

METHOD STATEMENT

CEMENTITIOUS GROUTING OF MACHINE BASES AND BASE PLATES

JULY 2024 / V3 / SIKA SERVICES AG / J. LOHNER + R. STÖRIKO-PASKER

BUILDING TRUST



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METHOD STATEMENT

EN/Corporate/Translation template

CEMENTITIOUS GROUTING OF MACHINE BASES AND
BASE PLATES

For local translation

July 2024, V3

850 2101

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1 SCOPE

This method statement describes the step-by-step procedure for grouting of machine bases and base plates using SikaGrout® range of ready to use mortar products.

2 SYSTEM DESCRIPTION

The SikaGrout® products are generally pre-bagged, 1-component, ready to use, high precision, fluid, shrinkage compensated, pourable cementitious mortars which are used to fill thin bed applications under machine bases and base plates as well as pre-cast elements.

USES

- Under grouting of equipment and machine bases
- Under grouting base plates
- Filling bedding joints in pre-cast concrete sections
- Filling cavities, gaps and recesses
- Sealing around penetrations
- Post fixings
- Concrete (enclosed formwork) repair



CHARACTERISTICS/ ADVANTAGES

- Pre-mixed for quality
- Only add water
- Adjustable consistency
- Good flow properties
- Shrinkage compensated
- Fast strength development
- No segregation or bleeding
- High effective bearing area
- Good adhesion to concrete
- Pumped or poured

2.1 REFERENCES

For best demonstrated practice, reference is made to the recommendations contained in European Standards EN 1504: Products and systems for the protection and repair of concrete structures, and the following relevant parts:

- EN 1504 Part 1: Definitions, requirements, quality control and evaluation of conformity
- EN 1504 Part 6: Anchoring of reinforcing steel bar
- EN 1504 Part 10: Site application of products and systems, and quality control of works

2.2 LIMITATIONS

- Products shall only be applied in accordance with their intended use.
- Local differences in products may result in some performance variations. The most recent and relevant local Product Data Sheets (PDS) and Material Safety Data Sheets (MSDS) shall apply.
- For specific construction / build information refer to the Architect's, Engineer's or Specialist's details, drawings, specifications and risk assessments.
- All work shall be carried out as directed by a supervising officer or a qualified Engineer.
- This method statement is only a guide and shall be adapted to suit local products, standards, legislation or other local requirements.
- The method statement must not be used for wind turbine-related installations. Please refer to specific Method Statement for wind turbine grouts (SikaGrout®-9xxx products).

3 PRODUCT EXAMPLES

| | |
|-----------------------------------|--|
| SikaGrout®-312 | Multi purpose, high precision, 1-component, shrinkage compensated, free flowing, low shrinkage expanding pouring mortar |
| SikaGrout®-311 /-314 /-318 | 1-component, shrinkage compensated, free flowing, precision grouts with different maximum grain size and layer thickness |
| Sikagrout-870 / -928 | 1-component, shrinkage compensated, free flowing, low shrinkage, high precision, machinery and anchoring grout |
| Sikagrout-980 | 1-component, shrinkage compensated, free flowing, low shrinkage thick-pour precision grout |
| SikaGrout®-800 | Low shrinkage, expanding pouring mortar with significant reduction in cement; demonstrated to improve sustainability and having the benefit of reducing the carbon footprint, contribute to climate protection and improve resource efficiency |
| SikaGrout®-340 | Very high performance, shrinkage compensated, very low shrinkage, 1 component pourable mortar for heavy duty and high layer thickness |
| SikaGrout®-4800 | Extra high strength precision grout with metallic aggregate for high dynamic loads |
| SikaGrout®-315 Fast | High early strength, shrinkage compensated, pourable mortar for fast load transfer and rapid turnaround projects. |

3.1 MATERIAL STORAGE



Materials shall be stored properly in undamaged original sealed packaging, in dry cooled conditions. Refer to specific information contained in the product data sheet regarding minimum and maximum storage temperatures.

