# Appendix G

# Restoration Details – Old East Quarry

SLR

global environmental solutions

# Ty Mawr West Slate Quarry

## Restoration Strategy for Old East Quarry

Ref: 421-03735-00001

April 2012

Ty Mawr West Limited

## CONTENTS



## APPENDICES



## DRAWINGS

## 1.0 INTRODUCTION

1.1 This report has been prepared by SLR Consulting Limited on behalf of Ty Mawr West Limited in support of a planning application for the resumption of slate extraction at the Old East Quarry, Ty Mawr West.

1.2 The purpose of this report is to prepare a restoration strategy to accompany the Restoration Plan for the area of proposed slate extraction. This work has been undertaken by Mark Williams, MSc.

## 2.0 RESTORATION STRATEGY

The proposals aim to create a restoration which will add to and complement the characteristics of the existing East Green Quarry to the immediate south of the proposed extraction area. The proposed Restoration Plan is illustrated on Dwg No. TMW-REST1-A.

## 3.0 RESTORATION MATERIALS

3.1.1 The restored landform will be achieved by utilising overburden and slate waste materials arising from within the Ty Mawr West operations. This waste product generally contains soil-forming materials and is currently being utilised in the restoration of other parts of Ty Mawr West Quarry therefore the use of this type of material in the proposed restoration is consistent with the approach currently being approved in the restoration of other parts of the quarry (refer to Plate 1 at Appendix B).

3.1.2 The overburden overlying the proposed extraction area is limited in quantity but any such material encountered will be stripped prior to extraction and placed into temporary store for use in future restoration.

3.1.3 The overall volume of material available for restoration will be c. 4,300$m^3$ (refer to calculations at Appendix A).

## 4.0 RESTORATION PROPOSALS

### 4.1 144m AOD Bench

4.1.1 On completion of working, the uppermost (144m AOD) bench and the face above it will be inaccessible. The proposed development will involve the loss of some existing rock faces which are classified as priority habitat in the UK Biodiversity Action Plan (UKBAP), namely 'Inland Rock Outcrop and Scree Habitats' BAP, therefore it is proposed to retain the 144m AOD bench and the face above it. This bench and face will be a zone of non-intervention where, in the long term, natural processes will result in the establishment of locally characteristic vegetation and the development of associated habitats.

### 4.2 138m AOD Bench/Plateau and 132m AOD bench

4.2.1 On completion of working, the 138m AOD bench will be accessible therefore restoration of the 138m AOD bench, the plateau area in the southern part of the extraction adjacent to the existing quarry hole and the 132m AOD bench will take place concurrently with the following phases of extraction. Restoration materials will be placed as fill on the benches and plateau area to achieve the profiles illustrated on

the Restoration Sections (Dwg No. TMW-REST2-A and 3-A). The uppermost parts of the faces will be retained as part of the restoration.

4.2.2 The proposed development will involve the loss of some existing vegetation, some of which is classified as a priority habitat in the UK Biodiversity Action Plan (UKBAP), namely the (developing) 'Upland Oakwood' BAP. Therefore, it is proposed to plant the 138m bench/plateau and the 132m AOD bench with native trees and shrubs. The bulk of the restoration fill placed on the aforementioned areas will comprise both slate waste arising from the proposed development and materials resulting from the ongoing slate waste reprocessing operations.

4.2.3 The following tree and understorey shrub species are present on land adjacent to the proposed development and are considered appropriate for restoration planting as this planting specification will assist in the long-term redevelopment of the 'Upland Oakwood' BAP habitat:

- *Quercus petraea* (Sessile Oak)
- *Corylus avellana (Hazel)*
- *Betula pubescens* (Downy Birch)
- *Sorbus aucuparia* (Mountain Ash)
- *Crataegus monogyna* (Hawthorn)
- *Rubus fruticosus* (Common Blackberry)
- *Ulex europaeus* (Common Gorse)

4.2.4 All planting stock will be of local provenance using plants grown from locally collected seed. Trees and shrubs will be planted as 1-year old seedlings at 50cm centres and protected from browsing damage by spiral guards. All trees and shrubs will be 'pocket' planted into a $15cm^3$ (3 litre capacity) pocket. The slate waste and fines dug out from the pocket will be mixed with a small quantity of the overburden stripped from the development area and a mineral N:P:K fertiliser (e.g. Osmocote Plus) and the mix used to backfill the pocket around the planted tree.

4.2.5 Maintenance visits will be undertaken for 5 years after planting, including adjustment of spiral guards where necessary. Planting will be maintained in a weed-free condition and any failed, diseased or damaged plants will be replaced during the 5-year period.

