

STOPDIGGING! THE GROUND SCREW FOR SOLID FOUNDATIONS

STOPDIGGING! GROUND SCREW SYSTEM

PURPOSE

The STOPDIGGING! ground screw system is supplied for use as a foundation system to support tensile, lateral and compressive loads. It is also suitable for all buildings and for use as a foundation system for hoardings, fencing, posts for signs or street lighting, uplift anchors for scaffold, where used with shrink-wrap envelope enclosures and ground mounted, solar PV panel racking systems.

EXPLANATION

The grounds screws are made of steel that complies with ISO630 Fe360A – High Tensile Steel for Structural Purposes and are manufactured with a hot-dipped galvanised coating that achieves an average of 125 μ m zinc cover. They are classified as category HDG900 (900 g/m²).

Ground screw are supplied in various screw diameters with extensions, adapters, and connection brackets. Specification of diameter, adapter and connection brackets are determined by soil conditions and fixing requirements. The ground screws are reusable and recyclable.

The ground screws are mechanically installed into soil to a depth at which the required resistance is achieved. It is suitable for use most locations, including expansive soil types and locations where frost heave could be an issue.

Ground screws can be installed without disturbance or damage to the ground, and concrete is not required.



For further assistance
please contact:

09 393 5528



- info@stopdigging.co.nz
- www.stopdigging.co.nz

SCOPE AND LIMITATIONS OF USE

Scope	Limitations
Location	
In all soil and ground conditions.	 Specific engineering is required where: soil conditions are: organic topsoil peat soil soft, very soft, or highly weathered clay geothermally affected soils, or site is subject to fill material, except where a certificate of suitability has been issued under NZS 4431:1989. Where soil type is likely to have pH level < 4 or soil resistivity < 1000 ohms-cm, the durability of the ground screws must be specifically designed.
	Specific engineering is required where installed on sloping ground, and maximum above ground height of the ground screw exceeds 900 mm.
In all wind zones as defined in NZS 3604: 2011 or any design wind ULS.	
In all earthquake zones as defined in NZS 3604:2011.	NZS 3604:2011 bracing demand must be met.
In all exposure zones in accordance with NZS 3604:2011. D. Shelter to protect.	Where used in exposure zone D, the above ground portion of the ground screws must be protected (coating or enclosed) or regularly washed down so they are not subject to prolonged exposure to airborne salts or rain wetting.
Building	
All buildings.	 Subject to specific design where Roof mass exceeds 20kg/m² Wall cladding mass exceeds 30kg/m² Floor load exceeds 1.5 kPa Deck load at ground level exceeds 2.0 kPa Snow load exceeds 1 KPa

USEFUL INFORMATION

For information on the design, installation and maintenance of the STOPDIGGING! ground screw system and for our warranty refer to **www.stopdigging.co.nz**.

OTHER CERTIFICATIONS AND APPROVALS HELD BY THE MANUFACTURER

- > a3cert. [10/03/2020] ISO 9001:2015. Certificate number 20152. Issued to Sluta Gräv AB.
- Shandong Zhong Xing Electric Tools Co. Ltd. [07/04/2021] EN 55014-1:2006/A2:2011, EN 55014-2:1997/A2:2008, EN60335-1:2012.

Certificate of Compliance. Issued by ISET S.R.L.

Qingdao Wangbaoqiang Industry Co. Ltd. [08/07/2015] Factory Production Control Certificate. Issued by UDEM International Certification.

CONDITIONS OF USE

Following installation, a completed record of installation must be provided.

PERFORMANCE CLAIMS

If designed, installed and maintained in accordance with all STOPDIGGING! requirements, the STOPDIGGING! ground screw system will comply with or contribute to compliance with the following performance claims:

N.Z. Building	BASIS OF COMPLIANCE ¹		
Code clauses	Compliance statement	Demonstrated by	
B1 Structure B1.3.1 B1.3.2 B1.3.3 (a), (b), (d), (f), (g), (h), (m) and (q) B1.3.4 (a, b, c, d, e)	STOPDIGGING! ground screws ALTERNATIVE SOLUTION Soil characteristics ACCEPTABLE SOLUTION Foundation system ALTERNATIVE SOLUTION	 > Tension and compressive testing for load bearing capacity [WSP Opus, 23/07/2018].Manufactured to meet ISO 630 Fe360A. > Compliance with B1/AS1 for soil characteristics (established in accordance with section 3 of NZS 3604:2011). > Engineering specification and installation requirements [Cook Costello, 07/08/2020] or as a substitute for NZS 3604:2011 timber pile foundations. 	
B2 Durability B2.3.1 (a) B2.3.2 (a)	VERIFICATION METHOD B2/VM1	Coating is hot-dipped galvanised and achieves an average of 125 µm zinc cover. Service life assessed in accordance with AS/NZS 2041.1:2011 for metal loss rates based on soil pH levels and soil resistivity ranges [Cook Costello, 07/08/2020].	
F2 Hazardous Building Materials F2.3.1	ALTERNATIVE SOLUTION	> Materials used are referenced in Acceptable Solution B2/AS1.	

