reid™

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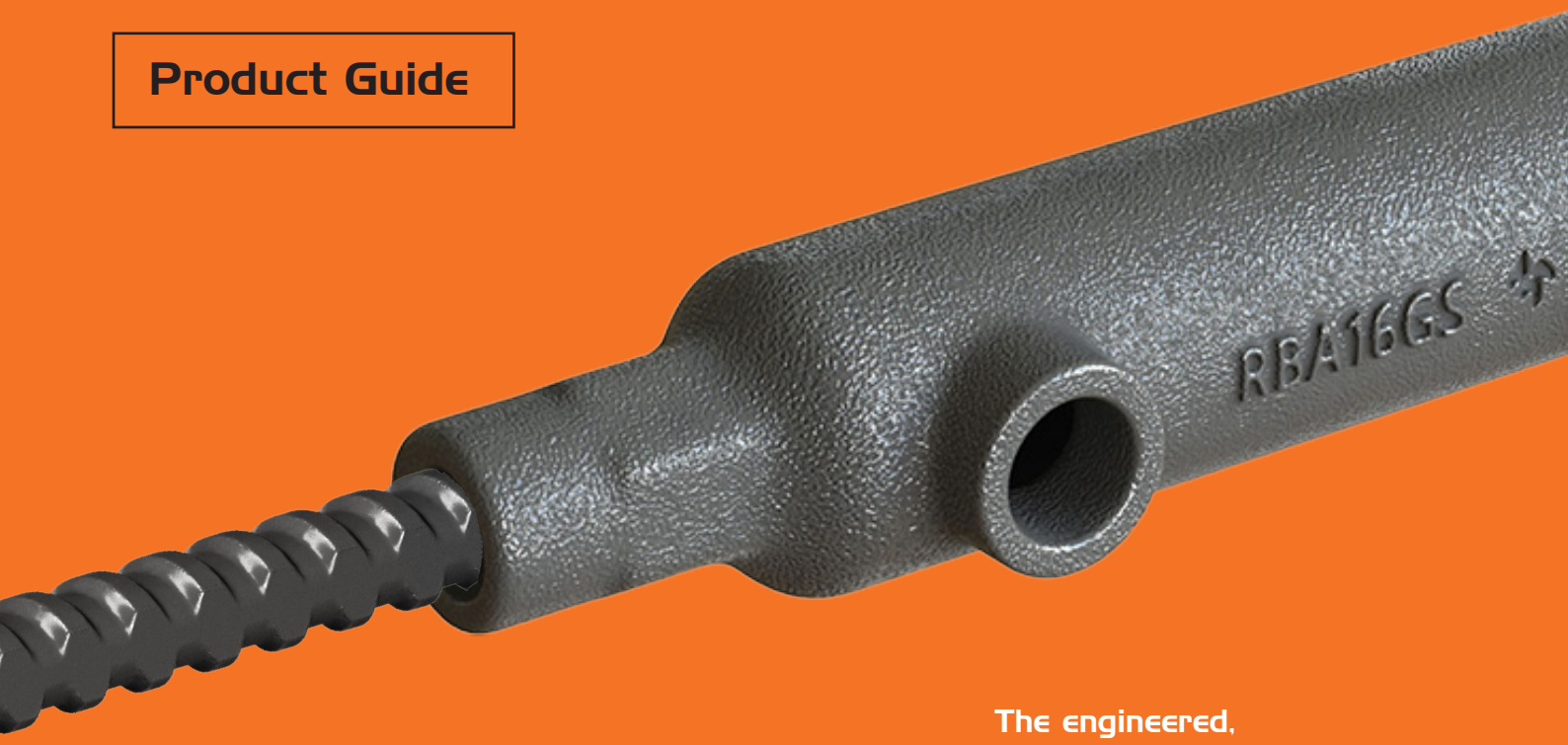
AU

GENUINE

ReidBar™ Grout Sleeve System

Product Guide



The engineered, full strength splicing solution for reinforcing bars.

100 YEARS

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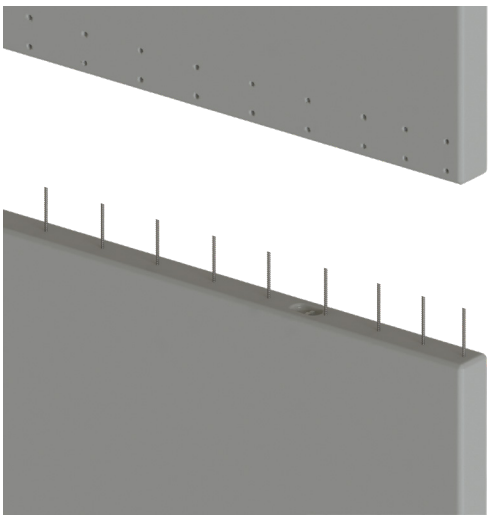
ReidBar™ Grout Sleeve System

The ReidBar Grout Sleeve System provides a full strength splicing solution for reinforcing bars allowing reinforcing continuity between load-bearing precast concrete elements.

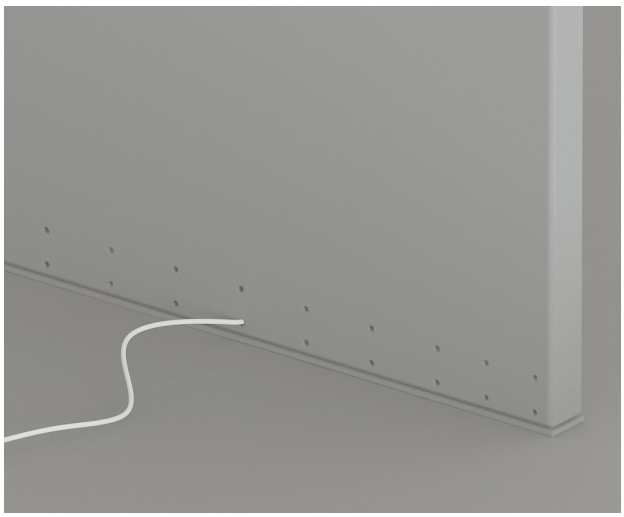
The ReidBar Grout Sleeve System is engineered for the task, and unlike spiral ducts & grouted tubes, require no modification, reducing production and installation costs, and eliminating error. The system is supported by technical assistance at every stage, face-face-training, procedures and checklists that take the guesswork out of construction. Backed by third-party accredited quality, the ReidBar Grout Sleeve system can be depended on, whether you're manufacturing precast concrete panels or installing on-site. Being independently certified, they enable designers to create efficient construction joints between precast concrete elements with confidence.

Applications

Panel to panel connections



Panel to foundation / slab connections



Features & Benefits

Meets the specification.

Tested to meet AS3600: 2018 Concrete Structures standard & AS3850.1:2015 Prefabricated Concrete Elements.

Supports quality workmanship

Engineered for the task and fully supported with face-to-face training, procedures and checklists that take the guesswork out of construction.

Keeps the team safe

through reducing on-site hazards caused by long protruding starter bars, allowing shorter embedment depths.

Technical support at every stage.

Reid products are backed with technical support from design to construction.

Minimises panel congestion and thickness

when compared to spiral ducts & plastic grout tubes, which must be fully confined.

Saves on project costs

by utilising less materials and less labour time on site compared to spiral duct applications. Save on lapping and confinement requirements, assembly labour, grout volume and grouting labour.

Simplifies panel transport & storage

by eliminating or reducing starter bar lengths.

Products that won't let you down.

ReidBar™ system components are quality assured and won't let you down when you're on site and timeframes are tight.