### 4.3 Restoration below 132m AOD Bench

4.3.1 Restoration works can only be undertaken below the 132m AOD bench once all slate extraction has been completed. On completion of extraction, the placement of restoration fill material will commence from the 126m AOD level to raise the levels to the restored contours and profiles illustrated on drawings TMW-REST1-A, 2-A and 3-A. The restoration landform below the 132m AOD level within the area of proposed extraction aims to replicate the general form of the quarry excavations found at Ty Mawr West. This is achieved via the creation of a bowl-shaped landform in cross-section (east-west) with a sloping landform from south to north to tie in with the surrounding terrain, by infilling the quarry floor with a combination of slate waste and the by-product of ongoing slate waste reprocessing activities which, although

variable, generally contains a proportion of soils or soil-forming materials. It is proposed to allow natural regeneration of the infilled quarry floor (refer to Plate 2 at Appendix B).

4.3.2 As illustrated on the Restoration Plan and Section B-B', slate waste only will be placed on a localised section of the 132m AOD bench/against the face to form a scree slope with the top of the extraction face locally exposed above the scree.

4.3.3 Stockproof fencing will be erected along the western perimeter of the infilled quarry floor to exclude sheep, thus allowing natural regeneration to occur. To the north the fencing will terminate against the existing quarry face and to the south against steeper land. Access to the infilled quarry floor, restored slopes and tree/shrub planting areas for maintenance purposes will be via a 5-bar gate at the base of the haul route.

4.3.4 The infilled quarry floor slopes from south to north and any surface water will drain through the existing drainage channel to the north of the development.

## 5.0 CONCLUSIONS

The restoration strategy and proposals have been designed to provide replacement UK BAP habitats such as 'Inland Rock Outcrops and Scree Habitat' BAP through a policy of non-intervention. A more proactive approach to restoration including tree planting is also proposed to compensate for the loss of secondary vegetation which will result from the development which will assist in the long-term redevelopment of the 'Upland Oakwood' BAP habitat.

# APPENDIX A: RESTORATION MATERIALS ESTIMATE

**Estimated waste volume generated from proposed development (Slate Extraction)**

| Item | Description | Volume ($m^3$) |
|---|---|---|
| A | Extraction to 126m AOD will release c.14,500$m^3$ of slate, approximately 5% (725$m^3$) of which will be slate waste | 725 |
| B | Re-grading of the existing haul route to achieve access to the 126m AOD level | 1,260 |
| **SUB-TOTAL** | - | **1,985** |

**Estimated waste volume generated from ongoing slate reprocessing operations at Ty Mawr West Quarry**

| Item | Description | Volume ($m^3$) |
|---|---|---|
| C | On the basis that slate waste reprocessing operations continue for 10 years, this equates to a saleable volume of c.46,290$m^3$, approximately 5% (2,315$m^3$) of which will be slate waste | 2,315 |
| **SUB-TOTAL** | - | **2,315** |

