A1

NOTES:
1) All dimensions in mm's unless otherwise specified.

2) BLOCKS:
Block type: Diamond Pro Air 4 degree blocks

3) INSTALLATION:
Please refer to standard Manufacturer's installation guidelines.

4) Minimum Paragrid W550 geogrid (or similar approved). Grids to be installed at maximum 3 block vertical centres with the bottom geogrid layer to be placed on top of the base of the Diamond Air Pro block. Grid lengths to be as shown in sections. Intermediate wall heights to be constructed with grid lengths from the higher section.

5) BACKFILL:
GEOGRID SECTIONS
The backfill for the walls shall comprise a selected compacted granular fill material to comply with MCHW Class 6I/J. This material is assumed to have the following characteristics: Phi' = 35 degrees, Gamma = 20 kN/m³ and c' = 0 kPa, compacted to in accordance with MCHW Series 600, Table 6/4. The Contractor is responsible for the selection of this material to ensure compliance with the geotechnical characteristics as shown on the relevant drawings and in the design documents/ calculations.

C20/25 CONCRETE BACKFILL SECTION:
C20/25 concrete to be installed to the width shown on the design sections. The concrete must be pokered into the voids in and between the blocks to create a monolithic structure.

Concrete backfill must be placed in lifts no higher than 600mm per day.
C20/25 concrete backfill to have a minimum density of 24kN/m³.

The concrete must comply with these standards which define exposure classes and design sulphate classes based on environmental conditions and the risk of deterioration mechanisms.

6) DRAINAGE:
CONCRETE BACKFILL SECTIONS:
A 150mmØ perforated drainage pipe should be placed along the full length of the wall at the rear of the backfill as shown. The pipe should be wrapped in a drainage geocomposite (Proofex Sheetdrain or similar) which extends up the rear face of the C20/25 concrete backfill. The pipe must be roddable and connected to appropriate site drainage outlet with consent to discharge.

GEOGRID SECTIONS:
Standard Diamond Pro Air wall drainage detail is to be formed behind the facing blocks, as shown on the sections. This is to comprise a 300mm width of free draining aggregate behind the blocks (with block voids filled with same material). A 150mmØ rigid PVC half-slotted drainage pipe should be placed along the full length of the walls at the base of the drainage column. This should be roddable and connected to appropriate site drainage outlet with consent to discharge.

Intermediate discharge/ rodding points at maximum 40m spacings required to ensure the full length of the walls drainage can be positively drained and maintained.

The installation area must be well drained to provide a stable area of works for the wall installer. The excavated slopes should be checked for any flows or seepage that require drainage measures. Any flows, seepage or standing water must be directed to a suitable outfall as soon as they are encountered. Permanent and maintained site drainage should be installed to ensure the walls remain in a fully drained condition for the design life of the structures. Temporary drainage measures should be installed to direct surface water away from the line of walls and also to prevent "ponding" at the toe/foundation which could cause this to deteriorate and soften over time.

Site drainage is outside the scope of this design.

7) FOUNDATION FOR THE WALLS:
To achieve a suitable foundation for the walls, excavation must take place down to the levels indicated on the drawing and allow for the placement of a minimum 300mm deep concrete or granular levelling pad on original slightly clayey sandy GRAVEL (GRANULAR RESIDUAL SOIL) or tested/proof rolled engineered upfill prepared by others with a minimum safe bearing resistance of 100kPa. If any soft/ loose or suitable material (such as soft clays, alluvium or organics) is present at formation it should be fully removed down to competent bearing stratum and replaced with concrete or compacted granular fill.

Due to the significant depth of variable Made Ground within the former quarry area, the proposed ground improvement solution is to excavate and re-compact the upper 3.0 m of colliery spoil (measured from existing ground level) using engineered upfill to provide a uniform, improved formation capable of supporting raft foundations. This treatment is intended to achieve a minimum allowable bearing resistance of 100 kPa.

