

Readymix





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AfriSam Readymix plants have ISO 9001 certification, and AfriSam Readymix is a member of associated industry related bodies.



By using readymixed concrete from more than 30 AfriSam Readymix plants in Gauteng, Mpumalanga, North West, KwaZulu-Natal and the Western Cape as well as in Botswana, customers are able to maintain a competitive edge in the construction marketplace by making use of AfriSam's expertise in choosing and proportioning suitable and compliant raw materials, computerised weigh batching, concrete pumping services, technical backup and quality assurance.

Our Product Technical team is available for on-site technical advice for issues relating to concrete technology, optimisation of mixes, and research and development.

AfriSam Readymix plants across southern Africa produce over 1.8 million m³ of readymixed concrete annually. Our fleet of 300 mixer trucks and pumps ensures that concrete is delivered, discharged and placed on-site on time and as close to its final position as humanly possible.

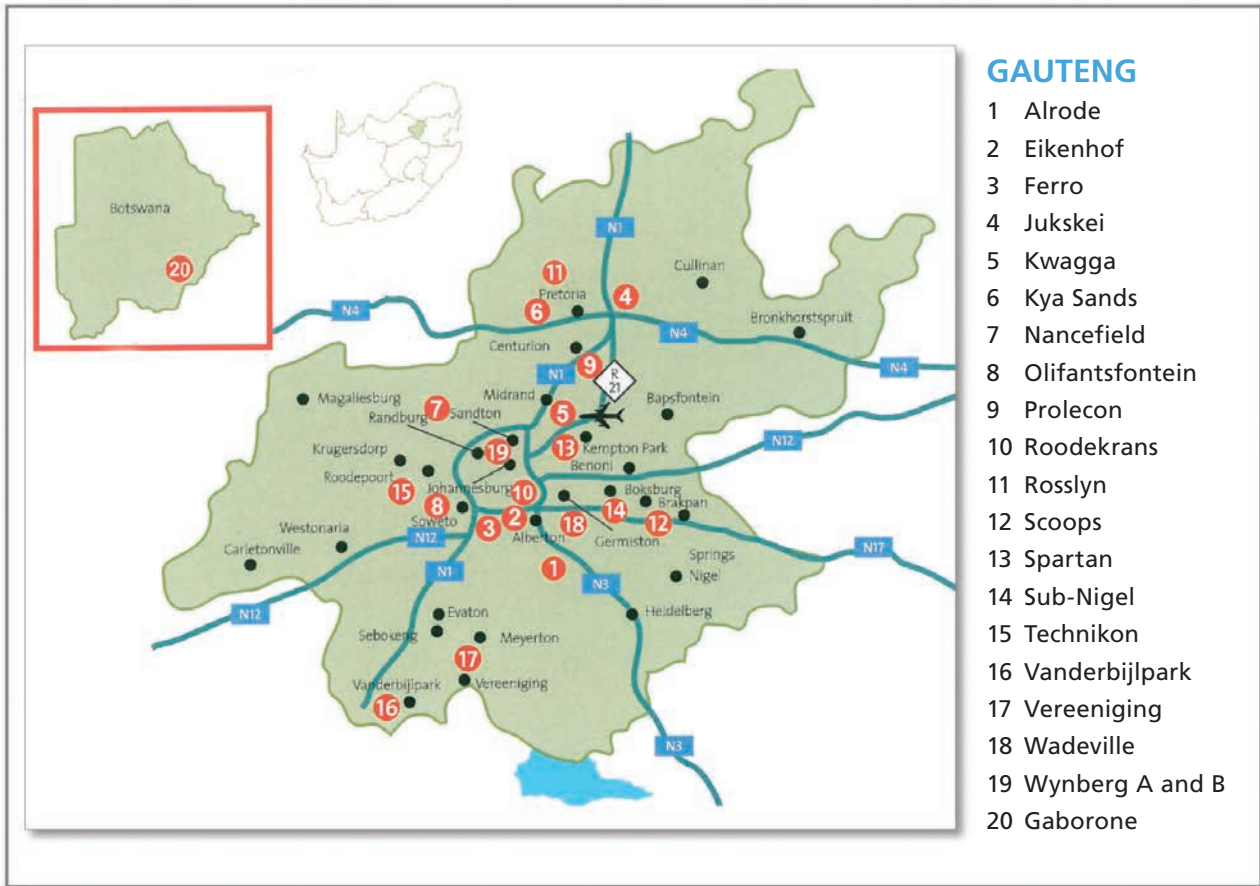
Carbon footprint of readymix concrete

Since 2009, the CO₂ footprints of AfriSam readymix plants and our Application Brand products have been quantified and monitored.



