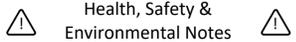


Do Not Scale
 DESIGN REVIEW
 Design review by: ** Checked by: **
 Residual hazards:



NOTES
 1. Drawing based on wall design by Redi-Rock. Dwg No. 5856952 Layout - 1
 Key:
 Proposed Ground Level - Top of Wall
 Proposed Ground Level - Bottom of Wall

| Date | Description | By | Chk | Rev |
|----------|-------------------------------------------------|-----|-----|-----|
| 20.10.23 | As Built Issue | OCB | AL | C1 |
| 01.09.23 | Drawing updated to reflect new Redi-Rock design | OCB | AL | P2 |
| 17.08.23 | Initial Issue | OCB | RP | P1 |



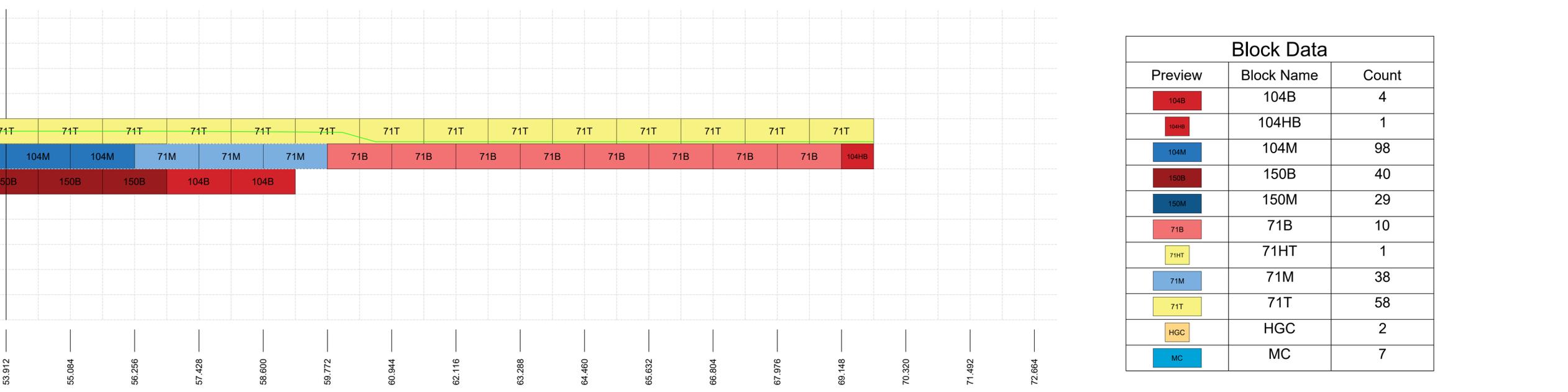
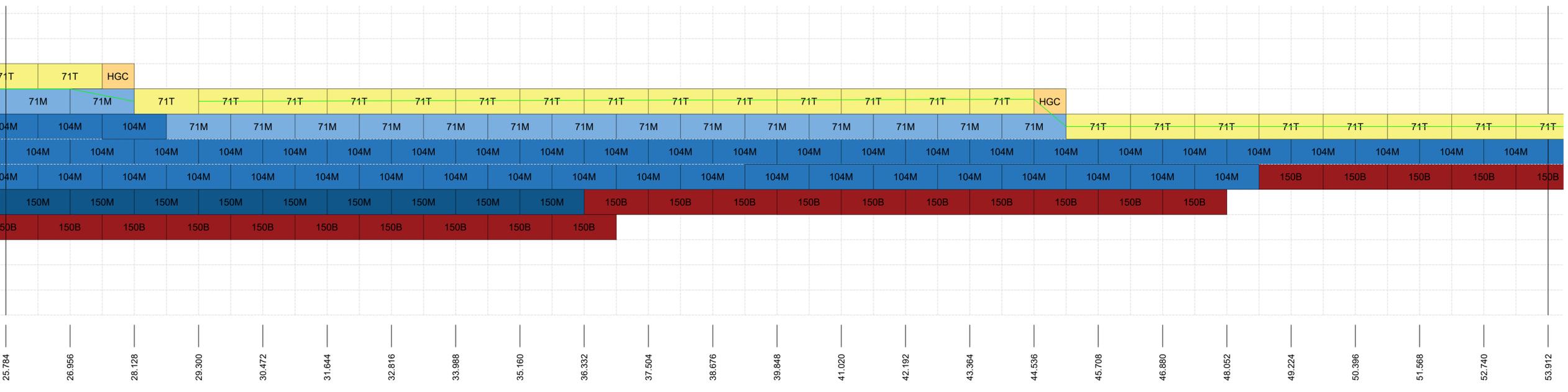
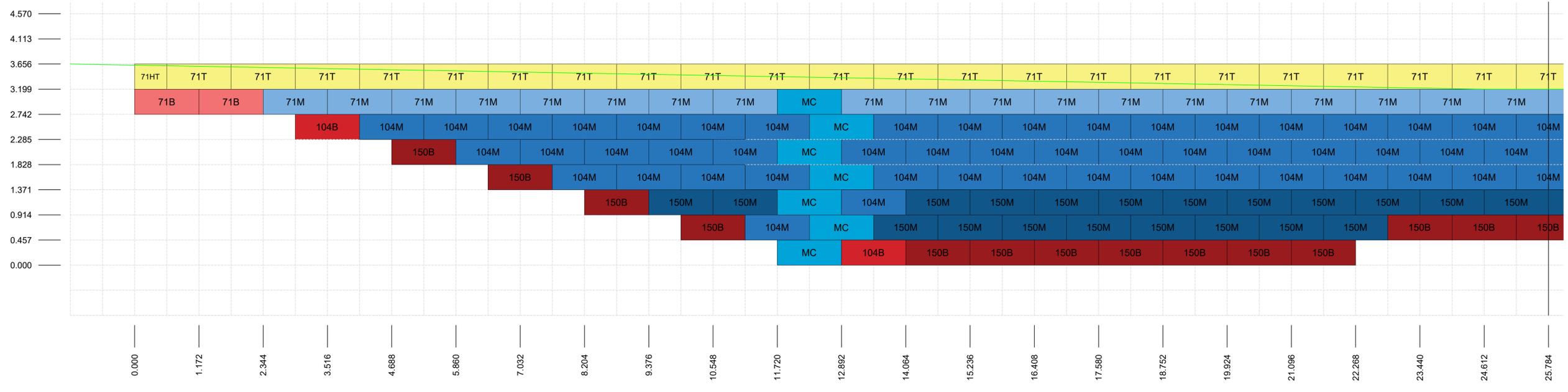
Web: www.adeptcsce.com
 Email: inbox@adeptcsce.com
 Tel: 0113 239 4518 (Head Office)
 Originating Office: Leeds
 1912 Mills, Sunny Bank Mills,
 Farsley, Leeds, LS28 5JJ
 Tel: 0113 239 4518

