

**Hanson Quarry Products Europe Limited, Forest Wood Quarry
Transitional Water Resources Licence Application
Form WRH**

Continuation Sheet: HN_Forest_Wood_001

Section 4 – Entitlement to apply continued

4.2 – See Figure 1 and drawing: Plan No.2 Landholding and Planning Application Area

Section 8.4 – Abstraction details, continued

Water is then pumped up to the top of the quarry where it meets a spur in the pipeline. From here, water can be diverted to fill two 10,000 litre storage tanks (20,000 litres combined) by use of a manually controlled diversion valve. Then water is pumped from the storage tanks facilitated by a Pentax ULTRA 5L-250/8T pump for dust suppression use at the plant (see photo 3). This has been on-going prior to 2011.

To estimate dust suppression usage, the flow rate curve is used to give a pump rate of 8.4 m³/hour at 19.1 m of pressure head. The pump is operated for 5 minutes per hour for a maximum of 10 hours a day. This gives a maximum total daily usage of 7 m³. As the pump is operated daily all-year round, multiplying 7 m³ by the number of working days per year, 260, gives 1820 m³ for maximum annual usage at an instantaneous pump rate of 2.33 l/s.

Eventually water from the sump discharges into a concrete-lined settlement lagoon at ST 01934 79972 at c. 52 mAOD (A2). Dewatering-derived groundwater is the only water which is stored and discharged from the lagoon (surface run off from the quarry catchment is drained using a different settlement lagoon system at ST 02145 79697). Water first passes a weir before settling in the lagoon. The weir was constructed in 2015 to British Standards and has a notch width of 1.75 m. The flow calculation is a simplified version of the Kindsvater-Carter rectangular weir equation and is given by:

$$Q_a = C_d \frac{2}{3} \sqrt{2g} L_b h^{3/2}$$

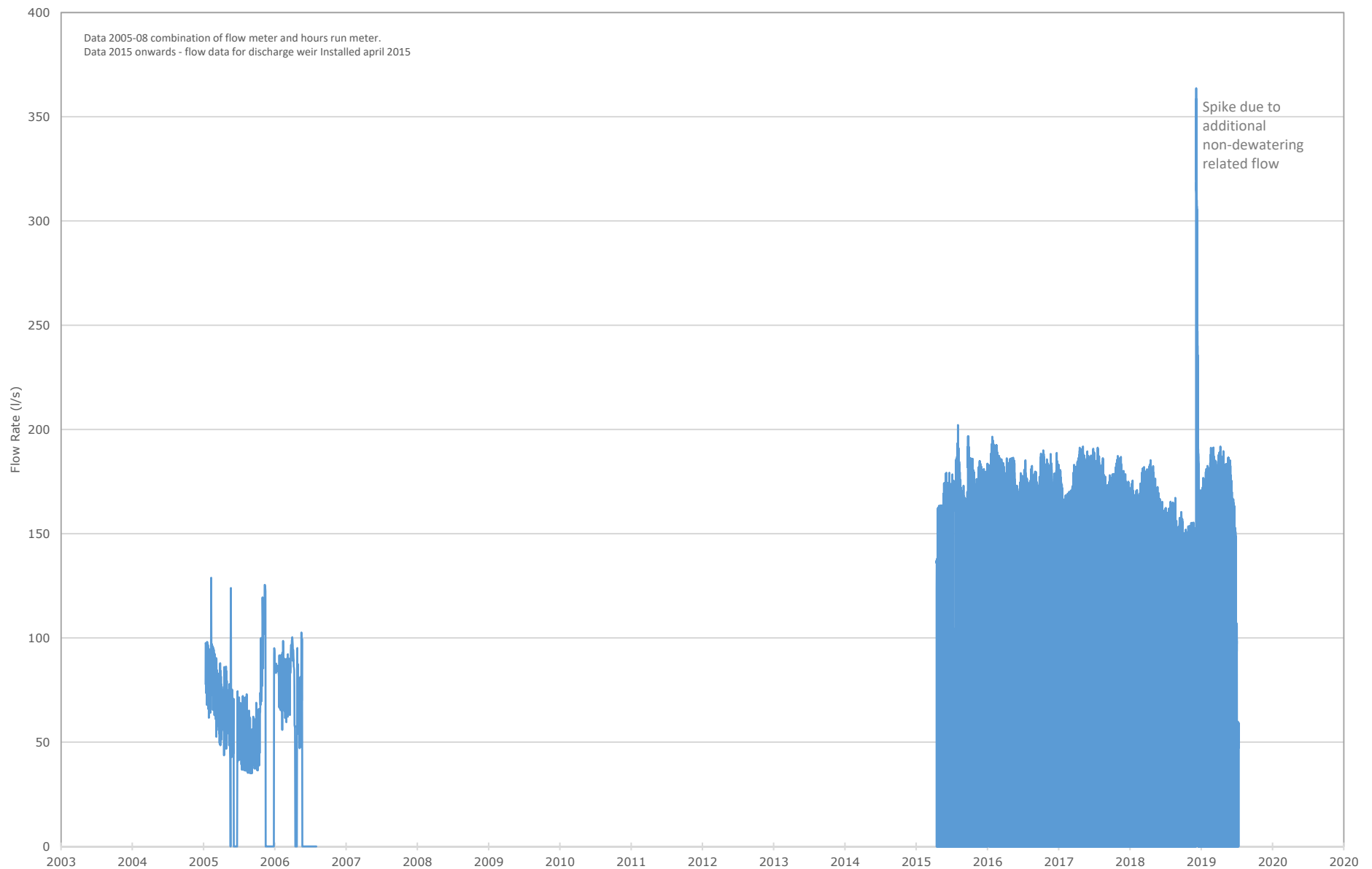
Where C_d , the correction factor comes to 1.84, L_b , the length of the weir is 1.75 m and h is the height above the weir. The height above the weir is recorded by a CTL logger which records levels at 15 minute intervals and is calibrated and uploaded monthly.

To calculate the dewatering volumes, the plant dust suppression usage must be added to the volumes discharged over the weir as the usage takes place before water reaches the weir. Table 1 gives a monthly summary of dewatering-related discharges from April 2015 to December 2017. The quarry discharge data graph shows the history of dewatering-related discharges from the site.

Table 1 - Hanson Aggregates UK Limited: Forest Wood Quarry dewatering discharges and plant dust suppression use

	Discharge over weir (m3)	Plant Dust Suppression (m3)	Total Dewatering Volume (m3)	Notes
2015				
Apr	95675.9	151.7	95827.6	Partial data for month
May	151140.5	151.7	151292.1	
Jun	139614.8	151.7	139766.5	
Jul	137258.4	151.7	137410.1	
Aug	130913.3	151.7	131065.0	
Sep	135912.6	151.7	136064.3	
Oct	134716.1	151.7	134867.8	
Nov	167343.3	151.7	167495.0	
Dec	240053.0	151.7	240204.7	
2015 Totals	1332628.0	1365.0	1333993.0	
2016				
Jan	316558.4	151.7	316710.1	
Feb	259266.9	151.7	259418.6	
Mar	204020.7	151.7	204172.4	
Apr	161920.4	151.7	162072.1	
May	157932.8	151.7	158084.5	
Jun	141117.3	151.7	141269.0	
Jul	139481.4	151.7	139633.1	
Aug	155075.5	151.7	155227.2	
Sep	134811.0	151.7	134962.7	
Oct	147965.9	151.7	148117.5	
Nov	160794.5	151.7	160946.1	
Dec	165552.3	151.7	165704.0	
2016 Totals	2144497.2	1820.0	2146317.2	
2017				
Jan	148677.8	151.7	148829.5	
Feb	148490.1	151.7	148641.8	
Mar	203454.2	151.7	203605.9	
Apr	174193.2	151.7	174344.9	
May	149008.0	151.7	149159.7	
Jun	131994.5	151.7	132146.1	
Jul	131183.5	151.7	131335.1	
Aug	128984.0	151.7	129135.7	
Sep	122521.0	151.7	122672.7	
Oct	142983.6	151.7	143135.3	
Nov	164961.0	151.7	165112.7	
Dec	208138.6	151.7	208290.2	
2017 Totals	1854589.5	1820.0	1856409.5	

Hanson Aggregates: Forest Wood Quarry - Quarry Discharge Data



Three separate abstractions take place at the settlement lagoon (A2) after water has passed the weir. The first is to fill a water bowser for dust suppression around the quarry haul roads (see photo 6). This typically occurs seasonally twice a day for 4-5 months during drier conditions and has been ongoing before 2011. Assuming a storage capacity of 3000L, the daily usage would be 6 m³/d. Multiplying this by the number of working days across 5 months (6*100), the maximum annual usage would be 600 m³/year.

The second abstraction from the settlement lagoon (A2) is via a 2" JST-22 submersible pump for filling up a 10,000L tank prior to use at the wheel-wash. This pump is suspended from the footbridge in photo 4 and has been in use prior to 2011. To estimate usage volumes, first an estimation was made to determine the volume of water used by each wheel wash use. Operatives at Forest Wood Quarry estimated this as 250L per use. Then multiplying this by the maximum number of vehicles passing through the wheel wash per day which is 50, give a daily volume of 12500L (12.5 m³). This figure is multiplied by the number of working days per year, 260, to give an annual volume of 3250 m³. The peak instantaneous flow rate is taken from the nameplate of the pump used for abstraction, this figure being 650 L/min or 10.8 L/second.

