



## REVISED DEVELOPMENT PROPOSALS, RESTORATION AND AFTERCARE PLAN

FOR

**YENNADON QUARRY, IRON MINE LANE,  
DOUSLAND, YELVERTON, DEVON, PL20 6NA**

**3<sup>rd</sup> July 2015**

**Job No. 7397/RP/A4.Rev.2**

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## QUALITY CONTROL

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For and on behalf of John Grimes Partnership Ltd			



## EXECUTIVE SUMMARY

Since the previous planning submission was refused, the quarry operators have commenced extraction in the southern end of the existing quarry. Taking into account the reserves in this area that was previously intended to be left unworked, the actual extraction area required in the proposed extension area is now approximately 35% less. This has enabled a revised extraction and restoration strategy to be produced to address concerns raised by Dartmoor National Park Authority (DNPA) during the previous submission

The red line area in this proposal remains 3.3ha, of which approximately 1ha comprises the extension area (the remainder being the existing quarry and access track). The actual proposed extraction area covers 0.53ha, with the remaining extension area comprising a screening bund along the western boundary (0.17ha) and a landscaped buffer zone (0.3ha).

The main changes in this plan from the previous submission includes:

- The eastern limit of excavation is reduced to the 264m AOD contour (as opposed to 268m AOD previously = 4m reduction).
- The approximately 3m deep overburden will be excavated at a 45° angle and planted (approved trees/native plants).
- This 4m reduction in elevation together with the angled/planted overburden, equates to a reduction of 7m of bare overburden/rock visible above the height of the bund from viewpoints to the west compared to the previous submission.
- A temporary 4m high bund will be only constructed along the western boundary of the proposed extension to provide visual and noise screening. The bund will be graded into the existing slope profile along the northern boundary. The lower 1m will be planted with approved trees/native plants and the upper bund grassed. On completion of quarrying the upper bund will be removed to reduce permanent visual impact from the bund itself.
- The northern end of the existing bund is currently un-vegetated. This will be battered back to a lower angle (and graded into the new bund), soiled and planted, all as part of pre-excavation works.
- The eastern side of the existing bund will be re-graded and upper 4m will be soiled and planted to improve view points from the east.
- Once extraction has ceased in the southeast end of the existing quarry (current working area), this area will be backfilled to a near-natural profile, soiled, planted and returned to moorland.
- The rolling landscaping and planting programme within the existing quarry (which will begin when permission is granted), will restore 7,040m<sup>2</sup> of land. This area is approximately a third larger than the new extraction area. Restoration will begin 8 -10 years earlier than under the current planning condition requirements.
- The new extension area will be worked from west to east in three sections, so that the initial extraction phases will be screened to the west by the bund.

- The extraction area will be fenced off in two phases so as to minimize loss of grazing / public access.
- A landscaped buffer zone will be formed along the eastern and northern boundaries between the proposed fence-line and actual extraction area, which will be planted with approved trees/native plants. Fencing will be moved closer to the edge of excavations once the landscape buffer has been established.
- Final restoration will be complete by end of 2025. It will involve removal / re-grading of the temporary bund, backfilling remaining eastern faces and re-grading / landscaping of the remaining areas within the quarry. All buildings and infrastructure will be removed.
- The final restoration scheme incorporates enhanced habitat (year-round pond and seasonal wetland; sections of quarry face retained for raptors). The ecological consultants will undertake regular monitoring throughout the phased extraction and restoration works.
- A public information board will be erected at the quarry entrance providing the history of the quarry and tramway.
- An aftercare plan, including a financial bond, will be negotiated between Yennadon Stone Ltd and the Maristow Estate.
- There are currently no common land rights or public access rights to the existing quarry area. The Maristow Estate have indicated that this will remain the case should planning permission be refused; i.e. the quarry will remain fenced off, primarily due to health and safety reasons associated with the quarry faces. Any future access will be subject to necessary negotiation between the Maristow Estate and the DNPA. Any access would be subject to the quarry being suitably and safely restored, as per the proposals. This access to the restored quarry would promote opportunities for the enjoyment of the biodiversity and special landscape features by the public.

In summary, the proposals provide betterment compared to the existing permission for the following reasons:

- earlier restoration of parts of the quarry that present the greater visual impact (the existing bund and south-eastern and eastern faces);
- an improvement in the final restored landscape of areas with the greater visual impact (the south-eastern and eastern faces will be infilled to near-natural profiles);
- increased biodiversity and habitat; and
- a restored accessible quarry would provide opportunities for the enjoyment of the biodiversity and special landscape features by the public.

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## CONTENTS

- 1.0 INTRODUCTION
  - 1.1 Summary
  - 1.2 Aims of the Restoration and Aftercare Plan
- 2.0 LANDSCAPE STRATEGY
  - 2.1 Key Landscape Features
  - 2.2 Extraction and Restoration Working Scheme
- 3.0 EXTRACTION AND RESTORATION PHASES
  - 3.1 Pre-Excavation Works
  - 3.2 Construction of the Extended Bund
  - 3.4 Planned Working Phases
  - 3.5 Other Matters
- 4.0 CONCLUSIONS

## DRAWINGS

Drawing 7397/RP01/R2	Pre-Excavation Works
Drawing 7397/RP02/R4	Proposed Extraction Phase 1
Drawing 7397/RP03/R4	Proposed Extraction Phase 2
Drawing 7397/RP04/R4	Proposed Extraction Phase 3
Drawing 7397/RP05/R5	Proposed Final Restoration
Drawing 7397/RP06/R4	Sections Showing Proposed Extraction & Restoration Phases
Drawing 7397/RP07/R1	Possible Restoration Based on Current Planning Permission

## **1.0 INTRODUCTION**

### **1.1 Summary**

1.1.1 This revised Restoration and Aftercare Plan for Yennadon Quarry has been prepared by John Grimes Partnership Ltd on behalf of Yennadon Stone Ltd to accompany the Environmental Statement in support of the extension to Yennadon Quarry. The revisions within this report are intended to address the concerns raised by Dartmoor National Park Authority (DNPA) during the previous submission.

1.1.2 This report has been prepared with reference to relevant guidelines and should be read in conjunction with the Landscape and Visual Impact Assessment (Appendix A15) and the Biodiversity Mitigation and Enhancement Plan (Appendix A14).

1.1.3 The main changes from the previous submission includes, a reduction in the size of area delineated for extraction by approximately 35%, changes in the screening bund configuration and a change in the landscape mitigation measures.

### **1.2 Aims of the Restoration and Aftercare Plan**

- 1.2.1 In line with current guidance, the purpose of this Restoration and Aftercare Plan is to:
- Provide a Landscape Strategy for the extraction and restoration phases of the proposed quarry extension and restoration of the existing quarry area; and
  - Outline the proposed after-use scheme.

## **2.0 LANDSCAPE STRATEGY**

### **2.1 Key Landscape Features**

2.1.1 Yennadon Quarry is located on the western flank of Yennadon Down at Grid Reference SX 543 688. Yennadon Down is common land owned by the Walkhampton Trust and administered by Lord Roborough's Maristow Estate. There is a Public Right of Way within 150m of the proposed extension and the public also have a right of access over Yennadon Down. The site also lies within the south-western confines of Dartmoor National Park. The site does not lie within any statutory or non-statutory sites of nature conservation interest.

2.1.2 Yennadon Down is flanked on its northern boundary by Dousland Plantation and farmland. To its east is Yennadon Plantation, beyond which is Burrator Reservoir.

Bowdens Plantation and farmland lie to the south. To the west of Yennadon Down is a strip of fields used for grazing, beyond which is the village of Dousland (approximately 300m west of the quarry). Dousland is a small village, with limited local amenities including a Post Office (and community shop) and a Public House.

- 2.1.3 The topography immediately surrounding the existing quarry is generally un-altered by recent human activities. The land drops gently from east to west across the site from around 269m AOD to around 247m AOD. The highest point on Yennadon Down is 301m AOD to the east of the site. The surrounding habitat comprises a mosaic of unimproved acid grassland, bracken and scattered gorse scrub and trees (as detailed in Appendix A14). Vegetation in this area is maintained at a very short sward height by the grazing of livestock (sheep, ponies and cattle).



**Typical views of Yennadon Down to the north of the existing quarry.**

- 2.1.4 Yennadon Quarry is located in an area of Dartmoor characterized as 'Upland Moorland with Tors', one of the key characteristics of which includes historic mineral workings and quarries. Yennadon Quarry itself has been in existence for approximately 150 years and is clearly evident on the Tithe map (mid 1800s) and First Edition Ordnance Survey map (1883). Just over 300m south and southeast of the existing quarry (and adjacent to the end of Iron Mine Lane) are the remains of Yennadon Mine (1830 to 1850). Notable pits and burrows are all that remains of this iron, copper, tin and manganese mine, with the shaft and adits having been obscured over time. Several other small quarries and pits are recorded across Yennadon Down and on its southeastern flank are two notable historic stone quarries, collectively known as the Burrator Quarries. Together they are designated a Site of Special Scientific Interest (SSSI) due to their geological and geomorphological interest.





**The remnant burrows and pits of Yennadon Iron Mine (1830 to 1850)**

- 2.1.5 Access to the existing quarry is gained from Iron Mine Lane via a compacted stone track. This access track was originally the line of the old 'Plymouth and Dartmoor Tramway', which was formed to transport goods and building materials, including stone from Yennadon Quarry. A siding from the railway is shown to extend into Yennadon Quarry on the Tithe and early OS maps.
- 2.1.6 The proposed extension (subject site) is located to the immediate north of the existing Yennadon Quarry. The extent of the extension area was based on discussions between Yennadon Stone Ltd and the then Case Officer from DNPA at a time when the current production rate of 14,000 tonnes was to remain. In addition the area was extended to enable a screening bund to be constructed along both the western and northern boundaries. Taking into account the extension area, as well as the existing quarry and access track, the red line area for the planning application totalled 3.3ha.
- 2.1.7 The red line area for the resubmission is to remain the same. Of this 3.3ha, the proposed total extension area is approximately 1ha. However, the actual proposed



extraction area covers 0.53ha. The remaining extension area will comprise a screening bund along the western site boundary only (0.17ha) and a landscaped buffer zone (0.3ha).

- 2.1.8 Since the previous planning submission was refused, the quarry operators have commenced extraction along the southern end of the quarry (as shown in the recent aerial photograph below). Taking into account the reserves in the southern end of the quarry and that over the past year a high yield was achieved, the actual extraction area required is less. This has enabled a review of the reserves required within the extension that are needed to enable full production to continue (up to a maximum of 10,000 tonnes per annum) until 2025 when the current planning permission expires. In addition, this has enabled a revised extraction and restoration strategy to be produced to address concerns raised by the Landscape Officer at the DNPA.



**Photograph showing areas of established vegetation (outlined in red), which will remain as existing should planning permission be granted; and area of existing bund (outlined in green) to be re-graded and vegetated (April 2015).**

- 2.1.9 The back-calculation of the actual extraction area required to achieve maximum production is provided in Table RP/01 below. The back-calculation indicates that the area required to achieve an annual production of 10,000t/annum of saleable product

is 5,270m<sup>2</sup>. This is just over 35% smaller than the original extraction area of 8.415m<sup>2</sup> submitted in the December 2013 application.

- 2.1.10 This reduction in area has enabled extraction to be limited to elevations below 264m AOD (which is 4m lower than the highest part of the existing face), reducing the amount of visible quarry face above the bund from distant viewpoints. This reduction in area creates a landscape buffer zone along the eastern boundary inside the fence line.