4 EQUIPMENT

4.1 MATERIALS

| | |
|--------------------------------|---|
| Sufficient quantity SikaGrout® | Refer to section 13 |
| Sufficient clean water | For mixing SikaGrout®, pre-wetting substrate & cleaning |

4.2 ESSENTIAL EQUIPMENT

| | |
|--------------------------------------|--|
| Hand tools | For stirring e.g. trowel |
| Measuring cylinder | For accurate measurement of mixing water |
| Mixing equipment | Refer to section 12 |
| Mixing bowl | Minimum ~18 - 20 litres per 25 kg bag |
| Sponge or pressurised air (oil free) | Wipe/blow away excess water from substrate |
| Curing | Membrane or similar to protect fresh exposed grout |
| Cleaning | Brush, low pressure water |
| Waste disposal | For paper bags and excess material |

4.3 MIXING EQUIPMENT

Use professional equipment for mixing SikaGrout®.



Paddle Mixer with one spindle paddle
small quantities
(e.g. Collomix Xo 4 R)



Duo Paddle Mixer with two spindle paddles
medium quantities
(e.g. Collomix Xo 55 R duo)



Forced Action Pan Mixer



large quantities
(e.g. PFT Multimix or Collomix XM 2-650)

general rule: use low speed (maximum 500 rpm)

Note: “Drum” or “Tumbler” mixer are not recommended for mixing SikaGrout® mortars.

4.4 PUMPING EQUIPMENT (IF REQUIRED)

To convey large quantities faster or to height/distance

Advantages:

- Constant mortar quality
- High capacity (~60 m delivery length, ~ 20 m delivery head, ~ 20 liter/ minute)
- Less surveillance effort

4.4.1 SPIRAL PUMP AND COMPULSORY MIXER

There are different types of pouring machines to select from. These include:

- Mixing pump
- Rotor Machines
- Screw Pumps
- Piston Pumps
- Double Piston Pumps
- Squeeze Pump

The following two pumping machine are examples of pumps that can be used with SikaGrout® mortar products:

Table 1 – Manufacturers of pumping machines

| Manufacturer | | Pumping Machine |
|----------------|--|--|
| Manufacturer 1 | | S5 |
| Name | Putzmeister GmbH |  |
| Address | Max-Eyth-Str. 10 72631 Aichtal Germany | |
| Telephone | +49-7127-599-0 | |
| Web site | www.putzmeister.com | |
| Manufacturer 2 | | |
| Name | Wilcowa AG |  |
| Address | Riedthofstrasse 172 8105 Regensdorf Switzerland | |
| Telephone | +49-7127-599-0 | |
| Web site | www.wilcowa.ch | |
| | | |



Note: Always refer to the machine manufacture before using a new machine with a certain product. Sika can't guarantee for the quality of the application.

4.4.2 CONTINUOUS MIXING PUMP

Mixing pumps combine mixing and pumping in one machine. Besides electricity (power current) water supply to the pump is required. Depending on the material, application and consumption different versions of mixing pumps are possible. Because mixing time is usually reduced, special consideration and tests are required to ensure the quality of the applied mortar (petrofabric analysis etc.), when first using a mixing pump.

Choosing the correct mixing pumps depends on material, ceiling height, dust reduction requirements, material supply (OWC, Bigbag etc.), pump capacity etc. One example of mixing pump is the inoCOMB Cabrio 2.0 from Inotec AG (ask for the Inotec Pump - equipment planer for more information about the characteristics).

Table 2 – Mixing pump from inotec GmbH

| Manufacturer | | Pumping Machine |
|----------------|--|---|
| Manufacturer 1 | | inoCOMB Cabrio 0.2 |
| Name | Inotec GmbH |  |
| Address | Daimlerstrasse 9-11 79761 Waldshut-Tiengen Schweiz | |
| Telephone | +49 7741/ 6805666 | |
| Web site | www.inotec-gmbh.com | |
| | | |
| | | Sika PumpFix |
| Name | Sika AG + Inotec GmbH |  |
| Anschrift | Tüffenwies 16 8048 Zürich Schweiz | |
| Telefon | +41799580981 | |
| Website | https://che.sika.com/ | |
| | | |

Following grouts have been tested with this machine:

- SikaGrout®-312 (AT)
- SikaGrout®-314 N (CH)
- SikaGrout®-316 (AT)
- SikaGrout®-334
- SikaGrout®-212 N (CH)
- SikaGrout®-3170 R

