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HAPAS Certificate
21/H311
Product Sheet 1

LOCK+LOAD RETAINING WALL SYSTEM

LOCK+LOAD WALL SYSTEM FOR REINFORCED SOIL-RETAINING WALLS AND BRIDGE ABUTMENTS

This HAPAS Certificate Product Sheet(1) is issued by the British Board of Agrément (BBA), supported by Highways England (HE) (acting on behalf of the Overseeing Organisations of the Department for Transport; Transport Scotland; the Welsh Government and the Department for Infrastructure, Northern Ireland), the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), the Local Government Technical Advisers Group and industry bodies. HAPAS Certificates are normally each subject to a review every three years.
(1) Hereinafter referred to as 'Certificate'.

This Certificate relates to the Lock+Load Wall System for reinforced soil-retaining walls and bridge abutments. The system comprises concrete block facing units with connected concrete block counterforts, in conjunction with Secugrid geogrids and compacted fill.

CERTIFICATION INCLUDES:

- factors relating to compliance with HAPAS requirements
- factors relating to compliance with Regulations where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design consideration
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Mechanical properties — the concrete block units and the geogrids are not physically connected, and transfer no force between them. The forces for which the geogrid is designed are predetermined. The facing system has been designed for pull out forces and shear between segmental units (see section 7).

Durability — when designed and installed in accordance with the provisions of this Certificate, the system will have adequate durability for its intended use as a retaining wall or bridge abutment over 120 year design life (see section 9).

The BBA has awarded this Certificate to the company named above for the system described herein. This system has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 1 October 2021

Hardy Giesler
Chief Executive Officer

Requirements

In the opinion of the BBA, the LOCK+LOAD Wall System for reinforced soil-retaining walls and bridge abutments, when designed and installed in accordance with the provisions of this Certificate, will contribute to meeting the requirements of Highways England and local Highway Authorities for the design and construction of reinforced soil-retaining walls and bridge abutments.

Regulations

Construction (Design and Management) Regulations 2015
Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See sections: 1 *Description* (1.2), 3 *Delivery and site handling* (3.1, 3.3, 3.5 and 3.6), 11 *General* (11.6) and the *Installation* part of this Certificate.

Additional Information

CE marking

The Certificate holder has taken the responsibility of CE marking the blocks in accordance with harmonised European Standard BS EN 771-3 : 2011.

The manufacturer has taken the responsibility of CE marking the geogrids in accordance with harmonised European Standard BS EN 13251 : 2001.

Technical Specification

1 Description

1.1 The LOCK+LOAD Wall System for reinforced soil-retaining walls and bridge abutments comprise:

- L+L Typical, L+L Half Panel, L+L Left Outside Corner and L+L Right Outside Corner concrete facing units
- L+L Counterfort
- Secugrid geogrids(1)
- Compacted fill material.

(1) Covered by BBA Certificate 14/H218.

Concrete facing units

1.2 The facing units are manufactured from concrete conforming to the following minimum specification, satisfying Highways England requirements for durability of class XF2 exposure to BS 8500-1 : 2006 (see Table 1 of this Certificate).

Table 1 Concrete characteristics

Property	Value
Minimum concrete cube strength at 28 days ($N \cdot mm^{-2}$)	40
Minimum cement content ($Kg \cdot m^{-3}$)	340
Maximum water/cement ratio	0.55

1.3 The concrete block facing units covered by this Certificate are shown in Table 2 and Figures 1a and 1b.

Table 2 Concrete block facing units

Unit type	Height (mm)	Depth (mm)	Width (mm)	Weight (kg)
L+L Facing Panel	405	95	810	40
L+L Counterfort	195	685	152.5	19