		Comments
<b>Bulk density of rock mass (kg/m<sup>3</sup>):</b>	2,650	Premium cut blocks have a density of up to 2800
<b>Max annual production (t):</b>	10,000	Saleable product
<b>Required annual reserve (t):</b>	20,000	Percentage of saleable product to spoil is between 60:40 to 50:50. Assumes 50% is spoil
<b>Max tonnes - 10yrs:</b>	200,000	Based on quarrying ceasing in 2025
<b>Equivalent volume of reserve (m<sup>3</sup>):</b>	75,472	Conversion based on density
<b>Average depth of excavation (m):</b>	15.75	Average depth of rock calculated across extension area (excluding 3m overburden).
<b>Area of Extraction Required (m<sup>2</sup>):</b>	4,792	Based on the above parameters
<b>Area of Extraction Required (m<sup>2</sup>) with 10% contingency</b>	5,270	To allow for unforeseen areas of potential poor quality rock

**Table RP/01: Back-Calculation of Area Required to Achieve 10,000 t/a.**

- 2.1.11 Once extraction has ceased in the southeast end of the quarry (current working area), this area and the eastern face will become the main stockpile areas. Existing stockpiles, where practicable, will be relocated to this area, as well as any new spoil generated. Once a suitable, near-natural profile has been achieved, then this area will be covered with topsoil and planted and returned to moorland.
- 2.1.12 The rolling landscaping and planting programme within the existing quarry, which will begin when permission is granted, will restore 7,040m<sup>2</sup> of land to moorland. This area is approximately a third larger than the new extraction area. ***In the revised proposals, the area restored to moorland within the existing quarry area is greater than the new extraction area.***

2.1.13 It should be noted that under the current planning conditions, a restoration plan is not required until two years before cessation of works; i.e. 2023, as discussed in Section 4.0. Therefore, restoration is unlikely to commence until 2024/2025, which is 8 – 10 years later than in the revised proposals. Due to the limited space within the existing quarry and the location of the current working areas, a rolling restoration scheme is not currently practical.

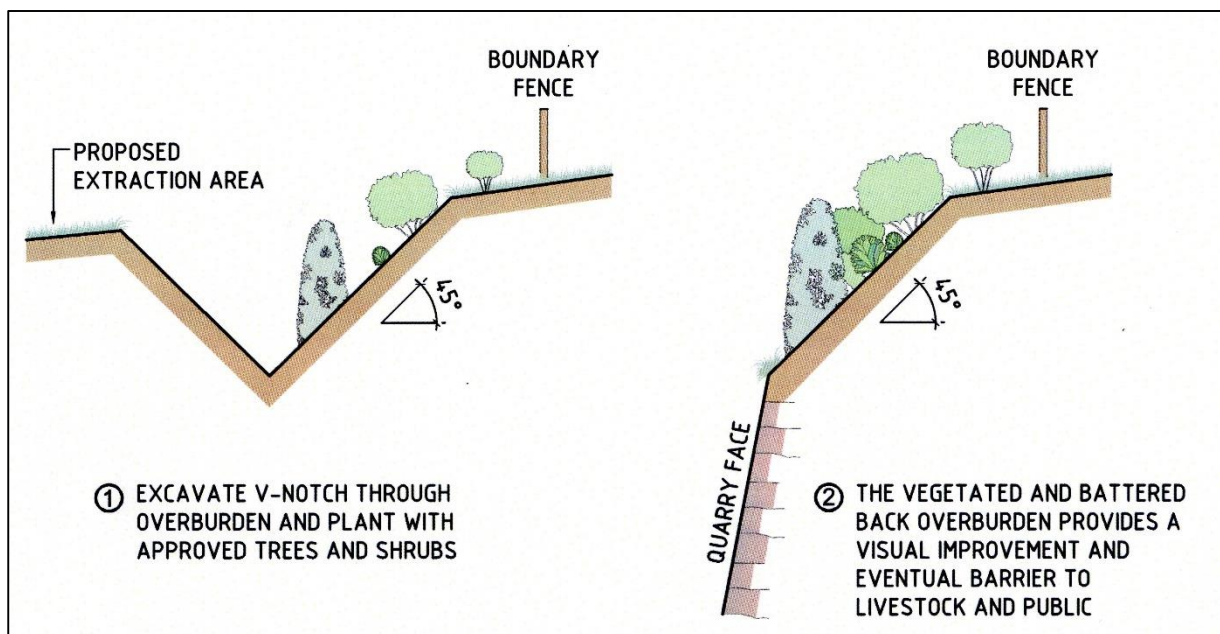
## 2.2 Extraction and Restoration Working Scheme

2.2.1 It is intended that the proposed extension will be worked in a phased manner, with spent areas of existing quarry being concurrently infilled, restored and eventually being returned to moorland (described in detail in Section 3.0).

2.2.2 The fundamentals of the revised scheme are summarised below, with key changes highlighted in bold:

- The red-line area remains the same; **however, the proposed extraction area has been substantially reduced. In particular, the eastern limit of excavation has been reduced so that the maximum elevation of excavations would be 264m AOD (as opposed to 268m AOD in the previous application).**
- **A 45° angled v-notch delineating the extraction area will be excavated through the 3m of overburden. The outer side of the v-notch will be planted with approved trees/native plants so as to cover the overburden (so when the adjacent section is being extracted the overburden is already battered back and vegetated), as shown in Figure RP/01. This v-notch will only be constructed one to two months ahead of stripping of topsoil / overburden to enable safe planting.**
- **The reduction in maximum elevation extracted together with the battered back / planted overburden, equates to a reduction in elevation of 7m of bare rock visible above the height of the bund from viewpoints to the west.**
- A new 4m high bund will be constructed along the western boundary of the proposed extension area to provide visual and noise screening. **The bund will be graded into the existing slope profile along the northern boundary so that a low bund will be formed at the northern western end providing screening to the properties west / north-west of the quarry.** The lower 1m of the bund will be planted with approved trees/native plants and the upper bund grassed. On completion of quarrying the upper bund will be removed and re-seeded as to reduce permanent visual impact from the bund itself.

- The northern end of the existing bund will be re-profiled (battered back to a lower angle) and graded into the new bund, soiled and planted to improve views from the west.
- The eastern side of the existing bund is to be re-profiled, soiled and planted at an early stage to improve views from the east.
- The quarry will be worked from west to east in three sections parallel to the contours, so that the initial extraction phases will be screened to the west by the bund.
- The extraction area will be fenced off in two phases so as to minimise loss of grazing / public access.
- A landscaped buffer zone will be formed along the eastern and northern boundaries between the proposed fence-line and actual extraction area, which will be planted with approved trees/native plants. Fencing will be moved closer to the edge of excavations once the landscape buffer has been established.



**Figure RP/01: Sketch Showing Principals of V-notch.**

2.2.3 Approximately 40% to 50% of the stone excavated is non-saleable "extractive material", which in accordance with the *Definition of Extractive Waste, Environment Agency Position Statement MWRP PS 015* this "extractive material" is defined as 'not-waste' (see Extractive Minerals Management Statement Appendix A5); i.e. the material is inert and has a defined use in site restoration. This 'not-waste' material spoil will comprise stripped topsoil, subsoil, weathered rock and non-saleable stone, which is stockpiled within the quarry and will be used to infill and profile the spent areas of



the quarry as part of the site's restoration. The previous quarry operators did not keep records as to the amount of material stockpiled. It has been estimated that there is approximately 55,000m<sup>3</sup> of material currently stockpiled within the existing quarry. It is considered that the anticipated volume of future spoil produced will continue to be accommodated within the quarry and the height of existing stockpiles will not be exceeded.

- 2.2.4 Soil (topsoil and subsoil) stripped during the extension works will be stored within the quarry area and used as capping soils for restoration. It has been calculated that a maximum of 20,000m<sup>3</sup> of soil will need to be imported to provide a viable growing medium across the whole site; i.e. **the total area being restored is greater than the new area of disturbance**. Following consultation with the Environment Agency (EA), the EA has confirmed that in accordance with current legislation and guidance, providing only certified soils are imported, no EA permits are required for the importation of topsoil/subsoil. Certification would include that the soil has been sourced from a Greenfield site that has no history of mining or industry. Where site history cannot be verified, soils would need to be accompanied by certificates of appropriate laboratory analysis to prove suitability. It is also considered essential that soils are sourced locally (i.e. within the Dartmoor Fringes) to ensure a similar composition (i.e. well drained loamy soils). Yennadon Stone Ltd would be required to keep records (Duty of Care documentation) of any soil imported to site (i.e. volumes, soil sources and areas where it has been placed). Any soil imported to site is likely to be on a gradual basis and the quarry operators would have to ensure that deliveries of soil would not exceed the maximum permitted HGV trips.
- 2.2.5 It is intended that the restoration of the quarry is carried out progressively as the proposed quarry extension is worked. As the restoration will be carried out in stages, it is considered appropriate that any imported soil will be undertaken on a gradual basis to keep lorry movements to a minimum. This will also minimise the need to import large volumes during the final restoration phase.
- 2.2.6 As described in the Biodiversity Mitigation and Enhancement Plan (Appendix A14) the application of appropriate seed mixes and tree planting will be undertaken on the new bund and in areas being restored. Once vegetation has established in the restored areas, these could potentially be returned to public access / common land for grazing, subject to necessary negotiations between the Maristow Estate and DNPA.



- 2.2.7 The Biodiversity Mitigation and Enhancement Plan (Appendix A14) also recommended the establishment of a year-round pond at the base of the restored quarry to provide enhanced habitat. It is intended that the surrounding ground would be seeded with a suitable Pond Edge seed mix.
- 2.2.7 Following the Public Consultation and liaison with the ecological consultant, it has been recommended that sections of quarry face are retained for raptors. Suitable sites have been identified and their visual impact assessed in the Visual Impact report (Appendix A15). It is considered essential that the land above these areas are densely vegetated and inaccessible to prevent access by the public and livestock. The provision of the landscaped buffer zone and v-notch will allow vegetation above the areas of near-vertical quarry face to readily become established without the grazing effects of animals.
- 2.2.8 Currently, there are no common land rights or public access rights to the existing quarry area. Any future access to the site will be subject to necessary negotiation between the Maristow Estate (on behalf of the Walkhampton Trust) and the DNPA. Any access would be subject to the quarry being suitably and safely restored, as per the proposals. ***Providing access to the restored quarry would promote opportunities for the enjoyment of the biodiversity and special landscape features by the public.***

### 3.0 EXTRACTION AND RESTORATION PHASES

#### 3.1 Pre-Excavation Works

- 3.1.1 The south-eastern end of the existing quarry is currently being worked. It is proposed that this area continues to be worked whilst preparatory works are carried out in the extension area. The proposed pre-excavation works are detailed below and summarised on Drawing 7397/RP-01/R2. It should be noted that the contours shown on the phased Drawings (7397/ RP-01/R2 to 7397/ RP-05/R5) are based on the most recent site survey (dated October 2013) and have been schematically adjusted based on anticipated excavation progress by the end of each phase.
- 3.1.2 Prior to the stripping of any overburden, both Ecological and Archaeological surveys will be undertaken as per recommendations provided by the respective consultants.

#### Ecological Survey

- 3.1.3 It is intended that the entire extension area will be surveyed by the ecological consultants, who will undertake reptile translocations, etc., as outlined in their reports, which are provided in Appendix A14 of the Environmental Statement. Timing of vegetation clearance and soil stripping will be undertaken following consultation with the ecologists.