1. The Compliance Statement is the pass holder's statement that they have met their obligations under s14G(2) of the Building Act 2004.

SOURCES OF INFORMATION

- > Cook Costello. [07/08/2020]. STOPDIGGING! Ground Screw Specification *Revision 2*. Project Number 13759.
- > WSP Opus. [23/07/2018] Ground Screw Load Testing. Test Report, Ref: I-LA399.00.
- Galvanizing Association NZ. [n.d.] An introduction to AS/NZS 2312.2:2014. Retrieved from https://www.galvanizing.org.nz/ docs/An_Introduction_to_New_Standards.pdf. [Accessed 16/3/2020].
- Material Grades. [8/2/13] ISO 630 Structural Billet Fe-430 Steel. Retrieved from https://www.materialgrades.com/iso-630-structuralbillet-fe-430-steel-773.html. [Accessed 16/03/2020].

Scan or click this QR code for a full download of Compliance Documentation for this pass™.

www.stopdigging.co.nz



VERSION:

DATE:

Note: Uncontrolled in printed format.

NAME:	Jude Hickson
POSITION:	Managing Director



Signed on behalf of STOPDIGGING!:

By signing this pass[™] the signatory confirms that, in respect of the subject of this pass[™], the company has met their s14G obligations under the Building Act 2004.



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This Product Assurance Supplier Statement (pass™) has been prepared by TBB in accordance with MBIE PTS guidelines and the recommendations of s9.2, Determination No. 2019-011 (issued 12 April 2019). TBB is ISO9001:2016 certified. Copyright © 2017, The Building Business Limited (TBB). All rights reserved.

PRODUCT SPECIFICATION



Ground Screw System.

1. GENERAL

1.1	GENERAL	This section relates to the supply and installation of the STOPDIGGING! ground screw system.
1.2	DOCUMENTS	 This specification must be read in conjunction with: > Product pass™ STOPDIGGING! Ground Screw pass™ STOPDIGGING! Ground Screw System Lightweight Structures pass™ for lightweight structures not requiring specific design. See www.thebuildingbusiness.co.nz/stopdigging/pass for controlled versions. > Technical Documents STOPDIGGING! Specification Guide STOPDIGGING! Design Guide Specific design in accordance with Cook Costello. [07/08/2020] STOPDIGGING! Ground Screw Specification Revision 2, where applicable.
13	GENERAL DESIGN	Check design
1.0	CONSIDERATION	Confirm scope:
COM		Refer to the STOPDIGGING! ground screw system pass™ to ensure that the intended building project falls within the allowable scope and limitations.
		The STOPDIGGING! ground screw system can be used for structures where a foundation system is required, as an alternative to traditional foundation piles and strip footings as defined in NZS 3604:2011, where floor loading is 2.0 kPa or less. Refer to the STOPDIGGING! design guide for lightweight structures.
		Projects not within the scope of the STOPDIGGING! design guide for lightweight structures require an assessment of soil conditions and specific engineering design (although generally this will be in accordance with NZS 3604:2011). The assessment of the soil conditions must be in accordance with the STOPDIGGING! ground screw capacity test methodology contained in the Cook Costello Ground Screw Specification Revision 2 (07/08/2020).
		Confirm bracing:
		Ensure bracing demand has been calculated in accordance with the STOPDIGGING! design guide for lightweight structures or specifically designed.
		Confirm ground screw selections:
Versio	on 1.0. October 2020.	Ground screws must be selected to meet bracing demand and all calculated loads.



2. PRODUCTS

2.1	PRODUCT DESCRIPTION	The STOPDIGGING! ground screw system is a proprietary foundation system to support tensile, lateral and compressive loads. The system is suitable for use in most locations, including expansive soil types and locations where frost heave could be an issue.	
		The ground screws are mechanicall required resistance is achieved.	y installed into soil to a depth at which the
	STOPDIGGING! ground screws are manufactured from ISO a compliant steel. The screws are coated in a hot-dipped galvar µm. If soil conditions require coating greater than 125 µm, the increased, an epoxy primer added, or a sacrificial anode fitte		re manufactured from ISO 630 FE360A ated in a hot-dipped galvanised coating of 125 g greater than 125 μm, the coating cover is , or a sacrificial anode fitted.
		STOPDIGGING! ground screws are available in various screw diameters with extensions and adapters to accommodate all soil conditions. Four models are avai	
		> adapter screw	> post screw
		> pipe screw	> beam screw.
2.2	ASSEMBLY AND ACCESSORY	The following assembly components are required for a specifically designed, brace pile system:	
COMPONENTS > minimum size 48.3 mm x 3.2 mm CHS Grade 250 tube> 6 kN pile fixing		CHS Grade 250 tube	
		> M12 bolt	
		> swivel clamp coupler coupler for	SHS connection.
2.3	SUBSTITUTIONS	Substitutions are not permitted to any of the specified components and associated products listed in this section.	