Project
 Blue Hills Farm,
 Birkenshaw

Title
 Redi-Rock Wall
 Proposed Ground Levels



| | | | | |
|------------------------------|----------------|-----------------|----------|--------------|
| Scale @ A1 | Initial author | Initial checker | Approver | Initial Date |
| 1:50 | OCB | RP | RP | Aug 23 |
| Status | Purpose | As Built | | Adopt Ref |
| A | | | | 09.21011 |
| Project Number | Originator | Volume | Level | Type |
| 09.21011-ACE-00-ZZ-DR-C-3615 | | | | |
| Rev. | C1 | | | |



| Preview | Block Name | Count |
|---------|------------|-------|
| | 104B | 4 |
| | 104HB | 1 |
| | 104M | 98 |
| | 150B | 40 |
| | 150M | 29 |
| | 71B | 10 |
| | 71HT | 1 |
| | 71M | 38 |
| | 71T | 58 |
| | HGC | 2 |
| | MC | 7 |

GENERAL NOTES

- This drawing is not to be scaled, figured dimensions only to be used. Any discrepancy to be reported to Marshalls Civils & Drainage
 - All dimensions are shown in millimetres
 - All levels are shown in metres
 - For installation details refer to the Redi-Rock Specification and Installation Manual
 - Vertical joint gaps may be acceptable up to 12mm and may be adjusted to suit closing dimensions. It is recommended that the length of the wall is checked at regular intervals to assess accumulative tolerances
 - Domes and blocks may require trimming to maintain alignment at external corners
- LIFTING**
 ALL lifting operations should comply with the Lifting Operations and Lifting Regulations 1998, and the Provision and Use of Work Equipment Regulations 1998. The client/contractor will assume ALL responsibility for site lifting operations involving Marshalls Civils & Drainage products, including safe use and return of any lifting equipment supplied by Marshalls Civils & Drainage. Where available, the use of manufacturer installed lifting facilities is recommended.
- Unit weights provided on Redi-Rock standard drawings RR/000000/23 to RR/000000/28.

ASSUMED SOIL PROPERTIES

- Bearing Strata: Undisturbed Native Ground
 - y= Min. 18kN/m²
 - Φ= Min. 30°
 - ABP= Min. 100 kN/m²
- Backfill: Well Compacted Class 6N
 - y= Max. 20kN/m²
 - Φ= Min. 38°
- Granular Foundation: Well Compacted Type 1
 - y= Max. 21kN/m²
 - Φ= Min. 39°

Natural ground to be battered back to a safe angle, as specified by the temporary works designer.

Well compacted class 6N backfill to provided a minimum angle of internal friction of 38°. Minimum angle of backfill material to allow an active wedge of Φ=38° to be 45+Φ/2, measured from the horizontal. This angle should be decreased where necessary to meet the safe angle of repose as specified by the temporary works designer.

ASSUMED IMPOSED LOADING

A maximum surcharge of 2.5 kN/m² has been considered behind the wall.