System Components

The ReidBar™ Grout Sleeve system is comprised of specialised components, engineered to perform as a system, validated as a system and independently certified as a system. Nothing is left to chance.

ReidBar™ Grout Sleeves

The ReidBar™ Grout Sleeve offers a mechanical/splice connection for concrete precast panels which has been independently tested to meet the performance requirements stipulated in AS3600: 2018 Concrete Structures standard & AS3850.1:2015 Prefabricated Concrete Elements.

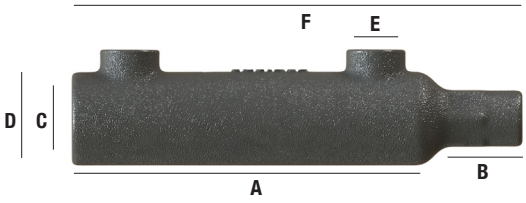


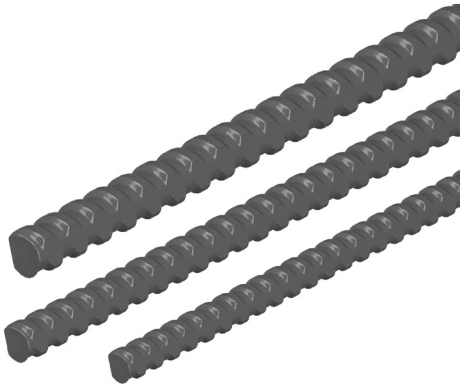
Table I: Product Specifications

Part No.	Suits ReidBar™	Embedment Depth (mm) (A)	Bar Thread Depth (mm) (B)	Grout Sleeve I.D (mm) (C)	Grout Sleeve O.D (mm) (D)	Grout Port Dia. (mm) (E)	Overall Length (mm) (F)	Nom Grout Vol (ml)
RB12GS	RB12	130 ± 20	40	28-40	46-58	21	200	200
RBA16GS	RB16	170 ± 20	44.5	32	50	21	240	200
RBA20GS	RB20	204 ± 20	60	40	60	21	290	350
RB25GS	RB25	254 ± 20	80	48	70	21	360	550
RB32GS	RB32	300 ± 20	109	55	75	26	445	900

ReidBar™

The ReidBar™ Structural Reinforcing System has been developed to provide full strength and positive connections between precast concrete panels, floor slabs and insitu suspended floors. ReidBar™ is a 500N grade continuous threaded reinforcing bar complying with AS/NZS 4671:2019. ReidBar™ can be cut at any point along its length & screwed into Genuine ReidBar™ threaded components, enabling fast, easy & efficient reinforcement in any concrete structure.

- Available in 12mm, 16mm, 20mm, 25mm & 32mm Bar Diameters.
- Reduced formwork damage.
- Reduced OH&S risk.
- Increased productivity.
- Meets the requirements of 'Steel Reinforcing Materials, AS/NZS 4671:2019'.



Please Note: Non proprietary 500N Grade Deformed (HD) Reinforcing Bar compliant with AS/NZS 4671:2019 can also be used in place of threaded ReidBar reinforcement within the grouted end of the grout sleeve connection system, providing bar dia. & min. bar embedment depths are maintained.

Compliance Details

ReidBar™ Grout Sleeves are fit for purpose for Construction applications as demonstrated by 20+ years trouble free track record and compliance with the provisions of AS3600:2018 and AS/NZS4671:2019

ReidBar™ Track Record

ReidBar™ reinforcing bar and ReidBar™ Grout Sleeves have been used extensively in construction projects throughout Australia and New Zealand for over 20 years. Construction partners such as Lend Lease, Multiplex, ProBuild, Hutchinson Builders, Watpac, Scentre Group, Hickory, Built, Meriton, Icon and CPB John Holland have used ReidBar™ extensively on their projects providing faster and safer installation processes resulting in compressed job programs and cost reductions. Over these 20+ years our customers and their clients have been satisfied with the zero serviceability issues associated with the ReidBar™ system.

ReidBar™ Compliance

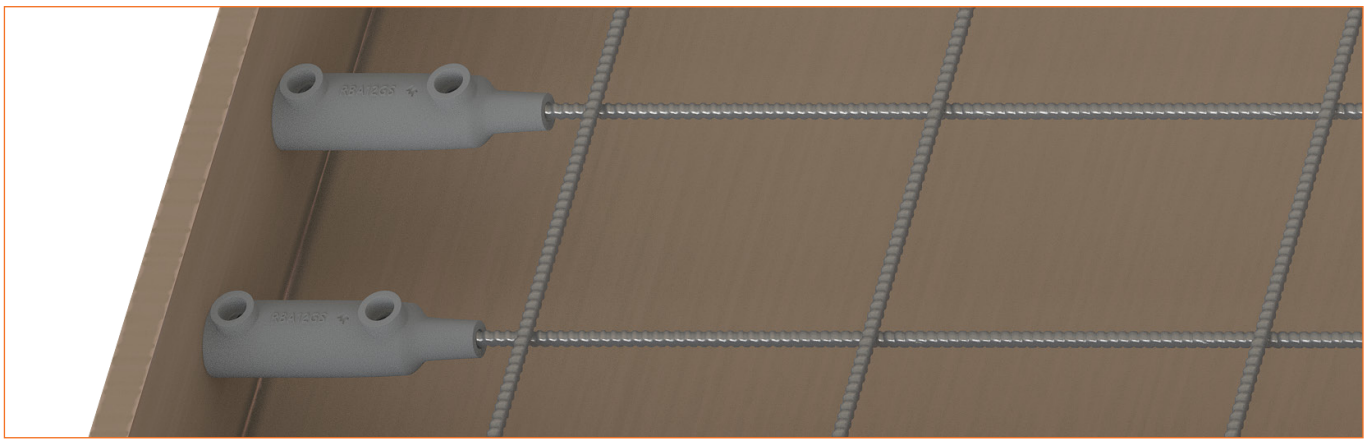
ReidBar™ Reinforcing Bar and associated ReidBar™ couplers and anchors comply with the provisions of AS3600:2018 – Concrete Structures ReidBar™ Reinforcing Bar complies with the provisions of AS/NZS4671:2019 – Steel Reinforcing Materials

You can be confident with ReidBar™

ReidBar™ is manufactured here in Australia by InfraBuild Reinforcing and is certified by ACRS, so you can be confident it is backed by the highest quality standards.

Expert Service and Advice

The ReidBar™ system is backed by first class Australia wide engineering know-how and practical on-site advice. We can optimize your project design to achieve maximum load design efficiency and buildability.



Compliance Details

Compliance statement

The system defined in Table 1 complies with AS3600:2018 clauses identified in Table 2.

Table 2: Compliance details AS3600:2018

Attribute	AS3600:2018 Clause	Requirement	ReidBar™ Assessment
Splicing of Reinforcement	13.2.1 (B)	The splice shall be made by mechanical means.	
Splicing of Reinforcement	13.2.1 (C)	Splicing of reinforcement shall allow for sufficient handling, placing & compaction of concrete, by ensuring close surrounding of all reinforcement, embedments & fixings.	
Mode of Failure Mechanical Splices	13.2.6	Mechanical splices shall not fail between ductility class N bars in tension or compression	
Bar slip in Mechanical Splices*	13.2.6 + Sections 8 to 12	Consider effects of bar slip on control of cracking and vertical deflection with respect to Serviceability Design. Concrete element crack control for applied tensile and shear stress in the reinforcing bar are subject to design engineer review on a case by case basis*	
Reinforcing Bar Characteristic Yield Strength & Uniform Strain of N grade Bar	3.2.1	Reidbar Reo requires no further treatment or-modification such as metric or tapered thread-ing,end upsetting or similar, ensuring uniform elongation and ductility is maintained across the full length of the bar f_{sy} = 500 MPa $_{E8u}$= 0.05	

General Requirements

Please read the contents of this publication in its entirety before commencing your project.

