

Inset Plan

- Notes:**
- The surface water drainage has been coordinated with Earthworks contours dated March 2017.
  - This drawing shows the proposed surface water drainage network for Site Preparation Phase 3.
  - For surface water drainage features refer to drawings 40-ARI-WS-71-CI-DR-1071 to 74.
  - The perimeter ditches around the platforms are to be lined with an impermeable liner.

- Key:**
- Land Ownership Boundary
  - Proposed General Arrangement layout
  - Surface water drainage attenuation pond
  - Existing watercourses / ditch
  - Manhole and carrier pipe
  - Swale
  - Check dam
  - Silt fence
  - Ditch
  - Ditch with impermeable liner
  - Inlet/ outlet headwall
  - Filter drain

|                     |          |    |      |      |
|---------------------|----------|----|------|------|
| 0                   | 31/03/17 | JB | CW   | AH   |
| Issued for Planning |          |    |      |      |
| B                   | 30/03/17 | JB | CW   | AH   |
| Draft               |          |    |      |      |
| A                   | 07/03/17 | JB | NF   | AH   |
| Draft issue         |          |    |      |      |
| Issue               | Date     | By | Chkd | Appd |

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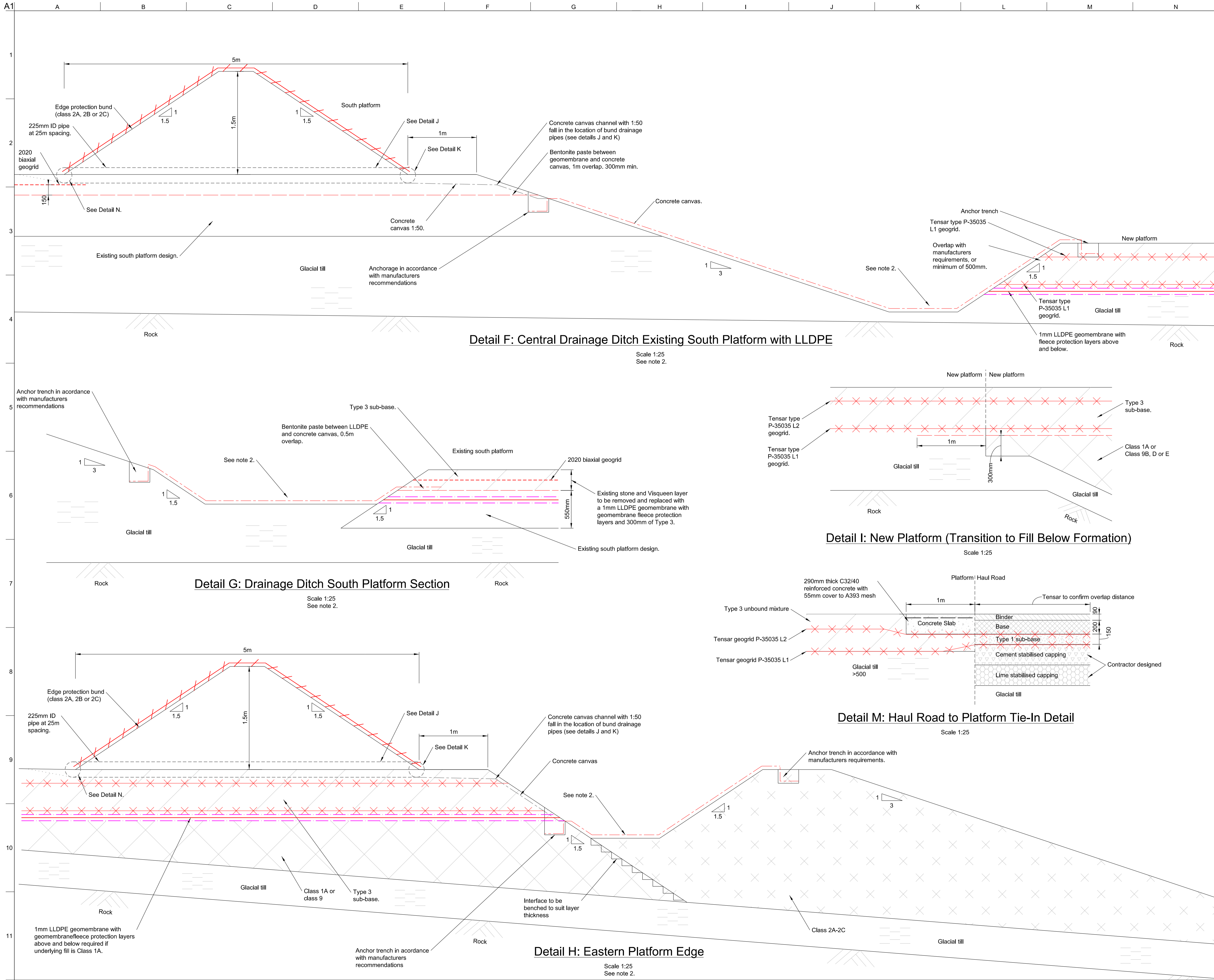
Client  
**Sirius Minerals Plc**

Job Title  
**Woodsmith Mine  
 Proposed Minehead**

**Woodsmith Mine Site  
 Construction Phase 3  
 Drainage General Arrangement**

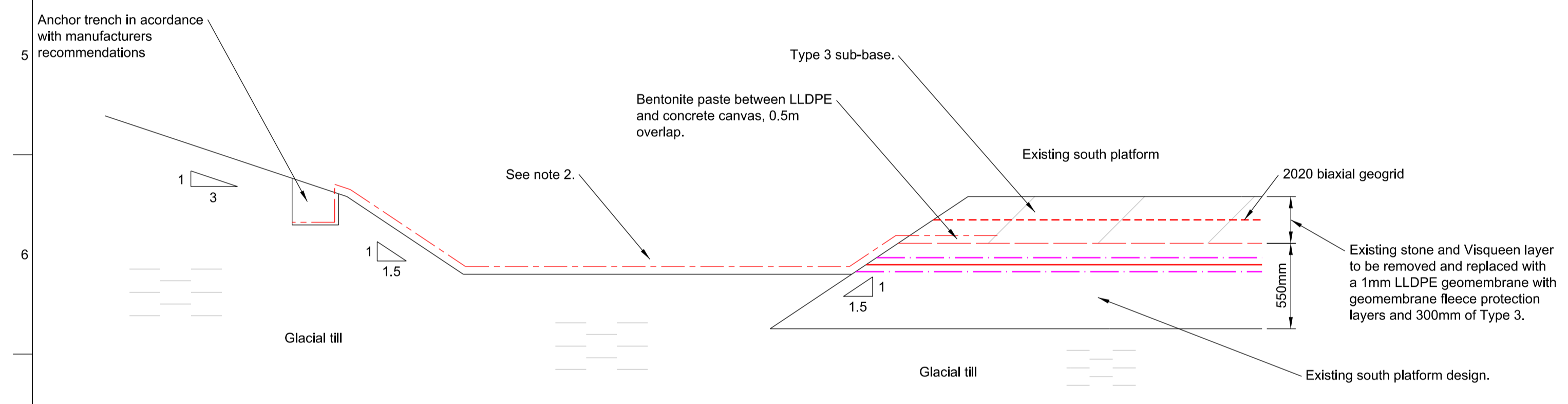
Scale at A1 1:2000  
 Discipline Drainage  
 Job No 253285 Planning  
 Drawing No 40-ARI-WS-71-CI-DR-1070 Issue 0