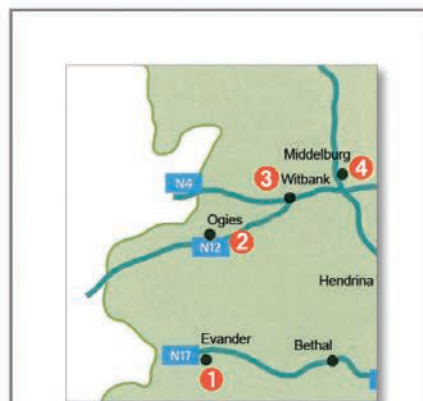


AfriSam Readymix plant locations



NORTH WEST

- 1 Brits
- 2 Marikana
- 3 Rustenburg

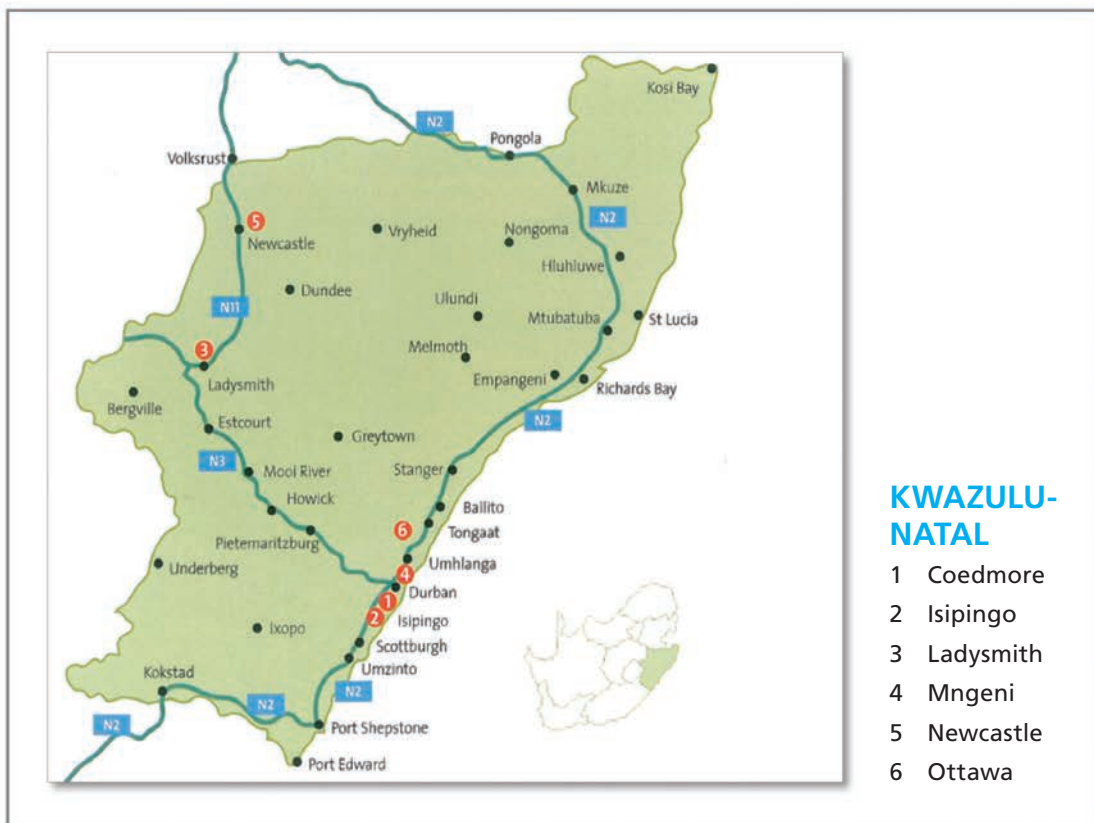
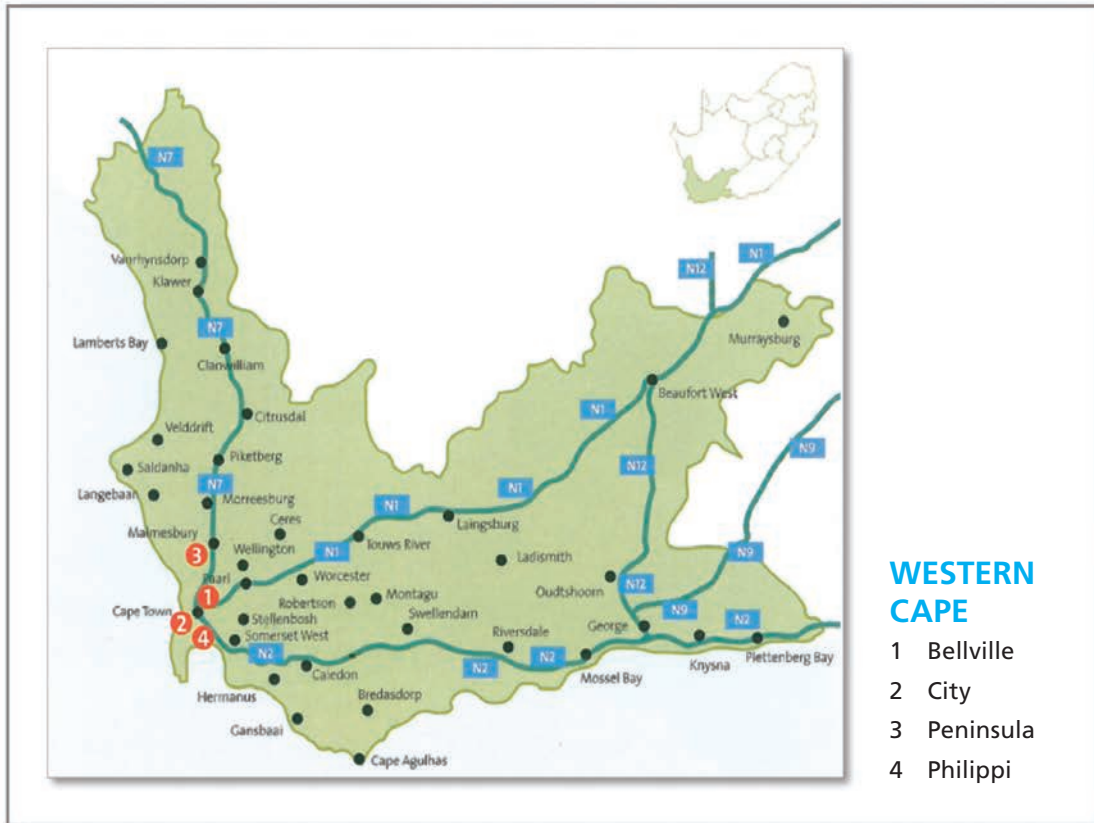


MPUMALANGA

- 1 Evander
- 2 Ogies A and B
- 3 Witbank
- 4 Middelburg



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AfriSam Readymix: Application brands

By carefully designing and producing application-branded mixes to comply with SANS 878, and for optimal performance in terms of workability and rate of strength gain as shown in Figure 9, AfriSam Readymix takes the uncertainty out of decisions regarding cost-effective and environmentally sound solutions for concrete for residential and non-residential construction, and also for the Starmix brand for smaller residential projects where specified strength relates directly to the application.

In addition, all our readymixed concrete products (with the exception of Foundation Mix) can be designed for placing by pump (see *Pumpable concrete*).

