



Method Statement

Ref. #: DCP10/03-0051-A-2022



Flo-Grout 60

(General purpose non-shrink cementitious grout)



Table of Content

SECTION A: GENERAL COMMENTS	3
General Notes	3
High-Temperature Working	3
Low-Temperature Working	3
Tools and Equipment	4
SECTION B: APPLICATION	5
Substrate Preparation	5
Formwork	5
Mixing	6
Placing	7
Thickness Limitation	9
Shoulders	9
Curing	9
Cleaning	10
Remarks	10
SECTION C: CAUTIONS	10
Health & Safety	10
SECTION D: APPROVAL AND VARIATIONS	10



Section A : General Comments

General Notes:

The information below is a detailed overview of the application of DCP's **Flo-Grout 60** and should be read in conjunction with the relevant technical data sheet prior to application. All DCP Products should be applied by experienced specialist contractors.

All the points below assume the correct preparation of the relevant surface.

High-Temperature Working:

It is suggested that, for temperatures above 30°C, the following guidelines are adopted as good working practice:

- i. Unmixed materials and equipment should be stored in a cool shaded area and away from direct sunlight.
- ii. Avoid application during peak temperature of the day.
- iii. Plan for enough materials, tools, and labor to ensure a continuous application process.
- iv. It is recommended to use potable water with a temperature not exceeding 25°C.
- v. In order to extend the working time that may be used with **Flo-Grout 60** it is recommended to use cold materials, base plates and foundations must be cool and shaded from direct sunlight.
- vi. Use cool chilled water for mixing to keep the grout temperature below 30°C, add ice in drums of water.
- vii. Do not add ice directly to the grout mix, and do not use 'dry ice' as a cooling agent.
- viii. Cool the mixer by charging it with chilled water, which helps reducing the heating of the grout.
- ix. Cover the pump line with wet burlap and fill it with chilled water to cool the pump line. Also, Sunshades should be provided to protect the line from the hot sun.

Low-Temperature Working:

It is suggested that, for temperatures below 10°C, the following guidelines are adopted as good working practice:

- i. Unmixed materials should be stored in a warm condition, to ensure optimum flow properties.
- ii. Cold temperatures will decrease the flow properties of the grout.
- iii. Avoid applying the grout if the temperature is around 5°C and falling.
- iv. Warm the mixing water to provide the desired temperature for mixing water.
- v. Place a contact thermometer and measure the temperature on both surfaces of the base plate and the concrete foundation, if the temperature is below the minimum application temperature, apply heat uniformly until reaching the minimum application temperature or more.
- vi. Use warm water for curing and maintain placed grout temperature above 20°C for 24 hours
- vii. Cold temperatures retard early strength gain. Warm, moist curing can be used in order to accelerate early strength gain.

Tools and Equipment:

It is suggested that the following list of equipment are adopted as a minimum requirement

Personal protection

- : Protective overalls
- : Goggles or a face mask
- : Good quality gloves
- : Safety shoes
- : Safety helmet



Equipment

- : Mixing drill (Fig.1)
- : Mixing paddle (Fig.2)
- : Empty bucket (25 ltr) (Fig.3)
- : Electrical hammer (Fig.4)
- : Chisel and hammer (Fig.5)
- : Feeding hopper (Fig.6)
- : Mixer (Multi bag mixing) (Fig.7)
- : Pump [if required] (Fig.8)



Fig.1: Mixing drill



Fig.2: Mixing paddle



Fig.3: Empty bucket



Fig.4: Electrical hammer



Fig.5: Chisel and hammer



Fig.6: Feeding hopper



Fig.7: Mixer (Multi bag mixing)



Fig.8: Pump

Section B : Application

1.0 Substrate Preparation

- 1.1 The substrate should be sound, clean and free from contamination. Surface laitance should be removed by acid etching or grit blasting
- 1.2 All honey combed or defected concrete surfaces must be removed to reach sound and solid surfaces.
- 1.3 Base plate's underside should be clean and free from oil, rust and scale.
- 1.4 For isolated areas and large base plate areas, it is recommended to open air release vent holes to relief air pressure
- 1.5 It is recommended that concrete is mechanically roughened to a minimum Concrete Surface Profile (CSP) of CSP 3 profile (2 – 5 mm) or maximum CSP 5 profile (3 – 10 mm). in accordance with ICRI 310.2R
- 1.6 All sections of the substrate that will come into touch with the grout, including holes, must be carefully cleaned before installing structural elements or machinery.
- 1.7 Concrete surfaces and bolt holes (if not anchored) shall be soaked with water prior to application aiming to reach saturated surface dry. All excess water must be removed before grouting.
- 1.8 All anchor pockets, sleeves or holes drilled for anchor bolts must be free of water and cleaned from dust and loose debris using suitable brush or compressed air.
- 1.9 Steel surfaces should be grit blasted to remove all rust and scale.
- 1.10 Remove all vibration sources that may cause settlement and bleeding until the grout has hardened.