Ramsetreid™ can provide technical assistance and training. Contact ramsetreid using the details provided at the end of this publication.

System Requirements

The ReidBar™ Grout Sleeves system is an engineered system comprising of ReidBar™ Grout Sleeves, Non proprietary high strength Grout (>65MPa) and ReidBar™.

Substitution, omission and/or modification of components will affect the performance of the system and thus the structural performance of the building.

Deviation from the technical literature, (eg. including but not limited to prescribed installation methods, operating conditions, measures, shelf life, storage and safety precautions) will affect the performance of the system, the structural performance of the building and/or the safety of workers.

Products shall only be used as in applications described in ramsetreid publications at or below the published capacities.

Manufacture, installation and grouting competence

The professional manufacture, installation and grouting of precast panels is integral to the structural performance of the building.

Precast panel manufacture, installation and grouting shall only be performed by competent workers.

For advice and training on the products referred to in this publication, please contact ramsetreid using the details provided at the end of this publication.

Workplace Health and Safety

The Precast industry has been identified as high risk construction work by government authorities. Ensure your team is familiar with current legislation and compliance codes for your jurisdiction.

Whilst on site:

- Observe the workplace health and safety procedures of the site.
- Ensure that workers are not exposed to workplace health and safety risks whilst accessing the work area and conducting the work, through the provision of adequate training, procedures and PPE to perform the work safely in accordance with WHS advice for your jurisdiction.
- Allocate workers to the job who are adequately trained to carry out the task safely.

Scope

The scope of this publication is limited to the following processes specifically in relation to the correct application of the ReidBar Grout Sleeve system, namely:

- **Grout sleeve assembly**
- **Grout sleeve installation**
- **On-site installation** (excluding cranage and propping procedures)

Reference Material

Please refer to the following supporting literature available from www.reid.com.au

- **Reid™ Precast Solutions Product Guide**

Ramsetreid™ reserves the right to amend this and referenced documentation from time to time.

Please ensure current literature is being referred to by accessing the website.

Panel Manufacturing Preparation

During the panel design process:

- [ ] Work with the structural engineer to refine the panel design and installation method
- [ ] If the intended panel design or components deviate from the structural engineering specification, then approval shall be sought from the structural engineer.
- [ ] Allocate workers to the job who are deemed competent to carry out the task safely, to the structural engineering specifications.

Preparing for panel manufacture:

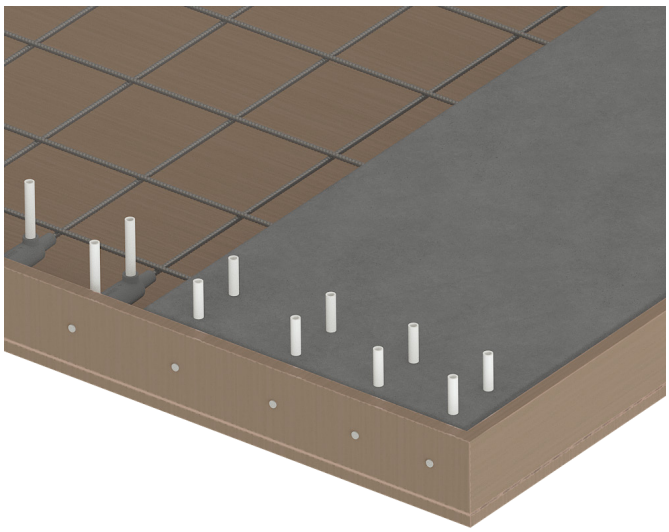
- [ ] Ensure workers are given the required tools, equipment and materials to carry out the work efficiently and accurately to the structural engineering specifications.
- [ ] Ensure tools and equipment are in correct working order.
- [ ] Ensure materials are to the correct specifications and are within their use by date (where applicable).
- [ ] Ensure workers are familiar with the requirements of the job and are provided with necessary documentation to do the job accurately to the structural engineering specifications.

Whilst manufacturing the panels:

- [ ] Ensure workers are given access to the required tools, equipment and materials to carry out the work efficiently and accurately to the structural engineering specifications.
- [ ] Ensure workers do not deviate from the structural engineering specifications. If manufacturing constraints force a deviation, stop and seek approval from the structural engineer before proceeding.

Tools and equipment:

- [ ] Appropriate Safety Equipment (PPE)
- [ ] Checklists (see end of this publication)
- [ ] Genuine ReidBar™
- [ ] ReidBar™ Grout Sleeves
- [ ] Relevant technical datasheets, manuals and MSDS.



Installation Procedure

Installing ReidBar™ Grout Sleeve

STEP 1 Create templates

A template is the most accurate way to ensure that ReidBar™ Grout Sleeves and their starter bars are located at the correct positions for repetitive casting. Templates can be easily fabricated using steel or timber. Timber templates tend to be more popular amongst precast concrete manufacturers given that most already have fully operational timber workshops.

Measure and mark on the template the centre locations of the ReidBar™ Grout Sleeves and their starter bars. For the starter bar template (and if timber is used), drill holes of sufficient diameter to pass the bars. When the construction of the concrete elements involve two or more parties, copies of the templates shall be provided to these parties so that all parties are working of the same measurement benchmark.

Step 1 Checklist:

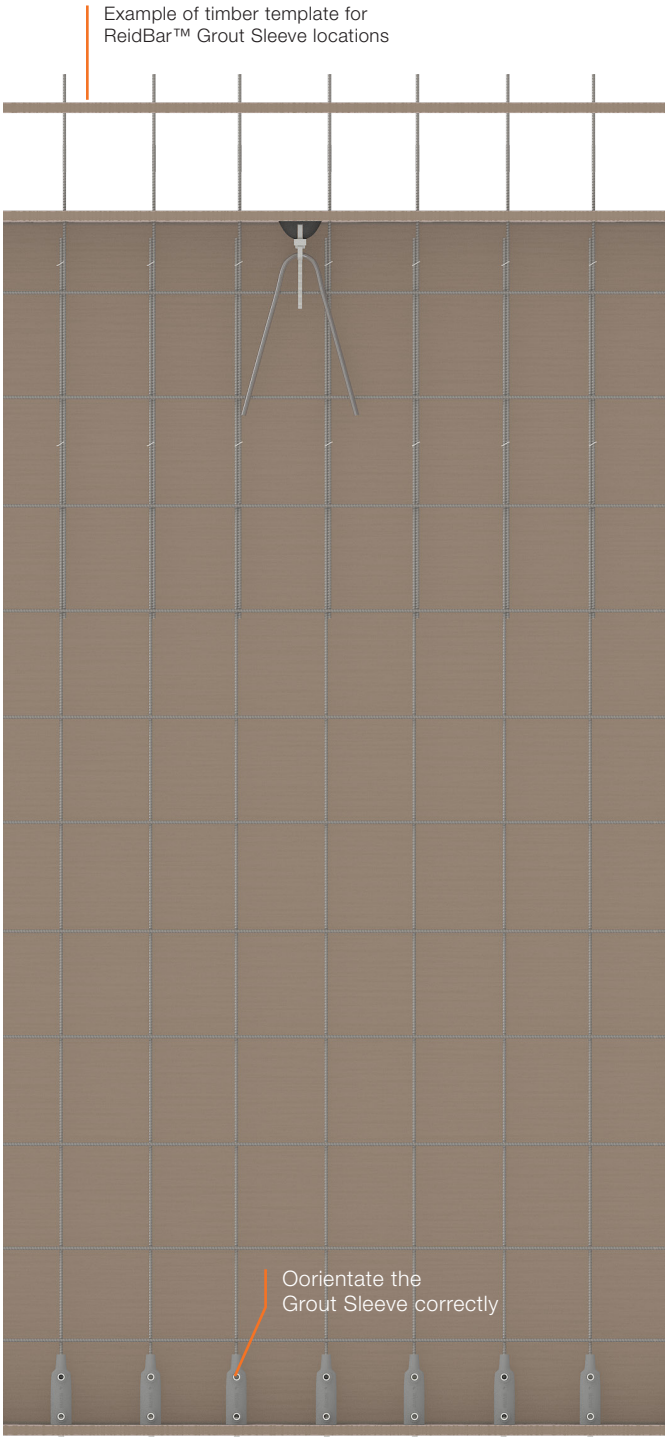
- ☐ Create templates as required and check if the marked & drilled hole locations of the ReidBar™ Grout Sleeves and their continuation bars are accurate.
- ☐ Duplicate these templates and provide them to other parties as required.