Figure 1a L+L facing units

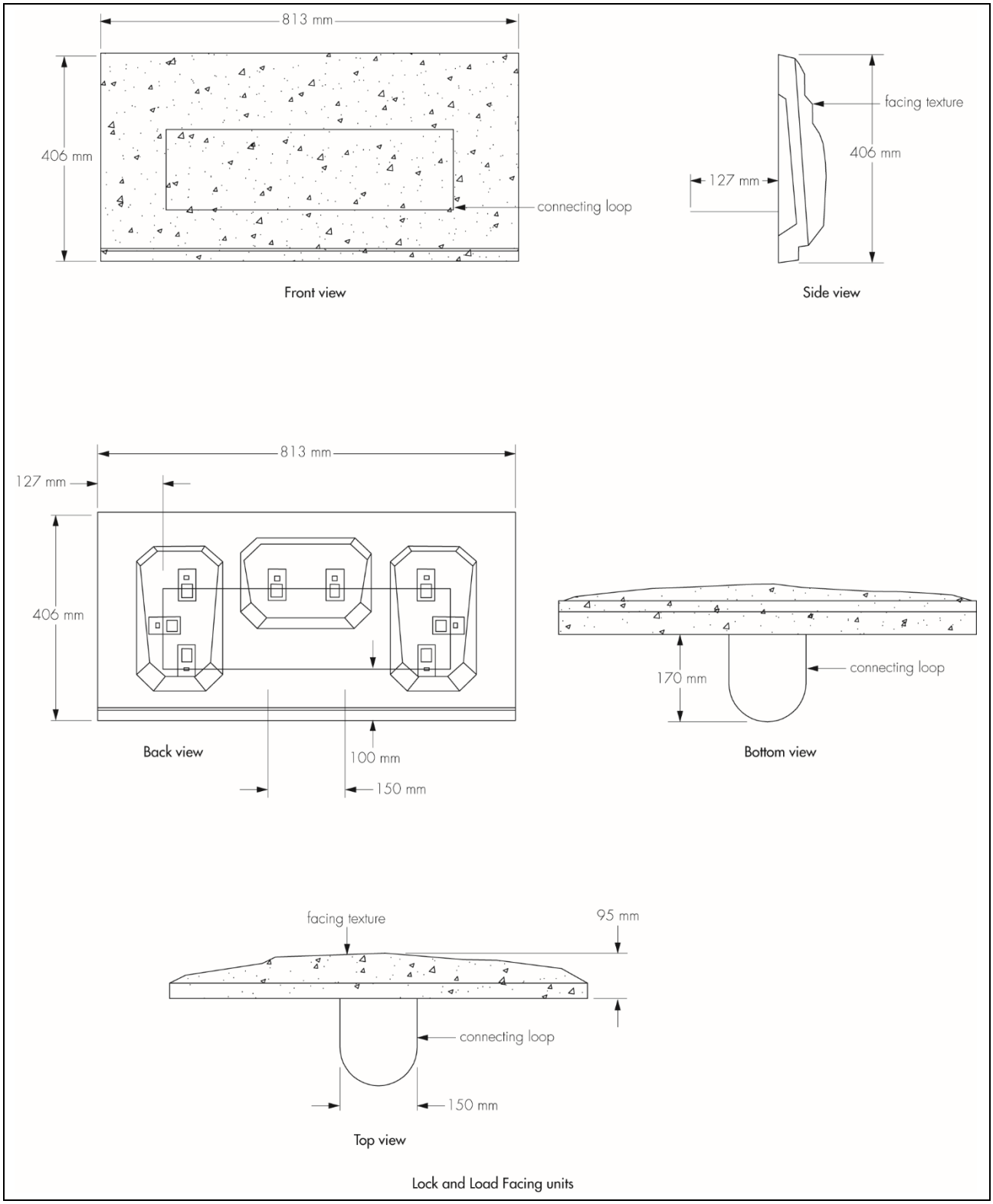
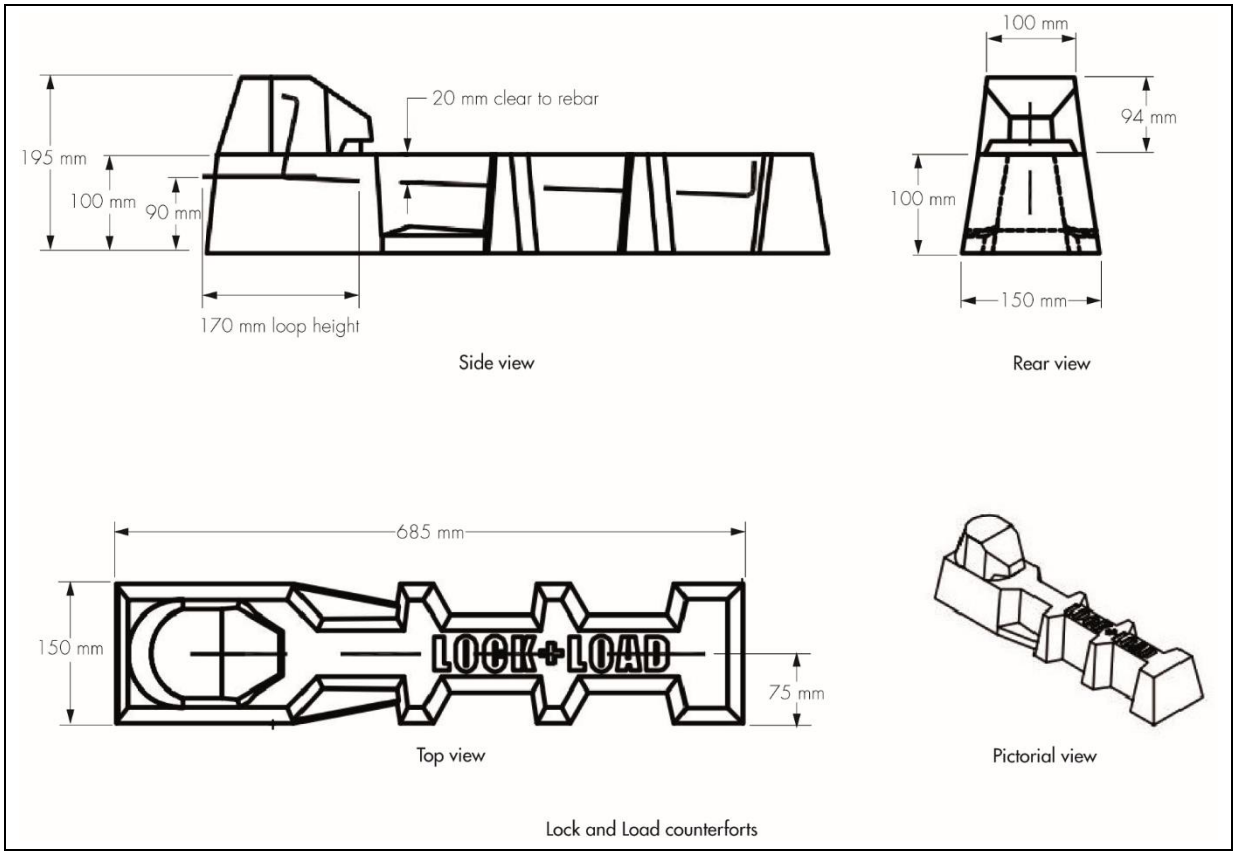