GROUND PROFILE BEHIND WALL

A maximum angle of 30° has been considered behind the wall.

The information presented was prepared by Marshalls for estimating and conceptual design purposes only. Marshalls assumes no responsibility for the use of this drawing for actual construction. Designs for Redi-Rock walls must be carried out by a suitability qualified engineer using the actual site conditions.

Marshalls does not assume any responsibility whatsoever regarding structural stability of any particular block or particular wall system. The role of Designer must be fulfilled by others.

| | | | | |
|------|---------------------------------------------------------|----|-----|----------|
| B | Corner details amended | HT | MD | 12.09.23 |
| A | Wall height and length amended to suit updated gradient | HT | MD | 21.08.23 |
| Rev. | Revision Note | By | CHK | Date |

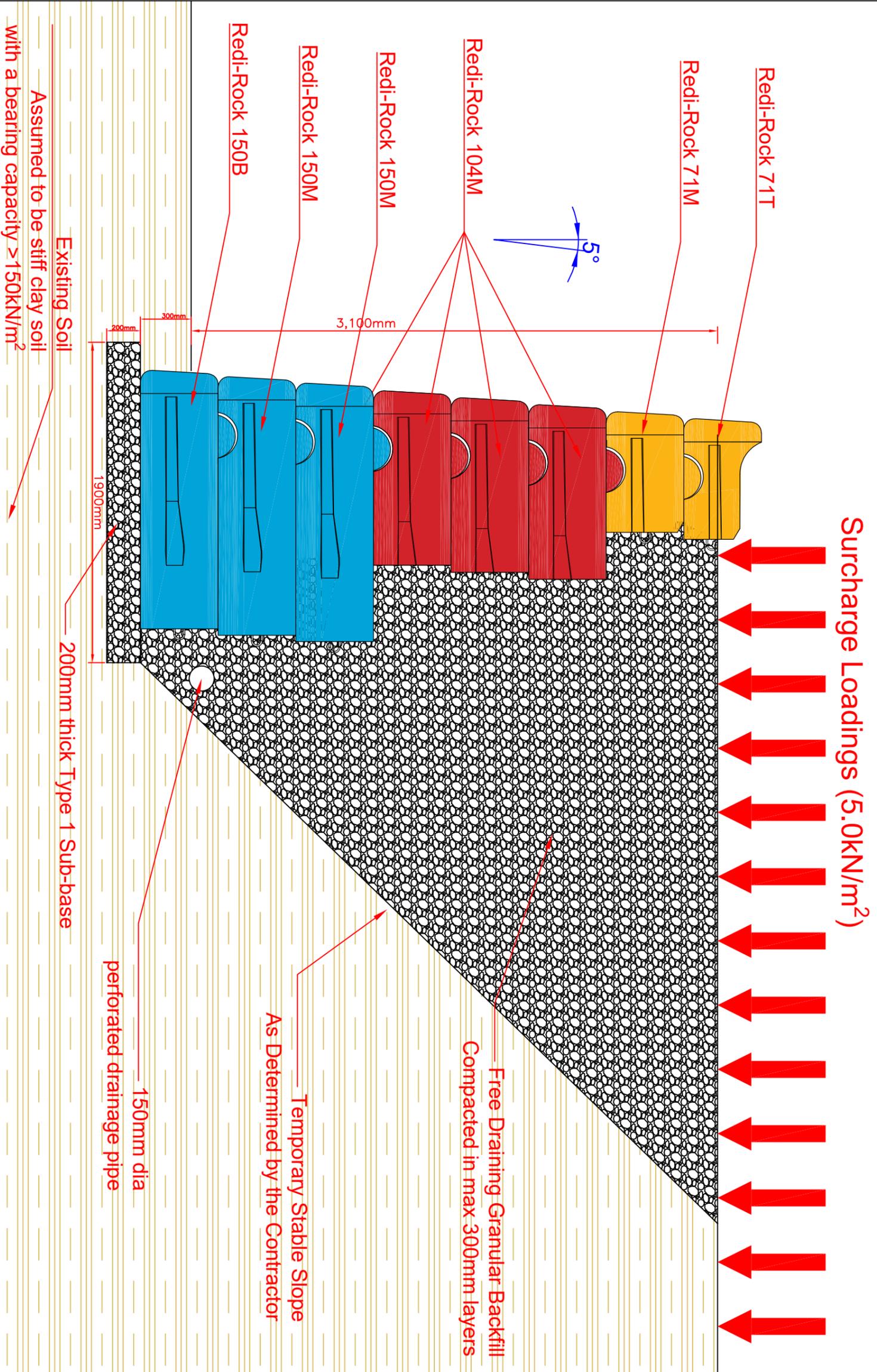
THIS DRAWING IS ISSUED SUBJECT TO THE CONDITIONS THAT IT IS NOT COPIED EITHER IN WHOLE OR IN PART OR DISCLOSED TO THIRD PARTIES UNLESS FROM WRITTEN AUTHORIZATION IS GIVEN BY MARSHALLS CIVILS & DRAINAGE.
 PREVIOUS VERSIONS OF THIS DRAWING SHOULD BE STAMPED SUPERSEDED OR DESTROYED
 DO NOT SCALE THIS DRAWING - IF IN DOUBT ASK