2.0 Formwork

- 2.1 Ensure that all areas to be grouted are clean from dust, dirt, and any other foreign materials before fixing any formwork.
- 2.2 The formwork must be constructed to be water tight (leak-proof), to prevent any possible grout loss from any formwork joints. This can be achieved by sealing underneath the formwork and at the joints by using an appropriate sealant. The area to be grouted within the formworks should be cleaned and submerged with water to check for any leaks in the formwork or between the form and foundation.

Note: The unrestrained areas should be kept to a minimum due to the expansive nature of Flo-Grout 60.

- 2.3 The formwork must be strong enough to withstand the hydraulic pressure developed during grout pouring.
- 2.4 Forms should extend vertically above the bottom of the base plate surface to prevent overflow and ensure that the space to be grouted is completely filled (typically 100 mm rise should be sufficient check Fig.9), the side formwork should provide a clearance of 25 - 50 mm horizontally to prevent displaced air from getting trapped below the plate.
- 2.5 **Pouring side:** To obtain maximum flow distance (free-flowing grout application), a side shutter feed (feeding hopper) should be erected on one side of the baseplate with 100 - 250 mm side height and slope away from the plate at approximately 45 degrees to provide minimum turbulence and build the required hydrostatic head.

Note: Pour the mixed grout into the prepared forms from one side only to prevent air entrapment.

- 2.6 The grout should be poured from the shortest distance across the base plate.
- 2.7 The formwork should be fixed in such a way as to allow easy stripping, without causing damage or stress on the grout. A suitable formwork release agent could be used.

2.8 **Opposite the grout filling side:** Erect the formwork typically 100 mm above the base plate edge. (see Fig.9).

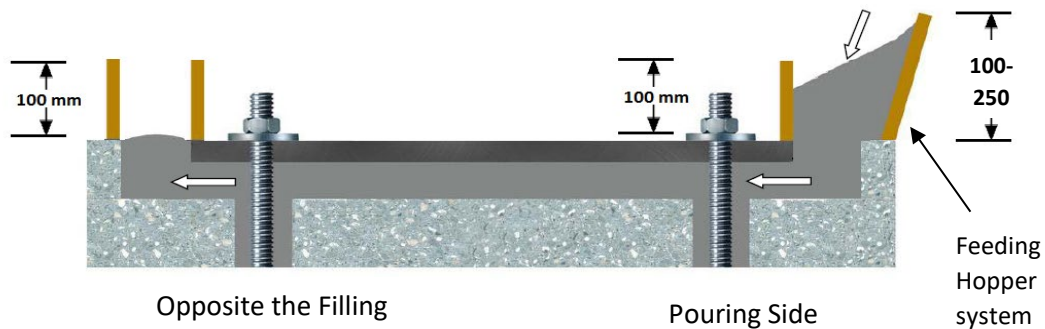


Fig.9: Formwork placement

3.0 Mixing

- 3.1 A mechanically powered mixer or drill fitted with suitable paddle type should be used to ensure proper mixing.
- 3.2 Locate the mixer or the mixing container as close as possible to the element being grouted in order to minimize the transporting time.
- 3.3 The addition of 4.125 litre of clean water per 25 kg bag is essential to obtain a flowable consistency. Yet to use in horizontal situations such as filling in tie rods opening, the addition of 3.3 litre of clean water per 25 kg bag should be used.
- 3.4 Place the mixing water into a clean container. And add the required weight of the dry powder slowly to the water while mixing continuously with low speed mixer/drill (400 – 600 rpm). Mixing should be continued for 3 minutes until uniform consistency is obtained.



Mixing using drill and mixing paddle

Multi-bag mixing

- For larger volumes, Pan Mixers or ribbon paddle-type mixers are most often used for mixing grout.
- Add 70 - 80% of the required mixing water as per TDS, then add the bags slowly into the mix with the mixer running.
- Do not dump the entire bag contents at once.
- Mix for 3 minutes then slowly add the remaining water.
- Keep mixing until a uniform consistency is obtained, (1 - 2 minutes).