The Principal Contractor should must confirm the suitability of the founding material and that it has a safe bearing resistance of 100kPa prior to construction commencing.
We suggest that several plate bearing tests should also be undertaken to confirm a minimum presumed bearing resistance of 100kPa for the material present at and below formation level. Plate bearing tests should be carried out to comply with BS1377-9. Incremental load tests to Cl4.1.6.4.2. If cohesive material is found at formation level, hand shear vane tests should be carried out to confirm a minimum undrained shear strength (su) of 50kPa. A minimum 600mm diameter plate should be loaded to at least 250kPa in 50kPa increments.

Construction must not commence until the Contractor has written confirmation from a local geotechnical specialist that the proposed formation level is competent and achieves the required safe bearing resistance.

The Principal Contractor and/or a Geotechnical Engineer must satisfy themselves that the proposed ground improvement will be sufficient to ensure global stability and acceptable bearing capacity/settlement magnitudes. The foundation detail, global stability, bearing capacity and settlement are outside the scope of this design and must be confirmed and checked by others. This design considers internal stability & sliding/ overturning only.

8) SITE / IN-SITU SOILS :
In-situ foundation soil (slightly clayey sandy GRAVEL (GRANULAR RESIDUAL SOIL) or tested/proof rolled engineered upfill prepared by others); these materials are assumed to have the following minimum properties:

GRANULAR RESIDUAL SOIL — *ϕ' = 33°, γ = 19kN/m³, c' = 0kPa
UPFILL — ϕ' = 27°, γ = 19kN/m³, c' = 0kPa

Retained (Class 1/2C Upfill); this material is assumed to have the following minimum properties.
UPFILL — ϕ' = 27°, γ = 19kN/m³ & c' = 0kPa

*As per Lithos Report No 3478/3, Section 15.5.26 angle of shearing resistance
The Principal Contractor is responsible for ensuring the in-situ soils comply with the geotechnical characteristics as shown on the relevant drawings and in the design calculations.

The Contractor is also responsible for ensuring the upfill is properly placed and compacted to achieve a minimum of 95% maximum dry density.

9) TYPICAL FRONT FACE STEP:
Face angle = 4°

10) TEMPORARY EXCAVATION
Excavations can fall rapidly and without warning.Temporary stability or design of any temporary works is currently outside Geoman's scope.

11) HEAVY CONSTRUCTION TRAFFIC OPERATING CLOSE TO THE WALLS
It should be ensured that the face batter is not compromised by the use of heavy compaction plant machinery too close to the front face of the Diamond Pro Air walls. If construction plant is to traffic the crest area of the walls, a suitable haul road design must be undertaken and be set back an adequate distance from the rear of the walls (designed by others). If construction plant operates on the unprotected retained material, bulging of the walls may occur.

12) STATUTORY APPROVAL
The Client/ Client's Consulting Engineer must check to see if any statutory approvals such as Technical Approval, NHBC Approval, Geotechnical Certification are required for the retaining walls. If approvals are required, these must be gained before construction. Any approval work is outside the scope of this design. Geomani A&G cannot be held responsible if the walls do not obtain Technical Approval. Proceeding without approval is at risk.

13) PEDESTRIAN/ VEHICLE BARRIER
Assumed a maximum 1.8m high fence (to be designed by others). The fence posts must be fully concreted into minimum 0.3mØ, 1.0m long void formers pre-installed in the backfill behind the walls. The geogrid reinforcement must be locally cut in secondary reinforcement direction to accomodate the fence post foundations.
If a higher screen fence is to be installed behind the walls larger post foundations will be required.

Any vehicular restraint system is subject to detailed design by the Client's Consulting Engineer and is outside Geoman's scope. VRS supporting base slab to be designed in accordance with BS8006-1:2010 Annex E, for normal/high level of containment, such that no load from the VRS needs to be considered in the retaining wall design.

14) SERVICEABILITY MOVEMENT OF FLEXIBLE RETAINING STRUCTURES AFFECTING EXISTING/PROPOSED BUILDING OR FOUNDATIONS OR SURFACE FINISHES
It is assumed that any foundations close to the walls will be placed prior to or alongside construction of the walls to avoid either being destabilised. The building foundations must be designed NOT to rely on the flexible Diamond Pro Air walls and the reinforced/ concrete backfill for any support (including lateral support). Any existing foundations are assumed to be based at a level deep enough that a 45 degree line taken down from the bottom of the existing foundation does not pass through the proposed reinforced soil/concrete block. The structure foundations are outside the scope of this design.