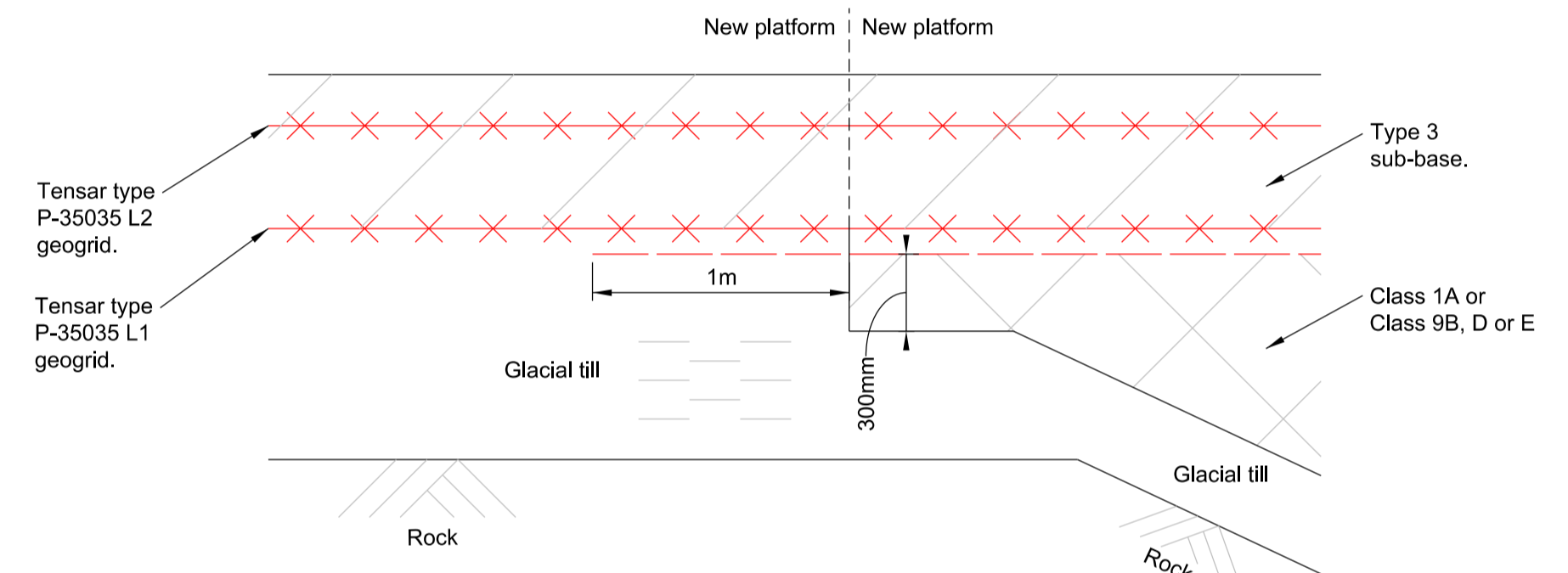
**Detail F: Central Drainage Ditch Existing South Platform with LLDPE**

Scale 1:25  
See note 2.



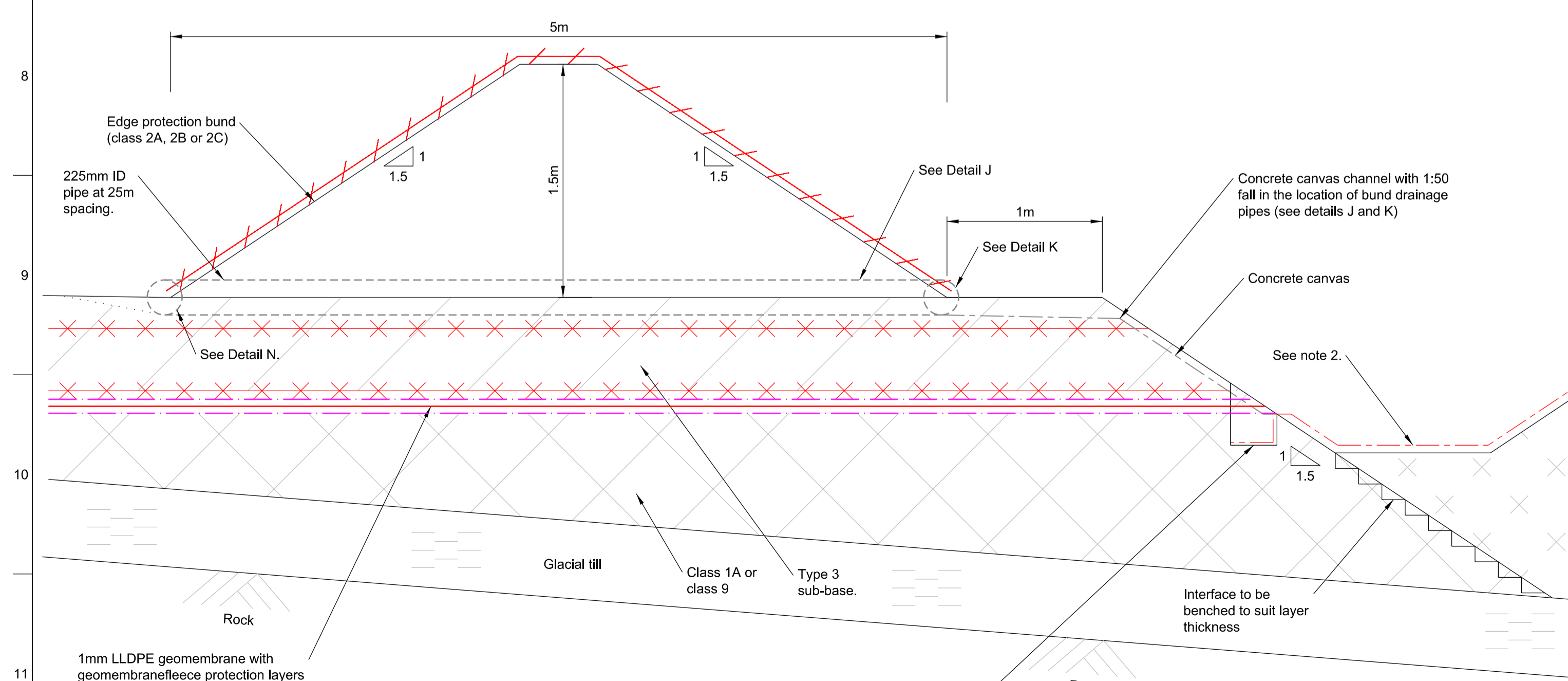
**Detail I: New Platform (Transition to Fill Below Formation)**

