

Geoff Ball Dip Tech Eng. BE MIE (Aust) CP Eng RPEQ NER

# **CONSTRUCTION MANAGEMENT PLAN**

# 1127 Barrenjoey Road PALM BEACH

**OWNER:** Dr. John & Mrs Ros Kennedy

**REPORT PREPARED BY GEOFFREY BALL** 

VISION-STRUCTURES (NSW) PTY LTD Reference: 5460R001.HB

Date: 27 November 2020

Commissioned by: Dr. John & Mrs Ros Kennedy



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# TABLE OF CONTENTS

	Page No.				
1.0	Executive Summary 3				
2.0	Introduction4				
3.0	Existing Site Conditions43.1Site Location3.2Location Plan3.3Existing Dwelling3.4Ground Conditions3.5Vegetation Protection				
4.0	Proposed Development				
5.0	Substructure Construction Conditions				
6.0	Erosion and Sedimentation Control				
7.0	Substructure Construction Sequence7				
8.0	Mainmark Permeation Injection9				
9.0	Superstructure Construction9				
10.0	Construction Programming and Resourcing9				
11.0	Site Access and Traffic Management9				
12.0	Conclusion10				
13.0	Limitations10				

## Attachments: -

Appendix A: Tree Location Plan
Appendix B: Architectural Drawings
Appendix C: Erosion and Sedimentation Control Plan
Appendix D: Substructure Excavation and Construction Drawings
Appendix E: Mainmark Material Data Specifications

### 1.0 Executive Summary

This construction specification describes the methodology to be adopted for the residential re-development of the site in a safe and sustainable manner by preserving the environmental features of the area generally, and by maintaining stability of the site and the property boundaries during the excavations and construction of the building.

The site soils and subsurface conditions are the subject of a Geotechnical Report.

A significant tree is located on the south side adjoining property which is the subject of an Arboreal Report.

The site has frontage to the Pittwater Estuary and is the subject of a Coastal Engineering and Estuarine Risk Management Report.

The control of stormwater and in particular the overland stormwater discharge from the property is the subject of a Flood Mitigation Works Plan and Stormwater Management Plan.

The treatment of the landscaping and integration of the landscaping with the final architectural concept is the subject of Landscape Design Plans.

A two storey dwelling house of approximately 70 years of age currently exists on the property. The existing building incorporates a half level habitable basement which covers approximately half of the building footprint on the Pittwater frontage.

The proposed development includes the total demolition of all of the existing buildings on the site.

Tregale & Associates – Architects has prepared the Architectural Design Concept for the proposed new works.

A split two storey dwelling house with a split level sub-floor basement is proposed.

The design retains the two-storey half level habitable basement concept of the existing dwelling on the Pittwater frontage and introduces a new full basement level on the Barrenjoey Road frontage.

Consequently, the construction will include excavation to a depth of 3.5m below the existing ground surface for approximately half of the building footprint on the Barrenjoey Road frontage.

Specialised construction procedure will be adopted to manage the water table which is located approximately 1.5m below the existing ground surface.

The construction process will be defined and systematic to ensure the stability of the site is maintained during the excavation and construction of the basement and ground floor slabs. In order to provide respite for the adjoining property owners during construction, two breaks have been identified where the Builder can safely introduce a construction pause. These are identified in 7.0 Substructure Construction Sequence.

Dust and sand suppression will be maintained continually throughout the build period to the completion of landscaping.

This construction specification considers the requirements of the Pittwater 21 Development Control Plan, B8 Site Works Management which are: -

- B8.1 Construction and Demolition Excavation and Landfill
- B8.2 Construction and Demolition Erosion and Sediment Management
- B8.3 Construction and Demolition Waste Minimisation
- B8.4 Construction and Demolition Site Fencing and Security
- B8.5 Construction and Demolition Works in the Public Doman
- B8.6 Construction and Demolition Traffic Management Plan

### 2.0 Introduction

Vision Structures (NSW) PTY LTD has been engaged by Dr. John & Mrs Ros Kennedy to prepare a Construction Management Plan which is required by Northern Beaches Council to form part of a Development Application for the residential development at 1127 Barrenjoey Road Palm Beach.