The third abstraction from the settlement lagoon (A2) is for the CEMEX plant. This is already licensed under consent no. WA/057/0031/0005 for a maximum rate of 9.4 m³/h, 75 m³/d and 5000 m³/y at a maximum instantaneous rate of 2.6 l/s.

Figure 2 shows cross sections of the site with ranges of current groundwater levels across the site.

Drawings no.3 and no.4 show geological cross sections of the final quarry development with the final depth of workings at -30 mAOD.

Plans 6A, 7A and the accompanying cross sections show the restoration development plans for the quarry with proposed final rest water levels.

Section 9 – Discharge details, continued

Water from the settlement lagoon (A2) is discharged to a tributary of the Nant Rhydhalog at ST 0210 7991 via a 300 mm diameter pipe via gravity outfall. This is permitted under consent no. AN0229002. The site also holds a discharge licence at D2, consent no. AG0018801, however this is for the discharge of surface runoff from the quarry and is not relevant to this application.

Section 17 Declaration, continued

In order to facilitate the timely progress for dewatering (and related activity) transfer/abstraction licence applications, the Company Secretary has provided a letter of authorisation (attached) to allow Gavinder Meetca of BCL Consultant Hydrogeologists Limited to sign the required application.



Photo 1 – Panorama of Forest Wood Quarry sump (A1) with dewatering facilitated by a 10" Godwin HL260M pump (26/06/19 13:09)

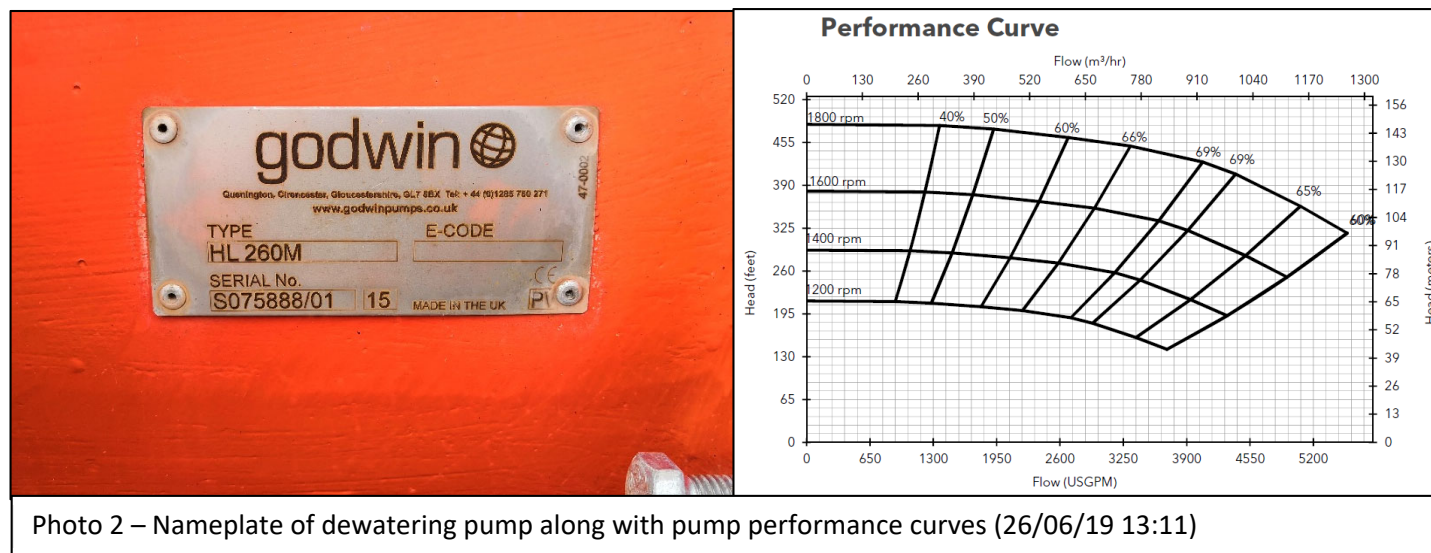


Photo 2 – Nameplate of dewatering pump along with pump performance curves (26/06/19 13:11)

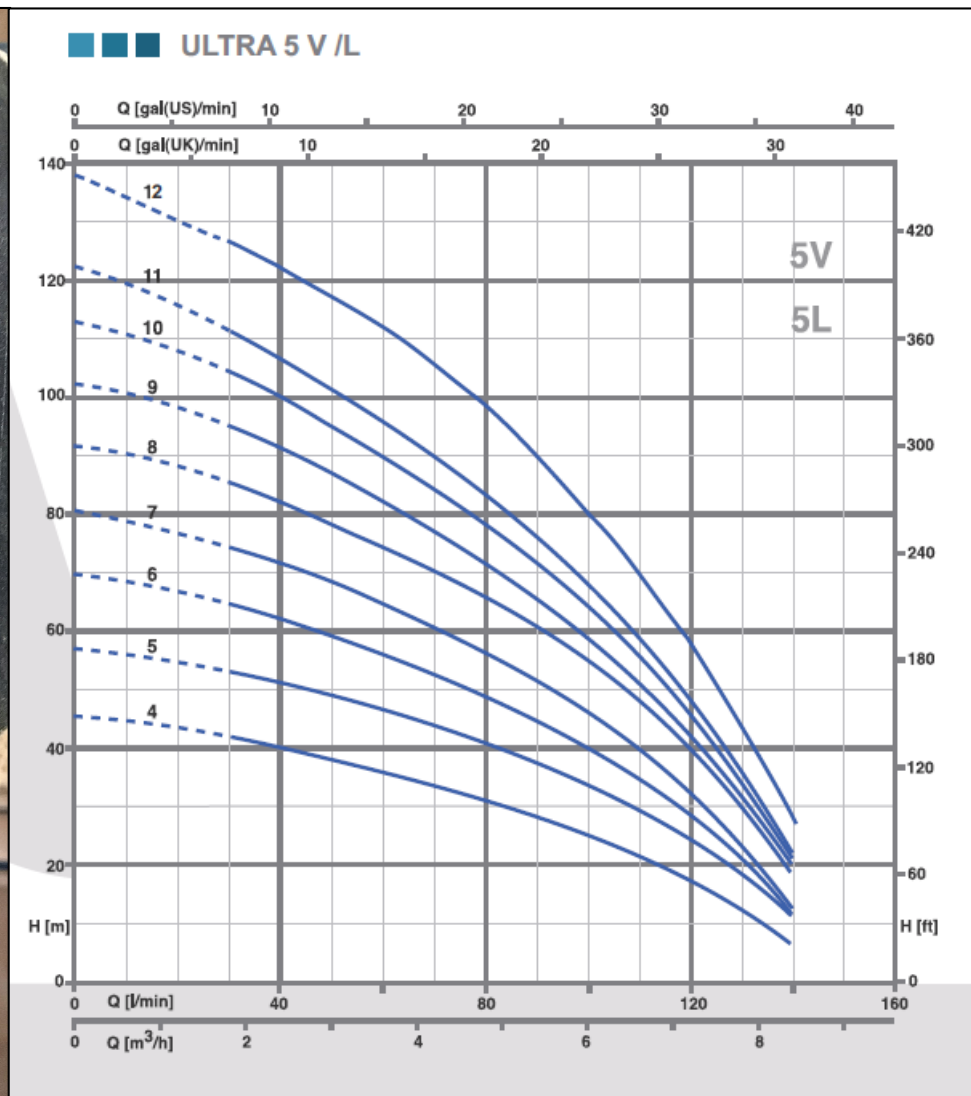


Photo 3 – Nameplate of Pentax ULTRA 5L-250/8T pump used for dust suppression at plant with accompanying pump performance curve (curve 8) (12/07/19 12:17)



Photos 4 and 5 – Water discharging from quarry sump (A1) passing a weir before entering the settlement lagoon (A2). The grey box next to the weir houses the logger which is used to record the height of water above the weir in 15 minute intervals (26/06/19 13:50)



Photo 6 – 3000L Water bowser used for dust suppression in Forest Wood quarry. Currently situated near the settlement lagoon (A2) and is typically used twice a day during drier months. (26/06/19 13:37)