Figure 1b L+L facing units



1.4 The concrete block facing units conform to BS EN 771-3 : 2011. The performance characteristics given in Table 3 have been declared by the manufacturer in accordance with this Standard.

Table 3 Performance values in accordance with BS EN 771-3

Property	Test method	Manufacturer's declared values
Dimensional tolerances		Category D2
Compressive strength (mean) ($N \cdot mm^{-2}$)		>40
Density ($kg \cdot m^{-3}$)		2350
Maximum water absorption (%)	BS EN 1338 : 2003 Annex E	6

1.5 The concrete block facing units are available in a range of colours including Sandstone and Black. All pigments used for the coloration of the concrete units comply with BS EN 12878 : 2014.

Geogrids

1.6 Secugrid PET geogrids are planar structures consisting of a regular open network of woven or knitted integrally connected tensile elements of extruded polyester bars welded together to form grids. The grades(1) covered by this Certificate are:

- Secugrid 30/30 Q6
- Secugrid 40/40 Q6
- Secugrid 60/60 Q6
- Secugrid 40/20 R6
- Secugrid 60/20 R6
- Secugrid 80/20 R6
- Secugrid 120/40 R6
- Secugrid 150/40 R6
- Secugrid 200/40 R6
- Secugrid 400/40 R6

(1) Full product details are given in BBA Certificate 14/H218.

Fill material

1.7 Fill material must comply with the requirements set out in BS 8006-1 : 2010 and the *Manual of Contract Documents for Highway Works* (MCHW), Volume 1 *Specification for Highway Works* (SHW).

2 Manufacture

2.1 The concrete block facing units are manufactured to an agreed specification by the Certificate holder. Ingredients for the concrete are weighed by a computer-controlled weigh-batcher system, and the blocks cast in block machines.

2.2 The geogrids are manufactured from extruded high tenacity polyester (PET) bars of various section sizes, which are welded together at the appropriate centres to form the grids.

2.3 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control being operated by the manufacturer are being maintained.

2.4 The manufacturer's management system for the concrete block facing units has been assessed by the BBA

2.5 The management system of the geogrid manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by TüV Nord Cert GmBH (Certificate 44 100 940655).

3 Delivery and site handling

3.1 The concrete block facing units and counterforts are tied together with steel loops and delivered to site on shrink-wrapped pallets. The pallets carry a manufacturer's label bearing the product type and batch code. Pallets should not be stacked more than two high.

3.2 To avoid damage, care should be taken in transit and handling. Damaged materials must not be used. During prolonged periods of storage on site, the blocks should remain covered on pallets.

3.3 The geogrids are delivered to site in 4.75 m wide rolls, either 50 or 100 m in length. Each roll is wrapped for transit and site protection, in stretch foil.

3.4 Rolls are labelled with the geogrid grade and identification. The grade of geogrid is ink-jet printed on the cross machine direction bars approximately every metre, to aid in identification on site in accordance with BS EN ISO 10320 : 2019.