Rate of strength gain	Rapid	Surfacebed Mix Polyfibre Mix	Retainer Mix Suspended Slab Mix Column Mix Post Tension Mix
	Enhanced	Surfacebed Mix Polyfibre Mix	Retainer Mix Suspended Slab Mix Column Mix
	Standard	Blinding Mix Foundation Mix Starmix Polyfibre Mix	Retainer Mix
Target slump: See specific details for each product			

Figure 9: Application brand performance matrix.

The different strength gain options relate directly to the following application requirements.

Table 28: Strength gain solutions.

Application brand	Typical requirements
Foundation Mix	Concrete does not normally require quick stripping times
Starmix	
Retainer Mix	
Surfacebed Mix	Concrete needs to stiffen and gain rapidly for power-floating and joint cutting
Suspended Slab Mix	Concrete requires enhanced strength to facilitate stripping of formwork
Column Mix	
Post Tension Mix	Rapid strength gain to achieve the required three-day hurdle and to allow for tensioning (see <i>Figure 10</i>)



Foundation Mix

Foundation Mix is a branded product with specific focus on strength gain and workability that can be used for all foundations. Foundation Mix has a target strength of between 10MPa and 35MPa, and a target slump of either 75mm or 100mm.

Features of Foundation Mix

- Will flow into difficult areas and shapes.
- Has increased resistance to aggressive environments due to the GGBFS and/or FA content in the mix.
- Is a cost-effective solution.

Benefits of Foundation Mix

- Faster placing into irregular shapes improves productivity.
- More durable concrete with less likelihood of concrete deterioration.

Retainer Mix

Retainer Mix is a branded product with specific focus on strength gain and workability, to ensure the mix is ideally suited to concrete wall applications. Retainer Mix has a target strength of between 25MPa and 45MPa, and a target slump of 100mm.

Features of Retainer Mix

- Suitable for direct, crane or skip discharge.
- Flows easily.
- Provides an excellent off-shutter finish.
- Has increased resistance to aggressive environments due to the GGBFS and/or FA content in the concrete mix.
- Quick discharge due to high workability.

Benefits of Retainer Mix

- Improved off-shutter finish requires less remedial work.
- Allows for more durable concrete with less likelihood of concrete deterioration.
- Minimal vibration required.

Surfacebed Mix

Surfacebed Mix is a branded product with specific focus on strength gain, finishing and workability for slabs on the ground, eg factories, shopping centres and parking areas, as well as road paving elements such as culverts, drains, etc.

Surfacebed Mix has a target strength of between 20MPa and 40MPa, and a target slump of 100mm.

Features of Surfacebed Mix

- Easily compacted, floated and finished.
- Optimal cutting time.

Benefits of Surfacebed Mix

- Optimal cutting time improves productivity.

Column Mix

Column Mix is specially designed with additional, selected fine material for increased paste and improved rheology to ensure effective pumpability and placeability. The concrete flows easily through areas congested with reinforcement to give excellent protection of steel, impermeable cover to steel and good finish without honeycombing.

Column Mix is available in rapid and enhanced strength gain options, and has a target slump of 125mm.

Features of Column Mix

- Pumpable due to high workability.
- Excellent flow of concrete into steel cages and around rebar.
- Excellent surface finish.

Benefits of Column Mix

- Improved cohesion results in better off-shutter finished.
- Denser, less permeable concrete to prevent penetration of moisture and rusting of steel.
- Minimises honeycombing at foot of columns.



Suspended Slab Mix

Suspended Slab Mix is a branded product with specific focus on strength gain and workability suitable for all slabs above ground, for high-rise buildings, parkades and hollow-block systems. Suspended Slab Mix has a target strength of between 20MPa and 40MPa with a target slump of either 100mm or 125mm.

Features of Suspended Slab Mix

- Pumpable due to high workability.
- May be easily placed.
- Makes for easy compaction.
- A good surface finish is easily achieved.

Benefits of Suspended Slab Mix

- Allows for more efficient use of labour as a result of easier placing, compacting and finishing.
- Improved cohesion results in better off-shutter finishes.

Stripping of formwork

How long the formwork should remain in place to provide the required finish is normally specified. Table 29 should be regarded as a guide only. In cool weather, stripping times are determined by interpolation between the periods specified for normal and cold weather.