Following tests are recommended for validating new mortars

- Spread Flow (e.g. EN 13395-1/ ASTM C 1437)
- Density (e.g. EN 12190)
- Shrinkage (e.g. EN 12617-4)
- Compressive Strength (e.g. EN 12190)
- Water content (Microwave)
- Slump (e.g. EN 12350-2)
- Slump flow (without hits)
- Air void content

4.5 ADDITIONAL EQUIPMENT

| | |
|----------------------------|---|
| Formwork | To profile or form sides of grout |
| Sealant | To prevent leakage from formwork e.g. Sika Boom |
| Rodding chain/stick | If required to aid flow |
| Additional bucket or chute | For grouting to point of application |

5 HEALTH AND SAFETY

5.1 RISK ASSESSMENT



The risk to health and safety from falling objects or defects in the structure shall be properly assessed.

Platforms and temporary structures shall provide a stable and safe area to work. Do not take any unnecessary risks!

5.2 PERSONAL PROTECTION



Work Safely!

Handling or processing cement products may generate dust which can cause mechanical irritation to the eyes, skin, nose and throat.

Appropriate eye protection shall be worn at all times while handling and mixing products.

Approved dust masks shall be worn to protect the nose and throat from dust.

Safety shoes, gloves and other appropriate skin protection shall be worn at all times.

Always wash hands with suitable soap after handling products and before food consumption.

FOR DETAILED INFORMATION REFER TO THE MATERIAL SAFETY DATA SHEET

5.3 FIRST AID



Seek immediate medical attention in the event of excessive inhalation, ingestion or eye contact causing irritation. Do not induce vomiting unless directed by medical personnel.

Flush eyes with plenty of clean water occasionally lifting upper and lower eyelids. Remove contact lenses immediately. Continue to rinse eye for 10 minutes and then seek medical attention.

Rinse contaminated skin with plenty of water. Remove contaminated clothing and continue to rinse for 10 minutes and seek medical attention.

FOR DETAILED INFORMATION REFER TO THE MATERIAL SAFETY DATA SHEET

6 ENVIRONMENT

6.1 CLEANING TOOLS / EQUIPMENT

Clean all tools and application equipment with water immediately after use. Hardened material may only be removed mechanically.

6.2 WASTE DISPOSAL



Do not empty surplus material into drains. Avoid runoff onto soil or into waterways, drains or sewers. Dispose unwanted material responsibly through licensed waste disposal contractor in accordance with local legislation and/or regional authority requirements.

FOR DETAILED INFORMATION REFER TO THE MATERIAL SAFETY DATA SHEET

7 PREPARATION

7.1 CONCRETE

The horizontal concrete substrate shall be thoroughly clean, in a good sound condition. The cement skin (laitance) as well as delaminated, weak, damaged and deteriorated concrete must be removed by suitable mechanical preparation as directed by the engineer or supervising officer. The textured concrete surface must have a roughness of minimum 2 mm. This reassures bonding which can be tested in accordance with EN 1766: clause 7.2 for horizontal surfaces.

The prepared surface must be free from dust, oil, loose material, surface contamination and other materials which reduce bond. Any pockets or holes for structural fixings must also be cleaned of all debris.

Testing the prepared substrate: The finished surface shall be visually inspected prior to application and can be tapped lightly using a metal hammer to detect delaminated concrete. The supervising officer or qualified engineer shall be informed immediately of any loose, cracked or damaged surfaces. In these circumstances repair materials shall not be applied without prior written consent of the supervising officer or qualified engineer.

7.2 PRE-WETTING SUBSTRATE

Concrete surfaces shall be saturated with clean low-pressure water before application, ensuring that all pores and pits are adequately wet. The surface shall not be allowed to dry before application of the grout. Best start pre-wetting 24 hours but minimum 2 hours before the application.

Just before application, remove excess water and ensure there is no standing water on the surface. The surface shall achieve a dark matt appearance without glistening and surface pores and pits shall not contain water ("saturated surface dry"). Use pressurised air (oil free) to blow away excess water in difficult to reach areas (especially the underside of the base plate and formwork).