Notes:

- *Slow speed mixer should be only used. Do not mix by hand.*
- *The mixed grout should be quickly transported to the head box and placed.*
- *While mixing, ensure that the mixing blade is kept below the surface of the grout to prevent air entrapment.*
- *Do not mix more than the amount of grout to be placed at one time within its pot life.*
- *Potable water should only be used for mixing.*
- *Do not use grout from damaged bags.*
- *Do not add sand or cement to the grout.*

4.0 Placing

Grouts can be either poured in a fluid or flowable state or can be pumped. The placement method depends on the shape and size of the grouting area, clearances and accessibility around the grouting area, and environmental temperature.

4.1 Pouring

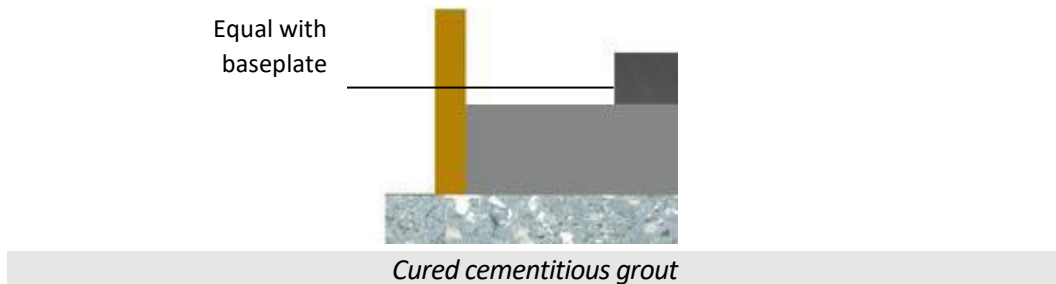
- 4.1.1 It is essential that the machine mixing capacity, material supply, and labor availability are adequate to enable the grouting operation to be carried out continuously.
- 4.1.2 Apply the grout as **immediately** as possible after preparation and cleaning. Prior to placement, ensure that all surfaces are dry and free from any standing water.
- 4.1.3 Always mix only the quantity of grout that can be used within its pot life. Never reduce the mixing time.
- 4.1.4 Enough mixed grout shall be ready to start with and to build the required hydrostatic head
- 4.1.5 Bolts holes should be grouted first before grouting between the base plate and concrete substrate.
- 4.1.6 Start placing grout at one end on the head box *along the slope* continuously with a maintained head to ensure proper grout placement until it reaches the open side of the formwork and rises above the underside of the base plate. Grout placing shall be continued slowly for the full length of the grouting area until completed.
- 4.1.7 It is a must to grout from one side to eliminate air entrapment.



Filling of bolt holes



Grout pouring



For large baseplates or grouting areas:

- Divide the areas to be grouted into sections. (use a width-to-length ratio of 1:1 or 1:2)
- Fabric hoses filled with water and temporary formwork that will not stuck to the grout can be used to divide the area into sections.
- Make sure all water, dust, dirt, and any other foreign materials to be removed from the grouting area and bolt holes before grouting starts.
- All bolts holes should be grouted prior to the grouting between the base plate and concrete substrate.
- Start placing grout at one end on the head box and continue until the grout reaches the open area and rises above the bottom of the base plate on the exit side.
- Move the pouring point slowly along the sloped head form on the pouring side as soon as grout continues to come up on the opposite side
- Grout should not be poured and placed in an indiscriminate manner at different locations along one side to ensure prevent trapping on developing large voids between pouring points.
- Do not pour grout towards the center from opposite sides.

Notes:

- *Pre-calculation of the exact needed volume of grout is essential to ensure full coverage under the base plate.*
- *Apply the grout across the shortest width of the equipment/base.*

4.2 Pumping

Flo-Grout 60 can be pumped using the typical pumps that pump cement-sand mixes such as (Screw Pumps, Piston Pumps, Double Piston Pumps, and Membrane Pumps). However, it is recommended to check the compatibility of the pump equipment and grout before the application. A pump hose of 50 mm internal diameter is recommended.