STEP 2 Set the Grout Sleeve Assembly into the Formwork

Determine the surface (or side) that the grout ports are expected to come out from, and orientate the Grout Sleeve correctly such that the grout ports are facing the right direction. This is typically towards the near face of precast elements or on multiple sides of precast columns.

Step 2 Checklist:

- ☐ Check if the ReidBar™ has been installed correctly onto the Grout Sleeve.
- ☐ Check if the ports of the ReidBar™ Grout Sleeves are facing the right direction.



Installation Procedure

Installing ReidBar™ Grout Sleeve

STEP 3 Install Grout Sleeve installation hardware to the formwork.

Using Timber Discs

(ideal if penetrations through the formwork are undesirable)

Find the marked centre locations of the ReidBar™ Grout Sleeves. Cut timber discs to suit the inside diameter of the corresponding ReidBar™ Grout Sleeve size. A circular drop saw is commonly used to create the timber discs.

Drill an appropriately sized hole and insert a screw through the middle of the timber disc. Tap the screw onto the marked locations and screw so that the timber disc is fixed firmly onto the formwork.

Afterwards, it is recommended to use two extra screws on the right and left sides of the timber disc to further fix it onto position.

Step 3 Checklist:

- ☐ Check if the set-up hardware is correctly placed and is firmly fixed to the formwork.

Timber discs screwed onto timber formwork

Installation Procedure

Installing ReidBar™ Grout Sleeve

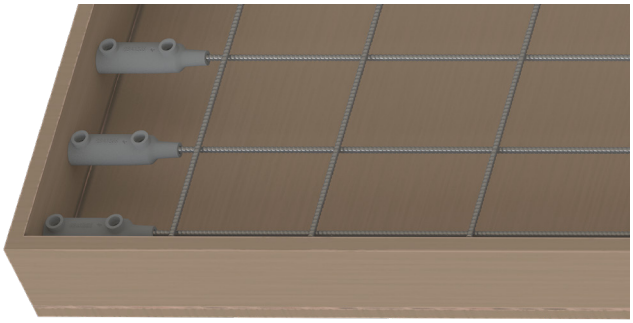
STEP 4 Install Grout Sleeves onto the installation hardware

Install the ReidBar™ Grout Sleeve assemblies onto the installation hardware. Install bar chairs underneath the Grout Sleeve continuation bar in close proximity to the Grout Sleeve.

Seal the bottom of the Grout Sleeve using a duct tape or similar means, to ensure that there is no concrete slurry seeping into the Grout Sleeve.

To further support the Grout Sleeve and maintain its rigidity upon reinforcement and concrete placing, more bar chairs may be required to support larger-sized ReidBar™ Grout Sleeve assemblies.

Install the timber or steel template to the top side of the precast panel to properly locate the protruding ReidBar™ Grout Sleeve starter bars. Ensure that the protruding starter bars are straight and perpendicular to the formwork.



Step 4 Checklist:

- ☐ Check if the Grout Sleeves are stable, perpendicular to the formwork and are sufficiently supported
- ☐ Check if the bottom of the Grout Sleeves are sufficiently sealed to stop concrete slurry ingress into the Grout Sleeves
- ☐ Check if the protruding starter bars are straight and perpendicular to the formwork

STEP 5 Prepare and connect port tubes to the grout ports

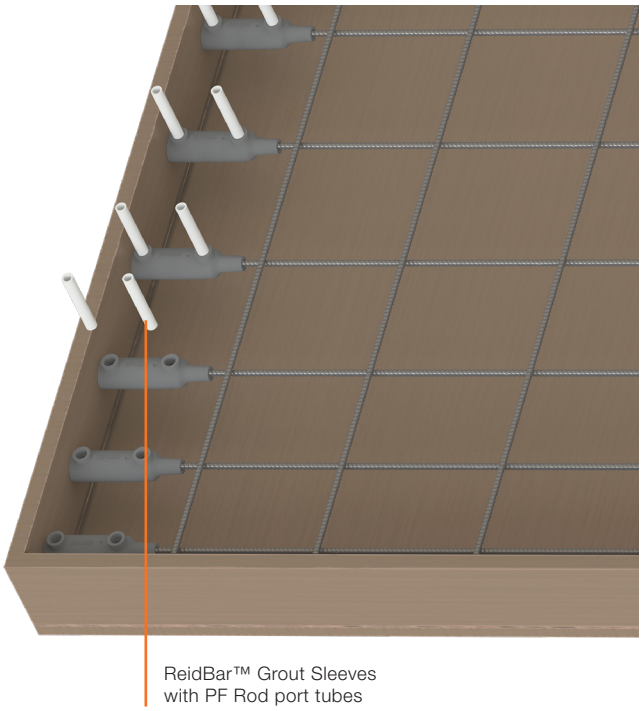
Prepare the port tubes such that they are neither too long nor too short, and then connect them to the ReidBar™ Grout Sleeves.

PF Rods, PVC tubes or plumbing hose can be used as port tubes. Connect port tubes into grout ports, and tape them to ensure that no concrete slurry seeps into the Grout Sleeve.

Label the port tubes where they come out of the precast unit – particularly when there is more than one layer of Grout Sleeves, such as in precast columns. This is to ensure that the grouting contractor onsite is aware of which are the inlet and outlet ports.

Step 5 Checklist:

- ☐ Prepare port tubes that are neither too long nor too short and connect them to the grout ports
- ☐ Label the port tubes so that it is clear which are the inlet and outlet ports
- ☐ Check if the grout ports are sufficiently sealed



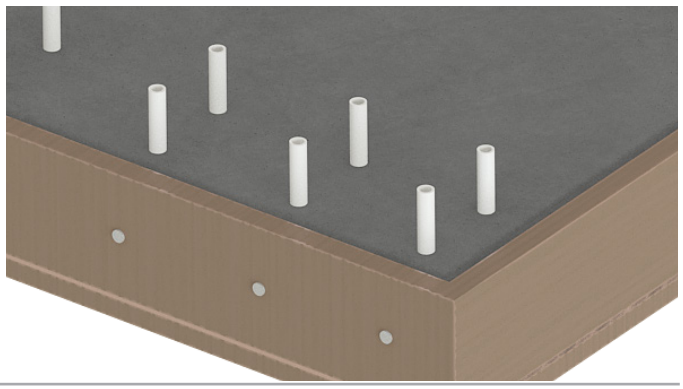
ReidBar™ Grout Sleeves with PF Rod port tubes

Installation Procedure

Installing ReidBar™ Grout Sleeve

STEP 6

Take good care during concrete placement and vibration to ensure that the Grout Sleeves are not displaced during the process.