Scale 1:25



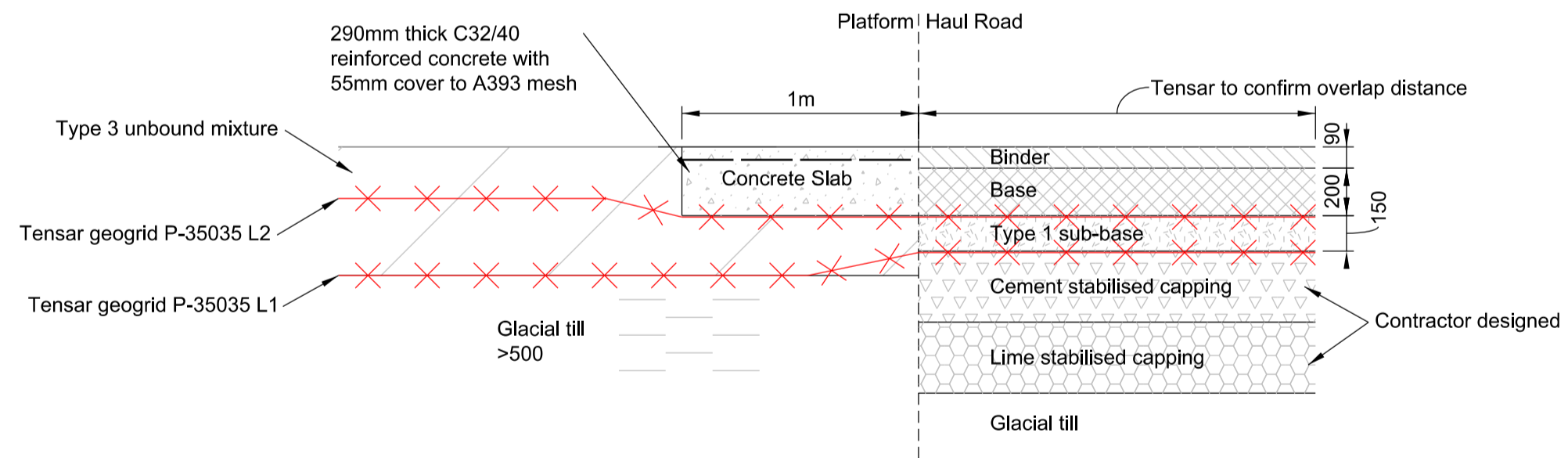
**Detail G: Drainage Ditch South Platform Section**

Scale 1:25  
See note 2.



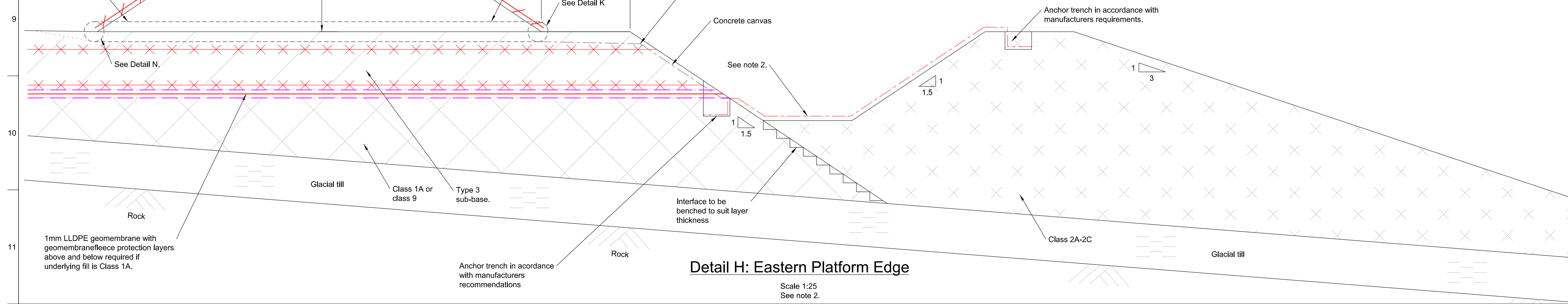
**Detail M: Haul Road to Platform Tie-In Detail**

Scale 1:25



**Detail H: Eastern Platform Edge**

Scale 1:25  
See note 2.



- Notes:
- Where glacial till is less than 500mm thick, geomembrane is to be provided at formation level. Glacial till thickness to be confirmed during construction with trial pits at 25m c/c.
  - Concrete canvas to be installed in accordance with the manufacturers guidance.
  - Formation soft spots to be excavated and replaced with compacted 6F1.
  - Edge protection bund to be hydroseeded.
  - LLDPE geomembrane to be double hot wedge welded and protected above and below by geotextile protection fleece. Refer to specification for protection fleece requirements.

- Key:
- Tensor geogrid
  - Existing geogrid
  - 1mm LLDPE geomembrane
  - Existing impermeable membrane
  - Concrete canvas (CC8 or equivalent approved)
  - Terram 1000
  - Erosion protection netting (Terracoir 400 or equivalent approved)
  - 300g/m<sup>2</sup> Geomembrane protection fleece to GRI12 (Wrekin Multitrack SNW 40UV or equivalent approved)
  - 400g/m<sup>2</sup> Geomembrane protection fleece to GRI12 (Wrekin Multitrack SNW 50SP or equivalent approved)
  - 2020 biaxial geogrid (Wrekin E'grid 2020 or equivalent approved)
  - 225mm ID drainage pipe
  - Type 1 unbound mixture (clause 803)
  - Type 3 unbound mixture (clause 805)
  - Class 1A
  - Class 2A - 2C
  - Class 6F1
  - Class 6H
  - Glacial till
  - Rock
  - Cement stabilised capping
  - Lime stabilised capping
  - Concrete slab with mesh

|                    |          |    |      |      |
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| 0                  | 31/03/17 | TC | CW   | AH   |
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| A                  | 30/03/17 | TC | CW   | AH   |
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Client  
**Sirius Minerals Plc**

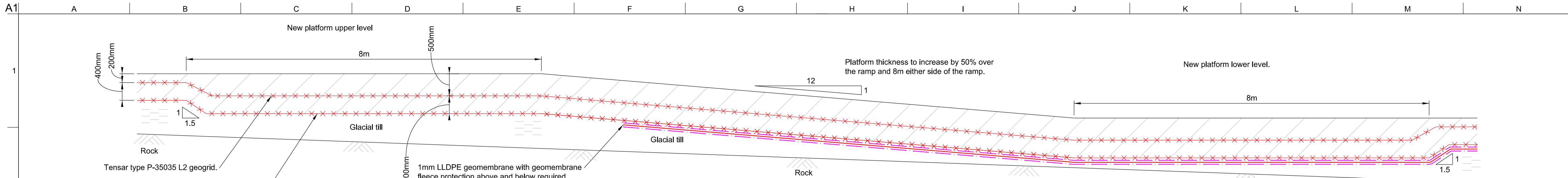
Job Title  
**Woodsmith Mine**

**Earthworks Sections  
Tie-in Details  
Sheet 2 of 2**

Scale at A1: 1:50

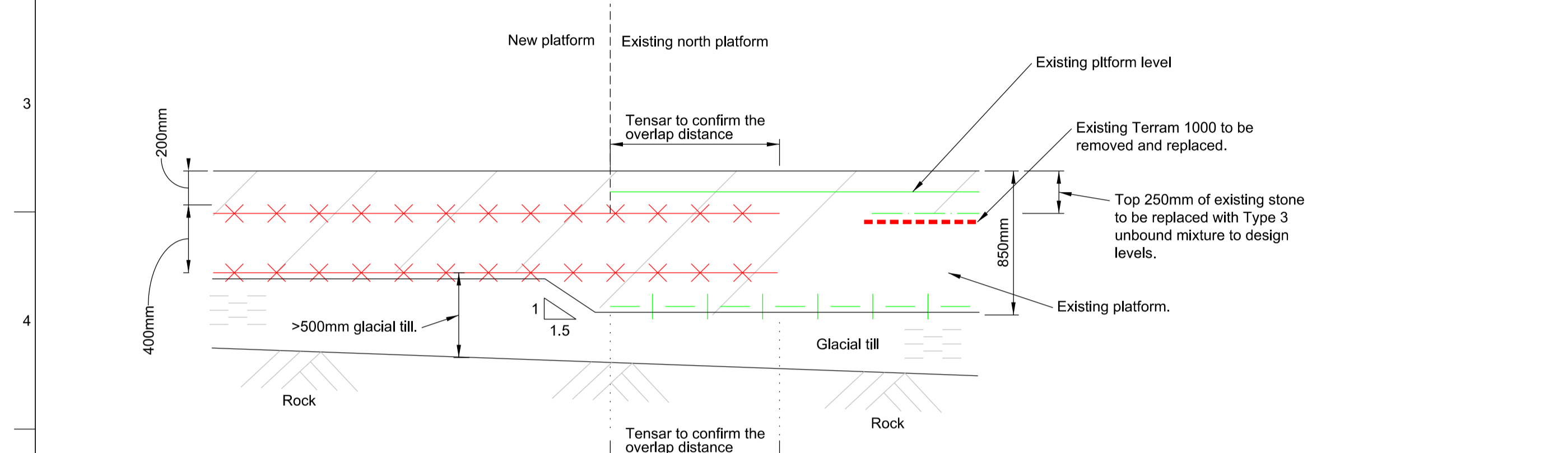
|                |                         |
|----------------|-------------------------|
| Discipline     | Earthworks              |
| Job No         | 253285                  |
| Drawing No     | 40-ARI-WS-71-CI-DR-1061 |
| Drawing Status | Planning                |
| Issue          | 0                       |