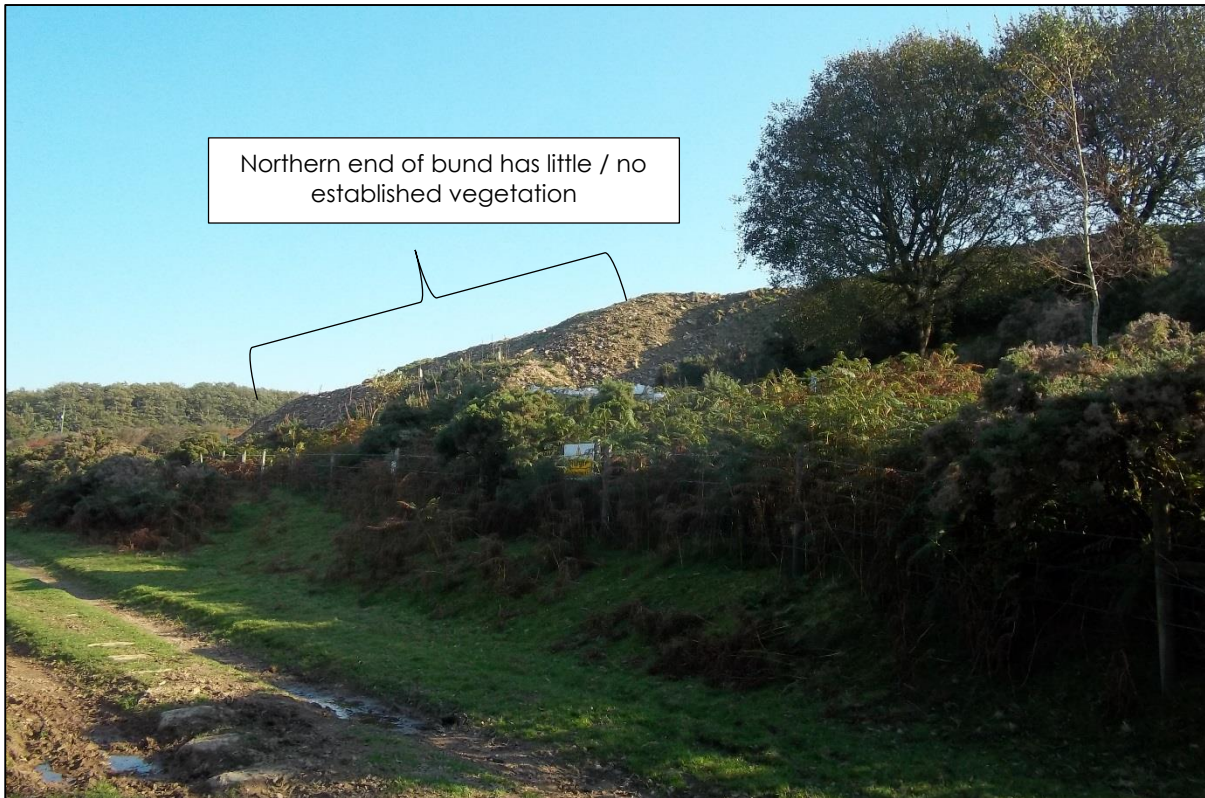
#### Archaeological Survey

- 3.1.4 Following approval from the ecologists, the area will be cleared of scrub (gorse) to enable an archaeological consultant to undertake a geophysical survey as outlined in Appendix A7 of the Environmental Statement. The archaeological consultants stated in their report that any further works would be dependent on the results of the geophysical survey. Should any anomalies be identified indicative of archaeological remains, then additional works could involve:

- excavation of evaluation trenches to target any identified anomalies; and/or
- archaeological watching brief during removal of topsoil; and/or
- an appropriate level of area excavation.

#### Construction of the Extended Bund

- 3.1.5 The new bund will be formed along the northwest boundary of the extension area. The bund has been designed to provide screening, both visually and acoustically, for the benefit of local residents living to the west/northwest of the quarry.
- 3.1.6 It is proposed that on completion of the ecological and archaeological surveys, the extension area will be fenced off to enable construction of the new bund. The only access to the new bund area will be from the northwest corner of the existing quarry; i.e. via the haulage road that leads to the top of the stockpile and existing bund. No heavy machinery will use the historic access track that runs along the western side of the existing quarry or across the actual Down outside of the extension area.
- 3.1.7 Concurrent with the construction of the new bund, the northern un-vegetated end of the existing bund will be re-graded. This part of the existing bund has been identified as an area for visual improvement by the Landscape and Visual Impact consultant (see Appendix A15). It is proposed to reduce the angle and re-profile the outer face of the existing un-vegetated bund, as well as the upper 4m of the inner face; cover with soil and seed.



**Existing bund along western site boundary – to be re-profiled and planted under new proposals.**

- 3.1.8 Soils to be stripped from the footprint of the new bund will be handled using best practice (MAFF 2000, Good practice guide for handling soils).
- 3.1.9 The new bund once formed, together with the re-graded existing bund will be covered with soils, seeded and planted with approved locally-sourced species. As the new bund is to be predominantly removed on completion of works, native trees and shrubs will only be planted along the lower 1m to 1.5m outer edge which will remain on final reinstatement (see Drawing 7397/RP-06/R4). Once vegetation has been established, the fencing around the bund area will be moved to enable access by grazing animals.
- 3.1.10 It is acknowledged that during construction of the bund there will be a temporary increase in visual and noise nuisance to local residents. It is anticipated that construction of the bund will be undertaken over the following timescale:
- a) Construction of fencing - allow 1 week
  - b) Stripping of overburden - allow 2 weeks
  - c) create bund - allow 3 weeks
  - d) re-soil, shape and seed - allow 2 weeks

- e) allow vegetation to establish – assume at least one growing season
- f) remove fencing - less than one week

3.1.11 It is proposed that once the preparatory works are complete that the approach outlined in “Phase 1” (detailed below) would be followed initially, with subsequent phases undertaken as workings progress up to 2025 when the current planning permission expires.

### **3.2 Phase 1**

3.2.1 The initial work will involve stripping of the topsoil and overburden. In accordance with the current planning permission “the stripping of topsoil and overburden shall not be undertaken more than 50ft (15.24m) in advance of the working face”. Soils will be handled using best practice (MAFF 2000, Good practice guide for handling soils). Where possible soils will be placed directly onto areas being restored, or stockpiled in accordance with the MAFF 2000 guidelines. It is estimated that 5,425m<sup>3</sup> of soil and overburden will be removed during Phase 1.

3.2.2 Once the topsoil and overburden has been removed, an initial trench will be excavated, from which further excavations will progress horizontally.

3.2.3 As is the current working practice at the quarry, two faces are worked simultaneously. Usually one at low level and one at a higher level. This enables a range of hues and block size to be produced. During Phase 1, remaining reserves in the south-east corner of the existing quarry will be worked at low level, while the upper levels within the western section of the extension are worked.

3.2.4 It is anticipated that approximately 8,525m<sup>3</sup> of rock will be excavated in this western section during Phase 1 based on excavations reaching a maximum of 248mAOD. Assuming an anticipated waste of 40%-50%, approximately 13,550 tonnes of saleable stone will be recovered, which assuming maximum production of 10,000 t/annum (7,000 t/a from within the extension area; 3,000 t/a from the existing quarry), it will take just under **two years to complete Phase 1**.

3.2.5 By the end of Phase I it is anticipated that the existing quarry will be depleted and this area will be backfilled to enable restoration to near-natural profiles.

- 3.2.6 Drawing 7397/RP-02/R4 provides an indication of the approximate contours following completion of Phase 1 works; and approximate profiles are indicated in Drawing 7397/RP-06/R4.

### **3.3 Phase 2**

- 3.3.1 The soil and overburden excavated during Phase 2 is estimated to be in the order of 6,125m<sup>3</sup>. Soils will be stripped and handled as detailed above in paragraph 3.2.1.
- 3.3.2 During Phase 2, there will be two areas worked:
1. Initial western area excavated in Phase 1 will be deepened down to a maximum of 240m AOD; and
  2. Upper level of the middle section will be worked down to a depth of approximately 248m AOD.
- 3.3.3 It is anticipated that approximately 20,275m<sup>3</sup> of rock will be excavated in this second phase. Based on anticipated waste of 40-50%, approximately 32,200 tonnes of saleable stone will be recovered, which assuming maximum production of 10,000 t/annum, will take just over **three years to complete Phase 2**.
- 3.3.4 Drawing 7397/RP-03/R4 provides an indication of the approximate contours following Phase 1 works; and approximate profiles are indicated in Drawing 7397/RP-06/R4.

### **3.4 Phase 3**

- 3.3.1 Assuming planning permission is granted by end of 2015 and the previous two phases produced the maximum 10,000 t/a permitted, Phase 3 would not commence until the end of 2020; i.e. Phase 3 would be worked from 2021 until second half of 2025 when restoration would commence. [Note: if production averaged 7,000t/a, this area is unlikely to be worked until the end of 2022].
- 3.3.2 Depending on progress within this final stage, the potential soil and overburden excavated during Phase 3 is estimated to be in the order of 6,860m<sup>3</sup>. Soils would again be stripped and handled as detailed in paragraph 3.2.1.
- 3.3.3 Approximately 49,800m<sup>3</sup> of rock is available for excavation in this third phase, which based on 40-50% waste, equates to a reserve of 79,250 tonnes of saleable stone.



- 3.3.4 During Phase 3, there will be two areas worked:
1. The middle section will be deepened down to a maximum of 240m AOD **(estimated 2  $\frac{3}{4}$  years of reserves at 10,000t/a)**; and
  2. The eastern section down to a depth achieved at the end of 2025, when current planning permission expires. Approximately just under half of the volume of this area is likely to be worked by 2025 unless areas of poor quality rock have been encountered elsewhere and waste exceeds 50% (worst-case scenario). This contingency area will enable a more sympathetic profile to be achieved on the upper levels of the eastern face, which presents the higher visual impact from view points to the west.
- 3.3.5 Drawing 7397/RP-04/R4 provides an indication of the generalised contours following Phase 3 works; and approximate profiles are indicated in Drawing 7397/RP-06/R4. As it is considered unlikely that maximum production of 10,000t/a will be achieved throughout the lifetime of works, the maximum depth reached is likely to be significantly less than shown.
- 3.3.6 It is recommended that a review of reserves is carried out prior to commencing excavations within the eastern section (Phase 3), with the intention of reviewing and potentially reducing further the level at which excavations should commence as it is acknowledged that the upper levels of the eastern face have a visual impact on viewpoints from the west. The revised scheme has already reduced the maximum elevation that extraction commences to 264m AOD and together with the battering back and planting of the overburden, reduces the amount of bare rock visible above the bund. If a further reduction is not possible following the review of reserves required for Phase 3, backfilling against this face will be carried out as a priority during the final stages of excavation.
- 3.4 Final Restoration**
- 3.4.1 The final phase, which will be carried out prior to cessation of works in 2025, involves the removal of most of the temporary bund, the backfilling the eastern faces within the quarry extension and re-grading / landscaping of the remaining areas within the quarry. All buildings and infrastructure within the quarry area will be removed. It is anticipated that this final stage will be undertaken over the following timescale:

- a) Backfilling eastern faces, re-grading bund and landscaping remaining areas within the quarry, including creation of pond/seasonal wetland area. Place topsoil, shape and seed/plant - **allow 2 months**
- b) Remove buildings, infrastructure – **allow 2 weeks**
- c) Allow vegetation to establish – assume at least two growing seasons. As part of the Biodiversity Mitigation and Enhancement Plan the ecological consultants will be undertaking monitoring throughout the duration of working of the extension area and during the aftercare period, with monitoring visits undertaken annually for the first three years after start of each phase of works and on alternate years for the next 4 years giving a total of seven years of monitoring for each phase of works. The monitoring will ensure the site mitigation and enhancement measures are establishing correctly and that populations are returning to or increasing from the baseline levels. Advice for improvements will be provided as necessary.
- d) Once vegetation has been established and the if landowners are satisfied that the site is safe to access, fencing will be removed - **less than one week**

3.4.2 In consideration that disused quarries are a feature of the landscape of 'Upland Moorland with Tors' and that leaving sections of near vertical quarry face will enhance biodiversity, it is considered appropriate that spoil within the quarry is focused on returning the southeastern and eastern faces to a near natural profile and leaving near-vertical faces elsewhere, which will enhance biodiversity (e.g. habitat for nesting raptors). The existing vertical faces to the rear of the site offices have remained untouched for several decades and have naturally become vegetated (see photographs below).

3.4.3 As with many of the other disused quarries within Dartmoor, the restored quarry would potentially provide a focus point for visitors to the National Park. It is proposed that a public information board is erected at the quarry entrance to provide information on the history of the site and tramway and demonstrates how the area's mineral wealth has been exploited since the 18th century.

3.4.4 An assessment of the volume of void space available, as well as spoil / soil produced has been undertaken to demonstrate that the development can be carried out as proposed. It has been estimated that there is at least 55,000m<sup>3</sup> of spoil within the existing quarry. Within the quarry extension, assuming a worst case of 40% waste, a bulking factor of 1.1 and that the full depth of excavation is not reached by 2025, the

anticipated volume of spoil produced in the extension area will be in the order of 25,000m<sup>3</sup>. It is planned to review volumes during the life cycle of the quarry to ensure feasible restoration profiles are practicable.



**Plate RP2: Partial encroachment of vegetation over cliff face to rear of site offices**



**Plate RP3: Densely vegetated spoil and cliff face to rear of site offices.**

- 3.4.5 With the exception of importing a maximum of 20,000m<sup>3</sup> of locally sourced soil for use as capping during restoration, no other material will be imported. Therefore, the final restored profile will form a deep elongated bowl. Restored slopes will generally be profiled to between 20° and 30°.