Useful Install tips

For accurate installation:

It is recommended to use ReidBar™ that are cut using band/ abrasive saw, instead of those that are hydraulically cropped.

Hydraulically cropped ReidBar™

ReidBar™ properly cut using band/abrasive saw

For onsite contractors/builders:

For the setting of Grout Sleeve starter bars, coordinate with the precast concrete manufacturer and work based on their measurements and templates to ensure accuracy of starter bar locations.

Precisely measured starter bar locations

On-site Installation Procedure

During the installation planning process:

- [ ] Work with the structural engineer to refine the installation method

  Verify the installation method against the structural engineering specification to confirm:

  - [ ] If shims and foam tape can be used and their location and size
  - [ ] Dry packing location and maximum coverage
  - [ ] Grout minimum coverage within the panel joint

- [ ] If the intended installation method deviates from the structural engineering specification, then approval shall be sought from the structural engineer.
- [ ] Allocate workers to the job who are deemed competent to carry out the task safely, to the structural engineering specifications.

Preparing for site:

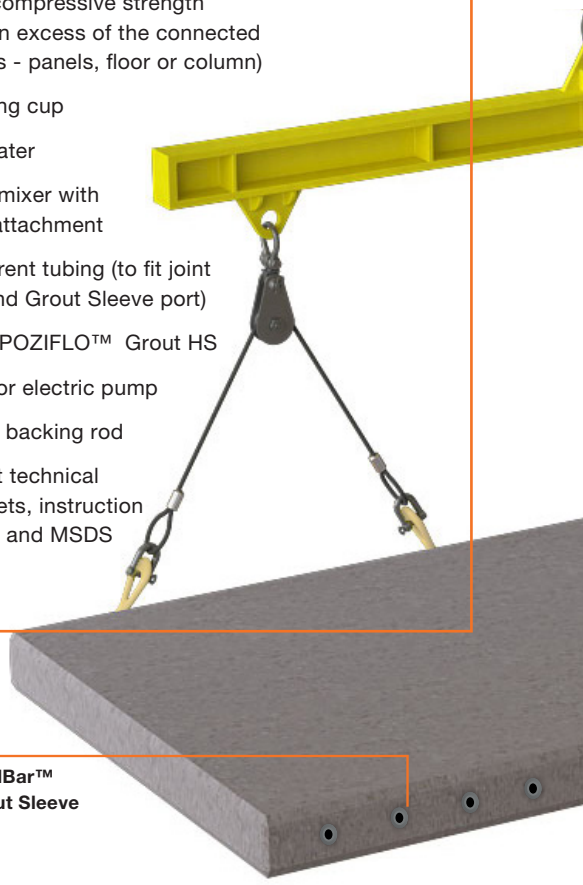
- [ ] Ensure workers are given the required tools, equipment and materials to carry out the work efficiently and accurately to the structural engineering specification.
- [ ] Ensure tools and equipment are in correct working order.
- [ ] Ensure materials are to the correct specifications and are within their use by date (where applicable).
- [ ] Ensure workers are familiar with the requirements of the job and are provided with necessary documentation to do the job accurately to the structural engineering specification.

Whilst on-site:

- [ ] Ensure workers are given access to the required tools, equipment and materials to carry out the work efficiently and accurately to the structural engineering specification.
- [ ] Ensure workers do not deviate from the intended installation method and structural engineering specification. If site constraints force a deviation, stop and seek approval from the structural engineer before proceeding.

Tools and equipment:

- [ ] Appropriate Safety Equipment (PPE)
- [ ] Checklists (see end of this publication)
- [ ] Measuring tape
- [ ] Foam tape (as required)
- [ ] Reid Shims
- [ ] Approved dry packing grout (with 28 day compressive strength 10MPa in excess of the connected elements - panels, floor or column)
- [ ] Measuring cup
- [ ] Clean water
- [ ] Electric mixer with paddle attachment
- [ ] Transparent tubing (to fit joint cavity and Grout Sleeve port)
- [ ] Ramset POZIFLO™ Grout HS
- [ ] Manual or electric pump
- [ ] Foam or backing rod
- [ ] Relevant technical datasheets, instruction manuals and MSDS



ReidBar™ Grout Sleeve

Installation Procedure

On-site Installation

STEP 1 Inspect & prepare starter bars

Verify to the structural engineering specification:

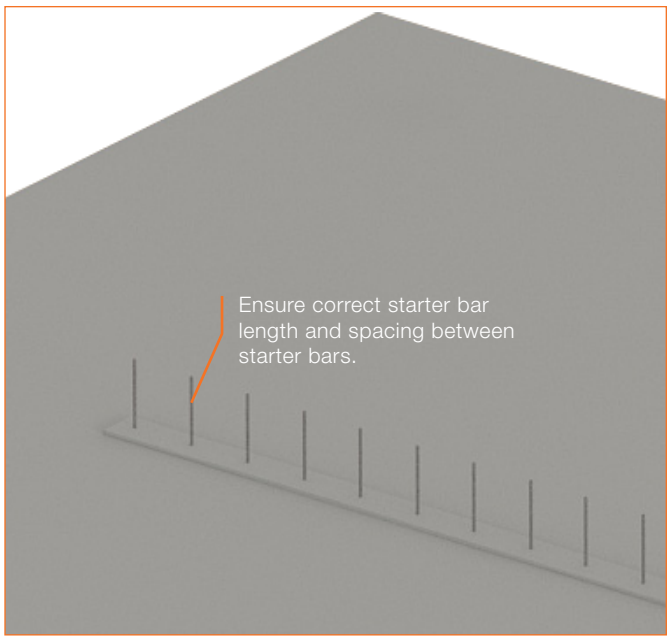
- ☐ The number of starter bars
- ☐ Starter bar size
- ☐ Starter bar position

Perform a visual inspection of the starter bars:

- ☐ Check for damage
- ☐ Check the ends show no signs of deformation and the bars are straight (if not, this will prevent the panel from sliding down)

Measure the length of the starter bars:

- ☐ Ensure the length of the bar (minus the packer height) matches the stated embedment depth (see ReidBar Grout Sleeve Dimensions in the References section)
- ⚠ Starter bars may be slightly chamfered to aid in insertion.
- ⚠ Do not place caps on the end of starter bars as an insertion aid.

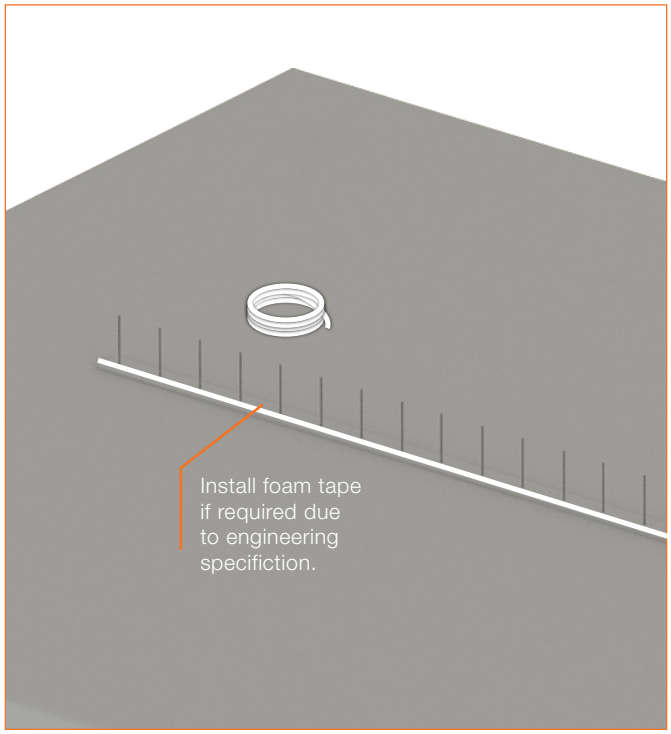


STEP 2 Install foam tape to base (as required)

- ☐ Verify the placement of the foam tape to the structural engineering specification. Only use foam tape where approved by the structural engineering specification as incorrect placement may affect the structural performance of the building.
- ⚠ Where foam tape is positioned on the only accessible faces, ensure transparent plastic inlet/outlet tubes are positioned within the foam tape, at each end of the panel and at intermediate points, to allow for adequate joint flooding and visual inspection.