3. EXECUTION

3.1	QUALIFICATIONS	The installation of the STOPDIGGING! ground screw system must be carried out by a STOPDIGGING! authorised and trained installer. The work must be carried out in accordance with the relevant building consent, stated requirements and any approved shop drawings.
3.2	RESTRICTED BUILDING WORK	Where Restricted Building Work applies, the designer and installer shall be a Licensed Building Practitioner (LBP) or be supervised by an LBP with the relevant license class





4. APPLICATION

4.1 GENERAL

General:

- > Installation of the system shall be in accordance with the plans and details for the specifically designed foundation system.
- Before commencing testing and/or installation:
 - a service location survey is to be completed in the area encompassing the proposed foundation system to minimise the risk of incidental damage to services during the ground screw installation.
 - risks of damage to adjacent structures and utilities must be considered and any risks mitigated by the proposed installation method.

Ground testing

> Where ground conditions are uncertain, carry out testing as specified in Cook Costello specification. (Refer documents).

Predrilling:

- > Predrill ground where ground screw is to be installed (to ensure installation to ground screw can be carried out in one drive).
- > Predrill in:
 - gravel soils using a masonry style drill bit
 - fine-grained soils such as silts and clays using an auger style drill bit.
- > Predrill to 100 mm above the final installation depth of the ground screw. Take care to avoid overdrilling, as this will likely decrease the compressive capacity of the installed ground screw.

Screw installation:

- > Install ground screw vertically and in one drive. Removing and redriving screws will result in a reduced bond between the screw shaft and surrounding soil.
- > Use a laser level and fixed datum to ensure ground screws that are part of a foundation system are installed so the screw heads are level.

Bracing:

> Where required, install bracing elements between STOPDIGGING! ground screws in accordance with the plans.





5. COMPLETION

5.1	QUALITY CHECK/ RECORD OF CONSTRUCTION	> Complete the STOPDIGGING! record of construction.
5.2	WARRANTIES	> A 25-year manufacturer's warranty is available. Refer to www.stopdigging.co.nz.
5.3	INFORMATION FOR OPERATION AND MAINTENANCE	There are no maintenance requirements for the STOPDIGGING! ground screw system.





6 PROJECT SPECIFIC SELECTIONS

Project address	
Lot/DP number	Date of plans
Purpose of plans	
DOCUMENTS SUPPLIED (CHECK WHICH APPLIES)	
STOPDIGGING! Ground Screw System pass™.	
STOPDIGGING! Ground Screw System Lightweight Struct or lightweight structures not requiring specific design.	ures pass™ f
STOPDIGGING! Design Guide For Lightweight Structures.	
Engineering calculations and specific design	
STOPDIGGING! Installation Guide.	
Cook Costello Ground Screw Specification Revision 2 (07,	/08/2020).
DESIGNER CONFIRMS	
Soil	
Soil conditions are considered as "good ground" ULS 300) kPa
OR	
Soil conditions fall outside the scope of "good ground" and	d subject to specific design
Soil type has pH >4	
Soil type has a resistivity >1000 ohms-cm	
OR	
Soil to be tested in accordance with Cook Costello Ground	d Screw Specification Rev 2. Project no. 13759
Site and location	
Screw pile used in exposure zone D, are protected in acco	rdance with pass™
If ground sloping, maximum height of screw, above ground	, does not exceed 900 mm.
Building	
Building is a lightweight structure	
OR	
Building is not a lightweight structure, specification subject t	o specific engineering.
Floor loading is less than 2.0kPa and snow loading is less t	han 1.0kPa
OR	
Floor loading is greater than 2.0kPa and/or snow loading is g	reater than 1.0kPa and is subject to specific design.



Sub-floor Sub-floor design within the scope of NZS3604 Image: Comparison of Compa

SCREW SELECTION

Pile selected based on calculated building load and BU requirements

Pile Type	Diameter (mm)	Length (mm)
SGU		
SGS		
SGC		
SGP		

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Document prepared by TBB October 2020

GROUNDSCREW FOUNDATIONS - BASIC DESIGN PATHWAY



Technical Design and Specification Advice available from StopDigging NZ Ltd.

Use span tables from 3604 for sizing of timber bearers / joists. This will determine pile quantity for the subfloor design

YES

Use StopDigging Groundscrew data sheet for pile load bearing capacities.



Height above ground to underside of bearer will dictate ground screw length

StopDigging undertake inground static pile testing to confirm load bearing capacity and length of Groundscrew required for site specific ground conditions. This is a formal verification method for Building Code compliance.



StopDigging provide PS3 on completion of installation. **CPEng to provide PS4**

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DESIGN LOADS

Individual Pile demand loads are needed in kN for compressive, tensile and lateral loads.

Typically all groundscrews are cantilever piles and share the lateral bracing demand evenly through all piles in the design. 20 bracing units = 1kN

Diagonal bracing and / or pile extensions (timber or steel posts) are available for multiple design options for high levels above ground or sloping building platforms.

Groundscrews can be used as a spot footing for post or 'foot' mounting.

Groundscrews are a superior option for use in expansive ground conditions, especially in conjunction with concrete slab foundations.

Grouped Groundscrew arrangements are available to achieve high point load.

Segmental, extendable Groundscrews are available for deep ground penetration for bridging and zone of influence requirements.









