



MetroWest+

Portishead Branch Line (MetroWest Phase 1)

TR040011

Applicant: North Somerset District Council

2.23 – 2.28 Earthworks
Mount Pleasant; Hardwick Road & Avon Road

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, regulation 5(2)(o)
Planning Act 2008

Author: Arup

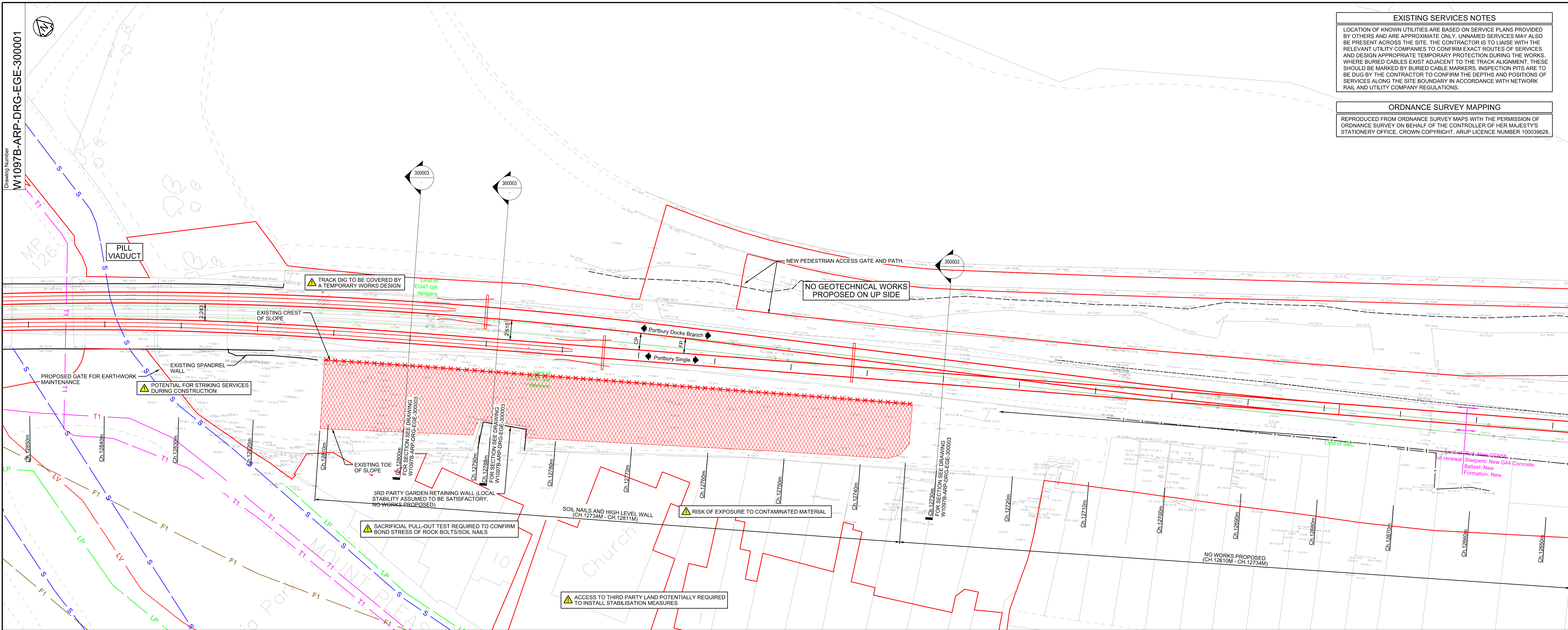
Date: November 2019



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| 2.24 | Mount Pleasant Embankment Typical Details | The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, regulation 5(2)(o) | W1097B-ARP-DRG-EGE-300002 Rev A02 |
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| 2.28 | Avon Road Embankment Typical Details | The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, regulation 5(2)(o) | W1097B-ARP-DRG-EGE-300008 Rev A02 |

Drawing Number
W1097B-ARP-DRG-EGE-300001



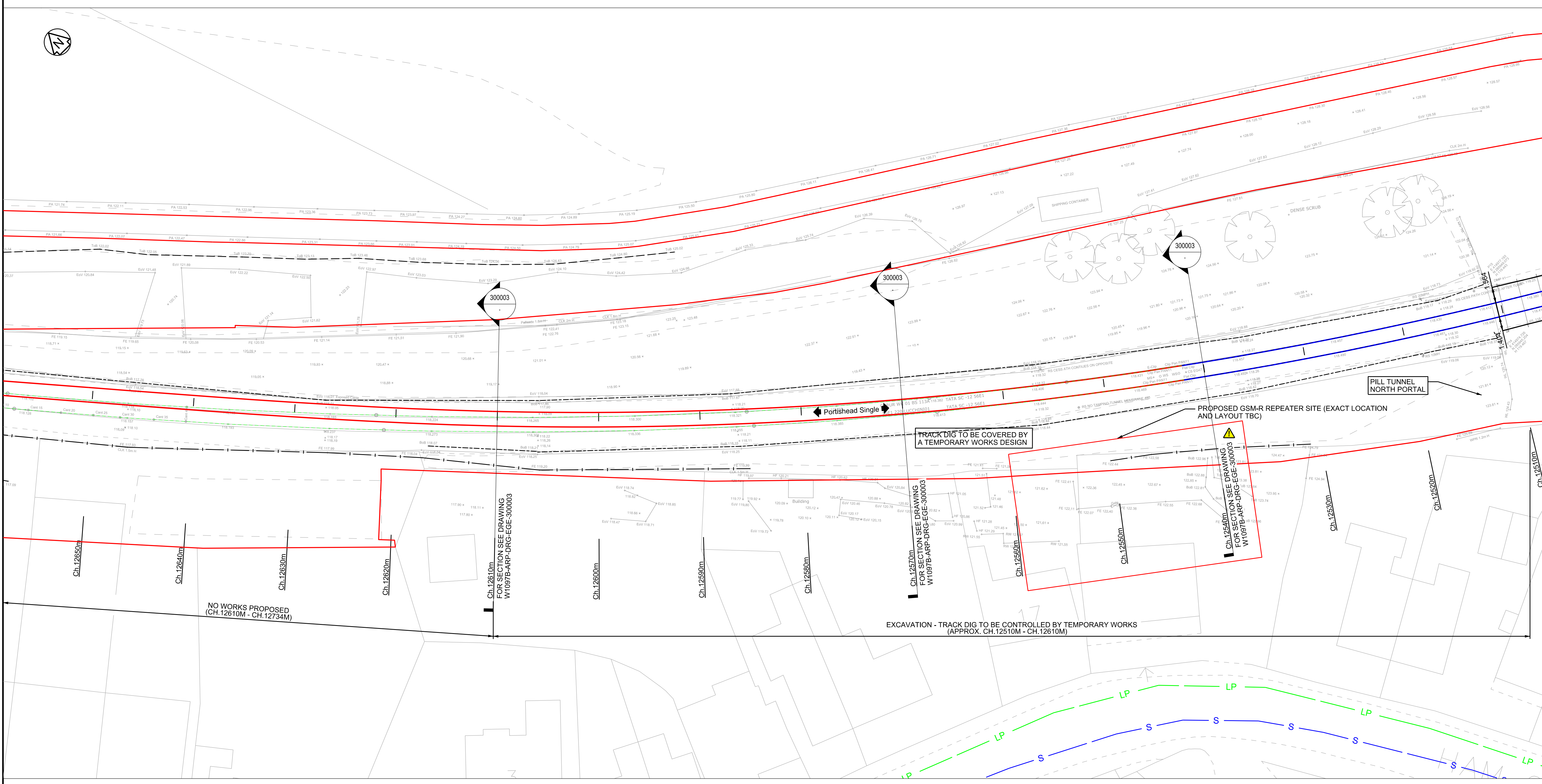
EXISTING SERVICES NOTES

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ORDNANCE SURVEY MAPPING

REPRODUCED FROM ORDNANCE SURVEY MAPS WITH THE PERMISSION OF ORDNANCE SURVEY ON BEHALF OF THE CONTROLLER OF HER MAJESTY'S STATIONERY OFFICE. CROWN COPYRIGHT. ARUP LICENCE NUMBER 100039828.