Please advise us if a piling rig is to be used on the retained side of the walls, as well as its required minimum offset and maximum operational surcharge. The design must be checked to consider the rig loads, and the geogrid lengths/ concrete backfill dimensions may need to increase (TBC).

Some settlement will occur after construction, depending on the compaction and condition of the backfill placed and the properties of the underlying soil. The proposed magnitudes of settlement experienced by the wall and reinforced backfill will be governed primarily by the compressibility of the underlying subsoils. We advise that the surface of the reinforced soil zone is monitored, and the final surfacing is only placed once post construction settlement has ceased..

15) SURCHARGE
A maximum live load of 5kN/m2 (unless where retaining driveway/internal road, then a maximum live load of 10kN/m2) was assumed to act on the retained side of the walls.
Please advise if a higher allowance should be considered and we will revise this design.

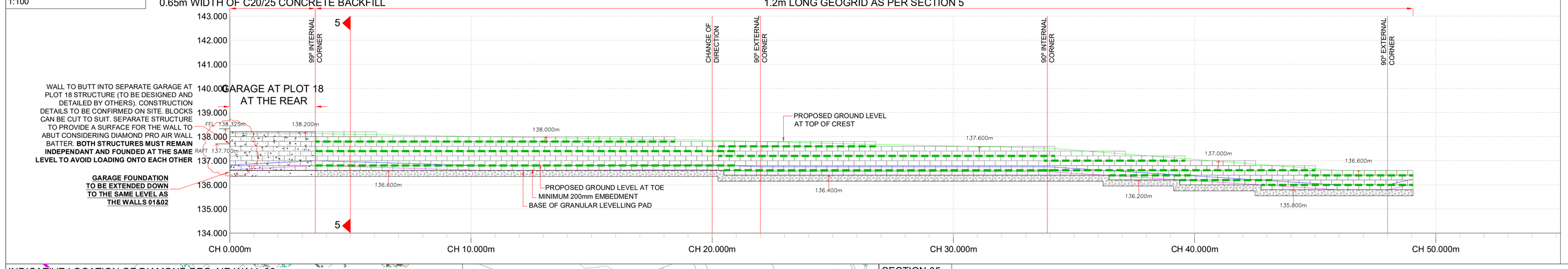
16) SETTING OUT
The setting out is to be provided by the Scheme Designer. The wall line shown on the plan is as per the drawing provided. The Fence line is offset from the toe of the wall as shown on the sections - any required correction to the toe line to accommodate the fence is to be confirmed prior to construction.

17) MINING AND QUARRYING
This design excludes all risks associated with the historic mining operations including the possible presence of voids beneath the retaining wall. It is assumed that all voids have been identified and stabilised via grouting or other suitable methods. Risks of differential settlement due to the location of historic mining are also outside the scope of this design and should be checked by others as part of the site settlement assessment.

18) NOTES ON CALCULATIONS/DRAWINGS:
These plans and the accompanying design documentation should be thoroughly checked by the Client's Consulting Engineer. Any apparent errors, omissions or variations should be reported immediately to Geoman Ltd. Construction of these walls shall not commence unless and until the Client/ Client's Consulting Engineer has considered the Geoman Design Submission Document (QP06 Ref: 25-6276-F1) to ensure that there are no errors, omissions or conflict with the scheme design.