### **3.5 Other Matters**

- 3.5.1 Haulage Roads: The temporary haulage roads that access each of the new phases of workings will be constructed out of fill and will ramp up or down into each area as required. To keep high level vehicle movements to a minimum the haulage roads will be accommodated at depth within the quarry area. The exact routes of the haulage roads will be adapted to the working faces within the quarry.
- 3.5.2 Working Adjacent to Spoil: Space within the quarry is limited and it has been the practise of the quarry operators to move spoil piles around within the quarry to accommodate working areas. The two photographs below show examples of working areas with adjacent spoil.





**Photographs showing extraction phases adjacent to spoil mounds.**

- 3.5.3 It is proposed that once extraction has ceased within the existing quarry area, all spoil produced will be used to infill the south-eastern and eastern faces for restoration. Therefore, the logistics of working adjacent to areas of spoil will be eased.
- 3.5.4 Throughout the proposed phases, Area C will remain as the main temporary stockpile areas. Spoil will be taken from this area as and when needed to construct haulage roads or to infill areas being restored. This will result in the temporary lowering of the stockpile in Area C. It is acknowledged that there have been concerns regarding the height of spoil heaps at the quarry in recent years; however, as the southeast and eastern faces are being restored to near-natural profiles, there will be no requirement to increase the height of the spoil within Area C.

### **3.6 Aftercare Plan**

- 3.6.1 Yennadon Stone Ltd has operated under its current lease agreement with the Maristow Estate since February 2005. The lease already contains reinstatement provisions.
- 3.6.2 The lease is managed and monitored and any variations, if required, will be a matter for parties to deal with confidentially. An amended lease agreement will include the requirement for a conditional financial Bond to include the cost of aftercare.
- 3.6.3 It should be noted that an amended lease, subject to formal agreement, will remain confidential between Yennadon Stone Ltd and the Maristow Estate.

3.6.4 The ecological consultants have produced a Biodiversity Mitigation and Enhancement Plan (Appendix A14), which provides a programme of mitigation, compensation and enhancement measures to ensure that the development has due regard for protected species and that the site is enhanced appropriately to benefit biodiversity. Prior to development, the ecological consultants on behalf of Yennadon Stone Ltd., will submit detailed proposals for each of the following:

- Grassland habitat creation and management statement
- Pond creation and management statement
- Post quarry restoration habitat and species management plan.

#### **4.0 RESTORATION REQUIREMENT UNDER CURRENT PLANNING PERMISSION**

4.1 There are no restoration plans in place for the existing quarry under the current planning conditions, which states that a 'scheme for the after-use and after-care' of the site shall be submitted to the DNPA for approval two years before cessation of working. On this basis, restoration plans would not be required to be submitted until 2023 and restoration is unlikely to commence until 2024/2025.

4.2 Currently there are no common land rights or public access rights to the existing quarry. The Trustees of the Walkhampton Trust have indicated that this will remain the case should planning permission be refused; i.e. the quarry will remain fenced off, primarily due to health and safety reasons associated with the quarry faces.

4.3 Drawing 7397/RP-07/R1 provides an indication of the anticipated final restoration of the existing quarry based on the current planning permission. All quarry faces would remain as near-vertical, with backfilling against the lower slopes only. Due to space constraints within the existing quarry, there would be no opportunity for phased landscaping or importation and stockpiling of topsoil for restoration. Therefore the quarry would be left to re-vegetate naturally.

#### **5.0 CONCLUSIONS**

5.1 This revised report has been produced to supplement the Restoration and Aftercare Plan in the Environmental Statement. It summarises the proposed working scheme for the quarry extension and the restoration scheme for the whole quarry site.



- 
- 5.2 The main changes from the previous (December 2013) submission include, a reduction in the size of area delineated for extraction by approximately 35%, changes in the screening bund configuration, a reduction in the maximum elevation of extraction and a change in the landscape mitigation measures.
- 5.3 The development proposals are such that once planning approval has been granted, restoration and landscaping works will commence straightaway. **This is eight to ten years earlier than under the current planning condition requirements.**
- 5.4 During the initial phases of the revised proposals, **the area restored to moorland within the existing quarry area is greater than the new extraction area.**
- 5.5 In addition, there are currently no common land rights or public access rights to the existing quarry area. The Maristow Estate have indicated that this will remain the case should planning permission be refused; i.e. the quarry will remain fenced off, primarily due to health and safety reasons associated with the quarry faces. Any future access to the site will be subject to necessary negotiation between the Maristow Estate (on behalf of the Walkhampton Trust) and the DNPA. Any access would be subject to the quarry being suitably and safely restored, as per the proposals. **This access to the restored quarry would promote opportunities for the enjoyment of the biodiversity and special landscape features by the public.**
- 5.6 In summary, it is considered that the proposals will allow for earlier restoration of parts of the quarry that present the greater visual impact, an improvement in the final restored landscape achieved, increased biodiversity and habitat; and enable the restored quarry to be potentially accessible to the public.

## DRAWINGS

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LEGEND:-

- (A)

VEGETATED SLOPE TO REMAIN
- (B)

EXISTING BUND UN-VEGETATED AREA HATCHED TO BE PROFILED (WEST FACING SLOPE ANGLE TO BE REDUCED AND LANDSCAPED) SOILED AND PLANTED
- (C)

LANDSCAPE BUFFER ZONE - TO BE PLANTED / PROTECTED TO ALLOW TREES / VEGETATION TO ESTABLISH. ONCE ESTABLISHED FENCING CAN BE MOVED INWARDS
- (D)

POSITION OF V-NOTCH DUG INTO OVERBURDEN TO ALLOW ESTABLISHMENT OF VEGETATION. THIS WILL PROGRESS 1-2 MONTHS AHEAD OF TOPSOIL STRIPING
- (E)

POSITION OF 3m WIDE, 45° ANGLED SLOPE THROUGH OVERBURDEN. TO BE PLANTED IMMEDIATELY TO ENABLE VEGETATION TO ESTABLISH
- (F)

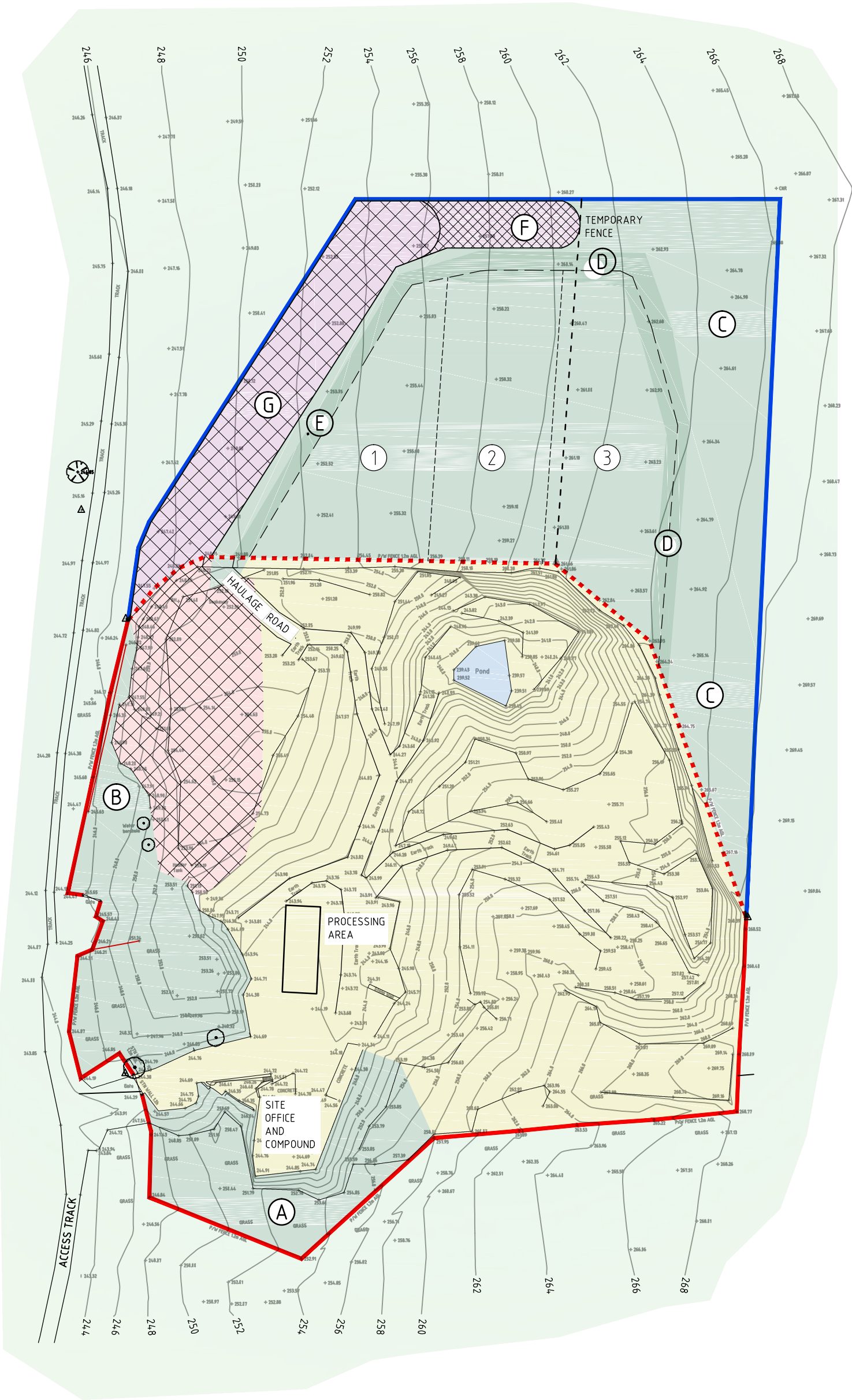
MAX 1m HIGH BUND WITH TREES PLANTED ON OUTSIDE FACE TO BE LANDSCAPED TO PROVIDE 'NATURAL' PROFILE
- (G)

PROPOSED NEW TEMPORARY BUND (MAX 4m HIGH) (TREES / SHRUBS PLANTED ON OUTSIDE FACE ON LOWER 1m ; UPPER SLOPE GRASSED. UPPER BUND TO BE REMOVED AS PART OF RESTORATION WORKS
- (1, 2 & 3)

FOR PHASE 1, 2 & 3 LAYOUTS, SEE DRAWING 7397-08

- VEGETATED AREAS
- NEW BUND'S TO BE LANDSCAPED
- EXISTING UN-VEGETATED BUND TO BE RE-GRADED, SOILED AND VEGETATED
- WORKING AREA
- POND
- CURRENT SITE BOUNDARY
- PROPOSED SITE BOUNDARY

CONTOURS BASED ON SURVEY DATED OCTOBER 2014



					Client <div>Yennadon STONE LIMITED</div>		Project PROPOSED EXTENSION TO YENNADON QUARRY		<div>JGP</div> <div>JOHN GRIMES PARTNERSHIP</div>
					Status REPORT		Title PRE EXCAVATION WORKS LAYOUT PLAN		
					© Copyright reserved	First Issue Signatures			
R2	REVISED DRAWING	17JUN16	TG	AR	Scales	1:1000	Author	T. Grimes	
R1	REPORT ISSUE	10JUN15	TG	AR	Original Size	A3	Checker	A. Robertson	
Issue	Description	Date	Drwn	Chkd					

50mm on Original

FILENAME: P:\7000-7999\7397 Yennadon Quarry\Drawings\Drawings\JGP\Drawings\Current\Restoration Plan\7397-RP01-R2, PLOTTED BY: Tim Grimes, DATE: 24 June 2015 14:20:50



