

Ben Volkofsky

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Response to Submissions

for the

Blayney Quarry

Prepared by:



R.W. CORKERY & CO. PTY. LIMITED

March 2019

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LIST OF ACRONYMS

ANZEC	Australian and New Zealand Environment Council
EIS	Environmental Impact Statement
EP&A Act	Environmental Planning and Assessment Act 1979
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
JHR	John Holland Rail
JRPP	Joint Regional Planning Panel
MIC	Maximum instantaneous charge
PPV	Peak particle velocity
RWC	R.W. Corkery & Co. Pty Limited
SEPP	State Environment Planning Policy
TfNSW	Transport for NSW
TSP	Total suspended particulates



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1. INTRODUCTION

Mr Ben Volkofsky (the Applicant) submitted a development application for the Blayney Quarry (the Proposal), located at 12 Grehamstown Road, Blayney, NSW. The Proposal is classified as follows.

- Designated Development under Clause 19 of Schedule 3 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation), as it would produce more than 30 000 cubic metres of material, disturb more than 2ha and is within 500m of another extractive industry that has operated during the last 5 years.
- Regional Development under the *State Environment Planning Policy (SEPP) (State and Regional Development) 2011*, because it is an extractive industry that is classified as a Designated Development. As a result, the determining authority for the Proposal would be the Joint Regional Planning Panel (JRPP).
- Integrated Development under Section 4.46 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), as the Applicant anticipates that the following additional approvals would be required.
 - An Environmental Protection licence under the *Protection of the Environment Operations Act 1997*.
 - A Section 138 Permit under the *Roads Act 1993*.

The application was accompanied by an *Environmental Impact Statement* (EIS) prepared by R.W. Corkery & Co. Pty Limited (RWC) hereafter referred to as RWC (2018). The Proposal would comprise the following.

- Extraction on a campaign basis of an average of 150 000tpa, and a maximum of 250 000tpa, using rip, push, load and haul techniques for the shallower material and conventional drill and blast techniques for the deeper, more competent material. Extraction operations would be undertaken for a period of approximately 21 years.
- Crushing, screening, stockpiling and blending of extracted material using mobile plant.
- Construction and use of a Site Access Road to permit access between the Project Site and Marshalls Lane.
- Loading and transportation of extracted material from the Project Site via Marshalls Lane and the Mid-Western Highway.
- Construction of a Haul Road and site entrance and upgrading of the unnamed local road and its intersection with Marshalls Lane.
- Construction and use of a range of site infrastructure, including a transportable site office and ablutions facilities, surface water management structures, safety/amenity bunds and a visual screen.
- Rehabilitation of the Project Site to achieve a final land use of agriculture and / or nature conservation.

The Proposal was publicly exhibited by Blayney Shire Council between 2 November and 3 December 2018 (Exhibition Period A) and, following a clerical error by Council, again between 21 December 2018 and 25 January 2019 (Exhibition Period B). During and immediately following those two exhibition periods the following submissions were received.

- Three submissions from Government agencies.
- One form submission supporting the Proposal, of which 50 individual copies were received.
- One form submission opposing the Proposal, of which 153 individual copies were received.
- One petition opposing the Proposal, signed by “over 100” members of the public.
- Twenty unique submissions opposing the Proposal.

This document has been prepared by RWC on behalf of the Applicant to provide a response to each of the submissions received. Where relevant, text extracted or paraphrased from individual submissions has been reproduced in *italics*, with responses to issues raised provided in normal text.

2. GOVERNMENT AGENCY SUBMISSIONS

2.1 ENVIRONMENT PROTECTION AUTHORITY

Comment(s)

Prior to issuing its general terms of approval, the EPA requested the following.

- *The Proponent demonstrate that blast impacts be capable of complying with the guidelines contained in Australian and New Zealand Environment Council – Technical Basis for guidelines to minimise annoyance due to blasting overpressure and ground vibration (ANZEC, 1990).*
- *The proponent provide a quantitative assessment of proposed predicted ground vibration and blast overpressure impacts to demonstrate compliance with ANZEC guideline criteria at residential locations and locations where ground vibration and overpressure can affect people based on the assumed blasting schedule.*

Additionally, the EPA indicates that the Proponent will need to work with infrastructure owners to identify sensitive equipment and appropriate criteria for ground vibration and overpressure.

Response

In order to appropriately respond to the Environment Protection Authority’s request for demonstration that blasting impacts at surrounding residences can comply with the Australian and New Zealand Environment Council (ANZEC) (1990) recommended criteria, the Applicant engaged Prizm Mining Pty Ltd to prepare an updated blasting assessment. The resulting report is presented as **Appendix 1** and is referred to hereafter as Prism (2019). The following presents a summary of the updated assessment.

Blasting criteria adopted by Prism (2019) are as follows.

- The recommended maximum overpressure for airblast is 115dB linear peak. The level of 115dB may be exceeded on up to 5% of the total number of blasts over 12 months, however, should not exceed 120dB linear peak at any time.
- Peak particle velocity (PPV) from ground vibration should not exceed 5mm/s for more than 5% of the total number of blasts over 12 months, however, the maximum level should not exceed 10mm/s at any time.

It is noted that these criteria are consistent with those presented in Section 4.2.2.4 of RWC (2018).

Prism (2019) relied upon the following equations derived from Australian Standard AS2187.2-2006 – *Explosives – Storage and Use*.

Ground vibration¹

- $V = k \times [\text{distance} / \sqrt[3]{(\text{charge mass})}]^b$

Where

- V = peak particle velocity (in mm/s).
- k = 1140
- b = -1.6
- distance = distance from the blast to a sensitive receiver (in metres).
- charge mass = mass of explosives per hole (in kilograms).

Prism (2019) notes that values for *k* and *b* are nominated by AS2187.2-2006 for “average” blasting operations. However, as actual ground vibration levels may vary from “average” conditions, Prism (2019) has conservatively modelled *k*-values of 1140 and 2280 (i.e. double the nominated value).

Air Blast Overpressure²

- $D115/D120 = [(K_a \times \text{diameter} / \text{stem height})^{2.5}] \times [(\text{charge/hole})^{1/3}]$ (behind the face)
- $D115/D120 = [(K_a \times \text{diameter} / \text{burden})^{2.5}] \times [(\text{charge/hole})^{1/3}]$ (in front of the face)

Where

- D115 = distance to 115dBL contour (in metres).
- D120 = distance to 120dBL contour (in metres).
- K_a = 220 (for D115 behind the face)
= 290 (for D115 in front of the face)
= 190 (for D120 behind the face)
= 250 (for D120 in front of the face)

¹ Derived from Australian Standard AS2187.2-2006 – *Explosives – Storage and Use*

² Derived from Richards & Moore (2002), ‘Airblast Design Concepts in Open Pit Mines’

- Diameter = hole diameter (in millimetres)
- Stem height = height of stemming material in the blasthole (in meters).
- Burden = thickness of rock between hole and open face (in metres).
- charge = mass of explosives per hole (in kilograms).

Prism (2019) noted that the closest residences to the Extraction Area are as follows.

- Residence R1 – approximately 350m.
- Residence R6 – approximately 420m.
- Residence R2 – approximately 840m.
- Residence R14 – approximately 1 400m.

In light of the above and the fact that blasting impacts decrease with distance from blasting operations, Prism (2019) determined the blasting parameters that would ensure compliance with the ANZEC (1990) criteria at the closest residential received, namely Residence R1 located approximately 350m from the Extraction Area.

In summary, Prism (2019) determined, using a conservative k value of 2 280, and the following blasting parameters, that ground vibration levels at a distance of 350m from the Extraction Area would be up to 4.1mm/s.

- Hole diameter76mm
- Charge mass per hole45kg

As a result, the ANZEC (1990) ground vibration criterion may be achieved at all surrounding residences.

Similarly, Prism (2019) determined using the following blasting parameters that the distance to the 115dB_L contour behind the face would be 350m.

- Hole diameter76mm
- Burden2.4m
- Stem height2.65m
- Charge mass per hole43kg

As a result, and taking into consideration the Applicant's previous commitment to orientate all blasts to the north, the ANZEC (1990) air blast criterion may be achieved at all residences to the south of the Extraction Area or behind the blast.

Prism (2019) also note that the air blast overpressure criterion may be achieved for all residences located to the north of the Extraction Area or in front of the blast.

Finally, Prism (2019) presents a range of recommendations which would be fully implemented by the Applicant. These are generally consistent with the management and mitigation measures presented in Section 4.2.3 of RWC (2018). In particular, the Applicant notes the following commitments that would ensure compliance with the ANZEC (1990) criteria.

- Design and implement each blast by a suitably qualified blasting engineer or experienced shot-firer.

- Design each blast to ensure that the ANZEC (1990) assessment criteria are complied with at all sensitive receivers.
- Develop a *Blast Management Plan*, including a rigorous monitoring program, prior to undertaking any blasting.
- Monitor and film all blasts to ensure compliance with the relevant blast criteria, including for fly-rock.
- Undertake trial and small-scale blasts initially in the northernmost section of the Extraction Area to enable blasting engineers to develop a comprehensive understanding of site laws and blast impacts, and to appropriately adjust blast parameters to ensure compliance with applicable criteria.³
- Design all blasts within 400m of residential properties and 200m of the Main Western Railway line with reduced maximum instantaneous charge (MIC) determined in accordance with site laws developed during the trial and small-scale blasting program.
- Design blasts with increased face burdens to limit airblast overpressure and improve flyrock control if and where necessary based on monitoring results.
- Utilise a “soft-start” approach with reduced charge in the first blasthole if and where necessary to limit airblast overpressure levels from free face blasts.
- Undertake careful assessment when charging face holes, undertaking face profiling where necessary, to avoid face bursts which can cause excessive airblast overpressure and flyrock.
- Modify blast-designs, mitigation measures and operating procedures on the basis of monitoring results as required.
- Conduct vibration and airblast overpressure monitoring during all blasting operations. Blast monitoring would be undertaken within the Project Site at locations closest to the Nestle Purina Petcare facility, Lime Siding Cottage, Residence R1 and Evans Crescent.

Finally, the Applicant acknowledges the comment in relation to working with infrastructure owners to identify sensitive equipment and appropriate criteria for ground vibration and overpressure. Sections 4.2.2.2 and 4.2.2.3 of RWC (2018) identify criteria determined following consultation with the operators of the Main Western Railway and the Nestle Purina Pet Care facility. The following commitments were included in RWC (2018) to ensure that the operators of that infrastructure are appropriately consulted during and following the commencement of blasting operation.

- Consult with the operator of the Main Western Railway and ensure that the relevant procedures for blasting near rail lines are implemented, including requirements for taking possession of the line during blasting operations at distances of less than 200m.

³ Blasting site laws are standard practice for well operated blasting operations. In summary, monitoring of small-scale blasts are undertaken to determine site-specific values for variables in blast impact equations. Site-specific blast laws would more accurately determine actual blast impacts when compared with the *AS2187.2-2006* - nominated “average” blast equations.

- Consult regularly with the operators of the Nestle Purina Petcare facility to ensure that blasting operations are not adversely impacting on that facility and adjust blasting parameters and assessment criterion as required.

2.2 BLAYNEY SHIRE COUNCIL

2.2.1 Introduction

Blayney Shire Council raised a range of matters in emails dated 17 January, 20 February and 18 March 2019. The following subsections present a response to each of the issues raised.

2.2.2 Noise

The following responses have been prepared by Mr Oliver Muller of Muller Acoustic Consulting, in consultation with RWC and the Applicant.

Comment(s)

The equipment noise levels appear reasonable and are at the lower end of the range with the exception of the processing plant and possibly the drill. For a hard rock quarry it would be expected that the levels of the processing plant be at least 5dB higher unless the plant includes specific partial enclosure, which has not been discussed. Could you please provide the source of the noise data and further justification for the use of these levels.

Response

The equipment sound power levels used to model construction and operational noise for the Proposal are based on measurements from an existing quarry similar to that proposed. The crushing plant adopted was a Terex Pegson 1100x650 hydraulic jaw crusher with a sound power level of 110dBA. The drill rig is considered representative (see Mangoola Mod4 Wilkinson Murray Drill Rig which also adopted a sound power level of 114dBA). The modelled sound power levels for this assessment represent a worst-case scenario with all plant equipment operating simultaneously over a 15 minute period at 100% utilisation. In reality, the drill rig and crushing plant would operate on a campaign basis. The drill rig in particular would operate for a few days per month only, with up to approximately 10 blasts per year preceded by a few days drilling operations. As a result, it would be rare for both the proposed drilling and processing operations to be operating concurrently. As a result, the approach taken is a conservative one.

Comment(s)

It would appear that the scenarios developed are limited to a typical level over the duration of the quarry, rather than scenarios reflecting the worst case noise levels at each receiver. It is considered that more operational scenarios are required to reflect the worst case conditions for the location of plant within the extraction area to the receivers in different directions and also a better understanding of the duration of each of these stages. This may result in exceedances of 40dBA and will assist Council in understanding the potential impacts. This will assist Council in understanding variability in noise levels.

Response

The two noise scenarios presented in RWC (2018) represent worst case scenarios for the reasons identified previously. In addition, the Applicant notes the following:

- Scenario 1 represents emissions at commencement of the extraction operations at the existing ground surface with no shielding from quarry walls.
- Scenario 2 includes operation of the majority of the plant at a floor elevation of 898m which is at an early stage of the quarry life. Later stages, while closer to residences would be deeper in-pit and have more attenuation due to shielding from the Extraction Area wall. Furthermore, Scenario 2 includes concurrent operation of an unshielded bulldozer out-of-pit and crushing and screening operations in-pit. As both these activities are campaign based, and likely operated by the same individual, it would be rare for them to be undertaken concurrently.

As a result, the scenarios adopted are considered worst case and commensurate for a Proposal of this size.

Comment(s)

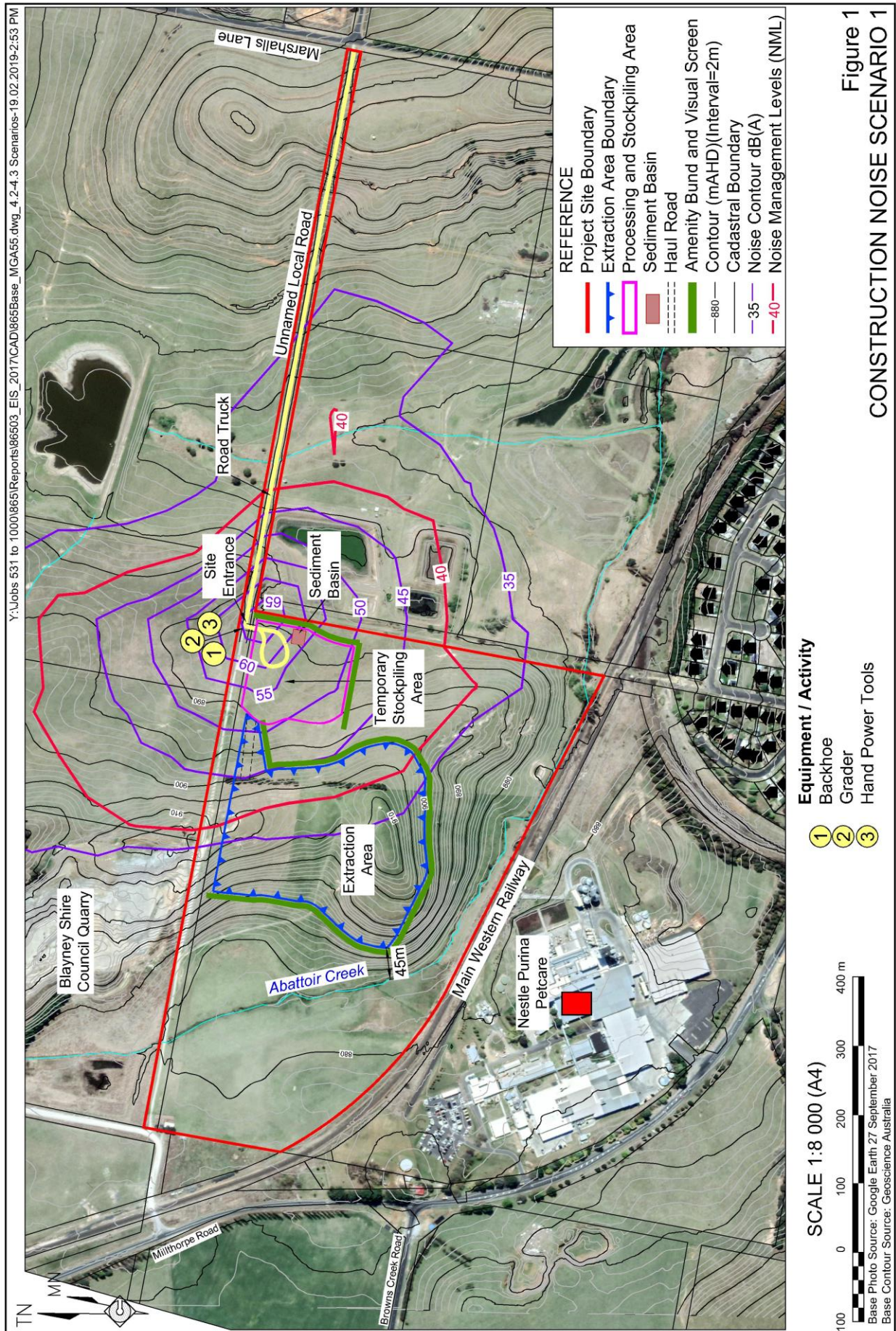
There is only one construction scenario with plant located close to the site entrance and a road truck as a line source. It is considered that other construction scenarios should be provided to show the typical worst case predictions at each receiver in relation to the access road. For example, the building of the amenity bund is recommended, including any cumulative impacts from contemporaneous road and bund construction to confirm criteria are achieved.

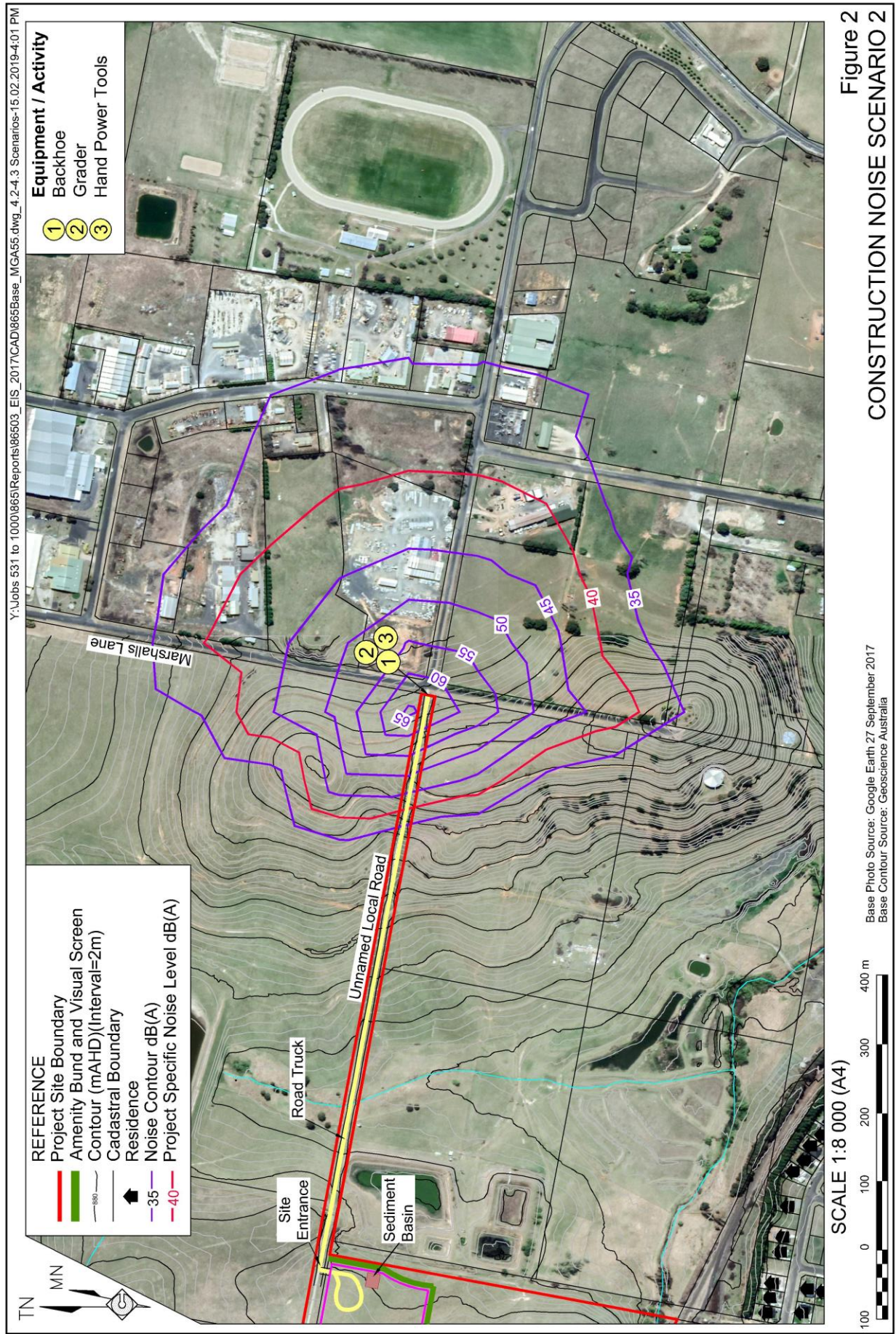
Response

The Applicant acknowledges only a single construction noise scenario was modelled. While both the Applicant and Muller Acoustic Consulting consider that the scenario modelled was adequate to assess construction noise impacts associated with the Proposal, a second additional scenario has been modelled. **Figures 1 and 2** present the original scenario (Construction Scenario 1) and the subsequently modelled scenario (Construction Scenario 2) respectively. The equipment and sound power levels assumed for both scenarios are as described in Section 4.1.2.2 of RWC (2018). Construction Scenario 1 is unchanged from that presented in RWC (2018) and assumed all construction-related equipment to be located at the western end of the Site Access Road. By contrast, construction Scenario 2 assumed all equipment would be located at the eastern end of the Site Access Road. Both scenarios assumed a road truck as a line source for the full length of the road.

In summary, noise emissions associated with both Construction Scenario 1 and 2 would be less than 40dBA at all surrounding residences. In addition, the Applicant notes that construction operations on the Site Access Road would be expected to be completed in a relatively short period, with noise emissions following completion of the works limited to operational vehicle movements assessed under Operational Noise Scenarios 1 and 2 in RWC (2018).

Finally, the Applicant notes that the Amenity Bund referred to by Council would be constructed as an operational activity and has therefore not been considered under the construction noise assessment. The bund would be between 1.0m and 1.5m high and would be constructed using overburden extracted during the initial extraction operations.





Comment(s)

- *Given the current report only shows the criteria of 40dB can just be achieved, the requirements above are likely to show an exceedance of criteria. As such, discussion around duration of exceedance and options for mitigation should be included, which would form part of an approved Plan of Management.*

Response

The noise assessment is considered to be conservative for the following reasons.

- The modelled scenarios included concurrent operation of equipment at 100% utilisation. In reality and as discussed previously, it would be rare for all equipment to operate concurrently and at 100% utilisation.
- The modelled scenarios included the operation of equipment at the most exposed locations they would be likely to operate within during the life of the Proposal. In particular, the bulldozer would only rarely operate at the natural surface and processing and stockpile management operations would, once the second bench is established during Stage 2, processing and stockpiling operations would be undertaken at an elevation of 882m AHD, not 897m AHD as modelled.

In addition, the Applicant, assuming that development consent is granted, anticipates that the conditions of consent would include a requirement to demonstrate compliance with the relevant noise criteria.

2.2.3 Riparian Land and Watercourses

Representative Comment(s)

A portion of the quarry extraction area is located within 40m of the Abattoir Creek. Accordingly, could you please provide further information to address the issues identified at Clause 6.6 Riparian land and watercourses (3)(a) and (c) of the Blayney Local Environmental Plan 2012.

In particular, the key issue is considered to be the potential impact on water quality and how that may affect aquatic and riparian species, habitats and ecosystems.

It is appreciated that the EIS refers to the preparation of an Erosion and Sediment Control Plan, however additional information is required to demonstrate how this would achieve a satisfactory outcome with regard to Clause 6.6.

Response

Clause 6.6(c) of the Blayney Local Environmental Plan 2012 (Blayney LEP) is reproduced below.

“(3) Before determining a development application for development on land to which this clause applies, the consent authority must consider:

(a) whether or not the development is likely to have any adverse impact on the following:

(i) the water quality and flows within the watercourse,

- (ii) aquatic and riparian species, habitats and ecosystems of the watercourse,
 - (iii) the stability of the bed and banks of the watercourse,
 - (iv) the free passage of fish and other aquatic organisms within or along the watercourse,
 - (v) any future rehabilitation of the watercourse and riparian areas, and
- (c) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.”

The Applicant notes that the minimum distance between the Extraction Area and Abattoir Creek would be approximately 45m (**Figure 1**). As a result, the Applicant notes that the proposed Extraction Area is not within Riparian Land as defined under the Blayney (LEP) and Clause 6.6 does not apply to the Proposal.

Notwithstanding above, the Applicant notes the following.

- The closest point of the Extraction Area to Abattoir Creek is located at an elevation of approximately 890m AHD. The elevation of the Creek by contrast is approximately 877m AHD or 13m lower than the Extraction Area.
- The Extraction Area would be internally draining and all surface water within the Extraction Area would be used for dust suppression.
- The Temporary Stockpiling Area would drain to a Sediment Basin that would be constructed in accordance with the requirements of Landcom (2004) and DECC (2008).

As a result, the Applicant contends the following.

- The Proposal would not adversely impact on water quality and flows within Abattoir Creek because no water would be permitted to flow to the Creek and no water would be removed from it.
- The Proposal would not adversely impact on aquatic and riparian species, habitats and ecosystems because there would be no direct or indirect impacts upon the Creek.
- The Proposal would not adversely impact on the stability of the bed and banks of the Creek, free passage of fish and other aquatic organisms or any future rehabilitation of the watercourse and riparian areas because there would be no surface disturbing activities in the vicinity of the Creek.
- Section 4.8.2 of (RWC (2018) presents all reasonable and feasible management and mitigation reassurance required to avoid, minimise or mitigate potential impacts to Abattoir Creek associated with the Proposal.

2.2.4 Visual Impact

Representative Comment(s)

The EIS identifies that the processing and stockpiling areas would be relocated within the extraction area as soon as adequate space is available. What is the likely timeframe for this to occur? How can this be ensured?



The EIS identifies that the temporary stockpiling area would be decommissioned and rehabilitated once sufficient space is available to stockpile material within the quarry pit. What is the likely timeframe for this to occur? How can this be ensured?

The EIS refers to an amenity bund and visual screen being established around the western, southern and eastern perimeter of the extraction area and eastern and southern sections of the temporary stockpile. Please provide further information to clarify how the amenity bund / visual screen will be established and maintained.

Response

The Applicant anticipates that stockpiling of extracted material within the Temporary Stockpile Area would be required during Stage 1 only. Indeed, Operational Noise Scenario 2 (see Section 4.1.2.2 of RWC (2018)) identifies that all mobile plant, including that associated with stockpile management, would be located in-pit. Operational Noise Scenario 2 is identified as being representative of early Stage 2 of the Proposal. Section 2.4.2 of RWC (2018) identifies that Stage 1 would require approximately 3 years to be completed. As a result, the Applicant anticipates that out-of-pit stockpiling operations would be complete between 3 and 5 years after commencement of extraction operations.

In relation to rehabilitation of the Temporary Stockpiling Area, the Applicant has a commercial imperative to reduce the area required for quarry operations to maximise the agricultural productivity of the Project Site. In particular, hardstand areas are unsuitable for grazing operations and would be rehabilitated to pasture as soon as practicable once they are no longer required for quarrying operation.