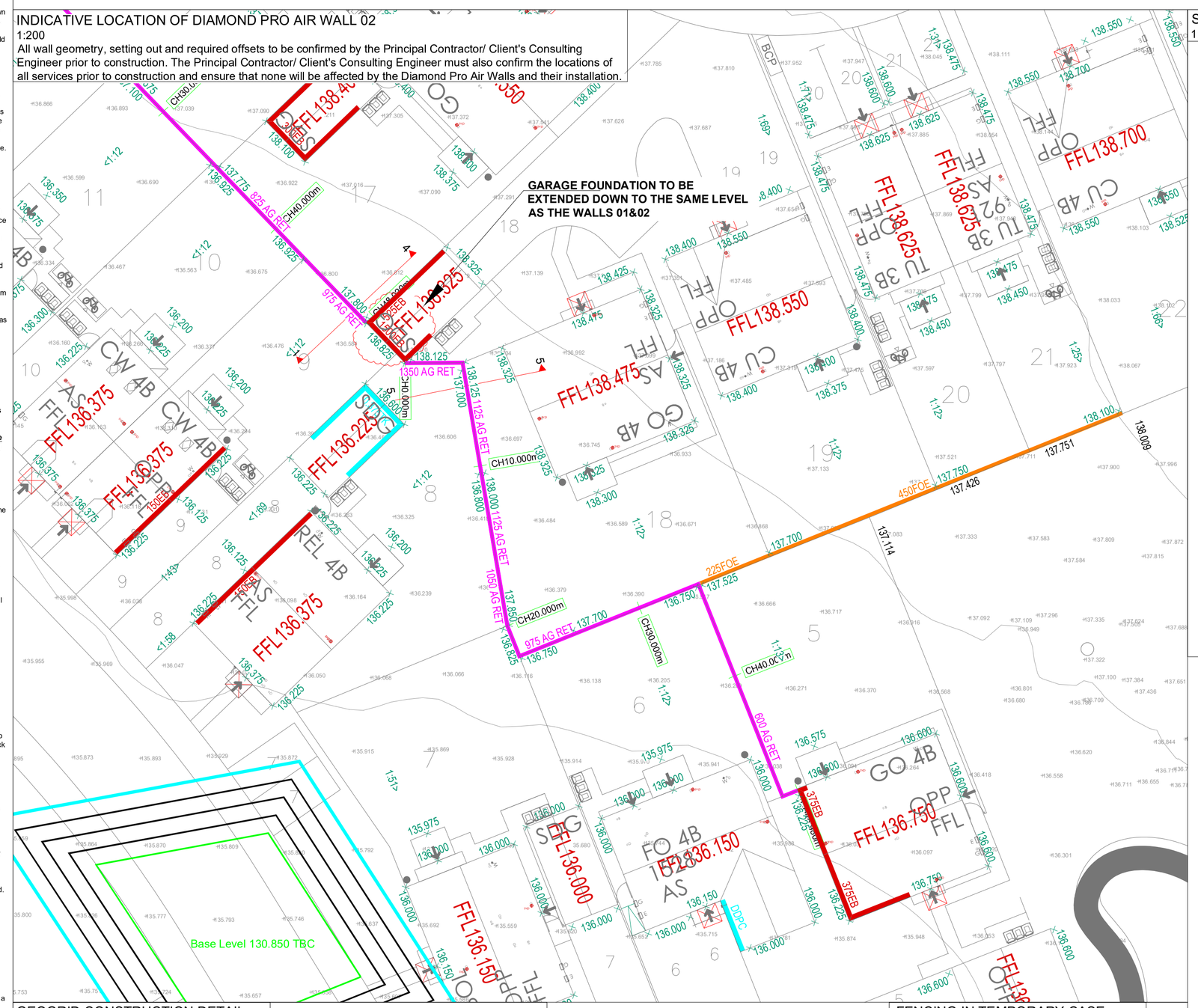
A&G will not be liable for any loss or damage resulting from or arising out of the use of its products where those products have been used other than in accordance with A&G's advice and product specifications. Unless advice is specifically requested in respect of parts of the slope not within the area where the works are undertaken A&G shall not be liable for any loss or damage resulting from or arising out of any weakness or other problem in the slope outside the area where the works are undertaken. This drawing, or design proposal, remains the copyright of A&G and is not to be copied or disclosed to any persons other than the person to whom it is originally intended.