- Legend/Notes:**
01. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEER'S DRAWINGS AND THE F001 DOCUMENT.
 02. THE CONTRACTOR MUST REFER TO THE HAZARD REGISTER FOR RISK CONCERNING THE WORKS. SOME OF THE KEY SITE SPECIFIC RISKS ARE HIGHLIGHTED ON THE DRAWING.
 03. ALL LEVELS ARE SHOWN IN METRES ABOVE ORDNANCE DATUM (MAOD), UNLESS NOTED OTHERWISE. ALL DIMENSIONS ARE IN METRES.
 04. DO NOT SCALE FROM THIS DRAWING. ONLY FIGURED DIMENSIONS AND LEVELS TO BE USED.
 05. DESIGN BASED ON TOPOGRAPHICAL SURVEY CARRIED OUT BETWEEN SEPTEMBER 2015 AND SEPTEMBER 2016 BY SEVERN PARTNERSHIP. IN SOME AREAS WHERE THE FACE OF THE EXISTING EARTHWORK IS STEEP OR INACCESSIBLE THE EXISTING PROFILE OF THE SLOPE HAS BEEN EXTRAPOLATED BASED ON ONE POINT AT THE CREST OF THE SLOPE AND ONE POINT AT THE TOE OF THE SLOPE. THE CONTRACTOR SHOULD BE AWARE OF THE APPROXIMATION OF THIS METHOD WHEN ASSESSING TEMPORARY WORKS AND CUT / FILL VOLUMES.
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 07. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY SUPPORTS AND / OR RESTRICTION ON THE SEQUENCE OF CONSTRUCTION INCLUDING PROTECTION OF THE TRACK AND ALL EXISTING LINESIDE EQUIPMENT WHICH WILL REMAIN IN OPERATION DURING THE WORKS.
 08. POSSESSION REQUIREMENTS FOR THE WORKS ARE TO BE IDENTIFIED AND MANAGED BY THE CONTRACTOR.
 09. MONITORING OF THE EMBANKMENT AND THE EXISTING PORTBURY DOCKS LINE IS REQUIRED DURING THE WORKS. THIS IS TO BE AS SPECIFIED DURING DETAILED DESIGN.
 10. NO GI UNDERTAKEN AT GRIP 3 - TO BE COMPLETED AHEAD OF DETAILED DESIGN.

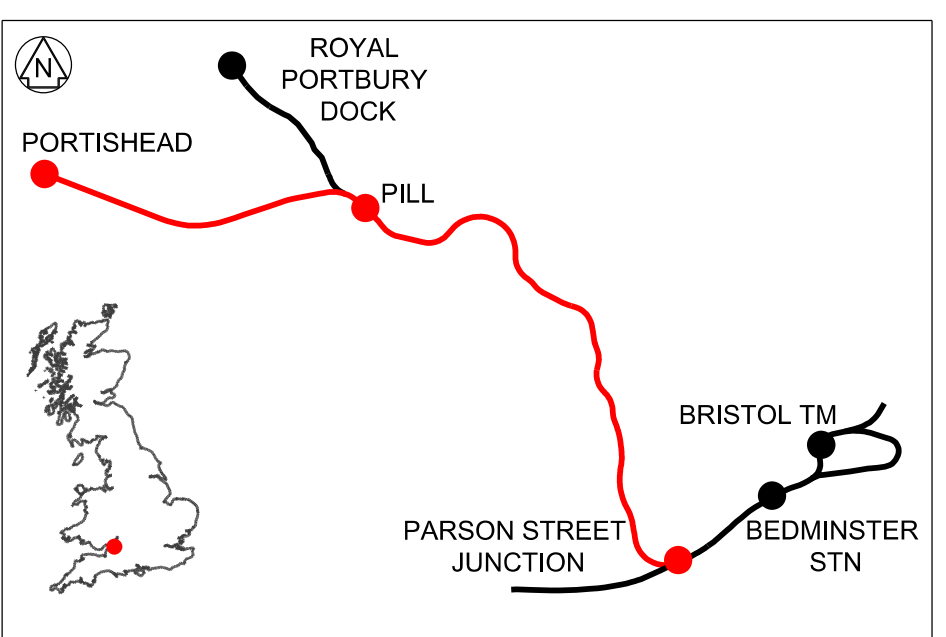


- EARTHWORK GENERAL ARRANGEMENT LEGEND**
- NEW TRACK TO BE INSTALLED
 - NEW ALIGNMENT OF EXISTING TRACK TO BE LUED
 - TRACK TIE IN
 - EXISTING TRACK TO BE REMOVED
 - ORIGINAL POSITION OF MODIFIED TRACK
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 - EXISTING TRACK DRAINAGE TO BE REMOVED
 - EXISTING TRACK DRAINAGE TO REMAIN
 - PROPOSED TRACK DRAINAGE (PERFORATED PIPE)
 - PROPOSED TRACK DRAINAGE (CARRIER PIPE)
 - PROPOSED CONTINUOUS POSITION OF SAFETY DEVELOPMENT CONSENT ORDER (DCO)
 - LAND BOUNDARY
 - EXISTING CABLE TROUGHING
 - PROPOSED CABLE TROUGHING
 - CABLE TROUGHING TO BE REMOVED
 - EXISTING TROUGHING MODIFIED/REPLACED
 - EXISTING EMBANKMENT/CUTTING CREST
 - EXISTING EMBANKMENT/CUTTING TOE
 - PROPOSED HIGH LEVEL RETAINING WALL
 - PROPOSED AREA OF SOIL NAILING

- EXISTING UTILITIES LEGEND**
- | DESCRIPTION | EXISTING |
|---|----------|
| WATER MAIN | — |
| FOUL SEWER | — F1 — |
| RISING MAIN | — R1 — |
| SURFACE WATER SEWER | — S — |
| HIGH VOLTAGE ELECTRICITY - BELOW GROUND | — HV — |
| LOW VOLTAGE ELECTRICITY - BELOW GROUND | — LV — |
| HIGH VOLTAGE ELECTRICITY - ABOVE GROUND | — HV — |
| LOW VOLTAGE ELECTRICITY - ABOVE GROUND | — LV — |
| GPSS PIPELINE | — |
| LOW PRESSURE GAS MAIN | — LP — |
| MEDIUM PRESSURE GAS MAIN | — MP — |
| HIGH PRESSURE GAS MAIN | — HP — |
| BT CABLE - BELOW GROUND | — T1 — |
| BT CABLE - ABOVE GROUND | — T2 — |
| CABLE & WIRELESS | — T3 — |
| VIRGIN MEDIA CABLE - BELOW GROUND | — |

0 4 8 12 16 20m
SCALE 1:200 @ A0

- FENCE LEGEND**
- EXISTING FENCE GRADE I
 - EXISTING FENCE GRADE II
 - EXISTING FENCE GRADE III
 - EXISTING FENCE REMOVED
 - EXISTING FENCE MODIFIED/REPLACED WITH GRADE I FENCE
 - EXISTING FENCE MODIFIED/REPLACED WITH GRADE II FENCE
 - EXISTING FENCE MODIFIED/REPLACED WITH GRADE III FENCE
 - PROPOSED FENCE GRADE I
 - PROPOSED FENCE GRADE II
 - PROPOSED FENCE GRADE III



| | | | | | |
|---------------------|----------|--------------------------|-------|-----|------|
| Rev | Date | Description of Revisions | JB | RS | RS |
| 1 | 20/09/19 | FOR DCO APPLICATION | | | |
| FIT FOR INFORMATION | | | Drawn | Chd | Appr |
| | | | | | S2 |



Contractor(s)

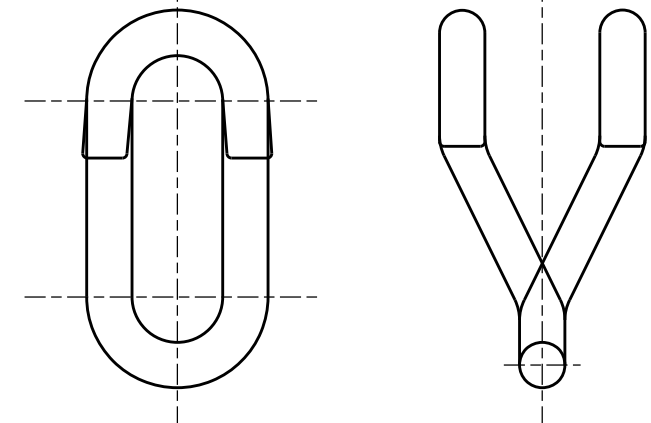
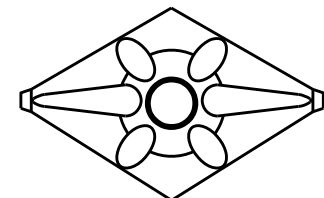
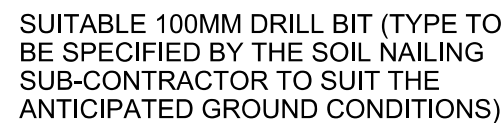
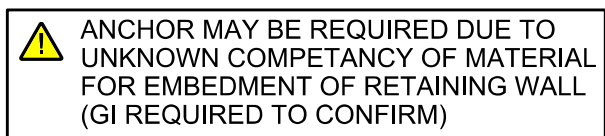
ARUP
61 St Thomas Street
Bristol BS1 6LZ
Tel +44(0)117 976 5432 Fax +44(0)117 976 5433
www.arup.com