Section 2.3 of RWC (2018) identifies that safety/amenity bunds would be established as indicated on Figure 2.1 of that document within 12 months of the granting of development consent, climatic conditions permitting. The Applicant anticipates that the bund would be constructed using subsoil or overburden and would be up to approximately 1.5m high. The outer face of the bund would be spread with topsoil and revegetated using native species to be determined in consultation with Council. The Applicant anticipates that the vegetation may be watered as required to facilitate establishment of the visual screen.

2.2.5 Availability of Water

Representative Comment(s)

The EIS refers to a commercial agreement with Central Tablelands Water to source any additional water required for the maintenance of the quarry. Please provide further details to clarify the likely volumes of water to be sourced from Central Tablelands Water, how the water would be obtained and stored, and how such a commercial agreement would operate (i.e. would a single agreement be established for the life of the quarry, would the agreement be renewed on an annual basis? How can an ongoing agreement be ensured?).

Response

The Applicant notes that details in relation to commercial agreements with suppliers are not matters that are relevant to an application under the *Environmental Planning and Assessment Act 1979*. Notwithstanding the above, the Applicant notes the following in relation to the commercial agreement with Central Tablelands Water.

- Central Tablelands Water have provided a quote to install a pipeline and to supply water at an agreed rate.

- The Applicant intends to accept that quote following the granting of Development Consent.
- The Applicant would construct one or more suitable water tanks in the vicinity of the Site Office and Amenities and would also use the existing water tank on site for storage of supplied water.
- The Applicant would initially use water stored within the onsite sediment basin and Extraction Area sump for dust suppression and other purposes.
- Once water within those storages has been exhausted, the Applicant would source water from the proposed water tanks and the Central Tablelands Water supply.
- The Applicant has been advised that water supply agreements do not require renewal.

In relation to the volume of water to be used annually, the Applicant notes that that would depend on the production rate and climatic condition. **Table 1**, however, presents an indicative summary of anticipated water use on site.

Table 1
Anticipated Annual Water Use

Category	Assumption	Anticipated Annual Volume
Dust Suppression (Roads)	Allow an average of 3 x water cart loads @ 10kL/load and 100 days per year	3.0ML
Dust Suppression (Processing)	Allow 3% moisture @ 150,000tpa	4.5ML
Ablutions, etc.	Allow 100L/person and 3 people on site for 200 days	<0.1ML
Total		7.6ML

2.2.6 Rehabilitation/Quarry Closure

Representative Comment(s)

The EIS indicates that a Quarry Closure Plan would be prepared either within 16 years of the date of granting development consent or 5 years prior to the end of the life of the quarry.

Given the requirement of the SEARS to provide a detailed description of the proposed rehabilitation measures that would be undertaken throughout the development and during the quarry closure, it is considered that a Quarry Closure Plan should be provided as part of the Development Application. If this not considered to be a best practice approach, evidence should be provided to justify why a detailed Quarry Closure Plan should not form part of the Development Application.

Further, additional information is required to address the rehabilitation measures that would be undertaken throughout the development / operation of the quarry.

Response

The Applicant notes that with the exception of the Temporary Storage Area, disturbed sections of the Project Site would be the subject of ongoing operational activities for the life of the Proposal. As a result, limited potential exists for progressive rehabilitation of disturbed sections of the Project Site.



In addition, the Applicant also notes recent emphasis in industry and the general media in relation to ensuring that extractive and other similarly disturbed sites are repurposed for beneficial use following the completion of extractive operations. Section 2.10.1 of RWC (2018) provides a description of potential post-extractive land uses. However, given the fact that those uses would require development consent under the relevant legislative requirements at the time, the Applicant has proposed a final land use of agriculture and/or nature conservation.

The Applicant considers the level of detail provided in Section 4.10 of RWC (2018) as adequate based on the life of the Proposal and the fact that limited progressive rehabilitation would be possible. The Applicant's commitment to prepare a detailed Quarry Closure Plan five years prior to the end of the life of the Proposal would permit alternate final land uses to be explored and development applications prepared if required.

2.2.7 Land Resources

Representative Comment(s)

The SEARS require an assessment of:

- *the potential impacts on soils and land capability (including potential erosion and land contamination) and the proposed mitigation, management and remedial measures; and*
- *potential impacts on landforms (topography), paying particular attention to the long-term geotechnical stability of any new landforms (such as overburden dumps, bunds etc); and*
- *the compatibility of the development with other land uses in the vicinity of the development, in accordance with the 12 of SEPP (Mining, Petroleum Production and extractive Industries) 2007.*

It is considered that further information is required to adequately address the first two dot points.

Response

Soils and Land Capability

The Applicant notes that Land Capability within the proposed disturbance areas is mapped as Class 4 or "land with moderate to severe limitations."⁴ The Applicant contends that steeply sloped sections of the Project Site would be classified as having "Severe" or "Very Severe" limitations."

Section 4.9. of RWC (2018) identifies the management and mitigation measures that would be implemented to manage risks associated with unacceptable soil-related impacts. In summary, the Applicant would strip, store and respread soil resources in a manner that would maximise the potential for reuse of that material during rehabilitation operations.

⁴ Source: SEED database – accessed 19/2/2019 - https://geo.seed.nsw.gov.au/Public_Viewer/index.html?viewer=Public_Viewer&locale=en-AU&runWorkflow=AppendLayerCatalog&CatalogLayer=SEED_Catalog.111

In addition, the Applicant would prepare an *Erosion and Sediment Control Plan* in accordance with the requirements of Landcom (2004) and DECC (2018a and 2018b). That Plan would fully describe measures to be implemented to prevent erosion of soil resources and contamination of surrounding landforms during initial soil stripping operations.

As a result, the Applicant contends that the adequate information, consistent with other similar Proposals, has been presented at this stage of the Application to permit determination of the development consent.

Landforms and Geotechnical Stability

Section 2.10.3 describes the proposed final landform. In particular, the final landform would include a bunded, fenced and geotechnically stable Extraction Area. The Applicant has conservatively assumed final wall angles of approximately 60°. However, the advice of a suitably qualified geotechnical engineer would be sought should steeper wall angles be proposed. In addition, the Applicant notes that terminal faces are typically not developed until extraction operations are well established and the operator and its advisors have developed a detailed understanding of the geotechnical behaviour of the material. In particular, it is in the Applicant's interests to ensure that the terminal faces of the Extraction Area are stable in the long term because rectification of failures is both costly and has the potential to significantly impact on both production and the Applicant's approvals to operate.

Finally, the Applicant notes that the landforms associated with other areas of proposed disturbance would remain unchanged.

2.2.8 Life of the Proposal

Representative Comment(s)

The Executive Summary Introduction (ES-1) refers to an operational period of up to 21 years. The Executive Summary Objectives of the Proposal (ES-5) refers to life of approximately 23 years. Could you please clarify the life span of the proposed quarry.

Response

Section 2.8.3 of RWC (2018) identifies that the life of the Proposal would be 23 years, comprising 21 years of extraction operations and 2 years of rehabilitation.

2.2.9 Onsite Effluent Management

Representative Comment(s)

Could you please clarify how on-site effluent management would work?

Response

Section 2.7.2 of RWC (2018) identifies that waste water would be directed to a pump-out septic facility that would be serviced by a suitably licenced contractor as required. Alternatively, the Applicant may install an aerated waste water treatment facility in accordance with Blayney Shire Council's requirements for such facilities.

In the event that an aerated waste water treatment facility is installed, relevant approvals would be obtained from Blayney Shire Council prior to installation of the facility. Should such a facility be installed, the Applicant anticipates that the treated waste water would be irrigated to land in the vicinity of the facility in a manner that would ensure that the treated waste water is not permitted to flow to surrounding watercourses.

2.2.10 Lease Agreement

Representative Comment(s)

The Applicant shall finalise a lease agreement for the unnamed road reserve (from Marshalls lane to the development site) with Blayney Shire Council, prior to the commencement of any works.

As a requirement of the lease, maintenance of the Site Access Road shall be the responsibility of the developer

Further, the lease shall include provision for use by Blayney Shire Council and Emergency Services vehicles in the event of an emergency resulting in the closure of the Mid-Western Highway (Adelaide Street) railway crossing in Blayney.

Response

The Applicant acknowledges the above requirements.

2.2.11 Site Access Road and Site Entrance

Representative Comment(s)

Please clarify the design standard adopted [for the Site Access Road upgrade noting discrepancies between the EIS and Traffic Impact Assessment].

Concern is held for the proposed 15.1% grade of the Site Access Road approaching the intersection of Marshalls Lane and Lowe Street. The braking of a fully laden semitrailer or truck and dog on approach to the intersection is of particular concern. Have any measures been considered to prevent errant vehicles from entering the intersection?

Further information is required in relation to the stabilising measures proposed for [the cut and fill] batters.

Prior to the commencement of construction, the developer is to provide to Council a letter from the relevant electrical authority indicating that satisfactory clearances from power lines will be maintained. Further, the letter shall indicate the electrical authority's satisfaction with regards to the stability of their infrastructure given the proximity of steep batters.

Evidence of the adjacent landowner's consent to proposed access relocations/ reconstructions shall be obtained and submitted to Council.

All vehicles entering or leaving the subject property shall be driven in a forward direction.

Design of the Site Entrance shall take into consideration a 25m gate set back from the edge of the Site Access Road.

Response

Design Standard to be applied

The design standard adopted for the Site Access Road upgrade would be as outlined in Section 2.6.2 of the EIS. This would include the sealing of the eastern-most 200m of the Site Access Road and a width of 6m plus road-side drainage. It is noted that the design references by the Traffic Impact Assessment referenced a superseded design.

Errant vehicles entering Marshalls Lane

The Applicant acknowledges concern surrounding the grade of the Site Access Road and potential issues regarding laden vehicles approaching the intersection of Marshalls Lane and Lowe Street. As a result, the Applicant would erect “trucks use low gear” signs at the eastern and western approaches to the steep section of the Site Access Road.

In addition, an updated set of concept designs for the Site Access Road, prepared by Duncan Priestly Civil Engineering is presented as **Appendix 2**. The updated Site Access Road concept designs include an arrester bed that would be located on the northern side of the Site Access Road to the west of the intersection with Marshalls Lane to cater for east-bound vehicles.

The Applicant anticipates that the arrester bed, combined with the 40km/h speed limit which would apply on the Site Access Road and the requirement for trucks to use low gear, would prevent any errant vehicles from entering the intersection of Marshalls Lane and Lowe Street.

Stabilisation of steep batters

The Applicant notes that the proposed steep cut and fill batters, namely those sloped greater than 2:1 (V:H) would be limited to a section of the Site Access Road from approximately Ch1410 to Ch1480. The steepest batters, namely those sloped at approximately 0.7:1 (V:H), would be limited to between approximately Ch1430 to Ch1450, a distance of 20m. The Applicant is advised that a range of stabilisation products are available, with VersiWeb one such product under consideration. The actual product to be used to stabilise the cuttings will be determined in consultation with the road construction contractor, Council and Essential Energy.

Consent of Essential Energy

Section 3.1 of this document provides a response to matters raised by Essential Energy. In particular, the Applicant acknowledges the requirement to obtain a controlled activity approval under Essential Energy’s guideline document *Operational Procedure: Work Near Essential Energy’s Underground Assets* (dated May 2015).

Consent of adjacent landholder’s

As indicated on Figure 3.5 of the EIS, the existing unnamed road reserve provides access to land registered to NE Oldham and Langway Pty Limited.

The Applicant has consulted Mr Oldham in relation to the Site Access Road and Mr Oldham has consented to upgrading of his access from the upgraded road. An email confirming this will be provided separately to Council.

The Applicant has leased the land registered to Langway Pty Limited since January 2012. Throughout the application process, the Applicant has attempted unsuccessfully to contact the director of Langway Pty Limited, with the latest attempts being phone calls on Friday 8 and Saturday 9 March 2019. The purpose of the most recent phone calls was to discuss the access from the upgraded Site Access Road to the Applicant's land. The phone rang out on both occasions. A text message was also left on 9 March 2019 requesting the director contact the Applicant or to indicate a convenient time for a return call. No reply was received.

The Applicant has committed to work with the owners of both properties to ensure that treatments at the access points comply with the requirements of the landowners.

Vehicles must enter and exit in a forward direction

The Applicant acknowledges this requirement.

Set back for site access gate

The Applicant anticipates that a detailed design of the intersection of the Site Access Road and Marshalls Lane and Lowe Street will be submitted to Council for approval prior to the commencement of construction. That design will include details in relation to the proposed gate and setback at the eastern end of the Site Access Road.

2.2.12 Intersection and Marshalls Lane Upgrades

Representative Comment(s)

Consideration shall be given to the intersection approach grades and roadside drainage. All intersection design shall be in accordance with Austroads' Guide to Road Design Set.

The proposed heavy duty gate constructed at the intersection of the Site Access Road and Marshalls Lane shall be set back a minimum of 25m from the intersection.

The upgrade of Marshalls Lane shall be in accordance with Austroads' Guide to Road Design Set and Blayney Shire Council's Guidelines to Engineering works. The road shall be designed and constructed to BSC's Industrial Road Standard.

Response

The Applicant acknowledges the requirement that the design for the intersection of the Site Access Road and Marshalls Lane and the upgrade of Marshalls Lane be undertaken in accordance with Austroads' *Guide to Road Design* and, where relevant, Blayney Shire Council's *Guidelines to Engineering Works* and *Industrial Road Standard*. The Applicant anticipates that a detailed design of the intersection of the Site Access Road and Marshalls Lane and Lowe Street as well as the proposed upgrades to Marshalls Lane will be submitted to Council for approval prior to the commencement of construction.

The Applicant notes that the widening of the westernmost portion of Marshalls Lane would be consistent with the existing sealed width of the adjacent section of Marshalls Lane, with an indicative width of 10m.

2.2.13 Contributions

Representative Comment(s)

The Applicant would provide Council with a report annually, identifying vehicle movements and tonnages to enable Council to prepare the required invoice for road maintenance contributions. The contribution shall address the maintenance of Marshalls Lane from the intersection with the Mid-Western Highway to the Site Access Road/ Marshalls Lane intersection.

The contribution shall be based on a monetary figure based on the Equivalent Standard Axles for the total distance of the haulage route (from the Site Entrance to State managed road) travelled by the development's laden heavy vehicles as per Blayney Shire Council's Developer Contributions Plan for Heavy Haulage developments.

Response

The Applicant acknowledges the requirement for an annual report identifying annual vehicle movements and tonnages and for a contribution, as per Blayney Shire Council's Developer Contributions Plan, to address maintenance on Marshalls Lane.

2.2.14 Erosion and Sediment Control

Representative Comment(s)

Council requires further information in relation to Erosion and Sediment Control measures proposed to prevent the scouring of batters and table drains given the steep, longitudinal grades proposed for the Site Access Road.

Response

The Applicant anticipates that a detailed design of the Site Access Road will be submitted to Essential Energy and Council for approval prior to the commencement of construction. That design will include a detailed description of the stabilisation of batters and road side drainage. In summary, however, all measures proposed would be consistent with those identified in the Austroads' *Guide to Road Design* (for batter stabilisation) and *Managing Urban Stormwater – Volumes 1 and 2C (Unsealed Roads)* (for road side drainage).

2.2.15 Dust Suppression

Representative Comment(s)

In addition to the proposed management and mitigation measures to minimise the potential for unacceptable air quality-related impacts, Council would require:

- The mobile crushing plant would be located within the extraction area which provides topographical shielding from the effects of the winds.*
- Water would be applied, as required during crushing and screening activities to reduce the potential generation of dust.*

- *The drop heights between front-end loader buckets and trucks would be minimised through operator training and education on the management of dust.*
- *The quarry access road would be regularly graded, re-sheeted with gravel, compacted and watered to reduce the potential for dust emissions.*
- *Activities such as stripping of soil and gravel winning (by ripping or excavation) would be avoided during periods of high wind (exceeding 5m/s) or dry weather.*

Response

The Applicant acknowledges the above requirements with the caveat that the mobile crushing plant would be moved into the Extraction Area once the size of the Extraction Area made such a relocation feasible.

2.2.16 Driver Code of Conduct

Representative Comment(s)

Prior to the commencement of the extractive industry the Applicant is to prepare and submit to Council a driver code of conduct that will be applied to the transport of materials from the site. The driver code of conduct is to be applied to all heavy vehicle operators that access the development, including haulage and delivery vehicles. All drivers shall be required to sign a register (or similar) acknowledging and accepting the driver code of conduct. The driver code of conduct is to include:

- A map detailing the approved haulage route highlighting critical locations and safety issues and other relevant traffic/transport issues.*
- Procedures and/or safety initiatives for trucks travelling through residential precincts, school zones where school bus pick p/set down areas are located.*
- That a 40km speed limit applies to the quarry access road, all trucks should avoid the use of engine brakes and that poorly maintained vehicles can be refused entry to the quarry.*
- Procedures to minimise noise and dust emissions.*
- Procedures for complaints resolution and disciplinary action.*
- All activities including loading and unloading of goods associated with the development are to be carried out on site and all loads are to be adequately covered before vehicles exit the quarry.*

Response

The Applicant acknowledges the requirement for a Drivers Code of Conduct which includes the above components and conditions.

2.3 WATER NSW

Comment(s)

Water NSW has reviewed the information submitted with the application for the proposed Extractive Industry and considers that for the purposes of the Water Management Act 2000, no further investigation is required by this agency.

It is noted on the site proposed for the Development there is an existing Basic Land Rights Bore. The owner should be aware that the proposed development is for commercial purposes and therefore the bore cannot be used to supply water to the new development.

Response

The Applicant acknowledges this submission and notes that water used for the Proposed Development would be sourced from the Central Tablelands Water-operated supply network under a commercial arrangement and not from the existing Basic Land Rights Bore on site.

3. INFRASTRUCTURE MANAGER SUBMISSIONS

3.1 ESSENTIAL ENERGY

Comment(s)

In review, I can confirm that Essential Energy would have safety concern with the development close to its powerlines.

Essential Energy notes that a 66,000 and 11,000 volt powerline are impacted by the proposed development.

Any development in proximity to Essential Energy's infrastructure should comply with the latest industry guideline currently known as ISSC 20 Guideline for the Management of Activities within Electricity Easements and Close to Infrastructure.

If the applicant believes that the development complies with ISSC20 then please provide plans certified by a suitably qualified person (showing distances from the proposed development to Essential Energy's infrastructure) together with any other relevant information for further consideration.

Response

The Applicant acknowledges the presence of Essential Energy's 66kV and 11kV powerlines and the requirement to comply with ISSC 20 Guideline for the Management of Activities within Electricity Easements and Close to Infrastructure (dated September 2012) throughout the life of the Proposal. In addition, the Applicant has been provided with a copy of a copy of an Essential Energy document *Operational Procedure: Work Near Essential Energy's Underground Assets* (dated May 2015).

The Applicant notes that the Proposal includes two possible modes of interaction with the powerlines, as follows.

Construction of the Site Access Road.

Appendix 2 presents updated concept plans for the Site Access Road, prepared by Duncan Priestly Civil Engineering. In preparing those plans, Mr Priestly was provided with copies of the above guidelines and the concept plans include a depiction of the “no dig zones” associated relevant power poles.

As the construction of the Site Access Road would occur within close proximity to electricity infrastructure, the Applicant acknowledges that appropriate controls would need to be designed and implemented to mitigate any safety risks. The Applicant anticipates that a detailed design of the Site Access Road will be submitted to Essential Energy for approval together with an application for a controlled activity.

Finally, an Identification Survey will be required to be carried out and a copy of the survey plan forwarded to Essential Energy upon completion of the Site Access Road upgrade works.

Operation of the Quarry

The Applicant notes that the identified electrical infrastructure would be located more than 10m from the boundary of the Extraction Area and associated processing operations.

Table 2 presents relevant requirements from the above guideline documents and how compliance with each requirement would be achieved.

Table 2
ISSC 20 Requirements and Compliance Measures

Page 1 of 3

Section	Requirement	Compliance Measure
ISSC 20 Guideline for the Management of Activities within Electricity Easements and Close to Infrastructure		
7.2.2	Operation of mobile plant/equipment Such equipment with a fully extended height greater than 4.6 metres including any load and/or person carried. The NO must be consulted to provide safe work requirements and locations.	Equipment with an extended height of more than 4.6m may be used during construction of the Site Access Road. As a result, an application for a controlled activity approval would be sought prior to commencement of the works.
7.2.10	Roads Standard design clearances are maintained or conductor heights can be adjusted at the proponents expense:	Standard clearances would, where practicable, be maintained. If standards clearances cannot be maintained, an application for a controlled activity approval would be sought prior to commencement of the works.
	access maintained to all line structures	The Applicant would ensure that access is maintained to all line structures. In particular, the Applicant notes that the proposed Site Access Road would provide improved access for heavy vehicles.
	Line structures are adequately protected against motor vehicle impact.	Where line structures are not protected by Site Access Road side slopes, barriers would be installed in accordance with the relevant guidelines.
	Roads and driveways required for access to electrical infrastructure must be capable of carrying a 30 tonne truck.	The Site Access Road would be upgraded to accommodate heavy vehicle use of the type described.

Table 2 (Cont'd)
ISSC 20 Requirements and Compliance Measures

Page 2 of 3

Section	Requirement	Compliance Measure
ISSC 20 Guideline for the Management of Activities within Electricity Easements and Close to Infrastructure (Cont'd)		
7.2.12	The maintenance of standard ground clearances, or conductor heights can be adjusted at the proponent's expense.	Standard clearances would be maintained.
	Access maintained to all line structures.	Access to line structures would remain unchanged. Any lease of the Road Reserve from Council would ensure that the Network operator has continued access. A key to the heavy duty gate at the entrance to the Site Access Road would be provided to the Network operator.
	The subsoil stability and surface drainage in the vicinity of the structures is not adversely affected.	The Site Access Road and associated side slopes would be constructed in line with detailed construction drawings. The Excavation Area would not adversely impact surface drainage in the vicinity.
	Excessive quantities of dust are not generated.	Dust controls and mitigation measures would be implemented as per Section 4.5 of RWC (2018).
7.2.12	Quarrying, earthworks or excavations the maintenance of standard ground clearances, or conductor heights can be adjusted at the proponent's expense;	Standard clearances would be maintained.
	access maintained to all line structures;	Access to line structures would remain unchanged.
	the subsoil stability and surface drainage in the vicinity of structures is not adversely affected and ; and	All excavation in the vicinity of power poles would be undertaken in accordance with the requirements of <i>Operational Procedure: Work Near Essential Energy's Underground Assets</i> (see below).
	excessive quantities of dust are not generated.	Section 4.5.5 of RWC (2018) identifies that the Proposal would dust levels that would comply with the relevant dust assessment criteria.
7.2.14	Use of explosives Satisfactory safety procedures are observed and the safe operation of the line is not jeopardised.	All procedures identified in any controlled activity approval would be implemented during construction of the Site Access Road.
	Blasting procedures being in accordance with the Network Operator.	Blasting procedures would be in accordance with requirements of the Network Operator and all blasts would be designed and supervised by a suitably qualified blasting engineer.
	Specific approval shall be required in each instance and arrangements made for appropriate NO supervision and monitoring.	Approval would be sought from the Network Operator during initial blasting operations. Arrangements ongoing supervision for supervision and monitoring would be made in consultation with the Network Operator.

Table 2 (Cont'd)
ISSC 20 Requirements and Compliance Measures

Page 3 of 3

Section	Requirement	Compliance Measure
Operational Procedure: Work Near Essential Energy's Underground Assets		
14	Excavations near power poles and stays For excavation depths greater than 250mm near power poles and stays it is mandatory to arrange for an Essential Energy representative to attend the worksite 2 weeks prior to work commencing.	The Applicant would arrange for an essential Energy representative to attend site a minimum of 2 weeks prior to works commencing.
	For excavation depths greater than 250mm near power poles and stays a written assessment and safety management plan shall be carried out by a competent person to ensure that the short and long term structural stability of Essential Energy poles and assets are maintained and provided to the Essential Energy representative.	The Applicant would ensure that the required written assessment and safety management plan is prepared by a person approved by Essential Energy and the document submitted to Essential Energy at least 2 weeks prior to works commencing.
	The form CEOF6529 Work Near Overhead Powerline Request shall be completed by the Essential Energy representative when excavating near Power Poles and Stays and recorded in TotalSAFE Global Audit ATE-0000048 Construction Work Underground along with the written assessment and safety management plan.	The Applicant would ensure that the required form is completed.
	Minimum Trench Depth and Distance from Pole without Pole Support – No Dig Zone extends at 45° from the base of the pole.	The proposed Site Access Road cutting would be no closer than 1.5m to the base of any pole and any cutting would not impact on the No Dig Zone.

3.2 TRANSPORT FOR NSW / JOHN HOLLAND RAIL

Comment(s)

Transport for NSW (TfNSW) requests that the following conditions be imposed by the consent authority.

- ...requiring the Applicant to submit to JHR [John Holland Rail] a Risk Assessment/Management Plan and detailed Safe Work Method Statements in respect of each separable work activity involving the Proposal for its review and comment prior to issue of a Construction Certificate. ... JHR expects that Risk Assessment and Safe Work Method Statements include work activities involving rehabilitation operation in order to assess any potential impact of the activities on the rail corridor land and rail infrastructure.*
- ... JHR agrees with the EIS findings and does not foresee any impact of extraction operations on the rail corridor in terms of Clause 86 of the ISEPP.*
- ... that heavy vehicles from the project site must be accessed via Marshall Lane not Gregghamstown Road during construction and operation so that this development will not have adverse impacts on the level crossing at*

Greghamstown Road during construction and operation. ... In the event that the level crossing is proposed to be used by heavy vehicles from the project site at any stage, Council is requested to have the Applicant prepare and provide to JHR further information based upon Australian Level Crossing Assessment Model in order to identify key potential risks at the level crossing. If such assessment finds that there will be a significant increase in use of the level crossing, Council will be requested to prepare an update of the current Road Rail Interface Agreement with JHR to reflect the increase in accordance with the Rail Safety National Law 2012.

