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CAPTURING CONCRETE EXCESS

INTERBLOC+

MSE INSTALLATION GUIDE

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REQUIREMENTS FOR FORMATION LEVEL PREPARATION AND BEARING CAPACITY ASSESSMENT

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MSE INSTALLATION GUIDE

This Installation Guideline provides a step-by-step guide intended for use by Contractors planning to construct Tensar reinforced soil structures with Envirocon Interbloc and Stonebloc precast elements. Any drawings or photographs are typical only and the contractor should satisfy themselves that the techniques discussed and shown are suitable for the specific conditions they are working under. The geometry of the blocks may vary as can be seen from the photographs above, therefore the following construction sequence is indicative only. This document should be read in conjunction with the specification and drawings for each individual contract.

Foundations and Footings

- The formation level should be prepared in accordance with requirements of the contract.
- Evaluation and suitability of the bearing capacity of the foundation soils is the responsibility of the Engineer and should be commensurate with the requirements of the design brief.

01 TRANSPORTATION AND HANDLING OF THE BLOCKS:

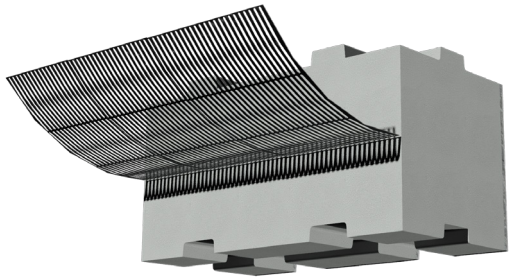
- The formation level should be prepared in Blocks should be transported with cast-in Tensar geogrid tags facing out. Where blocks with geogrid tags are being placed next to each other the distance between the blocks should not be less than 100mm. Care must be taken to prevent damage to the Tensar geogrid tabs when handling the blocks.
- Off-loaded blocks should be inspected and any block found to be defective, e.g. cracked or broken corners, damaged geogrid tabs, stains on exposed face, cracks in panel surface etc. should be set aside for further inspection by the Engineer to determine their suitability as to repair, incorporation into the works, or rejection.
- Refer to Envirocon's Guidelines for the Handling and Storage of blocks for further generic information on handling and storing Interbloc and Stonebloc blocks.

02 HANDLING OF GEOGRID

- Geosynthetic reinforcement must be stored in covered building with zero exposure to UV radiation, chemicals, open flames, welding sparks, precipitation and standing water
- Stacking of geosynthetic reinforcement must be limited to 3 rolls height
- Geosynthetic reinforcement rolls must not be dragged during handling at all stage

03 INSTALLATION OF BLOCKS AND FILLING

- The blocks should be carefully lifted into position using the appropriate lifting equipment.
- Longitudinal vertical alignment should be checked and adjusted by using shims.
- Subsequent blocks should be carefully placed and aligned using a string line as a guide.
- Once the blocks have been positioned, the placement of the reinforced fill may commence.



- Place and compact approved fill as specified in the contract documents, up to the level of the first layer of Tensar geogrid. With the important restriction within 2m of the face block to use only a vibrating plate compactor or vibrating roller with a mass per metre width less than 1300kg and a total mass less than 1000kg.
    - Tensar uniaxial geogrid is supplied in rolls, 1.3m wide x 50m or 75m length, unwrapped and bound using coloured identifying tape. The material is UV protected and may be stored outside until use.
    - Tensar HDPE bodkins are supplied in cardboard boxes of 40No. These may be stored outside until use but may benefit from being stored undercover to prevent water damage to the cardboard box.
- Cut the Tensar geogrid from the roll to the required design length and place into position.
- Tensar geogrid should be installed to the levels, lengths and orientations as shown on the drawings issued for construction.
- Using the correct Tensar bodkin[1] to connect the Tensar geogrid reinforcement to the cast-in Tensar geogrid tab as per the detail in Figure 3.
- To tighten the bodkin joint, insert the tensioning beam through the apertures at the free end of the Tensar geogrid and apply a load sufficient to remove any slack in the bodkin joint. Leverage on a steel bar dug into the fill through the loop on the beam is usually sufficient.