**PORTISHEAD BRANCH LINE
(METROWEST PHASE 1)**

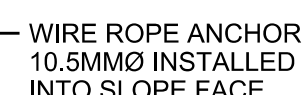
**MOUNT PLEASANT EMBANKMENT
GENERAL ARRANGEMENT
POD 125M 63.5CH TO 125M 77.5CH
(12510M TO 12830M)**

| | | | | | |
|-----------------------|---------------------------|---------------|-----------------|------|----------|
| Designed | J. BACINSKI | Signed | | Date | 20/09/19 |
| Drawn | J. BACINSKI | Signed | | Date | 20/09/19 |
| Checked | R. SNELL | Signed | | Date | 20/09/19 |
| Approved | R. SNELL | Signed | | Date | 20/09/19 |
| Scale(s) | 1:200 | ELR & Message | POD 125MI63.5CH | | |
| Alternative Reference | | Sheet | 1 of 1 | | |
| Drawing Number | W1097B-ARP-DRG-EGE-300001 | Revision | | | |

Sheet Size A0 841 x 1190

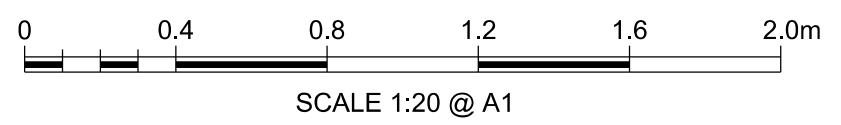


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- NOTES:
1. NAILS ARE TO BE INSTALLED USING SELF DRILLING TECHNIQUES, ASSUMED TO BE FROM AN EXCAVATOR OR SLOPE MOUNTED A-FRAME.
 2. NUT IS TO BE TIGHTENED TO A TORQUE OF 275NM OR UNTIL THE MESH IS PULLED FULLY INTO THE HOLLOW SO THAT IT MAKES GOOD CONTACT WITH THE SLOPE (WHICHEVER IS GREATER).
 3. GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 40N/MM² (28 DAYS), WATER/CEMENT RATIO SHALL NOT EXCEED 0.45. DESIGN SULFATE CLASS IS DC-4. GROUT CUBE SAMPLES (3NO) ARE TO BE TAKEN AND TESTED FOR EVERY 10TH SOIL NAIL (MINIMUM 1 CUBE PER DAY) INSTALLED IN ACCORDANCE WITH BS 1881.
 4. THE SLOPE IS TO BE STRIPPED OF ALL VEGETATION AND LOOSE MATERIAL PRIOR TO FORMING HOLLOW, PLACING THE MESH AND INSTALLING SOIL NAILS. MATURE TREE STUMPS SHALL BE CUT FLUSH TO THE SURFACE AND TREATED TO PREVENT REGROWTH. SOIL NAILS TO BE LOCALLY REARRANGED AROUND THESE STUMPS AS REQUIRED AND AGREED WITH THE DESIGNER PRIOR TO INSTALLATION.
 5. THE LAST 3M LENGTH (BAR) OF EACH NAIL IS TO BE GALVANISED.
 6. R32 OR R38 DYWI DRILL HOLLOW BAR SYSTEM BY DYWIDAG REQUIRED. R38 BARS ARE REQUIRED FOR NAILS EXCEEDING 12M IN LENGTH AND WHERE LOWER DEFLECTIONS ARE REQUIRED DUE TO THE CLOSE PROXIMITY OF STRUCTURES (TO BE CONFIRMED BY SPECIALIST SUB-CONTRACTOR).
 7. SOIL NAIL SPACING AND LENGTHS TO BE CONFIRMED DURING DETAILED DESIGN, AFTER GROUND INVESTIGATIONS HAVE BEEN COMPLETED.
 8. SOIL NAIL PULL OUT TESTS TO INFORM/VERIFY THE SITE SPECIFIC BOND STRESS REQUIRED. IDEALLY THESE WILL BE COMPLETED AHEAD OF DETAILED DESIGN TO LIMIT RISK OF ABORTIVE WORK DURING THE CONSTRUCTION PHASE.

01. THE CONTRACTOR MUST REFER TO THE HAZARD REGISTER FOR RISK CONCERNING THE WORKS. SOME OF THE KEY SITE SPECIFIC RISKS ARE HIGHLIGHTED ON THE DRAWING.
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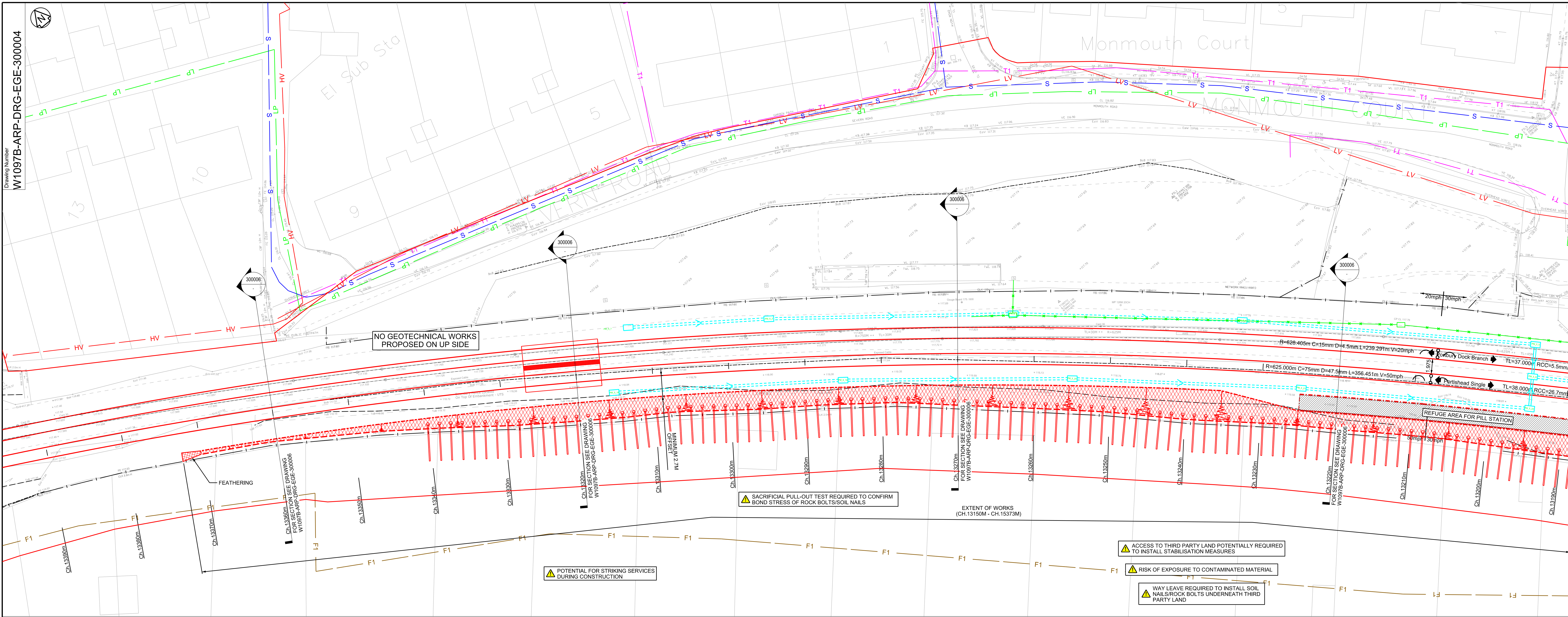
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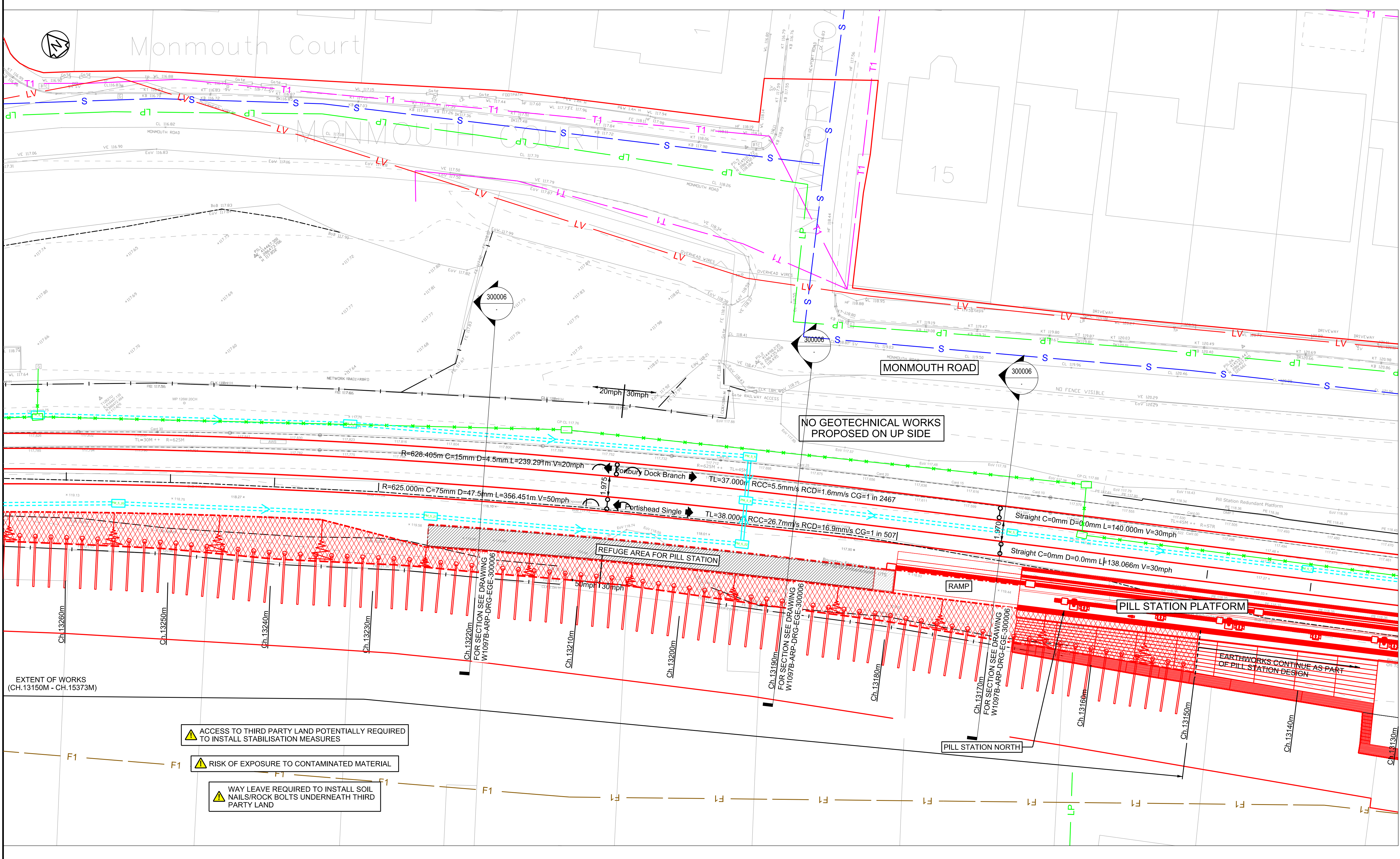
PORTISHEAD BRANCH LINE (METROWEST PHASE 1)