3.5 The geogrids should be stored in clean, dry conditions and protected from mechanical or chemical damage, exposure to direct sunlight (to protect against UV degradation) and extreme temperatures. When laid horizontally, the rolls may be stacked up to seven high. No other loads should be stored on top of the stack. The packaging should not be removed until immediately prior to installation.

3.6 Toxic fumes are given off if the geogrids catch fire and, therefore, the necessary precautions should be taken, following the instructions of the material safety data sheet for the product.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the LOCK+LOAD Wall System for reinforced soil-retaining walls and bridge abutments.

Design Considerations

4 General

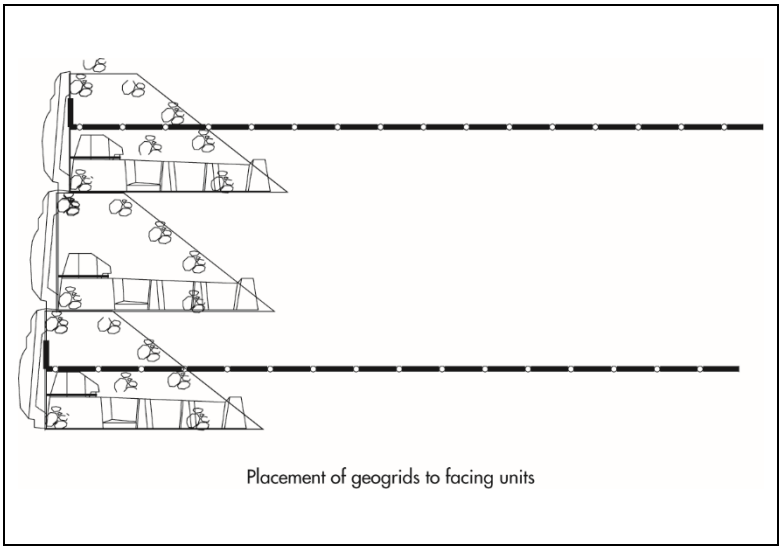
4.1 When designed and installed in accordance with this Certificate, the system is satisfactory for the construction of reinforced soil-retaining walls and bridge abutments.

4.2 Structural stability of the system is achieved through:

- interface shear capacity between face and counterfort
- the tensile strength of the geogrids
- the embedment and resistance to sliding and pull out of the geogrids from the fill material
- the embedment and resistance to sliding and pull out of the counterfort from the fill material.

4.3 The connection between the facing unit and the counterfort is provided by the steel loop, and the force generated by the counterfort restrains the facing unit. No attachment is made between the concrete units and the geogrid so force is not shared or transferred between them. The geogrid is laid up to and against facing material, however. It is critical the construction of the connection is carried out carefully and is closely supervised (see the *Installation* part of this Certificate).

Figure 2 Placement of geogrids to facing units



4.4 Prior to the commencement of work, the designer must satisfy the design approval and certification procedures of the relevant Highway Authority.

4.5 The BBA has not assessed the structures for supporting parapet loading caused by vehicle collision at the top of the concrete block facing units.

4.6 Reinforced soil structures constructed using the system should be protected with suitable barriers, to protect the structure against potential damage from vehicle impact and vehicle fires.

4.7 In addition to those factors covered in section 6, attention must also be paid in design to:

- site preparation
- fill material properties
- the specification for placing and compaction of the fill material
- drainage behind the wall
- protection of the geogrid against damage during installation.

4.8 It is considered that with correct design and workmanship, and by following the recommendations of this Certificate, normally accepted tolerances of line and level for the construction of retaining walls as defined in BS 8006-1 : 2010, Table 18, can be achieved. However, where the alignment of the vertical face is critical, consideration may be given to providing a brickwork skin, or similar, to the wall units.

4.9. Particular attention should be paid to changes in direction of walls where overlapping of the geogrids may occur. Detailed guidance is given in the Certificate holder's technical literature. BS 8006-1 : 2010 also gives guidance on typical layout plans for the geogrids (reinforcing elements) in bridge abutments.

5 Practicability of installation

The system is designed to be installed by trained contractors in accordance with the specifications and construction drawings (see the *Installation* part of this Certificate). Close supervision is required to ensure the integrity of the connection between the geogrids and concrete block facing units.

6 Design

Design methodology

6.1 Reinforced soil-retaining walls and bridge abutments constructed using the system must be designed in accordance with BS 8006-1 : 2010 and the Manual of Contract Document for Highway Works Volume 1, *Specification for Highway Works*.

6.2 In accordance with BS 8006-1 : 2010, Annex B, the required design life for permanent walls and bridge abutments is 120 years.

6.3 To evaluate the overall stability of the wall system, it is necessary to consider:

- the design strength and length of embedment of the geogrid
- the design strength of concrete facing units
- the interface shear capacity of the blocks between layers of geogrid reinforcement.