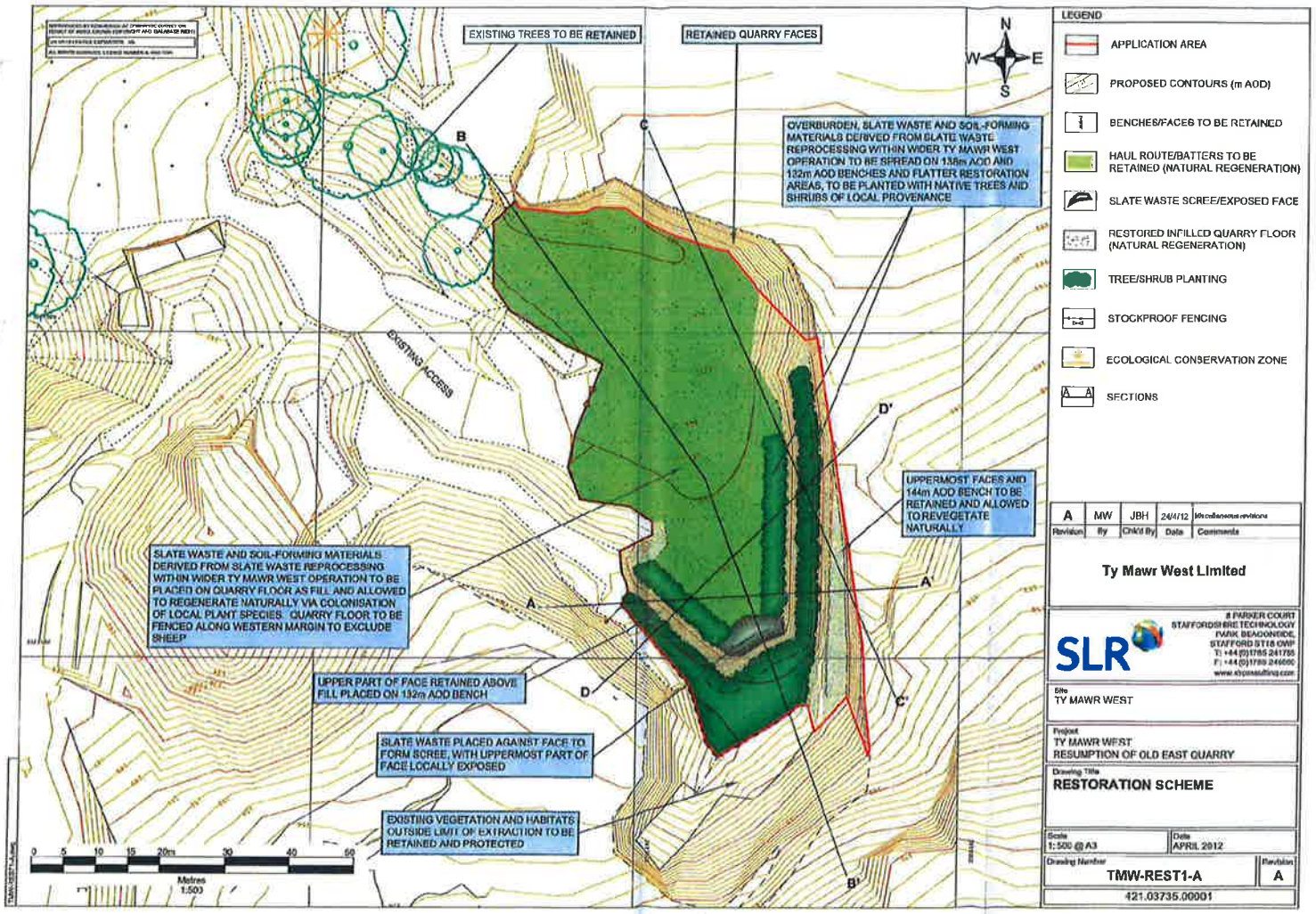
| | | |
|---|---|---|
| **GRAND TOTAL** | - | **4,300** |

# APPENDIX B: PLATES

**Plate 1:** Waste arising from slate waste reprocessing operations at Ty Mawr West Quarry generally containing soil-forming materials placed against existing tipped slate waste as part of restoration (February 2012).

**Plate 2:** Previously-restored land at Ty Mawr West using waste arising from slate waste reprocessing operations which generally contains soil-forming materials. No seeding has been undertaken on this area which is beginning to revegetate naturally.