MOUNT PLEASANT EMBANKMENT
TYPICAL DETAILS
POD 125M 63.5CH TO 125M 77.5CH
(12510M TO 12830M)

| | | | | |
|-----------------------|-------------|---------------|------------------|----------|
| Designed | J.BACINSKI | Signed | Date | 20/09/19 |
| Drawn | J. BACINSKI | Signed | Date | 20/09/19 |
| Checked | R. SNELL | Signed | Date | 20/09/19 |
| Approved | R. SNELL | Signed | Date | 20/09/19 |
| Scale(s) | As Shown | ELR & Mileage | POD 125MI 63.5CH | |
| Alternative Reference | | | Sheet | 1 of 1 |
| Drawing Number | | Revision | | |



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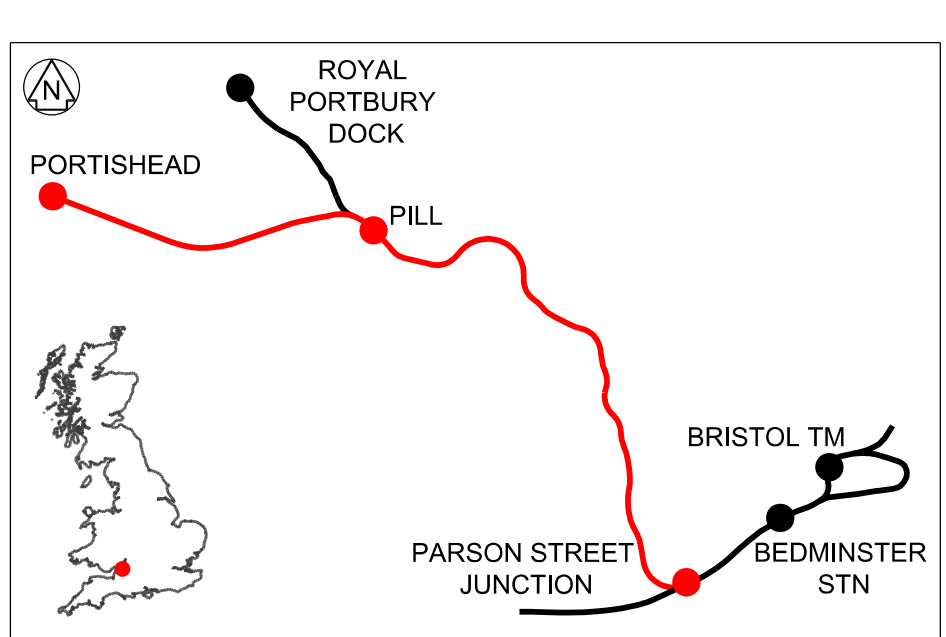
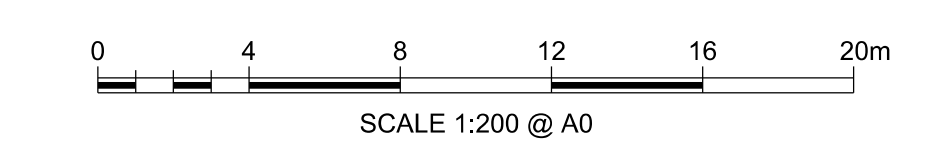
ORDNANCE SURVEY MAPPING

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 - NEW ALIGNMENT OF EXISTING TRACK TO BE SLUED
 - TRACK TIE IN
 - EXISTING TRACK TO BE REMOVED
 - ORIGINAL POSITION OF MODIFIED TRACK
 - EXISTING TRACK TO BE RETAINED/UNCHANGED
 - EXISTING TRACK DRAINAGE TO BE REMOVED
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 - LAND BOUNDARY
 - EXISTING CABLE TROUGHING
 - PROPOSED CABLE TROUGHING
 - CABLE TROUGHING TO BE REMOVED
 - EXISTING TROUGHING MODIFIED/REPLACED
 - EXISTING EMBANKMENT/CUTTING CREST
 - EXISTING EMBANKMENT/CUTTING TOE
 - PROPOSED EMBANKMENT/CUTTING CREST
 - PROPOSED EMBANKMENT/CUTTING TOE
 - PROPOSED BATTER (REGRADE ANGLE)
 - PROPOSED FEATHER REGRADE
 - PROPOSED AREA OF SOIL NAILING

- EXISTING UTILITIES LEGEND**
- | DESCRIPTION | EXISTING |
|---|----------|
| WATER MAIN | — |
| FOUL SEWER | — |
| RIISING MAIN | — |
| SURFACE WATER SEWER | — |
| HIGH VOLTAGE ELECTRICITY - BELOW GROUND | — |
| LOW VOLTAGE ELECTRICITY - BELOW GROUND | — |
| HIGH VOLTAGE ELECTRICITY - ABOVE GROUND | — |
| LOW VOLTAGE ELECTRICITY - ABOVE GROUND | — |
| GPSS PIPELINE | — |
| LOW PRESSURE GAS MAIN | — |
| MEDIUM PRESSURE GAS MAIN | — |
| HIGH PRESSURE GAS MAIN | — |
| BT CABLE - BELOW GROUND | — |
| BT CABLE - ABOVE GROUND | — |
| CABLE & WIRELESS | — |
| VIRGIN MEDIA CABLE - BELOW GROUND | — |