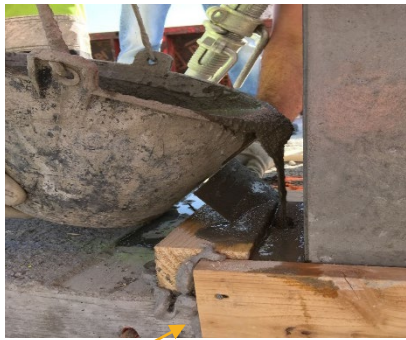
7.3 FORMWORK



Formwork shall be clean and fixed in place as soon as possible after the substrate has been prepared. If required, release agents shall be applied to the formwork before placing into position. Note: Do not contaminate the substrate with the release agent and reduce bond of the grout material due to spillage or run-off.

Openings in the formwork shall be protected to prevent ingress of debris or contamination. The formwork shall be watertight, which can be ensured by the use of a construction foam (see Sika Boom® range).

The Formwork shall be designed to allow air and eventually water bleed from excess water to escape.



Especially in the case of a long base plate, ensure there is enough pressure head (hydrostatic height, see Figure 1 left) to help the flow of the grout. Divide into sections if necessary and apply the grout in more than one stage. Always make sure that no air can be entrapped inside the void. Never pour from two opposite directions.

Metal wires or chains can be used to ensure grout flow underneath base plates.

Foam

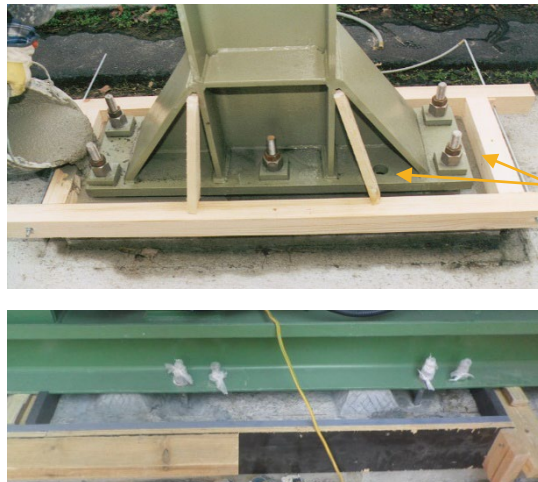


Figure 1. Left: Example solution for a hydrostatic height for additional flow. Right: formwork solutions

7.3.1 REMOVAL OF FORMWORK

The formwork shall not be removed until sufficient strength has been achieved. This time depends on the material characteristics and climate conditions. Formwork shall only be removed with the agreement of the supervising officer or qualified engineer.

8 MIXING



Mixing shall always be carried out in accordance with the recommendations contained in the latest product data sheet (PDS).

Do not use water beyond the stated maximum and minimum limits.

In determining the mixing ratio, the wind strength, humidity, water hardness, ambient and substrate temperature, shall be taken into consideration. For best results only mix full bags.

Best result for small to medium quantities:



- 1) Use a beaker* to measure minimum mixing water (mentioned in the PDS or on the bag layout) and place it in the mixing container.
- 2) Slowly start adding powder in the mixing container.
- 3) Start mixing (if possible, during step 2) with the paddle mixer for required time mentioned in the PDS or until homogenous mix is reached. Use the mixing tools for small and medium quantities mentioned in chapter 4.3.
- 4) Adjust water consistency by adding additional water, without exceeding the maximum water ratio (use beaker*!)

Note: The admixtures of some grouts require at least 2 minutes to react and liquify the mix.

Note: Some mixing containers can get holes through mixing and require replacement after mixing some bags.

*When available, also a balance can be used to measure the correct water amount.

Mixing high quantities:

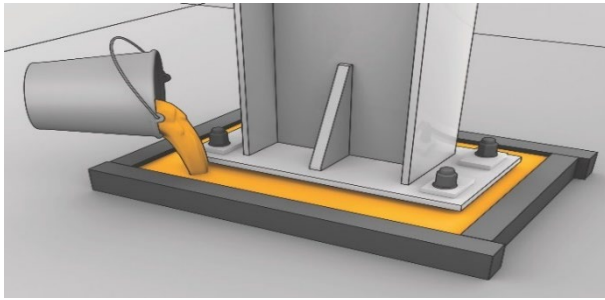


- 1) Use a beaker to measure minimum mixing water (mentioned in the PDS or on the bag layout times the number of bags) and place it in the forced action pan mixer.
- 2) Slowly start adding the powder in the mixing container.
- 3) Start mixing (if during step 2, while adding powder to the water) for the required time mentioned in the PDS or until homogenous mix is reached (usually 2-3 minutes). Use the mixing tools for large quantities mentioned in chapter 4.3, and seen on the left picture.
- 4) Adjust water consistency by adding additional water, without exceeding maximum mixing ratio (use beaker)

Note: The admixtures of some grouts require at least 2 minutes to react and liquify the mix.