STEP 3 Position the panel over the base (via crane)

- ⚠ Never work under a moving panel.



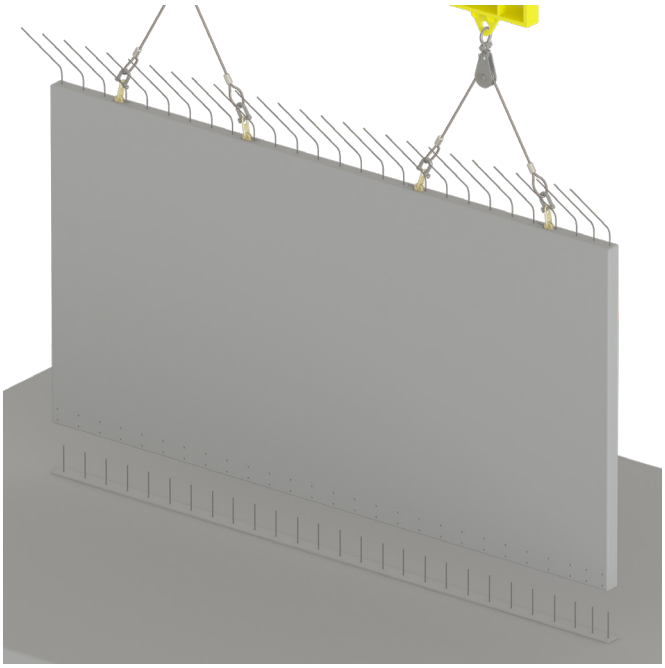
Installation Procedure

On-site Installation

STEP 4 Lower the panel and whilst supported inspect the grout sleeve cavity

Inspect the ReidBar Grout Sleeve cavities:

- ☐ Verify the number of cavities.
- ☐ Check that all cavities are free of obstructions
- ⚠ Verify the cavity depths match the ReidBar Grout Sleeve dimensional starter bar length measured in Step 1



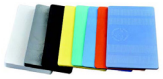
STEP 5 Lower the panel over the starter bars

This may require raising and lowering the panel several times if the starter bars are getting caught or are misaligned. Adjust where required.

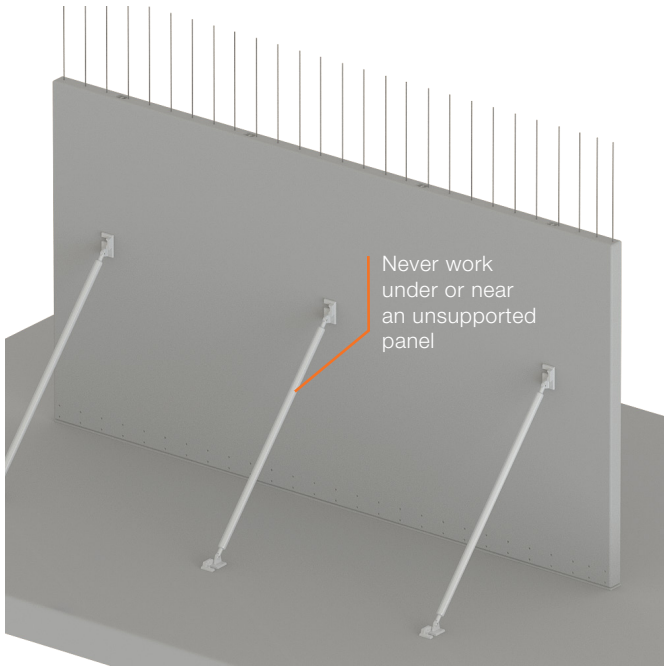
- ⚠ Never work under an unsupported panel.

STEP 6 Level the panel with Reid Shims (if required)

Verify the placement of the Reid Shims to the structural engineering specification.



- ☐ This may require raising and lowering the panel several times to achieve. Adjust shims heights where required.
- ⚠ Never work under a moving or unsupported panel.
- ⚠ Only use rated plastic shims (Reid Shims). Never use metal shims.
- ⚠ Only use shims where approved by the structural engineering specification. Adhere to locations specified.



STEP 7 After the panel is fully lowered onto the concrete base, prop the panel to secure

- ⚠ Never work under or near an unsupported panel

Installation Procedure

On-site Installation

STEP 8

Where dry packing is specified, dry pack the joint cavity with an approved dry packing grout.

Prepare the surfaces according to the manufacturer's instructions.

Mix grout to dry pack consistency according to the manufacturer's instructions.

- ☐ Verify the correct water volume is used.
- ☐ Verify the consistency of the grout is homogenous.
- ⚠ Ensure all instructions are complied to (refer to the manufacturer's instructions).

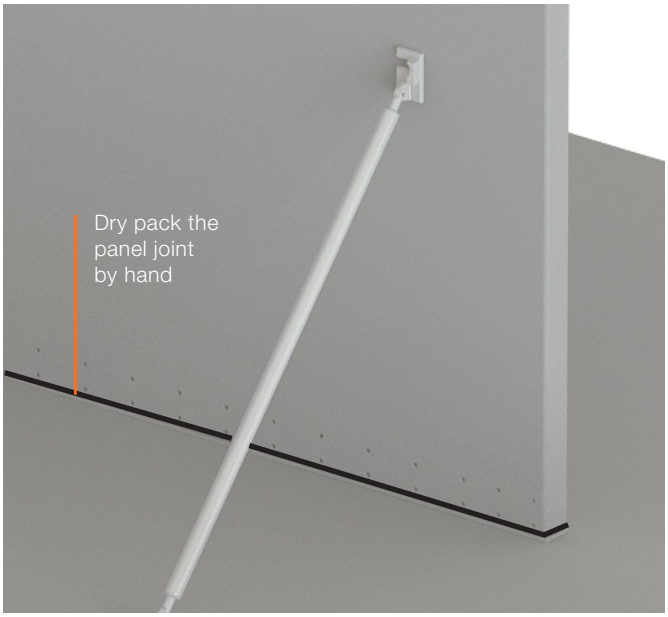
Dry pack the panel joint by hand in the timeframe shown on the instructions as indicated by the structural engineering detailing.