- FENCE LEGEND**
- EXISTING FENCE GRADE I
 - EXISTING FENCE GRADE II
 - EXISTING FENCE GRADE III
 - EXISTING FENCE REMOVED
 - EXISTING FENCE MODIFIED/REPLACED WITH GRADE I FENCE
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 - EXISTING FENCE MODIFIED/REPLACED WITH GRADE III FENCE
 - PROPOSED FENCE GRADE I
 - PROPOSED FENCE GRADE II
 - PROPOSED FENCE GRADE III



| | | | | | |
|-----|----------|--------------------------|----|----|----|
| Rev | Date | Description of Revisions | JB | RS | RS |
| 1 | 20/09/19 | FOR DCO APPLICATION | | | |
| 2 | 20/09/19 | FOR DCO APPLICATION | | | |
| 3 | 20/09/19 | FOR DCO APPLICATION | | | |
| 4 | 20/09/19 | FOR DCO APPLICATION | | | |
| 5 | 20/09/19 | FOR DCO APPLICATION | | | |
| 6 | 20/09/19 | FOR DCO APPLICATION | | | |
| 7 | 20/09/19 | FOR DCO APPLICATION | | | |
| 8 | 20/09/19 | FOR DCO APPLICATION | | | |
| 9 | 20/09/19 | FOR DCO APPLICATION | | | |
| 10 | 20/09/19 | FOR DCO APPLICATION | | | |
| 11 | 20/09/19 | FOR DCO APPLICATION | | | |
| 12 | 20/09/19 | FOR DCO APPLICATION | | | |
| 13 | 20/09/19 | FOR DCO APPLICATION | | | |
| 14 | 20/09/19 | FOR DCO APPLICATION | | | |
| 15 | 20/09/19 | FOR DCO APPLICATION | | | |
| 16 | 20/09/19 | FOR DCO APPLICATION | | | |
| 17 | 20/09/19 | FOR DCO APPLICATION | | | |
| 18 | 20/09/19 | FOR DCO APPLICATION | | | |
| 19 | 20/09/19 | FOR DCO APPLICATION | | | |
| 20 | 20/09/19 | FOR DCO APPLICATION | | | |



Contractor(s)

ARUP

61 St Thomas Street
Bristol BS1 6LJ
Tel +44(0)117 976 5432 Fax +44(0)117 976 5433
www.arup.com

Project

**PORTISHEAD BRANCH LINE
(METROWEST PHASE 1)**

Drawing Title

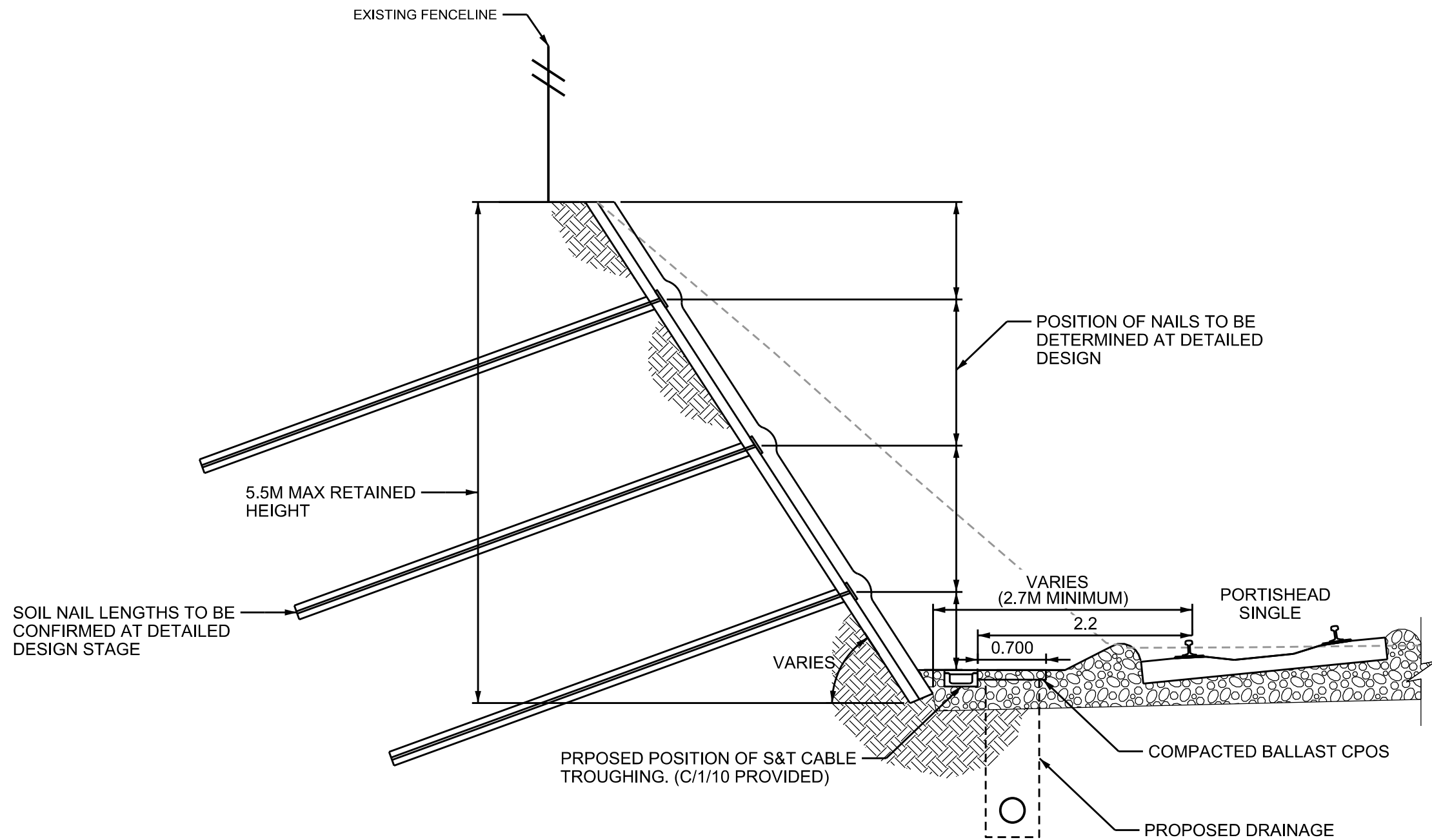
**HARDWICK ROAD CUTTING
GENERAL ARRANGEMENT
POD 126MI 15CH TO 126MI 27CH
(13150M TO 13370M)**

| | | | | | |
|-----------------------|-------------|---------------|----------------|----------|----------|
| Designed | J. BACINSKI | Signed | | Date | 20/09/19 |
| Drawn | J. BACINSKI | Signed | | Date | 20/09/19 |
| Checked | R. SNELL | Signed | | Date | 20/09/19 |
| Approved | R. SNELL | Signed | | Date | 20/09/19 |
| Scale(s) | 1:200 | ELR & Mileage | POD 126MI 20CH | Sheet | 1 of 1 |
| Alternative Reference | | | | Revision | |