Tensar Bodkin Connection

- Maintaining tension, place a layer of fill on the Tensar geogrid that is sufficient to restrain it in position when the load is released.
- Release the tension and remove the beam. Do not allow construction plant to travel on the Tensar geogrid until it is covered by at least 150mm of fill.
- Repeat procedure for as many adjacent blocks as is appropriate.
- Repeat step 17 compacting fill in the appropriate layer thickness' up to the level of the next layer of Tensar geogrid.
- Continue construction up to the full height of the structure.

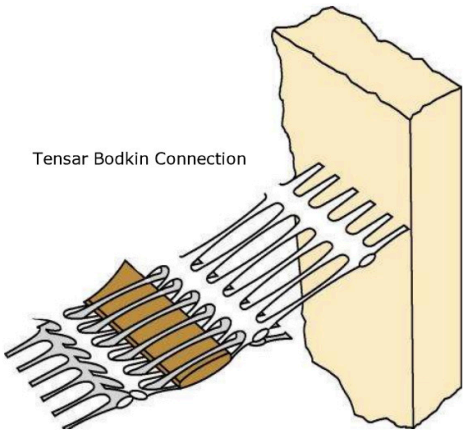


Figure 3 Tensar bodkin connection

TOOLS AND EQUIPMENT

There are some key tools and equipment required to successfully complete a Interbloc installation.

Lifting Equipment:

- 2.5-3.5T Forklift
- Forklift boom
- 2T Rated Chain
- 2.5t Ancon Lifting Klaw

Fixing Kit Installation:

- Hammer Drill
- Electrical extension cords
- Diamond tipped drill bit suitable for the size of the hole to be drilled
- Hole cleaning kit
- Hilti/Ramset epoxy dispenser

Block Installation:

- Pinch Bar
- Crowbar
- Plastic packing shims

INSTALLING FIXING KITS

‘Fixing Kit(s)’ is an Envirocon term which refers to the combined components required to tie the wall together, or to the concrete foundation.

STANDARD FIXING KITS

01 EPOXY

It is most common for Fixing Kits to be epoxied into the concrete foundation - Chemset C8 Extreme or Hilti Hit-500RE are common epoxies.

02 STARTER BAR

The Starter Bar is a short length of H-bar, or Reidbar, threaded at one end and either cast or epoxied into the underlying concrete foundation.

03 COUPLER

The Coupler joins the Main Bar to the Starter Bar.

04 MAINBAR

The Main Bar is a length of Reidbar threaded at both ends and forms the core part of the vertical reinforcing kit. The Main Bar is joined to the Starter Bar using a Coupler.

05 WASHER AND NUT

The Washer and Nut tie off the top of a wall.

TOP AND BOTTOM FIXING KITS

01 TOP AND BOTTOM FIXING KITS

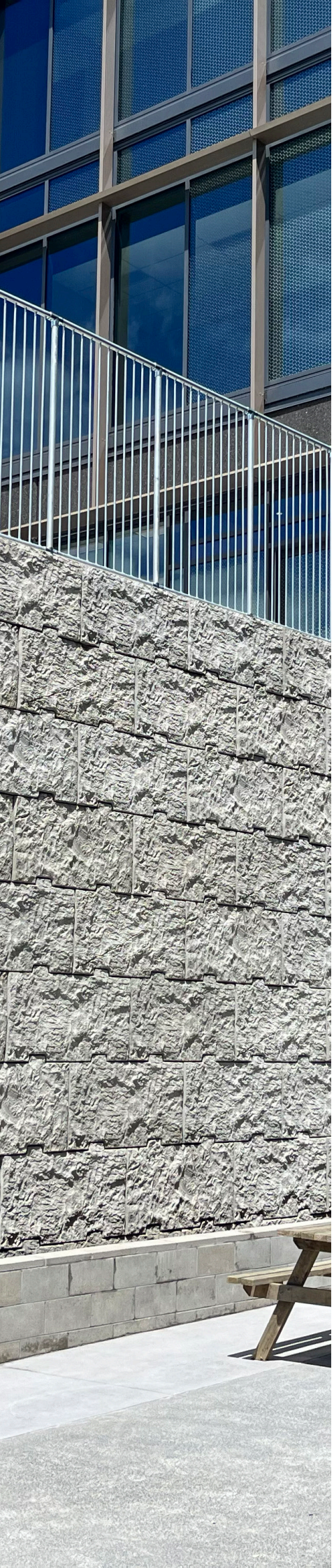
A washer and nut welded together and fixed the main bar at the base of the wall.

