

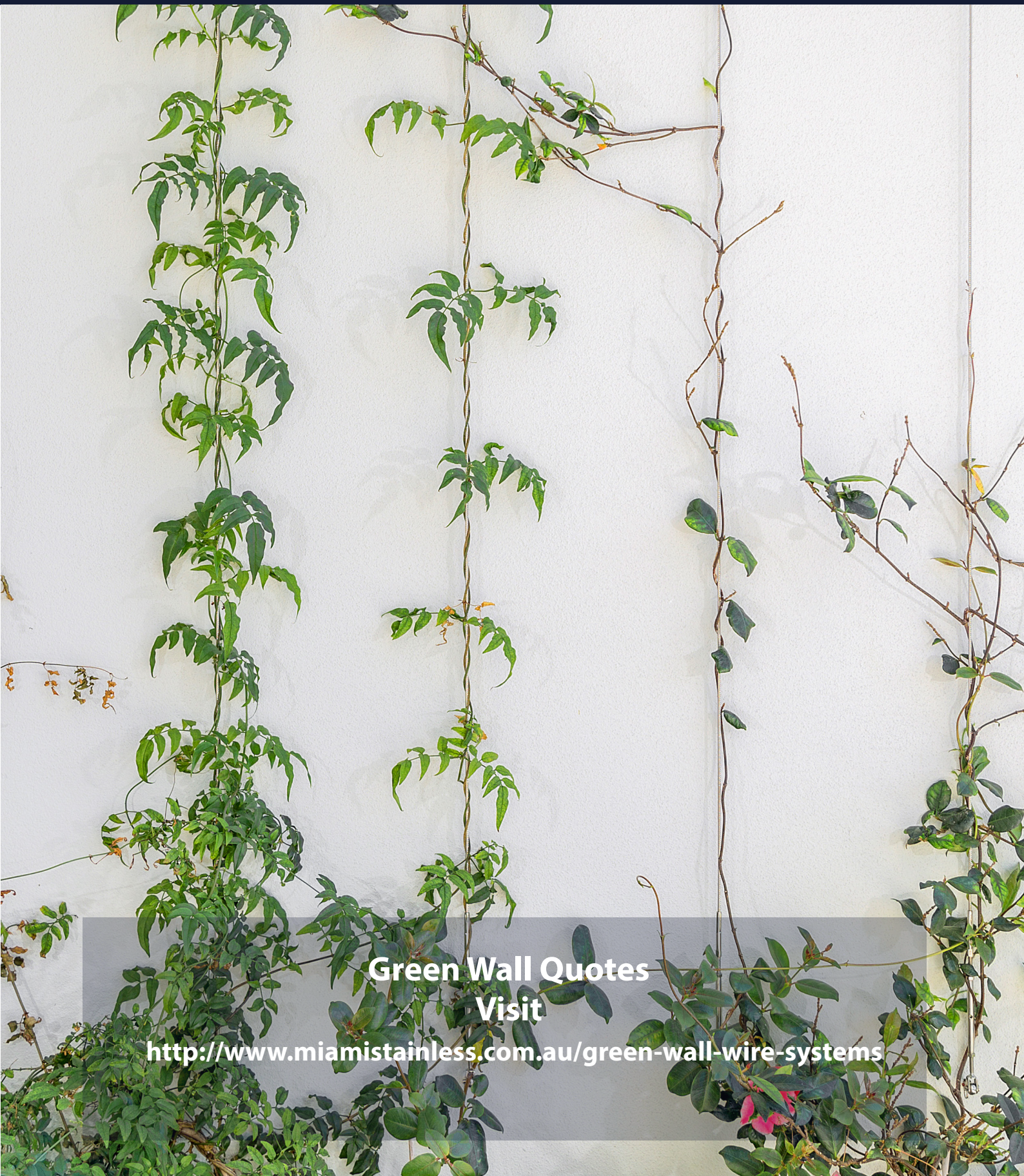
TECHNICAL DESIGN DOCUMENT

Green Wall Systems

VERTICAL, HORIZONTAL, GRID AND CUSTOM DESIGNS



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INTRODUCTION

Nothing brings to life a space quite like adding greenery. Vertical green walls, trellis systems and hanging gardens softening the exteriors façades, bringing warmth and life to buildings and homes.

