providing excellent quality products and services. We are ISO 9001:2015, ISO 14001:2015, ISO 37001: 2016 and ISO 45001:2018 certified. In addition to that, we are certified by SIRIM and CIDB for compliance with MS144:2014, MS145:2014 and MS146:2014 standards as well as obtaining the SIRIM Eco Label which grants SSM the right to use the MyHijau Mark on their products.


LESEN PENSIJILAN BARANGAN
Product Certification Licence
SOUTHERN STEEL MESH SDN. BHD.
WELDED STEEL FABRIC FOR THE REINFORCEMENT OF CONCRETE
MS 145 : 2014


LESEN PENSIJILAN BARANGAN
Product Certification Licence
SOUTHERN STEEL MESH SDN. BHD.
COLD WORKED STEEL WIRE FOR REINFORCEMENT OF CONCRETE PRODUCTS
MS 144 : 2014


LESEN PENSIJILAN BARANGAN
Product Certification Licence
SOUTHERN STEEL MESH SDN. BHD.
COLD WORKED RIBBED WELDABLE REINFORCING STEEL
MS 146 : 2014


LESEN PENSIJILAN EKO-LABEL
Eco-Label Licence
SOUTHERN STEEL MESH SDN. BHD.
STEEL PRODUCTS
SIRIM ECO 032 : 2020


MyHIJAU · MARK
This is to certify that
SOUTHERN STEEL MESH SDN. BHD.
5 1/2 Miles
Jalan Kapar
42100 Klang
Selangor
has the rights to use the MyHIJAU Mark on the following item:
(Refer to Schedule Page for more details)
Compliance Category:
Green Label Certification (ISO 14024 Type I ECO-Labels)
Certification Scheme:
SIRIM Eco-Labelling Scheme
Certificate no.: MyHP00432/23
Issue Date: 23-10-2023
Expiry Date: 22-06-2025


CIDB MALAYSIA
PERAKUAN PEMATUHAN STANDARD
(BAHAN BINAAN)
IRON AND STEEL PRODUCTS
HERYANTI HILMI
PENGARAH
CIDB NEGERI SELANGOR
b.p Ketua Eksekutif

ISO 9001:2015
Quality Management System

ISO 14001:2015
Environmental Management System

ISO 37001:2016
Anti-Bribery Management System

ISO 45001:2018
Occupational Health and Safety Management System

Disclaimer: *The content in this catalog, including product descriptions, pricing, and specifications, is for informational purposes only. Although SSM strives for accuracy, it cannot guarantee the absence of errors or omissions and assumes no liability for any issues arising from such discrepancies. Customers are advised to verify all information before making purchasing decisions.*

8.0 STEEL BAR / WIRE CROSS-SECTIONAL AREA

Bar / Wire Diameter, Ø (mm)	Cross Sectional Area per Bar/Wire (mm^2)	Bar / Wire Spacing (mm)									
		75	100	125	150	175	200	225	250	275	300
		Cross Sectional Area in mm^2/m									
25	490.87	6,545	4,909	3,927	3,272	2,805	2,454	2,182	1,963	1,785	1,636
20	314.16	4,189	3,142	2,513	2,094	1,795	1,571	1,396	1,257	1,142	1,047
16	201.06	2,681	2,011	1,608	1,340	1,149	1,005	894	804	731	670
13	132.73	1,770	1,327	1,062	885	758	664	590	531	483	442
12	113.10	1,508	1,131	905	754	646	565	503	452	411	377
11	95.03	1,267	950	760	634	543	475	422	380	346	317
10	78.54	1,047	785	628	524	449	393	349	314	286	262
9	63.62	848	636	509	424	364	318	283	254	231	212
8	50.27	670	503	402	335	287	251	223	201	183	168
7.5	44.18	589	442	353	295	252	221	196	177	161	147
7	38.48	513	385	308	257	220	192	171	154	140	128
6.5	33.18	442	332	265	221	190	166	147	133	121	111
6	28.27	377	283	226	188	162	141	126	113	103	94
5	19.63	262	196	157	131	112	98	87	79	71	65

Plant Locations:

Central Region

5 ½ Miles, Jalan Kapar,

42100 Klang,

Selangor, Malaysia.

Northern Region

2489 Mk 1, Lorong Perusahaan 12,

Prai Industrial Estate,

13600 Prai,

Penang, Malaysia.

www.southernsteelmesh.com