The proposed development comprises the demolition of an existing dwelling and the building of a new dwelling.

For the purpose of this report construction of the new building is described as: -

- the substructure the part of the building which will be below the ground surface, and
- the superstructure the part of the building which will be above the ground surface.

The primary purpose for this Report is to outline a construction strategy to facilitate the safe bulk excavation of the site and construction of the substructure. The superstructure is referenced in this Report, however it does not adversely impact upon site stability issues and right of support of adjoining properties along the boundary alignments.

### 3.0 Existing Site Conditions

### 3.1 Site Location

The subject site is located within a residential area of Palm Beach NSW. The property has street frontage to Barrenjoey Road and the rear boundary of the property provides direct access to Snapperman Beach and Pittwater Estuary. The properties on both sides of the subject support existing residential dwellings. The ground contours fall approximately 800mm from the Barrenjoey Road frontage to the rear boundary with no significant cross fall between the side boundaries.

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### 3.2 Location Plan



Figure 1: Location plan of 1127 Barrenjoey Road, Palm Beach

### 3.3 Existing Dwelling

The subject property supports a centrally located two storey dwelling with a basement subfloor at the rear of the dwelling. The existing building is weatherboard clad and rendered masonry construction. The main structure is supported on a concrete strip footing and a low brickwork fender wall forming the subfloor of the dwelling. The basement is a slab on ground with masonry retaining walls around the perimeter of the building edge.

### 3.4 Ground Conditions

A Geotechnical and Acid Sulfate Investigation Report, prepared by Geo-Logix Pty Ltd outlines the geology and subsurface conditions as follows: -

- fill encountered to depths of 0.4 to 0.8 meters below ground (mbg),
- soils underlying fill comprise loose, course grained sand to depths of 3.7 to 5.1mbg,
- ground underlying sand comprise weathered sandstone/shale to depths of 4.4 to 8.1mbg,
- drilling refusal was encountered at depths of 5.3 to 8.1mbg, and
- ground water was encountered at 1.5mbg in all borings.

### 3.5 Vegetation Protection

An arboreal investigation was undertaken by Hugh Millington to assess the impact of the proposed development upon the surrounding vegetation. A Norfolk Island Pine located on the southern adjacent property was identified as a significant tree to be preserved. Root mapping revealed that the tree has four significant surface roots which extend onto the subject property and must be retained for the preservation of the tree. The Arborist identified that the roots extend radially away from the tree towards the low brickwork fender wall of the existing dwelling. The roots then realign along the wall for a short distance. Refer to Appendix A, TREE 3, for the position of the Norfolk Island Pine.

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### 4.0 Proposed Development

The proposed development is presented on Architectural plans prepared by Tregale & Associates Pty Ltd, dated 26 November 2020 (reference: DA-01 to DA-19) comprising a two-storey split level dwelling. Refer to Appendix B for architectural drawings.

The superstructure comprises the top two split-level floors and the substructure comprises a split-level basement. One side wall of the proposed dwelling is nominally located 1m away from the southern boundary and the other side wall of the proposed dwelling has nominated offsets of 1.5m and 2.5m from the north boundary.

An unobstructed stormwater overland flow path is to be provided within the 1m corridor along the southern side property boundary.

### 5.0 Substructure Construction Conditions

Consideration has been given to the following site parameters when formulating the construction methodology of the substructure: -

- high water table may require constant dewatering of the site during construction stages,
- dewatering of the subject site must not result in the lowering of the water table on neighbouring properties. Lowering of water table on the neighbouring properties may cause subsidence of adjacent structures,
- hydrostatic pressure uplift of the basement,
- maintaining stability of the site during excavations in saturated sands,
- permanent structure must maintain 1m minimum clearance from side boundary to maintain architectural dimensions,
- protection of Norfolk Island Pine roots in the vicinity of proposed basement construction,
- a permanent stormwater overland flow path must be provided along the 1m corridor between the dwelling and the south side boundary, and
- protection of the substructure building materials from environmental elements and decay.

### 6.0 Erosion and Sedimentation Control

Erosion and Sedimentation Controls Specification prepared by Vision Structures (NSW) Pty Ltd, is shown on Drawings 5460\_E01A to 5460\_E02A, dated 27 November 2020. Refer to Appendix C.

