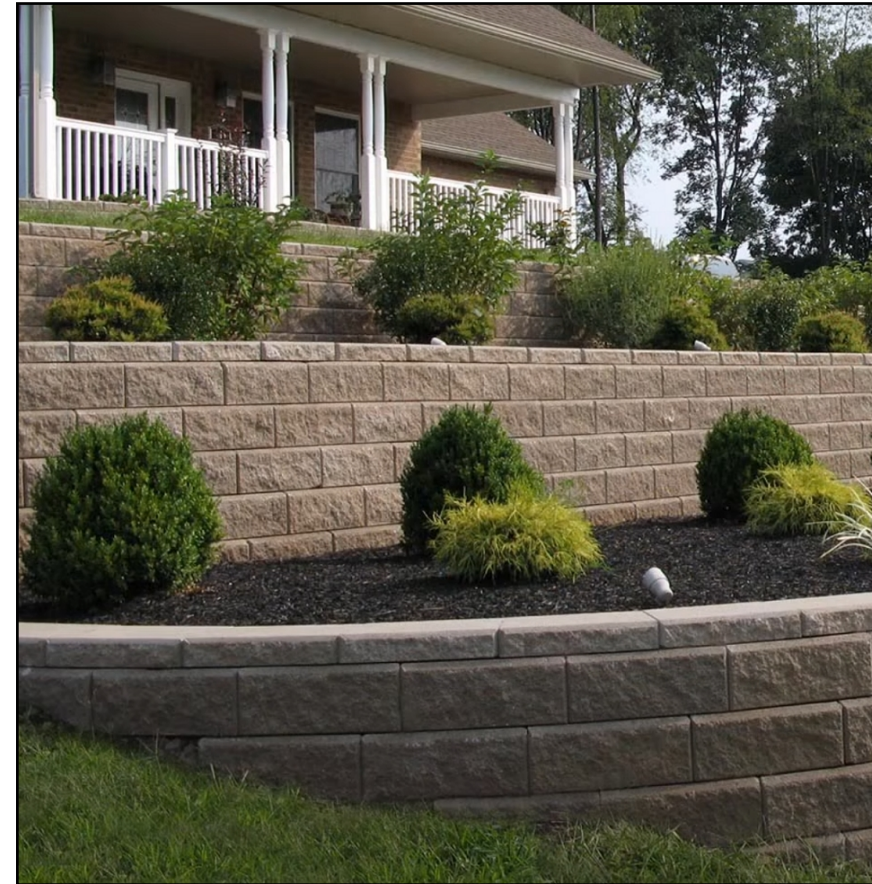


GEOGRID REINFORCED RETAINING WALL CONSTRUCTION DRAWINGS

MY RETAINING WALL

DRAWING INDEX

- S1 TITLE SHEET
- S2 SITE PLAN EXAMPLE
- S3 MY SITE PLAN
- S4 CROSS SECTION EXAMPLE
- S5 MY CROSS SECTION
- S6 QUANTITIES EXAMPLE
- S7 MY QUANTITIES
- S8 DESIGN/CONSTRUCTION NOTES



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PROJECT

MY RETAINING WALL

SHEET TITLE

TITLE SHEET

FILE NO. SHEET ID.

001

S1

SHEET SIZE 11X17 25 mm

*THESE ARE GENERAL CONSTRUCTION DRAWINGS THAT ARE NOT SUITABLE FOR ALL SITE CONDITIONS OR LOADING CONDITIONS.
THE DRAWINGS, NOTES, AND SPECIFICATIONS CONTAINED HEREIN SHOULD BE USED FOR INFORMATION ONLY.
NO WARRANTY IS EXPRESSED OR IMPLIED SHOULD THESE PLANS BE USED TO CONSTRUCT A RETAINING WALL.
YOU SHOULD NOT BUILD A RETAINING WALL WITHOUT FIRST CONSULTING WITH A LOCAL GEOTECHNICAL ENGINEER.

NOTES

THIS IS AN EXAMPLE SITE PLAN (BIRDS EYE VIEW). SEE THE NEXT PAGE FOR A BLANK SITE PLAN PAGE THAT YOU CAN FILL OUT.

THE INSTRUCTIONS HERE ARE TO HELP YOU DETERMINE THE REQUIRED MATERIAL QUANTITIES FOR CONSTRUCTION.

THE SITE PLAN HERE IS SHOWING A 1.15 m TALL WALL.