- 4.2.1 All pump parts should be clean and hardened material should be removed.
- 4.2.2 Provide power for the equipment to be used on site.
- 4.2.3 Place the pump where the line from the pump to the discharge outlet is as short as possible
- 4.2.4 Place the mixed grout into the hopper of the pump and keep it at least half full of grout at all times to prevent air entrapment in the line.
- 4.2.5 Pump the grout using a hose into the farthest corner point and gradually pull the hose as the space fills.
- 4.2.6 After finishing the pumping process or In case of a breakdown, quickly insert the water line into the grout pipe to clean it out to prevent blocking before grout stiffens.

In case of delays:

- Agitate and recirculate the mixed grout in the pump hopper when not actually pumping through the work.
- Waste some material and give the grout pump line a shot every 3 to 5 minutes if necessary.

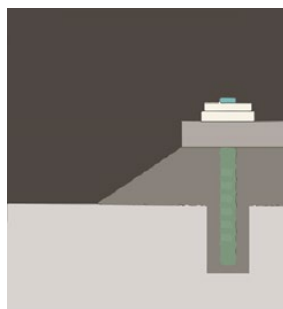
5.0 Thickness Limitations

- 5.1 **Flo-Grout 60** is usually applied in a single layer at a thickness between 10 - 100 mm. For greater thickness, 8 - 12 mm washed aggregate should be added at a ratio between 50 - 70% of **Flo-Grout 60**. However, this technique may affect the physical properties and flow of the material.

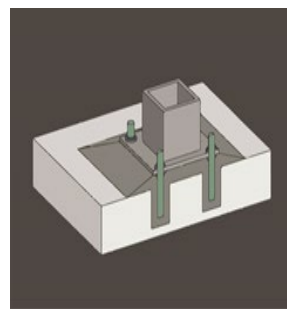
Note: refer to the technical data sheet of the product.

6.0 Shoulders

- 6.1 When the grout has stiffened to the point that it will hold its shape, remove the forms and cut the shoulders back at a 45° angle from the bottom edge of the baseplate to the foundation. Do not allow any excess grout to remain above the bottom edge of the baseplate or in a non-chamfered shape.



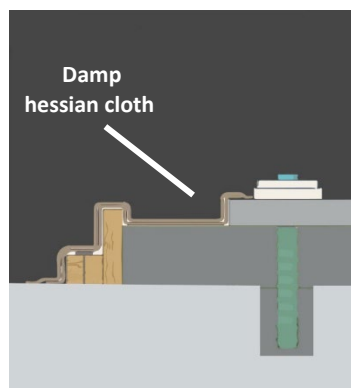
Chamfered edge



Shoulders

7.0 Curing

- 7.1 As the sheen of water disappears and the grout begins to stiffen, apply a damp hessian cloth. When the grout has stiffened to the point that it will hold its shape, remove the forms and cut the shoulders.
- 7.2 After finishing cementitious grouts shoulders, open areas should be cured for 3 days minimum using wetted hessian cloth and PE sheet or by using a curing compound such as **Setseal 22/33/44**.



Curing the grout with damp hessian



8.0 Cleaning

- 8.1 All tools should be cleaned **immediately** after finishing using a suitable epoxy thinner. Hardened materials should be cleaned mechanically.
- 8.2 Remove any excess grout into appropriate containers for disposal before it has hardened.
- 8.3 Always dispose of the excess or waste materials in accordance with local regulations.

9.0 Remarks

- 9.1 Confirm availability of mixing equipment.
- 9.2 Calculate the time required for preparing and mixing the grout. In many cases, two working teams are necessary to supply the feed hopper and to maintain the work flow.
- 9.3 Do not reduce the mixing time, even when in a hurry.
- 9.4 Check the substrate in advance. Ensure that the substrate is in good condition and clean.
- 9.5 Do not change the product mixing ratio.
- 9.6 Do not add admixtures, cement, or sand to the grout.
- 9.7 Do not vibrate the grout during placing.
- 9.8 Contact DCP Technical Services Department for advice on control spacing for large base plate grouting projects.

Section C : Cautions

Health and safety

Flo-Grout 60 is irritation to skin, eyes, and respiratory system. Wear suitable gloves and eye protection.

Fire:

Flo-Grout 60 is nonflammable.

For further information on refer to the Material Safety Data Sheet.

Section D : Approval and Variations

This method statement is offered by DCP as a 'standard proposal' for the application of **Flo-Grout 60**. It remains the responsibility of the Engineer to determine the correct method for any given application. Where alternative methods are to be used, these must be submitted to DCP for approval, in writing, prior to commencement of any work. DCP will not accept responsibility or liability for variations to the above method statement under any other condition.