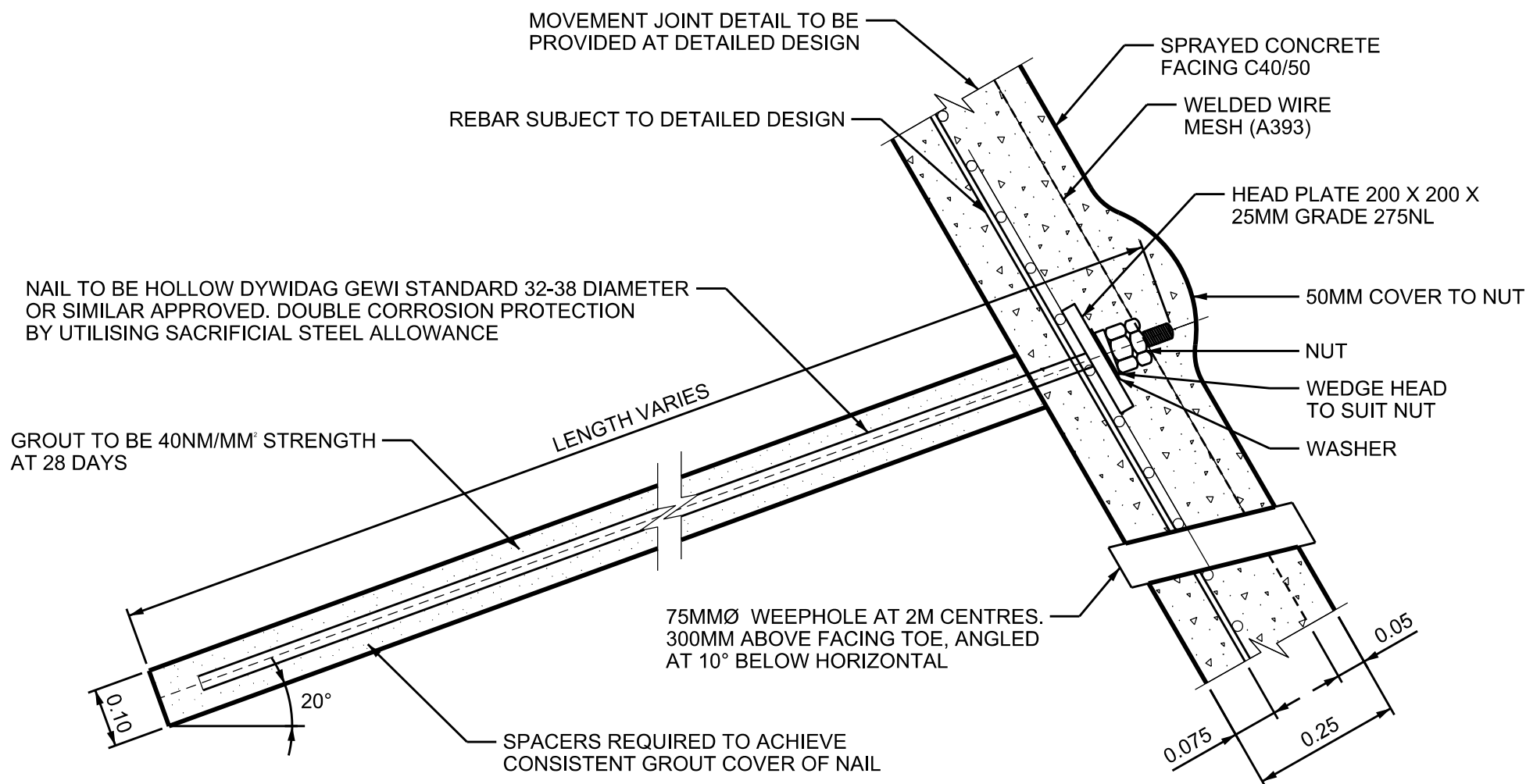
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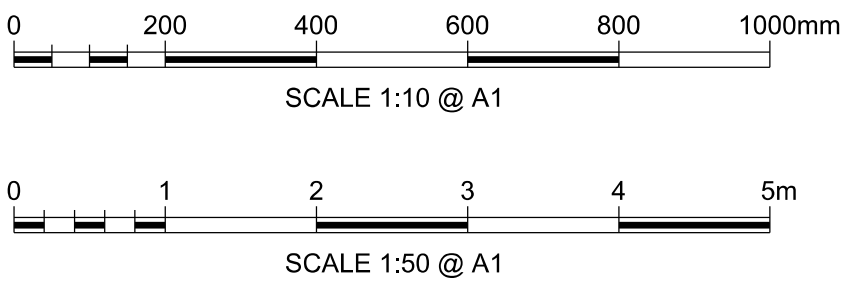
1 TYPICAL SOIL NAIL AND FACING SECTION
SCALE 1:50



2 INDICATIVE SOIL NAIL AND FACING DETAIL
SCALE 1:10

- NOTES:
01. NAILS ARE TO BE INSTALLED USING SELF DRILLING TECHNIQUES, ASSUMED TO BE FROM AN EXCAVATOR OR SLOPE MOUNTED A-FRAME
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 05. CONSTRUCTION SEQUENCE ASSUMED TO BE EXCAVATION FROM TOP OF CUTTING SLOPE IN STAGES WITH SOIL NAILS INSTALLED AFTER EACH STAGE AND BEFORE FURTHER EXCAVATION.
 06. SOIL NAIL INSTALLATION AND FACING DETAIL ASSUMED TO BE THE SAME AS FOR PILL STATION CUTTING.

- GENERAL NOTES:
01. THE CONTRACTOR MUST REFER TO THE HAZARD REGISTER FOR RISK CONCERNING THE WORKS. SOME OF THE KEY SITE SPECIFIC RISKS ARE HIGHLIGHTED ON THE DRAWING.
 02. ALL LEVELS ARE SHOWN IN METRES ABOVE ORDNANCE DATUM (MAOD). UNLESS NOTED OTHERWISE, ALL DIMENSIONS ARE IN METRES.
 03. DO NOT SCALE FROM THIS DRAWING, ONLY FIGURED DIMENSIONS AND LEVELS TO BE USED.
 04. DESIGN BASED ON TOPOGRAPHICAL SURVEY CARRIED OUT BETWEEN SEPTEMBER 2015 AND SEPTEMBER 2016 BY SEVERN PARTNERSHIP. IN SOME AREAS WHERE THE FACE OF THE EXISTING EARTHWORK IS STEEP OR INACCESSIBLE THE EXISTING PROFILE OF THE SLOPE HAS BEEN EXTRAPOLATED BASED ON ONE POINT AT THE CREST OF THE SLOPE AND ONE POINT AT THE TOE OF THE SLOPE. THE CONTRACTOR SHOULD BE AWARE OF THE APPROXIMATION OF THIS METHOD WHEN ASSESSING TEMPORARY WORKS AND CUT / FILL VOLUMES.
 05. THE CONTRACTOR IS TO ENSURE THE TEMPORARY STABILITY OF ANY CUT SLOPES. IN DOING SO THE CONTRACTOR SHOULD CONSIDER THE EXTENT OF SLOPE (I.E. PARALLEL TO THE TRACK) THAT CAN BE EXCAVATED AT ANY ONE TIME AND THE TIME PERIOD BEFORE BACKFILLING OR STABILISING.
 06. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY SUPPORTS AND / OR RESTRICTION ON THE SEQUENCE OF CONSTRUCTION; INCLUDING PROTECTION OF THE TRACK AND ALL EXISTING LINESIDE EQUIPMENT WHICH WILL REMAIN IN OPERATION DURING THE WORKS.
 07. POSSESSION REQUIREMENTS FOR THE WORKS ARE TO BE IDENTIFIED AND MANAGED BY THE CONTRACTOR.
 08. NO GI UNDERTAKEN AT GRIP 3 - TO BE COMPLETED AHEAD OF DETAILED DESIGN.



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|--------|----------|--------------------------|-------|------|-------------|
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| | | | | | |
| A02 | 20/09/19 | FOR DCO APPLICATION | JB | RS | RS |
| Rev | Date | Description of Revisions | Drawn | Chkd | Appr |
| Status | | | | | Suitability |

FIT FOR INFORMATION

S2



Contractor(s)

ARUP
63 St Thomas Street
Bristol BS1 6JZ
Tel +44(0)117 976 5432 Fax +44(0)117 976 5433
www.arup.com

Project
**PORTISHEAD BRANCH LINE
(METROWEST PHASE 1)**

Drawing Title
**HARDWICK ROAD CUTTING
TYPICAL DETAILS
POD 126MI 15CH TO 126MI 27CH
(13150M TO 13370M)**

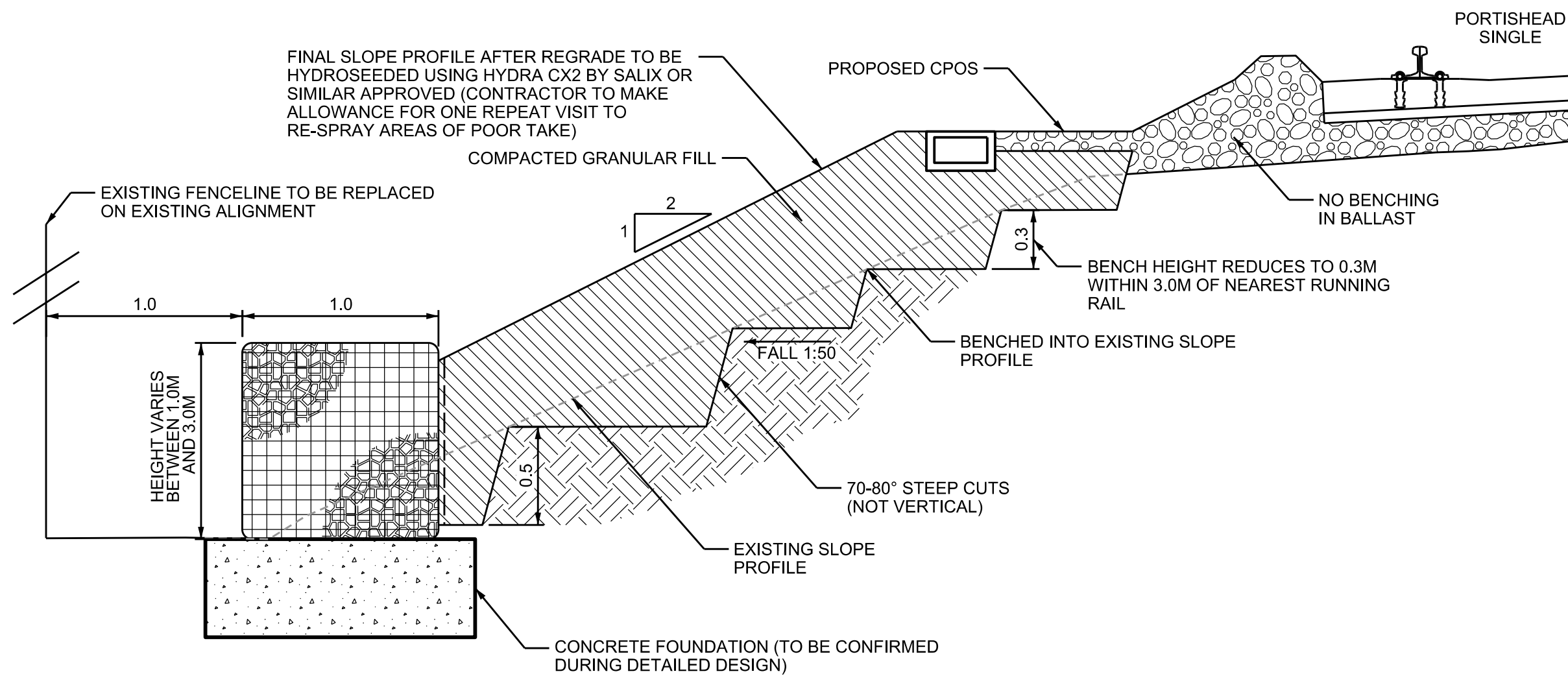
| | | | | |
|----------|-------------|--------|------|----------|
| Designed | J. BACINSKI | Signed | Date | 20/09/19 |
| Drawn | J. BACINSKI | Signed | Date | 20/09/19 |
| Checked | R. SNELL | Signed | Date | 20/09/19 |
| Approved | R. SNELL | Signed | Date | 20/09/19 |