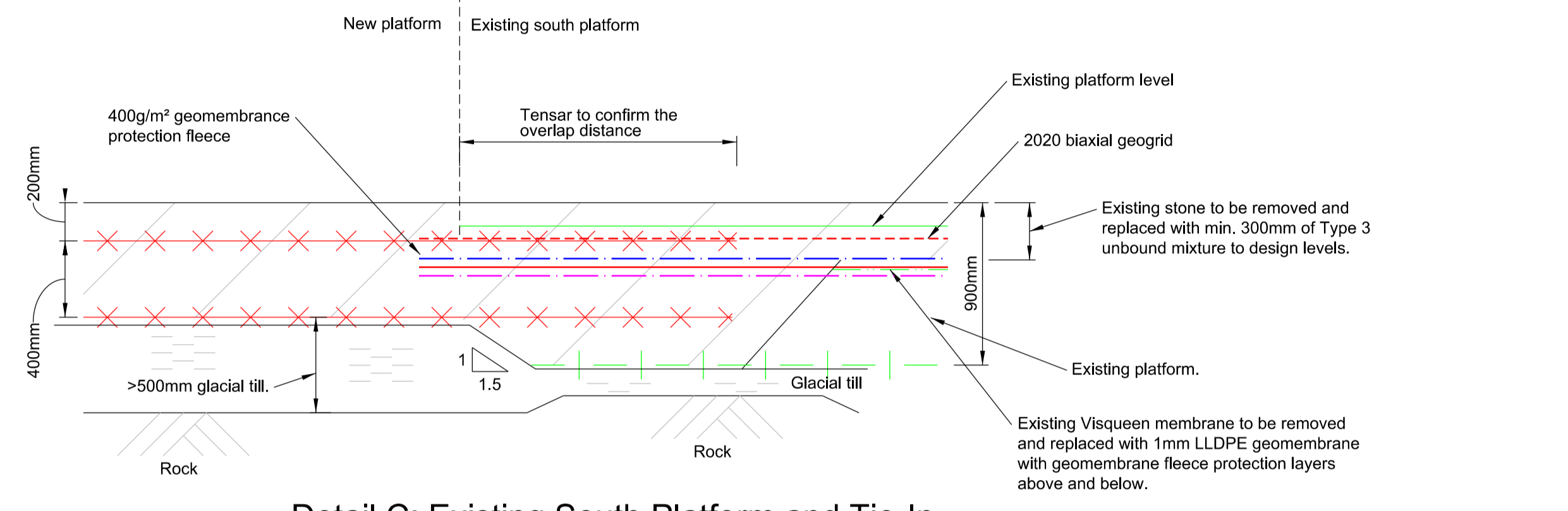
**Detail A: Ramp Platform Design**

Scale 1:50



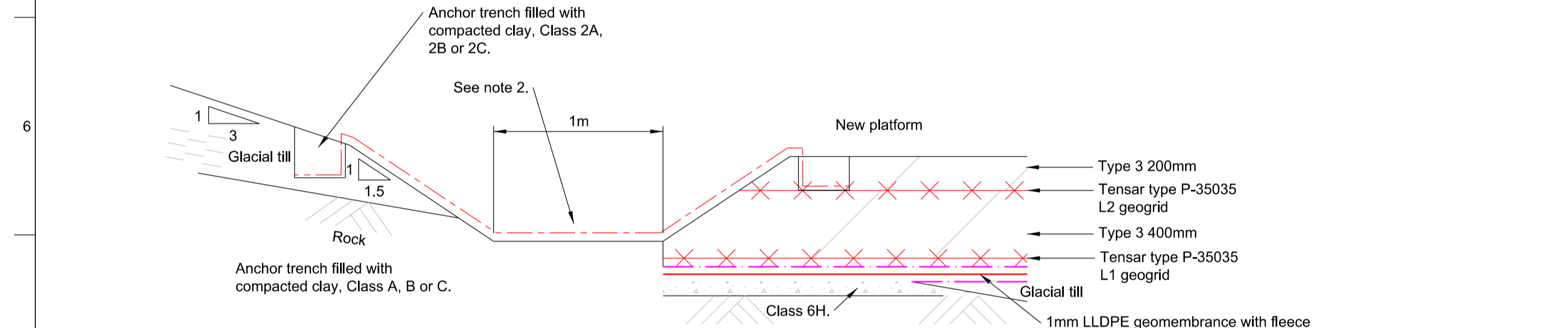
**Detail B: Existing North Platform Tie-in**