LEGEND:-

- A

VEGETATED SLOPE TO REMAIN
- B

EXISTING BUND RE-PROFILED AND PLANTED
- C

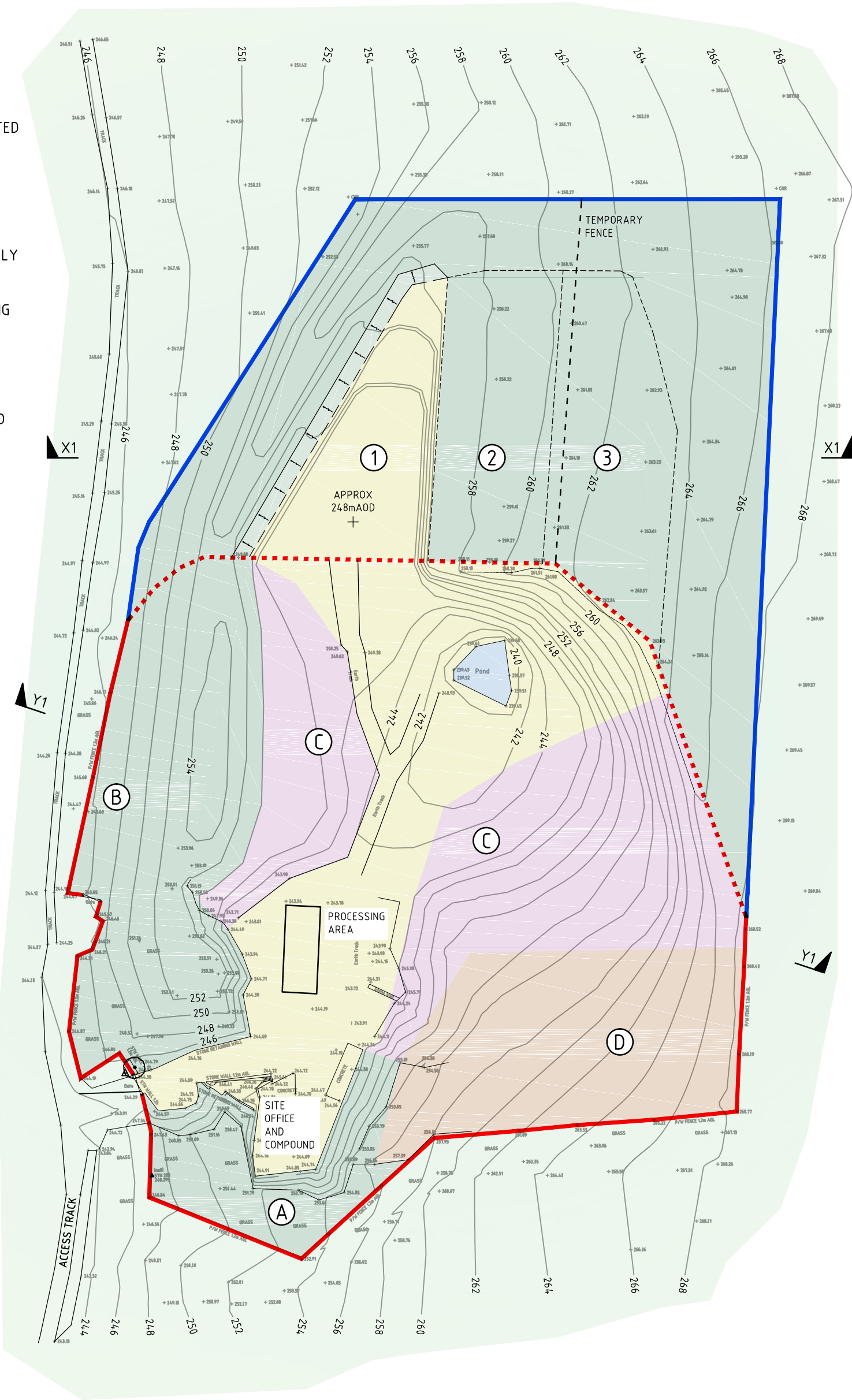
TEMPORARY SPOIL AREAS
- D

INFILL OF PREVIOUSLY WORKED AREA
- 1

AREA 1 TO WORK TO A DEPTH APPROX 248mAOD. WORKS WILL BE PROGRESSIVELY BENCHED DOWN
- 2&3

FOR PHASE 2 & 3 LAYOUTS, SEE DRAWING 7397-07 & 08
- VEGETATED AREAS
- AREAS BEING INFILLED / LANDSCAPED TO ACHIEVE NEAR-NATURAL PROFILE
- STOCKPILES
- WORKING AREA
- POND
- CURRENT SITE BOUNDARY
- PROPOSED SITE BOUNDARY

FOR SECTION SEE DRAWING 7397-RP-06

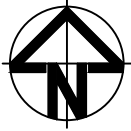


					Client <b>Yennadon</b> STONE LIMITED				Project PROPOSED EXTENSION TO YENNADON QUARRY				<b>JGP</b> <b>JOHN GRIMES</b> <b>PARTNERSHIP</b>		
					Status REPORT				Title PROPOSED PHASE 1 LAYOUT PLAN				Leonards Road, Ivybridge, Devon, PL21 0RU		
R4	REVISED DRAWING	23JUN15	TG	AR	© Copyright reserved				First Issue Signatures				Tel: +44 (0)1752 690533 Fax: +44 (0)1752 690570		
R3	REVISED DRAWING	17JUN16	TG	AR	Scales		1:1000		Author		T. Grimes		post@johngrimes.co.uk www.johngrimes.co.uk		
R2	REVISED DRAWING	12JUN15	TG	AR	Original Size		A3		Checker		A. Robertson		Project No. 7397		
R1	REPORT ISSUE	10JUN15	TG	AR									Drawing No. RP-02		
Issue	Description	Date	Drwn	Chkd									Rev. R4		

50mm on Original

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LEGEND:-

- (A)

VEGETATED SLOPE TO REMAIN
- (B)

EXISTING BUND TO REMAIN
- (C)

TEMPORARY SPOIL AREA
- (D)

EXISTING SPOIL AREA TO BE RE-GRADED
- (E)

LANDSCAPING AND INFILL OF PREVIOUS SPOIL AREA
- (F)

PREVIOUSLY INFILLED AREA TO BE PLANTED
- (1)

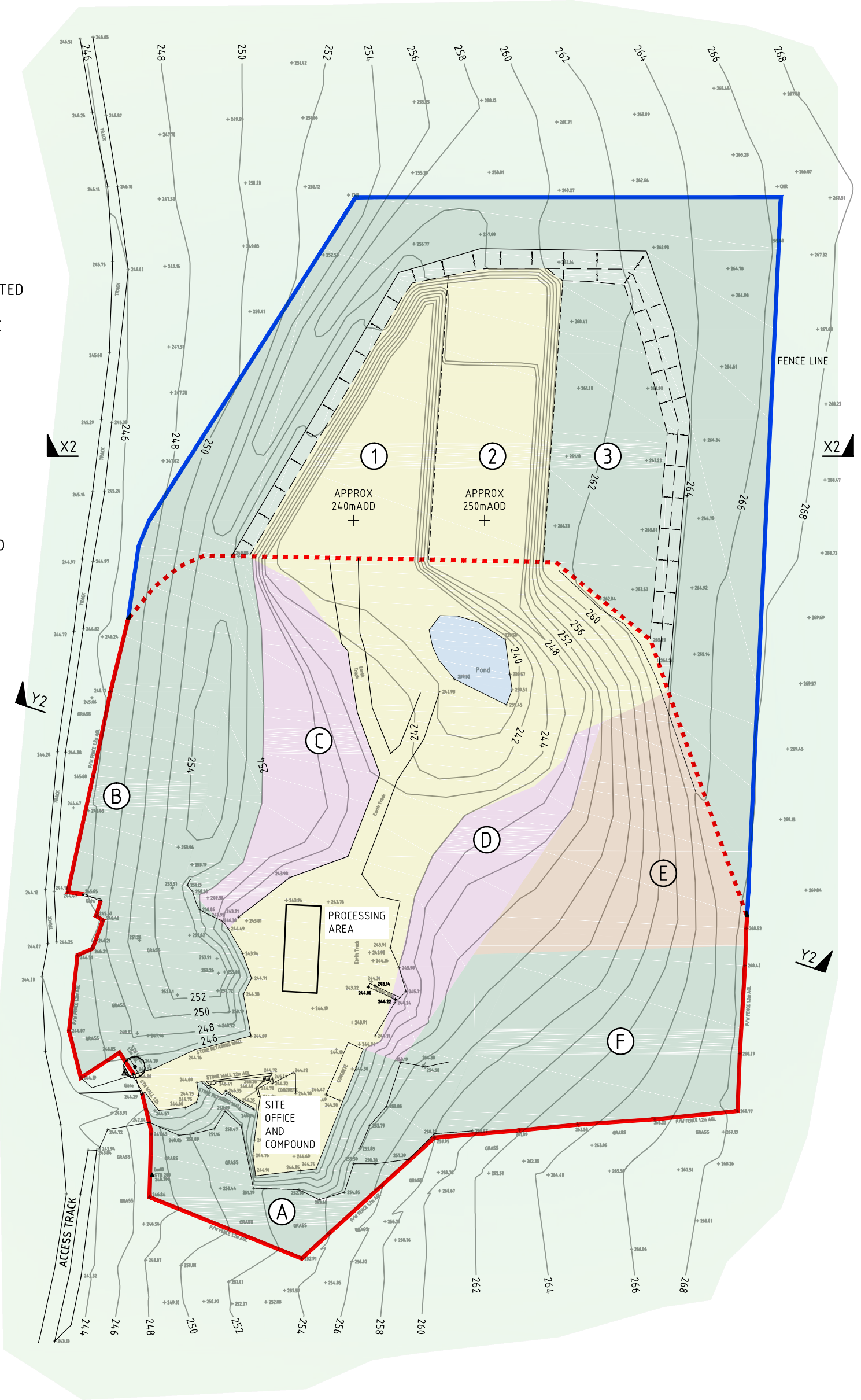
AREA 1 WORKED TO MAX DEPTH APPROX 240mAOD
- (2)

AREA 2 TO WORK TO A DEPTH APPROX 250mAOD
- (3)

FOR PHASE 3 LAYOUT, SEE DRAWING 7397-08

- VEGETATED AREAS
- AREAS BEING INFILLED / LANDSCAPED TO ACHIEVE NEAR-NATURAL PROFILE
- STOCKPILES
- WORKING AREA
- POND
- CURRENT SITE BOUNDARY
- PROPOSED SITE BOUNDARY

FOR SECTION SEE DRAWING 7397-RP-06



					Client <b>Yennadon</b> STONE LIMITED				Project PROPOSED EXTENSION TO YENNADON QUARRY				<b>JGP</b> <b>JOHN GRIMES</b> <b>PARTNERSHIP</b>		
					Status REPORT				Title PROPOSED PHASE 2 LAYOUT PLAN				Leonards Road, Ivybridge, Devon, PL21 0RU		
R4	REVISED DRAWING	23JUN15	TG	AR	(C) Copyright reserved				First Issue Signatures				Tel: +44 (0)1752 690533 Fax: +44 (0)1752 690570		
R3	REVISED DRAWING	17JUN16	TG	AR	Scales		1:1000		Author		T. Grimes		post@johngrimes.co.uk www.johngrimes.co.uk		
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Issue	Description	Date	Drwn	Chkd									Rev. R4		

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LEGEND:-

- (A)

VEGETATED SLOPE TO REMAIN
- (B)

EXISTING BUND TO REMAIN
- (C)

TEMPORARY SPOIL AREAS TO BE USED FOR FINAL RESTORATION OF AREA 3
- (D)

RE-GRADED SPOIL AREA TO REMAIN
- (E)

PREVIOUSLY INFILLED AREA TO BE PLANTED
- (1)