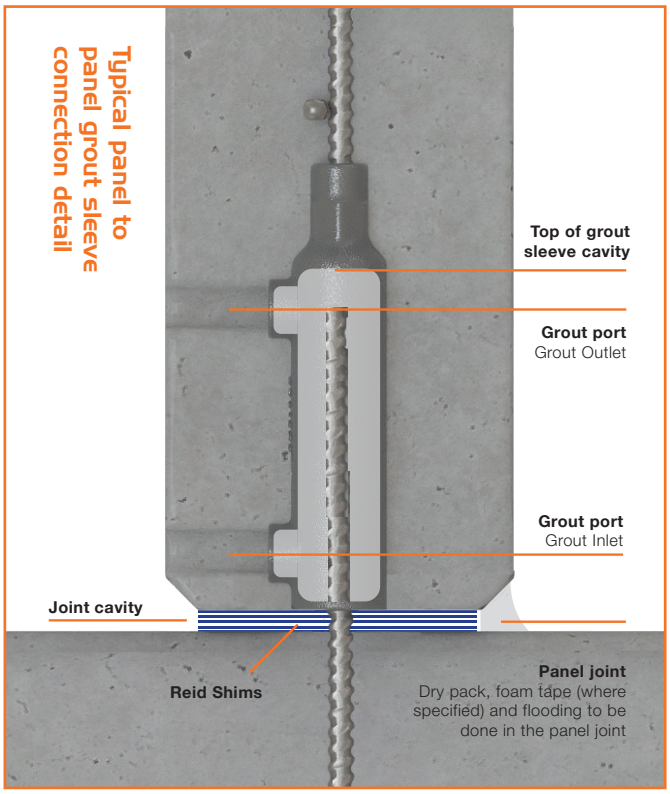
Ensure transparent plastic inlet/outlet tubes are positioned within the dry packed joint, at each end of the panel and at intermediate points, to allow for adequate joint flooding and visual inspection.

- ⚠ Ensure the exposed ends of the inlet and outlet tubes are long enough to create a head of grout just above the panel joint to ensure each grout sleeve is sealed at the flooding stage.
- ☐ Verify the position of the dry packing to the structural engineering specification.
- ☐ Verify the grout inlet and outlet tubes are present and clear of grout.
- ☐ Note the time of completion to ensure recommended setting times are observed (refer to the manufacturer's instructions).

Allow the dry packed grout to set according to the manufacturer's instructions before proceeding.

- ⚠ This step is intended to seal the joint cavity and provide support to the pressure exerted by grouting and may be done in conjunction with the use of foam tape (where specified).





Installation Procedure

On-site Installation

STEP 9 Flood the joint cavity with flowable High Strength Grout (28 Strength >65MPa)

- ☐ Verify setting time for the dry packing (where specified) has been met.

Mix high strength grout to flowable consistency according to the manufacturer's instructions.

- ☐ Verify the correct water volume is used.
- ☐ Verify the consistency of the grout is homogenous.
- ⚠ Ensure all instructions are complied to (refer to the manufacturer's instructions).

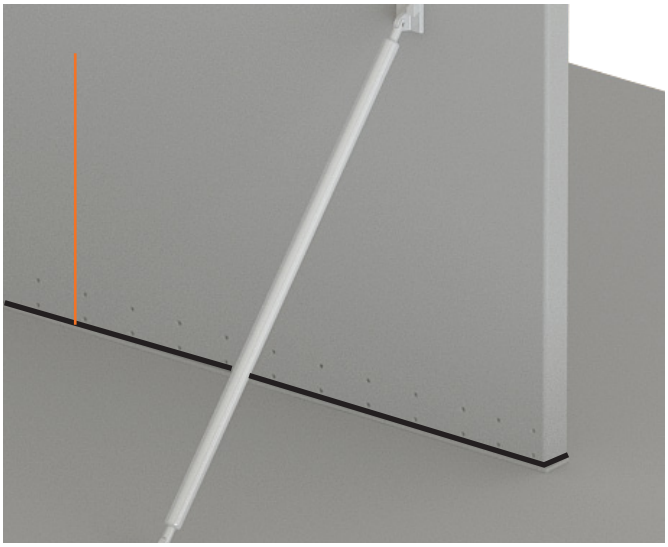
Working from one end of the panel to the other, and with a pump, flood the panel joint in the timeframe shown on the manufacturer's instructions. Flood until a head of grout is observed above the level of the panel joint for each inlet/outlet tube positioned within the dry packed joint.

Working from one side of the panel to the other, plug the tubes.

- ☐ Verify the grout inlet and outlet tubes are filled above the level of the panel joint.
- ☐ Note the time and temperature at completion to ensure recommended setting times are observed (refer to the manufacturer's instructions).

Allow the flooded grout to set according to the manufacturer's instructions before proceeding. For temperatures below 5 degrees Celcius, allow for longer setting times.

- ⚠ This step is intended to seal the joint cavity and also seal the base of each grout sleeve so they can be individually grouted.
- ⚠ Working from one side of the panel to the other ensures that voids are not formed during the flooding process.
- ⚠ Flooding may be done with either a manual or electric pump.
- ⚠ Foam or backing rod can be used to plug tubes.

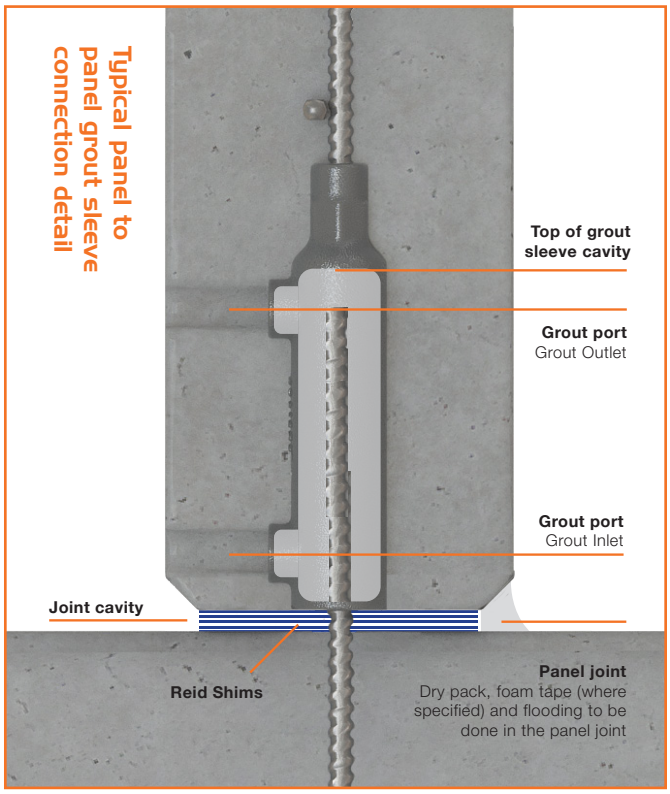


STEP 10 Prepare the Grout Sleeves for grouting

- ☐ Verify setting time for the flooded grout has been met.

Attach a transparent plastic tube to each of the upper grout sleeve ports.

- ⚠ Ensure the end of the transparent tubes are pointing upwards and are long enough to create a head of grout just above the level of the top of the grout sleeve cavity to ensure each grout sleeve is fully filled with grout.



Installation Procedure

On-site Installation

STEP II Grout the grout sleeve cavity with flowable High Strength Grout (28 Strength >65MPa)

Mix Grout to flowable consistency according to the manufacturer's instructions.

- ☐ Verify the correct water volume is used.
- ☐ Verify the consistency of the grout is homogenous.
- ⚠ Ensure all instructions are complied to (refer to the manufacturer's instructions).

Working from one side of the panel, grout each grout sleeve individually via the grout inlet (lower port) within the timeframe shown on the manufacturer's instructions.