Post Tension Mix

Post Tension Mix is a branded product with specific focus on strength gain, finishing and workability that can be used for all post tension applications or areas where early strength gain is a construction requirement.

Rapid strength gain is required in order for Post Tension Mix to achieve the three-day hurdle, and allow for tensioning of the slab. Figure 10 shows a typical strength curve of the expected MPa achievement over the 28-day cycle.

The product offers a target strength of no less than 30MPa at 28 days, and a guaranteed 18MPa after three days (ie 72 hours after completion of pour) under standard curing conditions. Target slump is 125mm.

Features of Post Tension Mix

- Pumpable due to high workability.
- May be easily placed.
- Makes for easy compaction.
- Is easily finished.
- May be power floated.

Benefits of Post Tension Mix

- Guaranteed early strength performance (see Figure 10).
- Allows for more efficient use of labour as a result of easier placing, compacting and finishing.
- Improved cohesion results in better off-shutter finishes.

Post Tension Mix is available with a target slump of either 100mm or 125mm.

Table 29: Guideline to stripping times.

Strength gain category	Rapid		Enhanced	
	Normal	Cold	Normal	Cold
Slabs with props left in place	4	7	6	10
Beam soffits with props left in place and ribs of a floor construction	7	12	10	17
Slab props including cantilevers	10	17	10	17
Beam props	14	21	14	21

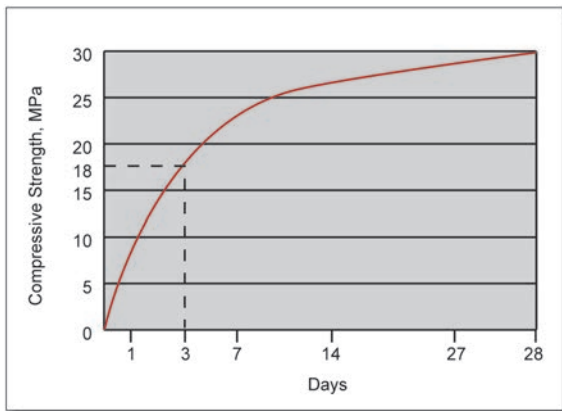


Figure 10: Typical minimum 28-day strength curve for 30MPa Post Tension Mix.

Starmix

Starmix is designed as the lowest-cost fit-for-purpose readymixed concrete solution for non-reinforced residential and non-residential building applications, and is manufactured in accordance with SANS 878 and 2001-CC1 specifications.

Starmix is available to the builder at the specified time and place, in the correct quantities, in amounts from as little as one cubic metre. By simply ordering Starmix and specifying strength requirements, the builder has the solution to all concreting applications.

- Unreinforced foundations (10MPa to 15MPa)
- Reinforced foundations (20MPa to 25MPa)
- Non-wearing driveways (20MPa to 25MPa)
- Suspended slabs (25MPa)

Depending on strength grade, excess or left-over Starmix can safely be used for other residential applications, eg garden pathways, DIY projects, etc.

Special requirements for branded products

The mix designs for the products described above can be modified on request to comply with special requirements, eg low carbon-footprint concrete for environmental requirements, or for products to be placed by pump.

Table 30: Other applications.

Application brand	Excess application-brand concrete can be safely used for the following construction elements:				
	Foundations	Retaining walls	Surfacebeds, non-wearing	Columns	Suspended slabs
Foundation Mix		Vibrate thoroughly			
Retainer Mix					
Surfacebed Mix					If same strength
Column Mix					If same strength
Suspended Slab Mix				If same strength	
Post Tension Mix					



Eco Readymix

AfriSam's industry-first range of low carbon footprint, environmentally responsible readymixed concrete is produced from a specially formulated blend of high-performance cement and carbon-neutral chemically activated mineral components.

All our fit-for-purpose branded products for foundations, retainer walls, surfacebeds, columns and suspended slabs can be designed to incorporate the environmental advantages encapsulated in Eco Readymix. Ultra-high performance Eco Readymix with strengths of above 70MPa can be supplied.