Architects and designers are now also using this stunning design feature as a way to tackle air pollution and improve the quality of the urban surroundings. The Miami Stainless range of green wall systems can offer a perfect solution for green wall designs in both commercial and residential projects.

This guide aims to serve as an introduction to green wall and trellis system solutions from Miami Stainless.





PLANNING YOUR TRELLIS OR GREEN WALL SYSTEM

Creating a year round appealing green wall project takes some consideration, not only in selecting appealing and reliable high performing wire and anchoring components but also the selection of appropriate climbing plants to suit your needs.

To assist you in your planning we have listed a range of things to consider before beginning your green wall project.

PRODUCT SELECTION & INSTALLATION

- ▶ The length of runs and weight of plants will greatly impact the components you will need for your green wall project. Those spanning large distances will require more anchorage and possibly bracing of the post systems. See pages 8 & 9 for more details.
- ▶ Each system will hold the wire from the wall at different distances from the wall. Greenline posts give the maximum distance (approximately 90mm). This space also allows for more foliage to grow around the wire runs.
- ▶ Eye Nut anchors and Brackets provide a cheaper alternative however can not hold the weight of the Greenline posts.
- ▶ Green wall trellis systems can be installed into almost any surface. Please consult with our sales team to discuss the correct anchoring components for your project.
- ▶ Each system requires a different level of skill for installation. The Greenline line post system is our best green wall system, is easy to install and requires no specialised tools. Straight vertical green wall runs can be made using brackets along with our swageless Rapid Lock bolts. These do not require any specialised swaging tools. All other systems require either hand swaging or hydraulic swaging.

PLANT SELECTION

- ▶ Dense foliage plants can offer a natural way to cool building walls. If the green wall project is on a Western facing wall (Southern Hemisphere) consider a wire system with multiple wires and dense foliage to help with internal cooling.
- ▶ The direction the green wall will face should be considered when selecting the plants. If your green wall will face the afternoon sun, you will need to consider sun-hardened plant varieties. Likewise if the area will not receive much sun you will need a variety to suit.
- ▶ Since many green wall projects are attached to building walls, possibly covered by awnings. When designing the area you will need to ensure suitable access to water or integrate a watering system into the planning.
- ▶ In most projects plant selection will be of the evergreen variety. Deciduous plant varieties lose all their leaves each year, in this scenario a green wall wire trellis system should be a stylish and beautiful design to compliment the area without the plant foliage.

DIY GREEN WALL INSTALLATIONS



GREENLINE POSTS

The Greenline post by Blue Wave is both extremely easy to install and provides for an elegant and stylish finish to your green wall project.

The posts have two holes positioned at right angles to each other making it perfect for regular trellis designs of vertical wires and/or horizontal wires, or the diamond trellis design. The posts have the versatility of being suitable for both end or intermediate posts.

The internal grub screw wire locking system will hold plant loads of 250kg or for greater loads please order pre-swaged wires, this will increase the wire pull out strength to 700kgs. Please note that for high loads an additional tie back wall anchor should be added.

The base of the post has an internal M8 metric thread for wall fixing. This is suitable for use with either dual thread coach screws, plastic



GREENWALL DESIGNING

WHICH GREENWALL SYSTEM SHOULD I USE?

The first step is to decide:

- Where you want to install your greenwall trellis system
- What climbing plants you are going to train
- What aesthetic are you after

For most domestic greenwall applications there should be no need for any other considerations, however for large scale commercial Greenwall projects further advice on loadings may be needed. For green façades of this type, we strongly recommend you seek design advice from structural engineers.

WHICH PLANTS WILL WORK WITH MY GREENWALL DESIGN?

Climbers grow in different ways and the way the plant grows will dictate the type of support you need. The speed it grows will dictate the spacing required between the supports and the distance it needs to be from the wall.

Vines or Twisting Plants naturally grow vertically, so they only need vertical supports. They twine around their supports by the circular movements of their stem tips. There are many types of vines such as Jasmin Star and Wisteria (*Wisteria Sinensis*).

In theory, vines only need vertical supports, however in the case of wisteria for example, with a little effort, they can also be trained along horizontal supports. The spacing needed between the vertical supports depends on the species.

For slow to moderate growing climbers the supports should be approximately 200-400mm apart. For very vigorous species the supports can be as much as 800mm apart.