1. START BY STAKING AND MEASURING THE LENGTH OF WHERE YOU'D LIKE YOUR RETAINING WALL TO GO. MARK THE SHAPE AND DIMENSIONS ON THE BLANK SITE PLAN ON THE NEXT PAGE. IF YOUR WALL IS CURVED YOU SHOULD USE **A MEASURING WHEEL** TO DETERMINE ITS LENGTH.

TOTAL LENGTH =
 $11.50\text{ m} + 4.0\text{ m} + 3.0\text{ m} + 5.0\text{ m} = 23.50\text{ m}$
 OR
 $450'' + 157.5'' + 118.1'' + 196.9'' = 922.5''$

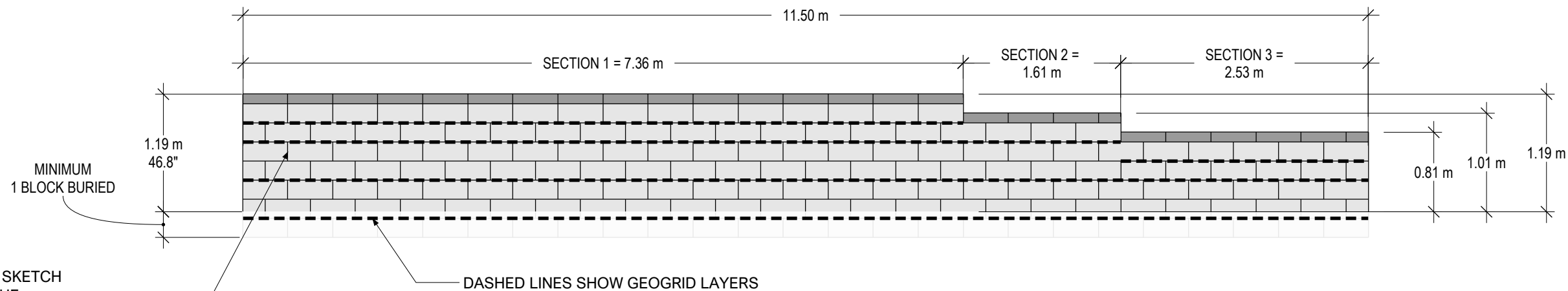
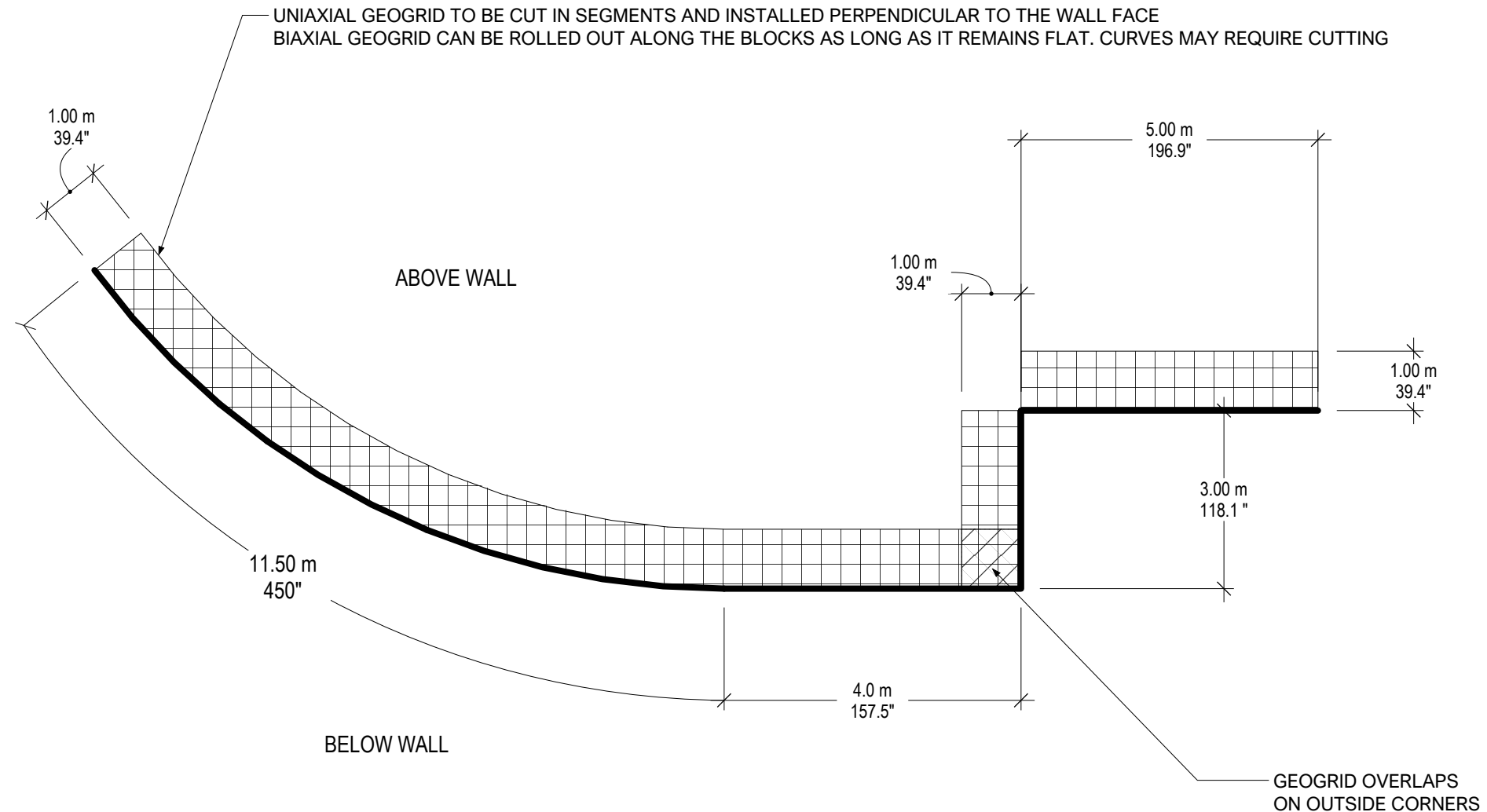
2. USE THE GEOGRID LENGTH FORMULA (GEOGRID LENGTH = $0.8 \times$ WALL HEIGHT) TO DETERMINE HOW MUCH EXCAVATION AND/OR BACKFILL YOU WILL NEED BEHIND THE WALL AND WRITE IT DOWN.