4. *... that the Applicant should obtain its own EPL appropriately addressed the impact of the Proposal so that the Proposal has no adverse impact on JHR's EPL. Furthermore, the Applicant be required to prepare a vibration assessment associated with each blasting operation to JHR for its review and approval prior to a scheduled blasting operation as a part of approval process for blasting operations in accordance with JHR's Blasting Guideline. ... Ensure that the Proposal would not be adversely affected by rail noise, vibration and air quality due to the volume of traffic.*
5. *In the event that cranes are required to be used in air space above the rail corridor ... the Applicant provides a safety assessment of the works necessary for the Proposal assessing any potential impact or intrusion on the Danger Zone (as defined in the JHR Network Rules and Procedures).*
6. *... that approval to work, access and possession to the current railway line or part thereof (or air space) must be assessed and endorsed by JHR prior to actual proposed access in accordance with JHR's Network Rules and Procedures and the JHR Possession Manual. ... In addition, please note that a track possession application must be submitted for each blasting operation.*
7. *JHR advises the following:*
 - a) *The applicant is required to submit an application to JHR for approval in principle (AIP) for JHR's endorsement and for TfNSW's approval with conditions/no conditions or non-approval.*
 - b) *Once an API is obtained, a Blasting Risk Management Workshop will be held between representatives of JHR and the Applicant to develop and agree with a Risk Management Plan.*
 - c) *Once a Risk Management Plan is agreed, a JHR Maintenance Superintendent will sign it off prior to a blasting operation.*
 - d) *The blasting operation should be undertaken during pre-planned Track Occupancy Authority possession.*
 - e) *The relevant Maintenance Superintendent must be notified at least 7 days prior to the blasting operation.*
 - f) *Once the blasting operation is performed, the Applicant is required to carry out a post-blasting inspection of the rail corridor and to prepare an inspection report confirming that the rail track and the relevant rail infrastructure remain fit for traffic.*

- g) *Prior to a post-blasting inspection, the Applicant is also required to submit an application to JHR for its endorsement and if endorsed, for TfNSW's approval in order to access to the rail corridor for the post blasting inspection. Once it is approved by TfNSW, the Applicant is further required to enter into a licence on terms suitable to TfNSW in relation to the access to the rail corridor. Terms of the licence may include provisions which allow TfNSW to terminate the licence at any time, will require the licensee to pay an annual licence fee, obligates the licensee to comply with certain safety requirements specifically in relation to accessing the rail corridor to perform maintenance on the rail infrastructure (e.g. engaging rail protection officers) etc. The licence will require the Applicant to hold relevant levels of insurance, bank guarantees, etc.*
 - h) *Any changes/damage to the rail infrastructure must be reported immediately to the relevant Maintenance Superintendent. Any costs associated with repairs should be fully borne by the Applicant.*
 - i) *Each blasting operation must be assessed in accordance with the JHR's Blasting Guideline on a case by case.*
8. *... the Applicant to provide JHR with a concept plan showing the current and proposed stormwater system of the proposal and an engineering report for JHR's assessment. In any event, Council is requested to impose a condition requiring that the quantity of water from the Proposal does not increase from pre-proposal flows, nor incorporate any discharge outlets into the rail corridor.*
9. *... that the boundary fences along the rail corridor should be installed and remain installed during construction and occupation in accordance with JHR's engineering standards. ... the Applicant is required to submit an application to install the boundary fences to JHR for its endorsement and for TfNSW's approval.*
10. *... that access to the Lane must be via Marshalls Lane and not via Greghamstown Road during construction and operation. In addition, access to the rail corridor is strictly prohibited during construction and occupation unless otherwise approved by TfNSW.*
11. *... that Council require the use of red and green lights being avoided in all signs, lighting building colour schemes on any part of a building which faces the rail corridor.*

Response

The applicant consents to all recommended conditions of consent outlined by JHR.

In relation to Item 7, the Applicant would liaise with JHR to determine the appropriate distance at which this requirement should apply. Section 4.2.3 of RWC (2018) nominates a distance at which railway possession would be required of 200m or less between blasting operations. This distance was nominated based on advice provided by JHR representatives during consultation prior to finalisation of RWC (2018).

With regards to Condition 8, the Applicant would provide JHR with the *Erosion and Sediment Control Plan* prior to the commencement of extraction operations. No stormwater would be directed to the railway corridor.

With regards to Condition 9, the Applicant notes that existing fences would remain in place in undisturbed areas of the Project Site to permit ongoing use of these areas for agricultural purposes.

4. PUBLIC SUBMISSIONS

4.1 INTRODUCTION

This section provides a response to the public submissions following both Exhibition Period A and B. A total of 26 individual submissions were received from members of the public, including 24 during Exhibition Period A and 2 during Exhibition Period B. It should be noted that:

- Submission A01 represents a form letter of which 153 individual copies were received;
- Submission B01 represents a form letter of which 50 individual copies were received;
- Submission A02 represents a petition signed by “over 100” members of the public; and
- Submissions A08 to A11 have been considered as a single submission because they are identical.

It should be noted that personal information associated with each submission was redacted by Blayney Shire Council prior to the receipt of submissions by RWC.

To minimise repetition and to ensure that matters raised in the submissions are adequately and efficiently addressed, each submission was reviewed and the matters raised categorised. **Table 3** presents the categorisation of each issue raised and which submissions raised which issues. The categorisation is presented before in no particular order of priority. It is acknowledged that classification of individual submissions is subjective and that individual respondents may classify issues raised in their own submission in a manner different to the way that they are classified in this document.

Notwithstanding the above, the form submissions and petition, namely Submissions A01, A02 and B01, have been addressed individually.

This subsection provides, for each category of issue raised, selected extracts from a range of submissions in *italics*, as well as a consolidated response to that issue. Submissions were selected when assembling the comments to be reproduced to ensure a representative selection of comments are presented and to avoid the perception of bias in the information presented. Again, the Applicant acknowledges selection of text for inclusion in this document is a subjective process and that individual respondents may have selected different sections of their submission for inclusion or may object to the fact that their submission was not included. However, the intention of this subsection is to provide a response to the issues raised rather than to each individual submission.

Table 3
Public Submissions

Submission	Support	Air Quality					Noise		Traffic			Blasting	Water			Economic Factors		Rehabilitation	Aesthetics		Community Consultation
		Suspended	Deposited	Silica	Asbestos	Data	Traffic	Operational (Including Blasting)	Accidents	Congestion	Road Damage	Vibrations and property	Supply	Groundwater	Surface Water	Property Values	Employment		Quarry Site		
A01 (form letter)		x		x	x		x	x	x		x	x				x			x		
A02 (petition)																x	x				
A03		x	x		x	x	x	x	x		x						x		x	x	
A04		x	x	x			x	x			x	x	x				x				
A05		x	x								x										
A06		x		x	x			x				x						x	x		
A07		x		x	x			x				x	x	x	x	x			x		
A08-A11		x				x		x	x	x		x								x	
A12		x	x				x	x		x	x					x	x		x		
A13				x																	
A14		x	x	x	x			x				x	x			x			x		
A15		x																			
A16								x								x					
A17		x	x		x			x								x					
A18		x			x			x								x			x		
A19		x						x													
A20		x		x				x								x					
A21		x	x					x													
A22						x		x												x	
A23		x					x				x	x				x	x				
A24								x													
B1 (form letter)	x																				
B2		x	x					x								x	x	x	x		
Total	1	17	8	7	7	3	5	17	3	3	4	8	4	1	1	11	6	2	8	3	

4.2 SUBMISSIONS IN SUPPORT

A total of 50 copies of the following form letter were received during the exhibition period.

Representative Comment(s)

I refer to the development application DA85/2018 regarding the proposed extractive industry at 12 Greghamstown road, Blayney.

I am strongly in favour of the abovementioned development application proceeding.

I understand that the applicant has engaged R.W. Corkery, and a number of specialist consultants to address the various environmental considerations, as required to ensure the environmental impact statement (EIS) has been adequately prepared.

As such, I believe the EIS speaks for itself with regard to the benefits of this project proceeding. These benefits, in my opinion, far outweigh the argument for the project not proceeding.

B01

Response

The Applicant acknowledges the submissions in support of the Proposal and concurs with the conclusion reached.

4.3 SUBMISSIONS OPPOSED

4.3.1 Submission A01 – Form Letter

A total of 153 copies of the following form letter were received during the submission period.

Representative Comment(s)

As a member of the Blayney Shire Community I strongly oppose the development application DA85/2018, proposed extractive industry 12 Greghamstown Road Blayney.

The boundary of this development is only 300 metres from the nearest house in Evans Crescent and within 700 to 800 metres of many other houses within the area.

Health concerns are a major issue as silica dust is a by-product of crushing limestone. Silica dust is harmful when breathed in, it can lead to lung cancer, silicosis, chronic obstructive pulmonary disease and kidney disease. The dust will also be a problem for those suffering from asthma, hayfever and sinus.

Response

The Applicant acknowledges the concerns in relation to dust and potential health impacts. These matters are addressed in Section 4.3.3 below. In summary, the Air Quality Assessment determined that all relevant air quality assessment criteria would be complied with. In addition, the material to be extracted, namely a micro-tonalite with approximately 20% quartz, does not present a particular risk for silicosis or silica-related diseases.

Representative Comment(s)

There is also a risk with naturally occurring asbestos on the road to be used by the trucks. It will be disturbed when the road is widened, then every truck that travels the road could potentially blow asbestos all over the houses in the surrounding area. This asbestos may also remain on the trucks and be distributed all over town.

Response

The Applicant also acknowledges the concerns in relation to naturally occurring asbestos. These matters are addressed in Section 4.3.3.4 below. In summary, the only section of the Project Site the subject of a medium risk of naturally occurring asbestos is the Site Access Road. Indeed, the majority of the residential area of Blayney has a similar risk level. The Applicant would inspect the Site Access Road and if naturally occurring asbestos is present, appropriate management measures would be implemented to manage this issue.

Representative Comment(s)

Small children growing up in the neighbourhood will have to listen to noise and breathe in polluted air all their lives, which could also have long term effects on their health.

Response

Matters related to noise and dust are addressed in Section 4.3.3 and 4.3.4. In summary, noise and dust levels are expected to comply with all relevant assessment criteria.

Representative Comment(s)

The development will increase traffic in our quiet country town, ruining roads and increasing noise and dust with the heavy trucks coming and going up to 60 times a day from the site and travelling through our town. These trucks will be going up Adelaide Street and past our schools increasing the possibility of accidents.

Response

Matters related to traffic are addressed in Section 4.3.5. In summary, all vehicles accessing the Project Site would do so via the Site Access Road, Marshalls Lane (within an industrial area) and the Mid Western Highway (a State Highway). As a result, Proposal-related heavy vehicles would not be accessing local roads within and surrounding Blayney unless material is required for works within those residential areas. In addition, the Applicant notes that if maintenance works are required in residential areas and the Proposal is not approved, the materials would be sourced from another location, potentially at a greater distance from the works location, thereby increasing the number of heavy vehicle kilometres.

Representative Comment(s)

With trucks, bulldozers and loaders all using their reversing alarms and the crushing of rocks, the noise will be continual five and a half days a week. The blasting will cause noise and environmental issues.

Response

Matters related to noise and blasting are addressed in Sections 4.3.4 and 4.3.6. In summary, noise and blasting impacts would be less than the relevant assessment criteria.

Representative Comment(s)

Blasting will potentially cause damage to houses and infrastructure such as gas lines, Cadia Dewatering Pipeline and Nestle Purina over a 21 year period.

Response

Matters related to blasting are addressed in Section 4.4.3.6. In summary, blasting impacts would be less than the relevant amenity criteria. As the amenity criteria are substantially less than the ground vibration or air blast overpressure levels required to cause structural damage, compliance with the amenity criteria would ensure that there is no damage to surrounding infrastructure.

Representative Comment(s)

House prices in the area will be severely affected by this project.

Response

Matters related to property values are addressed in Section 4.3.8.2. In summary, the Applicant acknowledges concerns in relation to this matter. However, land values and the value potential purchasers may place on a particular property are subject to many variables and are highly subjective. It has been RWC's experience that reduced land values are not a matter that has been identified at other extractive operations of similar scale to the Proposal.

Representative Comment(s)

Whites Quarry was established prior to all houses in this area and while the residents can hear some noise from drilling, the hill to be developed in this application shields most noise from residents. If this hill was removed or lowered there would be no buffer and residents would be affected by noise from both quarries. There is no blasting at Whites Quarry.

Response

The Applicant notes that it has deliberately staged development of the proposed Extraction Area to maximise acoustic shielding of its operations from surrounding residences. In addition, the Proposal would not result in removal of the hill referred to in the form letter. Rather, at the end of the life of the Proposal, the elevation of the southern crest of the Extraction Area would be approximately 900m AHD, or only 13m lower than the current crest of the hill at 913m AHD. The remaining southern face of the hill, from the crest of the Extraction Area at 900m AHD to Abattoir Creek at approximately 776m AHD, would be 24m. The Applicant contends that the interim and final landform would continue to provide acoustic shielding from both its own operations and those within the White's Quarry.

Representative Comment(s)

Residents will no longer be able to enjoy their view of rolling hills and peaceful serenity.

Response

Matters related to visual amenity are addressed in Section 4.3.10. In summary, the Applicant contends that views from surrounding residences and publicly accessible vantage points would, to the extent practicable, not be adversely impacted by the Proposal. In addition, the Applicant notes that the Project Site is located between White's Quarry and the Nestle Purina Pet Care Facility, both of which influence the visual amenity surrounding the Project Site.

Representative Comment(s)

This application needs to be rejected to keep our community and environment safe.

Response

This is a matter for Council, however, the Applicant contends that it has addressed to the extent practicable and reasonable, all likely adverse environmental and other impacts associated with the Proposal.

4.3.2 Submission A02 - Petition

The following letter, received during the submission period, was accompanied by a petition.

Representative Comment(s)

Please find attached a petition signed by over 100 members of the community regarding Development Application DA85/2018 for the development of an extractive industry.

We, as a community object this development application and recommend it be rejected.

This development has no benefit for our town and surroundings.

Response

The Applicant acknowledges this petition but contends that the Proposal does offer significant direct and indirect economic benefits to Blayney and the surrounding area. These benefits are described in Section 2.9 of RWC (2018) and Section 4.3.8.1 of this document.

In addition to the direct economic and employment benefits offered by the Proposal, the Applicant notes that the Proposal would produce a competitively priced, high quality product that would be used to maintain public and other infrastructure within the Blayney Local Government Area and surrounds. If the Proposal were not approved, that material would be required to be sourced from the other locations, potentially at a greater distance from the final work site, thereby increasing vehicle movements and costs for the community.

4.3.3 Air Quality

4.3.3.1 Suspended Particulate Matter

A total of 17 submissions raised the issue of suspended particulate matter.

Representative Comment(s)

I have 6 grandchildren 2 of whom live 650mts as the crow flies from the boundary of the proposed quarry, these 2 children have Asthma and just recently lost their 26 year old cousin from an Asthma attack, He was a Blayney resident. I personally know of 5 people who have lost their lives in Blayney due to Asthma attacks, 3 of which have been in the last 4 years. I am sure you can all understand my fear for my Grandchildren and all children of the area and Blayney overall. Over 21 years how WILL this affect the health of the children and towns people of

Blayney. Will we see a dramatic increase of asthma attacks or deaths attributed to asthma? I sincerely hope not, the heartbreak the families in town who have lost loved ones is already too many.

Blayney does not have any Doctors on call at our emergency department this is a huge concern if the incidents of Asthma attacks were to increase if the proposal is approved.

I also have a breathing issue that requires the use of an assisted breathing machine to be worn from 7 to 10 hours a day, I also fear that if the quarry is approved it may well make this worse.

A04

The dust coming from a crushing and screening plant is my main concern, not only for residents that are in that specific part of town but for Blayney in general, I'm sure you are well aware that airborne dust travels a significant distance and the effect it will have on the Blayney population especially young children and elderly would not be a healthy environment for all concerned.

The crushing and screening plant cannot have water suppression added as this bogs the machine and belts start to slip and becomes unproductive and will not operate!

A05

We spend a large amount of time outside enjoying our garden and entertaining our friends, will we still be able to do this? If it's dusty and noisy we may have to stay indoors with the doors and windows shut, or maybe we will need to move, but then no one will buy our house.

A07

Dust. Digging into the earth and extracting materials within such close proximity to residential property poses a direct problem where our properties, and the areas which we, as well as our children and families play and live, will be clouded with dust. Not to mention the impact those with family members who suffer from asthma or breathing difficulties will face due to tainted air quality.

A19

I have lived here at this address for forty five years and in that time we have had a gold mine and then Nestle Purina just over said Railway line which has not caused any problems but this Quarry is a great concern e.g. noise dust and dirt especially with the wind we have had lately.

A21

The risk of dust circulating in my area, in and around my home is also another health issue. I note that the applicant says there will be wetting processes to ensure that the dust levels in this area are minimal, but knowing about the crushing process, it is impossible to use water with it as it results in a slurry, a mud that prevents the machine from working.

A23

The dust levels from this extractive industry may be within "acceptable" limits, but I still believe this will have an effect on our community members who suffer from asthma and other respiratory illnesses. I believe there is only so much dust over a period of time that a person can breathe before it begins to have health effects both long term and short term. It is not only

the dust we can see that concerns me but the dust that cannot be seen. I understand that my above concerns with health issues from the dust may not affect us in this lifetime but I worry for my children and my children's children if we do not put a stop to it now.

B02

Response

Sections 3.8 and 4.5 of RWC (2018) present an overview of ambient air quality, existing sources of dust emissions, proposed management measures and anticipated air quality impacts associated with the Proposal. In addition, Appendix 7 of RWC (2018) presents the Air Quality Impact Assessment undertaken by Ramboll Australia Pty Ltd (Ramboll, 2018).

Air quality criteria for airborne particulate matter have been determined in accordance with the Environmental Protection Authority (EPA) document *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA, 2016). The relevant assessment criteria for deposited dust, total suspended particulates (TSP), and particulate matter with an aerodynamic equivalent diameter of less than 10 microns (PM₁₀) and 2.5 microns (PM_{2.5}) established by the EPA in order to protect surrounding residents from adverse health impacts and also to maintain the amenity of the surrounding environment.

Air quality impacts associated with the Proposal were modelled for two scenarios, namely:

- Scenario 1 - initial rip and push bulldozer activities and an annual extraction rate of 150 000tpa; and
- Scenario 2 - drilling and blasting activities, in-pit processing operations, and an annual extraction rate of 250 000tpa.

Modelling of emissions for the Proposal was undertaken in accordance with EPA (2016) , with emission rates estimated using conservative emission factors.

Results of the predicted air quality emissions associated with the Proposal indicate that both incremental and cumulative increases in emissions are compliant with air quality criteria for both scenarios (see Tables 4.14 and 4.15 of RWC (2018)). Estimated maximum incremental values for PM₁₀ and PM_{2.5} emissions over a 24-hour period are 14.8µg/m³ and 3.1µg/m³ respectively, both of which are well below the relevant criteria for PM₁₀ (50µg/m³) and PM_{2.5} (25µg/m³). Additionally, estimated maximum cumulative values for PM₁₀ and PM_{2.5} emissions over a 24-hour period are 48.8µg/m³ and 18.2µg/m³ respectively, both of which are below the relevant criteria for PM₁₀ (50µg/m³) and PM_{2.5} (25µg/m³).

In order to ensure that potential adverse health and visual amenity impacts associated with suspended particulate matter emissions are mitigated, the Applicant has committed to a number of management and mitigation measures including the progressive rehabilitation of soil stockpiles and the use of a water cart for active dust suppression in the Extraction Area and on the haul Road. One of these commitments states that drill rigs and all mobile processing equipment would be equipped with dust suppression equipment. While the type of equipment to be employed in the processing of fragmented material would depend upon the products being produced, it should be noted that processing equipment equipped with either water- or air-based dust suppression systems are commercially available and will be employed at the Project Site.

Finally, the Applicant notes and acknowledges the community's concerns in relation to the prevalence of asthma within the community and potential adverse impacts as a result of the Proposal. However, the Applicant also notes that many factors influence an individual's propensity to asthma and that asthma management plans are a matter for each individual. The Applicant contends that the proposed activities would have a negligible impact on asthma rates surrounding the Project Site or the management of the condition for those who already have it.

4.3.3.2 Deposited Particulate Matter

A total of 8 submissions raised the issue of deposited particulate matter.

Representative Comment(s)

I'm sure you are all aware that a crushing and screening machine CAN NOT be watered to stop the dust as it wets the finer gravel and dust and turns it to a slurry/mud that hinders the operation of the machine. This dust will be a problem no matter how many or how high any bung (sic) walls will be. Will watering of the haul roads and bung (sic) walls be 24 hours a day 7 days a week?? or only from 7am till 5pm Monday to Friday and Saturday mornings.

If water suppression of the dust is only during operating hours, how will it affect residents close by when it is summer and all will dry out quickly, will we still be able to enjoy our homes, have children play outside, have family and friends around on weekends for a BBQ, I think not if all our outdoor areas are covered in dust.

A04

Dust: Impact on health, increased cleaning, maintenance on air conditions, vegetable gardens and solar panels.

A12

The prevailing winds in this area will deposit dust created all over our property which may cause illness and stress.

A17

Response

Sections 3.8 and 4.5 of RWC (2018) present an overview of ambient air quality, existing sources of dust emissions, proposed management measures and anticipated air quality impacts associated with the Proposal. In addition, Appendix 7 of RWC (2018) presents the Air Quality Impact Assessment undertaken by Ramboll Australia Pty Ltd (Ramboll, 2018).

Deposited dust generated by the Proposal was modelled for the two scenarios as described previously.

Predicted incremental dust deposition values, described in Table 4.14 of RWC (2018), indicate that a maximum of 0.1g/m²/month would be generated by the Proposal. This value is significantly lower than the relevant incremental deposited dust criteria value of 2.0g/m²/month. The Applicant would contend that this rate of dust deposition is negligible.

The Applicant has also committed to a range of management and mitigation measures which aim to minimise dust generation at the Project Site, including active dust suppression with a water cart, the installation of dust suppression systems on processing equipment, and the progressive rehabilitation of soil stockpiles and terminal quarry faces. Furthermore, the Applicant would immediately cease operations resulting in visible dust emissions beyond the eastern, western or southern Project Site boundary and would respond promptly to any air quality-related complaints, including modifying on-site operations in the event that dust from those operations are not acceptable.

4.3.3.3 Silica Dust

A total of 7 submissions raised the issue of silica dust.

Representative Comment(s)

Health concerns are a major issue as silica dust is a by-product of crushing limestone. Silica dust is harmful when breathed in, it can lead to lung cancer, silicosis, chronic obstructive pulmonary disease and kidney disease. The dust will also be a problem for those suffering from asthma, hayfever and sinus.

A01

Dust from granite, limestone and disturbed naturally occurring asbestos is dangerous to people's health as it is carcinogenic, causes respiratory diseases such as silicosis, cancer; damages eyes, skin; can cause renal disease, even some autoimmune diseases...

A06

Another strong concern is regarding Crystalline Silica found in dust from Quartz which is found in almost all kinds of rock and gravel. Silica dust released into the air can permanently damage lungs over time, leading to diseases such as silicosis and cancer. The severe winds Blayney has experienced over the last 12 months is a concern. In years to come is the Blayney community going to be plagued with health problems from this dust. I am an asthma, hayfever and sinus sufferer at present and I fear that these problems will only worsen if this development goes ahead.

A14

The quarrying and crushing of limestone will produce limestone dust which contains crystalline silica. Inhalation of limestone dust can cause irritation and inflammation of the respiratory system. Repeated exposure can cause lung disorder Silicosis. Blayney already has a high incidence of asthma without a north westerly wind blowing limestone dust all over our schools and community.

A20

Response

The Applicant acknowledges the community concern in relation to silica dust and the associated risk of silicosis. Safe Work Australia identifies that breathing high concentrations of fine particles of silica may result in adverse health impacts, including but not limited to silicosis. Silica dust is commonly associated with quartz and is, according to Safe Work Australia, one of the most common minerals on earth.

Section 1.4 of RWC (2018) identifies the material to be extracted as micro-tonalite. A petrographic analysis of the material prepared by Geochempet Services identified the material has having approximately 21% quartz. Quartz content of other commonly quarried materials in the Central West of NSW are as follows (Berkman, 1995).

- Granite20% to 60%
- Rhyolite.....20% to 60%
- Quartzite up to 99%

As a result, the quartz content in the material to be extracted is not particularly high when compared with other surrounding quarrying operations.

In addition, silicosis is typically an occupational health and safety issue, namely, it is workers who spend substantial time in dusty, silica-rich environments that are at greatest risk from silicosis.

In light of the above, and the fact that silica dust has not been an issue for communities surrounding other quarries in the Central West, the Applicant contends that silica dust would not be an issue for the Proposal.

4.3.3.4 Asbestos

A total of 7 submissions raised the issue of asbestos.

Representative Comment(s)

There is also a risk of naturally occurring asbestos on the road to be used by the trucks. It will be disturbed when the road is widened, then every truck that travels the road could potentially blow asbestos all over the houses in the surrounding area. This asbestos may also remain on the trucks and be distributed all over town.

A01

The dust from the vehicles onsite and trucks coming and going over the road to the quarry site will be another huge factor. Naturally occurring asbestos and silica dust from the crushed rock may result in health issues as well as having an impact on asthma, allergy and hayfever sufferers. The prevailing winds have been from the W/NW in recent months and this will cause dust to be spread all over the town.

A07

Noise from blasting, crushing machinery, air pollution, dust and natural asbestos are also large concerns and may result in health issues. The prevailing winds in this area will deposit dust created all over our property which may cause illness and stress.

A17

Response

Naturally occurring asbestos occurs throughout the Blayney Local Government Area, with substantial area between Tallwood in the west and Fitzgeralds Mount in the east mapped by the NSW Department of Trade as having a low, medium or high risk of naturally occurring asbestos. Naturally occurring asbestos is typically limited to particular rock types and associated soils.



The Extraction Area at the Project Site consists of micro-tonalite which is unsuitable for the formation of naturally occurring asbestos. However, Environmental Protection Authority resources indicate that a portion of the Site Access Road (See Figure 1.2 of RWC (2018)) lies within an area with medium potential for naturally occurring asbestos.

Section 4.5.4 of RWC (2018) identifies the measures that would be implemented to manage risks associated with naturally occurring asbestos for the Proposal. In particular, the Applicant has committed to undertaking an inspection of the Site Access Road by a suitably qualified person prior to the commencement of construction operations in order to identify any actual areas of naturally occurring asbestos. If naturally occurring asbestos is present, the Applicant would ensure that the road construction contractor employed to construct the Site Access Road prepares and implements an Asbestos Management Plan. While Blayney Shire Council does not have an Asbestos Management Plan, the Applicant would ensure that any Asbestos Management Plan implemented at the Project Site is consistent with Council's standard asbestos management policies.

Furthermore, the Applicant would ensure that all materials used to sheet the site access road are sourced from the Extraction Area and that no materials on the road surface have the potential to contain naturally occurring asbestos.

Finally, the Applicant notes that the potential for naturally occurring asbestos to be disturbed during construction of the Site Access Road no greater than similar road works in and around Blayney in areas mapped as having medium potential for naturally occurring asbestos.

4.3.3.5 Data Quality

A total of 3 submissions raised the issue of meteorological data quality for the Blayney area.

Representative Comment(s)

The meteorological data was collected at Orange Airport Automated Weather Station which is 18 kms away from the proposed development site.

The average wind speed when tested was 5.9m/s to 6.3m/s.

As I sit and write this submission today the wind speed is 43km/h or 11.94m/s which is a significant difference. The weather is uncontrollable. Wind, temperature, rainfall, flooding and evaporation will all have potential impacts on the proposal and the surrounding neighbourhood.

A03

Noise and dust omission scenarios were moulded on wind data that was sources from Orange Airport Weather station 18 km from the site and McPhillamys Gold Mines at Kings Plains 9.2 kms from the site. Both sites are at the same elevation as Blayney however both are on open ground and not surrounded by hills. Blayney has an elevation of 873 mts and is surrounded on 4 sides by hills that reach 1000mts effectively placing the town in a geological basin. Stated in 4.1.2.3 Meteorological Conditions in the Environmental Impact Statement that 'the project site is elevated there for wind speed and directions were excluded from the models'. That statement I believe makes all scenarios null and void in the environmental impact statement.

A08-A11

ENVIRONMENTAL IMPACT STATEMENT Scenarios that are based on the below.
NSW OEH Bathurst – 2013 to 2017
Inter-annual Wind Roses – McPhillamys Project – 2013 to 2017
Diurnal Wind Roses – Orange Airport Site – 2013 to 2017

But appears no actual environmental impact monitoring done in regards to the above on the area surrounding the proposed quarry.

These are assumed Scenarios.

A22

Response

Data used to describe local meteorological conditions and model air quality impacts is described in Sections 3.2, 3.8, and 4.5 of RWC (2018) as well as in the Air Quality Impact Assessment located in Appendix 7 of RWC (2018).

Meteorological data used to summarise climatic conditions including temperature, rainfall, evaporation and flooding, wind and temperature inversions at the Project Site was sourced from the Bureau of Meteorology-operated Orange Airport automated weather station. This station, despite being located approximately 18km northwest of the Project Site, provides the most complete meteorological data for the area and is located at a similar elevation to the Project Site.

The Air Quality Impact Assessment undertaken by Ramboll Australia Pty Ltd (Ramboll) for the Proposal used the industry standard AMS/US EPA regulatory model atmospheric dispersion model (AERMOD), to predict and quantify air quality impacts. Meteorological data used for modelling was sourced from a monitoring station at the proposed McPhillamys Gold Project Site, located approximately 6.5km east-northeast of the Project Site. This data was supplemented by data from the Bureau of Meteorology-operated Orange Airport automated weather station as well as from the Agricultural Institute, located approximately 26km northwest of the Project Site.