Marshalls
 Civils & Drainage

Heath Mill Road
 Wombourne
 WVS BAP
 01902 356220
 Redi-Rock@Marshalls.co.uk

| | | | |
|---------------|----------------------------------------------------|---------|----------|
| Client | Countryside Properties | | |
| Job Title | Bradford, Blue Hills Farm | | |
| Drawing Title | Marshalls Proposed Layout Redi-Rock Retaining Wall | | |
| Status | Conceptual | | |
| Drawn | KC | Checked | HT |
| Scale | 1:50@A1 | | Date |
| Date | | | 19.04.23 |
| Dwg No. | 5856952 Layout -1 | | Rev. |
| | | | B |

NOTES



| REV/DATE | DESCRIPTION | BY/APP |
|----------|-------------|--------|
| | | |



TITLE
 Countryside Partnerships
 Blue Hills Farm Estates
 Redi-Rock Wall Design
 3.10m

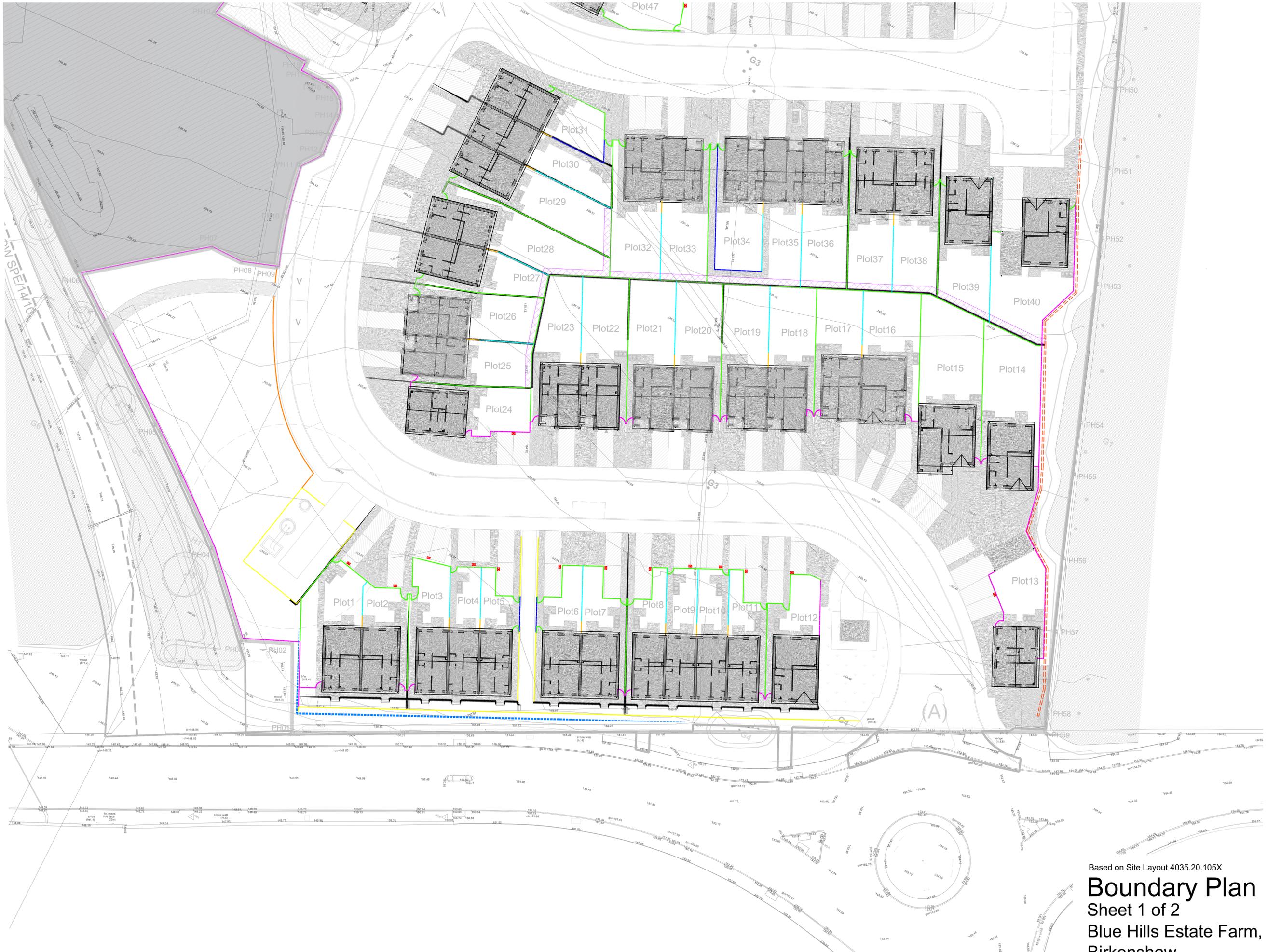
| | | | |
|-----------------------------------------------------------------------------|---------------|------------|------------|
| S Webster CEng, M.I.C.E. Director, CIVILWeb Consulting Engineers Ltd. | | | |
| PREPARED BY | SW | CHECKED BY | SW |
| DATE | 25/05/2023 | DATE | 25/05/2023 |
| SCALE | 1:25 | CLIENT REF | X |
| DWG No. | P0121-265-001 | | |