9 APPLICATION

The product and system shall be appropriate for the type of substrate, structure and exposure conditions.



9.1 BEFORE APPLICATION



Working space shall be clean and tidy with no obstructions.

Record the substrate, ambient temperature and relative humidity. Check pot life information on bag or in the product data sheet and allow for climatic conditions e.g. high / low temperatures & humidity.

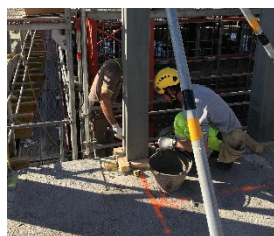
External applications shall be adequately protected. Do not apply grout in direct sun, windy, humid or rainy conditions, do not apply grout if there is a risk of frost within 24 hours in unprotected areas.

Make sure blow holes are not obstructed and can allow the escape of air.

Calculate the required volume for the application. Using the equation in section 10 of this method statement, calculate the consumption of the product and make sure there is enough material on job site for the work.



9.2 POURING APPLICATION



- Grout shall be poured immediately after mixing into prepared openings (within 15 minutes to optimise expansion properties). Make sure air displaced by the grout can escape easily.
- Pour the grout through the “mouth” of the formwork allowing the material to flow to the opposite end. Always maintain sufficient pressure head (hydrostatic height) while pouring.
- Ensure a process of continuous pouring to avoid air entrapment (allow air to be removed) and prevent the grout flow from coming to a stop before the grouting operation is completed.
- Keep pouring until the grout is up to the top of the base plate. This will force the material to the underside of the baseplate and achieve an **effective bearing area** without any voids. Always pour grout from opposite ends to any blow holes.
- Never grout from two places on the same application as it will be difficult to determine if the entire void under the base plate has been filled.
- Depending on the size of the application, it may be necessary to “rod” the grout with a thick chain or metal stick to help the grout flow.
- Keep any visible and exposed grout surfaces as small as possible and protect from premature drying by curing with an appropriate method.
- Do not vibrate the formwork.

9.3 PUMPING APPLICATION

Pumping is a specialist technique is recommended to be carried out by an experienced Contractor. The risk associated with pumping a fluid grout is bleeding as the sand separates while it is under pressure and can cause a blockage.

In the conventional way SikaGrout® is pre-mixed, placed into the hopper of the equipment and pumped through a hose to the point of application. Typical pump machines can be seen in chapter 4.4.1.



9.3.1 BEFORE PUMPING APPLICATION:

- It is recommended to check the compatibility of the pump equipment and grout before the main application.
- The pump machine and ancillary equipment shall be of adequate capacity for the volumes to be applied.
- All moving parts, fittings and hopper shall be inspected for cleanliness and damage before use. Any hardened material shall be removed. The equipment shall not leak.
- Power for the equipment shall be approved for use on job site. Always conform to local laws and restrictions when using diesel powered equipment. When using an electric motor check the voltage requirement is available on job site.
- The Contractor shall keep full details and records of the type of machine and equipment used for the project. This information shall be provided to the Engineer, when requested.
- The hose or pipe shall not have any dents or kinks and be long enough to reach from the pump location to the point of application. It is advisable to use the shortest hose length available to reduce the risk of blockage.
- Plan the timing and possible breaks for the pumping application.
- Always consult with the recommendations provided by the machine manufacturer.

9.3.2 DURING PUMPING APPLICATION

- Once the machine is set up, the pump, hose and pipe shall be lubricated to prevent suction using SikaPump®-Start-1 or a slurry mortar/ cement mix*. When using a slurry mix be careful that it doesn't contain too much water to prevent sedimentation. Do not pump the lubricating slurry or pre-wetting mixes on the application area (additional containers can be helpful). Plan in additional material to make sure, that lubricant is completely removed, and material has the right consistency. Especially for continuous mixing pumps.
- Quality control of the material is recommended. Refer to chapter 10.3. Especially for continuous mixing pumps Special consideration must be taken regarding the right water pressure, constant material supply, material temperature, climate conditions etc.
- During the application there shall be no interruption in the grout supply.
- Pot life shall be determined by tests on job site according to the ambient temperature and climate conditions. The pot life of the grout shall not exceed the time required to apply the grout on the substrate. No material can harden inside the pump or pipe. Breaks need to be planned.
- Stick to same "rules" as for pouring application mentioned in chapter 9.2

9.4 CURING

Protect the fresh material from premature drying. Cure exposed area with proper curing methods for at least 3 days or spray with appropriate curing compound once the grout starts to stiffen. Suitable curing covers include jute and water, plastic sheets or other suitable membranes.