Additionally, continuous PM₁₀ and PM_{2.5} monitoring data was sourced from the Bathurst monitoring station operated by the NSW Office of Environment and Heritage, located approximately 34km northeast of the project Site. While spatially distant, Ramboll considered these records to be appropriate in conservatively representing ambient PM₁₀ and PM_{2.5} concentrations that would occur in the Blayney area.

4.3.4 Noise

4.3.4.1 Operational Noise (Including Blasting)

A total of 17 submissions raised the issue of noise associated with the operation of the proposed quarry.

Representative Comment(s)

With trucks, bulldozers and loaders all using their reversing alarms and the crushing of rocks, the noise will be continual five and a half days a week. The blasting will cause noise and environmental issues.

A01

I have been to a quarry that an acquaintance manages elsewhere in the central west and have seen a crushing screening plant in operation the dust and noise was unbearable and I did not stay long.

A04

The noise pollution from Blasting up to 10 times annually, plus 6 days of truck and machinery, can adversely affect people physically [health] and psychologically [stress], therefore emotionally.

A06

Noise from blasting, crushing machinery, air pollution, dust and natural asbestos area also large concerns and may result in health issues.

A17

Noise. Extracting materials and crushing on site will create ongoing daily noise pollution which will be audible on our properties. We invested in this area knowing that the trains would only pass behind our properties a couple of times a day, but constant noise pollution due to this new extraction development is not what we signed up for.

A19

First see that resident noise monitoring has been done in a small corner closest to the perimeter of Nestle Purina PetCare facility North/East corner. R5 R6 R7 R8 R9.

...

What you do not see is the residents R5 R6 R7 R8 R9 are at the lowest point.

As you move South-East from this low point the land rises higher and residents will be more susceptible to noise emitting from proposed quarry.

A22

Response

The background noises setting of the Project Site and an assessment of operational noise impacts are detailed in Sections 3.4 and 4.1 of RWC (2018) respectively. Additionally, Appendix 4 of RWC (2018) presents the Noise Impact Assessment undertaken for the Proposal.

The operational noise assessment was prepared in accordance with the Environmental Protection Authority's *Noise Policy for Industry* (2017). These criteria consist of both intrusive and amenity criteria for commercial and residential receivers, of which the lower value was used to form the Project Noise Trigger Levels. For residential receivers, the intrusiveness criteria value is LAeq (15 minutes) 40 dBA and the amenity criteria value is LAeq (15 minutes) 58 dBA. For commercial receivers, only an amenity value of LAeq (15 minutes) 63 dBA is reported.

Operational noise was modelled for a worst-case scenario (Scenario 2) which included drill and blast operations in addition to ripping and pushing activities at the natural surface of the Project Site. This scenario represents the worst-case noise scenario because subsequent extraction stages are likely to result in lower noise emissions as operations move deeper into the proposed Extraction Area. The results of this modelling indicated that no residence is expected to receive noise emissions in excess of the 40 dBA residential amenity criterion. Additionally, modelling indicated that noise emissions would remain well below the 63 dBA commercial amenity criterion at the Nestle Purina Petcare facility.

In order to ensure that noise impacts do not exceed the identified criteria, the Applicant has omitted to implementing a range of management and mitigation measures including strictly complying with the proposed hours of operation, regularly servicing all on-site equipment to ensure sound power levels of each item remains at or below the default or factory-set values, and maintaining an open dialogue with the surrounding community and neighbours to ensure that any concerns over noise are addressed.

With regard to noise associated with blasting (air blast overpressure), recommended levels specified by the Australian and New Zealand Environment and Conservation Council based on the prevention of human discomfort have been adopted as assessment criteria for residential receptors. The recommended maximum air blast overpressure is 115 dB linear peak, a level which may be exceeded on up to 5% of the total number of blast over 12 months but should not exceed 120 dB linear peak at any time.

Estimates of air blast overpressure detailed in the Blasting Assessment (Appendix 5 of RWC (2018)) indicate that values can be controlled to remain below the recommended maximum air blast overpressure of 115 dB criterion at the closest sensitive receiver to the Project Site by adjusting a range of blasting parameters.

In order to ensure that noise impacts associated with blasting are minimised, the Applicant has committed to developing a Blast Management Plan, including a rigorous monitoring program, prior to undertaking any blasting. This plan would include a commitment to undertake air blast overpressure monitoring within the Project Site at locations closest to sensitive receivers during all blasting operations. Furthermore, trial and small-scale blasts would be undertaken initially in the northernmost section of the Extraction Area in order to enable blasting engineers to appropriately adjust blast parameters to ensure compliance with applicable criteria.

4.3.4.2 Traffic Noise

A total of 5 submissions raised the issue of noise associated with traffic generated by the Proposal.

Representative Comment(s)

As you are aware, we already have Nestle Purina and the main western railway at our back door.

When purchasing this land and building our family home we knew we would have noise coming from both Nestle and the railway track. With the new development we will now have to deal with up to 60 laden heavy vehicles entering and exiting the Proposal site per day, bulldozers, front end loaders, haul trucks, blasting and rock crushing machines as well.

A03

Should my street [Palmer Street] become major truck route for this development , it is also likely to impact upon my health – please see attached a recent article from the Sydney Morning Herald, living on a noisy street is harming your health, p11, 10 November 2018.

A23



Response

Assessments of existing noise and Project-related noise, including noise associated with traffic, are outlined in Sections 3.4 and 4.1 of RWC (2018). Additionally, Appendix 4 of RWC (2018) contains the Noise Impact Assessment undertaken for the Proposal.

The Applicant notes that all vehicles accessing the Project Site would do so via the Site Access Road, Marshalls Lane (within an industrial area) and the Mid Western Highway (a State Highway). As a result, Proposal-related heavy vehicles would not be accessing residential areas surrounding the Project Site unless material is required for works within those residential areas.

Notwithstanding the above, road traffic noise criteria for the Proposal were determined in accordance with the NSW Environmental Protection Authority's *Road Noise Policy*. The results of the modelling determined that road traffic noise associated with the Proposal would be substantially lower than the relevant criteria.

In addition to complying with established road noise criteria, the Applicant has committed to developing a Drivers Code of Conduct which heavy vehicle drivers would be required to sign and abide by. The Drivers Code of Conduct would outline procedures for minimising and reducing noise impacts during transportation both within the Project Site and off site. Maintenance of the unsealed Site Access Road would also be undertaken in order to minimise body noise associated with empty trucks.

4.3.5 Traffic

4.3.5.1 Traffic Accidents

A total of 3 submissions raised the issue of the potential for traffic associated with the Proposal to cause road accidents.

Representative Comment(s)

The development will increase traffic in our quiet country town, ruining roads and increasing noise and dust with the heavy trucks coming and going up to 60 times a day from the site and travelling through our town. These trucks will be going up Adelaide Street and past our schools increasing the possibility of accidents.

A01

The roads will be under pressure with increased number of oversize and higher mass vehicles, the streets will become more dangerous.

On numerous occasions the Primary and High school crossing on Church Street is unattended without a crossing supervisor. Children, parents and care givers will all be put at risk on this busy road with the increased number of heavy vehicles passing through.

A03

As there was 13 crashes reported, 11 resulting in injury in a 4 year period (as found in the EIS), clearly an increase on those numbers is to be expected.

A08-A11

Response

Traffic management and mitigation measures as well as road safety impacts associated with the Proposal are outlined in Sections 4.3.2 and 4.3.3.3 of RWC (2018) respectively. Additionally, the full Traffic Impact Assessment undertaken for this proposal is contained within Appendix 6 of RWC (2018).

A Traffic Impact Assessment, completed by Transport and Urban planning Pty Ltd, was undertaken in order to assess potential impacts upon traffic conditions associated with the Proposal. This assessment concluded that, as the Proposal would generate a relatively small number of trucks, the quarry is not expected to have a negative impact on road safety or other road users.

The Applicant notes that all vehicles accessing the Project Site would do so via the Site Access Road, Marshalls Lane (within an industrial area) and the Mid Western Highway (a State Highway). As a result, Proposal-related heavy vehicles would not be accessing local roads within and surrounding Blayney unless material is required for works within those residential areas. In addition, the Applicant notes that if maintenance works are required in residential areas and the Proposal is not approved, the materials would be sourced from another location, potentially at a greater distance from the works location, thereby increasing the number of heavy vehicle kilometres, with the commensurate risk of accident. As a result, the Proposal would be likely to reduce the risk of a heavy vehicle accident.

In order to further manage and mitigate the potential for impacts upon road safety, the Applicant has committed to developing a Drivers Code of Conduct. All heavy vehicle drivers accessing the project Site, including subcontractors, would be required to sign and abide by this Drivers Code of Conduct which would outline the Applicant's expectations in relation to driver behaviour and courtesy on the public road network as well as any necessary enforcement mechanisms. Additionally, drivers of product trucks would be sourced from local transport companies and would therefore be familiar with traffic conditions in the area.

4.3.5.2 Traffic Congestion

A total of 3 submissions raised the issue of traffic associated with the Proposal to contribute towards traffic congestion in the area.

Representative Comment(s)

An average of 40 movements (20 loads) per day. A maximum of 120 movements (60 loads) per day. A maximum of 20 movements (10 loads) per hour.

This is only the laden heavy 19-metre-long semi-trailers.

There will also be employees, 3 in 3 out per day, and maintenance vehicles 2 in 2 out per week.

The roads will be under pressure with increased number of oversize and higher mass vehicles, the streets will become more dangerous.

A03

The extra trucks in town are also a concern for the community with the impact on roads and increased traffic.

A12

60 layden (sic) trucks ie. 120 movements per day were assumed. Why was a model not undertaken on this amount of movements?

A08-A11

Response

Assessments of current traffic levels, levels of service, and impacts of the Proposal on local traffic are detailed in Sections 3.6.2.2 (Current Traffic Levels), 3.6.2.3 (Level of Service), 4.3.3 (Assessment of Traffic Impacts) of RWC (2018), as well as in Appendix 6 (Traffic Impact Assessment) of RWC (2018).

While the proposal is expected to generate a maximum of 120 truck movements per day, including 60 vehicles exiting and 60 vehicles entering the Project Site, the average traffic generation is expected to be 40 truck movements per day, including 20 vehicles exiting and 20 vehicles entering the Project Site. The average traffic generation associated with the Proposal is estimated to be between 2 and 4 truck movements, or 1 to 2 exiting and 1 to 2 entering the Project Site per hour. On peak days, the maximum traffic generation is estimated to be up to 20 truck movements per hour, or 10 vehicles exiting and 10 entering the Project Site per hour.

Modelling of a worst-case traffic scenario was undertaken based on 20 heavy vehicle movements, 10 exiting and 10 entering the Project Site, during morning and evening peak hours. The results of that modelling determined that the level of service at both the Marshalls Lane and Mid Western Highway intersection and at the Mid Western Highway and Church Street intersection would remain unchanged, with a classification of “good operation” or “A”.

It should also be noted that products generated by the Proposal, including rock suitable for use in concrete and sand aggregate, road base, and rail ballast, are required for local construction, road maintenance and other public works. In the absence of the proposed quarry, local construction activities would still require these products and therefore trucks would still enter the area in order to facilitate product pickup and delivery.

4.3.5.3 Road Damage

A total of 4 submissions raised the issue of traffic associated with the Proposal to contribute towards road deterioration in the area.

Representative Comment(s)

The road entry to this property is very steep and unlikely to be suitable – whether sealed or not – for the continuous convoy of trucks proposed to use it over the next 23 years should the development be approved.

It has been suggested that Palmer St, the street on which I (redacted) would be the best entry road for this development and that the convoy of trucks would go along this street, up over the railway line (in a northerly direction) to the site. Palmer Street is a suburban road, in no way designated for that kind of truck traffic. It is a residential street. I have invested in this area knowing it is a quiet street, a suburban street, I have invested in improvements to my house since purchasing it in late 2012, including extensively garden landscaping. I am fearful I will lose the quiet amenity of my property, that my many hours of hard slog in working on my garden will be all for nought as possibly the land will be 'resumed' for the purpose of road widening to accommodate the trucks.

A23

As far as I can see this Development has Zero benefits for Blayney, It will employ 2 to 3 people and a small section of truck drivers, it will increase the amount of trucks coming in and out of Blayney, The roads in and around Blayney are already in a terrible state, I can only imagine the problems caused by more trucks. Also the amount of trucks going past the schools is a concern also

A04

Response

Road maintenance and upgrades associated with the Proposal are detailed in Sections 2.6.2 (Site Access Road), 2.6.3 (Public Road Upgrades), 2.6.4 (Off-site Transport operations) as well as in Appendix 6 (Traffic Impact Assessment Report) of RWC (2018).

The Applicant notes that all vehicles accessing the Project Site would do so via the Site Access Road, Marshalls Lane (within an industrial area) and the Mid Western Highway (a State Highway). The Proposal does not include plans for vehicles to enter or exit the Project Site via Palmer Street

The Applicant is currently negotiating with Blayney Shire Council to lease the road reserve for the life of the project for the Site Access Road. This lease is anticipated to include a clause ensuring that Council, emergency services and landholders whose properties adjoin the road reserve, in addition to any other users who may reasonably require access to the road reserve, would have continued access. The Site Access Road would be constructed and maintained by the Applicant at its cost for the life of the Project.

The Applicant would upgrade a 220m section of Marshalls Lane as well as the intersection of the Site Access Road, Lowe Street, and Marshalls Lane at its cost. In addition, the Applicant acknowledges that it would be required to pay a contribution, based on tonnage, towards the maintenance costs of Marshalls Lane.

Finally, as the Mid Western Highway is a State Road, the Applicant notes that there is no requirement to pay maintenance costs on that road.

In light of the above, the Applicant rejects the assertion that the Proposal would result in unacceptable damage to the surrounding road network. In fact, as opposed to damaging Blayney's road network, the Proposal would actually contribute towards its ongoing maintenance and provide for significant road upgrades where necessary to accommodate project-related vehicle movements.

4.3.6 Blasting

A total of 8 submissions raised the issue of damage associated with blasting activities.

Representative Comment(s)

Blasting will potentially cause damage to houses and infrastructure such as gas lines, Cadia Dewatering Pipeline and Nestle Purina over a 21 year period.

A01

How can the idea of Blasting even be allowed so close to a residential area, as far as I am aware there is no blasting a whites quarry as it is considered too close to town, please contact me to correct this if I am wrong. 10 Blasts a year if it is approved is 10 to many, over a period of 21 years this will be 210 blast if not more, what will this do to the foundation of the houses in the area, it will over a period of time cause foundations to shift and crack and cause damage to our homes.

A04

We are also concerned about blasting so close to town. Blasting is listed at 10 times a year, that doesn't sound like much but in 21 years that's 210 blasts. How can the applicant prove that this amount of blasting is not going to affect the foundations of our homes and adjoining infrastructure and business?

A07

Response

Blasting management and mitigation strategies are outlined in Section 4.2 of RWC (2018) and the Blasting Assessment undertaken for the Proposal in presented as Appendix 5 of RWC (2018). Further assessment of blasting impacts are also presented in Section 2.1 and **Appendix 1** of this document.

In summary, blasting operations would comply with the ANZEC (1990) amenity criteria. Those criteria have been established to ensure the comfort and amenity of surrounding residents. Ground vibration and air blast over pressure levels that would result in structural or other damage to buildings or associated infrastructure substantially exceed the amenity criteria. As a result, by ensuring compliance with the amenity criteria, the Applicant would ensure that damage to surrounding buildings would also be avoided.

4.3.7 Water

4.3.7.1 Water Supply and Usage

A total of 4 submissions raised the issue of water supply and usage associated with dust suppression activities.

Representative Comment(s)

Where will the water come from to use for water to suppress the dust???

Will it be our potable town water. If so how much will be used? What happens during the years of drought and residents of Blayney are on water restrictions, we will suffer either way, no water suppression means more dust, the use of water will be extremely unfair to everyday residents of Blayney if this proposed development goes ahead.

A04

I have heard that there will be provisions for watering the area to minimise the dust but we are in a drought and on water restrictions so where is this water going to come from. With climate change we do not know if the water is going to be about to fulfil these provisions. Water should be saved for drinking purposes and household use and not wasted here. We also have a water storage tank connected to our house and we use this water not only for watering gardens but also for drinking purposes. Is the dust from this proposed quarry going to contaminate our tank water.

A14

Response

The Project Site water balance and water licencing arrangements are outlined in Section 4.8.3.1 of RWC (2018).

Water used on site for the irrigation of the visual screen vegetation and for the suppression of dust would, where practicable, be sourced from sediment basins on site. Where that water is not available, additional water would be supplied under a commercial arrangement via the Central Tablelands Water-operated supply network in the same manner that other commercial operations in and around Blayney. The availability of water would therefore be determined by Central Tablelands Water as the commercial supplier.

4.3.7.2 Groundwater

One submission raised the issue of groundwater impacts associated with the Proposal.

Representative Comment(s)

It is also a concern that the quarry could affect the groundwater flow and also pollute Abattoir Creek, which flows into the Belubula River and on to the Carcoar Dam.

A07

Response

The groundwater setting of the Project site is described in Section 3.11.2 of RWC (2018) and potential impacts on groundwater are discussed in Section 4.8.3.4 of RWC (2018).

The aquifer underlying the Project Site is a fractured rock aquifer, an aquifer type characterised by very limited porosity or permeability and therefore a very limited yield. While perched groundwater may occur immediately following rainfall events, the Extraction Area is unlikely to intersect the saturated aquifer as the deepest section of this area would remain between 3m and 9m above the elevation of Abattoir Creek.

4.3.7.3 Surface Water

One submission raised the issue of surface water impacts associated with the Proposal.

Representative Comment(s)

It is also a concern that the quarry could affect the groundwater flow and also pollute Abattoir Creek, which flows into the Belubula River and on to the Carcoar Dam.

A07

Response

The surface water setting of the Proposal is described in Section 3.1 of RWC (2018) and relevant surface water management and mitigation measures are outlined in Section 4.8.2 of RWC (2018).

In order to ensure that no polluted surface water leaves the site and enters receiving waters such as Abattoir Creek, the Applicant has committed to several management and mitigation measures, including preparation of an Erosion and Sediment Control Plan which would identify surface water control and storage structures necessary to ensure that potentially sediment-laden water is not discharged from the Project Site. Key elements of the Plan would include:

- operational procedures required in order to ensure the appropriate implementation of the Plan; and
- design criteria for surface water storages to contain a 1-in-50-year rainfall event.

4.3.8 Economic Factors

4.3.8.1 Employment

A total of 6 submissions raised the issue of minimal benefits to the local community associated with small site staff numbers.

Representative Comment(s)

The proposed Employment and Economic Contribution \$130,000pa, a relatively negligible amount as is only employing 1-3 employees.

A03

The benefit to the region is minimal – one full time worker – is simply not enough to justify the increased dust, noise, the eyesore, the ground shaking from explosive work (what will this do to the foundations of my house, to my sleep?).

A23

Response

The employment opportunities and economic contributions to the Blayney Local Government Area and surrounds are detailed in Section 2.9 of RWC (2018).

The Proposal would require the employment of between 1 and 3 staff members on a full-time basis, with this level of employment being consistent with the rate of production at the site. In addition to these full-time positions, the Proposal would provide employment opportunities for

additional personnel during extraction, drilling, blasting, and processing phases of site operations. Furthermore, a number of contract truck drivers would be required in order to facilitate the delivery from the Project Site.

In total, the Applicant anticipates that direct economic benefits to the Blayney Local Government Area and surrounds would include direct employee wages of \$130 000 per year, mining contractor fees of \$450 000 per year, drill and blast contractor fees of \$250 000 per year, and crushing and screening contractor fees of \$900 000 per year. In total, the Proposal would contribute \$1 730 000 per year worth of direct economic benefits to the Blayney Local Government Area and surrounds.

In addition to direct economic benefits, the Proposal would generate competitively priced products for use in local projects including road construction and maintenance, thereby contributing to the ongoing economic development of the area.

4.3.8.2 Property Values

A total of 11 submissions raised the issue of negative impacts upon local property values as a consequence of the Proposal.

Representative Comment(s)

If this quarry goes ahead our homes will devalue, no one is going to want to move into an area that has a quarry so close.

A07

Home evaluation: Decreased house prices from its actual impact and the community's potential negative preconception.

A12

The proposed site for this development is near our residential area and in view where there are many new and older homes, home owners I'm sure like ourselves are very proud of. The development will make this area not attractive and we believe will decrease the value of our home.

A14

Lastly we believe the quarry will lower the value of our property in our area which will be devastating to us as we would not be able to remain in our home if our children are affected.

A16

The proposed financial benefit is approximately to be just \$130,000 annually. Compare that to the potential for house and property values falling very significantly throughout the township affecting all residents.

A20

Response

The Applicant acknowledges concerns in relation to property values. However, land values and the value potential purchasers may place on a particular property are subject to many variables and are highly subjective. It has been RWC's experience that reduced land values are not a matter that has been identified at other extractive operations of similar scale to the Proposal.



Furthermore, the Project Site and nearby residential areas are already located within close proximity to an industrial area, the Nestle Purina Petcare facility, and the existing Blayney Shire Council-operated White's Quarry. It is likely that these features have already been factored into existing property values. The Proposal is unlikely to have a perceptible impact upon property prices.

4.3.9 Site Rehabilitation

A total of 2 submissions raised the issue of site rehabilitation following the closure of the Quarry.

Representative Comment(s)

Browns creek mining caused 2 sinkholes and the flooding of the mine with aquifer water, and it was abandoned. It also ceased 1-2 kms of surface water to a neighbouring farm from the creek, causing irreparable damage.

Hence, the cost of environmental restoration and stabilisation needs to be considered if there are any adverse environmental, or other impacts through the course of 'mining' the land.

A06

Response

Site decommissioning and rehabilitation activities are outlined in Section 2.10 of RWC (2018).

Due to the relatively small size of the site and the nature of the extractive and processing activities proposed, limited opportunity would exist for progressive rehabilitation of the Project Site. However, following initial extraction operations, material stored in the Temporary Stockpiling Area would be moved into the pit and the area would be decommissioned and rehabilitated.

While the final land use for the Project Site, including the site access road, remains undetermined, the Applicant is committed to preparing a Quarry Closure Plan in consultation with Council five years prior to the end of the life of the Proposal. This plan would describe the final landform and land use options considered, rehabilitation methods to be implemented, completion criteria, and a post-closure risk assessment. The proposed final land use, in the absence of future development consent, would include a combination of agriculture (namely grazing) and nature conservation uses. In consultation with Council, the Applicant would also investigate alternative final land uses including industrial use and water storage.

It should be noted that while decommissioning and rehabilitation activities are a common issue for all quarry sites, there is a commercial imperative for the Applicant to ensure suitable and adequate rehabilitation is undertaken in order to maximise the future value of the land. Finally, the Applicant notes that rehabilitation-related issues at Brown Creek are unrelated to the Proposal.

4.3.10 Visual Amenity

A total of 8 submissions raised the issue of negative impacts upon local visual amenity associated with this Proposal.

Representative Comment(s)

It is enjoyable to watch the livestock within the paddocks, along with the rolling hills and trees, listen to the birds and enjoy the serenity.

If this development is to be approved some parts of the Proposal will be observable from surrounding land and residences. We will be looking at moving trucks all day, bare land, rocks dust and dirt as well as bulldozers and heavy plant machinery.

The applicant has stated that they would establish a visual bund and vegetation screen early during the life of the proposal. From my understanding a bund is a containment around an area usually a large mass of concrete, plastic or prefabricated steel or a large mound of soil. The planted vegetation screen will take years to grow before it will screen the proposed development site.

When travelling into Blayney from the Millthorpe road the first thing you see is Blayney Shire Councils Whites Quarry (which does not blast) and Nestle Purina.

This gives our visitors/tourists an unsightly first impression of what sort of town they are about to enter, we do not want another extractive industry to look at every time we drive into town.

A03

The visual impact on our house will be enormous changing from rolling green hills to an unsightly hole or if screened a mound of dirt that will cause dust issues. The Environmental Impact Statement lists that a 'views of the extractive area would be available from a small number of residences', we believe that a larger number of residents have a view of the area than has been considered by the applicant.

A07

This extraction industry has a life expectancy of up to 21 years this will hold large visual impacts on residents as they will be left with a dusty hill, devoid of vegetation for many years to come as trees and flora will not just reappear immediately.

B02

Response

Existing visual amenity and measures aimed at managing and mitigating impacts upon visual amenity are outlined in Sections 3.7 and 4.4 of RWC (2018) respectively. Additionally, projected views of the Project Site at various stages of extraction are presented in Figures 4.4 to 4.7 of that document.

It is noted in RWC (2018) that visual amenity and the effects of changes to visual amenity are highly subjective and changes that may be acceptable to one person may not be acceptable to another. Acknowledging this, the Applicant has designed the Proposal to minimise the visual impacts and intrusiveness of the operations at multiple stages of extraction.

The proposed site layout includes a buffer on the southern and eastern sides of the Project Site. This means that buffer areas would effectively screen views of the Extraction Area from these directions, including from residential areas of Blayney. Additionally, the development of the Extraction Area would be undertaken in a staged manner designed to utilise existing topography and landscape features in order to maximise visual shielding and thereby minimise impacts on visual amenity. Soil stockpiles which are not located within the Extraction Area would be progressively rehabilitated, minimising both visual impacts as well as potential dust generation.

The Applicant has also committed to establishing an amenity bund and a vegetated visual screen around the western, southern, and eastern perimeter of the Extraction Area and along the eastern and southern sides of the temporary stockpile area. This amenity bund and screen would be vegetated as soon as practicable in order to shield the Extraction Area from view. As is evident in Figures 4.4 to 4.7 of RWC (2018), the staging and visual screen would effectively screen the Extraction Area from view and significantly reduce any impacts on visual amenity.

In contrast to the Blayney Shire Council-operated White's Quarry, the Proposal would be obscured almost entirely by a combination of existing topography and the proposed visual screen.

4.3.11 Community Consultation

A total of 3 submissions raised the issue of inadequate community consultation associated with this Proposal.

Representative Comment(s)

The Environmental Impact Statement also states that community consultation was attended to however, I do not consider palmer Street and Sturt Street to be a whole community or a representative sample of the community. The applicant door knocked 22/7/18 and handed out an information sheet. It was not made aware to the whole community until it was advertised on the front page of the Blayney Chronicle on 15/11/2018.

A03

Any consultation with surrounding residents was very ad hoc and occurred on one day only 22 July 2018. The very small survey of 2 streets visited on Sunday with no prior notice does not give an indication of what a whole community might feel when given time to digest the information in the EIS. I can assure anybody who would query my opinion on the proposal that I am very much against it proceeding.

A08-A11

Also appears the Applicant had no interest to consult or door knock any other residents. Which are in direct line and sight of the proposed quarry.

Only relying on assumed Scenarios that had come from other sites/areas.

Then assuming that is NOT going to affect any residents without even consulting them in the first place.

A22

Response

Details of the Applicant's consultations with various stakeholders are provided in Section 1.6 of RWC (2018).

In addition to consulting with stakeholders including Nestle Purina, owner and operator of the Nestle Purina Petcare facility, and John Holland, operator of the Main Western Railway, and various government agencies, the Applicant also personally undertook community consultation with residents closest to the Project Site.

Community consultation undertaken by the Applicant included door-knocking residences encompassed by Palmer Street and Sturt Street on 22 July 2018, a letter box drop, speaking with residents about the Proposal, and distributing a Community Information Sheet. During this consultation, no particular concerns to be addressed in RWC (2018) were raised.