COPYRIGHT ©
 CIVILWeb

REVISION
 1

A3

ALTHOUGH ALL CARE AND ATTENTION IS TAKEN TO ENSURE THAT THE INFORMATION GIVEN ON THIS DRAWING IS ACCURATE, CIVILWEB MAKES NO WARRANTY AS TO ITS ACCURACY AND WILL NOT ACCEPT RESPONSIBILITY, HOWSOEVER ARISING, FOR ANY ERRORS OR OMISSIONS OR FOR ANY CONSEQUENCES RESULTING THEREFROM.



Acanthus WSM Architects
 The general contractor is responsible for the verification of all dimensions on site and the architect is to be informed of any discrepancy.
 The status of information contained in a computer copy of this drawing shall be limited to that conveyed by the paper copy.

Revisions:

| | | |
|---------------------------------------------------------------------------------------------------------------------------------------------|------------|---------|
| Rev P1 | 01.09.23 | MWC/JK |
| First Issue | | |
| Rev P2 | 04.09.23 | MWC/JK |
| Scale increased as per client instruction. | | |
| Rev P3 | 26.09.2023 | JDK/DRP |
| Plots 1-12 moved back to accommodate footpath. Redirock wall & external steps. Fences updated to suit. Plots 41 & 42 rear gardens adjusted. | | |
| Rev P4 | 10.10.2023 | JDK/DRP |
| Plots 1 & 2 moved towards plots 3 & 4, in order to increase distance to Redirock wall. | | |
| Rev P5 | 30.10.2023 | JDK/DRP |
| Gabion wall to rear of plots 50-53 updated. | | |

- Key**
- Type A 1.8m High timber fence with lockable timber gate
 - Type B 1.5m High fence with 0.3m trellis
 - Type C 1.5m High fence
 - Type D 1.1m High galvanized steel railings fence powder coated finish (colour black)
 - Type E 2.0m High acoustic fence specification subject to noise report recommendations. Concrete gravel boards to be used along fence line where required.
 - Type F 0.45m Knee rail. Square timber posts with circular powder coated galvanized steel rails.
 - Type G 1.5m High open boarded fence with 0.3m trellis
 - Indicative location of gabion wall retaining structure
 - Indicative location of the Cortig retaining structure
 - Indicative location of the Redi-Rock retaining structure
 - Potential retaining structure TBC
 - Precast concrete or timber stair
 - Number of risers subject to confirmation of the height of adjacent banking 1.1m high metal balustrade face fixed to steps where level changes are greater than 600mm in height.

Countryside Partnerships

| | |
|------------------------------------|------------|
| Scale | 1:250 @ A1 |
| Date | 04.09.23 |
| Drawn/Checked | MWC/JK |
| 4035-20-AWSM-XX-XX-DR-A-SO-1032-P2 | |
| Status | S0 Rev P5 |

ACANTHUS ARCHITECTS

Based on Site Layout 4035.20.105X
Boundary Plan
 Sheet 1 of 2
 Blue Hills Estate Farm,
 Birkenshaw

1:1 SCALE BAR
 0 10 20 50 100 Millimeters

Scheme title: A58 Whitehall Road West, Birkenshaw
Structure title: Proposed Private Redi-Rock Retaining Wall

Struct Ref: K66044
Rev P5 19/06/2024

APPENDIX C

ADDITIONAL INFORMATION

Redi-Rock International

05481 US 31 South
Charlevoix
MI 49720
USA

Tel: 001 231 237 9500 Fax: 001 231 237 6521
e-mail: info@redi-rock.com
website: www.redi-rock.com



HAPAS Certificate
15/H235
Product Sheet 1

REDI-ROCK MODULAR BLOCK SYSTEM

REDI-ROCK RETAINING WALL AND FREE STANDING WALL SYSTEMS

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 Redi-Rock Retaining Wall and Free Standing Wall Systems, non-reinforced concrete modular blocks for use in constructing retaining and free standing walls founded on granular or concrete foundations.

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 considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.



KEY FACTORS ASSESSED

Mechanical properties — key areas evaluated include:

- design strength of the concrete wall system including safety factors (see section 7)
- connection strength (see section 7).

Durability — the wall systems, with concrete modular blocks classified as XF2 to BS 8500-1 : 2015, can achieve a design life greater than 120 years (see section 9).