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## 7.0 Substructure Construction Sequence

This Construction Management Plan specifies the proposed methodology for the construction of the substructure, making allowance for the site considerations identified above. Refer to Appendix D for Drawings 5460\_T01A to 5460\_T56A prepared by Vision Structures (NSW) PTY LTD, dated 25 November 2020, which are to be read in conjunction with the basement construction sequence as follows: -

- 7.1 Partially clear site of existing structures. Retain a section of the existing subfloor and an 8m long section of existing subfloor wall and footing adjacent to the Norfolk Island Pine which will serve as a barrier to protect the tree roots. Refer to Drawings 5460\_T01A to 5460\_T04A.
- 7.2 Locally inject the ground around the existing sunken courtyard/subfloor retaining wall using permeation injection to stabilise the loose sands prior to demolition of the ret wall. Clear site of remaining existing structures with the exception of an 8m long section of existing subfloor wall and footing adjacent to the Norfolk Island Pine which will serve as a barrier to protect the tree roots. Refer to Drawings 5460\_T05A to 5460\_T08A.
- 7.3 Bulk excavate the centre of the rear section for the substructure (Section 1) to RL 1.28 and batter sides at 1:1.7. Refer to Drawings 5460\_T09A to 5460\_T12A.
- 7.4 Install geotextile blankets to the exposed batters for erosion control and dust suppression. Refer to Drawings 5460\_T09A to 5460\_T12A.
- 7.5 Inject the ground using permeation grout injection to stabilise the loose sands and colloidal silica permeation injection in areas where the water table is encountered. Refer to Drawings 5460\_T13A to 5460\_T16A.
- 7.6 Drill piers and construct the steel frames as cantilever columns in Section 1. Backfill holes using clean loose sand after installation of steel frames. Refer to Drawings 5460\_T17A to 5460\_T20A.
- 7.7 Excavate Section 1 to RL 0.65, while progressively and simultaneously installing segmental precast concrete wales into the steel frames to construct the side wall retaining structure of the new building. Refer to Drawings 5460\_T21A to 5460\_T24A.
- 7.8 Waterproof inside face of the concrete wales/steel frame retaining walls. Refer to Drawings 5460\_T25A to 5460\_T28A.
- 7.9 Construct ground floor slab of Section 1 including wall starter bars. Refer to Drawings 5460\_T25A to 5460\_T28A.
- 7.10 Form up and pour a 100mm thick R.C wall slab to inside face of the retaining wall structure. Refer to Drawings 5460\_T25A to 5460\_T28A.
- 7.11 Waterproof inside face of 100mm thick wall slab to the level of the underside of upper ground floor slab. Refer to Drawings 5460\_T25A to 5460\_T28A.
- 7.12 Form up and pour the upper ground floor slab for Section 1 at RL 3.85. Refer to Drawings 5460\_T25A to 5460\_T28A.
- 7.13 Construction break for respite of adjoining properties.