The Applicant also submitted RWC (2018) for a mandatory exhibition period of 30 days following the advertisement of the Proposal in the Blayney Chronicle, during which public submissions regarding the Proposal and EIS were received. Due to a clerical error on the part of Blayney Shire Council, the Proposal and EIS was re-submitted for an additional 30 day exhibition period, during which further public submissions were received. Submissions from both exhibition periods have been considered in this document.

The Applicant contends that the community consultation undertaken for the Proposal is consistent with that that would typically be expected for similar projects.

5. REFERENCES

Australian and New Zealand Environment Council (ANZEC) (1990). *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration.*

Berkman DA (1995). *Field Geologists' Manual (Third Edition).* Published by Australasian Institute of Mining and Metallurgy.

Prism Mining Pty Ltd (2019). *Updated Blast Assessment.* Presented as Appendix 1.

Richards & Moore (2002). *Airblast Design Concepts in Open Pit Mines.*

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Appendix 1

Updated Blasting Assessment

prepared by

Prism Mining Pty Ltd

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Prism Mining

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UPDATED BLASTING ASSESSMENT FOR PROPOSED BLAYNEY QUARRY Compliance With ANZEC Guidelines 6th February 2019

Prepared for: R.W.Corkery & Co. Pty. Ltd., 62 Hill Street, ORANGE, NSW 2800.

Prepared by: Prism Mining Pty. Ltd., 16 Rosewood St, Bardon, QLD 4065.

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Document: Updated Blasting Assessment - Blayney Quarry - ANZEC Compliance.doc

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Disclaimer

This document provides general guidance based on information provided by the client, using generic methodologies for calculating blast parameters and blasting impacts. Significant site-specific changes may be required to achieve desired results and minimise impacts, and these can only be refined by initial small-scale blasts once operations commence. For further assistance during implementation contact the author, or other suitable qualified person.

INTRODUCTION

The following report is aimed at demonstrating that blast designs for the proposed Blayney Quarry can be implemented in a manner that minimises annoyance due to blasting overpressure and ground vibration, as per the Australian and New Zealand Environment Council (ANZEC) guidelines (Reference #1).

For further detail of the planned drilling and blasting process at the proposed quarry, refer to the earlier report 'Blasting Assessment For Proposed Blayney Quarry, Final Report', 8th August 2018 (Reference #2)

The proposed quarry is located adjacent to the Main Western Railway line, north-west of Blayney NSW (see Figures 1 and 2).

Figure 1 – Project Site North-West of Blayney NSW

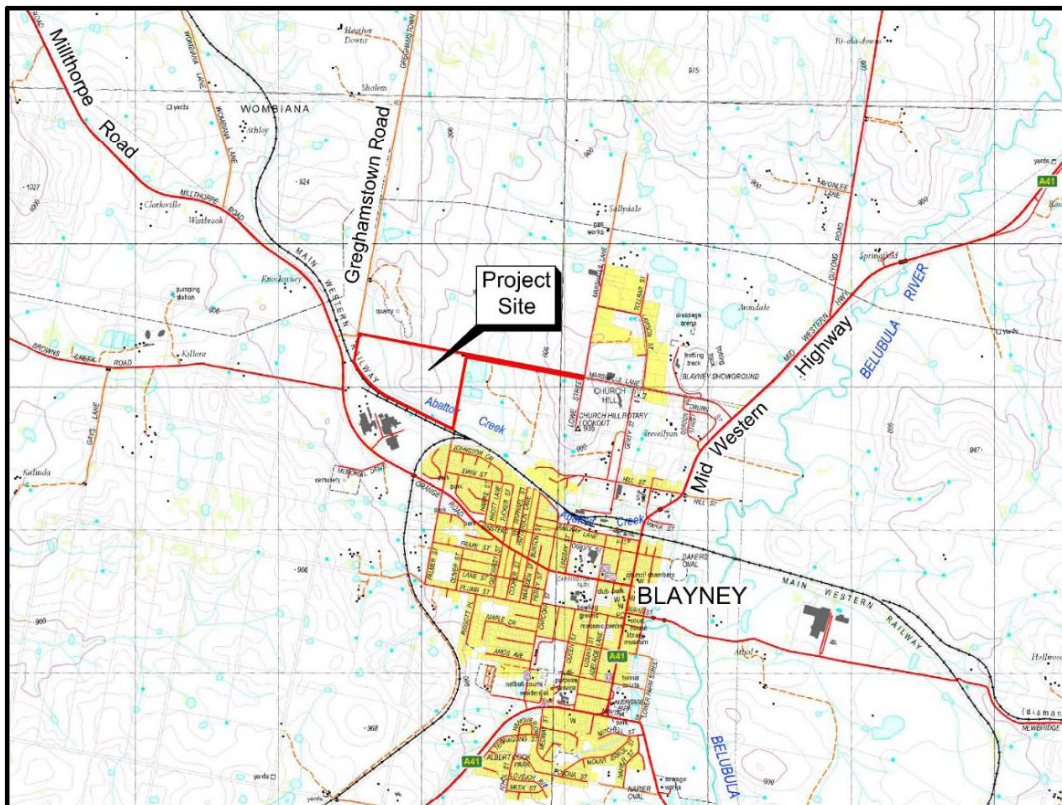
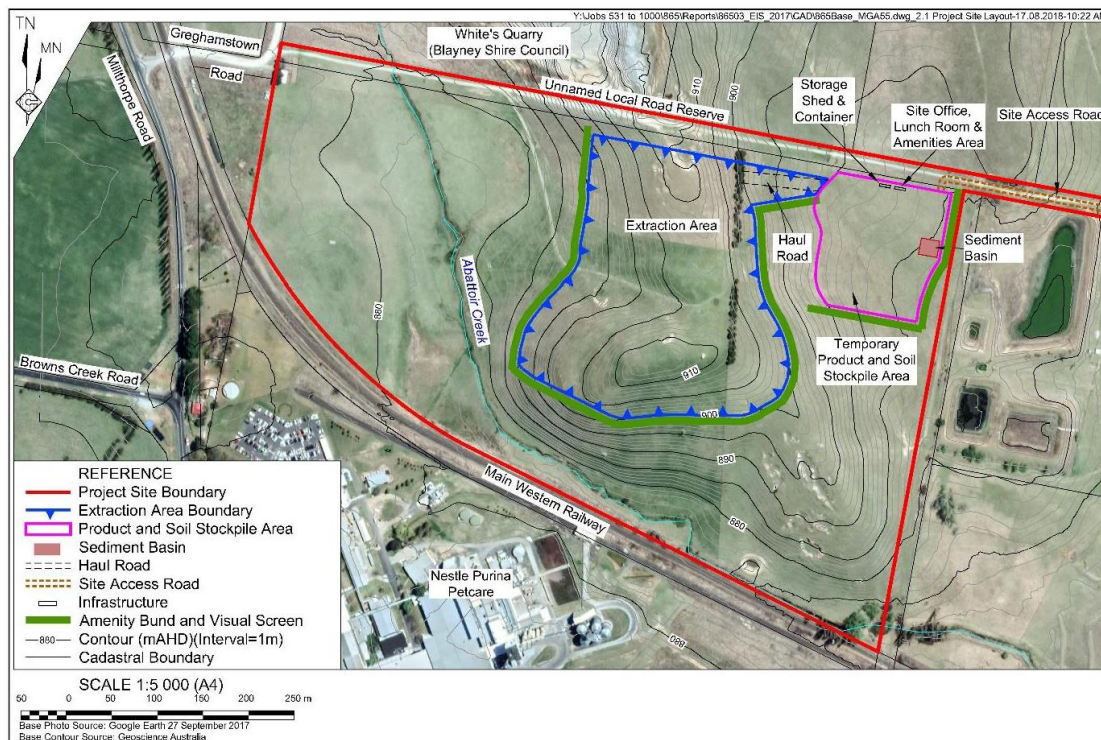


Figure 2 – Conceptual Site Layout



1. ANZEC GUIDELINES

The 'Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration' published by the Australian and New Zealand Environment Council (ANZEC), specifies recommended comfort criteria for ground vibration, overpressure, time of blasting and frequency of blasting (Reference #1).

The intent of these criteria is to minimise annoyance and discomfort to persons at noise sensitive sites (e.g. residences, hospitals, schools etc.) caused by blasting, and applies to mining, quarrying, construction and other operations which involve the use of explosives for fragmenting rock.

2.1 Ground Vibration

The recommended maximum level for ground vibration is 5mm/sec (peak particle velocity), which may be exceeded for up to 5% of the total number of blasts over a period of 12 months, but not exceed 10mm/sec at any time. The guideline recommends that a level of 2mm/sec (ppv) be considered as the long-term regulatory goal for the control of ground vibration.

In order to comply with this guideline, a ground vibration limit of 2mm/s to 4mm/s (peak vector particle velocity) has been used for preliminary blast design work, to demonstrate that compliance is achievable. Ongoing monitoring and adjustment of blast designs will be carried out to maintain compliance with this guideline once blasting commences.

Monitoring of ground vibration from blasting will be carried out using calibrated equipment and approved methods that comply with the recommendations of the manufacturer and Appendix J, of the Australian Standard for Explosives Storage and Use (Reference #3).

2.2 Overpressure

The recommended maximum level for overpressure is 115 dB (Lin Peak), which may be exceeded for up to 5% of the total number of blasts over a period of 12 months, but not exceed 120 dB (Lin Peak) at any time.

In order to comply with this guideline, an overpressure limit of 115 dB (Lin Peak) has been used for preliminary blast design work, to demonstrate that compliance is achievable. Ongoing monitoring and adjustment of blast designs will be carried out to maintain compliance with this guideline once blasting commences.

Monitoring of overpressure from blasting will be carried out using calibrated equipment and methods that comply with the recommendations of the manufacturer, Appendix J, of the Australian Standard for Explosives Storage and Use (Reference #3), and the ANZEC Guidelines (Reference #1).

2.3 Times and Frequency of Blasting

The guidelines state that blasting should generally only be permitted during the hours of 9:00am – 5:00pm Monday to Saturday, and that blasting should not take place on Sundays or Public Holidays. Also, blasting should generally take place no more than once per day (excluding minor works), and should be avoided (if practical) when temperature inversion is known to exist.

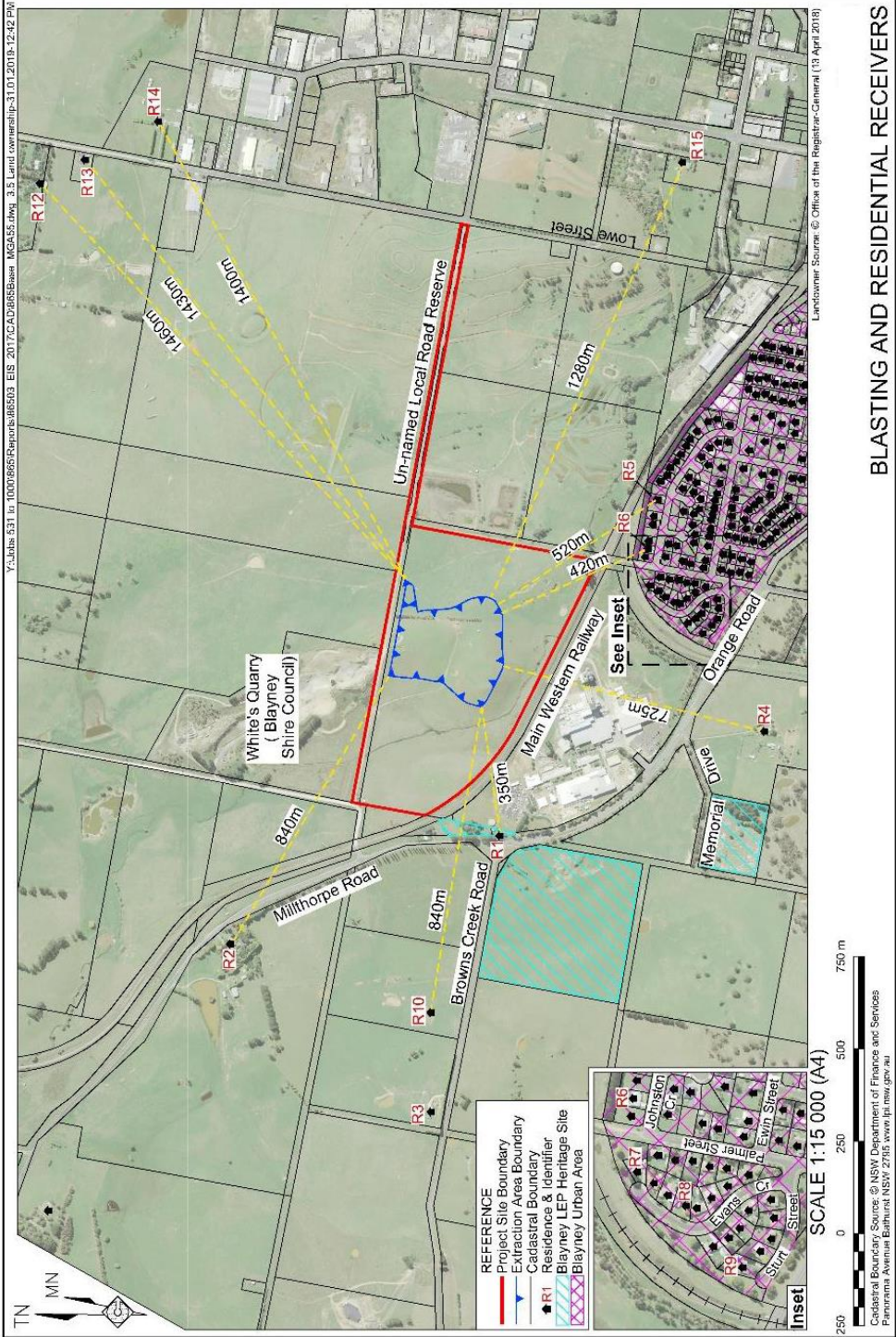
Based on expected production levels, a blasting frequency of around one blast per month has been estimated (Reference #2).

2. SENSITIVE RESIDENTIAL LOCATIONS

Residential locations surrounding the proposed Blayney Quarry are shown in Figure 3, labelled R1 to R14. The shortest distances from these residences to the proposed quarry boundary (and hence closest blasts) varies from approximately 350m at R1 (the junction of Browns Creek and Millthorpe roads, south-west of the quarry); 420m at R6 and other more distant neighbours (Evans Close, south-east of the quarry); 840m at R2 (Millthorpe Road to the north-west); and 1400m at R14 and other more distant neighbours (to the north-east).

The closest distance to a near neighbour will be used for assessment purposes, to demonstrate that compliant blasting can be achieved under ANZEC guidelines for all blasts.

Figure 3: Location of Sensitive Residential Locations Surrounding Proposed Blayney Quarry



BLASTING AND RESIDENTIAL RECEIVERS

3. BLASTING CONSTRAINTS FOR ANZEC COMPLIANCE

Guidelines outlining suitable design parameters for blasting at the proposed Blayney Quarry can be found in a prior report by Prism Mining Pty Ltd (Reference #2).

This additional report identifies the extent to which the blast design restrictions mentioned in that prior report will be applicable, in order to meet ANZEC guidelines for ground vibration and overpressure, as described in Section 2 above.

4.1 Ground Vibration

Estimation of mean peak ground vibration, V (peak vector sum in mm/s) at a sensitive receiver, from 'average' free face blasting conditions, is provided in AS2187.2-2006 (Reference #3) and is represented in Equation 1:

$$\text{Equation 1} \quad V = 1140 \times [\text{distance} / \sqrt{\text{charge mass}}]^{-1.6}$$

Where distance is measured from the blast to the monitoring location (metres) and charge mass is the maximum charge per blasthole (kg) for sequential (hole-by-hole) firing. Site constants of k=1140 and b=-1.6 are suggested in AS2187.2 for 'average' free face blasting conditions.

Variation of ground vibration occurs because of changing intervening ground conditions, blast size and orientation, firing sequence and other factors. AS2187.2-2006 suggests a range of 0.4 to 4 times the value of V estimated above, but for small scale quarry blasts, with blastholes fired sequentially, a range of 0.4 to 2 times the value of V is more realistic as a guide. A range in k factor from 1140 to 2280 has therefore been used in this assessment.

Maximum charge limitations, at minimum distances from the blast area, with site constant range k=1140 to 2240 (exponent b=-1.6), can therefore be determined using Equation #1, and are presented in Table 1 below.

Blast locations 1 to 4 have been used to represent examples of the closest blasts around the perimeter of the proposed quarry, to residences R1, R2, R6, R14, as worst-case scenarios (Figure 4). The estimated 4mm/s ground vibration contour for these scenarios is shown in Figure 5, where small scale 76mm diameter blastholes are used, with a maximum charge of 45kg/hole for ANZEC compliance. The major constraints of blasthole diameter and maximum charge for a range of distances are also illustrated graphically in Figure 7, as distance between the blast and nearest residence increases.

Table 1: Limiting maximum charge per blasthole at varying distances from sensitive residential receivers for ground vibration control

Parameter	350m scenario		400m scenario		450m scenario		500m scenario	
k	1140	2280	1140	2280	1140	2280	1140	2280
b	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6
Minimum distance (m)	350	350	400	400	450	450	500	500
Maximum charge (kg)	45	45	60	60	75	75	75	75
Blasthole diameter (mm)	76	76	89	89	89	89	89	89
Peak vibration (mm/s)	2.0	4.1	2.1	4.1	2.1	4.1	1.7	3.5
Compliant (Y/N)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

For blasts within 350m to 400m of residential locations, the use of 76mm blasthole diameters, on bench heights of 8m to 10m is recommended to meet the ANZEC ground vibration criteria. For blasts greater than 400m from residential locations, the use of larger 89mm blastholes, on bench heights of 10m to 12m can be implemented, adjusted accordingly using this method, and validated with monitored data once blasting commences.

Figure 4: Blast locations around the proposed quarry perimeter (B1 to B4) used to illustrate closest proximity to sensitive residential receivers (R1, R2, R6, R14)

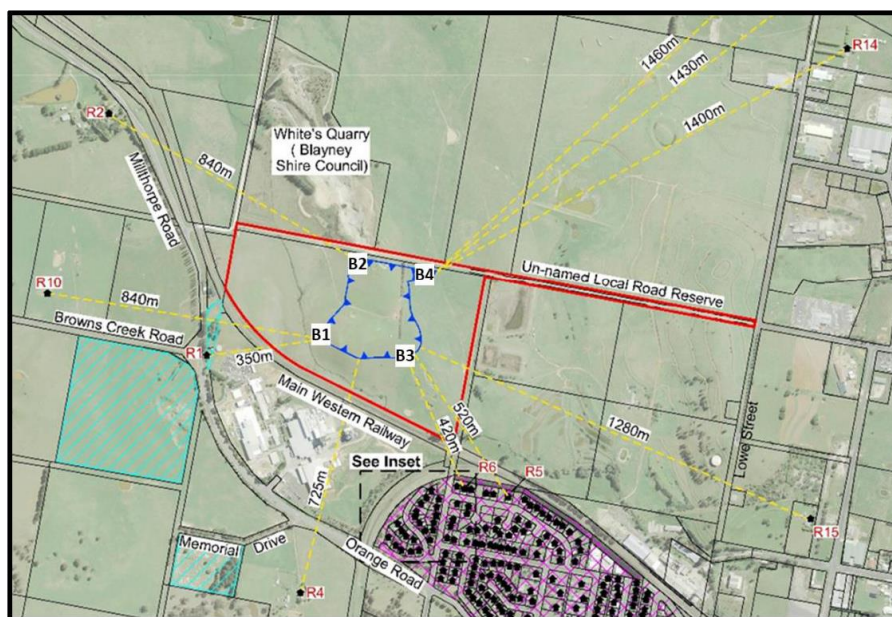
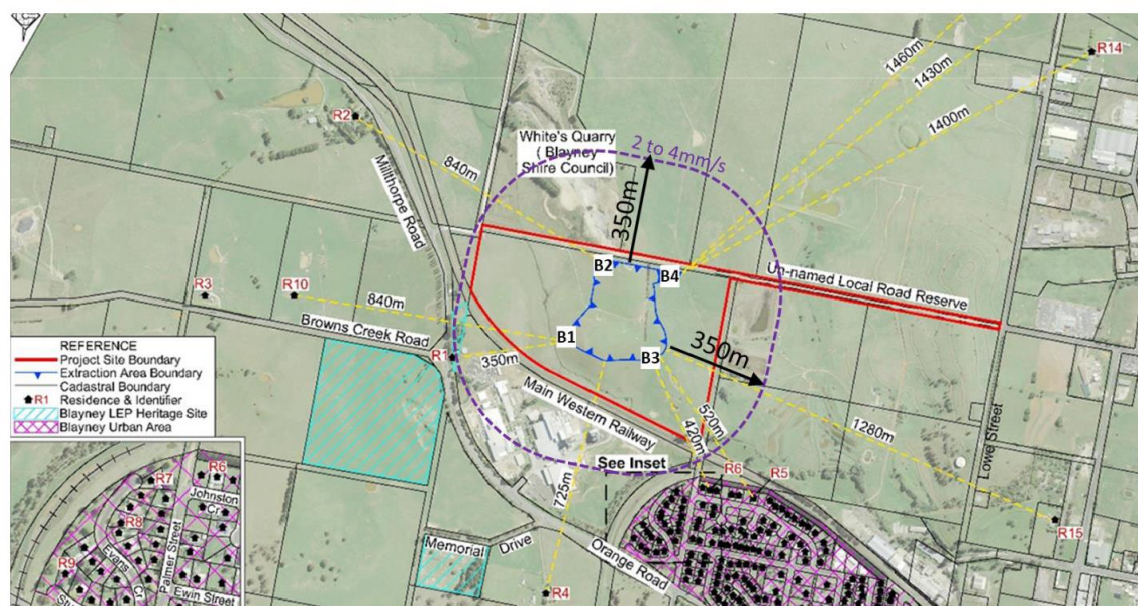


Figure 5: Indicative area with ground vibration impacts between 2mm/s to 4mm/s from small scale 76mm diameter blasts, with restricted charge mass, around the proposed quarry boundary



4.2 Overpressure

A method for estimating likely overpressure impacts from quarry blasts at sensitive receivers is based on the calculation of distances to the 115dBL and 120dBL contours (D115 and D120), in front of the free-face and behind the face as follows:

Equations 2

$D115 = [(K_a \times \text{diameter} / \text{stem height})^{2.5}] \times [(\text{charge/hole})^{1/3}]$ behind the face

$D120 = [(K_a \times \text{diameter} / \text{burden})^{2.5}] \times [(\text{charge/hole})^{1/3}]$ in front of face

Where $K_a = 220$ (behind the face) to 290 (in front of the face) for D115, and $K_a = 190$ (behind the face) to 250 (in front of the face) for D120, where the diameter of the blasthole, burden and stemming are measured in mm, and charge mass is maximum charge per hole (kg) for sequential (hole-by-hole) firing.

In order to comply with ANZEC overpressure guidelines, distances to the 115dBL contour, in front and behind the free face have been assessed (Table 2).

Blast locations around the proposed quarry perimeter have been used to represent the closest blasts to residences R1, R2, R6, R14, as worst-case scenarios (Figure 4). Predicted 115dBL overpressure contours (in front of the free face and behind the face) are shown in Figure 6, where small scale 76mm diameter blastholes are used, with a maximum charge of 43kg/hole, and increased face burdens and stem heights used for ANZEC compliance.

The minimum charge for overpressure compliance is therefore slightly less than that required for ground vibration compliance and will therefore be the controlling factor. The major constraints of blasthole diameter, maximum charge, face burden and stem height for a range of distances are also illustrated graphically in Figure 7 as distance between the blast and nearest residence increases.

This suggests that blasting closest to near neighbours can be carried out in a manner compliant with the ANZEC overpressure guidelines with some adjustment of maximum charge, stem height and front-row burden for some blast locations. Maximum charge constraints for blasting at greater distances can be adjusted accordingly using this method, and validated with monitored data once blasting commences.

Given that the nearest neighbours are to the south-west and south-east, it is recommended that blasting commences at the northern end of the quarry and proceeds to the south, with free faces directed towards the north-east, away from the more critical southern receivers.