Scale 1:25



**Detail C: Existing South Platform and Tie-In**

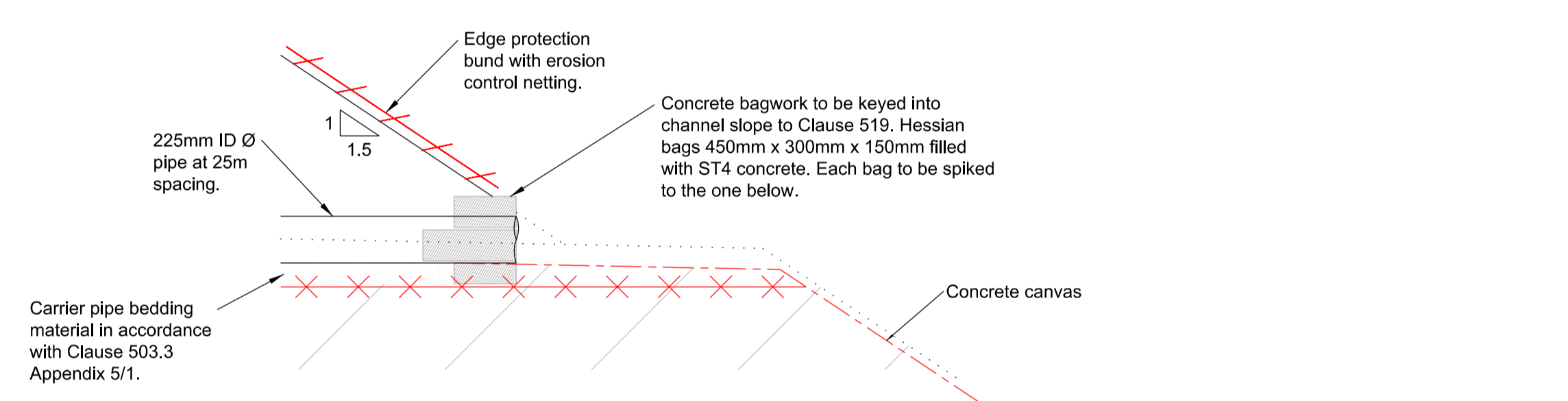
Scale 1:25



**Detail D: Drainage Ditch West WS Platform and LLDPE**

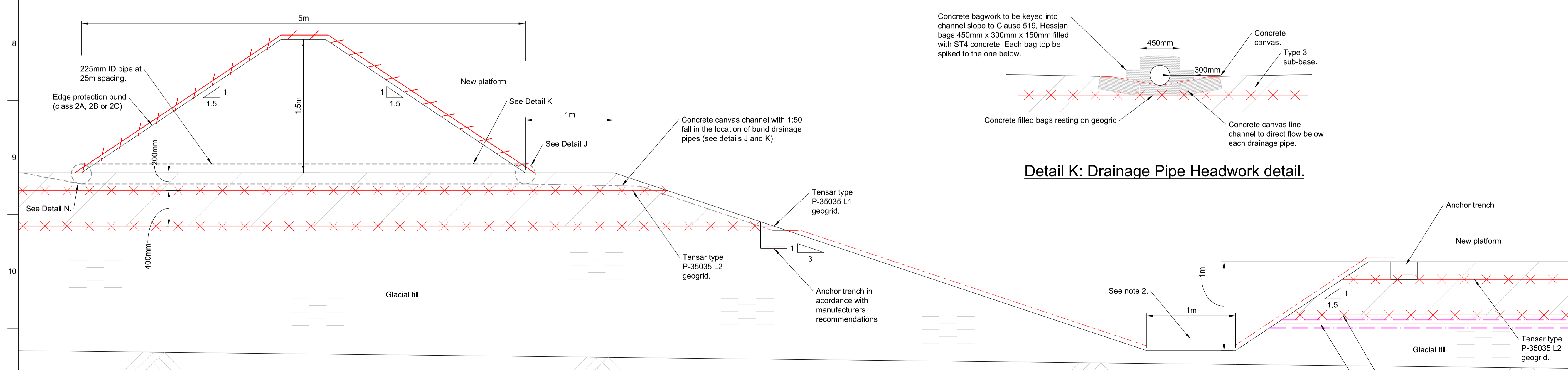
Scale 1:25

See note 2.



**Detail J: Drainage Pipe Connection Detail**

Scale 1:25



**Detail E: Drainage Ditch Central Slope and LLDPE**

Scale 1:25

See note 2.

**Notes:**

- Where glacial till is less than 500mm thick, geomembrane is to be provided at formation level. Glacial till thickness to be confirmed during construction with trial pits at 25m c/c.
- Concrete canvases to be installed in accordance with the manufacturers guidance.
- Formation soft spots to be excavated and replaced with compacted 6F1.
- Edge protection bund to be hydroseeded.
- LLDPE geomembrane to be double hot wedge welded and protected above and below by geotextile protection fleece. Refer to specification for protection fleece requirements.

**Key:**

- Tensor geogrid
- Existing geogrid
- 1mm LLDPE geomembrane
- Existing impermeable membrane
- Concrete canvas (CC8 or equivalent approved)
- Terram 1000
- Erosion protection netting (Terracoir 400 or equivalent approved)
- 300g/m² Geomembrane protection fleece to GR112 (Wrekin Multitrack SNW 40UV or equivalent approved)
- 400g/m² Geomembrane protection fleece to GR112 (Wrekin Multitrack SNW 50SP or equivalent approved)
- 2020 biaxial geogrid (Wrekin E'grid 2020 or equivalent approved)
- 225mm ID drainage pipe
- Type 3 unbound mixture (clause 803)
- Type 3 unbound mixture (clause 805)
- Class 1A
- Class 2A - 2C
- Class 6F1
- Class 6H
- Glacial till
- Rock
- Cement stabilised capping
- Lime stabilised capping
- Concrete slab with mesh

|                    |          |    |      |      |
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Client  
**Sirius Minerals Plc**

Job Title  
**Woodsmith Mine**

**Earthworks Sections  
 Tie-in Details  
 Sheet 1 of 2**

Scale at A1: 1:50

|                |                         |
|----------------|-------------------------|
| Discipline     | Earthworks              |
| Job No         | 253285                  |
| Drawing No     | 40-ARI-WS-71-CI-DR-1060 |
| Drawing Status | Planning                |
| Issue          | 0                       |





- Notes:
- Dewatering during phase 3 to a maximum of 3m below platform level.
- Key:
- Approximate location of dewatering wells. Actual number and location to be determined by specialist dewatering contractor.
  - Temporary dewatering pipeline
  - Existing culvert

|                     |          |    |      |      |
|---------------------|----------|----|------|------|
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| Draft               |          |    |      |      |
| A                   | 07/03/17 | JB | CW   | AH   |
| Draft Issue         |          |    |      |      |
| Issue               | Date     | By | Chkd | Appd |