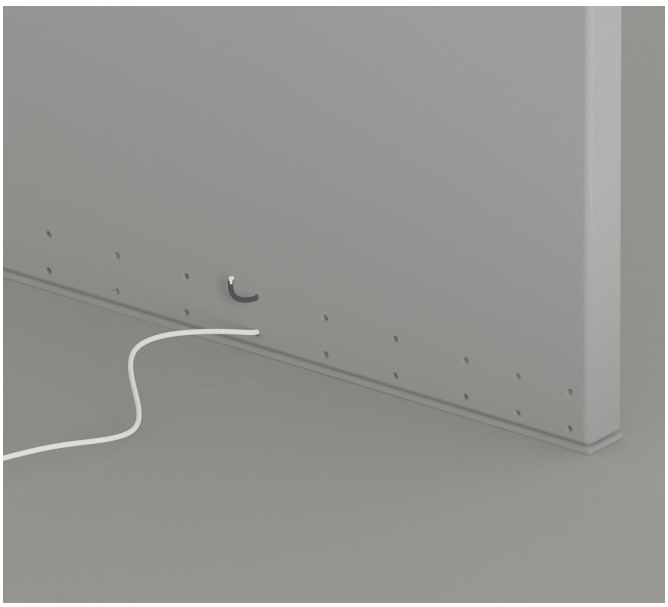
Grout until a head of grout is observed above the level of the top of the grout sleeve cavity in each outlet. Plug the grout inlet immediately after removing the pump, then plug the grout outlet tube.

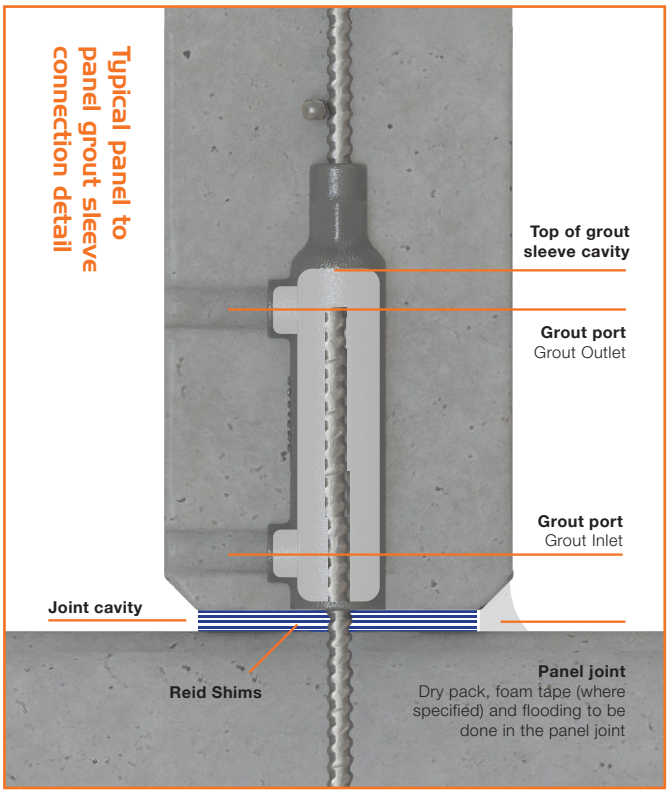
Continue across the panel until all grout sleeves are grouted.

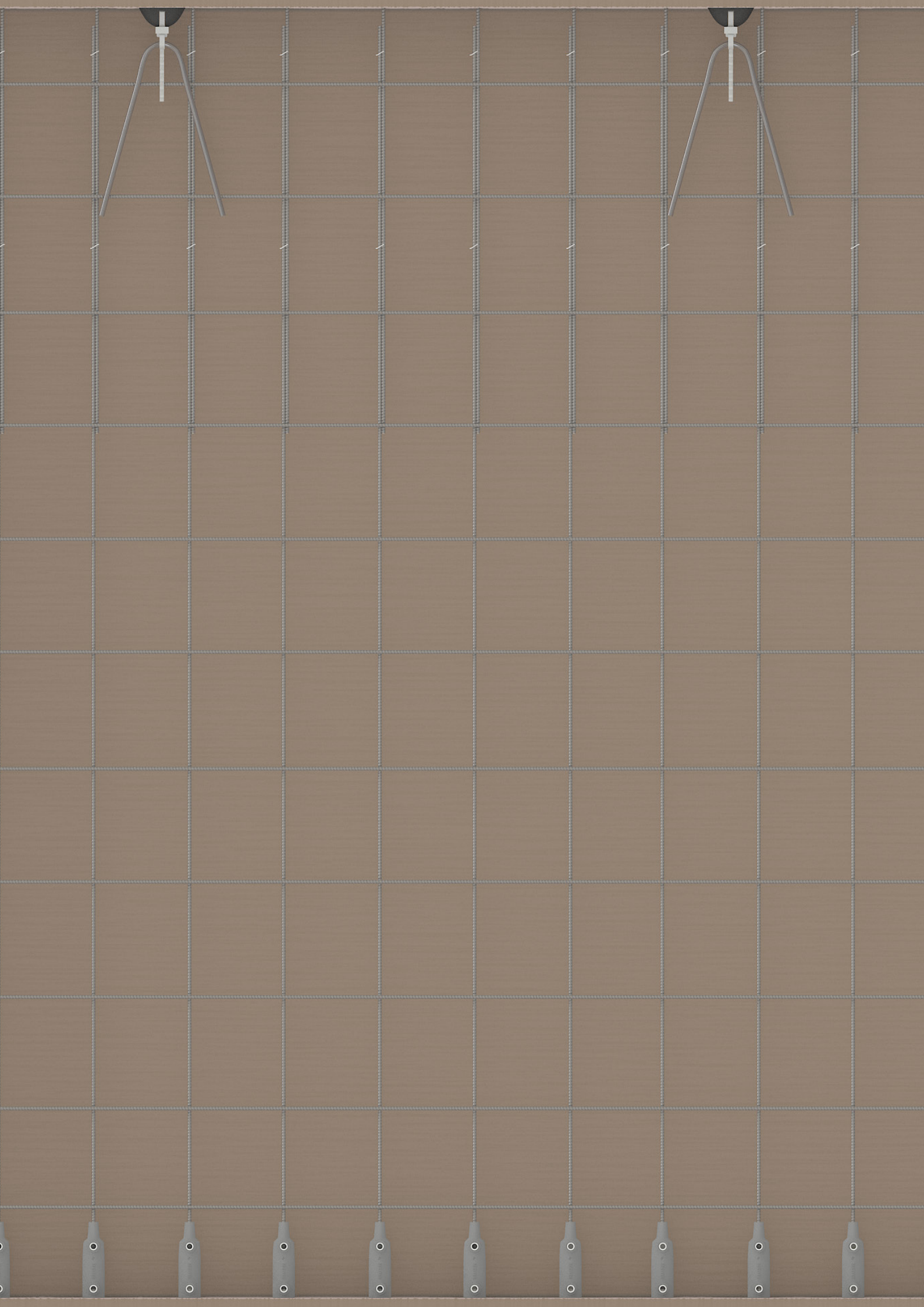
- ☐ Verify the grout inlet and outlet tubes are filled above the level of the top of the grout sleeve cavity.
- ☐ Note the time and temperature at completion to ensure recommended setting times are observed (refer to the manufacturer's instructions).

Allow the flooded grout to set according to the manufacturer's instructions. For temperatures below 5 degrees Celcius, allow for longer setting times (refer to the manufacturer's instructions).

- ⚠ Working from the grout inlet (the lower Grout Sleeve port) ensures that voids are not formed during the grouting process.
- ⚠ Foam or backing rod can be used to plug the ports.
- ⚠ During this step the grout path to some or all Grout Sleeves may not have been sealed if under-flooded previously, thus multiple grouting of some/all grout sleeves may be required. If this is the case work from one side of the panel to the other to avoid the formation of voids.
- ⚠ Grouting may be done with either a manual or electric pump.
- ⚠ Once fully set, plugs and tubes can be removed and the surfaces treated as required.







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