Table 2: Limiting stem height, face burden and charge mass per blasthole at varying distances from sensitive residential receivers for overpressure control

Parameter	Overpressure behind the face				Overpressure in front of the face			
	350m scenario	400m scenario	450m scenario	500m scenario	800m scenario	1000m	1200m	1400m
Ka115 (Front)	290	290	290	290	290	290	290	290
Ka115 (Behind)	220	220	220	220	220	220	220	220
Minimum distance (m)	350	400	450	500	800	1000	1200	1400
Maximum charge (kg)	43	57	65	75	75	75	75	75
Minimum face burden (m)	2.4	3.1	3.1	3.1	3.2	2.9	2.7	2.6
Minimum stem height (m)	2.65	3.06	3	2.9	2.4	2.4	2.4	2.4
Blasthole diameter (mm)	76	89	89	89	89	89	89	89
D115 (m) Front	895	770	804	844	779	997	1191	1309
D115 (m) Behind	350	399	438	500	802	802	802	802
Compliant (Front)	N/A	N/A	N/A	N/A	YES	YES	YES	YES
Compliant (Behind)	YES	YES	YES	YES	YES	YES	YES	YES

Figure 6: Indicative 115dBL contour in front of the free face, and behind the face, for blasts orientated away from southern sensitive locations. Shown for small scale 76mm diameter blasts, with restricted charge mass, face burden and stem height around the proposed quarry boundary

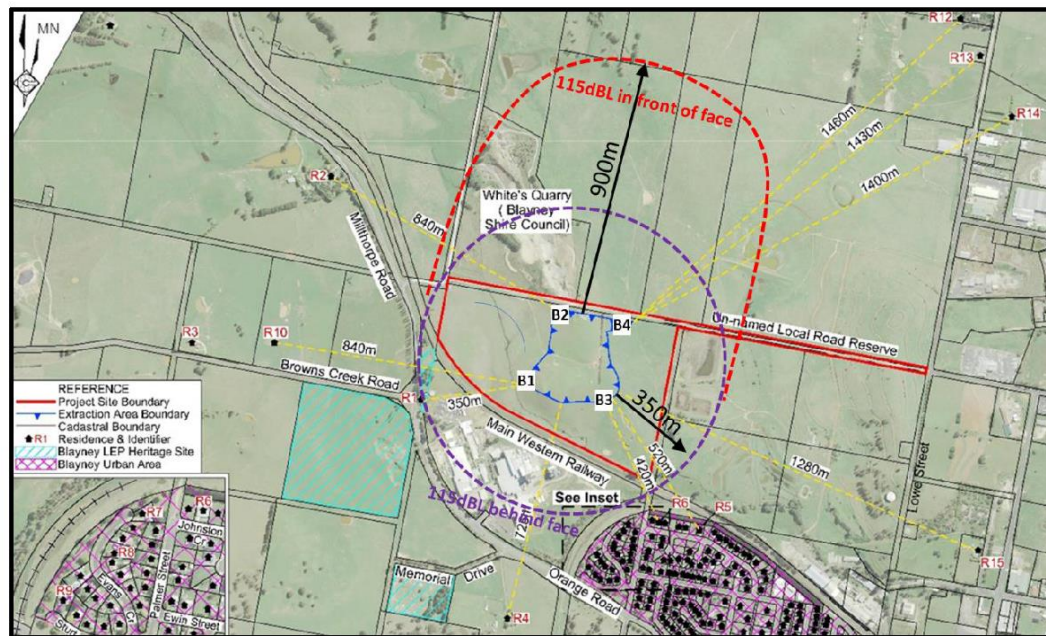
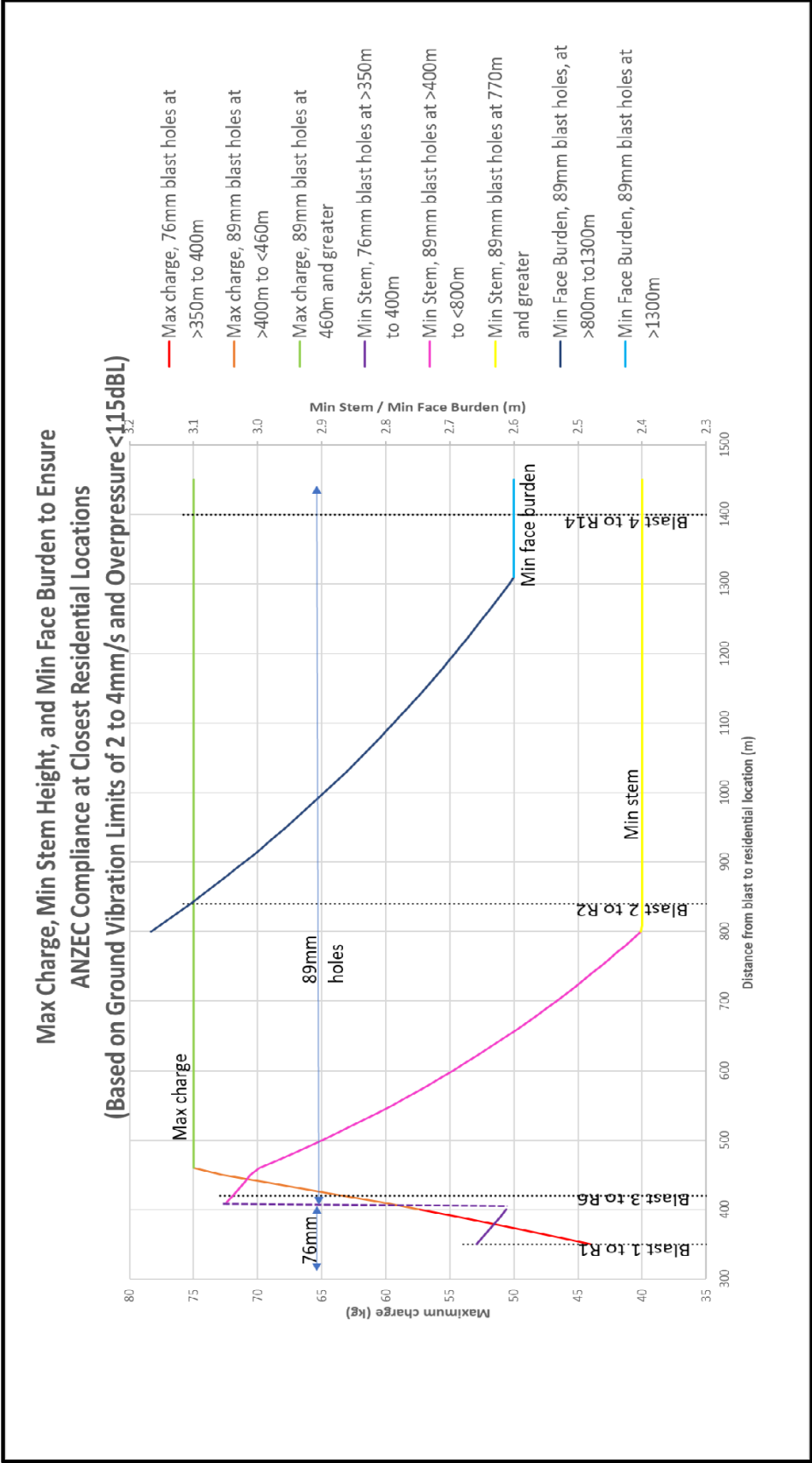


Figure 7: Variation of maximum charge mass, minimum stem height and minimum face burden required for compliance with ANZEC ground vibration and overpressure guidelines (distance from each blast to nearest sensitive receiver, and orientation of free face to be considered)



5. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are made, based on the assessment of available data using generic methods and the assumption of good blasting practice:

- The ANZEC guidelines relating to ground vibration and overpressure impacts at sensitive receivers, and the times and frequency of blasting, will be complied with and included within an appropriate Blast Management Plan and associated operating procedures.
- Blasting should generally be able to be carried out, using commonly utilised quarry blast parameters (76mm and 89mm diameter blastholes on 8 to 12m bench heights), subject to distances from the blasts to sensitive receivers.
- While blast parameters within typical ranges will be achievable in some areas, modifications will be necessary when blasting closest to residential properties around the perimeter of the proposed quarry, particularly to the south-east (Evans Cres) and south-west (Lime Siding Cottage).
- Reductions to maximum charge mass have been specified in order to meet ANZEC ground vibration guidelines when blasting closest to residential locations.
- Further reductions to charge mass, with increased stem heights and face burdens have been specified in order to meet ANZEC overpressure guidelines when blasting closest to residential locations. These constraints will take precedence in most cases.
- Blast monitoring should include vibration/overpressure monitors at Lime Siding Cottage and Evans Crescent (locations to be determined) to validate site models, and the nearest sensitive residential location for each blast.
- All blasts must be videoed as a record of blast behaviour. Face profiling may be required to control charging behind irregular faces for front row blastholes.
- Development of a blast management plan, operating & monitoring procedures, record keeping systems and risk assessments will be undertaken with proper consideration for blasting near sensitive locations, prior to the commencement of operations. Proximity to nearby residences and other infrastructure warrants tight control and careful monitoring to avoid undesired impacts.
- Blasting should commence at the northern end of the site, where impact risks are lowest, in order that effective blast designs and well-controlled blasting practices can be developed as mining advances towards more sensitive locations.
- Controlled blasting is required to avoid fly-rock travelling outside the project site, with orientation of blast faces towards the north being preferable in the event of an unexpected face burst.
- Initial rip and push extraction methods provide an opportunity to expose less weathered material and better assess the level of blasting required. Note, however,

that it is advisable not to maximise the rip and dig process to a 'hard' floor, as a proportion of weaker material on surface will allow better bench preparation and allow for more conservative stem heights with initial blasting (for fly-rock and overpressure control). It will also reduce the potential for blocky surface material generated within the stem zone of the next blasted bench.

- Critical areas requiring a reduction in blast pattern, bench height, hole diameter etc should be defined accurately when quarry plans are developed and validated as initial blasts provide real data. Initial production blasts must be monitored as they will be critical in developing effective and compliant blasts closer to sensitive locations.
- Additional constraints for fly-rock control, and blasting adjacent to the rail line and Nestle facility may further reduce ground vibration and overpressure impacts at more distant residential locations.

6. REFERENCES

The following references have been used in preparing this report.

1. Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration, Australian and New Zealand Environment Council, September 1990.
2. Blasting Assessment For Proposed Blayney Quarry – Prism Mining Pty Ltd, 8th August 2018
3. Appendix J, Australian Standard for Explosives Storage and Use, AS2187.2-2006.
4. Airblast Control Techniques, Terrock, 2006.
5. Efficient Blasting Techniques course, Blast Dynamics and Dyno Nobel (various dates).

Appendix I - Blast Design Parameters (Reference #2)

The following parameters are based on a series of guidelines published by Blast Dynamics and Dyno Nobel (Reference #5) for efficient blasting in a range of blasting conditions. Indicative blast parameters are presented that allow limitation of instantaneous charge mass, and maintain blast confinement, in order to achieve adequate fragmentation and muckpile profile.

These parameters require adjustments when blasting closest to sensitive residential locations, as described in Section 4 of this report.

Initial blast design parameters

Parameter	Moderate intensity blasting		Higher intensity blasting	
Blasthole diameter (mm)	76	89	76	89
Bench height (m) ¹	8 to 10	10 to 12	8 to 10	10 to 12
Hole angle (degrees) ²	80	80	80	80
Rock density (g/cc) ³	2.6	2.6	2.6	2.6
Ground conditions ⁴	Dry/damp/wet	Dry/damp/wet	Dry/damp/wet	Dry/damp/wet
Explosive density (g/cc) ⁴	1.1	1.1	1.1	1.1
Charge density (kg/m) ⁵	5.0	6.8	5	6.8
Sub-drill (m) ⁶	0.7 to 1.2	0.8 to 1.4	0.7 to 1.2	0.8 to 1.4
Burden (m) ⁷	2.4	2.8	2.2	2.6
Spacing (m) ⁸	2.8	3.2	2.5	3.0
Stem height (m) ⁹	2.2	2.5	2.1	2.4
Charge mass per hole (kg) ¹⁰	35 to 45	60 to 75	35 to 45	60 to 75
Powder factor (kg/m ³) ¹¹	0.66 to 0.68	0.66 to 0.68	0.79 to 0.81	0.78 to 0.80
Energy factor (Kj/tonne) ¹²	800 to 900	800 to 900	1000	1000
Timing	17ms to 25ms inter-hole delays and 25 to 42ms or 67ms inter-row delays on a limited number of rows for sequential firing.			

Notes for Table 1

1. Bench height (m) greater than the hole diameter (mm) divided by 15, and less than 4 times the burden.
2. Nominal 80-degree angle holes to reach the toe and achieve better forward movement.
3. Rock density nominal at 2.6g/cc until advised.
4. Ground conditions assumed to be damp/wet as this provides a more conservative starting point for vibration/overpressure/fly-rock assessment.

5. Charge mass (kg) per metre length of charged blasthole, based on fully coupled bulk explosives at 1.1g/cc density.
6. Sub-drill 0.3 to 0.5 times the burden (m).
7. Burden range of 20 to 35 hole diameter, or using Blast Dynamics calculation utilising blasthole diameter, explosive density and rock density for a nominal value. Larger front row burdens are required for overpressure and fly-rock control near sensitive locations (see later comments).
8. Spacing based on 1.15 times the burden on a staggered pattern for uniform energy distribution (equilateral triangle).
9. Stemming range at 20 to 30 diameters, or 0.5 times the burden plus sub-drill for a nominal value. Crushed aggregate stemming is required for fragmentation, overpressure and fly-rock control, not drill cuttings. Larger stem heights may be required for overpressure and fly-rock control near sensitive locations (see later comments).
10. Based on an explosive density of 1.1g/cc, hole diameter and charge length excluding stemming.
11. Charge mass (kg) per cubic metre of rock blasted (excluding sub-drill zone). Target powder factor 0.65 to 0.70 kg/m³ for moderate intensity blasting and around 0.8 kg/m³ for higher intensity blasting.
12. Energy factor (Kj/tonne) based on an absolute weight strength of 3.3Mj/kg (90% of ANFO) and rock density of 2.6g/cc. Target greater than 800 Kj/tonne as a starting point and greater than 1000 Kj/tonne in harder conditions.

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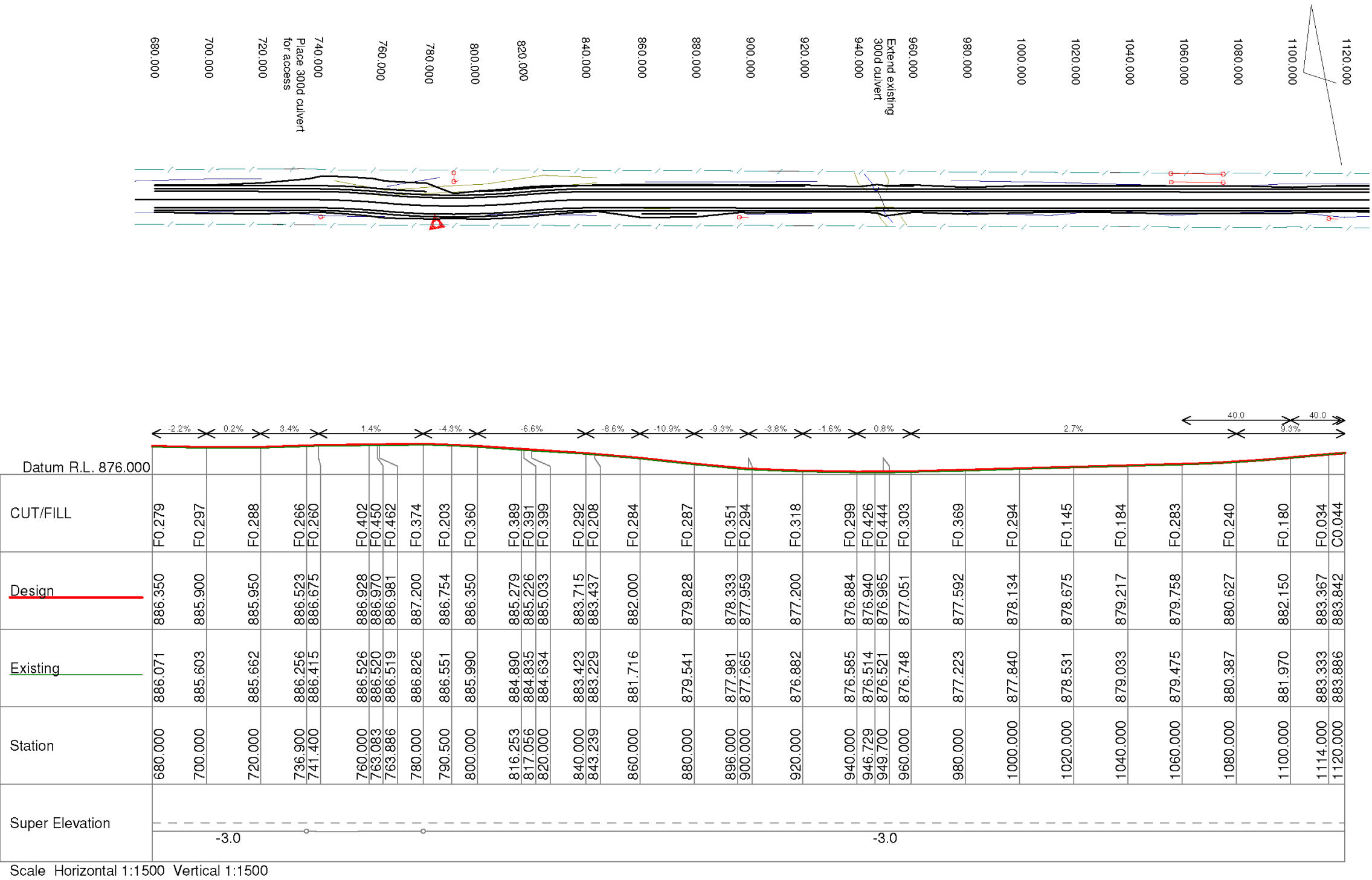
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Appendix 2

Updated Site Access Road Concept Designs

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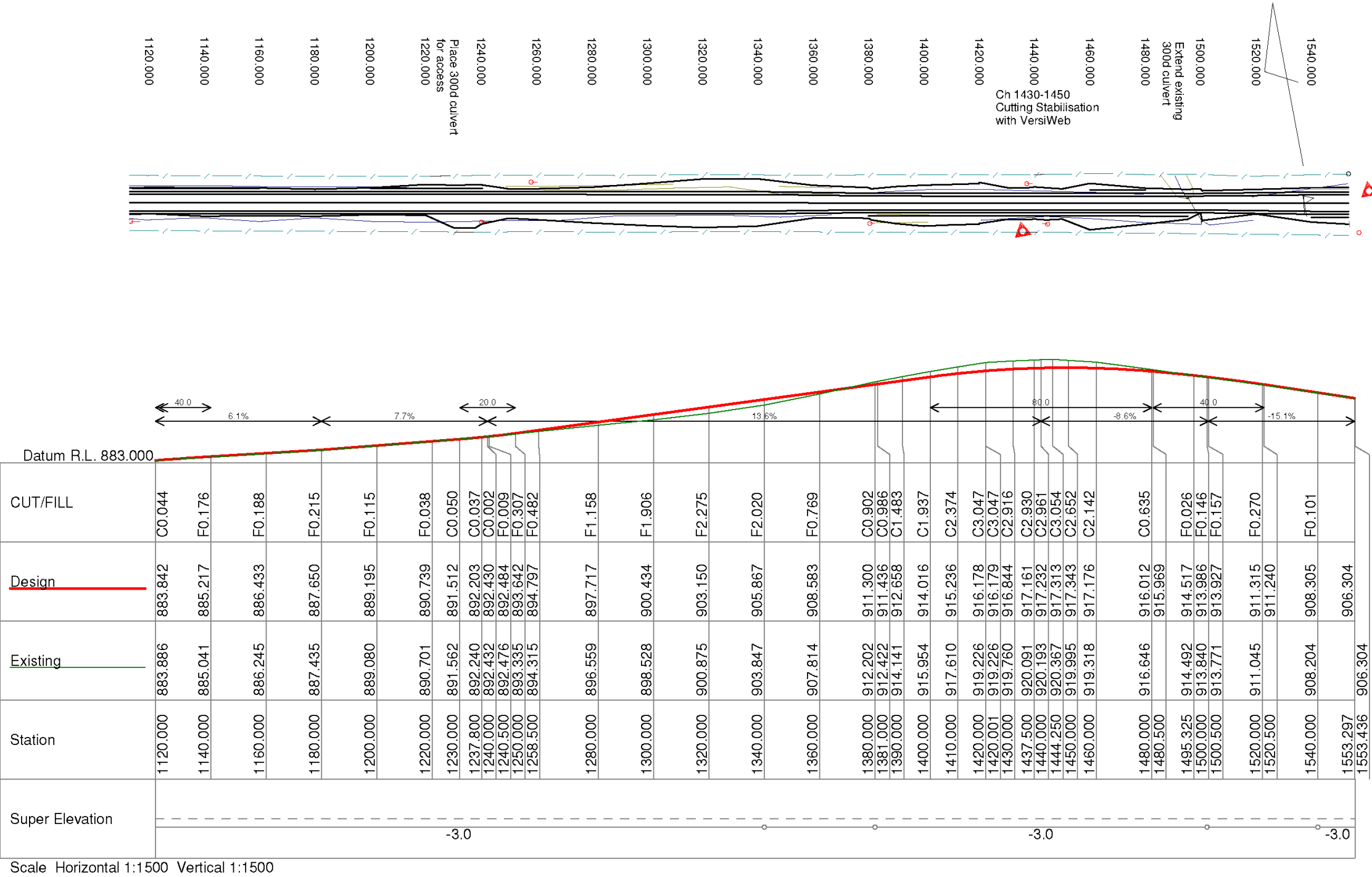
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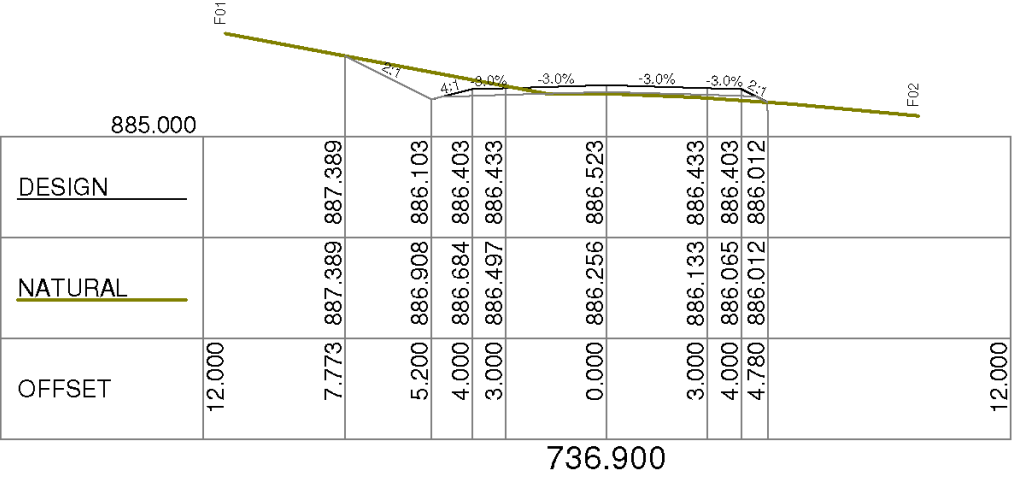
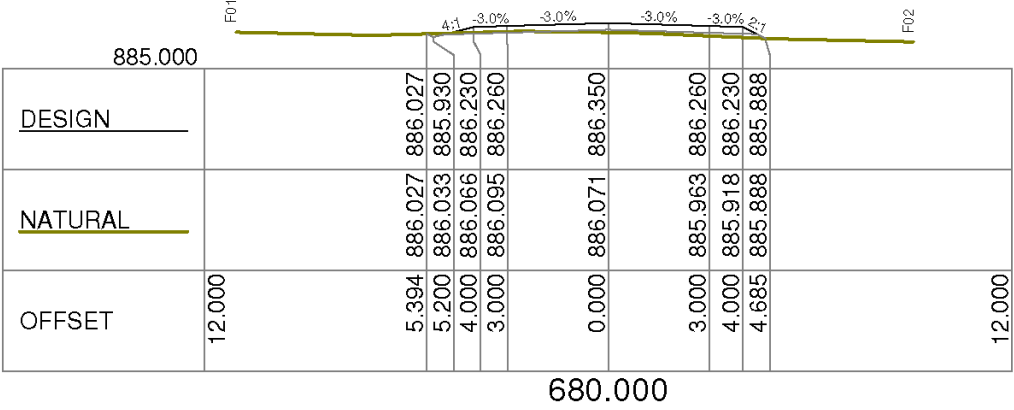
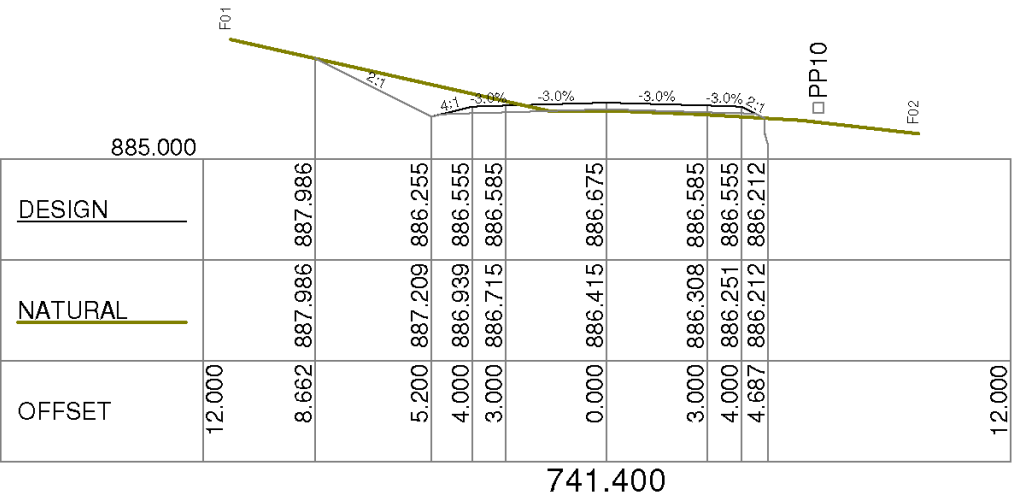
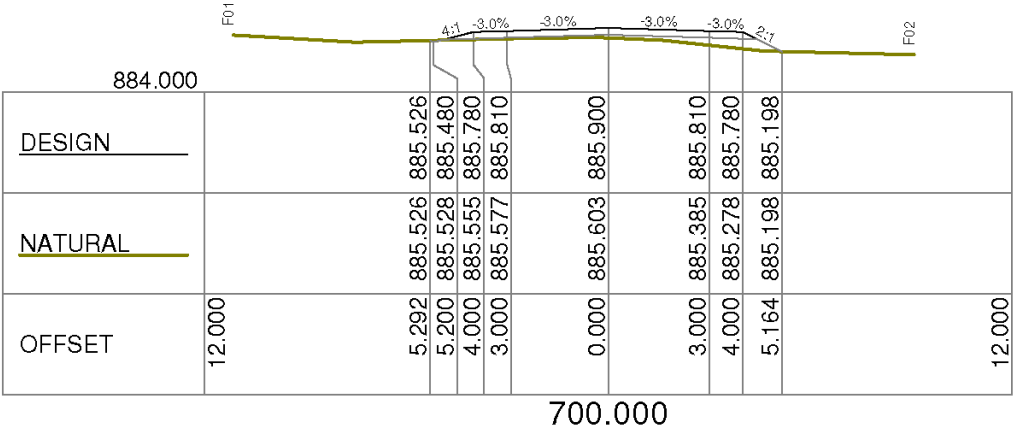
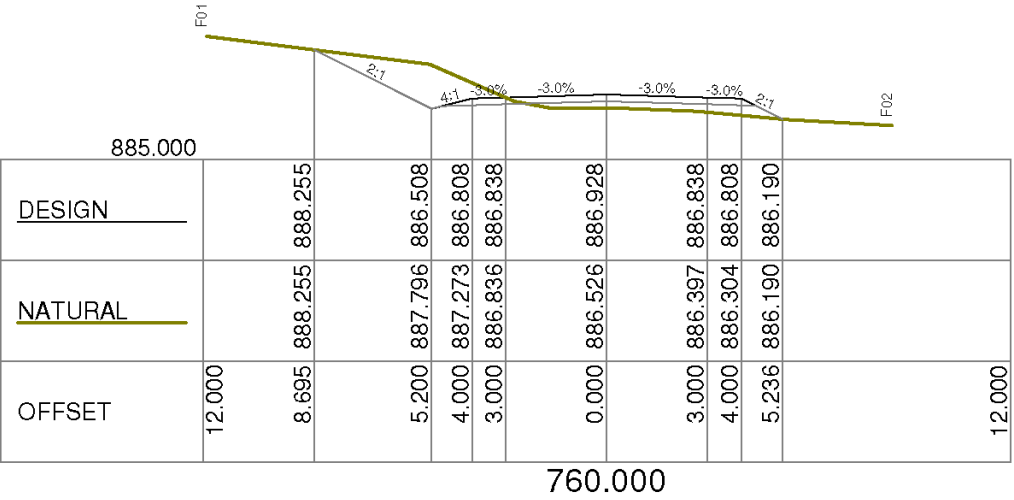
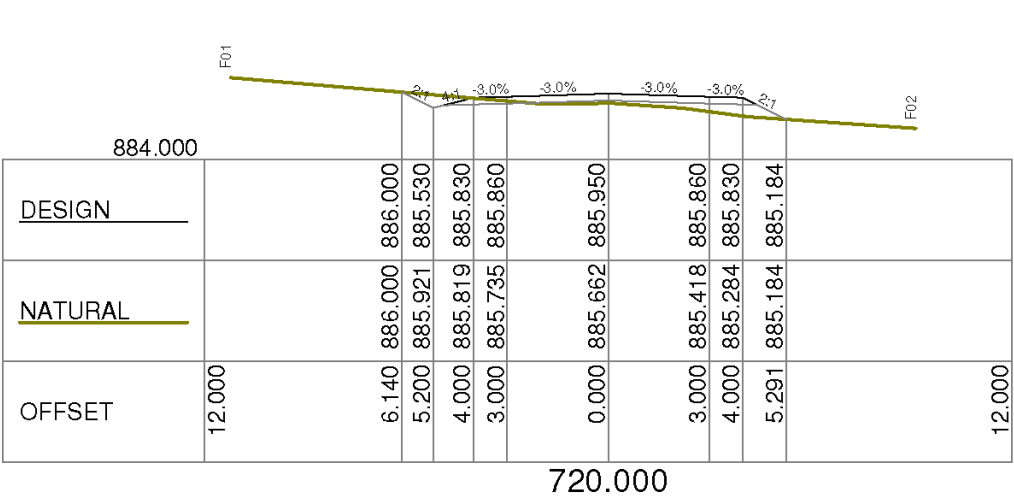
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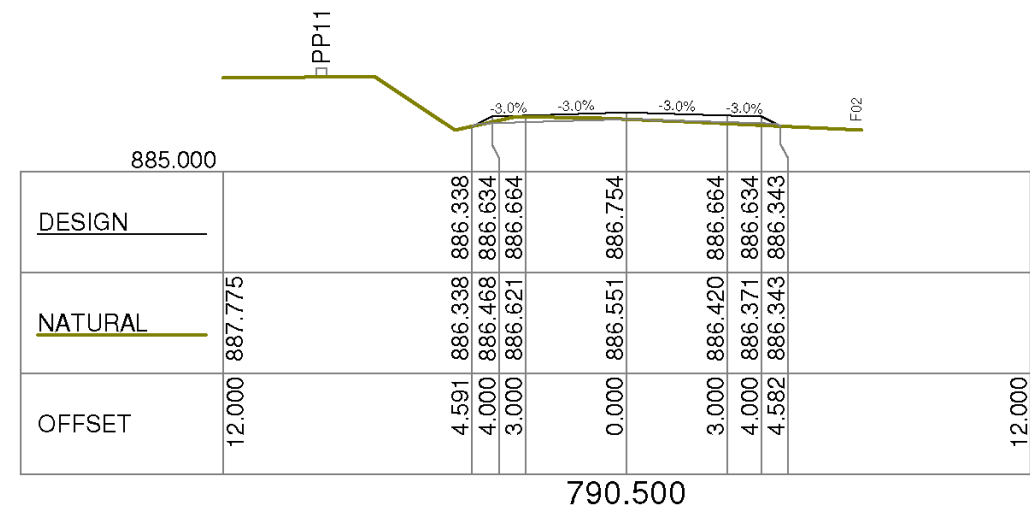
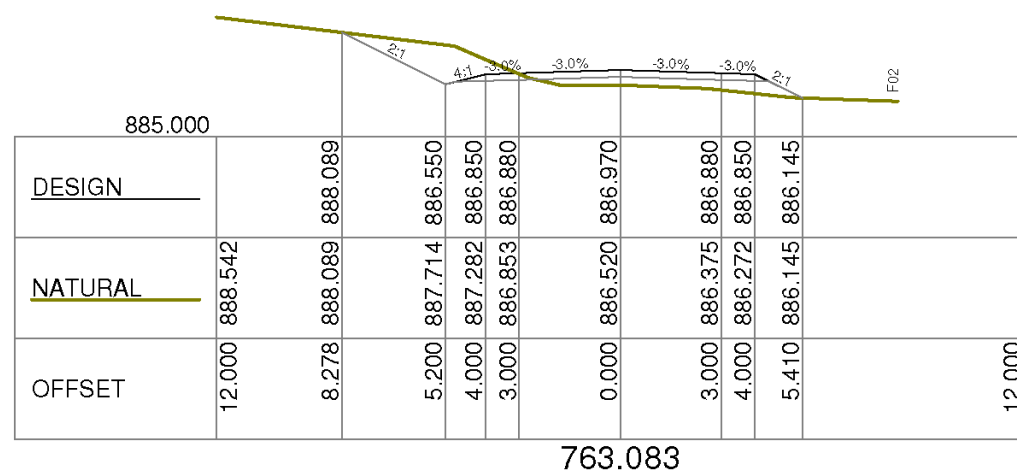
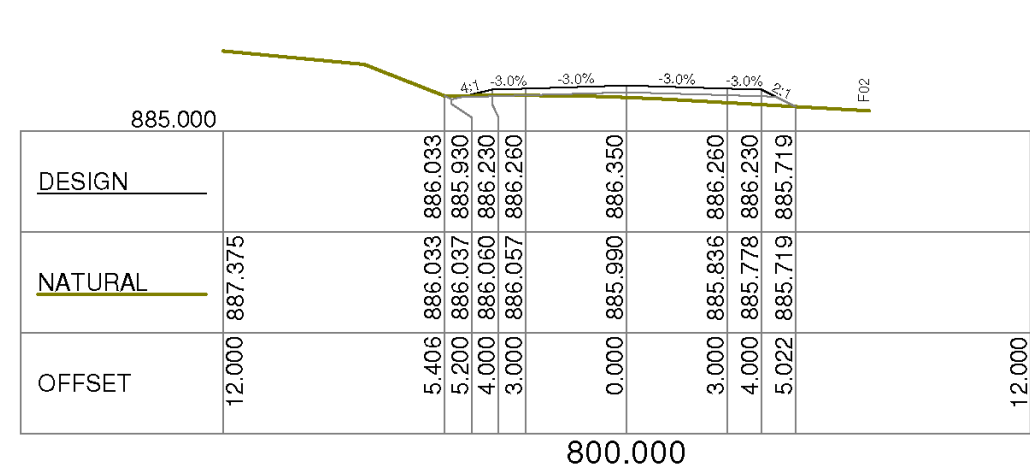
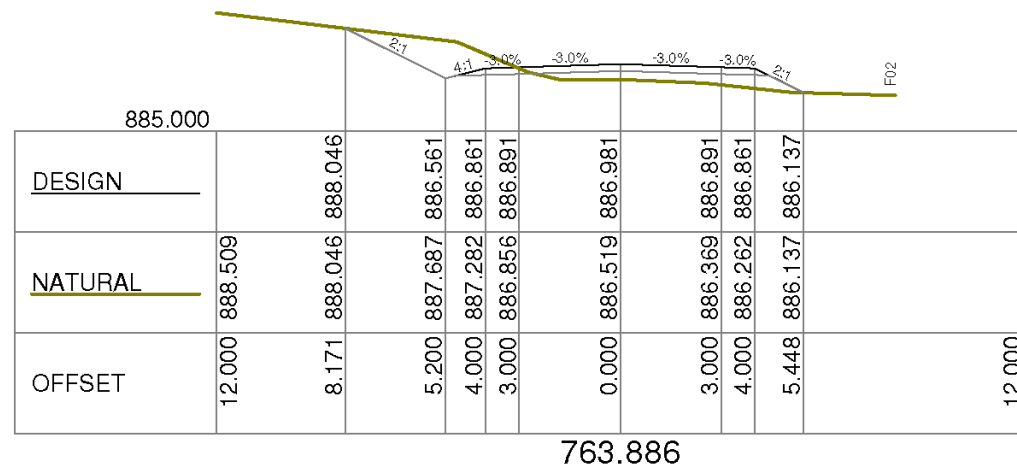
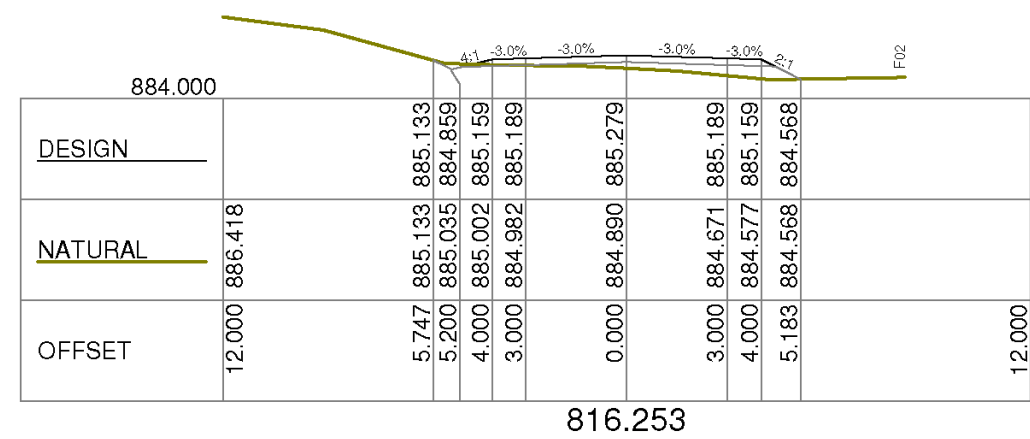
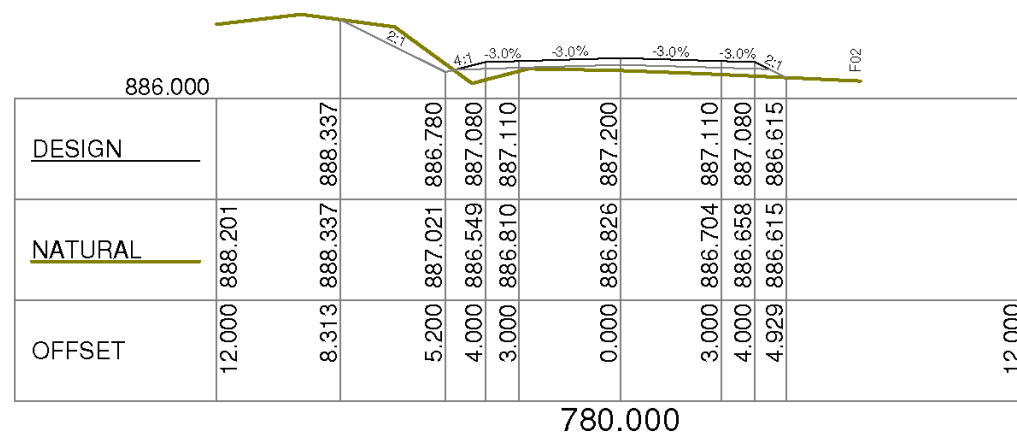