IN THIS EXAMPLE YOU WILL NEED 1.0 m OF EXCAVATION BEHIND EACH 1.0 m WALL SEGMENT.

3. IF YOUR WALL CHANGES HEIGHTS OVER ITS LENGTH, IT MAY BE HELPFUL TO ALSO SKETCH A FACE VIEW OF YOUR WALL. IF YOU DO SKETCH YOUR WALL, MAKE SURE YOU ACCURATELY SHOW EACH ROW OF BLOCKS AND THE MEASUREMENTS OF EACH DIFFERENT HEIGHT SECTION

SECTION 1: 7.36 m
 SECTION 2: 1.61 m
 SECTION 3: 2.53 m

THESE LENGTHS ARE VERY IMPORTANT FOR YOUR GEOGRID AND GEOTEXTILE QUANTITY CALCULATIONS



THIS FACEVIEW SKETCH ONLY SHOWS THE CURVED PORTION OF THE WALL

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MY RETAINING WALL

SHEET TITLE

MY SITE PLAN

FILE NO.

001

SHEET ID.

S3

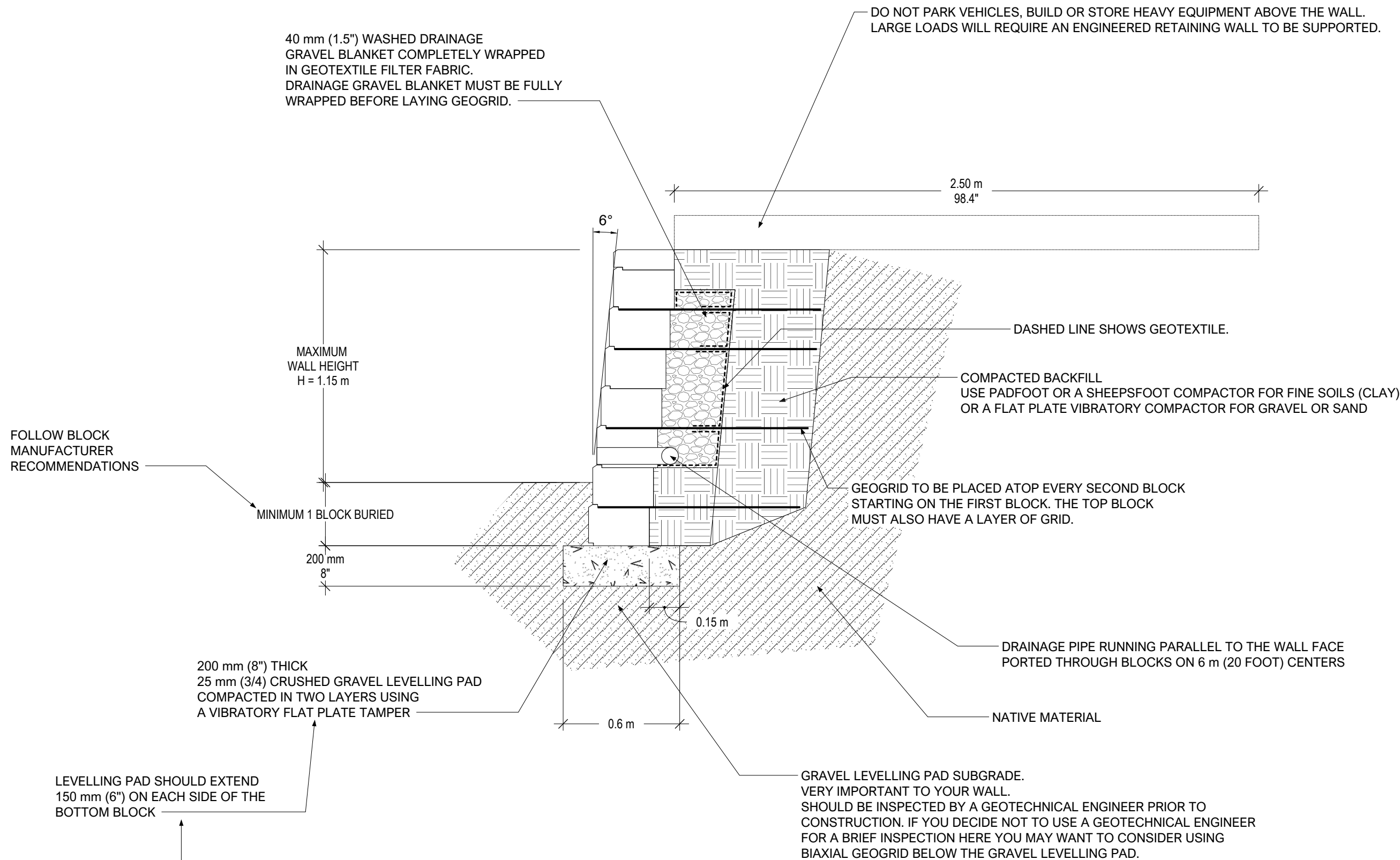
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SHEET SIZE 11X17

25 mm

0



MY RETAINING WALL

CROSS SECTION EXAMPLE

001

S4

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MY RETAINING WALL

SHEET TITLE

MY CROSS SECTION

FILE NO.

001

SHEET ID.

S5

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LEVELLING PAD CALCULATION