ELEVATION OF WALL 02
1:100

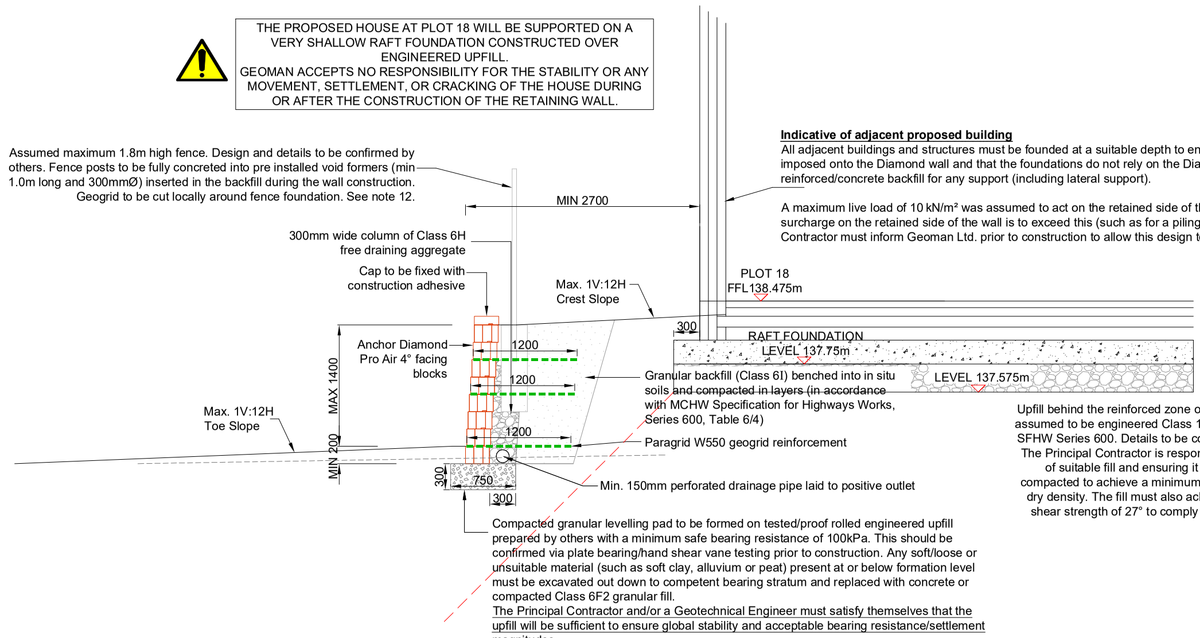


INDICATIVE LOCATION OF DIAMOND PRO AIR WALL 02
1:200

All wall geometry, setting out and required offsets to be confirmed by the Principal Contractor/ Client's Consulting Engineer prior to construction. The Principal Contractor/ Client's Consulting Engineer must also confirm the locations of all services prior to construction and ensure that none will be affected by the Diamond Pro Air Walls and their installation.

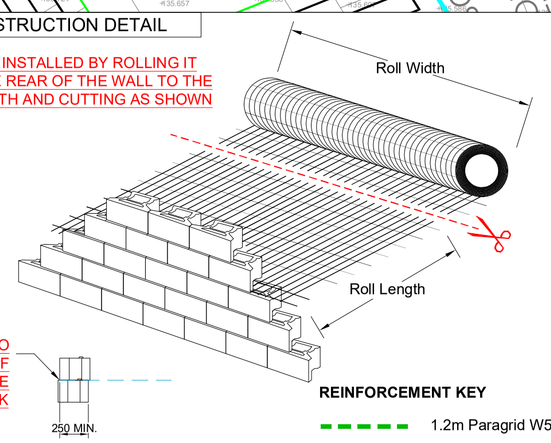


SECTION 05
1:50



GEOGRID CONSTRUCTION DETAIL

GRID MUST BE INSTALLED BY ROLLING IT AWAY FROM THE REAR OF THE WALL TO THE REQUIRED LENGTH AND CUTTING AS SHOWN



EXTEND GRID TO WITHIN 25mm OF THE FRONT OF THE LOWER BLOCK

REINFORCEMENT KEY
1.2m Paragrid W550

INCORRECT ORIENTATION OF THE PARAGRID (FOR EXAMPLE ROLLING THE PARAGRID OUT PARALLEL TO THE ROLL FACE) IS LIKELY TO LEAD SUDDEN TO WALL FAILURE DUE TO INSUFFICIENT PARAGRID STRENGTH IN THE SECONDARY DIRECTION. **PARAGRID MUST NOT BE ROLLED OUT PARALLEL TO WALL FACE.**