02 MAINBAR

The Main Bar is a length of Reidbar threaded at both ends and forms the core part of the vertical reinforcing kit. The Main Bar is joined to the Starter Bar using a Coupler.

03 TOP WASHER AND NUT

The Washer and Nut tie off the top of a wall.



INSTALLING STARTER BARS

Vertical reinforcing essentially uses Reidbar to 'tie' the wall into the foundation. To increase the speed of build fixing kits are installed post construction of the wall. However, one crucially important element of the fixing kit is installed prior to the erection of the wall.

Process:

To ensure the structural integrity of an Interbloc structure with vertical reinforcing, it is vital to follow the correct process for installing the starter bar. Deviation from this procedure may result in structural failure. It is ultimately the responsibility of the installer to ensure the process is followed correctly.

Prepping and Drilling

- The location of the starter bars first need to be marked out on the foundation. Unless otherwise specified in the design, the location of the starter bars should be a minimum of 300mm from the nearest edge of the concrete foundation.
- The space between each hole is a minimum of 603mm for 600 series blocks this allows for creep in blocks as the blocks are placed.
- If the wall requires more than 20 holes, at the 21st hole re-calibrate your measuring tool to ensure accuracy.
- Drill holes in the concrete at the marked points along the centre line, and to the correct diameter and depth for the size of rod specified to be used. For best results a diamond tipped drillbit should be used.
- The hole should then be cleaned according to the process described below, and the epoxy injected into the hole. Interbloc® suggests the use of Chemset™ C8 Extreme or Hilti® HIT-RE 500 epoxies. The following tables provide the minimum depth and quantities specifications for Interbloc® wall structures. Engineers should specify structure specific requirements as part of the design process

	Anchor Size (mm)				
	12	**16**	**20**	**25**	**32**
Drill Bit Diameter (mm)	16	20	25	32	40
Typical Embedded Depth (mm)	110	125	170	210	300
Base Material Thickness (mm)	160	175	220	275	380
Filling Volume (ml)	13-20	19-29	40-64	70-96	162

Typical Starter Bar Lengths:

	Bar Size (mm)				
	12	16	20	25	32
Starter Bar Length (Min)	560mm	575mm	620mm	660mm	750mm

Once cleaned, the epoxy should be injected into the hole, followed by the starter bar. This should be allowed to set for the required time before installing the blocks.

	Ramset™ Chemset™ C8 Extreme		Hilti™ HIT-HY 200	
	Open Time	F100%	Open Time	F100%
5°C - 9°C	20 min	30 h	>90 min	>7 h
10°C - 19°C	14 min	23 h	40 min	2 hrs
20°C - 24°C	11 min	16 h		
25°C - 29°C	8 min	12 h	15 min	1 hr
30°C - 39°C	5 min	8 h	9 min	1 hr
40°C	5 min	6 h	NA	NA

On completion of the wall structure the main length of bar is inserted through the reinforcing ducts cast into Interbloc blocks at 600mm centres. The bar is then screwed into the coupler, ensuring a minimum of 80% engagement.

For tying the top of the bar off, provided the bar is screwed tightly against the washer, or the bar is fully through the nut (which ever is appropriate) the full breaking strength of the bar will be developed. Reid recommends using a wrench with a minimum length of 300mm to ensure the bar is fully engaged.

Starter Bar Quality Control:

Ensuring the quality of the bond between the starter bar and the foundation is essential
to the structural integrity of the wall. The detailed starter bar installation process has a
number of inbuilt quality control processes to provide peace of mind.