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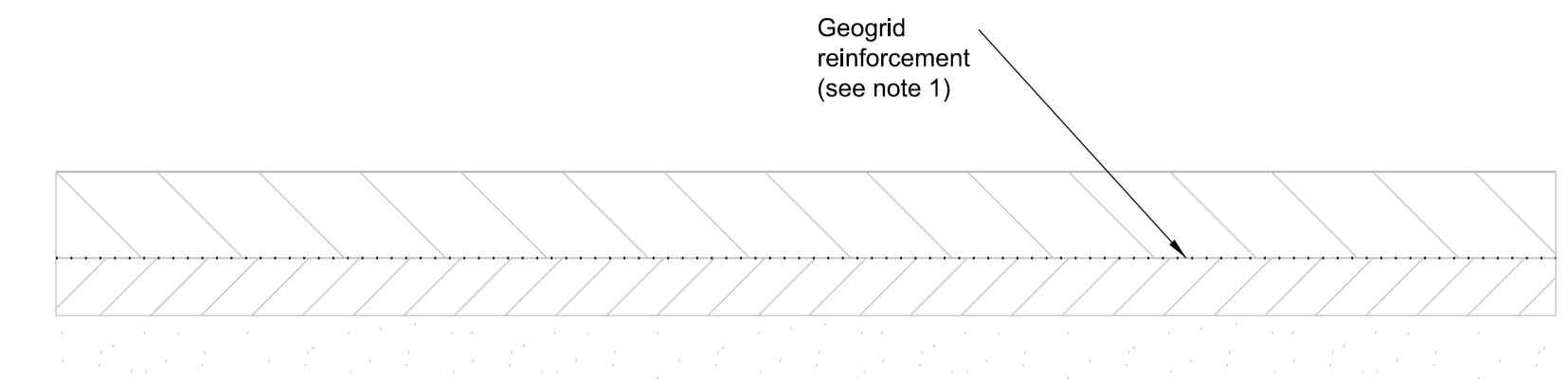
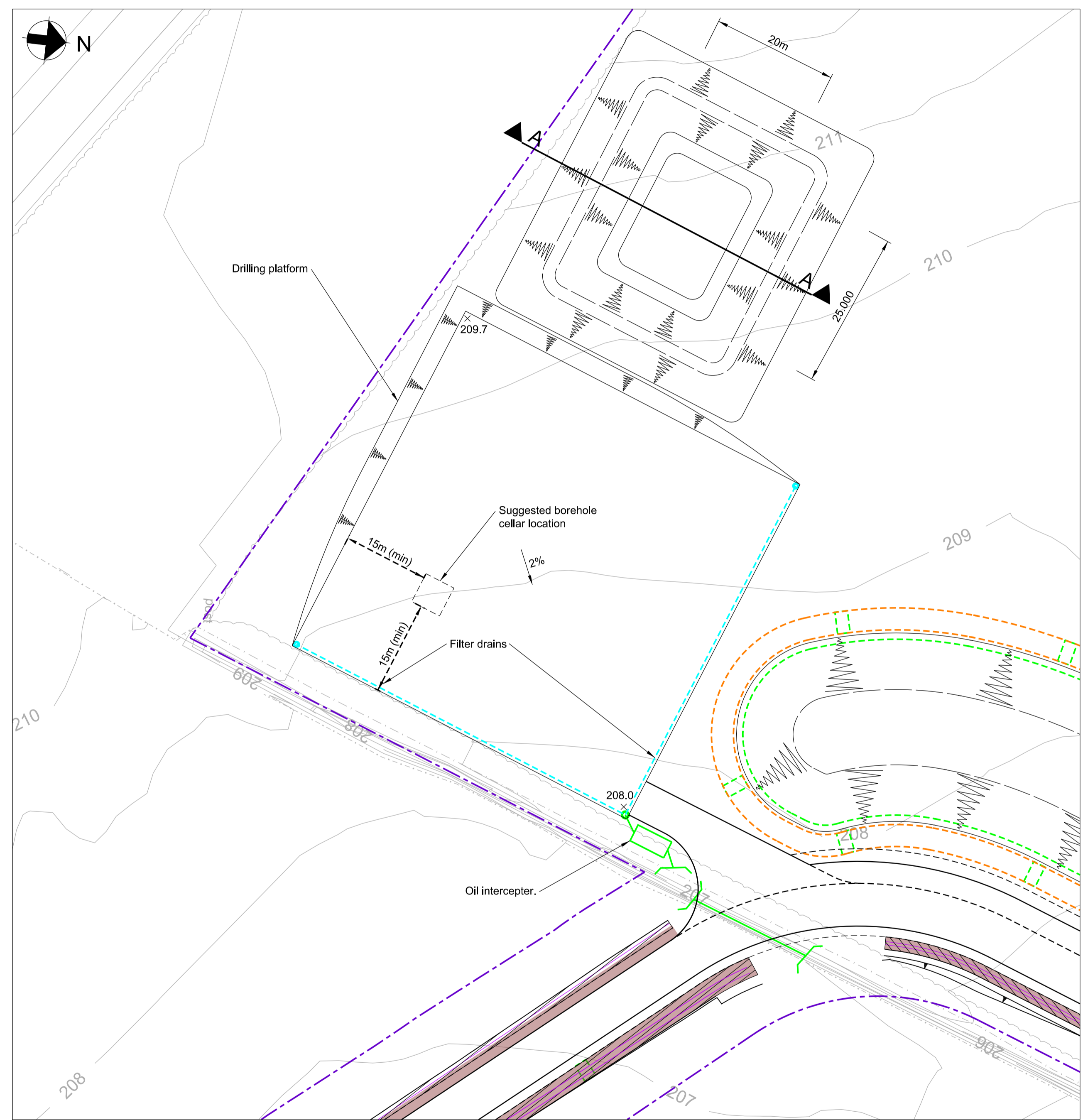
Client  
**Sirius Minerals Plc**

Job Title  
**Woodsmith Mine  
 Proposed Minehead**

**Woodsmith Mine  
 Construction Phase 3  
 Platform Dewatering  
 Infrastructure**

Scale at A1: 1:1250  
 Discipline: Civil  
 Job No: **253285** Drawing Status: **Planning**  
 Drawing No: **40-ARI-WS-71-CI-DR-1058** Issue: **0**

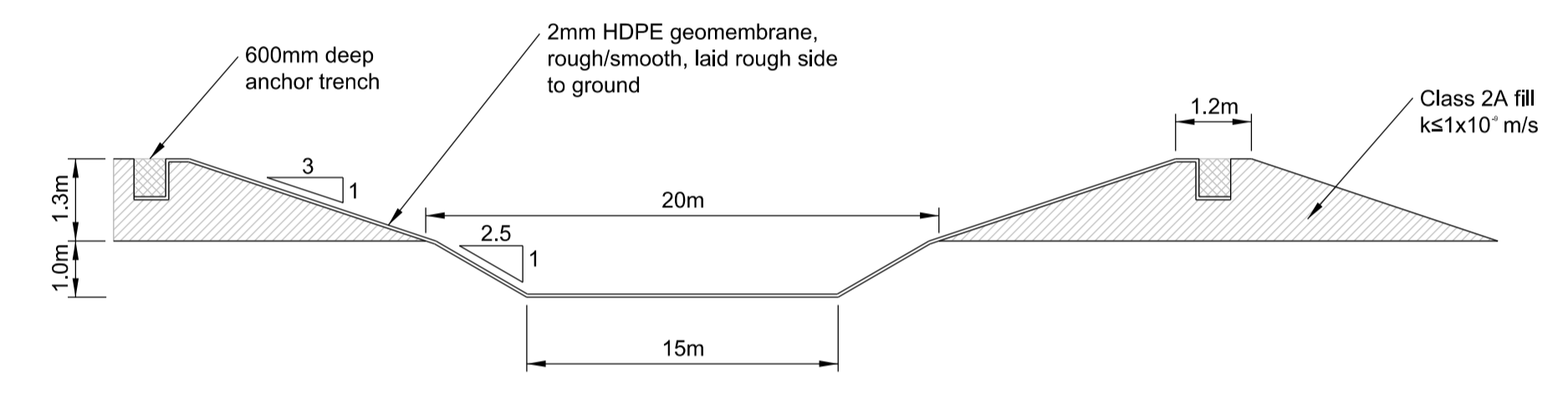




**Recharge Borehole Drilling Platform Typical Detail**

Not to scale

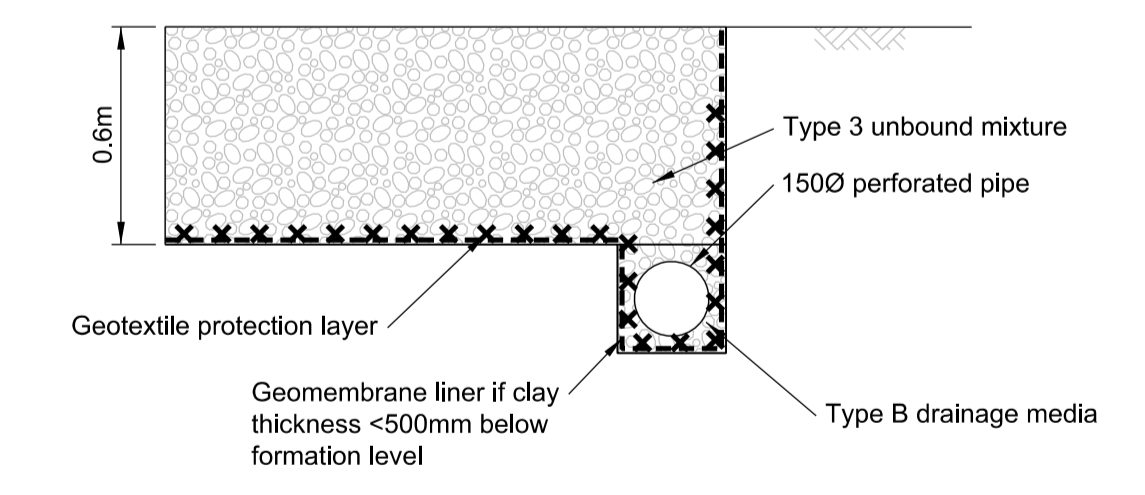
- Notes:
1. Geogrid reinforcements in accordance with Tensar design P35035.
  2. LLDPE liner to be placed at formation level if thickness of glacial till is less than 0.5m to be established by trial pits. Liner to be laid on smooth formation free from stones or roots that could drainage the membrane. Liner to be protected by a geomembrane liner protection geotextile with a mas/m<sup>2</sup> > 300 g/m<sup>2</sup>.