9.5 APPLICATION LIMITS

- Do not apply a grout as a patch repair or overlay in unconfined areas (horizontal, free applications)
- Avoid application in direct sun and/or strong winds
- Do not add water over the maximum recommended dosage
- Always check the material's pot life and adjust for climate conditions
- Temperature of the repair mortar and substrate shall not differ significantly

10 INSPECTION, SAMPLING, QUALITY CONTROL

As part of "Good Practice" the grouting contractor shall provide a QC report containing the following recommended data. For more detailed information refer to EN 1504-10 Annex A, or any other local standards or legislation which may apply.

10.1 SUBSTRATE QUALITY CONTROL - BEFORE AND AFTER PREPARATION

The following checks should be carried out before and after preparation of the substrate surface

| Characteristic | References | Frequency | Parameters |
|----------------------------|--|--|---|
| Cleanliness of Concrete | Visual | After preparation & immediately before application | No contamination, loose particles or defects |
| Delaminating Concrete | Hammer Sounding | After preparation | No delaminating concrete |
| Roughness | Visual or EN 1766 on horizontal surfaces | After preparation | Minimum roughness 2 mm; not over roughened to effect flow |
| Substrate tensile strength | EN 1542 | After preparation works | > 1.0 N/mm ² |

Table 1 QC summary before and after preparation

10.2 CLIMATIC AND MATERIAL QUALITY CONTROL – BEFORE APPLICATION

The following checks should be carried out before, during and after application.

| Characteristic | References | Frequency | Parameters |
|-----------------------------------|------------|--------------------|-------------------------------------|
| Temperature (ambient & substrate) | Record | During application | Within PDS limits |
| Ambient Humidity | Record | During application | Within PDS limits |
| Precipitation | Record | During application | Keep records and provide protection |
| Batch Number | Visual | All bags | Keep records |

Table 2 QC summary before, during and after application

10.3 MATERIAL QUALITY CONTROL

The following are optional quality control which could be performed on job site before and just after mixing – subject to requirements of Supervising Officer / Engineer

| Characteristic | References | Frequency | Parameters |
|------------------------|------------------------------|--------------------------|--|
| Packaging | Visual | Every bag | No damage |
| Dry product aspect | Visual | 2 bags per 10 | Loose, no lumps and not compacted |
| Mixed material | Visual | Every mix | Homogeneous, no lumps no un-mixed dry powder |
| Bleeding Sedimentation | Visual | Every mix | None |
| Compressive Strength | EN 12190 / ASTM C1107 | 3 prisms per application | According to job specification |
| Flow characteristic | EN 13395-1 and 2 / ASTM C939 | Before application | Defined by R&D |

Table 3 Job site material QC before and after mixing

10.4 PERFORMANCE TESTING – AFTER APPLICATION

The following can be used to check the adequacy of the application.

| Characteristic | References | Frequency | Parameters |
|------------------------------------|--|---------------------------|----------------------------|
| Cracking | Visual | 28 days after application | No cracking on application |
| Presence of Voids/ Delaminating | EN 12504-1 Hammer sounding or *ultrasonic testing | After application | No delaminating concrete |
| Adhesion Bond*(pull off) | EN 1542 | Min 3 on a test area | Within PDS limits |

Subject to material grain size and local requirements / standards

Table 4 QC summary of performance testing after application

11 ADDITIONAL GUIDANCE

The following applications offer further guidance in specific situations.