TO DETERMINE THE TOTAL VOLUME OF 25 mm (3/4") GRAVEL WE WILL REQUIRE, WE NEED TO MULTIPLY THE TOTAL LENGTH BY THE AREA OF THE GRAVEL LEVELLING PAD. MAKE SURE YOU ARE MULTIPLYING BY THE SAME UNITS! (m x m, mm x mm, foot x foot,)

RECALL THE GRAVEL LEVELLING PAD AREA WE CALCULATED ON PAGE S4: **0.12 m²**
RECALL THE TOTAL LENGTH OF THE WALL WE MEASURED ON PAGE S2: **23.50 m**
VOLUME OF CRUSHED GRAVEL REQUIRED: 0.12 m² x 23.50 m = 2.82 m³

AS THE GRAVEL COMPANY WILL DELIVER UNCOMPACTED MATERIAL, YOU MUST ACCOUNT FOR THE LOSS OF VOLUME FROM COMPACTING THE MATERIAL. A TYPICAL "COMPACTION FACTOR" FOR GRAVEL IS **0.88**

REQUIRED CRUSHED GRAVEL VOLUME = VOLUME ÷ COMPACTION FACTOR
REQUIRED 80 mm (3") GRAVEL VOLUME = 2.82 m³ ÷ 0.88 = **3.20 m³**

THEREFORE, YOU REQUIRE 3.20 m³ OF CRUSHED GRAVEL TO BE DELIVERED FOR THE LEVELLING PAD.

THE COMPACTION FACTOR DEPENDS ON YOUR LOCAL GRAVEL. ASK THE GRAVEL COMPANY BY HOW MUCH YOU SHOULD INCREASE YOUR ORDER QUANTITY TO ACCOUNT FOR COMPACTION.