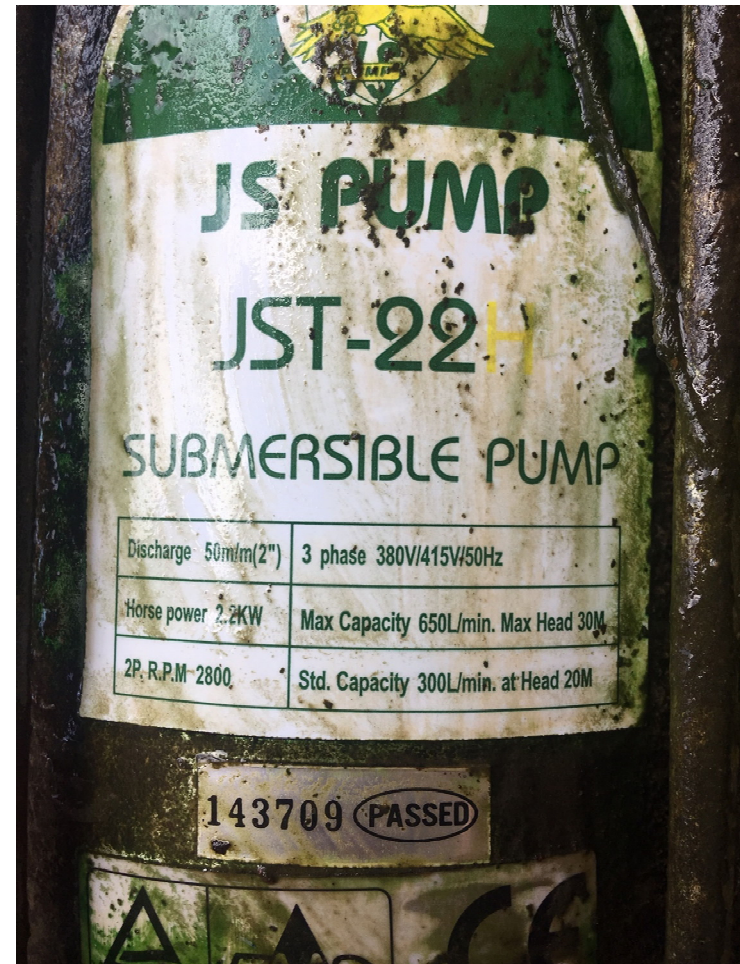
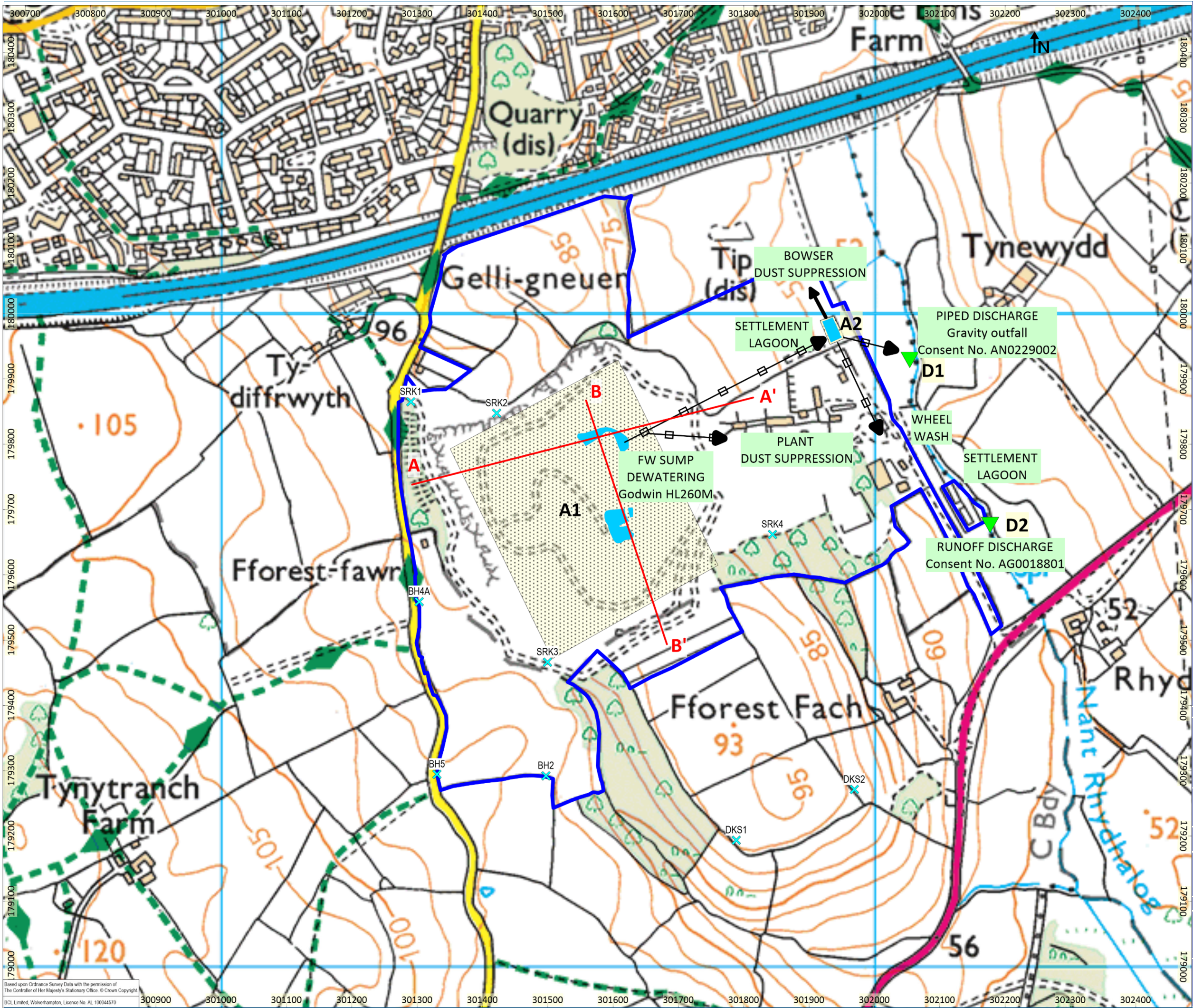


Photo 7 – 2" submersible JST-22 pump used for abstraction from settlement lagoon (A2) to the wheel wash storage tank (24/07/19 16:34)

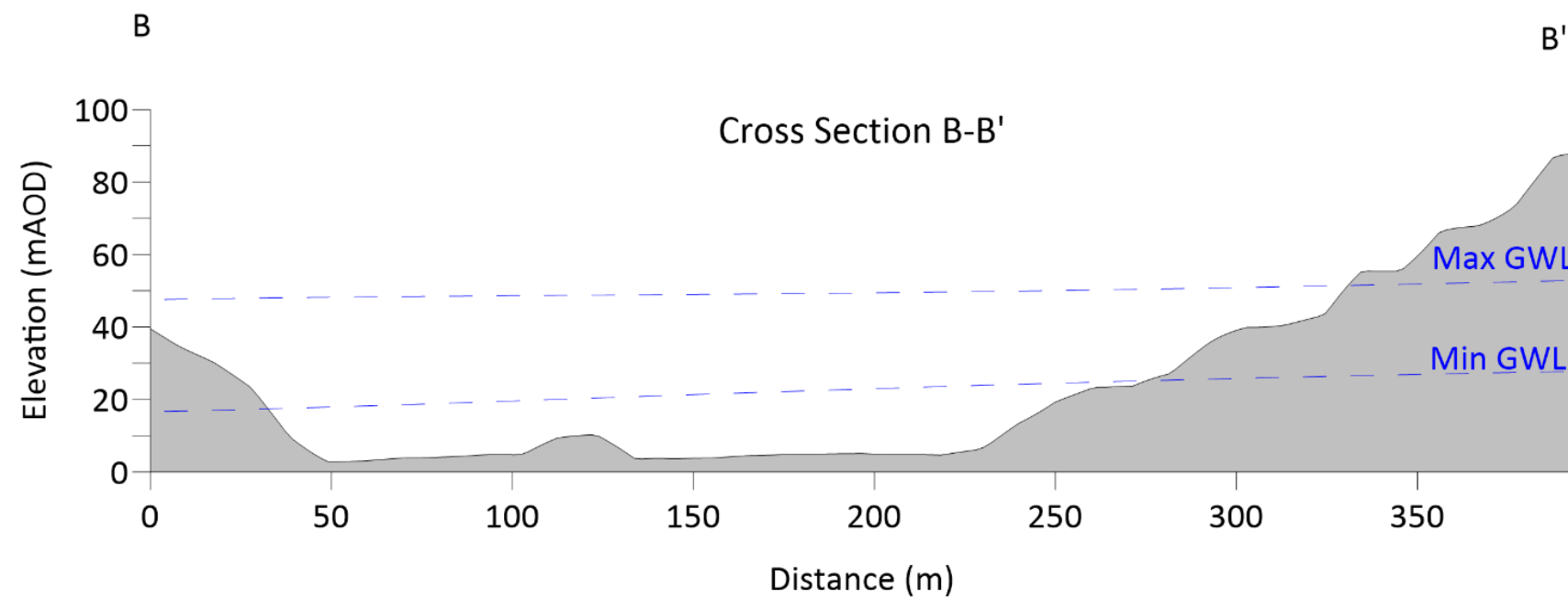
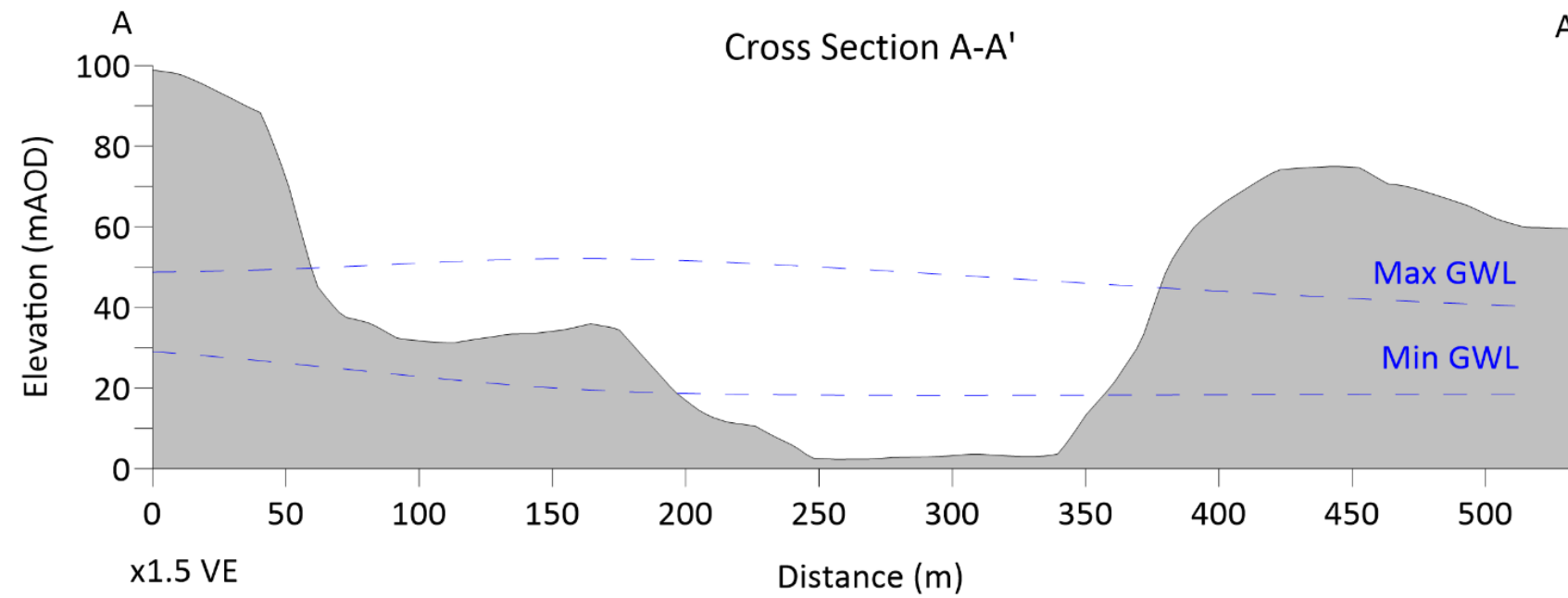