- 7.14 Bulk excavate the centre of the front section for the substructure (Section 2) to RL 1.28 and batter sides at 1:1.7. Refer to Drawings 5460\_T29A to 5460\_T32A.
- 7.15 Install geotextile blankets to the exposed batters for erosion control and dust suppression. Refer to Drawings 5460\_T29A to 5460\_T32A.
- 7.16 Inject the ground of Section 2 using permeation grout injection to stabilise the loose sands and colloidal silica permeation injection in areas where the water table is encountered. Refer to Drawings 5460\_T33A to 5460\_T36A.
- 7.17 Drill piers and construct the steel frames with temporary steel ties forming a series of portal frames throughout Section 2. Backfill holes using clean loose sand after installation of steel frames. Refer to Drawings 5460\_T37A to 5460\_T40A.
- 7.18 Excavate Section 2 to RL -0.90, while progressively and simultaneously installing segmental precast concrete wales into the steel frames to construct the side wall retaining structure of the new building. Refer to Drawings 5460\_T41A to 5460\_T44A.
- 7.19 Waterproof inside face of the concrete wales/steel frame retaining walls. Refer to Drawings 5460\_T45A to 5460\_T48A.
- 7.20 Construct ground floor slab of Section 2, including wall starter bars and "pockets" around centre columns to allow the upper section of the centre column to be removed at a later stage. Refer to Drawings 5460\_T45A to 5460\_T48A.
- 7.21 Where habitable areas are located form up and pour a 100mm thick R.C wall slab to inside face of the retaining structure of Section 2. Where non-habitable areas are located form up and pour a 140mm thick R.C wall slab to inside face of the retaining structure of Section 2. Refer to Drawings 5460\_T45A to 5460\_T48A.
- 7.22 Waterproof inside face of 100mm and 140mm thick wall slabs to the level of the underside of upper ground floor slabs. Refer to Drawings 5460\_T45A to 5460\_T48A.
- 7.23 Form up and pour the upper ground floor slabs for Section 2 at RL 2.85. Refer to Drawings 5460\_T45A to 5460\_T48A.
- 7.24 Construct the car stacker walls in a similar procedure to the underside of the first floor. Refer to Drawings 5460\_T45A to 5460\_T48A.
- 7.25 Form up and pour the section of the first floor slab over the car stacker. Refer to Drawings 5460\_T45A to 5460\_T48A.
- 7.26 Remove temporary elements of portal frame structure. Refer to Drawings 5460\_T49A to 5460\_T52A.
- 7.27 Form up and pour the walls of the swimming pool which are in contact with existing sub-floor wall and footing which was retained. Refer to Drawings 5460\_T53A to 5460\_T56A.
- 7.28 Construction break for respite of adjoining properties.
- 7.29 Construct superstructure. Refer to Drawings 5460\_T53A to 5460\_T56A

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### 8.0 Mainmark Permeation Injection

As described by Mainmark Ground Engineering Pty Ltd, the proposed permeation injection specified in section 7.0 of this report is a specialised process that can be used for the agglomeration and solidification of unstable sands and other non-cohesive soils at depths as great as 60 metres.

The process works by filling the spaces between the soil, creating a solidified mass that can support increased load. Permeation grouting substantially decreases the permeability of sandy soil by transforming the soil to be almost watertight. Permeation grouting is environmentally inert, and the construction equipment is compact and non-invasive.

It is expected that the permeation grouting will allow dewatering of the excavation without causing the displacement of the water table on neighbouring properties due to the soils reduced permeability after injection.

Vision Structures (NSW) and Mainmark have carried out a collaborative assessment to develop a construction methodology for this project and propose the use of two product injection systems: -

- Cementitious Grout Permeation Injection to be used above the water table.
- Colloidal Silicate Permeation Injection to be used below the water table

Refer to Appendix E for injection material data specifications.

It is also proposed to carry out a site prototype excavation and permeation injection trial to predetermine the rate of injection required to achieve the permeation state to stabilise the site sands above and below the water table.

### 9.0 Superstructure Construction

Vision Structures (NSW) has also carried out a high-level preliminary structural assessment of the superstructure to integrate the construction methodology with the substructure proposal. The design of the superstructure is expected to involve relatively conventional structural analysis principles to comply with the National Construction Code and Australian Standards and will be resolved in detail at Construction Certificate stage.

### **10.0 Construction Programming and Resourcing**

The construction programming and resource management will be finalised following direct consultation and collaboration with the Building Contractor.

### **11.0 Site Access and Traffic Management**

A site access and Traffic Management Plan will be prepared by an accredited Consultant in collaboration with the Builder and the Consultant Design Team at the Construction Certificate stage.

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### 12.0 Conclusion

This Construction Management Plan has been prepared for submission to Northern Beaches Council to form part of the documentation for Development Application for a new dwelling in accordance with documentation prepared by Tregale & Associates – Architects.

The architectural design and the site conditions present at 1127 Barrenjoey Road, Palm Beach require considered management during the construction stage. Vision Structures (NSW) Pty Ltd has formed the view that the proposed development can be safely constructed by implementing this Construction Management Plan.