Design strength of geogrids (ultimate limit state)

6.4 The design methodology for determination of the ultimate limit state (ULS) design strength of the geogrids is given in BS 8006-1 : 2010 and in the design sections of BBA HAPAS Certificate 14/H218 (see also section 7.1 of this Certificate).

6.5 The ULS design strength of the geogrid ($T_{D\,(ULS)}$), should be taken as:

$T_{CR}/f_{m,}$

where:

T_{CR} is the long-term tensile creep strength of the geogrid, at the appropriate design life and design temperature
f_m is the partial material factor.

6.6 For the ULS, the design load (T_j) at each level that the geogrid must resist, is calculated using prescribed load factors in accordance with BS 8006-1 : 2010. In all cases, T_j must be < $T_{D\,(ULS).}$

Design strength of geogrids (serviceability limit state)

6.7 The serviceability limit state (SLS) design strength of the geogrid ($T_{D\,(SLS)}$), should be taken as:

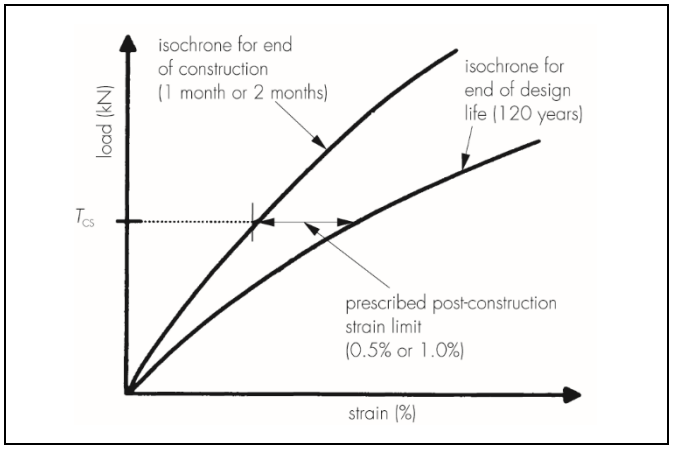
T_{CS}/f_m,

where:

T_{CS} is the tensile load in the reinforcement which induces the prescribed limit value of post-construction strain in the geogrid
f_m is the partial material factor.

6.8 The strain in the geogrid must be limited to 0.5% over the service life for installations subject to permanent structural loading, such as bridge abutments, and limited to 1.0% post-construction for structures not subject to permanent structural loading (eg retaining walls). The definitions of prescribed post-construction strain limit and T_{CS}, the tensile load that would create the prescribed post-construction strain, are explained in Figure 3.

Figure 3 Definition of T_{CS}



6.9 The prescribed maximum allowable post-construction creep strains allowed by BS 8006-1 : 2010 for the SLS of reinforced soil-retaining walls and bridge abutments are shown in Table 4 of this Certificate.

Table 4 Serviceability limits on post-construction internal strains for bridge abutments and retaining walls

Structure	Strain (%)	Design period for the purposes of determining limiting strain
Bridge abutments and retaining walls with permanent structural loading	0.5	2 months – 120 years
Retaining walls, with no applied structural loading, ie transient live loadings only	1.0	1 month – 120 years

6.10 Post-construction strain can be related to the average load in the reinforcement. The average SLS design loads (T_{avj}) that the geogrid must resist is to be calculated in accordance with BS 8006-1 : 2010. The average load in the *j*th level (T_{avj}), is related to the maximum load in the reinforcement (T_j) by a factor *k* such that $T_{avj} = T_j/k$. The factor *k* has a minimum value of unity and generally falls in the range of 1.0 to 2.0. Where the distribution of tensile load along the loaded length of the reinforcement is not proven by field measurements, the factor *k* should be taken as unity. In all cases, $T_{avj} < T_{D(SLS)}$.

6.11 Design values for T_{cs} and reduction factors for determination of $T_{D(SLS)}$ are given in sections 7.2 to 7.3.

Design of geogrids (determination of resistance to direct sliding and pull out)

6.12 The design methodology for determination of resistance to pull out and direct sliding and, therefore, the required length of embedment of the geogrids, is given in BS 8006-1 : 2010 and in the design sections of BBA HAPAS Certificate 14/H218, Product Sheet 1.

Design strength of concrete facing units

6.13 The design resistance to pull-out between the concrete block units and soil is determined by testing in accordance with ASTM Designation Number D 6706-01 and is considered acceptable for the intended use specified in this Certificate.

Interface shear capacity between concrete facing units and counterforts

6.14 The interface shear capacity between the concrete block facing units should be checked at the ULS and checks should be made to ensure that it is not exceeded by the design load (*T*j) at each level (see section 7.7).