IT IS RECOMMENDED THAT YOU DO NOT ORDER ALL OF THE GRAVEL AT ONCE. GRAVEL TRUCKS CAN SPREAD THE GRAVEL FOR YOU, SAVING YOU A LOT OF WORK. YOU WILL ALSO BE ABLE TO ADJUST YOUR ORDER SIZE ONCE YOU SEE HOW MUCH MORE YOU NEED AFTER THE FIRST LAYER OF GRAVEL HAS BEEN COMPACTED.

START BY ORDERING HALF THE CALCULATED GRAVEL QUANTITY FOR THE BASE LAYER.

GEOTEXTILE FILTER FABRIC QUANTITY CALCULATION

FOR EVERY SECTION OF WALL OF A DIFFERENT HEIGHT, YOU WILL REQUIRE
1.9 x WALL HEIGHT x SECTION LENGTH = GEOTEXTILE AREA

FROM OUR EXAMPLE ON PAGE S2: WE WOULD REQUIRE
SECTION 1 HEIGHT: **1.19 m**. SO, 1.9 x 1.19 m = **2.26 m** OF GEOTEXTILE PER m OF WALL FACE
SECTION 2 HEIGHT: **1.01 m**. SO, 1.9 x 1.01 m = **1.92 m²** OF GEOTEXTILE PER m OF WALL FACE
SECTION 3 HEIGHT: **0.81 m**. SO, 1.9 x 0.81 m = **1.54 m²** OF GEOTEXTILE PER m OF WALL FACE

SECTION 1 LENGTH: **7.36 m**. SO, 2.26 m²/m x 7.36 m = **16.63 m²** OF GEOTEXTILE FOR SECTION 1
SECTION 2 LENGTH: **1.61 m**. SO, 1.92 m²/m x 1.61 m = **3.09 m²** OF GEOTEXTILE FOR SECTION 2
SECTION 3 LENGTH: **2.53 m**. SO, 1.54 m²/m x 2.53 m = **3.54 m²** OF GEOTEXTILE FOR SECTION 3

REMEMBER THAT YOU'LL NEED TO OVERLAP THE GEOTEXTILE 0.3 m (1') AT SEAMS, SO SUBTRACT THE OVERLAP FROM THE ROLL WIDTH, THEN DETERMINE HOW MANY ROLLS YOU NEED.

EXAMPLE: ROLL WIDTH = 3.0 m , ROLL LENGTH = 15.0 m
SO, EFFECTIVE ROLL WIDTH = 3.0 m - 0.3 m = 2.70 m
EFFECTIVE ROLL AREA = 15.0 m x 2.70 m = 40.5 m²

USUALLY YOU NEED TO BUY AN ENTIRE ROLL OF GEOTEXTILE SO YOU'LL NEED TO MULTIPLY THE WIDTH OF THE ROLL BY ITS LENGTH AND MAKE SURE THAT RESULT IS HIGHER THAN THE SUM OF ALL OF YOUR RETAINING WALL SECTIONS

IN THE CASE OF OUR EXAMPLE **PORTION** OF WALL, WE WOULD NEED TO BUY 1 ROLL OF GEOTEXTILE.

NOTE THAT WE HAVE ONLY CALCULATED THE CURVED PORTION OF THE WALL IN THIS SECTION

BACKFILL CALCULATION

RECALL THE TOTAL LENGTH OF THE WALL WE MEASURED ON PAGE S2: **23.50 m**
RECALL THE LENGTH OF GEOGRID WE ARE USING: **1.00 m**

BACKFILL VOLUME = GEOGRID LENGTH x WALL SECTION HEIGHT x WALL SECTION LENGTH
SECTION 1 HEIGHT: **1.19 m** SECTION 1 LENGTH: **7.36 m**
SECTION 2 HEIGHT: **1.01 m** SECTION 2 LENGTH: **1.61 m**
SECTION 3 HEIGHT: **0.81 m** SECTION 3 LENGTH: **2.53 m**

SECTION 1 BACKFILL VOLUME = 1.0 m x 1.19 m x 7.36 m = **8.75 m³**
SECTION 2 BACKFILL VOLUME = 1.0 m x 1.01 m x 1.61 m = **1.62 m³**
SECTION 3 BACKFILL VOLUME = 1.0 m x 0.81 m x 2.53 m = **2.05 m³**

TOTAL VOLUME = 8.75 m³ + 1.62 m³ + 2.05 m³ = 12.42 m³

AS THE BACKFILL COMPANY WILL DELIVER UNCOMPACTED MATERIAL, YOU MUST ACCOUNT FOR THE LOSS OF VOLUME FROM COMPACTING THE MATERIAL. A TYPICAL "COMPACTION FACTOR" FOR GRAVEL IS **0.88**

REQUIRED BACKFILL VOLUME = 12.42 m³ ÷ 0.88 = 14.11 m³
THEREFORE, YOU REQUIRE 14.11 m³ OF GRAVEL BACKFILL TO BE DELIVERED.