The BBA has awarded this Certificate to the company named above for the systems described herein. These systems have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Paul Valentine
Technical Excellence Director

Claire Curtis-Thomas
Chief Executive

Date of Second issue: 20 November 2018

Originally certificated on 4 August 2015

The BBA is a UKAS accredited certification body – Number 113.

*The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk
Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.*

Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

British Board of Agrément

Bucknalls Lane
Watford
Herts WD25 9BA

©2018

tel: 01923 665300
clientservices@bbacerts.co.uk
www.bbacerts.co.uk

Requirements

In the opinion of the BBA, Redi-Rock Retaining Wall and Free Standing Wall Systems, when designed and installed in accordance with the provisions of this Certificate, will meet the requirements of all UK Highway Authorities for the design and construction of retaining and free standing walls founded on granular or concrete foundations.

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* (1.1) and 3 *Delivery and site handling* (3.1) of this Certificate.

Technical Specification

1 Description

1.1 Redi-Rock Retaining Wall and Free Standing Wall Systems comprise plain concrete interlocking blocks with a simulated limestone, smooth limestone⁽¹⁾ or cobblestone finish, for use when constructing retaining or free standing walls. The blocks are manufactured with the dimensions and finishes indicated in Tables 1 and 2 and Figure 1.

(1) Smooth non-hazardous limestone face in compliance with the *Design Manual for Roads and Bridges* (DMRB), TD 19/06 Ref 3/2 cl 3.12 (iv).

Table 1 Block dimensions (retaining wall blocks)

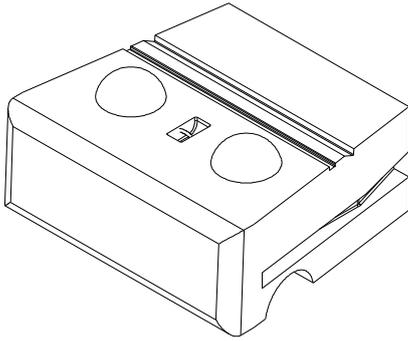
| Description | Height (mm) | Depth (mm) | Width (mm) | Setback (mm) | Weight (kg) |
|---------------|-------------|---------------|------------|--------------|---------------|
| Top | 330/457 | 710/1040 | 1170 | 41/238/422 | 555 |
| Half top | 330/457 | 710/1040 | 585 | 41/238/422 | 268 |
| Middle | 457 | 710/1040/1520 | 1170 | 41/238/422 | 739/1066/1492 |
| Half middle | 457 | 710/1040/1520 | 585 | 41/238/422 | 347/472/604 |
| Bottom | 457 | 710/1040/1520 | 1170 | 41/238/422 | 802/1126/1551 |
| Half bottom | 457 | 710/1040/1520 | 585 | 41/238/422 | 375/501/632 |
| Planters | 457 | 1040/1520 | 1170 | 422 | 916 |
| Half planters | 457 | 1040/1520 | 585 | 422 | 404 |

Table 2 Block dimensions (free standing wall blocks)

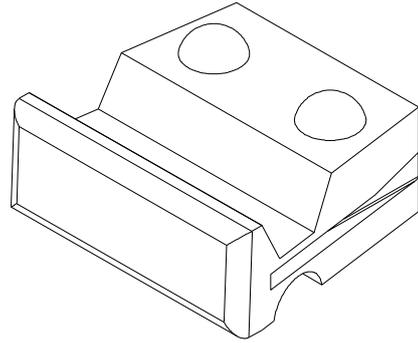
| Description | Height (mm) | Depth (mm) | Width (mm) | Weight (kg) |
|--------------------------------|-------------|------------|------------|-------------|
| Top ⁽¹⁾ | 457 | 610 | 1170 | 579 |
| Half top ⁽¹⁾ | 457 | 610 | 585 | 339 |
| Top ⁽²⁾ | 457 | 610 | 1170 | 651 |
| Top garden ⁽¹⁾ | 457 | 610 | 1170 | 518 |
| Half top garden ⁽¹⁾ | 457 | 610 | 585 | 257 |
| Top garden ⁽²⁾ | 457 | 610 | 1170 | 496 |
| Middle ⁽¹⁾ | 457 | 610 | 1170 | 693 |
| Half middle ⁽¹⁾ | 457 | 610 | 585 | 346 |
| Middle ⁽²⁾ | 457 | 610 | 1170 | 665 |
| Bottom ⁽¹⁾ | 457 | 610 | 1170 | 703 |
| Half bottom ⁽¹⁾ | 457 | 610 | 585 | 372 |
| Bottom ⁽²⁾ | 457 | 610 | 1170 | 720 |

(1) Straight block.

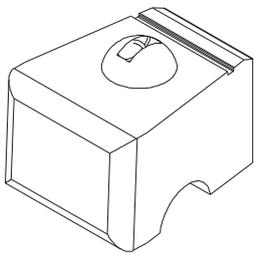
(2) Curved block.