# DRAWINGS


EXISTING TREES TO BE RETAINED
RETAINED QUARRY FACES
N
W
E
S
B
C
OVERBURDEN, SLATE WASTE AND SOIL-FORMING MATERIALS DERIVED FROM SLATE WASTE REPROCESSING WITHIN WIDER TY MAWR WEST OPERATION TO BE SPREAD ON 138m AOD AND 132m AOD BENCHES AND FLATTER RESTORATION AREAS, TO BE PLANTED WITH NATIVE TREES AND SHRUBS OF LOCAL PROVENANCE
EXISTING ACCESS
D'
UPPERMOST FACES AND 144m AOD BENCH TO BE RETAINED AND ALLOWED TO REVEGETATE NATURALLY
SLATE WASTE AND SOIL-FORMING MATERIALS DERIVED FROM SLATE WASTE REPROCESSING WITHIN WIDER TY MAWR WEST OPERATION TO BE PLACED ON QUARRY FLOOR AS FILL AND ALLOWED TO REGENERATE NATURALLY VIA COLONISATION OF LOCAL PLANT SPECIES. QUARRY FLOOR TO BE FENCED ALONG WESTERN MARGIN TO EXCLUDE SHEEP
A
A'
UPPER PART OF FACE RETAINED ABOVE FILL PLACED ON 132m AOD BENCH
D
C'
SLATE WASTE PLACED AGAINST FACE TO FORM SCREE, WITH UPPERMOST PART OF FACE LOCALLY EXPOSED
EXISTING VEGETATION AND HABITATS OUTSIDE LIMIT OF EXTRACTION TO BE RETAINED AND PROTECTED
B'
0 5 10 15 20m 30 40 50
Metres
1:500
LEGEND
APPLICATION AREA
PROPOSED CONTOURS (m AOD)
BENCHES/FACES TO BE RETAINED
HAUL ROUTE/BATTERS TO BE RETAINED (NATURAL REGENERATION)
SLATE WASTE SCREE/EXPOSED FACE
RESTORED INFILLED QUARRY FLOOR (NATURAL REGENERATION)
TREE/SHRUB PLANTING
STOCKPROOF FENCING
ECOLOGICAL CONSERVATION ZONE
SECTIONS
A | MW | JBH | 24/4/12 | Miscellaneous revisions
Revision | By | Chk'd By | Date | Comments
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RESUMPTION OF OLD EAST QUARRY
Drawing Title
RESTORATION SCHEME
Scale
1: 500 @ A3
Date
APRIL 2012
Drawing Number
TMW-REST1-A
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A
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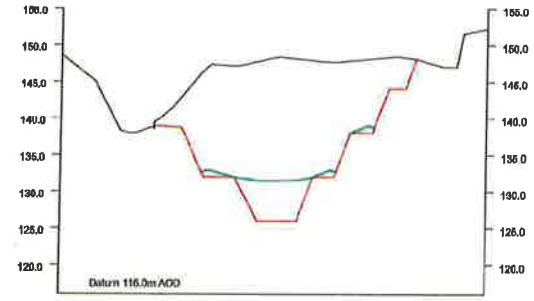
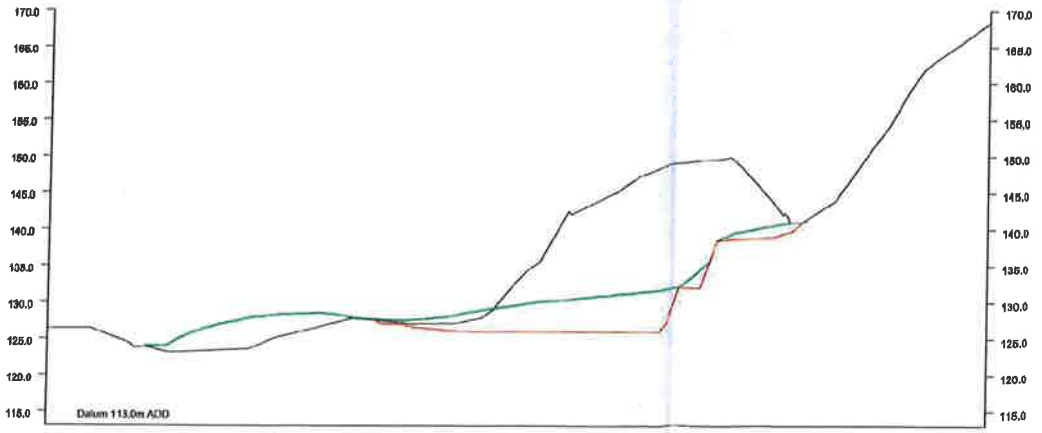



SECTION A- A'




SECTION B- B'

LEGEND

TOPOGRAPHICAL SURVEY

FINAL EXTRACTION PROFILE

RESTORATION PROFILE

| Revision | By | Ch'd By | Date | Comments |
|---|---|---|---|---|
| A | MW | JBH | 24/4/12 | Miscellaneous revisions |

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Site: TY MAWR WEST

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Drawing Title: **RESTORATION SECTIONS A & B**

| Scale | Date |
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| 1: 500 @ A3 | MARCH 2012 |

| Drawing Number | Revision |
|---|---|
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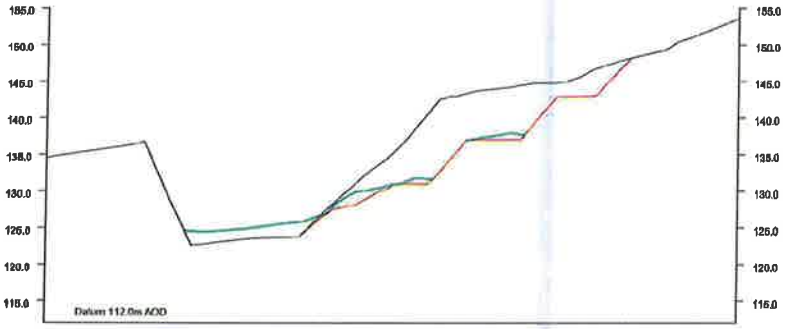


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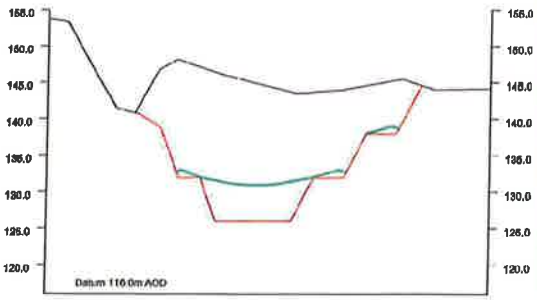


SECTION D- D'

LEGEND

TOPOGRAPHICAL SURVEY

FINAL EXTRACTION PROFILE

RESTORATION PROFILE

| Revision | By | Ch'd By | Date | Comments |
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| A | MW | JBH | 24/4/12 | Miscellaneous revisions |

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