Grid Systems provide the optimum support for Leaf-stem and leaf climbers as they form coils and cling around their supports. Most varieties of Clematis and Nasturtiums are examples of the former and grape vines (*Vitis*), Passion flowers the latter. Choose a 200-330mm grid for slow growing to moderately vigorous climbers eg Clematis and 400-500mm for very vigorous climbers (eg *Vitis*).

Long horizontal wires with a small vertical range are ideal for ramblers, scrambling plants and espalier trees such as climbing and rambler roses, bramble-like shrubs and winter-flowering jasmine. They use thorns, bristles and prickles to climb up their support and tend not to grow so much upwards as horizontally. The recommended vertical spacings between the horizontal wires is 300-500mm.

Plants with different climbing patterns can be combined perfectly well. The chosen plants as well as the aesthetic aspects will determine the choice of climbing support.

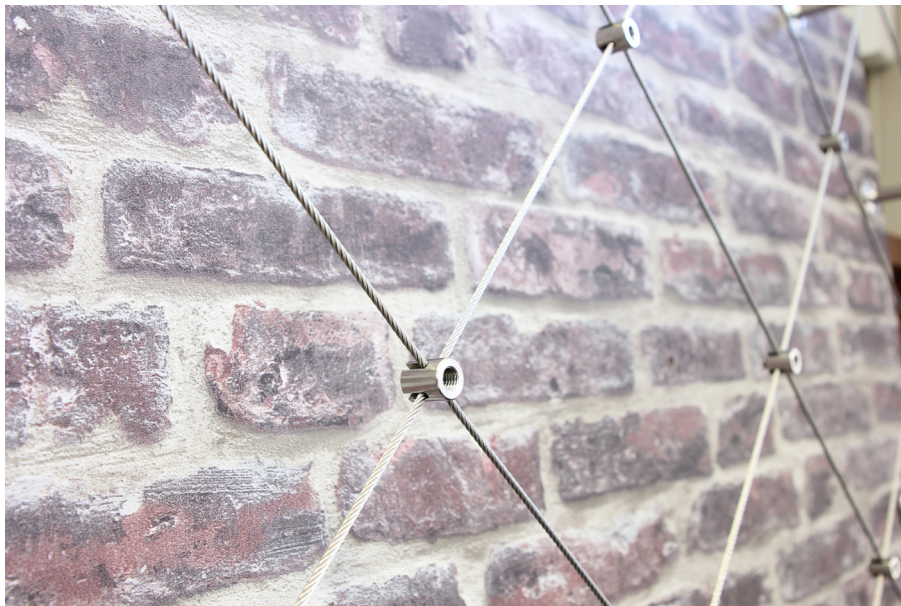
GREENWALL DESIGNING

WHAT CAN I BUILD A GREEN WALL STRUCTURE ON?

Greenwall trellis structures can be attached to almost any surface, such as wood, metal, brick, stone, masonry or metal. The most important factor to consider when selecting a location is that the area is strong enough to take the weight of the system and also the greenery which will cover it.

WHAT IS THE MAXIMUM RECOMMENDED GRID SIZE?

We would recommend that if the wires are not tensioned the maximum grid size is 3m x 3m with 500mm spacings. As a general rule we suggest 500mm spacings for vigorous, fast growing plants and 300mm for medium to slower growing plants.



DO I NEED TO WORRY ABOUT THE WEIGHT OF THE PLANTS?

Yes, you do. The weight of the plants can vary greatly depending on the variety you choose. The weight per square metre of plants can vary from 1-50kg per square metre. Our wire rope, posts and fixings supplied for greenwall projects are very strong. For example we suggest using a minimum of 3mm 7 x 7 wire rope, which has a breaking load of 585kg and the Greenline Posts can handle up to 218kg.

What you need to ensure is that the surface in which you are fixing and anchoring to can support the weight of the system and the foliage.

GREENWALL DESIGNING

HOW MUCH MAINTENANCE IS REQUIRED FOR GREENWALL SYSTEMS?

With careful planning and design of the support system most green facades need very little maintenance or cleaning. Small scale domestic green walls are simple and require very little maintenance, whilst bigger installations or those with very sophisticated planting combinations may need a bit more. As with many plants, the plants themselves may need pruning to prevent them entering gutters or blocking windows.