- Area of abstraction
- Land holding boundary
- Discharge

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Hanson Quarry Products Europe Limited	
Forest Wood Quarry, Pontyclun	
Water Resources Licence Application	
Form WRH Continuation Sheet	
Figure 1: Forest Wood Quarry Water Management Plan	
Drawn By: GM	Scale: 1:5500
Date: July 2019	Format: A3L



Groundwater level data 2018-2019

DOCUMENT REF: D:\HN\FW\002



Hanson Quarry Products Europe Limited

Forest Wood Quarry, Pontyclun

Water Resources Licence Application

Form WRH Continuation Sheet

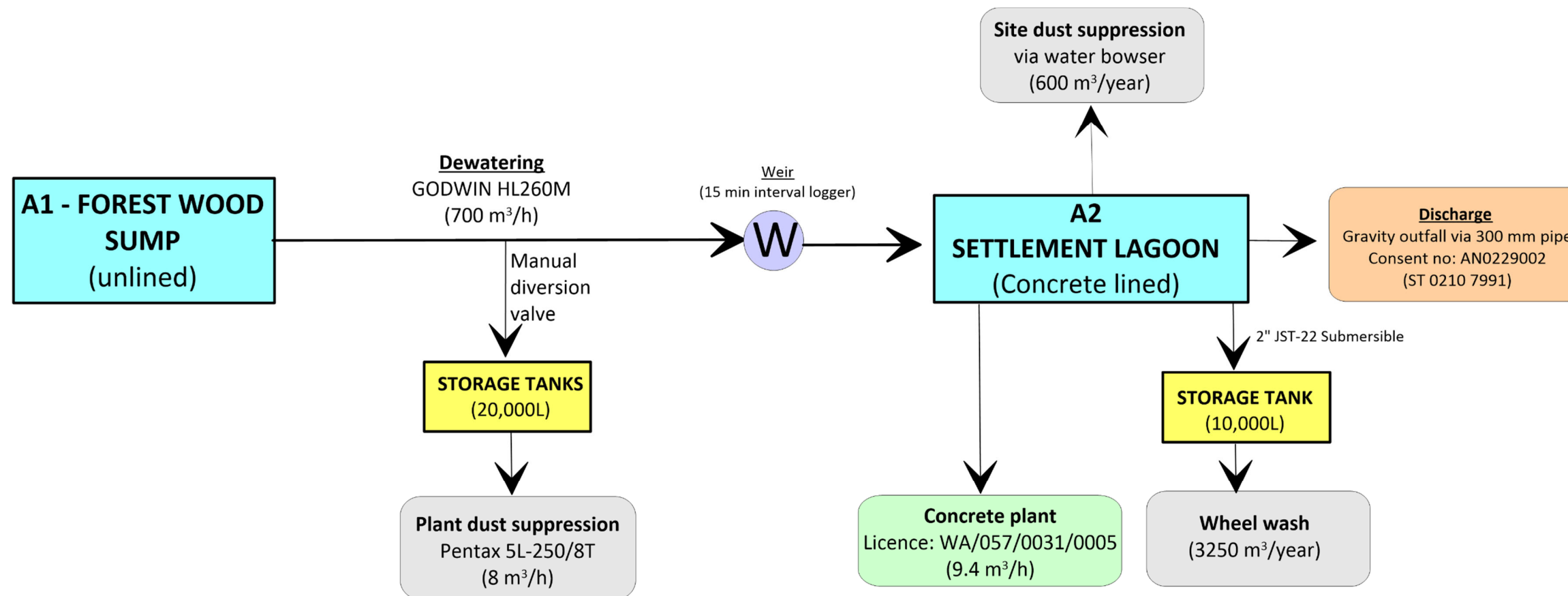
Figure 2: Forest Wood Quarry Cross Sections

Drawn By: GM

Scale: NA

Date: July 2019

Format: A3L



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Hanson Quarry Products Europe Limited

Forest Wood Quarry, Pontyclun

Water Resources Licence Application

Form WRH Continuation Sheet

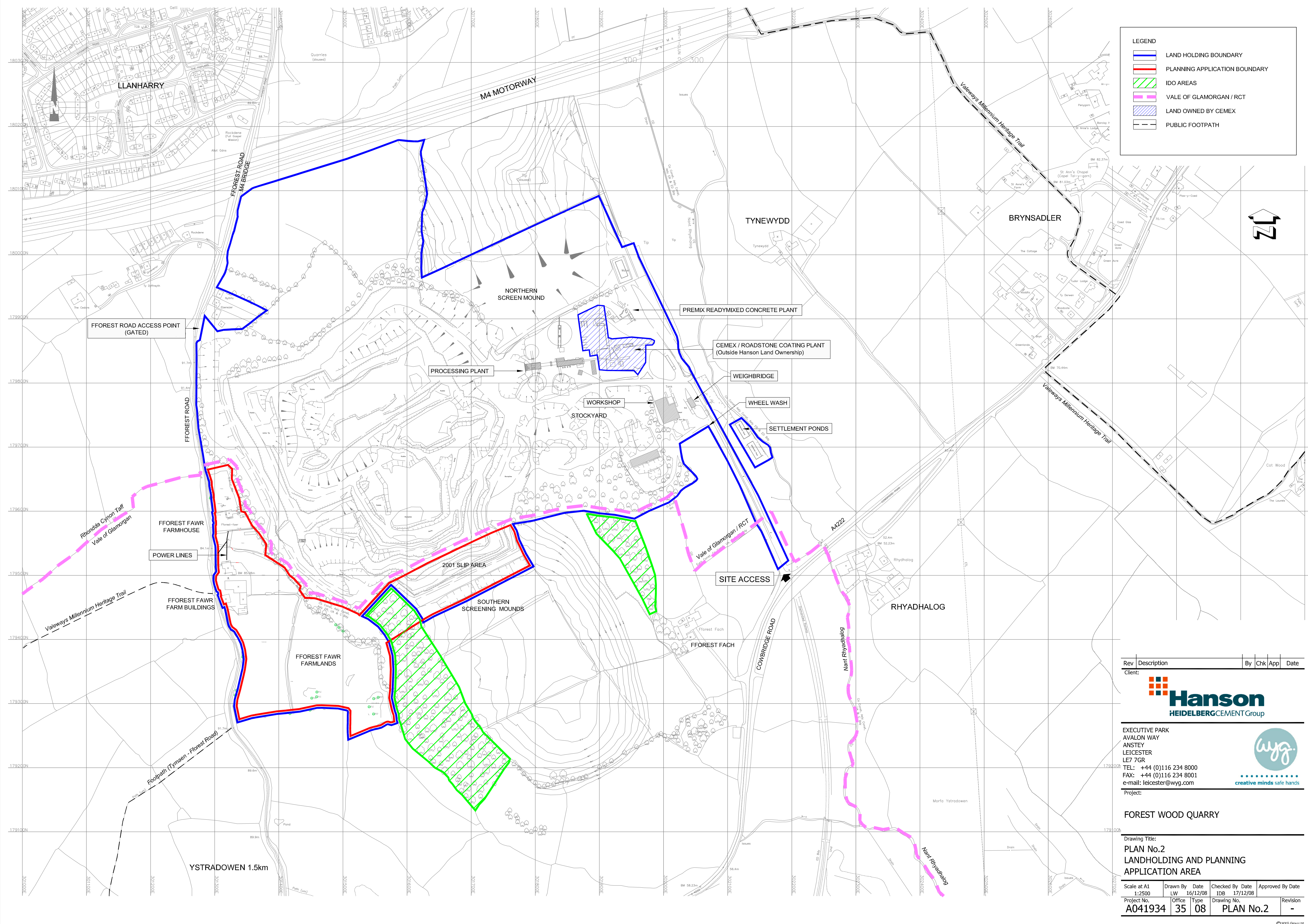
Figure 3: Forest Wood Quarry Water Management Schematic