11.1 GROUTING IN CONFINED SPACES

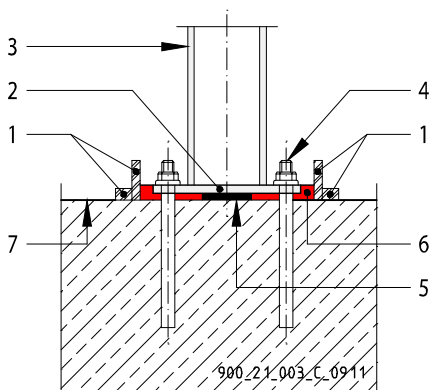


Use a sloping channel or chute to convey grout to a lower level. Avoid the free fall of the material to prevent segregation of the aggregates.

Maintain a constant flow of grout during application. Apply grout only in one corner making sure there is adequate space around the application for release of air.

Do not drop material from height.

11.2 GROUTING BASE PLATES



- 1 Formwork with suitable de-bonding agent on inside face
- 2 Baseplate in steel of the stanchion
- 3 Stanchion / column
- 4 Holding down bolts
- 5 Levelling plates (as specified)
- 6 SikaGrout®
- 7 Top of concrete foundation

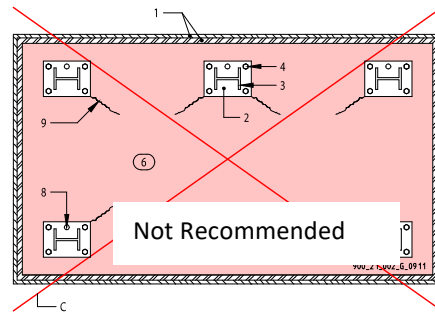
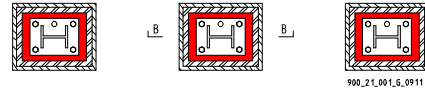
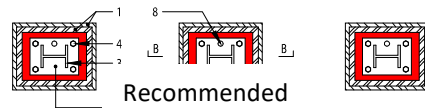
Note: refer to specialist Engineer's details for specific information.

Typical illustration of a base plate, not to be used for construction purposes

11.3 GROUTING MORE THAN ONE BASE PLATE

It is not recommended to cast large exposed areas as the grout is likely to crack.

- 1 Formwork with suitable de-bonding agent on inside face
- 2 Baseplate in steel of the stanchion
- 3 Stanchion / column
- 4 Holding down bolts
- 5 Levelling plates (as specified)
- 6 SikaGrout®
- 7 Top of concrete foundation
- 8 Air release holes to Engineers specification
- 9 Cracks due to high stress on corners



11.4 GROUTING LARGE AREAS



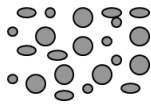
Large horizontal application areas may be subdivided into smaller manageable areas to reduce extent of application and also reduce potential cracking. Proposals shall be agreed with the supervising officer or qualified Engineer before work proceeds.

11.5 EXCEEDING MAXIMUM LAYER THICKNESS

Prevent exceeding the specified maximum layer thickness of the repair mortar by choosing the correct SikaGrout®. When the repair depth exceeds the maximum layer thickness of the repair material, build up layers on top of one another to increase the overall construction depth. When indicated by the relevant PDS, aggregates can be added to increase the layer thickness as well.

11.5.1 INCREASING MAXIMUM LAYER THICKNESS WITH AGGREGATES (WHEN INDICATED IN THE PDS)

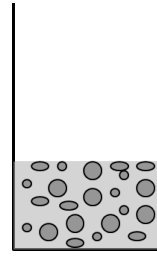
The application thickness of SikaGrout® can be increased with the addition of more aggregate. This technique only applies for filling voids or applications subject to static compression loads e.g. under base plates and machine bases. Use fire dried rounded aggregates. The general rule for additional aggregate is to use a rounded clean well graded between d_{max} to $(2 \text{ or } 3 \times d_{max})$. Add only the maximum of aggregates indicated in the respective PDS. Be careful the use aggregates where ASR is not possible. Especially high strength grouts use aggregates with high mechanical characteristics (e.g. quartz)



Step 1 – Pre-wash / wet the aggregate. The aggregate shall be saturated surface dry (fire dried) when adding to SikaGrout®



Step 2 – Mix SikaGrout® as normal. Slowly add the aggregate and mix slowly until homogeneous. Over mixing will aerate. Leave to stand for 2 minutes.



Step 3 – Apply mix into void

The SikaGrout® characteristics will be affected with the addition of more aggregate, significantly the flow. These new characteristics shall be taken into account when the technique on job site. For example flow distance, grouting height, volume, ambient and substrate temperatures. The E modulus as well as the compressive strength are usually enhanced.