THE COMPACTION FACTOR DEPENDS ON YOUR LOCAL GRAVEL. ASK THE GRAVEL COMPANY BY HOW MUCH YOU SHOULD INCREASE YOUR ORDER QUANTITY TO ACCOUNT FOR COMPACTION.

REMEMBER IT IS ALWAYS BETTER TO HAVE A LITTLE TOO MUCH BACKFILL THAN NOT ENOUGH. YOU MAY WANT TO ADD A BIT MORE VOLUME TO YOUR ORDER.

YOU MAY USE CLAY AS BACKFILL, JUST MAKE SURE YOU ADJUST THE COMPACTION FACTOR TO 0.8.

GEOGRID QUANTITY CALCULATION

RECALL THE SECTION LENGTHS WE MEASURED. IF YOUR WALL IS A CONSISTENT HEIGHT YOU WILL ONLY NEED TO DO THIS ONCE. TO CALCULATE THE TOTAL GEOGRID WE WILL NEED TO DETERMINE THE REQUIRED AREA OF GEOGRID PER SECTION.

REQUIRED AREA OF GEOGRID = GEOGRID LENGTH x SECTION LENGTH x GEOGRID LAYERS
SECTION 1 LENGTH: **7.36 m** , SECTION 2 LENGTH: **1.61 m** , SECTION 3 LENGTH: **2.53 m**

REQUIRED AREA OF GEOGRID (SECTION 1) = 1.0 m x 7.36 m x 4 LAYERS = 29.44 m² OF GEOGRID
REQUIRED AREA OF GEOGRID (SECTION 2) = 1.0 m x 1.61 m x 3 LAYERS = 4.83 m² OF GEOGRID
REQUIRED AREA OF GEOGRID (SECTION 3) = 1.0 m x 2.53 m x 3 LAYERS = 7.59 m² OF GEOGRID

TOTAL REQUIRED AREA OF GEOGRID = 41.86 m²

SEE THE FACE VIEW DRAWING ON PAGE S2 TO SEE LAYERING OF GEOGRID. REMEMBER THAT THE BOTTOM BLOCK NEEDS GEOGRID, EVERY SECOND BLOCK AFTER THAT NEEDS GEOGRID, AND THE TOP BLOCK NEEDS GEOGRID.

ALL CALCULATIONS DONE HERE ARE IN METRIC UNITS. THE SAME CALCULATIONS AND FORMULAS WILL WORK IN IMPERIAL (FEET/INCHES). JUST MAKE SURE YOU ARE USING THE SAME UNITS THROUGHOUT EVERY CALCULATION. USUALLY YOU WILL WANT TO CONVERT ALL OF YOUR UNITS TO INCHES, COMPLETE ALL THE CALCULATIONS, THEN CONVERT BACK TO FEET/INCHES.

SEE OUR RECOMMENDED PRODUCTS PAGE FOR THE PRODUCTS WE WOULD USE ON OUR OWN HOME
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LEVELLING PAD CALCULATION

BACKFILL CALCULATION

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GEOTEXTILE FILTER FABRIC QUANTITY CALCULATION

GEOGRID QUANTITY CALCULATION

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PROJECT

MY RETAINING WALL

SHEET TITLE

MY QUANTITIES

FILE NO.

001

SHEET ID.

S7

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SHEET SIZE 11X17

25 mm

0

DESIGN NOTES

1. MATERIALS

- a) BLOCK UNITS: ALLAN BLOCK CLASSIC BLOCK UNITS
L x D x H - 460 mm x 300 mm x 190 mm , 33 kg
- b) GEOTEXTILE: SUPER GEOTEXTILE (SEE OUR RECOMMENDED PRODUCTS PAGE)
- c) SOIL:

SOIL TYPE	DESCRIPTION
BACKFILL	25 mm CRUSHED GRAVEL
LEVELLING PAD	25 mm CRUSHED GRAVEL

2. WALL DESIGN DETAILS

- a) LEVELLING PAD
 - WIDTH: 600 mm
 - THICKNESS: 200 mm
- b) DRAINAGE
 - DETAILS: 300 mm WIDE BLANKET BEHIND BLOCK, ABOVE BOTTOM OF WALL ELEVATION
 - DRAIN PIPE: 100 mm PERFORATED PVC
 - DRAINAGE PORT: PORT THROUGH BLOCK UNITS ON 6 m CENTERS OR PORT TO STORMWATER
- c) GEOTEXTILE LOCATION: AT ALL INTERFACES BETWEEN DRAIN ROCK AND BACKFILL OR NATIVE MATERIAL
- d) CAP
 - MATERIAL: LOW PLASTIC SILT OR CLAY OR TOPSOIL
 - THICKNESS: 100 mm
- e) PLUG
 - MATERIAL: LOW PLASTIC SILT OR CLAY
 - THICKNESS: TO BOTTOM OF WALL ELEVATION
- f) MIN. WALL EMBEDMENT: ONE BLOCK
- g) WALL BATTER: 6.0 DEGREES

CONSTRUCTION NOTES

1. COMPACTION RECOMMENDATIONS

- a) COMPACT LEVELLING PAD IN TWO 100 mm (4") LIFTS WITH A VIBRATORY FLAT PLATE TAMPER.
- b) COMPACT BACKFILL IN MAXIMUM 150 mm (6") LIFTS BEFORE COMPACTION
USE A VIBRATORY FLAT PLATE TAMPER FOR GRAVELS OR SANDS
USE A PADFOOT OR SHEEPSFOOT TAMPER FOR CLAYS
- c) COMPACT MATERIAL OVER GEOGRID, STARTING FROM NEAR THE BLOCK AND TOWARDS THE END OF THE GEOGRID TO MAINTAIN TENSION IN THE GRID.
GRID MUST REMAIN TENSIONED TO PROVIDE SUPPORT TO THE WALL
- d) EXERCISE CAUTION WHEN OPERATING COMPACTION EQUIPMENT WITHIN 0.3 m OF THE WALL FACE. IT MAY DISPLACE OR ROTATE THE BLOCKS.

2. SUBGRADE PREPARATION

- a) CLEAR THE AREA UNDER THE PROPOSED RETAINING WALL (UNDER BOTH THE LEVELLING PAD AND BACKFILL ZONE) OF ALL VEGETATION, TOPSOIL, BRUSH, SOD, CONSTRUCTION DEBRIS OR OTHER ORGANIC MATERIAL
- b) THE SUBGRADE SHOULD NOT BE WET, MUDDY, OR SOFT. WALKING ON IT SHOULD NOT LEAVE ANY IMPRESSION.
- c) YOU SHOULD ENGAGE A GEOTECHNICAL ENGINEER TO PERFORM A BEARING INSPECTION ON THE SUBGRADE BELOW YOUR RETAINING WALL LEVELLING PAD
IF YOU DECIDE NOT TO HIRE A GEOTECHNICAL ENGINEER, IT IS RECOMMENDED THAT YOU PLACE A LAYER OF BIAXIAL GEOGRID BELOW THE LEVELLING PAD.

3. GEOTEXTILE FILTER FABRIC PLACEMENT

- a) GEOTEXTILE FILTER FABRIC IS TO BE PLACED AT THE INTERFACE BETWEEN DRAINAGE GRAVEL AND OTHER FILL OR NATIVE MATERIALS TO PREVENT THE MIGRATION OF FINE SOIL PARTICLES
- b) A MINIMUM OVERLAP OF 300 mm IS REQUIRED BETWEEN ALL PIECES OF FILTER FABRIC
- c) WHERE GEOGRID INTERFERES WITH FILTER FABRIC PLACEMENT, A SEPARATE PIECE OF FILTER FABRIC WILL BE REQUIRED BETWEEN EACH GEOGRID LAYER

4. DRAINAGE PIPE INSTALLATION

- a) INSTALL DRAINAGE PIPE ALONG THE ENTIRE LENGTH OF THE WALL, WITHIN THE DRAINAGE BLANKET
- b) MAINTAIN A MINIMUM 1.5% POSITIVE GRADIENT THROUGHOUT DRAINAGE PIPES TO THEIR EXIT POINT
- c) WHERE THE DRAINAGE PIPE IS PORTED THROUGH THE FACE OF THE RETAINING WALL, TEE JOINTS ARE TO BE UTILIZED
- d) SURFACE DRAINAGE AND ROOF DRAINS ARE NOT TO BE CONNECTED TO THE RETAINING WALL DRAINAGE PIPE. ALL EXTERNAL DRAINAGE IS TO BE INDEPENDENT OF THE WALL DRAINAGE SYSTEM.