Drawn By: GM

Scale: NA

Date: July 2019

Format: A3L



LEGEND

LAND HOLDING BOUNDARY

PLANNING APPLICATION BOUNDARY

IDO AREAS

VALE OF GLAMORGAN / RCT

LAND OWNED BY CEMEX

PUBLIC FOOTPATH

Rev	Description	By	Chk	App	Date
Client:					



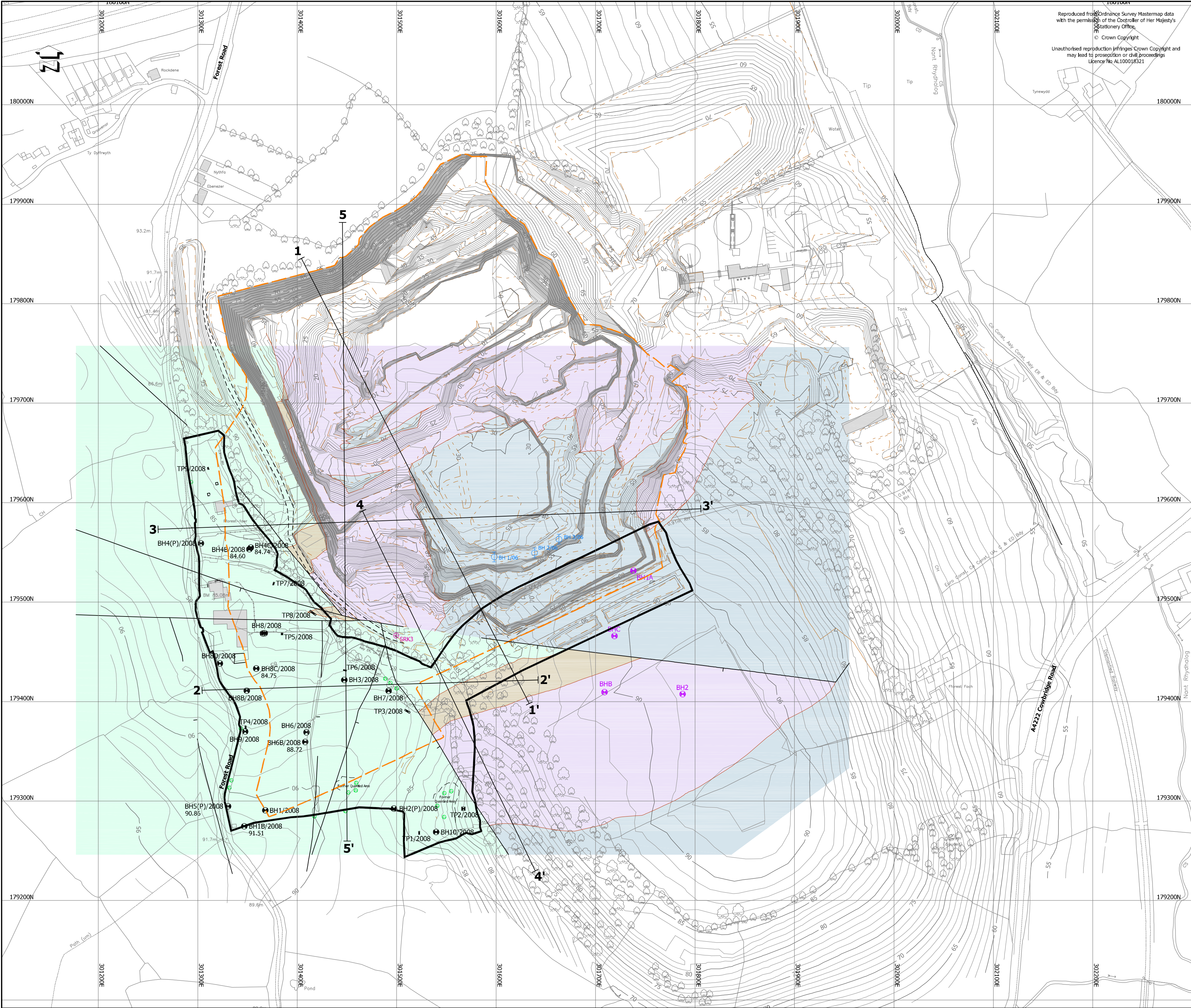
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e-mail: leicester@wyg.com
Project:



FOREST WOOD QUARRY

Drawing Title:
PLAN No.2
LANDHOLDING AND PLANNING
APPLICATION AREA

Scale at A1 1:2500	Drawn By LW	Date 16/12/08	Checked By Date IDB 17/12/08	Approved By Date
Project No. A041934	Office 35	Type 08	Drawing No. PLAN No.2	Revision -



Application boundary

Proposed final excavation limit

Crest of slope

Ground surface contour mAOD

TP2/2008

GWP Trial pit location 2008

BH3/2008

Borehole drilled by GWP (2008)

BH4(P)/2008

Borehole drilled by GWP with water monitoring stand pipe installed (2008)

BH 1/06

Borehole geologged in 2008

BHC

Cored borehole drilled by DK Symes Associates (1999)

SRK3

Borehole drilled for groundwater investigation by SRK (1995)

Surface subcrop of inferred/conjectural fault zones with direction of downthrow based on borehole intersections

1'

Line of cross section

Inferred subcrop of High Tor Limestone

Inferred subcrop of Caswell Bay Mudstone

Inferred subcrop of Gully Oolite

Inferred subcrop of Friars Point Limestone

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earth & water resources

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Rev	Description	By	Chk	App	Date
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creative minds safe hands