**Typical Section through Saline Water Storage Lagoon (A-A)**

Not to scale

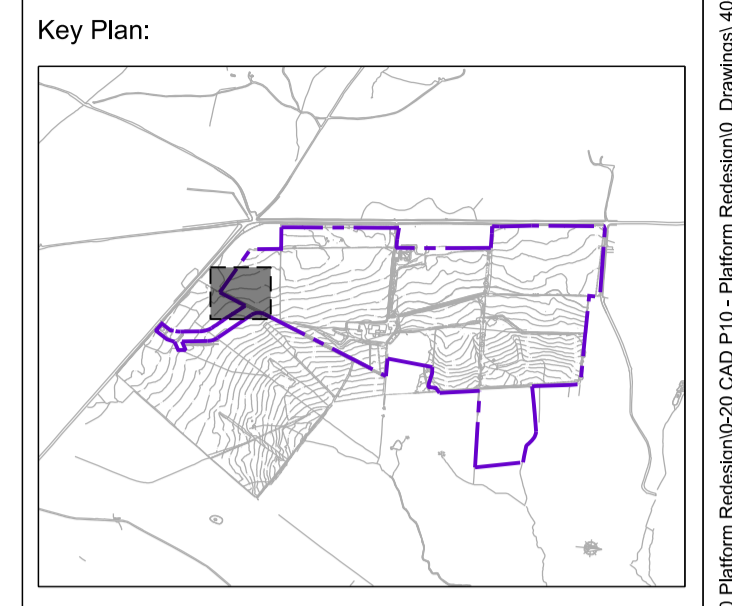
- Notes:
1. Geomembrane to be fully welded using double hot wedge welding technique.
  2. All welds to be air pressure tested.
  3. Repairs / details to be extrusion welded.
  4. All extrusion welds to be vacuum box tested.
  5. Geomembrane to comply with GRI standard GM13.
  6. Start up weld testing to be carried out in accordance with LFE5 - Using geomembranes in landfill engineering, Appendix A, published by the Environment Agency.
  7. Geomembrane testing to be carried out in accordance with LFE5.
  8. Formation to geomembrane to be smooth, free from stones, roots or other deleterious materials that may damage the geomembrane and free from sharp changes in level that exceed 10mm under a 1m straight edge.
  9. Minimum thickness of clay beneath lagoon liner to be 1.0m



**Typical section of filter drain**

Not to scale

Notes:  
1. Refer to details for notes.



|                     |          |    |      |      |
|---------------------|----------|----|------|------|
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| Draft               |          |    |      |      |
| A                   | 07/03/17 | JB | CW   | AH   |
| Draft               |          |    |      |      |
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Client  
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Job Title  
**Woodsmith Mine Development**

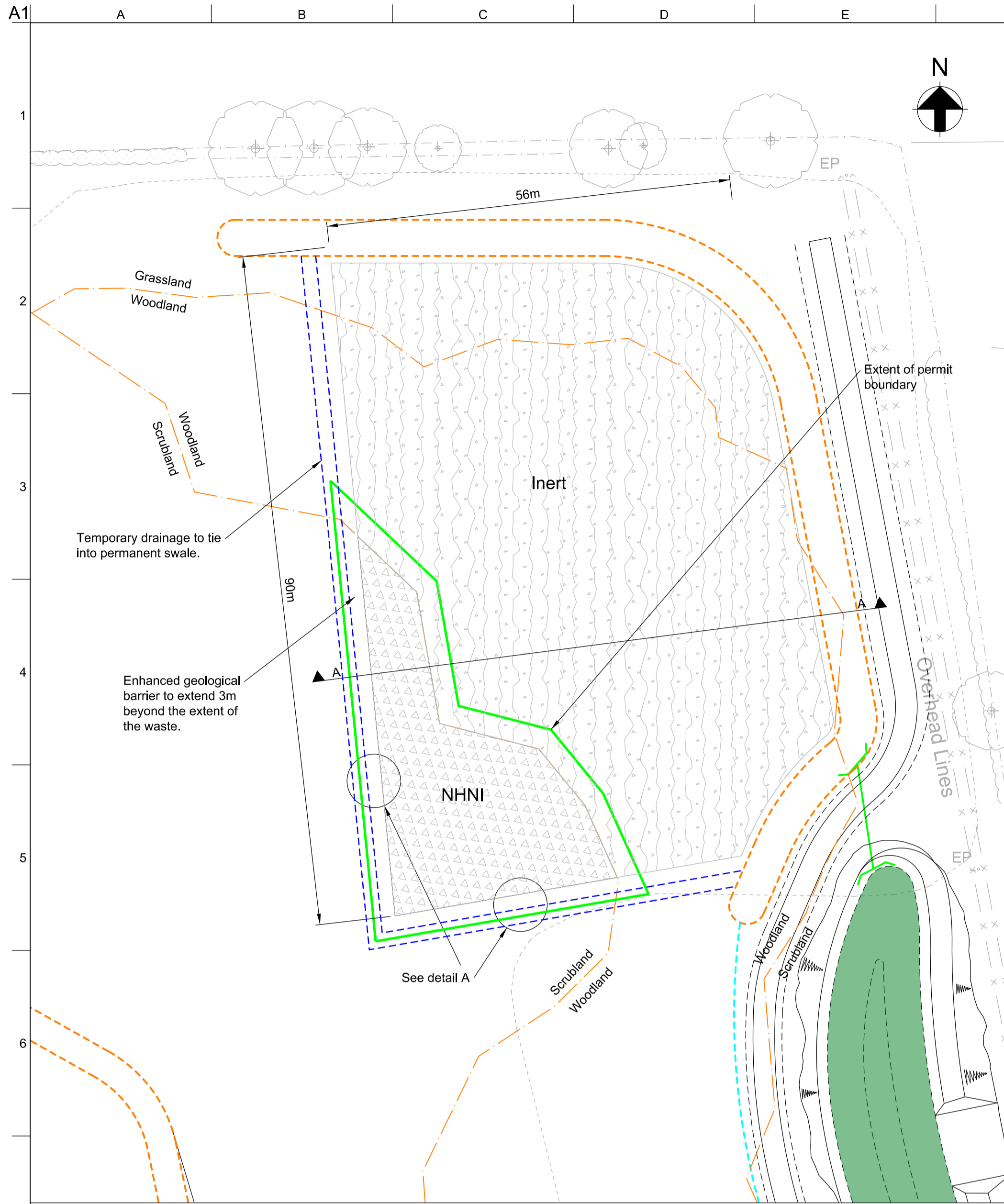
**Woodsmith Mine Site  
Construction Phase 3  
Reinjection Borehole  
GA and details**