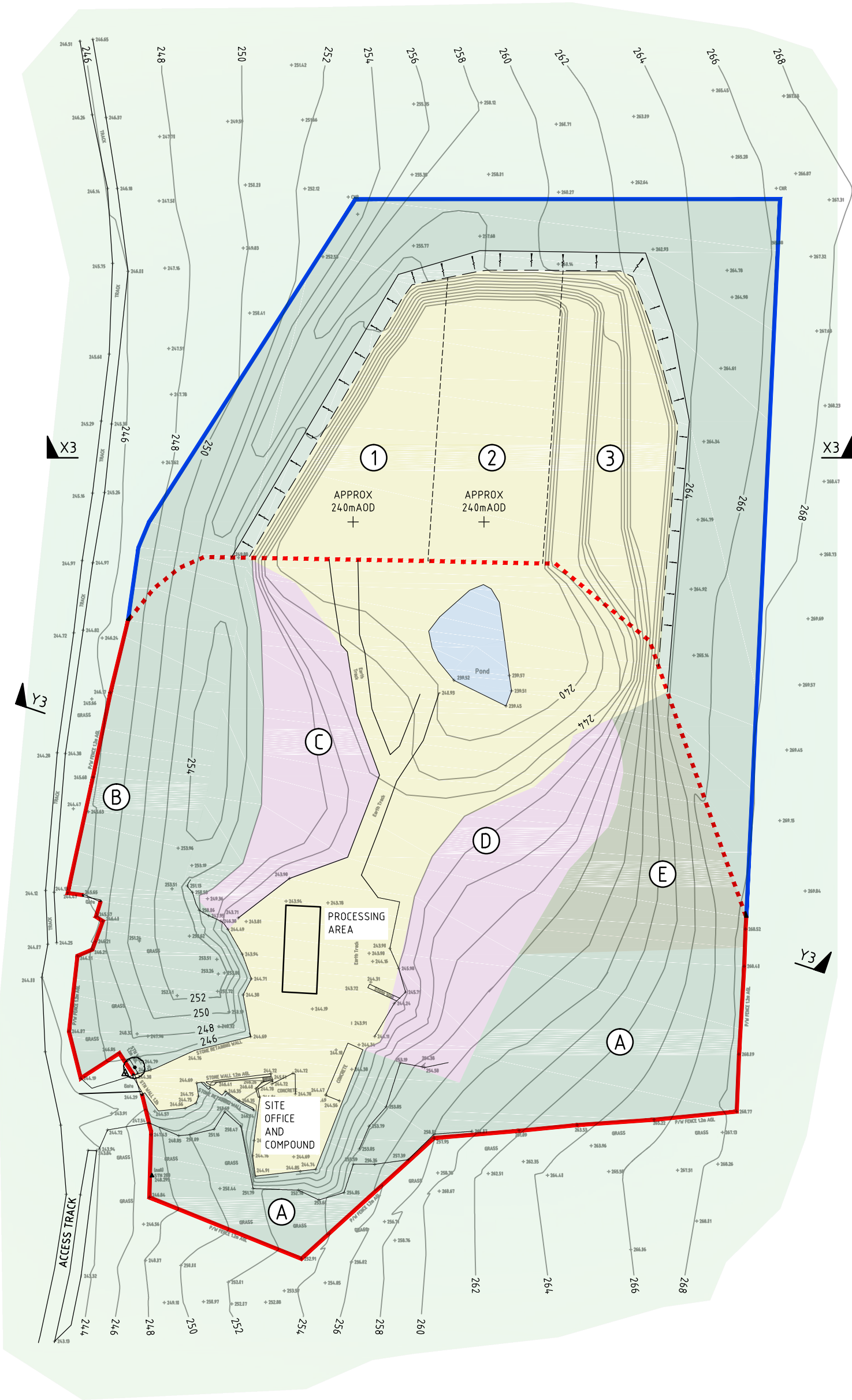
PREVIOUSLY WORKED AREA 1 REMAINS AT A DEPTH OF APPROX 240mAOD
- (2)

AREA 2 WORKED TO MAX DEPTH OF APPROX 240mAOD
- (3)

AREA 3 WORKED TO MAX DEPTH. ACHIEVED BY END OF 2025

- VEGETATED AREAS
- AREAS BEING INFILLED / LANDSCAPED
- STOCKPILES
- WORKING AREA
- POND
- CURRENT SITE BOUNDARY
- PROPOSED SITE BOUNDARY

FOR SECTION SEE DRAWING 7397-RP-06



					Client <b>Yennadon</b> STONE LIMITED				Project PROPOSED EXTENSION TO YENNADON QUARRY				<b>JGP</b> <b>JOHN GRIMES</b> <b>PARTNERSHIP</b>		
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R3	REVISED DRAWING	17JUN15	TG	AR	Scale	1:1000	Author	T. Grimes					post@johngrimes.co.uk www.johngrimes.co.uk		
R2	REVISED DRAWING	12JUN15	TG	AR	Original Size	A3	Checker	A. Robertson					Project No. 7397		
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Issue	Description	Date	Drwn	Chkd									Rev. R4		

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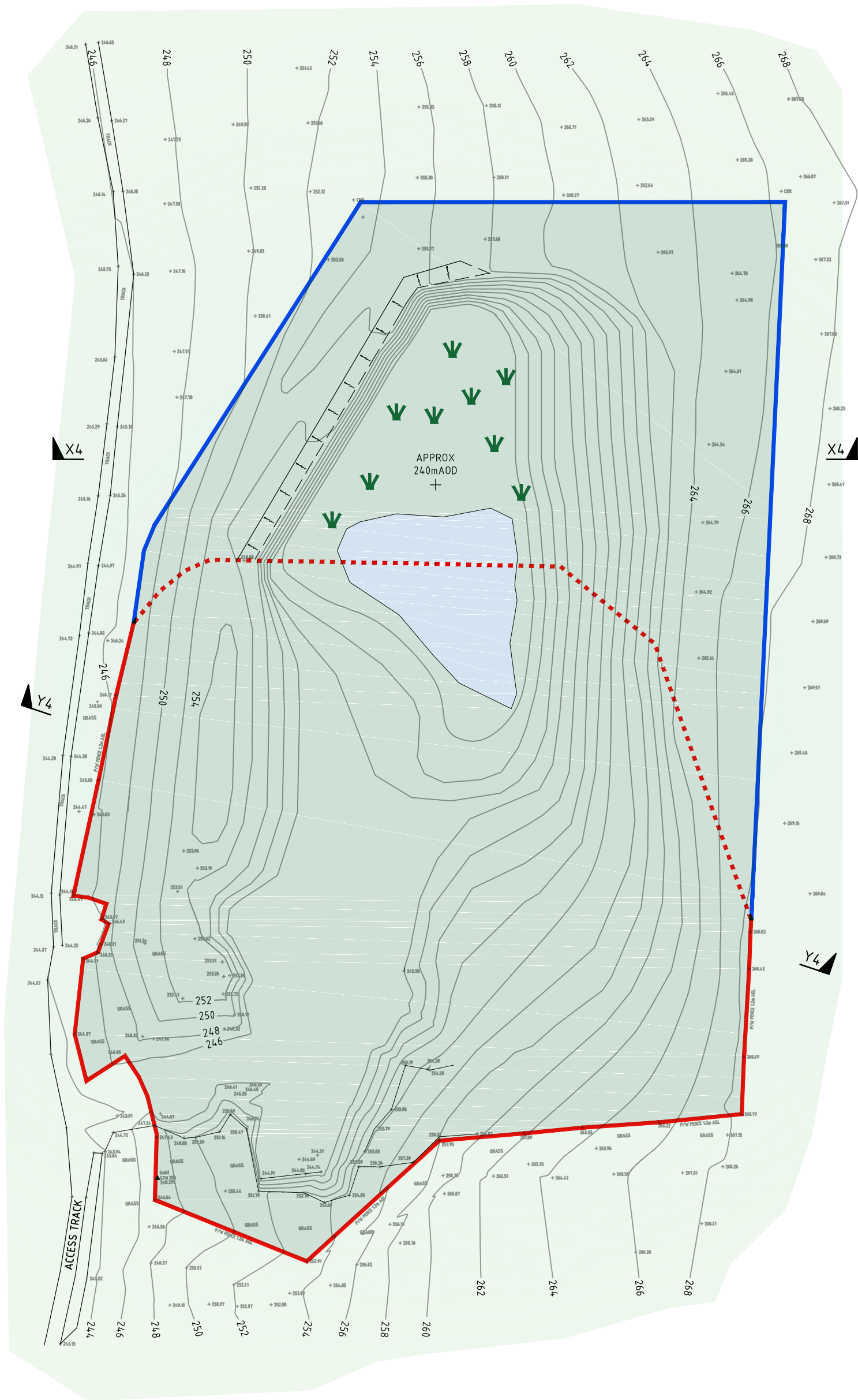
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LEGEND:-