Features of Eco Readymix

- Cost-effective building solutions for both short and long-term compliance with Green Star system requirements.
- Faster setting times to enable shorter building cycles (early strength gain)

Benefits of Eco Readymix.

- All of the environmental advantages of using concrete, with an extremely low carbon footprint.

Specify Eco Readymix for any construction projects where a low carbon footprint is important.

Pumpable concrete

AfriSam's branded products to be placed by pump are specially designed to avoid pipeline blockages during the pump operation on-site, and to minimise segregation and bleeding during and after placing.

The AfriSam pumping division has a range of concrete pumps and provides this service to all Readymix customers. The current pump fleet is shown on www.afrisam.com.

For more detail on pumping concrete on-site, see *Concrete*.

For a more detailed discussion on the environmental and sustainability advantages of using concrete in general, see *Concrete*.

Table 31: Eco Readymix carbon footprint (based on 2011 values).

Concrete strength, MPa	CO ₂ , kg/m ³		Reduction in CO ₂
	Typical concrete	Eco Readymix	
25	227	122	46
30	227	141	49
35	309	152	51

AfriSam Readymix: Speciality products

To incorporate the full benefits of using speciality concretes for specific applications, our Product Technical team offers access to AfriSam experience and knowledge from design stage through laboratory and site trials onwards.

The following are typical examples of concretes designed in response to constantly changing industry and therefore customer requirements.

Hi-spec durability-grade concrete

Designed to comply with today's stringent durability requirements, this concrete has optimal cement contents to meet required durability specifications.

The use of new-generation admixtures allows for a reduction in design water content thereby improving durability and compressive strength characteristics.

Self-compacting concrete

A combination of the following fresh concrete properties defines self-compacting concrete (SCC):

- **High fluidity and deformability.** By limiting the coarse aggregate content, the increased paste content and the addition of superplasticisers provide the necessary flow under self-weight.
- **Resistance to segregation.** Because of a reduction in the water:powder content and where necessary the addition of viscosity-modifying agents, SCC resists segregation during flow and at rest after placing.
- **Ability to pass "obstacles" without blocking.** SCC passes through and around reinforcing bars without requiring additional mechanical vibration.

Trial mixes are recommended in a controlled laboratory environment or on-site to achieve optimal SCC properties. A slump flow or spread diameter (mortar flow cone) of 65cm and V-funnel flow time of 10 to 20 seconds are considered adequate to achieve the above properties.

Flowcrete

A specially modified, highly workable, cohesive readymix concrete designed to meet specific placement and performance requirements for concrete with enhanced fluidity without promoting the segregation normally found in highly fluid mixes, allowing greater flexibility in both design and construction. This concrete is designed for strengths from 15MPa upwards for normal placing or pumping, and can be pumped from the bottom of the formwork upwards.

Once placed, the mix requires minimal compaction and is virtually self-levelling, with no segregation and minimal bleeding. The rate of strength gain and attainment of specified 28-day compressive strengths are the same as for normal concrete. Durability is enhanced due to improved compaction, and very high quality off-shutter surfaces are obtained. Shrinkage characteristics are similar to normal concrete.

Features and benefits

- Faster discharge and ease of placement.
- Less site equipment.
- Flows through narrow spaces and irregular shapes, congested reinforced concrete members, and into areas not accessible to poker or other vibration, eg underground.
- High quality off-shutter finishes.
- Increased free fall limits and deeper lifts without segregation.
- Improved level tolerances of floors and slabs.
- High quality finishes can be achieved.
- Excellent workability.
- No segregation or workability is achieved without compromising cohesion.
- Greater productivity or flexibility and efficient use of labour.

Placement benefits

- Ability to flow laterally up to 15m without mechanical propulsion.
- Lower pumping pressures and longer pipelines allow for less relocation of the pump during pours.
- May be pumped over longer distances, due to its fluidity and ability to flow past obstacles without segregating.
- May be pumped at a faster speed over distance.
- Stable in fresh state, ie no segregation during pour due to external factors.
- Use of retarders allows extended pour periods.