Specification of fill material

6.15 The designer should specify the relevant properties of the fill material for the reinforced soil structure deemed acceptable for the purposes of the design. Acceptable materials should satisfy the requirements of BS 8006-1 : 2010 and the MCHW, Volume 1, Series 600.

6.16 Where concrete wall units are to be embedded in potentially aggressive soils, the guidance given in BRE Special Digest 1 : 2005 should be followed.

6.17 Fill materials classified as 6I, 6J, 7B, 7C and 7D should comply with the limits of the MCHW, Volume 1, 600 series, Table 6/3, regarding maximum water soluble sulfate content and maximum oxidisable sulfides content.

7 Mechanical properties

ULS design strength of geogrids ($T_{D(ULS)}$)

7.1 The characteristic short-term tensile strength (T_{char}) and the associated reduction factors for creep (RF_{CR}), installation damage (RF_{ID}), weathering (RF_{W}), environmental degradation (RF_{CH}) and extrapolation of data (f_s) required for determination of the ULS design strength of the geogrids ($T_{D(ULS)}$) are given in BBA HAPAS Certificate 14/H218, Product Sheet 1.

SLS design strength of geogrids (T_{CS})

7.2 Secugrid geogrids design values for T_{CS} are given in Table 5. To limit strain to less than 0.5% over design life, limit loading to 30% of T_{Char}.

Table 5 Maximum tensile load inducing prescribed post-construction strain limits for Secugrid geogrids

Grade	Machine Direction (MD)				Cross Machine Direction (CMD)			
	Short Term Tensile Strength(1) (kN per m width)			Mean Strain at Maximum Tensile Load(1) (%)	Short Term Tensile Strength(1) (kN per m width)			Mean Strain at Maximum Tensile Load(1) (%)
	Mean Value	Tolerance	T_{char}[2		Mean Value	Tolerance	T_{char}[2	
Secugrid 30/30 Q6	30.0	0.0	30.0	6.0 (+2.0/-2.0)	30.0	0.0	30.0	6.0 (+2.0/-2.0)
Secugrid 40/40 Q6	40.0	0.0	40.0	6.0 (+2.0/-2.0)	40.0	0.0	40.0	6.0 (+2.0/-2.0)
Secugrid 60/60 Q6	60.0	0.0	60.0	6.0 (+2.0/-2.0)	60.0	0.0	60.0	6.0 (+2.0/-2.0)
Secugrid 80/80 Q6	80.0	0.0	80.0	6.0 (+2.0/-2.0)	80.0	0.0	80.0	6.0 (+2.0/-2.0)
Secugrid 40/20 R6	40.0	0.0	40.0	6.5 (+2.0/-2.0)	20.0	0.0	20.0	6.5 (+2.0/-2.0)
Secugrid 60/20 R6	60.0	0.0	60.0	6.5 (+2.0/-2.0)	20.0	0.0	20.0	6.5 (+2.0/-2.0)
Secugrid 80/20 R6	80.0	0.0	80.0	6.5 (+2.0/-2.0)	20.0	0.0	20.0	6.5 (+2.0/-2.0)
Secugrid 120/40 R6	120.0	0.0	120.0	6.5 (+2.0/-2.0)	40.0	0.0	40.0	6.5 (+2.0/-2.0)
Secugrid 150/40 R6	150.0	0.0	150.0	6.5 (+2.0/-2.0)	40.0	0.0	40.0	6.5 (+2.0/-2.0)
Secugrid 200/40 R6	200.0	0.0	200.0	6.5 (+2.0/-2.0)	40.0	0.0	40.0	6.5 (+2.0/-2.0)
Secugrid 400/40 R6	400.0	0.0	400.0	6.5 (+2.0/-2.0)	40.0	0.0	40.0	6.5 (+2.0/-2.0)

(1) Values derived from short-term tests in accordance with BS EN ISO 10319 : 2015.
(2) The characteristic short-term tensile strength (Tchar) values are the mean short-term tensile strength minus 1 x the tolerance value, in accordance with BS EN 13251 : 2016.

7.3 Reduction factors for installation damage, weathering and environmental degradation (RF_{ID}, RF_{W} and RF_{CH}) and factors of safety for the extrapolation of data (f_s) required for determination of the serviceability design strength of the geogrids ($T_{D(SLS)}$) are given in BBA HAPAS Certificate 14/H218, Product Sheet 1.

Counterfort capacity

7.4 The counterforts are tested for resistance to pull out forces by soil interaction. Long term capacities have been determined by testing in accordance with ASTM D6706-01.