| | | | |
|----------|----------|---------------|----------------|
| Scale(s) | As Shown | ELR & Mileage | POD 126MI 20CH |
|----------|----------|---------------|----------------|

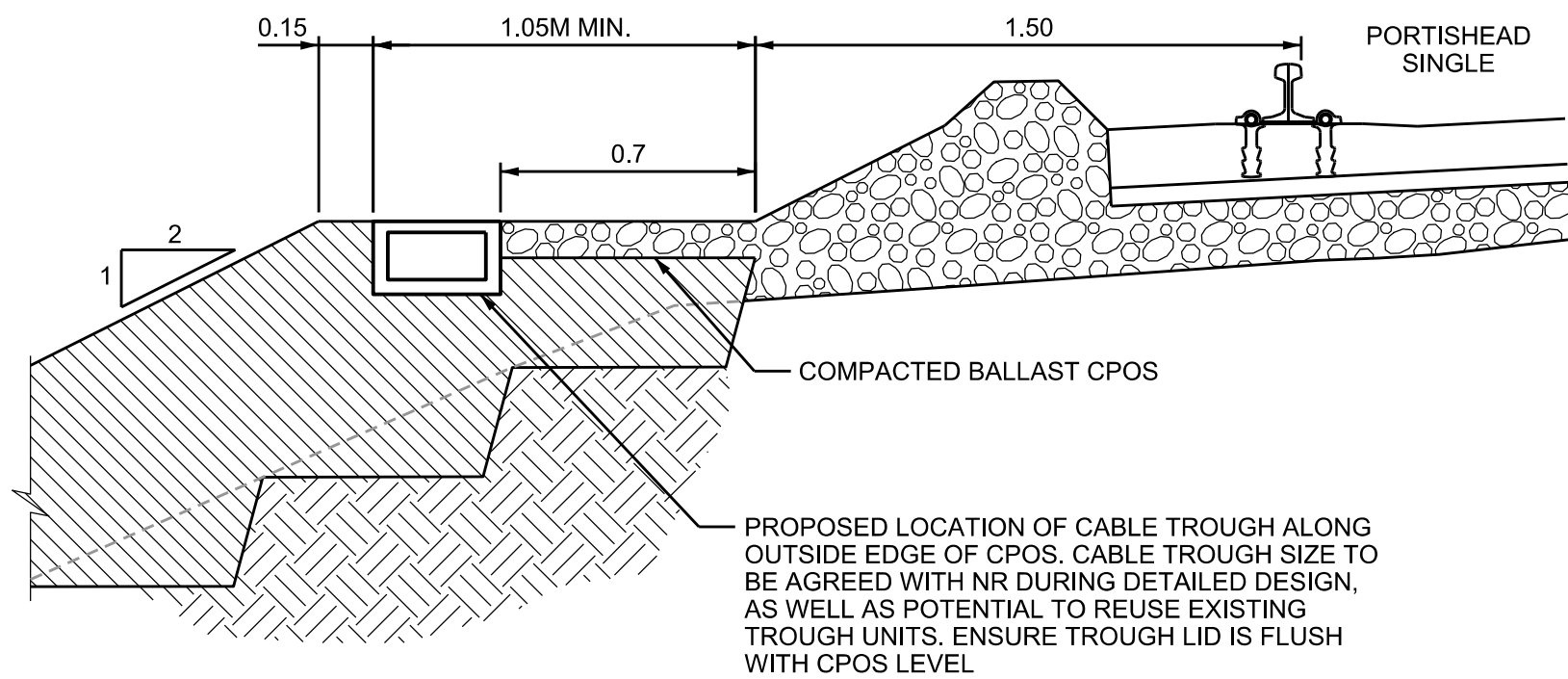
| | |
|-----------------------|-------|
| Alternative Reference | Sheet |
|-----------------------|-------|

| | |
|----------------|--------|
| Drawing Number | 1 of 1 |
|----------------|--------|