GEOGRID PLACEMENT RULES:

1) 1st layer no higher than top of the 1st block course

2) Subsequent layers at no greater than 600mm vertical c/c (3 Anchor Diamond Pro Air block courses)

3) Top layer to be min 200 mm (1 blocks) or max 400mm (2 blocks) below finished ground level.

4) Where a geogrid layer steps up/down one course, there should be a minimum overlap of 450mm (one block length)

5) Grid lengths from the higher sections should be used for intermediate wall heights.

6) The geogrid is always placed with the roll direction (direction of strength) perpendicular to the wall face, i.e. cut in the required lengths.

7) When filling over the geogrid, a minimum of 100mm of fill must be placed over the geogrid before driving plant over it.

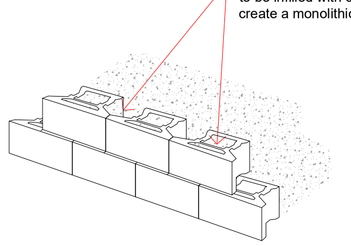
FENCING IN TEMPORARY CASE

The retaining structure is designed to support a 1.8m fence in the permanent condition, however in the temporary condition issues can arise as the fence may not be fully supported. This can lead to damage to the fence and the retaining structure. Therefore we would make the following recommendations to avoid any movement of the fence in the temporary condition.

- We strongly recommend all fence boarding to be left off where possible until all other surrounding works are complete (e.g. fence returns, upfilling, surrounding structures)
- Where boarding must be installed prior to installation of fence returns (ie fences between gardens), temporary braces should be installed.
- In locations where any of the above is not possible boarding must not be installed until all other works are complete.

Where any movement occurs in the temporary case and these recommendations have not been followed, Geoman shall not be held liable for the cost of any repairs to the fencing and/or the retaining structure.

C20/25 CONCRETE BACKFILL DETAIL



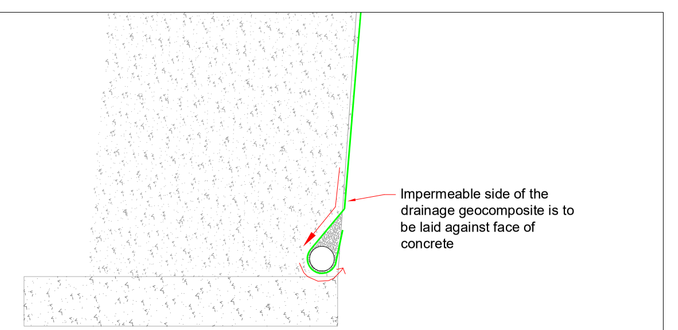
C20/25 CONCRETE BACKFILL NOTES:

C20/25 must be placed in no higher than 600mm (3 block course) lifts per day.

The C20/25 concrete backfill must be pokered into the voids in and behind the facing blocks to create a monolithic structure.

REINFORCEMENT KEY:

MIN 0.65m WIDE C20/25 CONCRETE



REVA				RC		16/12/25	
REV0				RC		05/12/25	
Status/Rev:	Description:			Drawn:	App.:	Date:	

Drawing Title: DIAMOND PRO AIR WALL 02 GENERAL ARRANGEMENT
Designed: RC Date: 05/12/25
Project Title: HOYLAND, SOUTH YORKSHIRE
Scale @ A1: As Shown Unit: mm Project Number: 25-6276-F1
Checker: RC Date: 05/12/25
Client: BELLWAY
Drawing Number: SK25-6276-F1-02 Revision: A
Approved: Date:
Drawing Status: CONCEPT/PRELIMINARY ONLY ☐ FOR APPROVAL ☒ FOR CONSTRUCTION ☐ AS BUILT ☐

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