CONSTRUCTION NOTES

5. GEOGRID INSTALLATION

- a) GEOGRID TO BE INSTALLED ON THE TOP OF THE BOTTOM BLOCK AND EVERY SECOND BLOCK THEREAFTER.
- b) GEOGRID TO BE PLACED ON BLOCKS ACCORDING TO MANUFACTURER RECOMMENDATIONS. IN GENERAL SHOULD BE PLACED AS FAR FORWARD ON THE BLOCK AS POSSIBLE WITHOUT THE GRID BEING VISIBLE FROM THE FRONT OF THE WALL
- c) UNIAxIAL GEOGRID MUST BE INSTALLED WITH THE STRONG GRID AXIS PERPENDICULAR TO THE FACE OF THE WALL. THIS WILL REQUIRE CUTTING THE GRID INTO SEGMENTS AND INSTALLED INDIVIDUALLY.
THE THICKER OR HEAVIER GAUGE GRID SHOULD GO INTO THE WALL, NOT RUN ALONG IT
- d) BIAXIAL GEOGRID MAY BE ROLLED OUT ALONG THE BLOCKS AS LONG AS THE ROLL IS WIDE ENOUGH TO SATISFY THE GEOGRID LENGTH FORMULA
GEOGRID LENGTH = 0.8 x WALL HEIGHT

6. FINAL GRADING AND LANDSCAPING

- a) UPON COMPLETION OF RETAINING WALL INSTALLATION POSITIVE DRAINAGE IS TO BE MAINTAINED BOTH ABOVE AND BELOW THE RETAINING WALL
- b) IF SURFACE DRAINAGE IS DIRECTED TOWARDS THE RETAINING WALL, A GRASS OR CONCRETE DRAINAGE SWALE SHOULD BE INSTALLED TO DIRECT SURFACE FLOWS PARALLEL TO AND AWAY FROM THE RETAINING WALL SYSTEM
- c) MAINTAIN A MINIMUM 2% POSITIVE GRADIENT IN LANDSCAPED AREAS AND A 0.5% POSITIVE GRADIENT IN CONCRETE OR PAVED AREAS AT ALL TIMES
- d) A LOW PERMEABILITY CAP IS TO BE INSTALLED ABOVE THE TOP OF WALL AND BELOW THE BOTTOM OF WALL TO PREVENT INFILTRATION OF SURFACE WATER
- e) PONDING OF WATER ABOVE OR BELOW THE WALL, OR FLOW OF SURFACE WATER INTO THE WALL SYSTEM AT ANY TIME ARE NOT PERMITTED AND COULD RESULT IN WALL FAILURE
- f) INSTALLATION OF VEGETATION BEHIND THE RETAINING WALL IS PERMITTED IF THE ROOT BULB DOES NOT COME WITHIN 150 mm OF GEOGRID.

7. BLOCK PLACEMENT

- a) BLOCKS ARE TO BE INSTALLED AS PER MANUFACTURER RECOMMENDATIONS
- b) ENSURE BLOCKS ARE LEVEL AFTER EACH SUBSEQUENT BLOCK COURSE IS PLACED
- c) BURIED BLOCKS ARE TO BE BACKFILLED AND COMPACTED BOTH IN FRONT AND BEHIND THE BLOCK, PRIOR TO ADDITIONAL BLOCK PLACEMENT

8. ADDITIONAL NOTES

- a) ALL WALL COMPONENTS ARE TO BE INSTALLED AS PER MANUFACTURER DETAILS AND RECOMMENDATIONS
- b) NO EXCAVATION IN FRONT OF THE COMPLETED WALL IS PERMITTED
- c) TO ALLOW FOR SEASONAL MOVEMENTS, A 10 mm FIBRE-BOARD SHOULD BE INSTALLED WHERE RIGID STRUCTURES SUCH AS CONCRETE OR PAVEMENT ARE CONSTRUCTED AGAINST THE WALL

9. LIMITATIONS

- a) THE DRAWINGS AND INSTRUCTIONS CONTAINED WITHIN THIS DOCUMENT ARE NOT A SUBSTITUTE FOR ENGINEERING ADVICE OR RECOMMENDATIONS.
- b) THIS DOCUMENT SHOULD NOT BE USED FOR THE CONSTRUCTION OF ANY RETAINING WALL WITHOUT CONSULTATION FROM A QUALIFIED, LOCAL GEOTECHNICAL ENGINEER

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PROJECT MY RETAINING WALL	
SHEET TITLE DESIGN/CONSTRUCTION NOTES	
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