Interface capacity between concrete facing units and counterforts

7.5 Interface capacity between the concrete block facing units and the counterfort is provided by the steel loop connection. Steel loop connection complies with BS EN 14475 : 2006 and contributes to compliance with BS 8006-1 : 2010 + A1 : 2016 (steel coating exceeds 70µm). For the system, the interface shear capacity of the blocks is higher than the corresponding connection strength values. Therefore, the connection strength values govern the design.

8 Maintenance

The exposed faces of the concrete block facing units may require periodic maintenance, to remove dirt build up, mould and moss growth. All other components of the system are confined within the wall and do not require maintenance.

9 Durability

9.1 When designed and installed in accordance with this Certificate, the system will have adequate durability for the required 120 year design life of a retaining wall and bridge abutment in conditions encountered in the UK.

9.2 Where the blocks are to be embedded in potentially aggressive soils, the guidance given in BS 8006-1 : 2010 and BRE Special Digest 1 : 2005 should be followed.

10 Reuse and recyclability

The concrete facing units can be crushed and re-used as aggregate. The fill material can also be re-used.

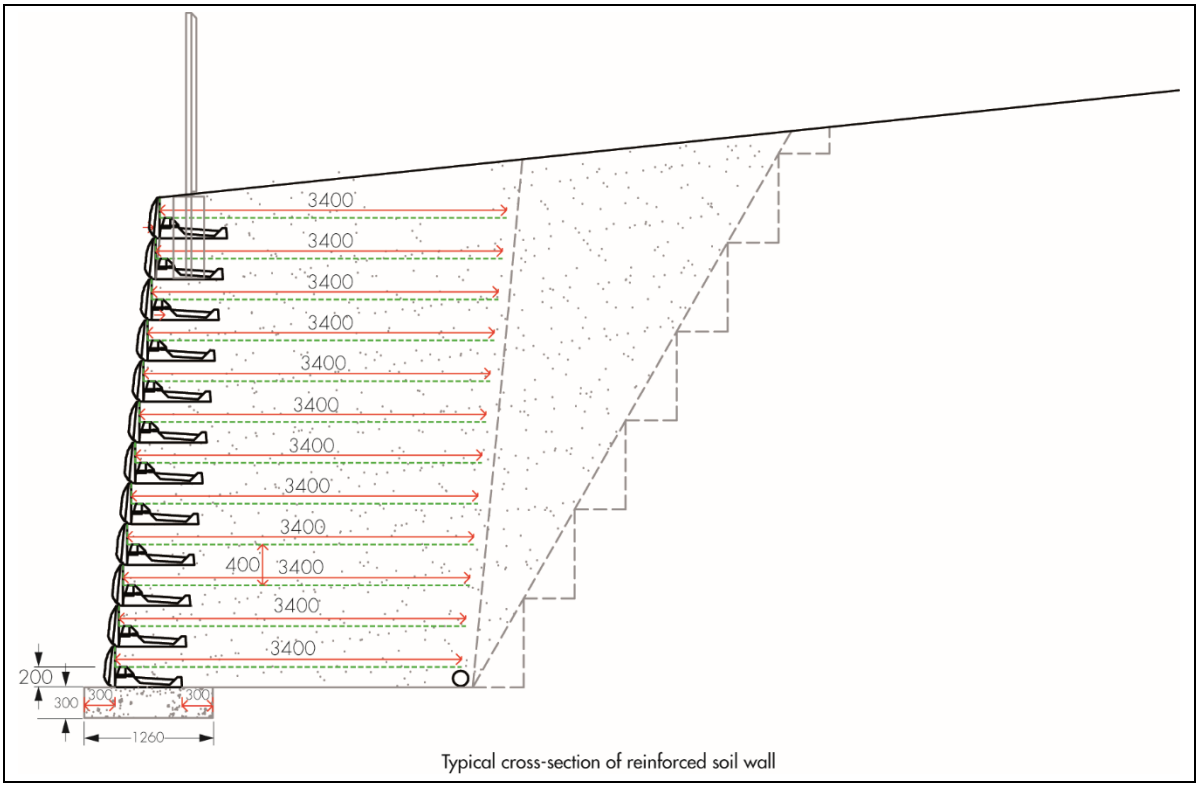
Installation

11 General

11.1 Detailed information on installation of the LOCK+LOAD Wall System for reinforced soil-retaining walls and bridge abutments can be found in the Certificate holder's Installation Guide.

11.2 A typical cross-section of a reinforced soil-retaining wall constructed using the system is shown in Figure 4.

Figure 4 Typical cross-section of reinforced soil wall



11.3 Installation should also comply with the requirements of BS 8006-1 : 2010 and BS EN 14475 : 2006.

11.4 Close supervision is required, particularly during placement of the geogrids and initial compaction of the backfill material.