### **13.0 Limitations**

This Construction Management Plan has been formulated on the Architectural Plans and other documentation and information provided to Vision Structures (NSW) Pty Ltd at the date of this Report. Any changes by a third party to this Construction Management Plan must be reviewed and endorsed in writing by Vision Structures (NSW) Pty Ltd before implementation of the Plan and commencement of construction. Vision Structures (NSW) Pty Ltd cannot be held liable for any damages or costs resulting from unauthorised variation to the Plan.

### Yours faithfully, VISION STRUCTURES (NSW) PTY LTD

yeoffrey Ball

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# **APPENDIX A**



**APPENDIX B** 















# DA SUBMISSION DRAWING















# PROPOSED BEACHSCAPE ELEVATION

SCALE - APPROX 1 : 200 @A3

1129, 1127 & 1125 FROM SURVEY 1131, 1123& 1121 FROM VISUAL OBSERVATION

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DRAWING **ELEVATION** (FAC

PALM BEACH NSW 2108

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## DRAWING **ELEVATION 3** (FACING BA

PALM BEACH NSW 2108



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### SECTION / ELEVATION 5 - EAST ELEVATION (FACING BEACH PAVILION)

SCALE - APPROX 1 : 100 @A3

REFER TO BUILDING COLOURS & MATERIALS BOARD DA-20 FOR FURTHER DETAIL OF EXTERNAL MATERIALS AND FINISHES.

REFER DA-16 TO DA-19 INCLUSIVE FOR 3D SKETCH IMAGE MASSING MODEL VIEWS

REFER TO DA-21 & DA-22 FOR WINDOW. GLAZED DOOR AND SKYLIGHT SCHEDULE AND BASIX COMMITMENTS

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## SECTION / ELEVATION 6 - WEST ELEVATION (FACING FRONT PAVILION)

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MASSING MODEL VIEW 1 FROM BARRENJOEY ROAD LOOKING NORTH EAST

SCALE - NTS (NB - EXISTING TREES & VEGETATION NOT SHOW FOR CLARITY)



# MASSING MODEL VIEW 2 FROM BARRENJOEY ROAD LOOKING SOUTH EAST

(NB - EXISTING TREES & VEGETATION NOT SHOW FOR CLARITY)

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©Copyright These drawings and designs and the copyright thereof are the property of Tregale & Associates P/L and must not be used retained or copied without the written permission of Tregale & Associates P/L.				Tregale & Associates Pty Ltd. P.O.Box 603, St. Ives, NSW 2075 T : (02) 9983 1712 M : 0418 791 920 E : matthewtregale@bigpond.com	PALM BEACH NSW 2108	DRAWING : MASSING MO (FROM BARF
ACN 135 339 954				Reg. Architect – Matthew Tregale NSW 7415		-

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# MASSING MODEL VIEW 5 - FROM BEACH SIDE

SCALE - NTS

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SURVEY DATA -EXISTING SITE DATA, CONTEXT AND LEVELS SHOWN ON THESE DRAWINGS ARE BASED ON SURVEY PREPARED BY DETAILED SURVEYS CONSULTING SURVEYORS DATED 28/02/20. AS THESE DRAWINGS HAVE BEEN PREPARED BASED ON THE WORK OF OTHERS, REFERENCE SHOULD BE MADE BACK TO ORIGINAL SURVEY FOR VERIFICATION OF ALL LEVELS AND SITE DETAIL.

### Date: 03/04/20 DRAWING SERIES: CHED DWELLING ROAD PALM BEACH NSW 2108 PROPOSAL IN DP 313630) SERIES DRAWING NO .: REV. MODEL VIEW 5 DA-19 BEACH SIDE

# **APPENDIX C**



# SILT FENCE CONSTRUCTION NOTES -

- 1. CONSTRUCT SILT FENCE PARALLEL TO THE CONTOURS OF THE SITE, OR AS CLOSE AS POSSIBLE
- 2. DRIVE 1.5m LONG STAR PICKETS INTO THE GROUND AT 3m MAX CTS
- 3. DIG A 150mm x 100mm TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED
- 4. BACKFILL TRENCH OVER THE BASE OF THE FABRIC
- 5. FIX SELF SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POST WITH WIRE TIES OR AS RECOMMENDED BY THE GEOTEXTILE MANUFACTURER
- 6. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP



# **CONSTRUCTION NOTES -**

- 1. ERECT EROSION AND SEDIMENTATION CONTROL DEVICES (E&S DEVICES) PRIOR TO START OF CONSTRUCTION.
- 2. E&S DEVICES ARE TO BE INSPECTED REGULARLY. ENSURE TO CLEAN E&S DEVICES OF SEDIMENT BUILDUP WHERE NECESSARY.
- 3. E&S DEVICES ARE TO BE CLEANED IF THE BUILDER IS EXPECTING TO BE OFFSITE FOR A DURATION GREATER THAN 1 DAY OR PRIOR TO STORMS.
- 4. IF AN E&S DEVICE IS REQUIRED TO BE REMOVED TEMPORARILY, ENSURE THAT RUNOFF OF SOIL OR OTHER MATERIALS DO NOT ENTER THE UNPROTECTED STORMWATER SYSTEM. ENSURE TO REINSTATE E&S DEVICE AS SOON AS POSSIBLE OR AT THE END OF THE DAY.
- 5. E&S DEVICES TO REMAIN IN PLACE UNTIL THE END OF THE CONSTRUCTION WORKS.



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# **APPENDIX D**








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# **APPENDIX E**

# **GeoTek CS**

# normet

#### CONSTRUCTION CHEMICALS

TECHNICAL DATA SHEET

Colloidal Silica for Soil and Rock Injection

### DESCRIPTION

GeoTek CS is an environmentally friendly, highly stable, single component, ultra-low viscosity colloidal silica primarily used for injection into sands, silts, and fine joints and fissures in rock strata. GeoTek CS is available in three grades with varying SiO2 content.

By adjusting the accelerator dosage, GeoTek CS can be used where very slow migration and penetration capabilities are required. The chemical properties and hydrophilic nature of GeoTek CS, ensures excellent adhesion to wet / saturated surfaces.

#### **KEY BENEFITS**

- > Single component, low viscosity
- > Good adhesion to wet surfaces
- > Solvent-free and environment friendly
- > Adjustable gel time
- > Standard grouting equipment can be used
- > Can clean with water

## **TYPICAL APPLICATIONS**

- > Pre-injection of rock, sand and silt strata
- > Consolidation of soil
- > Passive ground stabilisation

## **TECHNICAL DATA**

GeoTek CS						
	GeoTek GeoTek GeoTek GeoTek					
	CS15	CS30	CS40	Accelerator		
Form	Liquid	Liquid	Liquid	Liquid		
Density (g/cm³)	1.1	1.2	1.3	1.07		
Viscosity (cP)	13	5	16	2		
SiO2 (%)	15	30	40	-		
pH Value	9 - 10	9 - 10	9 - 10	6 - 7		
All at 25°C						

All technical data state herein is based on tests carried out under laboratory conditions.

### **APPLICATION GUIDELINES**

Pre-determine the required gel time of GeoTek CS.

Results based on GeoTek CS30 and ambient temperature of 20°C.

Accelerator Volume	10%	15%	20%
Gel time achieved	55 min	25 min	4 - 5 min

Add the required dosage of accelerator to the GeoTek CS whilst agitating and ensure it is well mixed prior to commencement of injection.

Avoid over mixing (2 minutes is sufficient). Pump the GeoTek CS uniformly through an injection packer using any kind of grout pump, such as a mono type, diaphragm type or piston type pump.

Note: A series of Grout Packers are available for selection. Contact your local Normet representative for technical installation advice.

#### PACKAGING

GeoTek CS and GeoTek CS Accelerator are available in 20 litre pails, 200 litre drums and 1000 litre IBC tanks. Packaging size may vary subject to local regulations and requirements.

#### STORAGE

GeoTek CS should be stored at room temperature above 5°C, kept dry and out of direct sunlight. If these conditions are maintained and the product packaging is unopened, then a shelf life of one year can be expected.

#### **HEALTH & SAFETY**

GeoTek CS should only be used as directed. We always recommend that the Safety Data Sheet (SDS) is carefully read prior to application of the material. Our recommendations for protective equipment should be strictly adhered to for your personal protection. The Safety Data Sheet is available upon request from your local Normet representative.