Cleaning Holes - Use the Blow-Brush-Blow method. The hole should be brushed to loosen cement dust and loose aggregate followed by blowing the debris from the hole using compressed air. Where the hole is wet, use water followed by compressed air.

Dispensing Epoxy - Use a long nosed epoxy dispenser to ensure the hole fills from the bottom up.

Inserting the Bar - Slowly rotate the starter bar as it is inserted into the hole, this ensures the epoxy fully coats the bar and prevents air bubbles forming.

Pull Test - Once cured, ensure the bars are cemented in place by conducting a pull test on the bar.

INSTALLING BLOCKS

01 BEFORE YOU START

Interbloc blocks incorporate a Ancon® certified lifting anchor as the central lifting point. Standard Interbloc 1200 blocks use a 2.5t anchor 120mm long. 1800 and 600 blocks incorporate two 2.5t anchors 120mm long. n all cases, the lifting anchors have a factor of safety great then 5.

Foot anchors should be inspected and free of damage, nicks or rust before lifting.

Note: Foot anchors are designed to be lifted vertically. Under no circumstances should the lifting anchor be used outside its design parameters.

Lifting Klaws

- Interbloc blocks are lifted using a Ancon® lifting klaw. The lifting klaw is easily connected to the anchor head by admitting the anchor head into the slot of the lifting klaw and rotating the tab of the lifting klaw until is rests on the concrete surface.
- The klaw is designed so that it cannot accidentally disengage while under load. Despite this care should be taken when lifting.
- WARNING: Using any lifting device other than a Ancon® Klaw will void the block warranty and may lead to a failure of the lifting anchor. Lifting clutches should regularly be checked or wear and tear.

Transportation and Shock Loading

Transporting loads over uneven terrain can induce anchor loads that are 5 times greater than those calculated from weight of the concrete element. As such always lift the block using forks under the block when transporting over uneven terrain. Failure to do so will void the block warranty and may result in failure of the lifting anchor.

Chains

Chains are used to connect the lifting clutch to the lifting point on the lifting machine. Only certified chains should be used to lift blocks.

Before lifting, chains should be inspected for:

- Current test tag
- Corrosion
- Worn, Stretched, or deformed links
- Worn, stretched or deformed hooks and fittings
- Wear on load pins and to ensure retainers are installed correctly

Operators and installers should refer to relevant codes of practice issued by local health and safety regulators

Forklift or Front-End Loader with Forks or Tele-handler.

Where a forklift or front-end loader with forks is used to lift and maneuvers the block, a load tested and certified boom should be fitted to the forks as per the manufacturer of the boom recommendations (correctly chained to the fork mast).

Excavator

Where an excavator is used to lift and maneuver the blocks, the chain should be attached to the end of the excavator arm via a certified connection, preferably without the bucket.

Angle of Chains

When lifting a standard 1200 block the chain hangs vertically from the attachment point on the machinery.

When lifting either a 600 block or 1800 block two chains are used to connect the lifting clutches to the machinery. The angle at which these chains hang from the machinery impact the load capacity of the lifting anchors. At a minimum both chains should be the sam length.

As a minimum the angle at which the chains hang from the machinery should be no greater then 60°.

Key Lifting Safety Rules:

- Do not stand under, of near a block while it is being lifted.
- Machinery should only be operated by competent persons with appropriate training and certificates.
- All lifting clutches, chains, and booms should be regularly checked and be in good working condition.
- Only Ancon® Klaw's should be used, use of any other lifting clutch/device will void the block warranty and may result in failure of the lifting anchor.
- Blocks should never be transported over distances or rough terrain using the lifting anchor.
- Where it is intended the blocks are to be lifted regularly (more than five times in one year) blocks with dual lift anchors will be required.

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At Envirocon, we lead the way in sustainable construction with our innovative precast concrete block system, designed to support the circular economy by transforming surplus concrete into durable, reusable building solutions.

As the country's first accredited construction product stewardship scheme, we create ultra-low embodied carbon products that can be reused, recycled, or repurposed at the end of their life, and our buyback guarantee keeps concrete in circulation and out of landfills.