11.5 Detailed guidance on forming curves and corners, including the placement of geogrids, can be found in the Certificate holder's Installation Guide.

11.6 Where accurate cutting of concrete block facing units is required on site, disc-cutting techniques may be used, for which appropriate precautions must be taken to mitigate against hazards associated with dust.

11.7 During construction it is particularly important to ensure that:

- fill is properly compacted, especially close to concrete block facing units
- at each construction stage, the level of the compacted fill coincides with the level of the concrete block facing unit connection to prevent the risk of voids occurring below the geogrid
- the geogrid is tensioned at right angles to the plane of the facing, within a tolerance of ± 50 mm in a five-metre length, and the geogrid is pulled tight to ensure that all slack is removed
- regular checks are made to confirm the alignment of the face and to ensure that any disturbance from the compaction process is promptly corrected.

12 Procedure

12.1 The first row of concrete block facing units is laid on a levelling pad comprising either well-graded, good compactable material ranging in diameter from 6 to 38 mm, or a suitable concrete foundation laid to the correct level. It is important that the first course of concrete block facing units is laid accurately to the correct line and level, to avoid compounding errors in alignment as the wall is built. If steps occur in the base level, refer to the Certificate holder's Installation Guide.

12.2 The drain pipe and drainage stone are placed at the back of the counterfort, or as specified on plans.

12.3 The backfill is placed over the tail of the counterfort first, with a minimum of 610 mm of select 4/20 mm material kept behind the wall face for the foundation of the next row. Beyond this, the specified back fill material is used. For rows that will contain soil reinforcement, the grid is placed after the first lift of fill is compacted (305 mm).

12.4 The compaction requirements for the main fill material depend on the fill type selected and can be found in the MCHW, Volume 1, Clause 612. Heavy plant exceeding one tonne should not be allowed within 610 mm of the wall (Note: This differs from typical modular block wall systems). A large vibrating plate compactor must be used to carry out compaction within this zone, and must compact right up to the rear of the wall.

12.5 Geogrids are placed at the levels shown on the project construction drawings. A suitable length of geogrid is cut from the roll and laid with a minimum of 50 mm of the cut edge rolled up against the back edge of the raised front lip of the concrete block facing units. The geogrid is placed with the machine direction perpendicular to the wall face and pulled back over the compacted area. Steps 12.3 to 12.4 are repeated until the backfill is level with the top of concrete facing unit.

12.6 The next course of concrete blocks facing units is laid, ensuring that the vertical faces are offset by at least 20 mm. The filling and compaction process is repeated as detailed in sections 12.3 to 12.5.

12.7 The general construction procedure described is repeated until the required coping is reached.

Technical Investigations

13 Investigations

13.1 The manufacturing process for the concrete block facing units was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

13.2 An examination was made of test data relating to:

- strength of concrete block facing units
- durability
- the connection strength between the geogrids and concrete block facing units.

13.3 An assessment was made of the method of installation to assess the practicability and ease of construction of the system.

13.4 Research papers and test reports regarding the performance of the system during seismic activity were examined.

13.5 Case studies relating to use of the system in projects around the world were examined.

13.6 Dimensional check tests were carried out on the concrete block facing panels and the counterfort units.

Bibliography

BRE Special Digest 1 : 2005 *Concrete in aggressive ground*

BS 8006-1 : 2010 + A1 : 2016 *Code of practice for strengthened/reinforced soils and other fills*

BS 8500-1 : 2006 + A1 : 2012 *Concrete — Complementary British Standard to BS EN 206-1 — Method of specifying and guidance for the specifier*

BS EN 1338:2003 *Concrete paving blocks — Requirements and test methods*

BS EN 771-3 : 2011 + A1 : 2015 *Specification for masonry units — Aggregate concrete masonry units (Dense and lightweight aggregates)*

BS EN 12878 : 2014 *Pigments for the colouring of building materials based on cement and/or lime — Specifications and methods of test*

BS EN 13251 : 2001 *Geotextiles and geotextile-related products — Characteristic required for use in earthworks, foundations and retaining structures*

BS EN 14475 : 2006 *Execution of special geotechnical works — Reinforced fill*

BS EN ISO 9001 : 2015 *Quality management systems — Requirements*

BS EN ISO 10320 : 2019 *Geotextiles and geotextile-related products — Identification on site*

BS EN ISO 10319 : 2015 *Geosynthetics. Wide-width tensile test*

ASTM D6706-01 *Standard Test Method for Measuring Geosynthetic Pullout Resistance in Soil*

Manual of Contract Documents For Highway Works, Volume 1 *Specification for Highway Works*, amendment November 2008

14 Conditions

14.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document – it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

14.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

14.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

14.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

14.5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

14.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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