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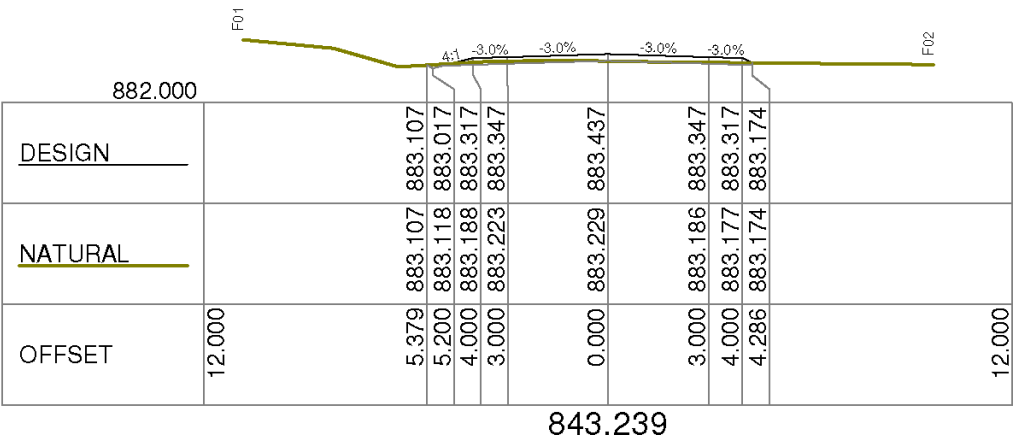
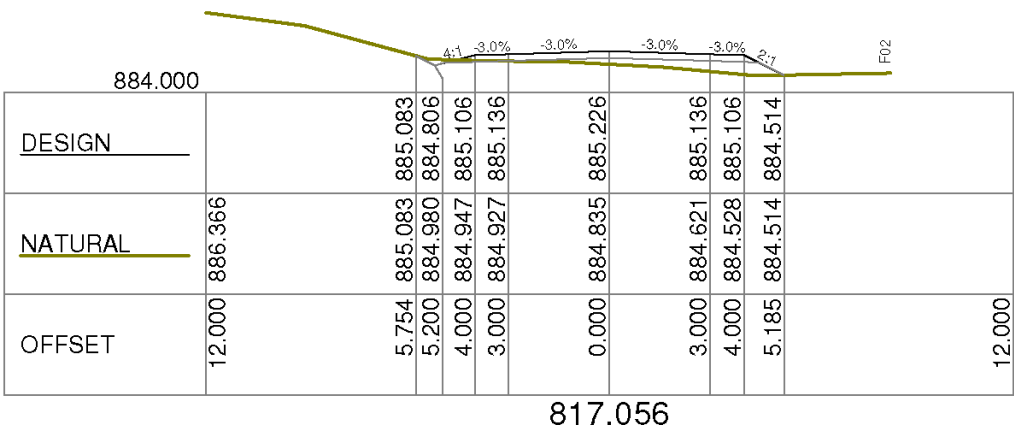
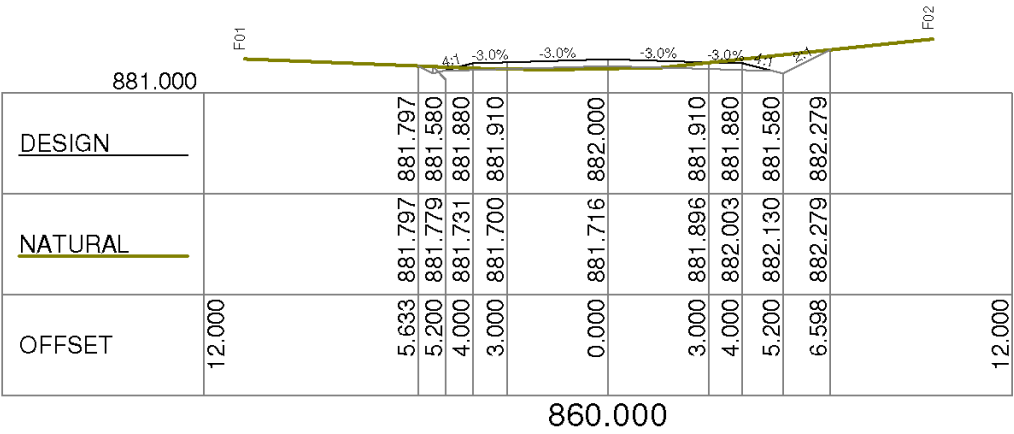
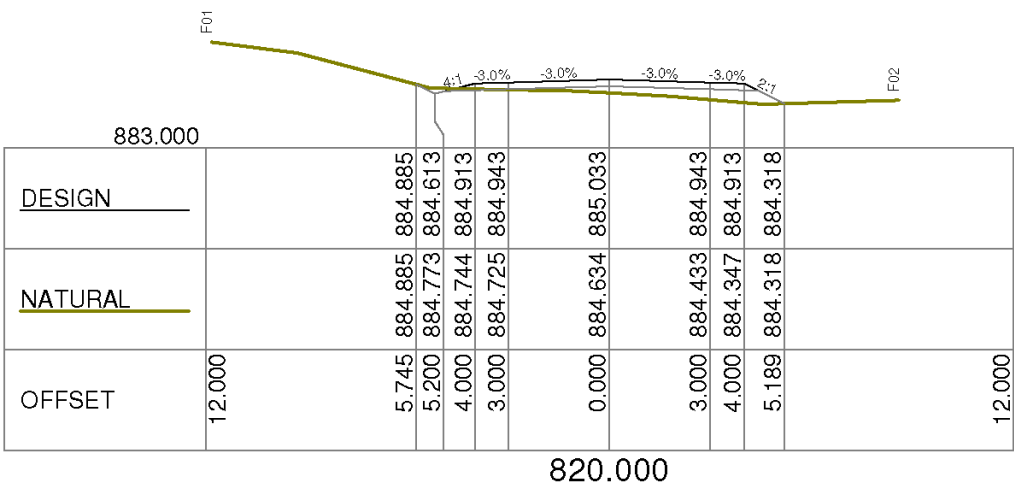
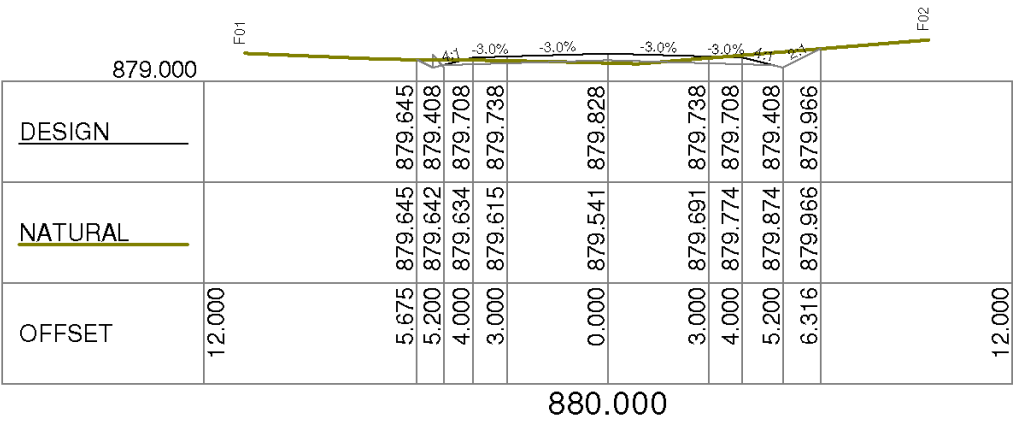
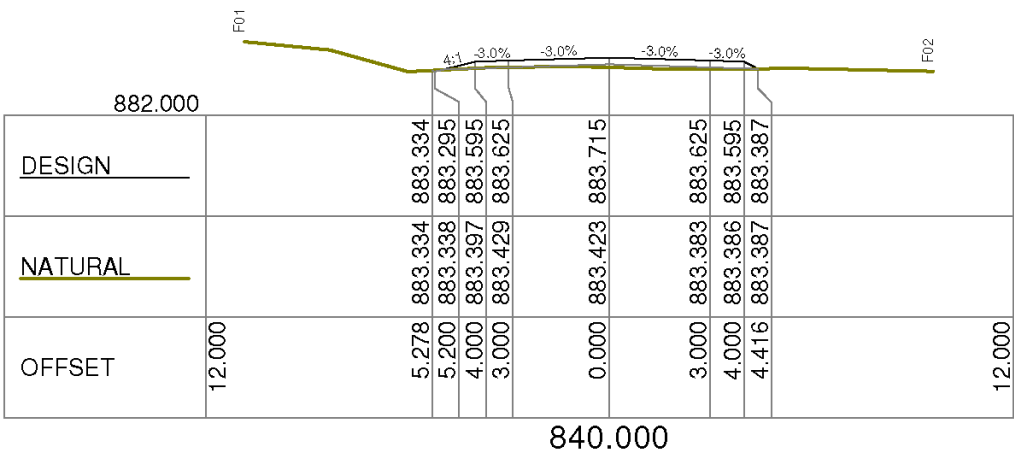
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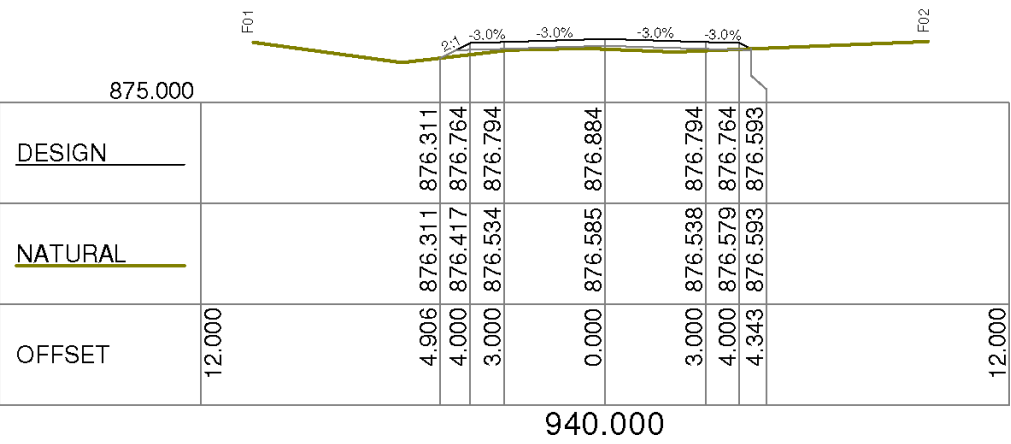
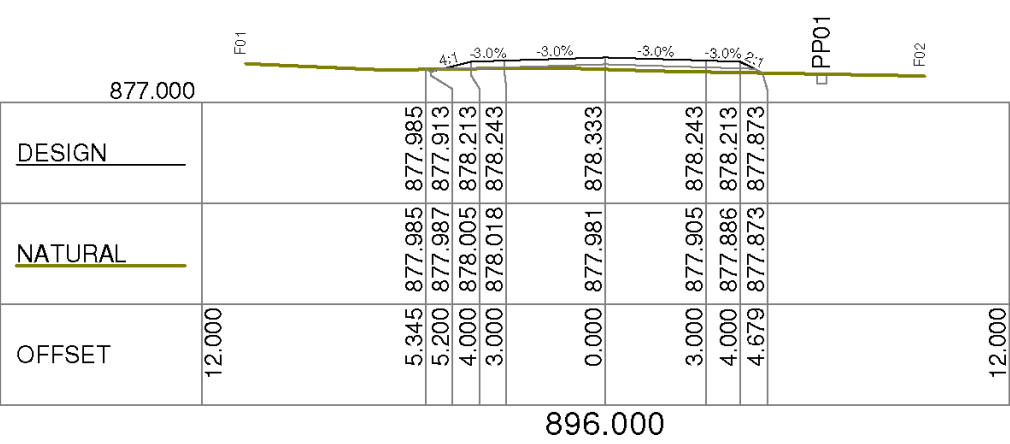
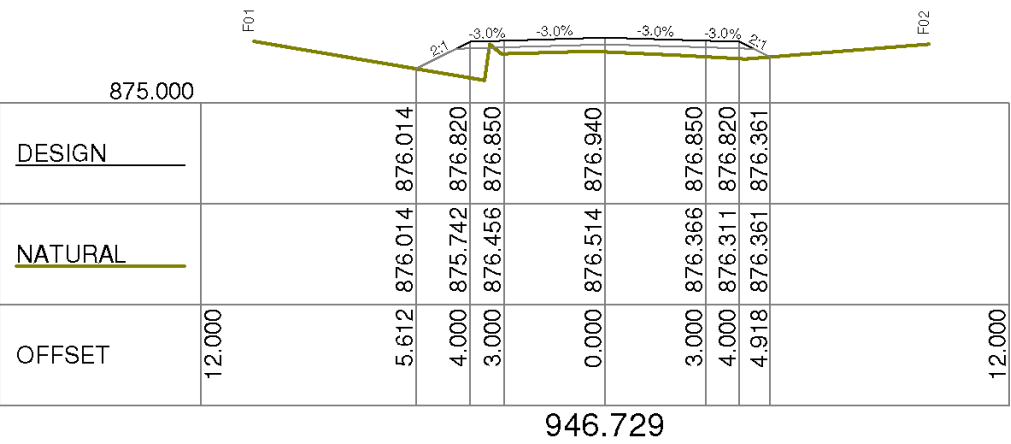
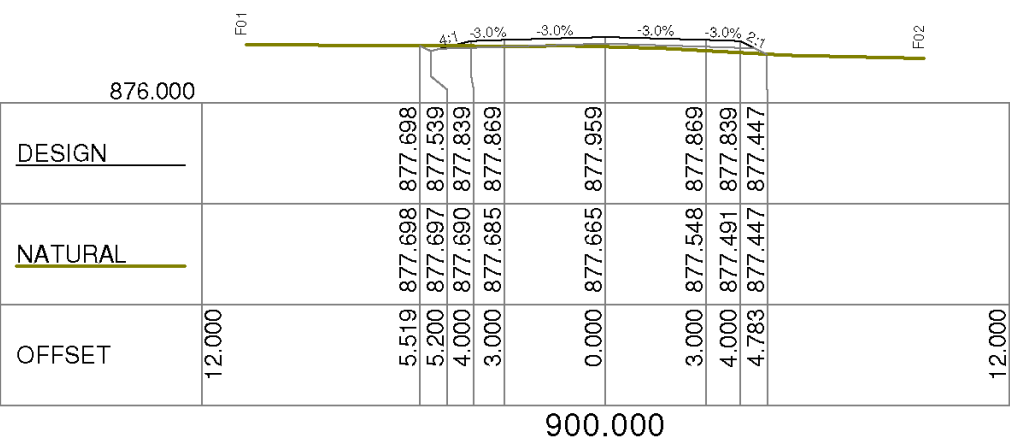
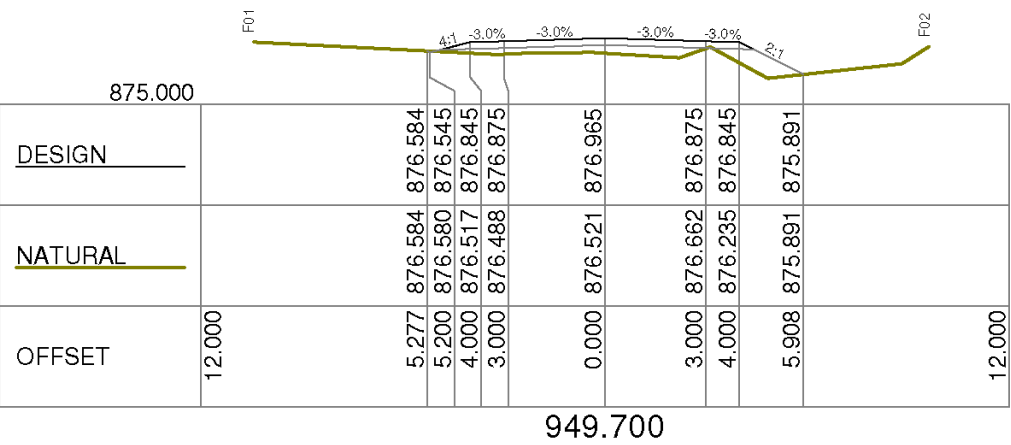
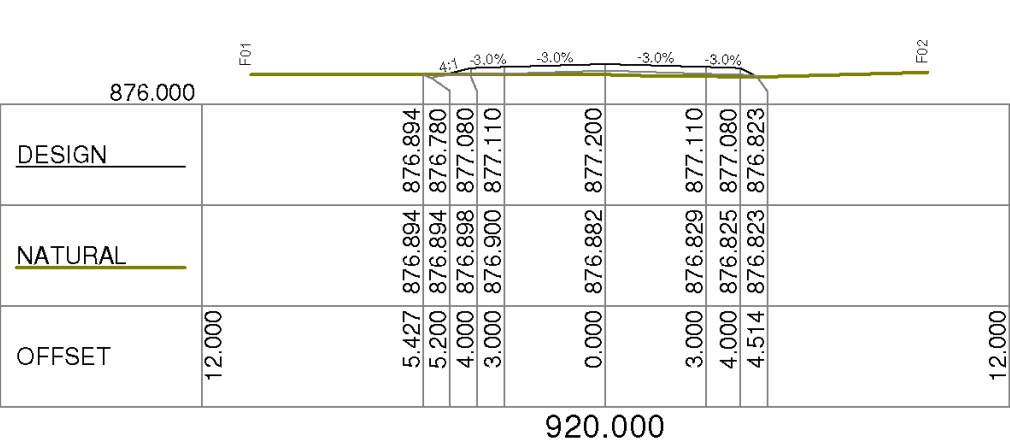
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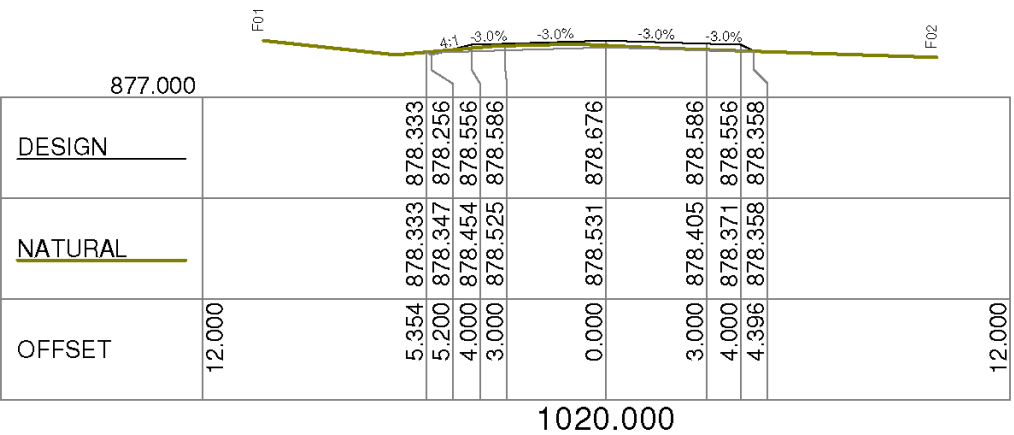
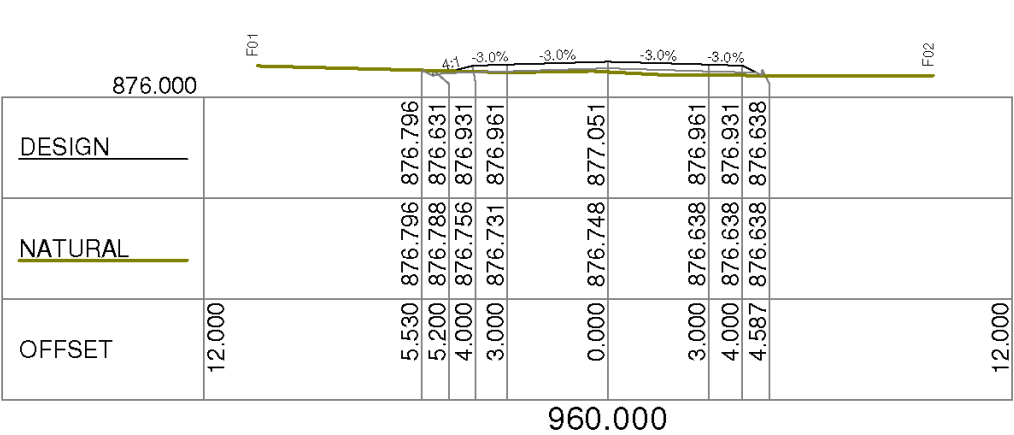
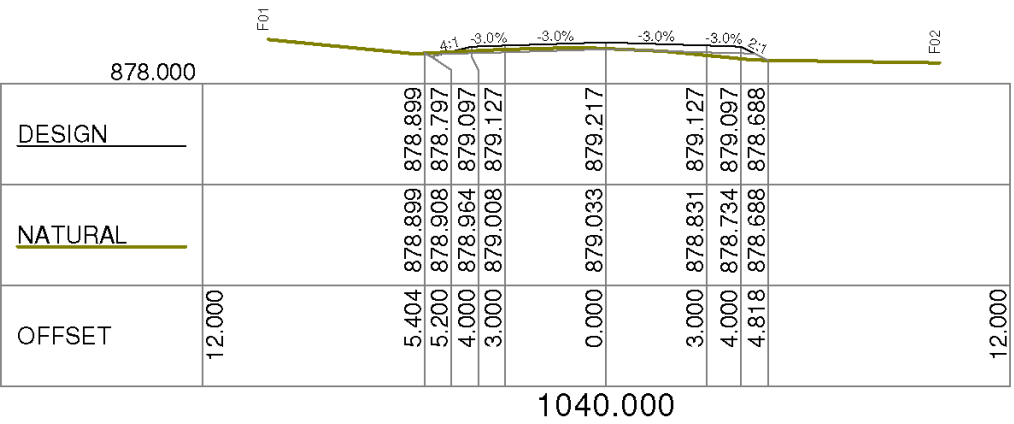
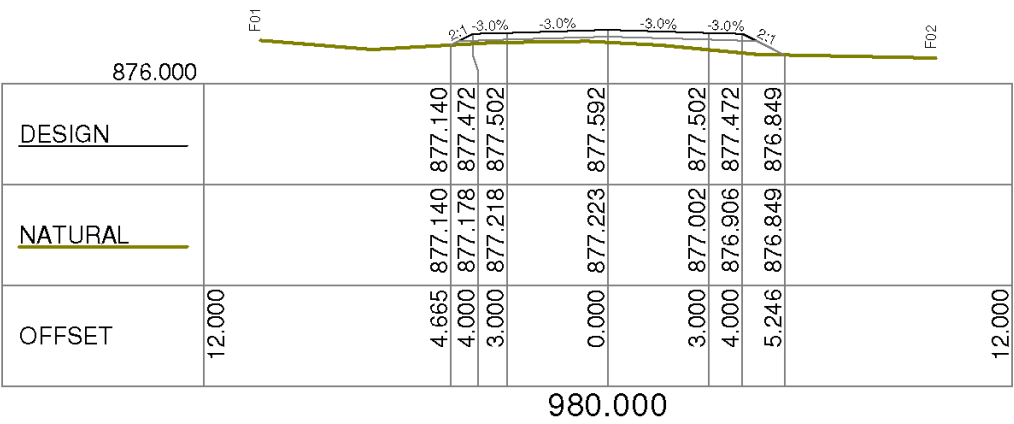
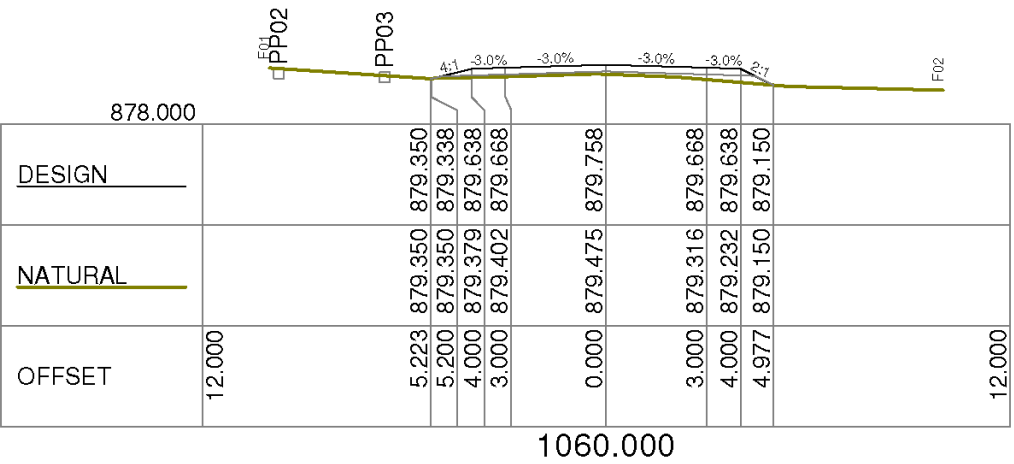
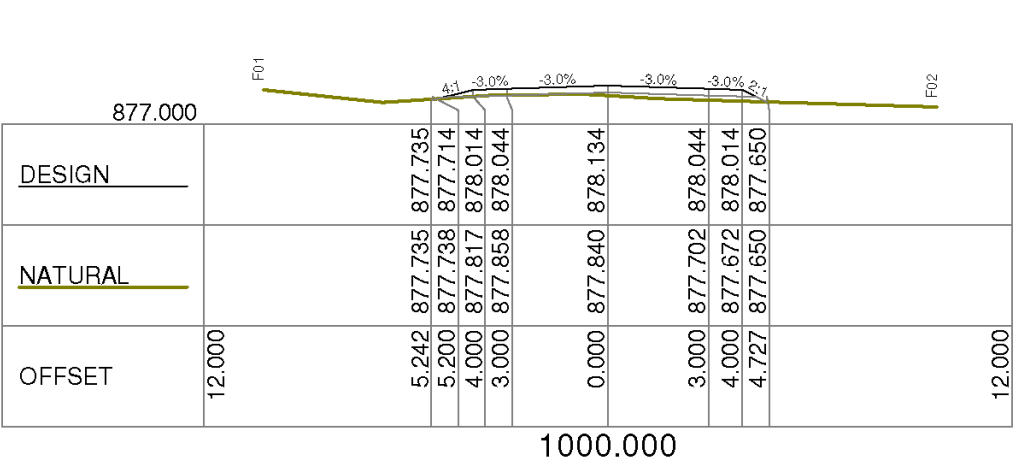
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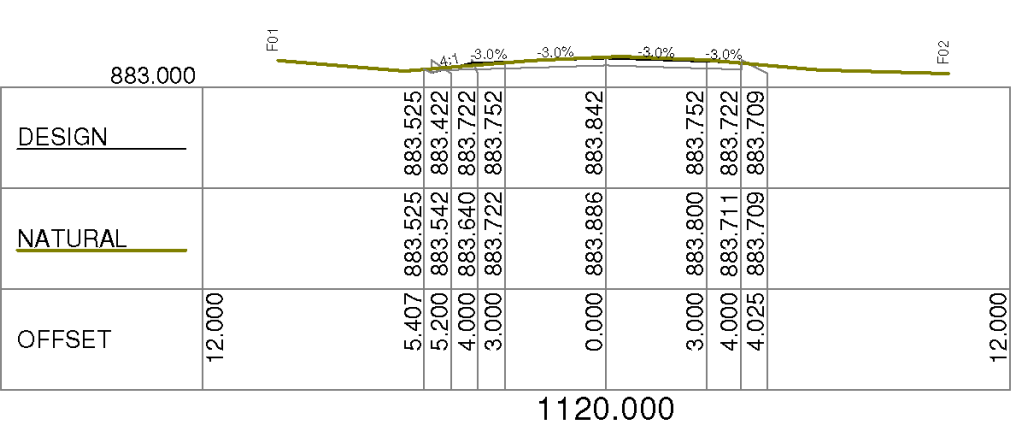
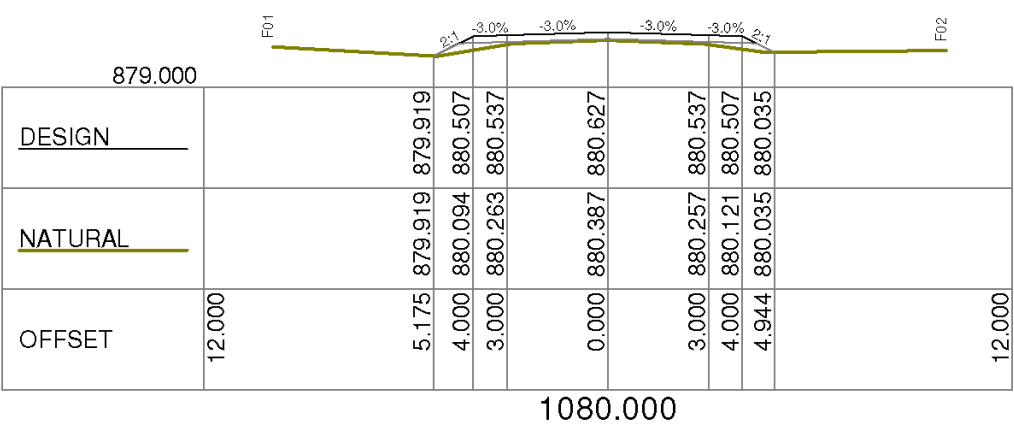
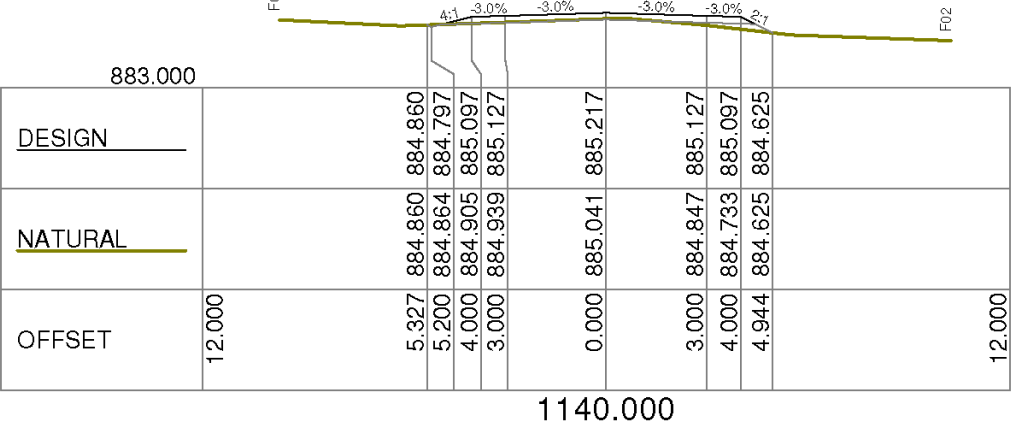
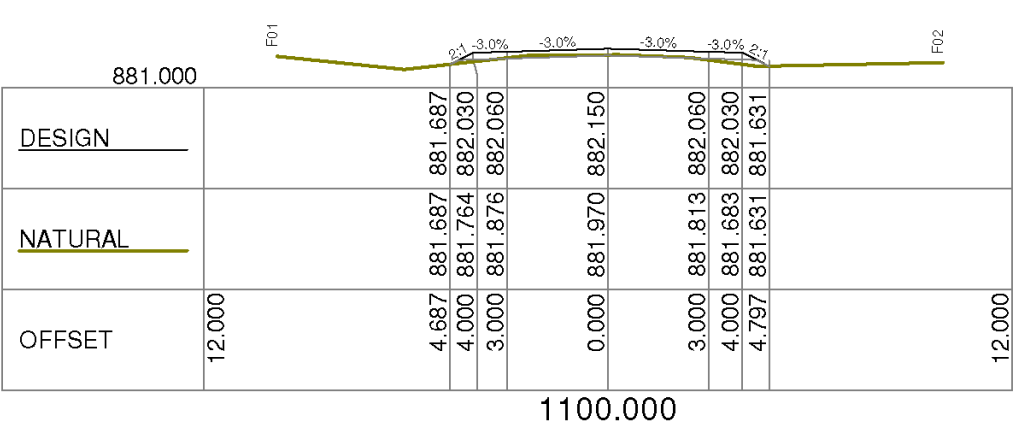
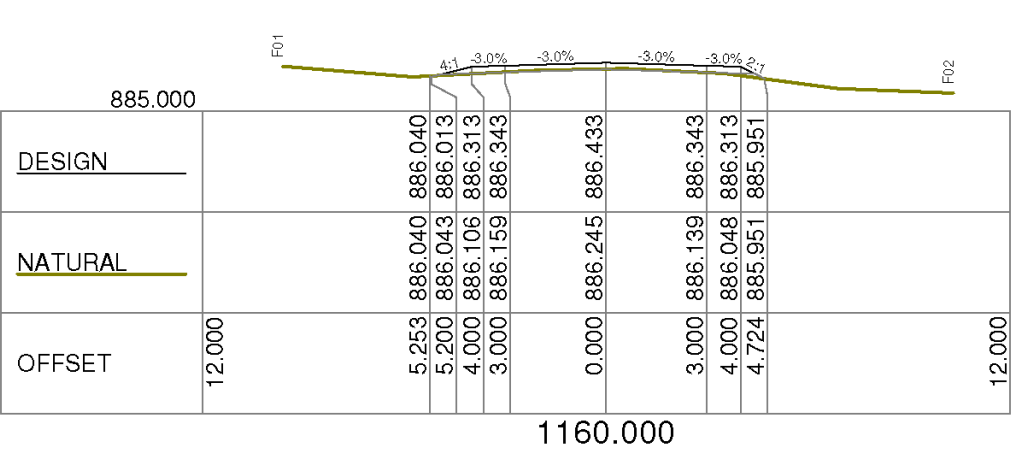
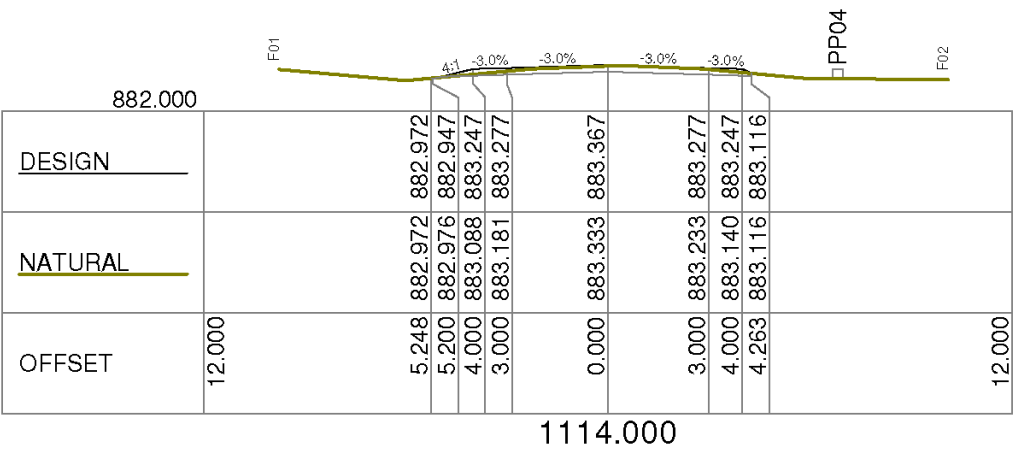
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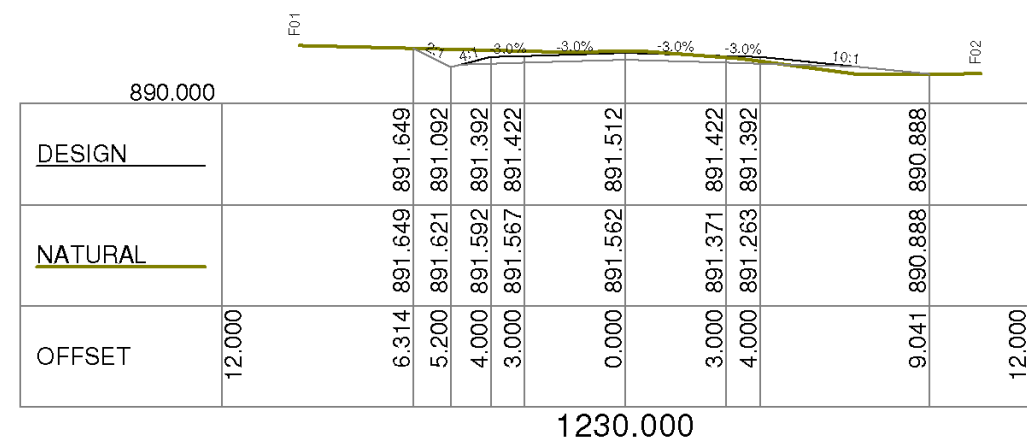
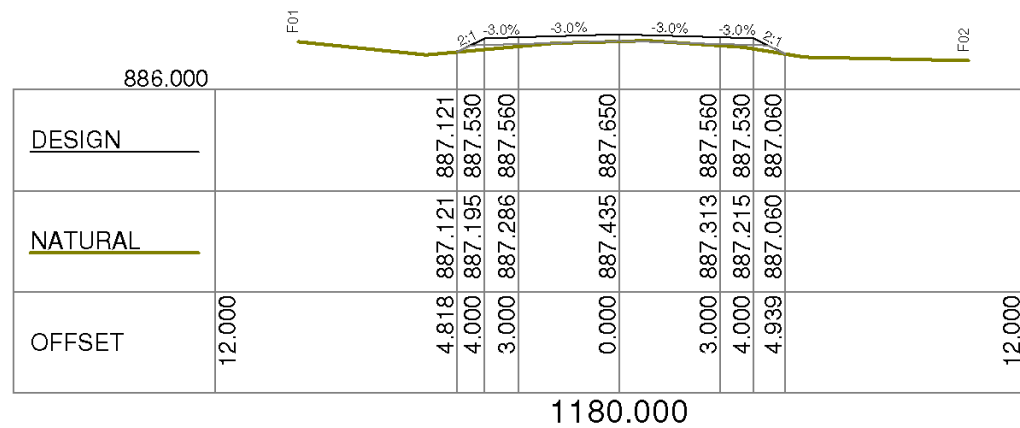
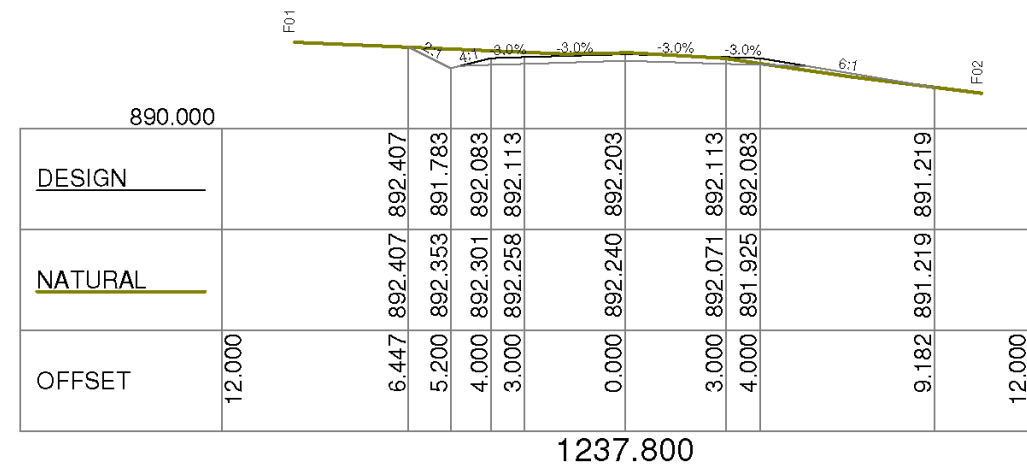
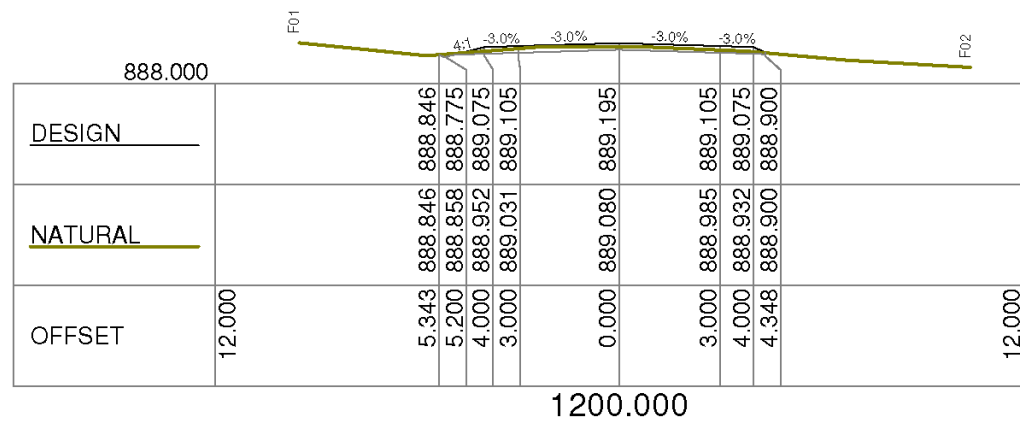
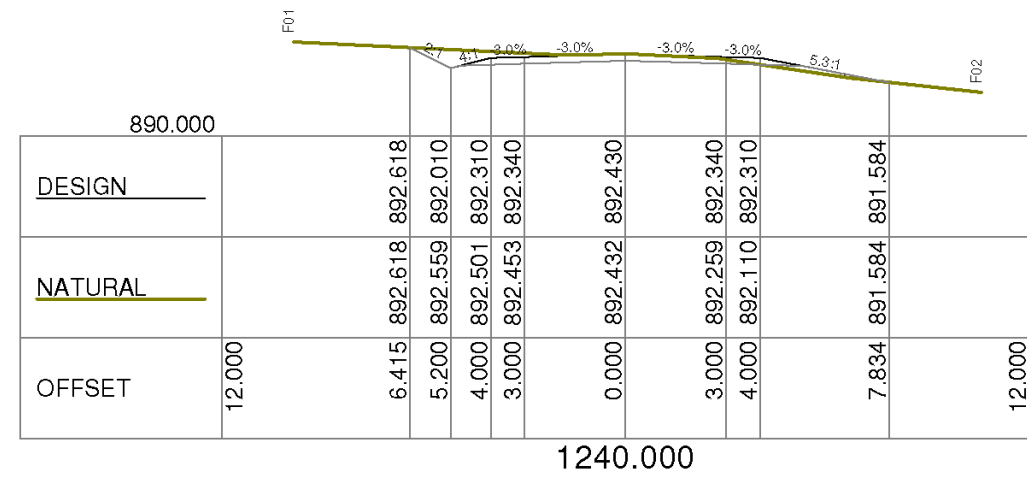
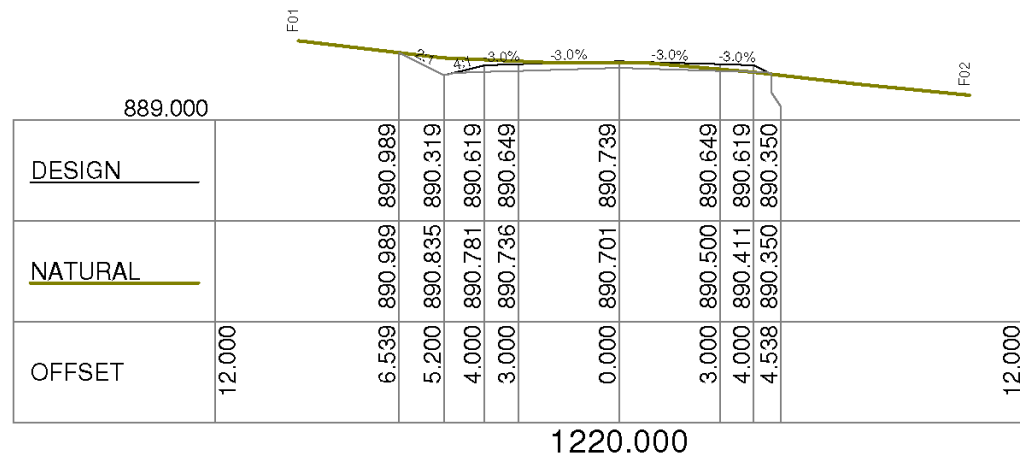
ISSUE STATUS	COORD SYSTEM	SURVEY	DESIGN	DUNCAN PRIESTLEY CIVIL ENGINEERING	DRAWING	Total Sheets: 14
	MGA Zone 55	DUNCAN PRIESTLEY CIVIL ENGINEERING	DUNCAN PRIESTLEY CIVIL ENGINEERING	PASTORAL HELICOPTERS	QUARRY ACCESS ROAD V2 - MP	
13/03/2019	HEIGHT DATUM			QUARRY ACCESS ROAD	PLAN NUMBER	Sheet: 7
	AHD	SURVEYED: D Priestley	DESIGNED: D Priestley	BLAYNEY		