Whilst any information and/or specification contained herein is to the best of our knowledge, true and accurate, we always recommend that a trial be carried out to confirm suitability of the product. Nearenty is given or implied in connection with any recommendations or suggestions made by us or our representatives, agents or distributors. The information in this data sheet is effective from the date shown and supersedes all previous data. Please check with your local Normet office to confirm that this is current issue.



# **ULTRAFINE CEMENT**

SUPERFINE is a blast furnace slag based ultrafine cementitious grout material with a  $D_{95}$  particle size of 10 micron and a  $D_{50}$  of 3 micron. It is able to permeate very small openings such as pores and microscopic rock fissures, and improve strength and reduce permeability.

#### PROPERTIES

Specific Gravity		$3.00  \text{g/cm}^3$
	•	0.00 g/011
Particle Size D <sub>95</sub>	:	8 micron
Particle Size D <sub>50</sub>	:	3 micron
nitial Set Time	:	8 - 16hours
Final Set Time	:	10 - 22 hours
Bleeding in 2 hrs	:	1 - 3%
UCS (σ3)	:	25 N/mm²
UCS (σ7)	:	34 N/mm²
UCS (σ28)	:	60 N/mm²

\*UCS measured in accordance with JIS-R5201

## APPLICATIONS

Pre- and post-excavation grouting Water cut-off grouting Dam grout curtain Soil consolidation Stabilization of structure foundation

# 100

**PARTICLE SIZE DISTRIBUTION** 



Test Method Measured by SediGraph III5120

# TRACK RECORDS

Seikan Subsea Tunnel (Hokkaido, Japan) Pirika Dam (Hokkaido, Japan) Amtrak Bridge pier (North Carolina, USA) Arrowhead Tunnels (California, USA) Lake Mead (Nevada, USA) Perth Rail (Perth, Australia)

# ADVANTAGES

Excellent Permeability Non-Toxic Cementitious Grout Long Term Durability High Strength

# PACKAGE

20kg (44lb) NET P.E. bag 1MT (2204lb) NET Jumbo bag

## FUNCTION

Rock fissure grouted with SUPERFINE



# CERTIFICATION

NSF/ANSI 61 - NSF International



# NIPPON STEEL CEMENT Co., LTD.

# TamCrete MFC / SFC



#### CONSTRUCTION CHEMICALS

TECHNICAL DATA SHEET

**Injection Cement** 

# DESCRIPTION



TamCrete MFC and TamCrete SFC are Microfine Portland cements for rock injection. The superfine particle size, together with the addition of TamCem Superplasticisers, provides superior penetration into tight joints, fissures, thus providing a water-tight grouted rock mass.

TamCrete MFC and SFC are ground from pure Portland cement clinker to achieve a Blaine surface value of > 625  $m^2/kg$ .

All grades of our TamCrete MFC and SFC achieve initial and final set faster than OPC, which reduces the waiting time to a minimum for the next activity to start. This increases productivity in a tunnel grouting operation. The initial set time can be adjusted depending on the level of TamCem superplasticiser or TamCem HCA added to the mix.

#### **KEY BENEFITS**

- > Standard cement injection equipment can be used
- > Superior penetration into rock fissures
- > Fast initial gel and setting
- > Higher strengths achievable than with chemical grouts
- Greater penetration imparts greater water tightness
- Better working environment and no hazardous components
- > Durable
- > Economical solution

## **TYPICAL APPLICATIONS**

Rockmass grouting for tunnels, caverns, mines, etc., used for pre and post excavation injection. Ground water sealing and ground stabilisation.