Fibre-reinforced concrete

AfriSam's multiple-component fibre-reinforced concrete with an even distribution of polypropylene and/or steel fibres throughout the mix is designed to comply with specific project specifications provided by the engineer for:

- Floor slabs, including heavy industrial applications.
- Concrete roads.
- Industrial and commercial parking areas.
- Warehouses.
- Channel linings.

In the hardened state, the fibres enhance the properties of concrete:

- Inclusion of polypropylene fibres in the matrix reduces plastic-shrinkage cracking.
- Reduced bleeding.
- Reduced surface permeability.
- Crack control.
- Increased toughness, ductility and impact resistance.

Special attention must be paid to joint detailing and adequate surface finishing.

Poolmix

Poolmix is a semi-dry readymixed concrete specifically designed for handpacking pools. A high cement and low water content allows for high-early strength development. The mix facilitates hand packing and complex shaping, and is very cohesive, allowing the walls and floor to form a monolithic unit.

No specialised equipment is needed, and noise and dust pollution is eliminated. This makes Poolmix ideal for the construction of swimming pools, water features, Koi ponds and drainage channels in domestic and other environments.

Recommended strength for most applications is 30MPa. Poolmix uses a cement that promotes rapid strength gain.

See *Concrete for specific requirements for placing Poolmix*.

Mortars and plasters

AfriSam Readymix supplies readymixed mortars and plasters in the following classes:

- Class I for highly stressed masonry incorporating high-strength structural units in multi-storey buildings and for reinforced masonry.
- Class II for normal load-bearing applications as well as parapets, balustrades, retaining structures and free-standing garden walls, as well as other walls exposed to possible severe dampness.

Benefits of using readymixed mortar or plaster

This service provides the same advantages as readymixed concrete, including:

- Consistent product: the correct mix proportion every time.
- Guaranteed strength.
- Savings on plant and labour costs.
- No cement required on-site: extra ordering, storage, handling, pilferage.
- Reduced wastage: the exact quantity required, in amounts from as little as one cubic metre.

In addition, retarded mortar with up to 36-hour workability can be supplied on request.

Blinding Mix

Blinding Mix is available on request to provide a level surface over compacted subgrade to facilitate further construction activity.



Trenchcrete

Trenchcrete is a highly workable mix for use as an economical alternative to placing and compacting soil or granular material. Trenchcrete is virtually self-compacting and can be used primarily for applications requiring a highly fluid mixture for thin, irregular sections and pipe filling where early strength is not required.

Pumping is possible due to the product's high flowability.

Benefits of Trenchcrete

- Consolidates under its own weight and is self-levelling, needing no internal vibration or surface compaction.
- Can easily flow into voids beneath pipes and around obstructions.
- May be placed in all weather conditions.
- Hardens with very little settlement and does not require overfilling.
- May be pumped into inaccessible or restricted areas.

Hydrafil

Hydrafil is a workable, highly stable backfill material used primarily for regular trenches and larger voids where early trafficking is essential.

Benefits of Hydrafil

- Ensures that the excavation is efficiently reinstated with stable material.
- Hydrafil sets and hardens in all weather conditions.

AfriSam Readymix delivers loads of Trenchcrete and Hydrafil as small as 1m³ to suit applications such as narrow trenches across roads and pavements.

Problems associated with conventional backfilling methods

- Trenches need to be dug wider to accommodate compaction equipment.
- The original structured layers of road are removed and replaced. No consideration is given to moisture content. The structural integrity of the road base is not maintained.
- Often it is not possible to compact each new fill layer fully because of space and time constraints.
- The density of the refilled area is not the same as on either side of the trench. Vehicles driving over the surface compact the filled area to a level below the road surface.
- The road layers on either side of the trench are not adequately supported by conventional backfilling methods.

Additional products on request include:

- **Piling Mix** designed for 25MPa or 30MPa, with 175mm slump.
- **Waterproofing Mix** designed for the strength specified by the engineer and 125mm slump.

Applicable specifications

SANS 878:2012: Readymixed Concrete

SANS 2001-CC1: 2012 Construction works Part CC1: Concrete works (structural)