- VEGETATED AREAS
- POND / WETLAND
- CURRENT SITE BOUNDARY
- PROPOSED SITE BOUNDARY

FOR SECTION SEE DRAWING 7397-RP-06

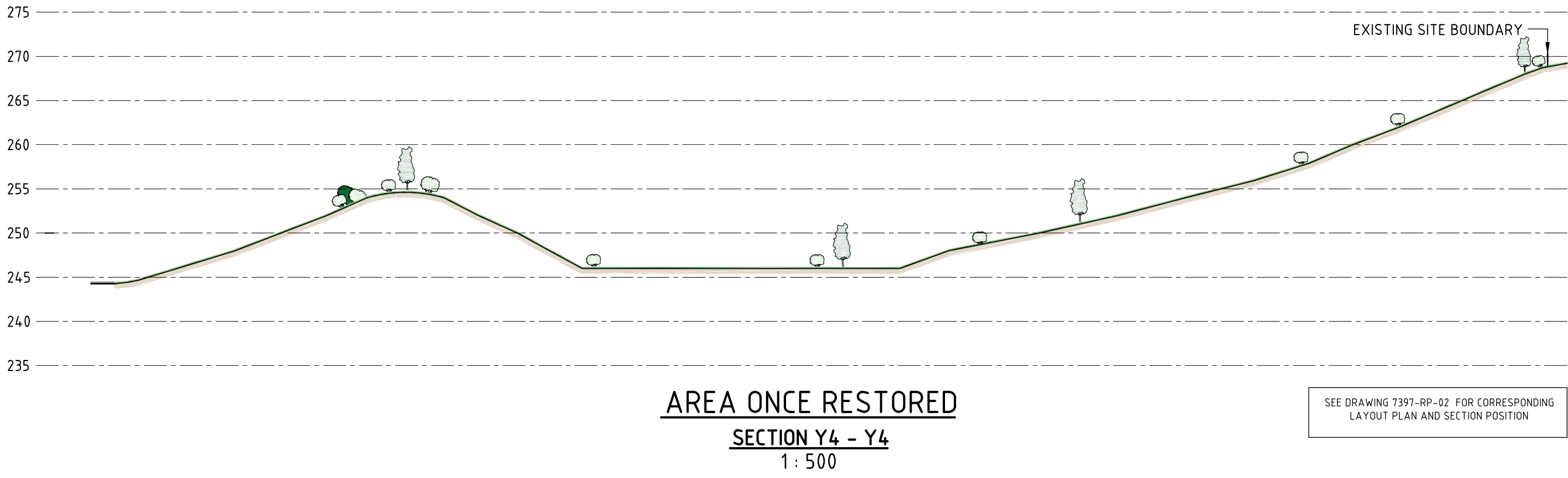
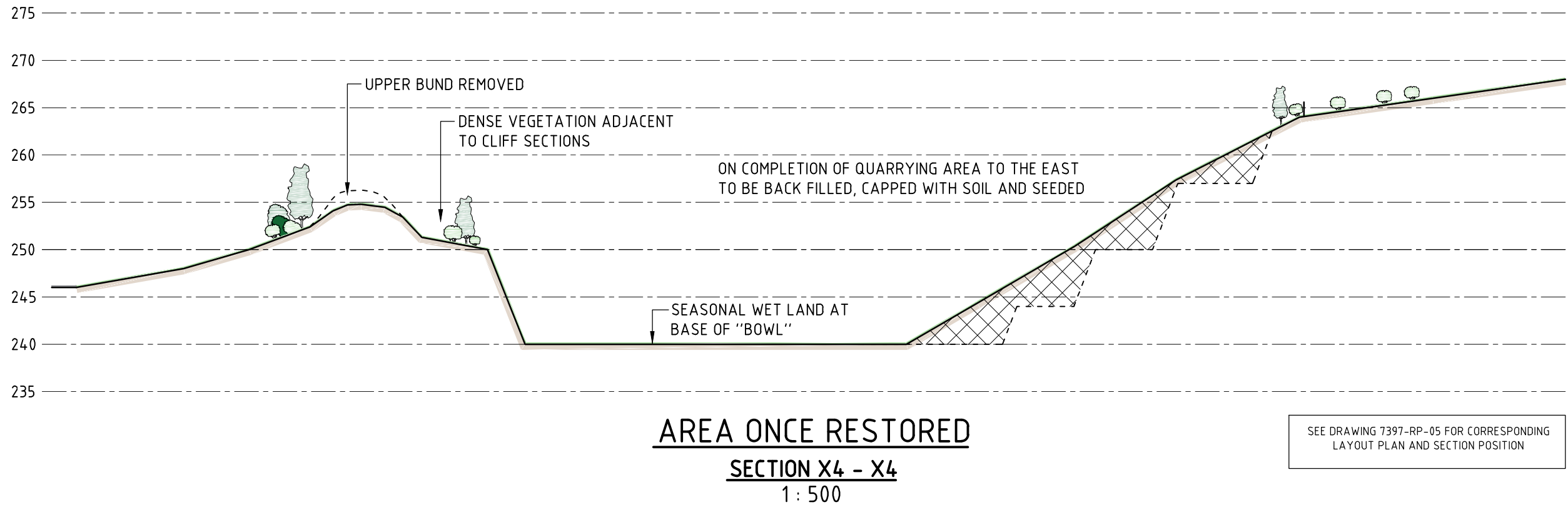
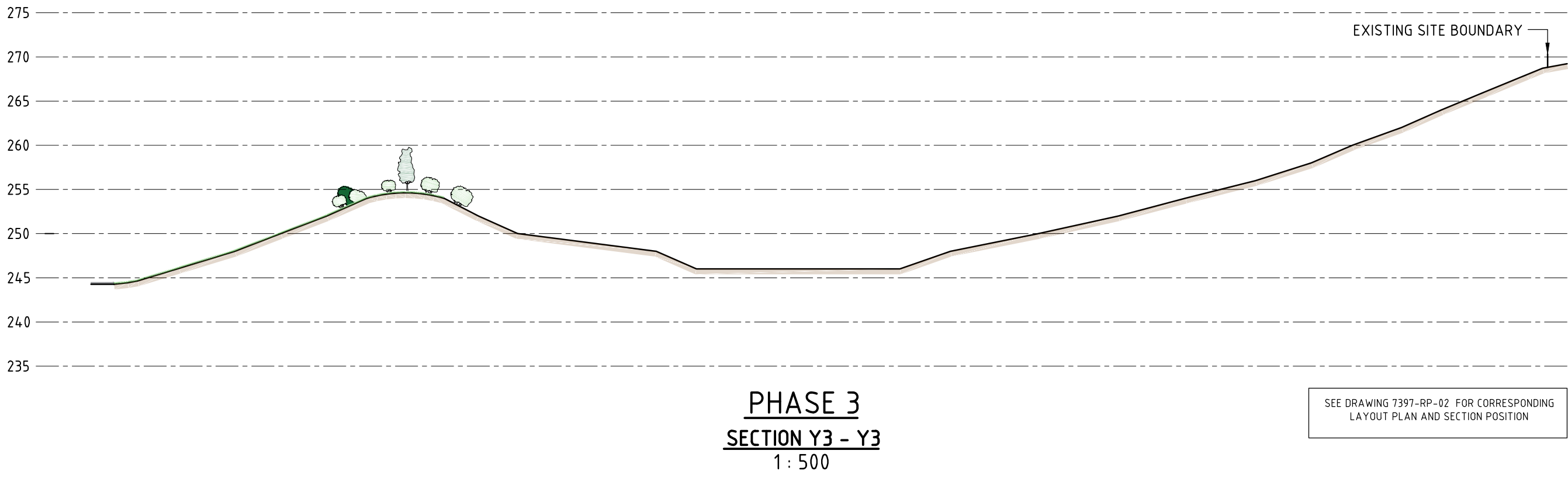
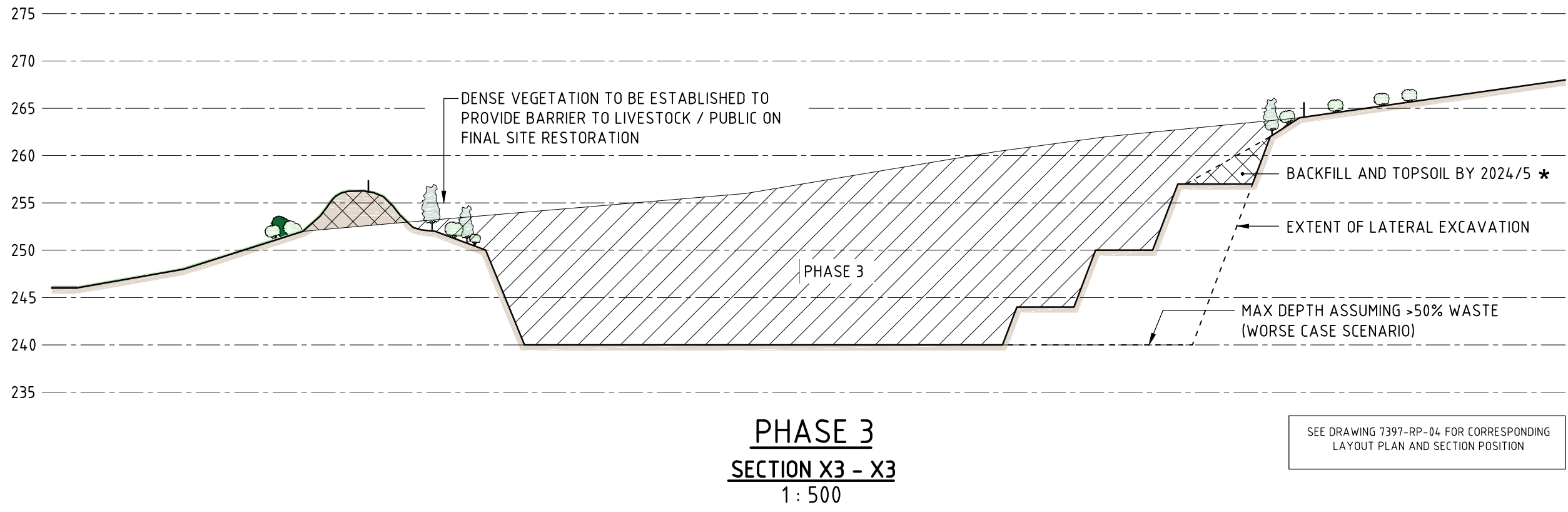
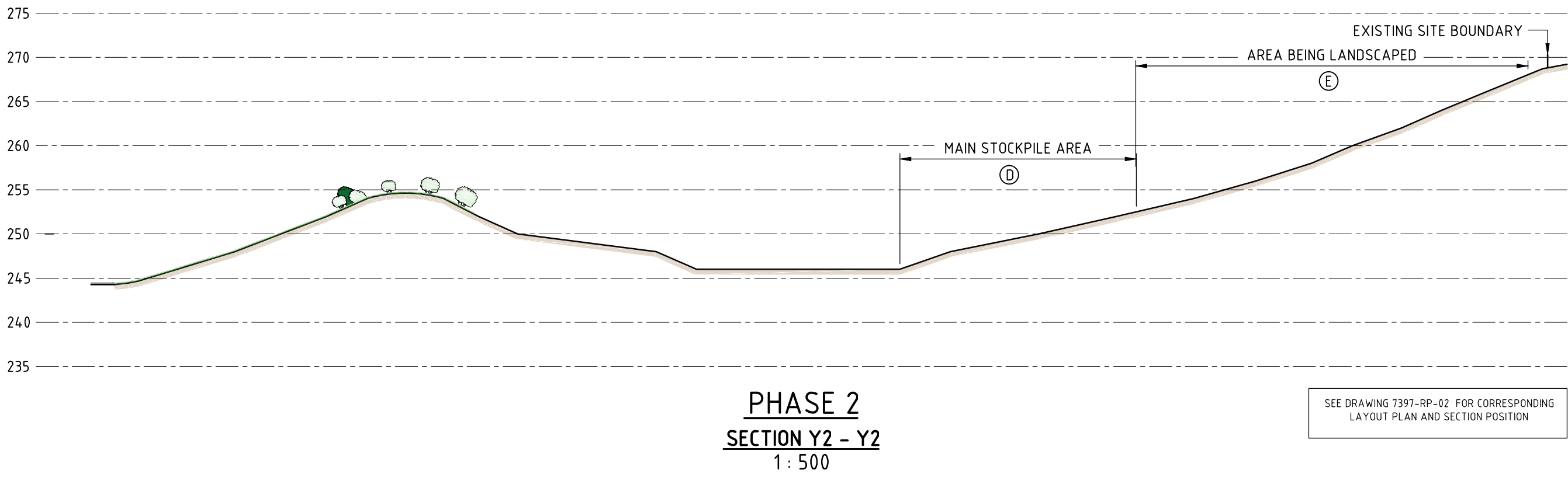
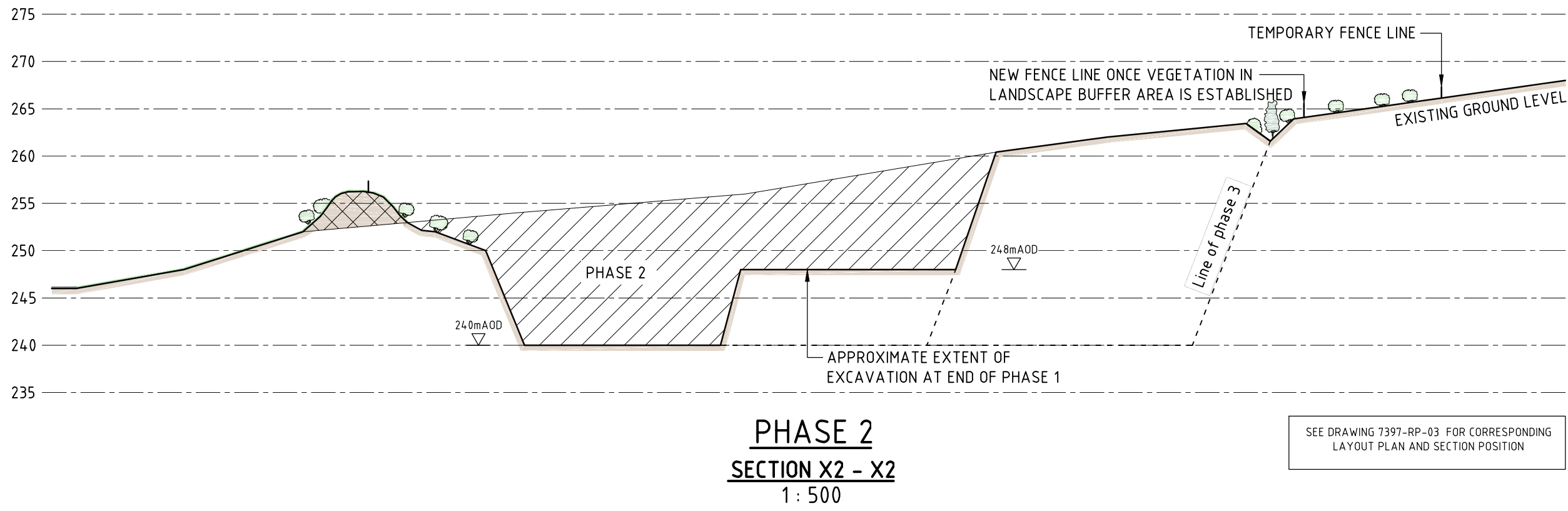
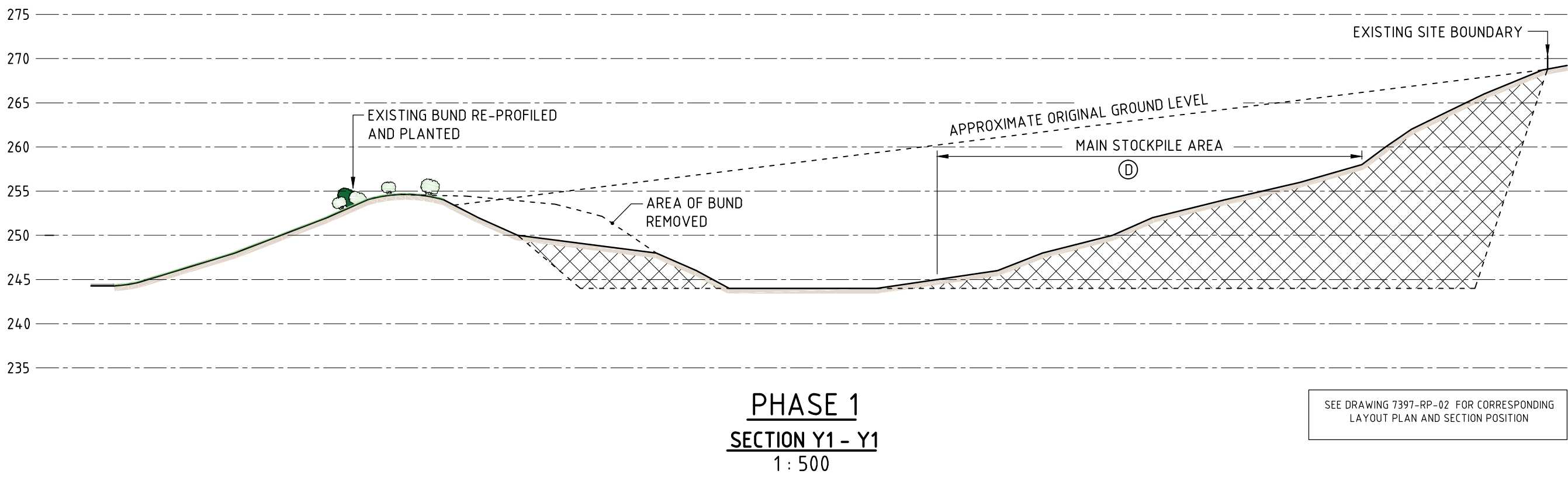
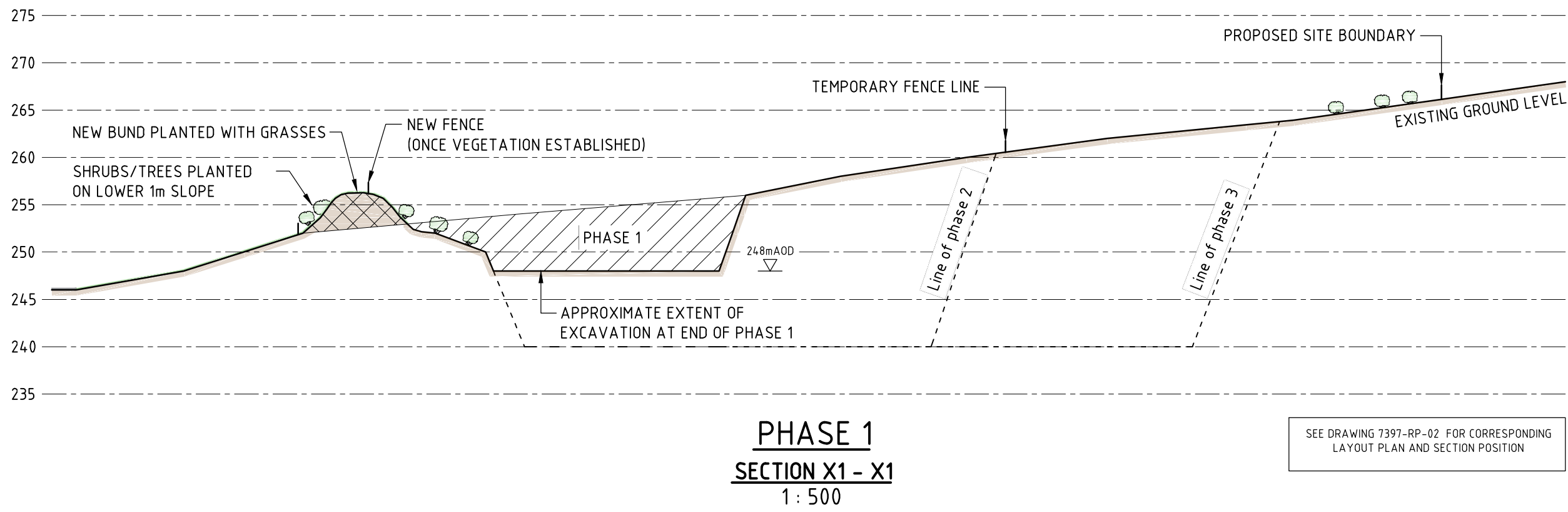