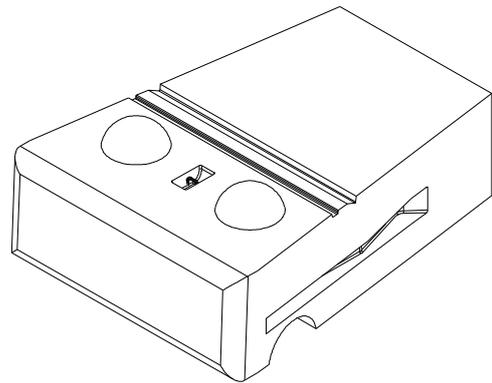
1040 middle retaining wall block



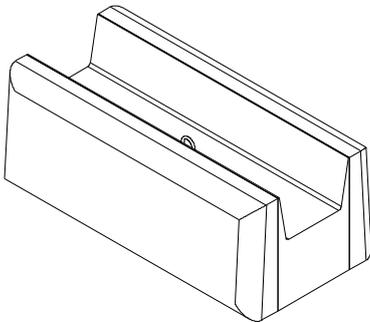
1040 planter retaining wall block



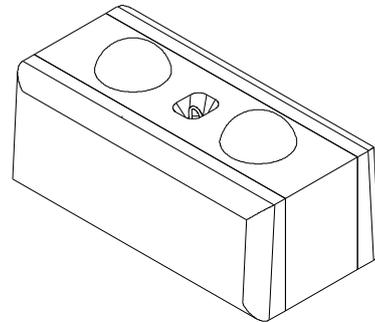
710 half middle retaining wall block



1520 middle retaining wall block



top garden free standing wall block



middle free standing wall block



limestone finish
(smooth or simulated)