The wire and fittings are made of 316 marine grade stainless steel so maintain the highly polished finish for years. Over the years, however, as the plant gets heavier it may cause the cable to sag a bit, so you may need to retention the wire or add anchors.

HOW FAR SHOULD THE CABLE BE FROM THE WALL?

As a rule, slow-growing to moderately vigorous climbers (eg clematis) should be approx 20-80mm from the wall whereas very vigorous climbers eg Wistera are better 90mm or more from the wall.

STANDARD SYSTEM = wire 20mm to 60mm from the wall

GREENLINE SYSTEM = wire 90mm from the wall

HOW DO I REDUCE THE SAG OF HORIZONTAL WIRES?

This can be diminished with intermediate supports. We recommend for minimal deflection, you use an intermediary fixing a minimum of every 1 metre.

IS GREENWALL DIFFICULT TO INSTALL AND DO I NEED ANY SPECIAL TOOLS?

No. All systems are designed to be DIY. They install in minutes with no specialist tools, training or expensive installers are needed. Depending on the system you choose you may require Wire Cutters, Hexagon Socket Key or the Greenline Post Clamp Tool.



GREENWALL DESIGNING

WHAT FITTINGS AND WIRE DO I NEED?

We recommend 7 x 7 stainless steel cable as it not only looks good but gives a good surface for the plants to climb up. The 1 x 19 construction tends to be too smooth.

GRID SYSTEMS

- STANDARD SYSTEM - choose between standard screw eye S3182-10080 (wire 35mm from wall) or short fittings S3182-0860 (wire 20mm from wall), RapidLock swageless fittings and 3 or 4mm 7x7 cable and appropriate size black plastic end caps. Depending upon the wall material you may also need Mungo Plugs.



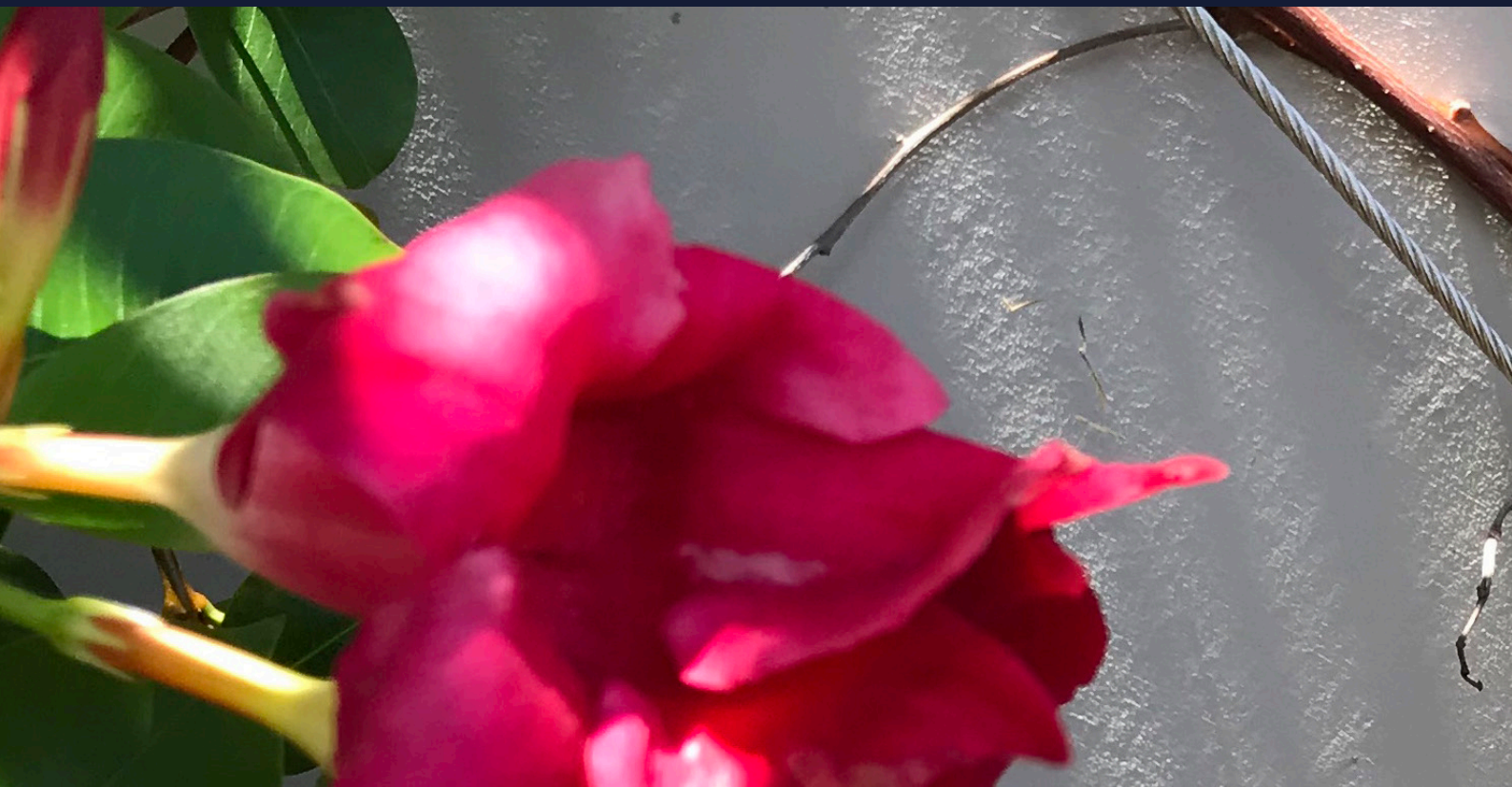
- GREELINE SYSTEMS - Greenline Posts (wire 90mm from wall), Netclips and either 3 or 4mm 7 x 7 cable and appropriate size black plastic end caps. Depending upon the wall material you will also need Dual Headed Coach Screws and Mungo Plugs.