					Client <div>Yennadon STONE LIMITED</div>		Project PROPOSED EXTENSION TO YENNADON QUARRY		<div>JGP</div> <div>JOHN GRIMES PARTNERSHIP</div>		
					Status REPORT		Title PROPOSED LAYOUT PLAN SHOWING AREA ONCE RESTORED			Leonards Road, Ivybridge, Devon, PL21 0RU  Tel: +44 (0)1752 690533    Fax: +44 (0)1752 690570  post@johngrimes.co.uk    www.johngrimes.co.uk	
R3	REVISED DRAWING	23JUN15	TG	AR	© Copyright reserved		First Issue Signatures				
R2	REVISED DRAWING	12JUN15	TG	AR	Scales	1:1000	Author	T. Grimes			
R1	REPORT ISSUE	09JUN15	TG	AR	Original Size	A3	Checker	A. Robertson			
Issue	Description	Date	Drwn	Chkd					Project No. 7397	Drawing No. RP05	Rev. R3

50mm on Original

FILENAME: P:\7000-7999\7397 Yennadon Quarry\Drawings\Drawings\JGP\Drawings\Current\Restoration Plan\7397-RP05-R3, PLOTTED BY: Tim Grimes, DATE: 24 June 2015 11:34:07





Issue	Description	Date	Drwn	Chkd
R4	REVISED DRAWING - PAPER SIZE CHANGED	23JUN15	TG	AR
R3	REVISED DRAWING	17JUN15	TG	AR
R2	REVISED DRAWING	12JUN15	TG	AR
R1	REPORT ISSUE	10JUN15	TG	AR

- Notes:
- ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE.
  - CONTRACTORS MUST CHECK ALL DIMENSIONS ON SITE. ONLY FIGURED DIMENSIONS ARE TO BE WORKED FROM.
  - DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE PROCEEDING.

LEGEND:-

- AREA OF EXTRACTION
- SPOIL INFILLING
- AREA OF PRIORITY BACKFILLING / RESTORATION TO REDUCE VISUAL IMPACT TO VIEW FROM WEST

Client	Yennadon Stone Limited
Status	REPORT ISSUE
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Scales	1:500 @ A1 1:1000 @ A3
Original Size	A1
Author	
Checker	

Project	PROPOSED EXTENSION TO YENNADON QUARRY
Title	SECTION SHOWING PROPOSED EXTRACTION PHASES

<b>JGP</b>		<b>JOHN GRIMES PARTNERSHIP</b>	
Leonards Road, Ivybridge, Devon, PL21 0RU			
Tel: +44 (0)1752 690533		Fax: +44 (0)1752 690570	
post@johngrimes.co.uk		www.johngrimes.co.uk	
Project No.	Drawing No.	Rev.	
7397	RP-06	R4	



LEGEND:-

- (A)

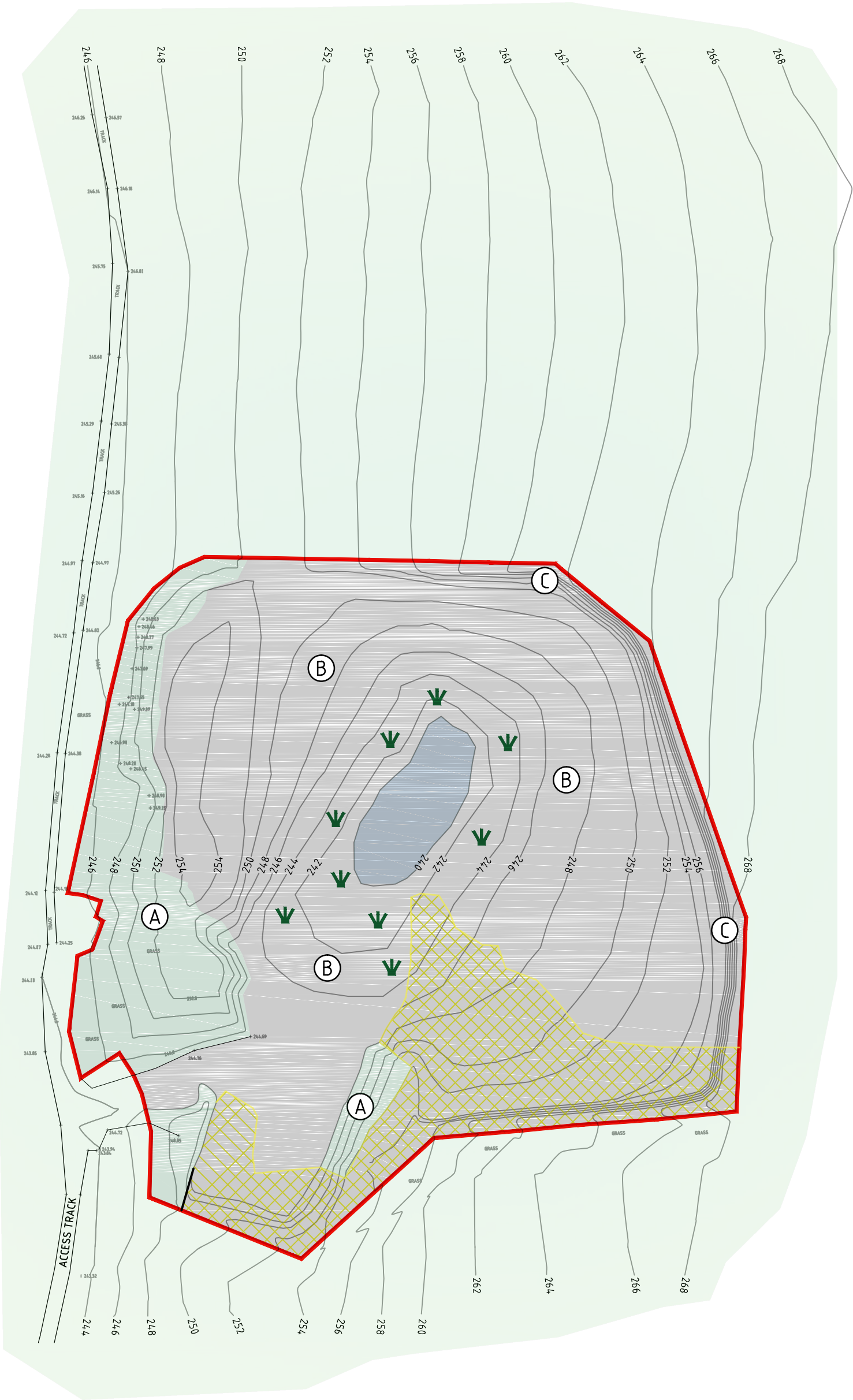
VEGETATED SLOPES TO REMAIN
- (B)

NO TOPSOIL / SUBSOIL CURRENTLY STOCKPILED IN QUARRY. AREA LEFT TO VEGETATE NATURALLY.
- (C)

QUARRY FACES AS ROCK EXPOSURES (OR LEFT TO VEGETATE NATURALLY)
- VEGETATED AREAS
- AREA LEFT TO VEGETATE NATURALLY.
- AREA WORKED UNTIL 2025
- POND AND SEASONAL WETLAND IN BASE OF RESTORED QUARRY
- CURRENT SITE BOUNDARY

NOTES:

1. CONTOURS SHOW POSSIBLE RESTORATION BASED ON REMAINING SPOIL BEING SLOPED AGAINST BASE OF NEAR VERTICAL QUARRY FACE
2. OUTSIDE FACE OF EXISTING BUND WHICH HAS BEEN PLANTED LEFT TO VEGETATE
3. INTERNAL QUARRY LEFT TO VEGETATE NATURALLY
4. FENCE AROUND ENTIRE SITE (H+S RISK TO LIVESTOCK / PUBLIC)



						Client <div>Yennadon</div> <div>STONE LIMITED</div>		Project PROPOSED EXTENSION TO YENNADON QUARRY		<div>JGP</div> <div>JOHN GRIMES PARTNERSHIP</div>						
						Status REPORT		Title POSSIBLE RESTORATION BASED ON CURRENT PLANNING PERMISSION		Leonards Road, Ivybridge, Devon, PL21 0RU						
						© Copyright reserved				First Issue Signatures		Tel: +44 (0)1752 690533    Fax: +44 (0)1752 690570				
						Scales 1:1000				Author T. Grimes		post@johngrimes.co.uk    www.johngrimes.co.uk				
						Original Size A3				Checker A. Robertson						
R1	REPORT ISSUE	10JUN15	TG	AR								Project No.	Drawing No.	Rev.		
Issue	Description	Date	Drwn	Chkd								7397	—	RP-07	—	R1