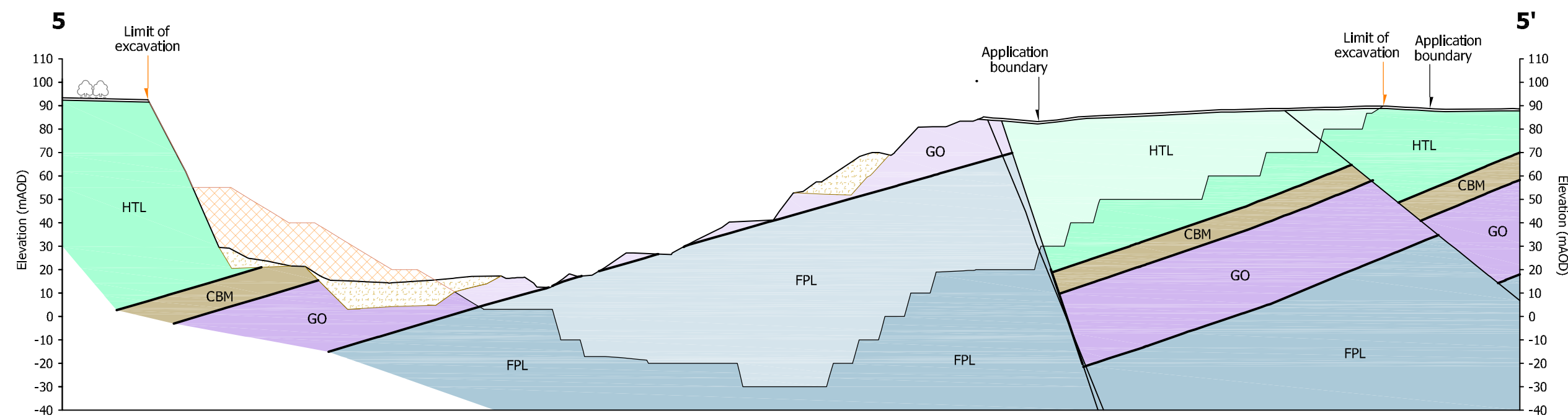
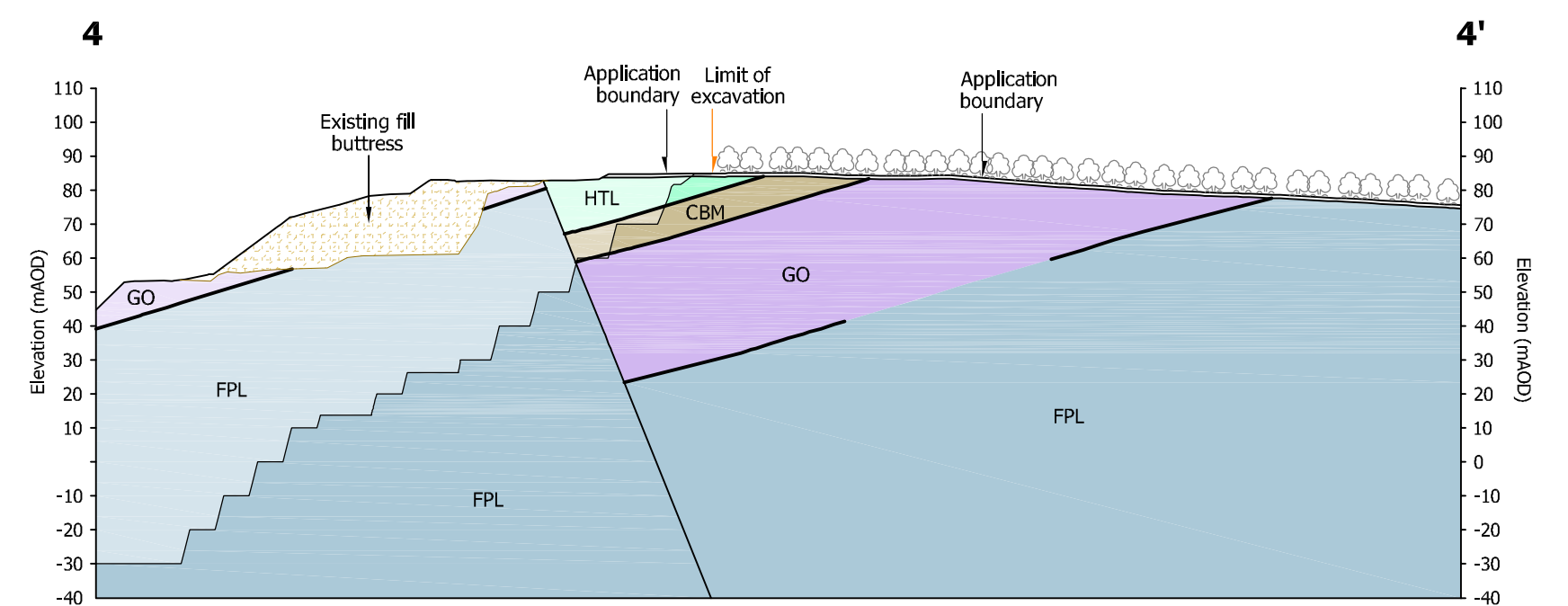
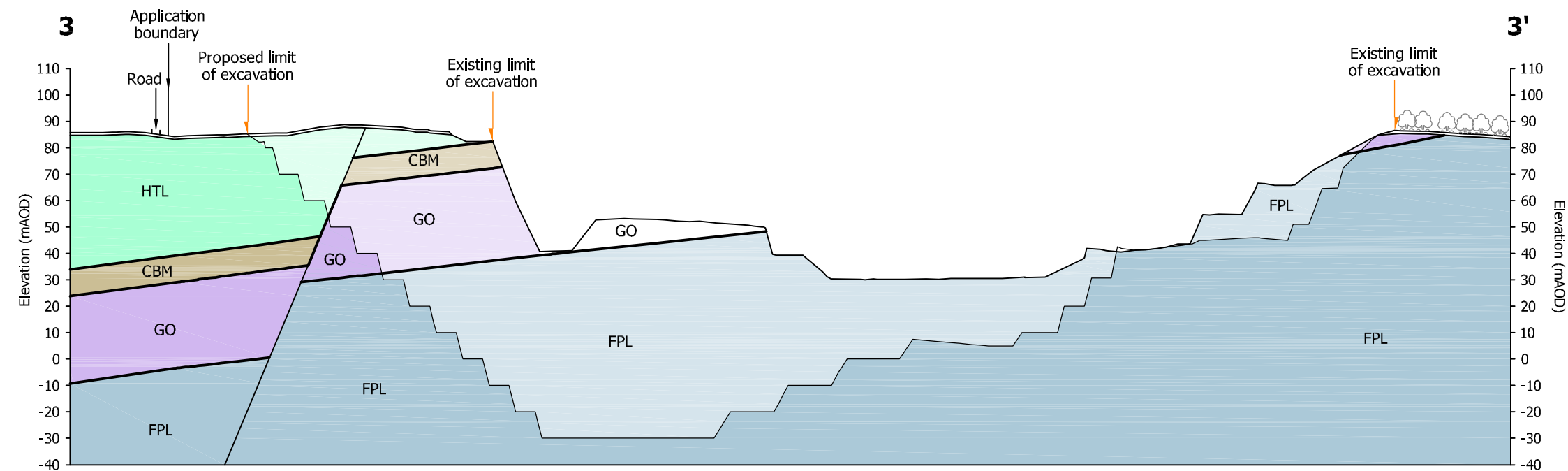
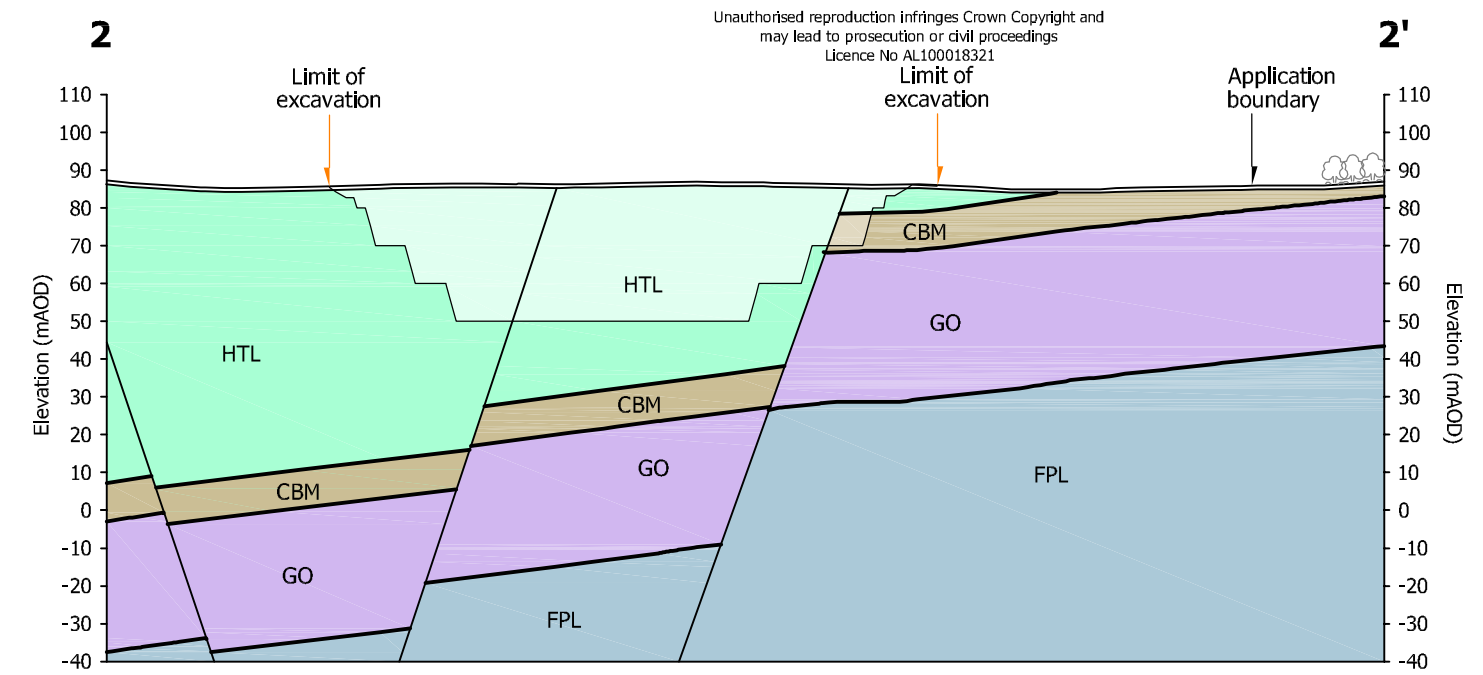
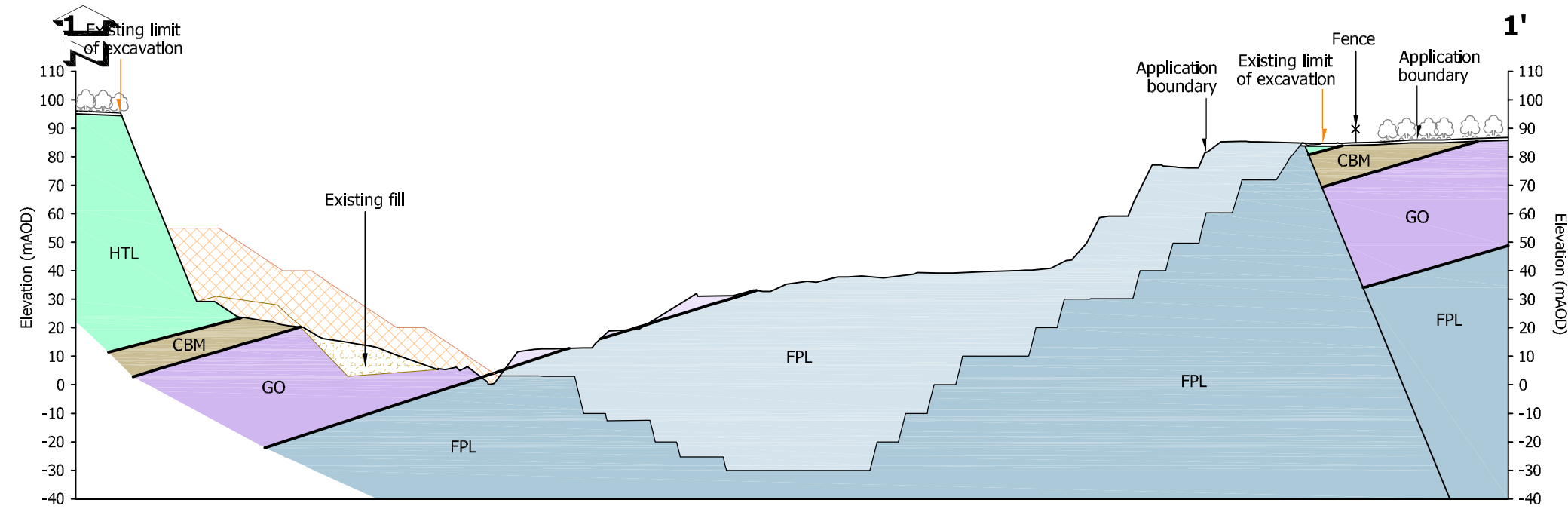
Project:

FOREST WOOD QUARRY

Drawing Title:

PLAN No. 3
INFERRED GEOLOGY OF THE
EXTENSION AREA

Scale at A2 1:2500	Drawn By IB/LS	Date 11/12/08	Checked By DJ	Date 11/12/08	Approved By Date
Project No. A041934	Office 35	Type 08	Drawing No. PLAN No.3	Revision -	



LEGEND

- Existing ground surface
- Proposed final excavation
- Inferred/conjectural geological boundaries
- High Tor Limestone (HTL) excavated
- High Tor Limestone (HTL) remaining
- Caswell Bay Mudstone (CBM) excavated
- Caswell Bay Mudstone (CBM) remaining
- Gully Oolite (GO) excavated
- Gully Oolite (GO) remaining
- Friars Point Limestone (FPL) excavated
- Friars Point Limestone (FPL) remaining
- Inferred/conjectural faults
- Existing fill
- Final in pit tip profile

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Rev	Description	By	Chk	App	Date

Client:

Hanson
 HEIDELBERGCEMENT Group

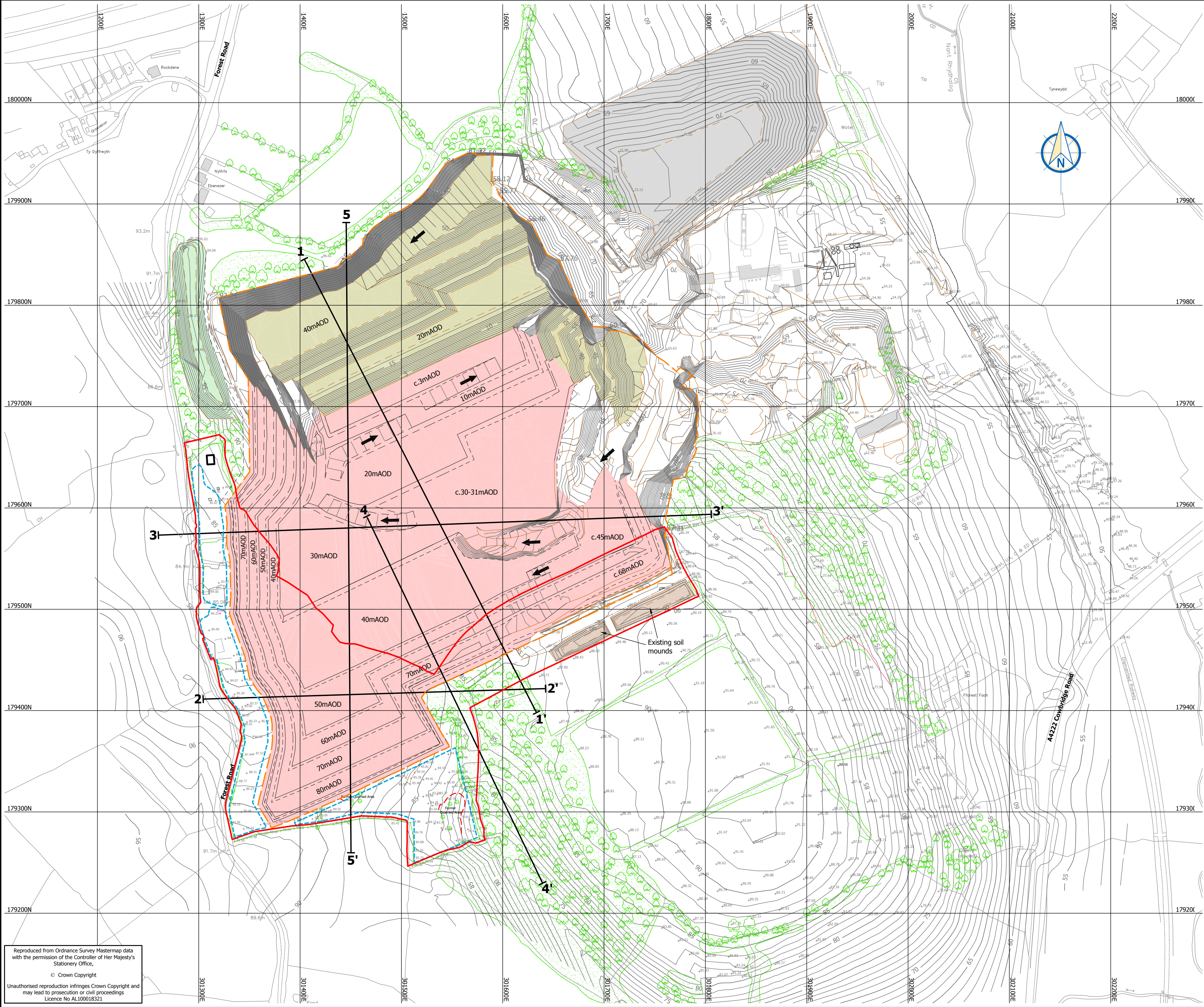
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 e-mail: leicester@wyg.com

Project:

FOREST WOOD QUARRY

Drawing Title:
PLAN No.4
CROSS SECTIONS SHOWING
INFERRED GEOLOGY

Scale at A2 1:2000	Drawn By IB/LS	Date 11/12/08	Checked By DJ	Date 11/12/08	Approved By Date
Project No. A041934	Office 35	Type 08	Drawing No. PLAN No.4	Revision -	



LEGEND

Application boundary for proposed extension

Proposed final excavation limit for proposed extension

Crest of slopes

Crest of proposed quarry faces

Ground surface contour mAOD

Line of cross section

Existing wooded areas (from 2005 aerial photograph)

Restored tip (existing)

Screening bunds (existing)

In-pit fill

Soil mounds (existing)

Footprint of proposed areas of soil and screening mounds

Proposed extended quarry excavation

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WYG Planning & Design

part of the **WYG** group



**Hanson**

HEIDELBERGCEMENTGroup

Version	Revision and compilation notes	Date
A	Quarry scheme revised to accommodate bat mitigation measures	14.12.2010

Project
Forest Wood Quarry - Fforest Fawr Extension - Planning Application

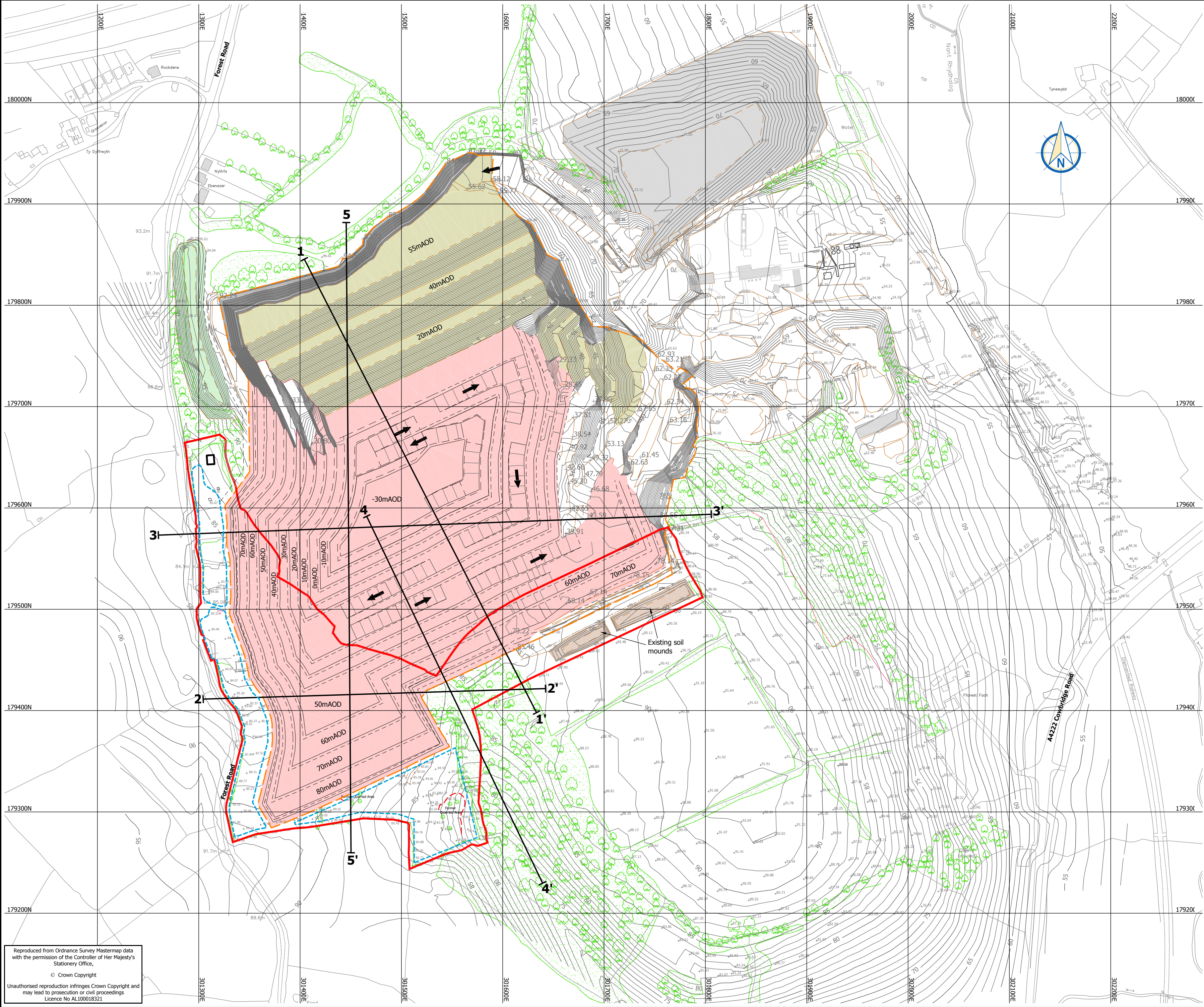
Quarry development at c.Year 12

Date 14.12.2010	Scale 1:2500
Drawing Ref	Version

PLAN 6A

A

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LEGEND

Application boundary for proposed extension

Proposed final excavation limit for proposed extension

Crest of slopes

Crest of proposed quarry faces

Ground surface contour mAOD

Line of cross section

Existing wooded areas (from 2005 aerial photograph)