Scale at A1 1:500

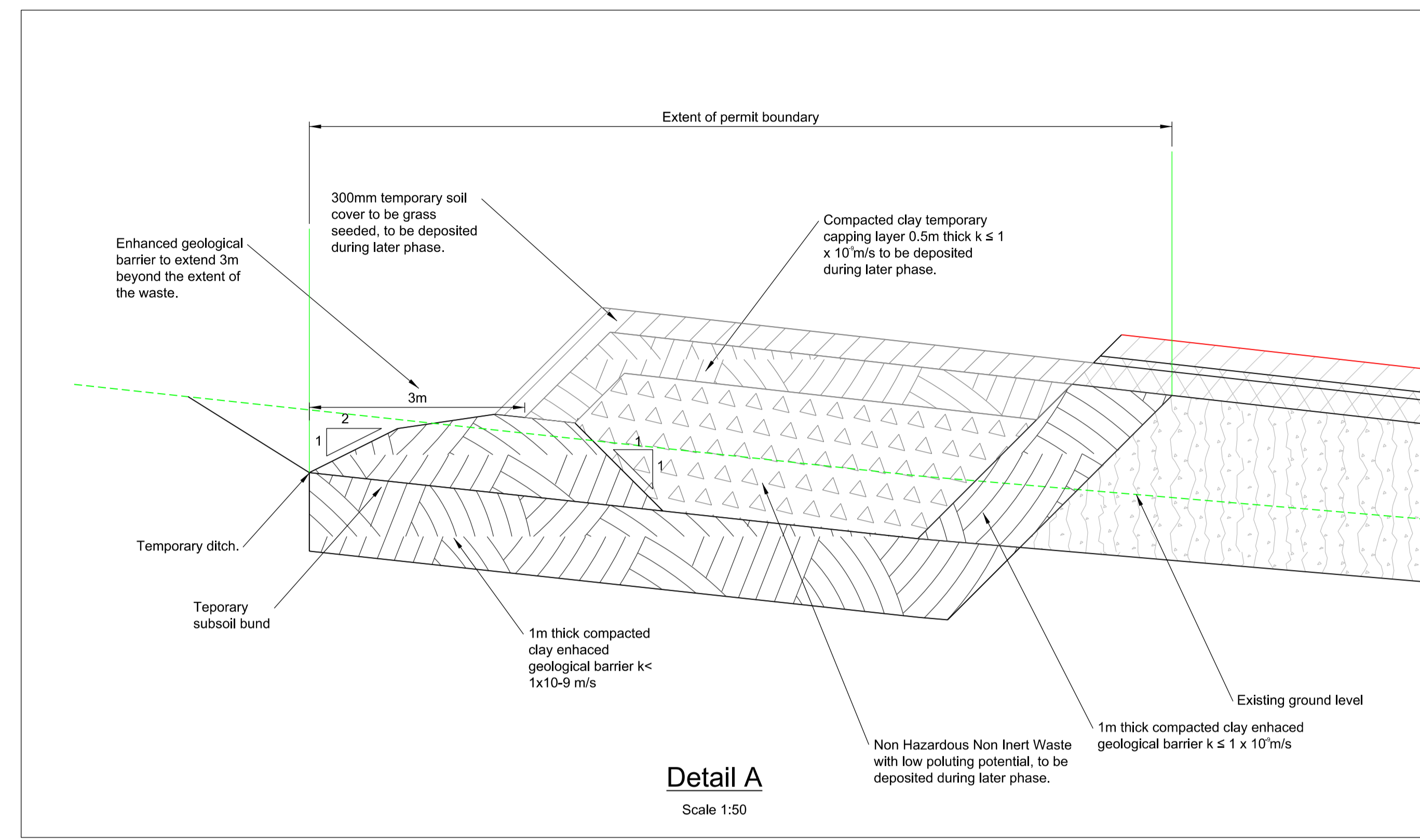
Discipline Civil

|  |                                   |
|--|-----------------------------------|
| Job No<br><b>253285</b>                      | Drawing Status<br><b>Planning</b> |
| Drawing No<br><b>40-ARI-WS-71-CI-DR-1057</b> | Issue<br><b>0</b>                 |

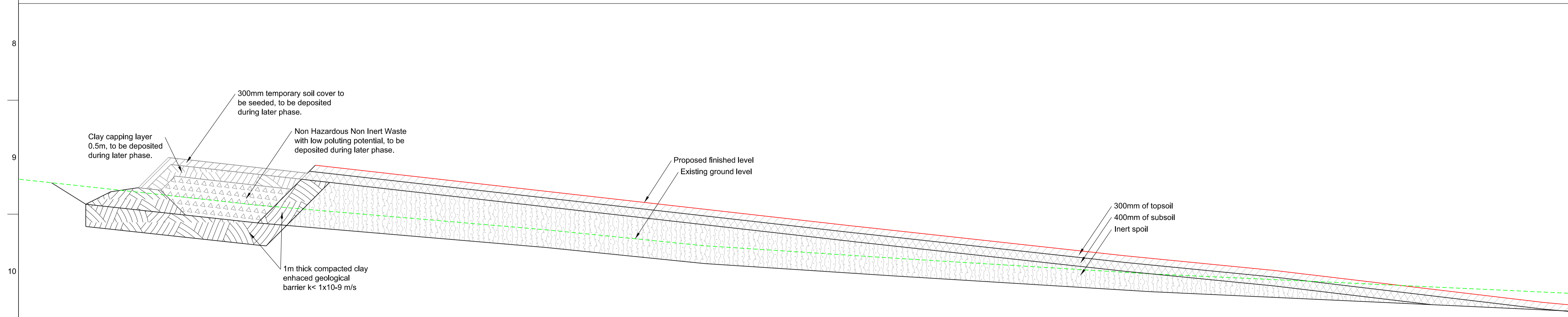




**Plan**  
Scale 1:500



**Detail A**  
Scale 1:50



**Section A-A**  
Scale 1:100

- Notes:
1. Restoration area designation from Estell Warren drawing 2309-MH03.
  2. Restoration topsoil and subsoil thickness from 2322 landscape appendix1\_doves nest farm\_rev00.
  3. Contractor to manage surface water to minimise ponding and silt run off.
  4. Only non-hazardous non-inert spoil with low polluting potential to be deposited within the storage area.
  5. NHNI spoil to be compacted in layers not exceeding 300mm thick, 6 passes of a vibrating roller with mass = 3500kg/m width.

Volume within waste storage facility:

Inert = 3,900 m<sup>3</sup>  
NHNI = 1,500m<sup>3</sup>

- Key:
- Proposed GL
  - Existing GL
  - Permit boundary
  - Enhanced geological barrier
  - NHNI waste
  - Inert waste
  - Restoration soil
  - Wetland

|                         |          |    |      |      |
|-------------------------|----------|----|------|------|
| 0                       | 31/03/17 | JB | CW   | AH   |
| Issued for Construction |          |    |      |      |
| C                       | 30/03/17 | JB | CW   | AH   |
| Draft                   |          |    |      |      |
| B                       | 17/03/17 | JB | TC   | AH   |
| Draft                   |          |    |      |      |
| A                       | 10/03/17 | KK | TC   | AH   |
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Client  
**Sirius Minerals Plc**

Job Title  
**Woodsmith Mine**

**Woodsmith Mine Site  
Phase 3 NHNI Store  
General Arrangement**

Scale at A1 As shown

Discipline Drainage

Job No **253285** Drawing Status **Planning**

Drawing No **40-ARI-WS-71-CI-DR-1055** Issue **0**