Pre-testing of the modified material shall be carried out first to determine an acceptable construction method together with new material mechanical performances.

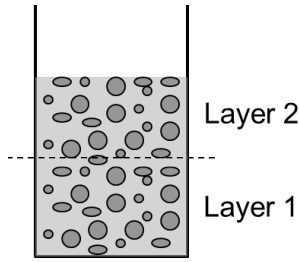
- Always pre-test the new material characteristics
- Always check no bleeding or sedimentation
- Use same aggregate and grading to be used on job site
- Consider ambient and substrate temperatures
- Check the new mechanical properties
- Do not add more water to the mix
- Aggregate shall not be wet

11.5.1.1 Example

| Material | Application thickness |
|---|-----------------------|
| *SikaGrout®-314 (4 mm max grain size) | 10 – 40 mm |
| *SikaGrout®-314 + 40% by weight 4–5 mm to 8-12 mm washed well graded fire dried clean rounded aggregate free from fine graded material e.g. silts, sands etc. | ~20 – 80 mm |

For even higher layer thickness refer to the next chapter

11.5.2 BUILD UP LAYERS



The first layer shall be hardened and be at the ambient temperature before applying the second layer (ca. 24 h). If possible, roughen the surface of the first layer. The first layer shall be cleaned before applying subsequent mortar layers to remove dirt and loose material. Use adequate water pressure (150 – 200 bar Roloc nozzle) or compressed air. The first layer shall not be damaged.

In confined spaces, where roughening is not possible, rebars can be used to ensure bondage between the layers. Otherwise the addition of aggregates or a different SikaGrout® with higher layer thickness might be necessary to avoid shrinkage cracks.

Build up in layers. The first layer shall be hardened, exothermic reaction completed and be at ambient temperature before applying next layer

12 YIELD AND CONSUMPTION

12.1 YIELD

The yield of a product can be determined from the following equation (assuming no wastage). When calculating the required consumption on job site take into consideration that additional material might be required to create the necessary pressure head (hydrostatic height). Remember to calculate the required volume to the top of the base plate.

Equation:
$$\text{yield (litres)} = \frac{\text{weight of powder (kg)} + \text{weight of water (kg)}}{\text{density of mixture (kg/l)}}$$

Where: weight of water 1 litre = ~1 kg

Example:

Calculate consumption of a bag weighing 25 kg mixed with 3.2 litres of water, when the density of the fresh material is 2.3 kg/l.

1 bag of 25 kg powder yields:
$$\frac{(25 + 3.2)}{2.3} = \sim 12.3 \text{ litres of grout}$$

Therefore, the number of bags required for 1m³ of grout will be:

N° of bags required per 1m³ =
$$(1/12.3) \times 1000 = \sim 81 \text{ bags}$$

12.2 CONSUMPTION

Consumption of a product can be calculated as follows:

Calculate how many kg of powder is required for a 30 mm thick application over an area 2 m²
(assuming no wastage)

$$\begin{aligned}\text{Weight of mixed mortar (kg)} &= \text{volume (m}^3\text{)} \times \text{density (kg/m}^3\text{)} \\ &= (2\text{m}^2 \times 0.030\text{m}) \times 2300 \\ &= 138 \text{ kg (total)}\end{aligned}$$

Less weight of water;

If water to powder mixing ratio = *12.0% then; * refer to PDS for exact figure

$$\begin{aligned}\text{Required weight of powder} &= 138 / ((100+12.0)/100) \\ &= \sim \mathbf{123.2 \text{ kg powder}} \text{ (or minimum 5 x 25 kg bags)}\end{aligned}$$

13 LEGAL NOTE

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the products suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

KEY WORDS*

Method Statement, SikaGrout, grouting, base plates, machine bases, dry-mix, pouring, pumping, precision grout, fluid mortar

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SIKA SERVICES AG
TM Refurbishment
Tueffenwies 16
8048 Zürich
Switzerland
www.sika.com

Version given by
Johannes Lohner
Phone: +41 59 91 99 711

Mail: lohner.johannes@ch.sika.com
R. Störiko-Pasker
stoeriko-pasker.reinhard@de.sika.com

METHOD STATEMENT
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