- Soil Injection: Ground stabilisation, ground water sealing
- > Concrete crack injection
- Consolidation of weak and fractured rock
- > Sealing of water channel

#### **TECHNICAL DATA**

	Particle Size (approx.)						
Grain Size um	MFC	MFC	MFC	SEC			
	Rapid	Fast	Standard	010			
<40	100 %	100 %	100%	99			
<30	100 %	100 %	99%	97			
<20	99 %	99 %	95%	90			
<15	95 %	95 %	85%	75			
<10	83 %	83 %	70%	60			
<5	56 %	56 %	45%	35			
<2	30 %	30 %	25%	15			
	MFC	MFC	MFC	SEC			
	Rapid	Fast	Standard				
Grain Size d₅₀ (µm)	< 5	< 5	< 7.5	< 10			
Grain Size d <sub>95</sub> (µm)	< 16	< 16	< 20	< 25			
Run out time after mixing (sec/DM <sub>3</sub> ) (Marsh Cone)	31 - 35	31 - 35	31 - 35	31 - 35			
Initial Gel (min)	30 - 45	70 - 110	120 - 180	150 - 250			
Initial Set (50 kPa shear strength) (min)	45 - 75	90 - 150	180 - 300	200 - 350			
Bleeding Maximum	< 2%	< 2%	< 5%	< 5 %			
Mud Balance	1.45 -	1.45 -	1.45 -	1.45 -			
(kg/l)	1.50	1.50	1.50	1.50			
CS, 1 day (MPa)	~5	~5	~4	~ 3			
CS, 2 days (MPa)	~10	~10	~7	~ 5			
CS, 28 days (MPa)	~15	~15	~15	~ 12			

All technical data stated herein is based on tests carried out under laboratory conditions. Slurry was 1:1 W/C ratio incorporating TamCem admixture and prepared with a high colloidal mixer (2 litre batches).

Whilst any information and/or specification contained herein is to the best of our knowledge, true and accurate, we always recommend that a trial be carried out to confirm suitability of the product. Please note regional climatic conditions may cause a variation in the performance of the product. No warranty is given or implied in connection with any recommendations or suggestions made by us or our representatives, agents or distributors. The information in this data sheet is effective from the date shown and supersedes all previous data. Please check with your local Normet office to confirm that this is current issue.

# TamCrete MFC / SFC

Injection Cement

All mix designs incorporated TamCem admixtures. For further information on specific MFC and SFC versions and specific mix design, please contact your local Normet representative.

#### **APPLICATION GUIDELINES**

#### Mixing

Water/Cement ratio (by weight) shall normally be between 0.8 - 1.2.

- > Fill the mixer with water and superplasticizer.
- > Add Cement. Mix for 2 3 minutes.
- > Add HCA. Mix for 1 minute (if required).
- > Transfer to agitator tank ready for injection.

For efficient mixing and dispersion of our TamCrete MFC and SFC, a high speed colloidal mixer is recommended. Minimum stirring rate shall be 1500 rpm. Note: Mixing time should be kept to a maximum of 4 minutes.

#### Pot Life

The mix shall be kept under constant agitation prior to injection. Do not keep grout in agitator for longer than 30 minutes, unless the open time has been extended accordingly with the use of TamCem HCA hydration control admixture.

#### Injection

High-pressure piston pumps are normally used to pump the suspension into the rock. The grout should be injected within 20 - 60 minutes (depending on grade) after mixing to ensure that it keeps penetrating into the fissures. Longer open times can be achieved with TamCem HCA.

#### PACKAGING

TamCrete MFC and SFC products are supplied in 20 kg bags or 1000kg bulker bags. Packaging size may vary subject to local regulations and requirements.

norme

TECHNICAL DATA SHEET

CONSTRUCTION CHEMICALS

#### **STORAGE**

TamCrete MFC and SFC products should be stored at room temperature (min 10°C and max 45°C), kept dry and out of direct sunlight. If these conditions are maintained and the product packaging is unopened, then a shelf life of six months can be expected.

#### **HEALTH & SAFETY**

TamCrete MFC and SFC should only be used as directed. We always recommend that the Safety data sheet (SDS) is carefully read prior to application of the material. Our recommendations for protective equipment should be strictly adhered to for your personal protection. The Safety data sheet is available upon request from your local Normet representative.

Whilst any information and/or specification contained herein is to the best of our knowledge, true and accurate, we always recommend that a trial be carried out to confirm suitability of the product. Nease note regional climatic conditions may cause a variation in the performance of the product. No warranty is given or implied in connection with any recommendations or suggestions made by us or our representatives, agents or distributors. The information in this data sheet is effective from the date shown and supersedes all previous data. Please check with your local Normet office to confirm that this is current issue.