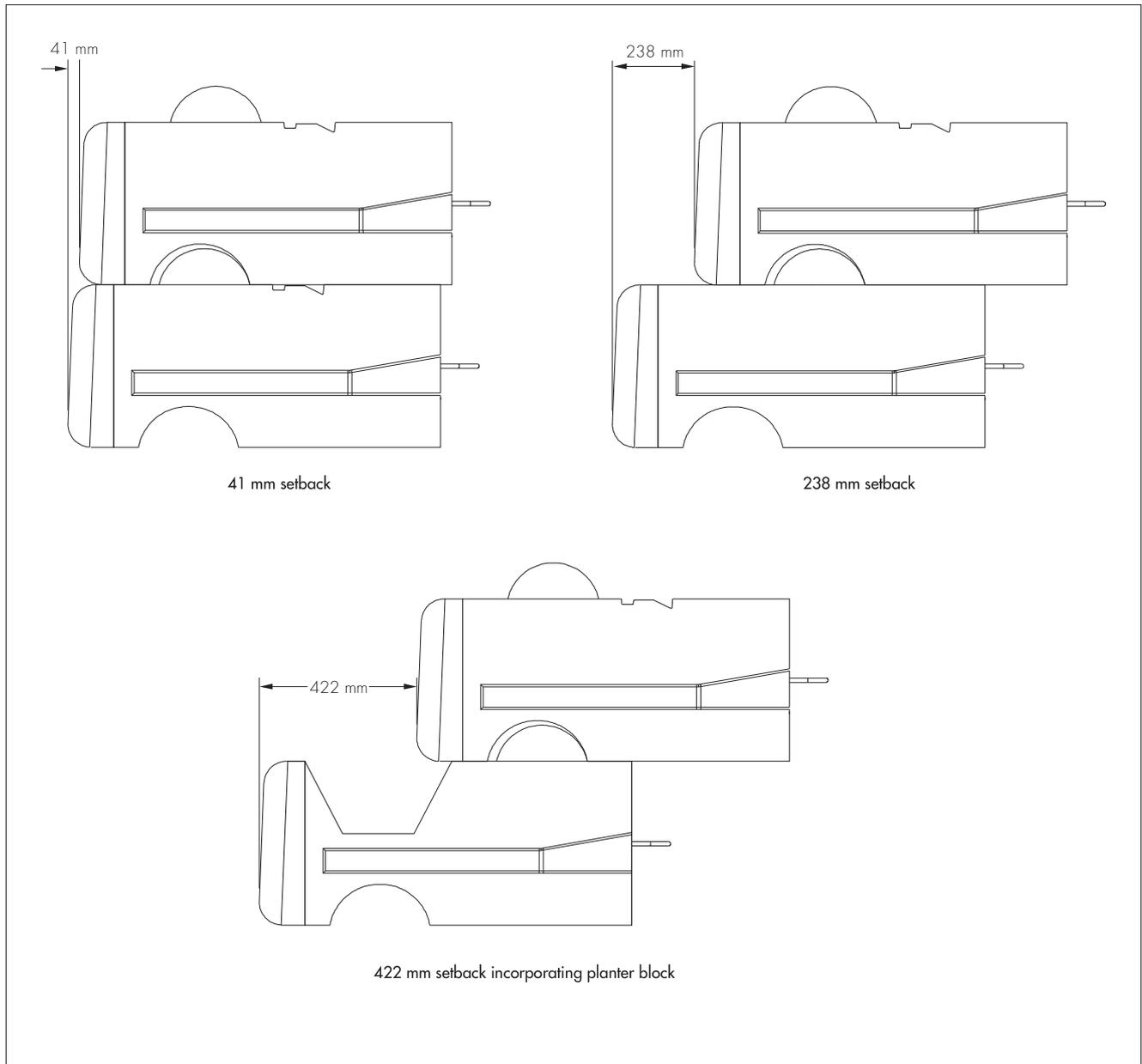


cobblestone finish

1.2 The interlocking mechanism is formed between two domes on the top surface of the block and a half circular recess along the bottom surface of the block as shown in Figure 1.

1.3 Retaining wall blocks are designed to incorporate a setback when stacked upon each other to aid stabilisation in a retaining wall system (see Figure 2). This setback is achieved by staggering the alignment of the interlocking mechanism. A 41 mm setback block will give a 5 degree batter to the front face when stacked horizontally upon each other.

Figure 2 Retaining wall block setback detail



1.4 The free standing wall blocks are designed to sit flush on top of each other via connection with the interlocking mechanism.

1.5 During the casting process, lifting points are incorporated on the top of the blocks.

1.6 The minimum concrete strength of the blocks is $40 \text{ N}\cdot\text{mm}^{-2}$ at 28 days. The concrete mix specification comprises a minimum cement content of $380 \text{ kg}\cdot\text{m}^{-3}$ and a maximum water/cement ratio of 0.4. The concrete satisfies the requirements of BS 8500-1 : 2015, exposure class XF2.

1.7 Corner blocks are available to form internal and external, right- or left-hand diversions.

1.8 Example wall details are shown in Figures 3 and 4.

Figure 3 Example of retaining wall detail

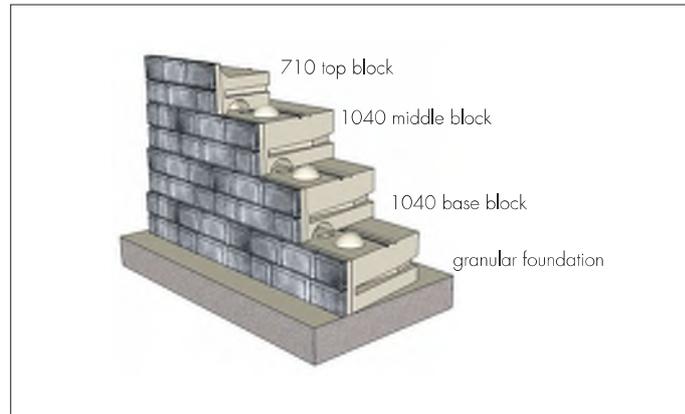
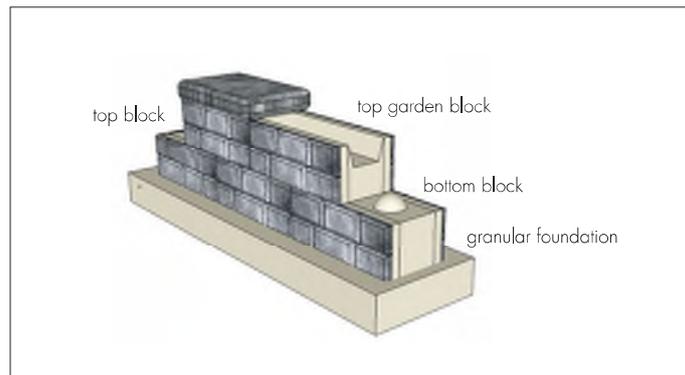


Figure 4 Example of free standing wall detail



2 Manufacture

2.1 The blocks are manufactured from architectural-grade precast concrete.

2.2 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 operated by the manufacturer are being maintained.

2.3 The systems are manufactured and marketed/distributed in UK and Ireland by:

- Marshalls PLC t/a CPM Group, CPM House, Heath Mill Road, Wombourne, Wolverhampton WV5 8AP. Telephone: 01902 356220, Fax: 01902 356221, e-mail: sales@cpm-group.com, website: www.cpm-group.com
- Moore Concrete Products Ltd, Caherty house, 41 Woodside Road, Ballymena, Co Antrim BT42 4QH. Telephone: 028 2565 2566, Fax: 028 2565 8480, e-mail: info@moore-concrete.com, website: www.moore-concrete.com

2.4 The management systems of Moore Concrete Products Limited and Marshalls PLC t/a CPM Group have been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by BSI (Certificates FM 53305 and FS 571714 respectively).

3 Delivery and site handling

3.1 Blocks are delivered to site to a maximum weight of 1.8 tonnes.

3.2 Checks must be carried out by the installer on the material upon delivery to ensure that correct unit types have been received.

3.3 The contractor/installer must prevent excessive mud, wet cement and similar materials from coming in contact with the units.

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