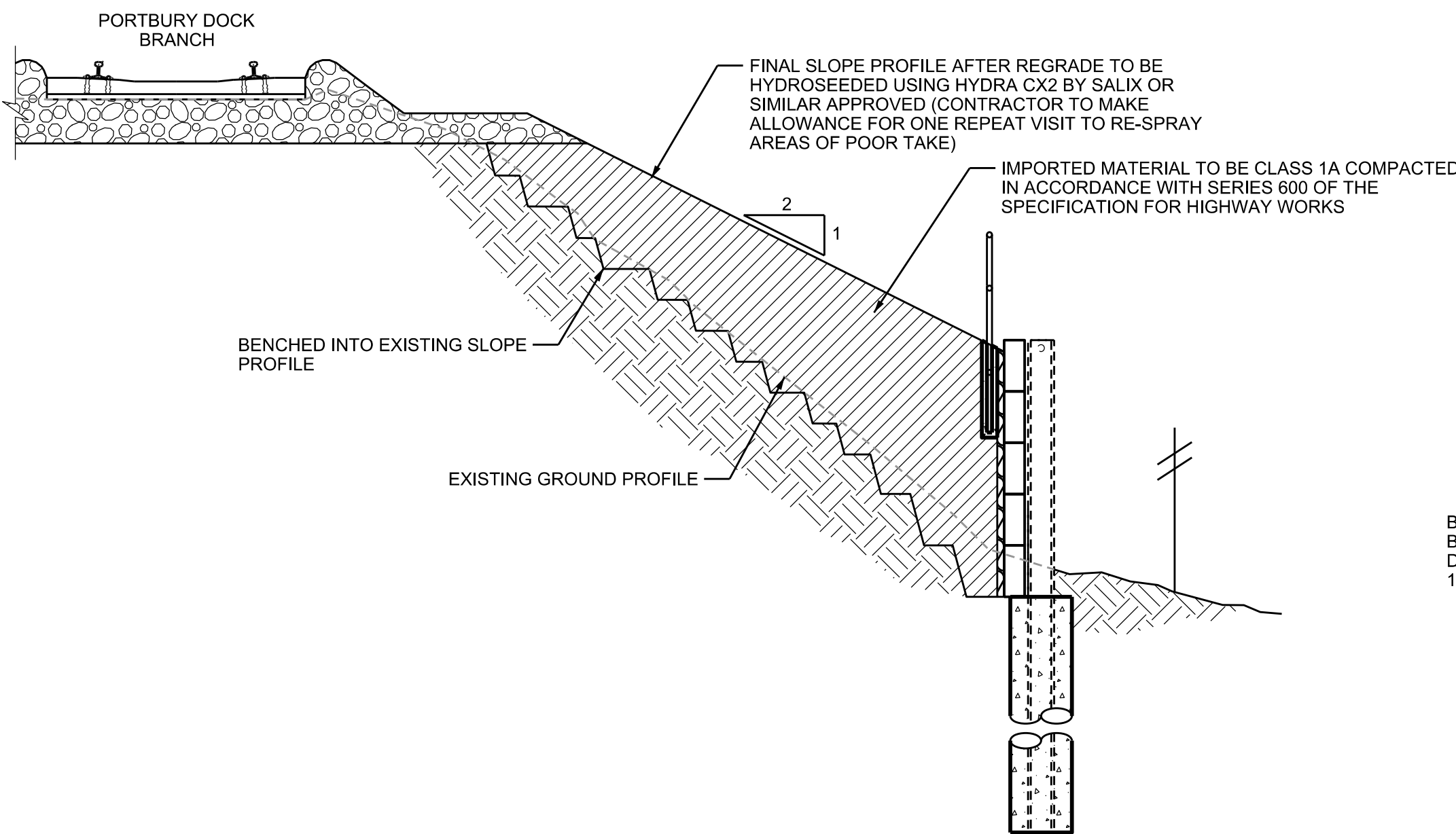
W1097B-ARP-DRG-EGE-300005 A02



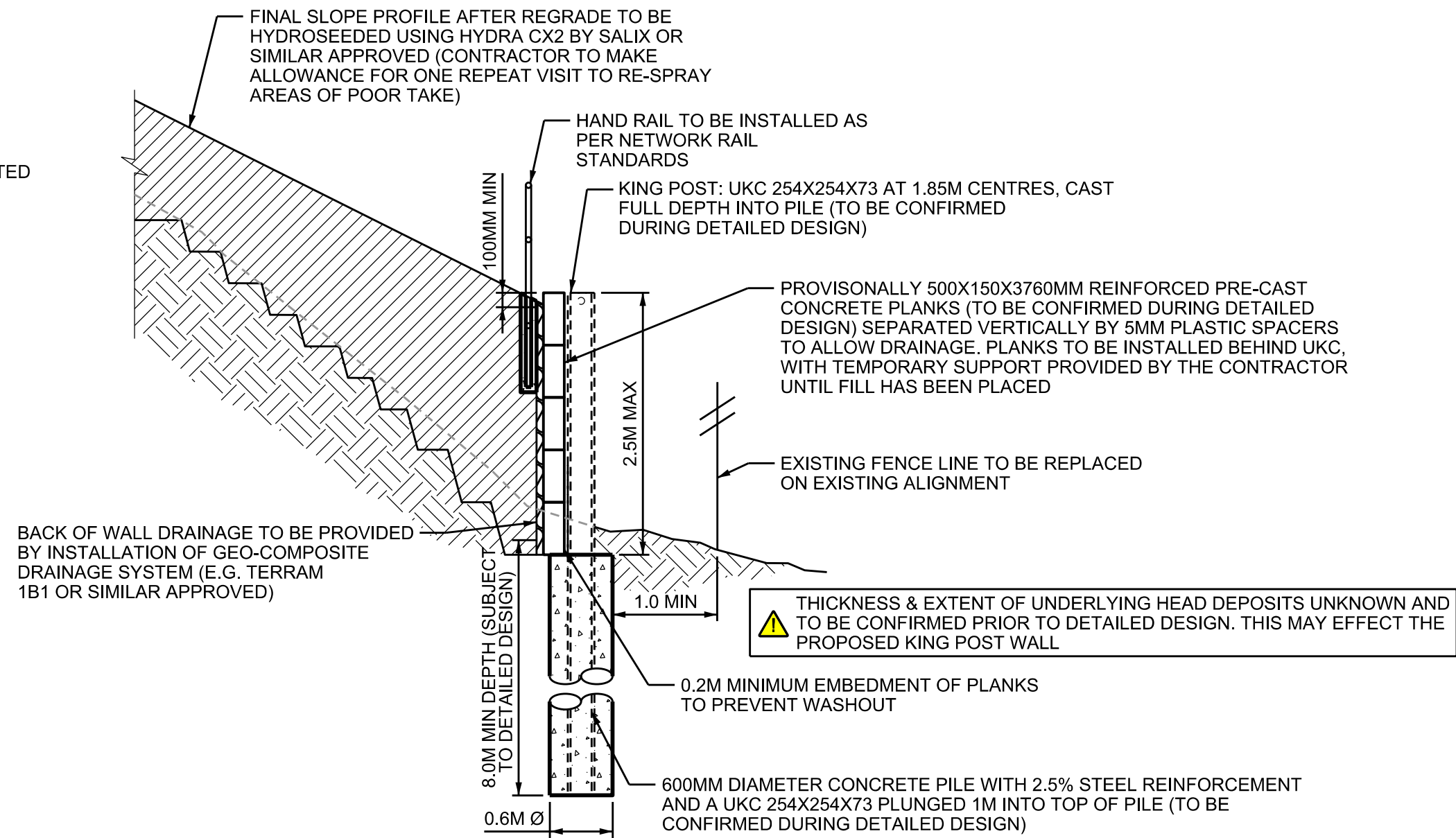
1 TYPICAL CROSS SECTION FOR TOE WALL AND SLOPE REGRADE WITH BENCHING
SCALE 1:25 (DESIGN METERAGE CH.13482M - CH.13505M)



2 EMBANKMENT CREST DETAIL WITH CPOS
SCALE 1:20

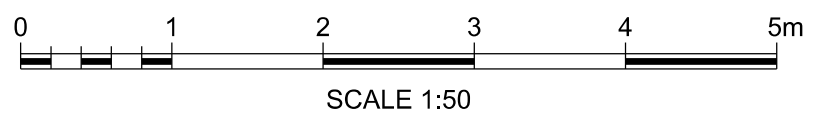
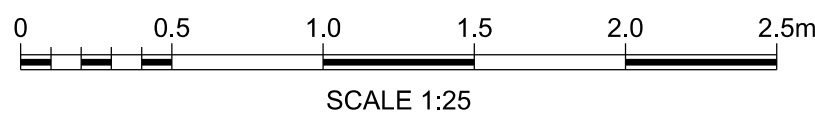
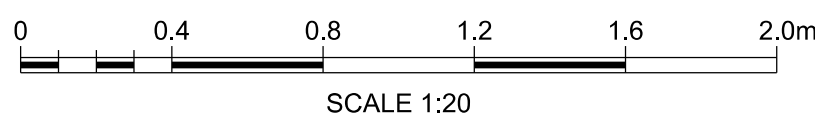


3 TYPICAL REGRADE WITH KING POST WALL
SCALE 1:50 (DESIGN METERAGE CH.13443 - CH.13488)



4 TYPICAL KING POST WALL DETAIL
SCALE 1:50

- GENERAL NOTES:
01. THE CONTRACTOR MUST REFER TO THE HAZARD REGISTER FOR RISK CONCERNING THE WORKS. SOME OF THE KEY SITE SPECIFIC RISKS ARE HIGHLIGHTED ON THE DRAWING.
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 07. POSSESSION REQUIREMENTS FOR THE WORKS ARE TO BE IDENTIFIED AND MANAGED BY THE CONTRACTOR.
 08. MONITORING OF THE EMBANKMENT AND THE EXISTING PORTBURY DOCK BRANCH LINE IS REQUIRED DURING THE WORKS. THIS IS TO BE AS SPECIFIED DURING DETAILED DESIGN.
 09. NO GI SPECIFIC TO THE EARTHWORK UNDERTAKEN - TO BE COMPLETED AHEAD OF DETAIL DESIGN.



| Rev | Date | Description of Revisions | Drawn | Chkd | Appr |
|-----|----------|--------------------------|-------|------|------|
| A02 | 20/09/19 | FOR DCO APPLICATION | JB | RS | RS |

| Status | Suitability |
|--------|-------------|
| | S2 |

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Contractor(s)

ARUP
63 St Thomas Street
Bristol BS1 6JZ
Tel +44(0)117 976 5432 Fax +44(0)117 976 5433
www.arup.com

Project
**PORTISHEAD BRANCH LINE
(METROWEST PHASE 1)**

Drawing Title
**AVON ROAD EMBANKMENT
TYPICAL DETAILS
POD 126MI 27CH TO 126MI 34CH
(13390M TO 13510M)**

| | | | | | |
|----------|-------------|--------|--|------|----------|
| Designed | J.BACINSKI | Signed | | Date | 20/09/19 |
| Drawn | J. BACINSKI | Signed | | Date | 20/09/19 |
| Checked | R. SNELL | Signed | | Date | 20/09/19 |
| Approved | R. SNELL | Signed | | Date | 20/09/19 |

| Scale(s) | ELR & Mileage |
|----------|----------------|
| As Shown | POD 126MI 30CH |

| Alternative Reference | Sheet |
|-----------------------|----------|
| | 1 of 1 |
| Drawing Number | Revision |

W1097B-ARP-DRG-EGE-300008 A02