Restored tip (existing)

Screening bunds (existing)

In-pit fill

Soil mounds (existing)

Footprint of proposed areas of soil and screening mounds

Proposed extended quarry excavation

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Version	Revision and compilation notes	Date
A	Quarry scheme revised to accommodate bat mitigation measures	14.12.2010

Project
Forest Wood Quarry - Fforest Fawr Extension - Planning Application

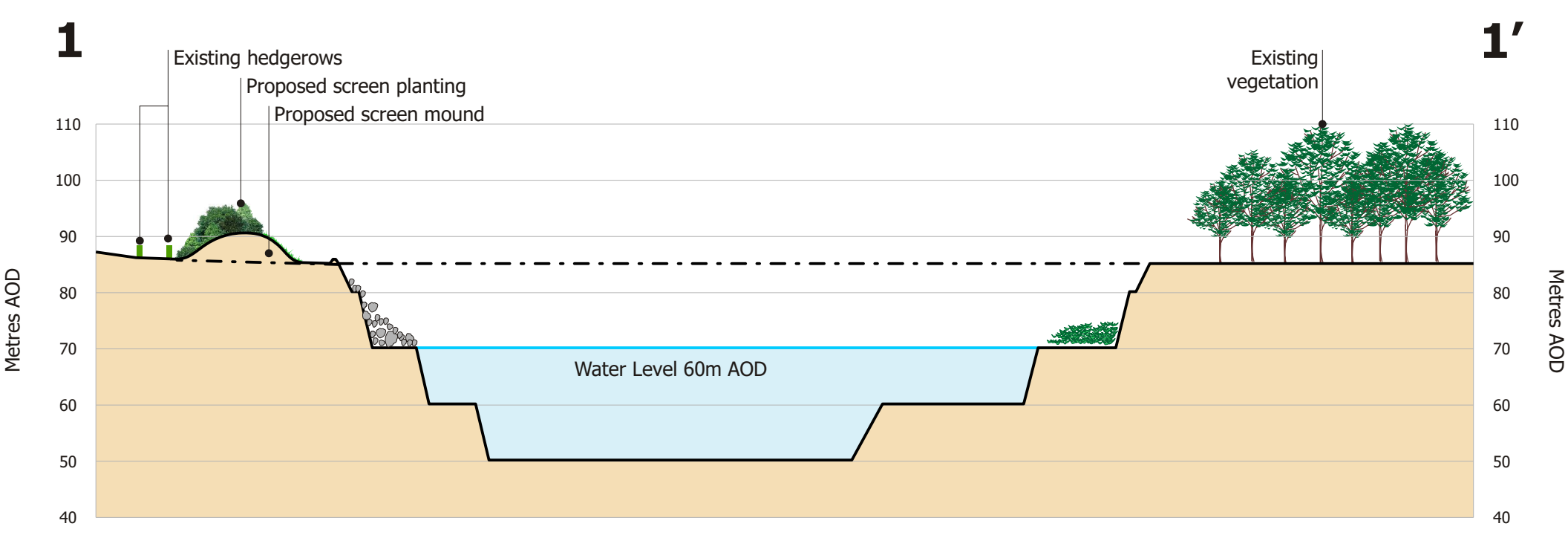
Final quarry development

Date 14.12.2010	Scale 1:2500
Drawing Ref	Version

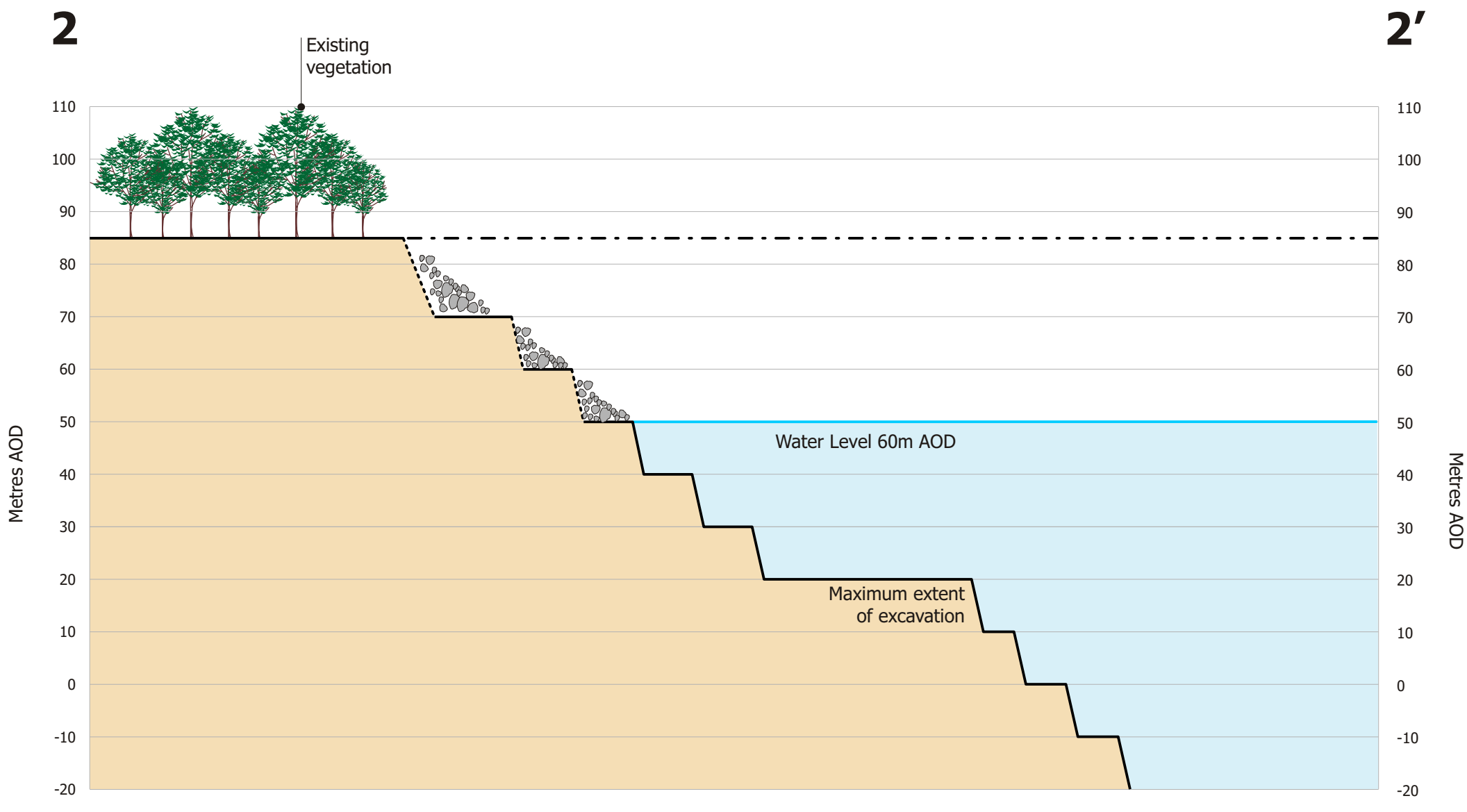
PLAN 7A

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Restoration Section 1 - 1'



Restoration Section 2 - 2'

key

- Existing ground level
- Proposed ground level
- Proposed water level
- Quarry bench treatment 2: Subsoil with boulders and quarry waste
- Proposed advance planting
- Retained woodland and trees

0 10 20 30 40 50m
Scale 1:1,000 @ A3 Do not scale from this drawing

Hanson Quarry Products Europe Limited

Permit Receipt Centre
Natural Resources Wales
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18 June 2019

Dear Sirs,

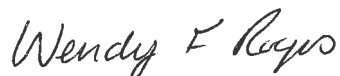
**Water Act 2003 Applications
Transfer Licences and Abstraction Licences
Applicant: Hanson Quarry Products Europe Limited**

We hereby authorise Paul Burfitt and Gavinder Meetca of B C L Consultant Hydrogeologists Limited – Company number 4043373 of 33 Wolverhampton Road, Cannock, Staffordshire, WS11 1AP – to sign on our behalf, forms relating to the submission of new transfer licences and full abstraction licences.

Please note this authorisation lapses on 31 May 2020.

Yours faithfully

For and on behalf of
Hanson Quarry Products Europe Limited



W F Rogers
Company Secretary