HORIZONTAL AND VERTICAL SYSTEMS

- STANDARD SYSTEM - Screw Eyes S3182-0860 with RapidLock swageless fittings and either 2.5mm or 3mm 7x7 cable. Run through intermediary screw eye fittings.

- STANDARD WITH TENSIONER - Screw Eye S3182-10080 fittings with jaw tensioners and either 3 or 4mm 7x7 cable. Run through screw eye fittings.

- GREENLINE SYSTEM - Greenline Posts and either 3 or 4mm 7 x 7 cable and appropriate size black plastic end caps.



DIY GREEN WALL SYSTEMS COMPONENTS



Net Clip
(BWA600003/4C)



Wire Rope Grips
(S260-03)



Eyes Nut
(S3291-08080)



Greenline Post
(BW08165095)



Wire Rope
(W0377 or W03.277)



Hook Eye Turnbuckle
(S311HE-05PR)



**5mm Bottlescrew
Jaw/Jaw**
(S312J-05)



**Angle Bracket (SAB-
6550)**



**5mm Bottlescrew
Jaw/Swage
(S312T-0503)**



**6x20mm Eye Bolts
(S444-0620)**



**6x60mm Screw Eyes
(S3182-10080)**



**Mungo Plugs
(MP-08)**



**Rapid Lock Stud
(R7801R)**



**Barrel Nuts
(SBN)**



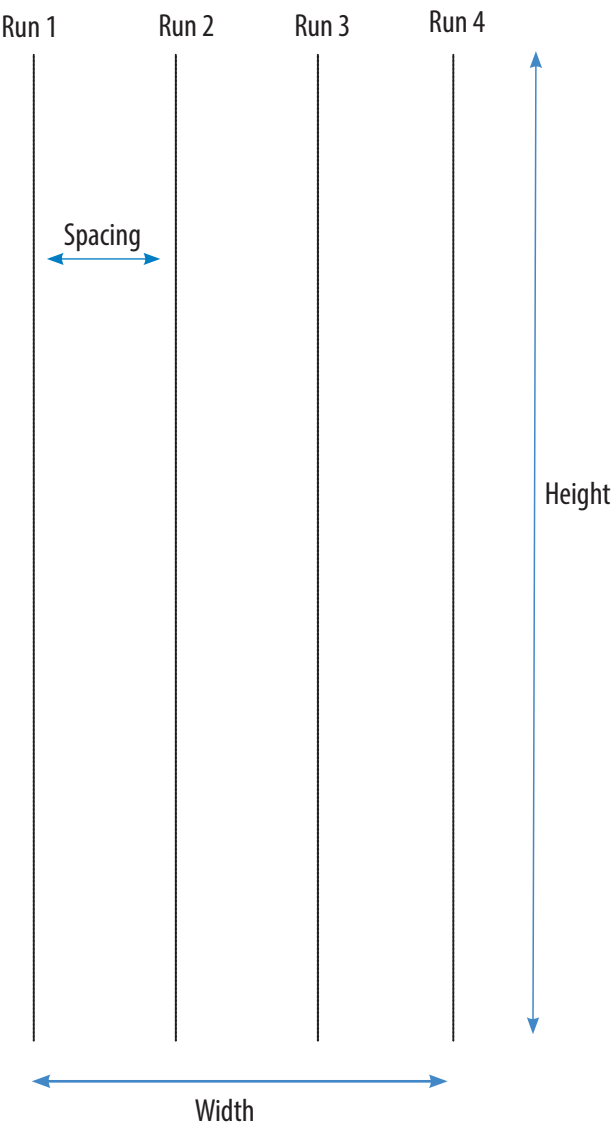
**5mm Saddle
Eye Straps
(S322-05)**



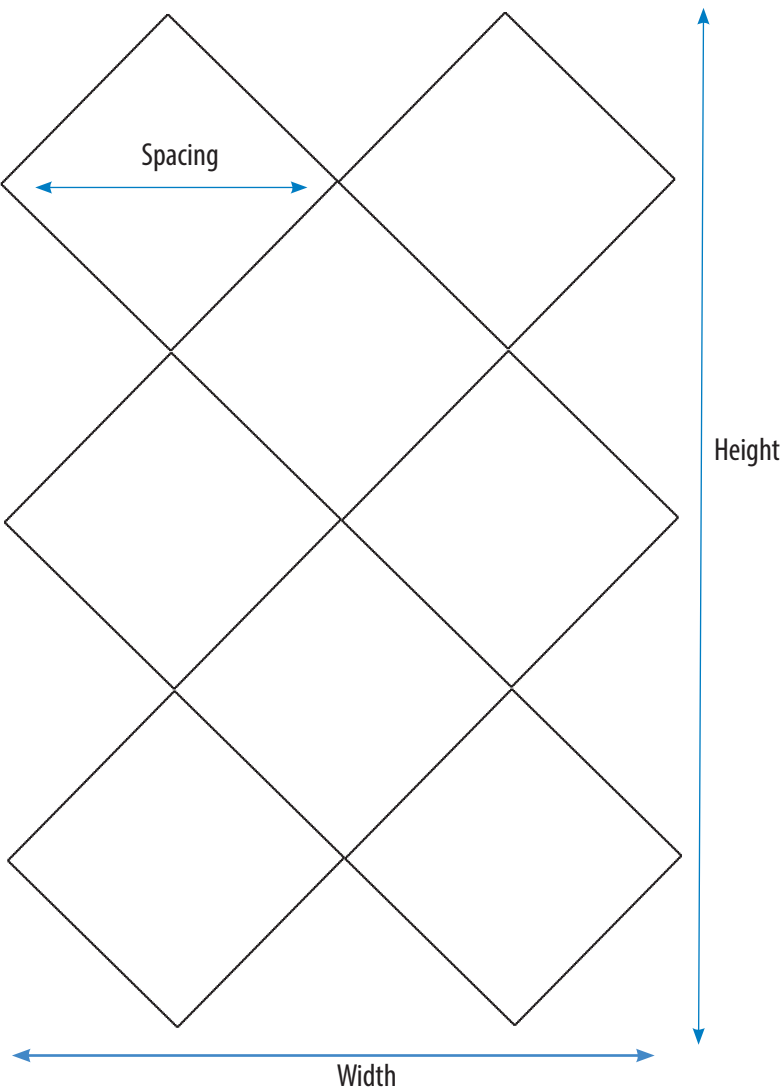
**Wire Rope Cutters
(WRC-4CR)**

DIY GREEN WALL DESIGNS

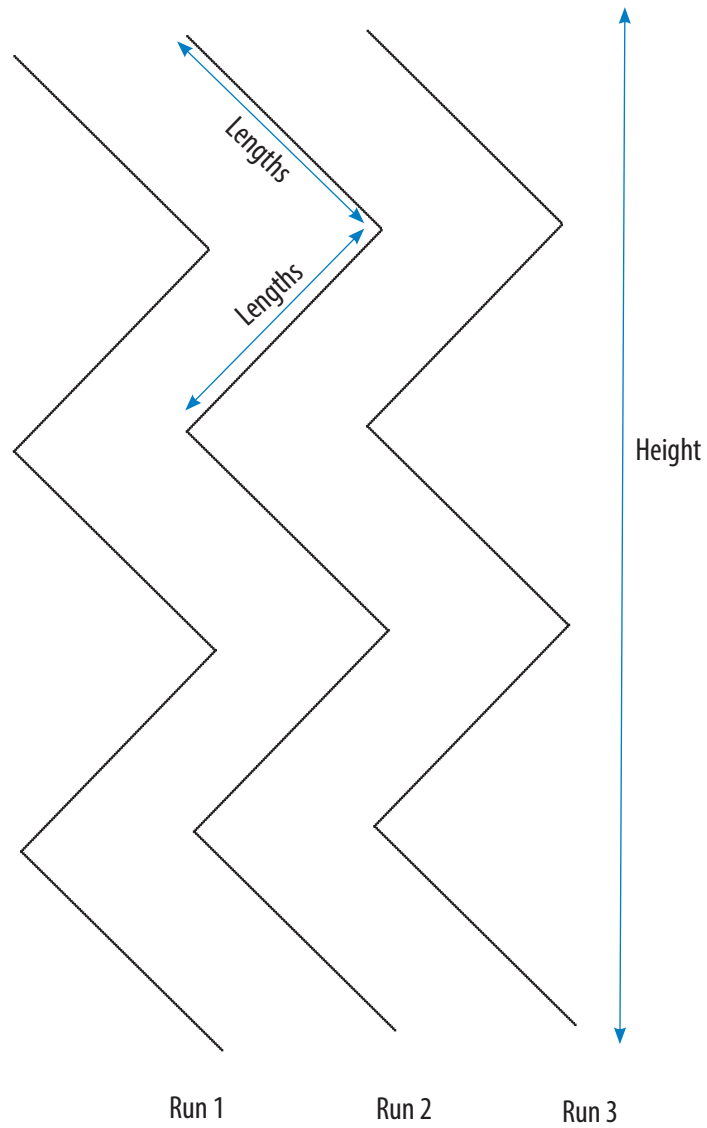
Vertical Design



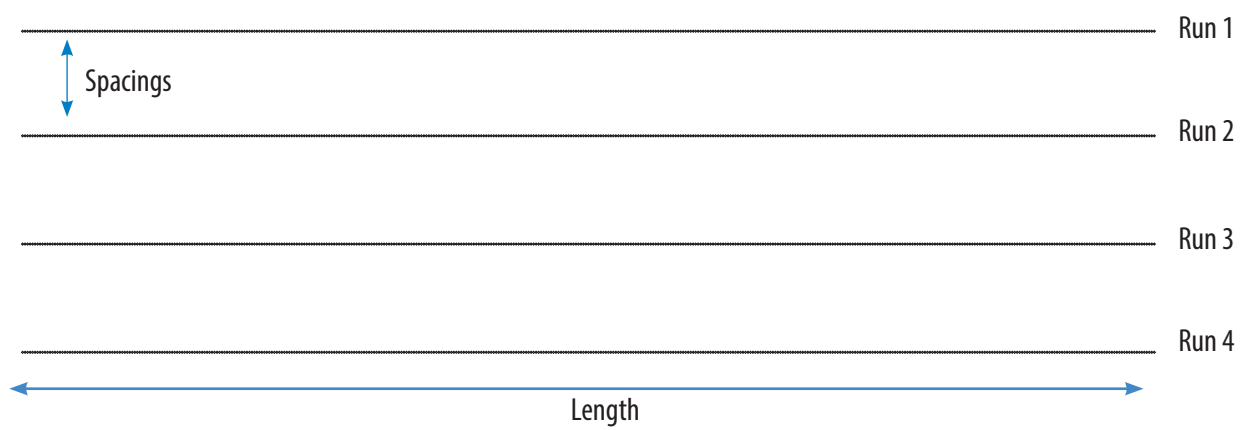
Crisscross Design



Zigzag Design



Horizontal Design





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