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Scale Horizontal 1:200 Vertical 1:200								
ISSUE STATUS	COORD SYSTEM	SURVEY		DESIGN		DUNCAN PRIESTLEY CIVIL ENGINEERING	DRAWING	Total Sheets: 14
13/03/2019	MGA Zone 55	DUNCAN PRIESTLEY CIVIL ENGINEERING		DUNCAN PRIESTLEY CIVIL ENGINEERING		PASTORAL HELICOPTERS	QUARRY ACCESS ROAD V2 - MP	
	QUARRY ACCESS ROAD					PLAN NUMBER	Sheet: 8	
	AHD					SURVEYED: D Priestley		DESIGNED: D Priestley

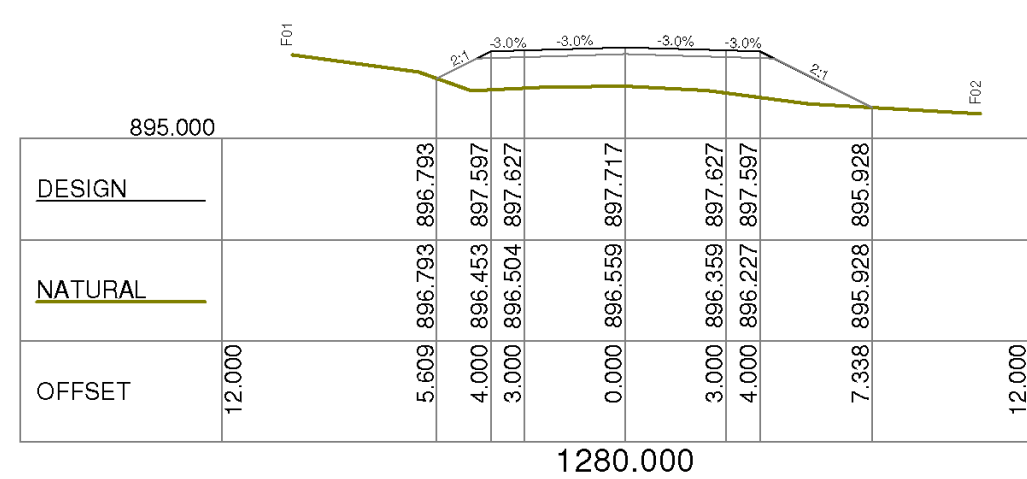
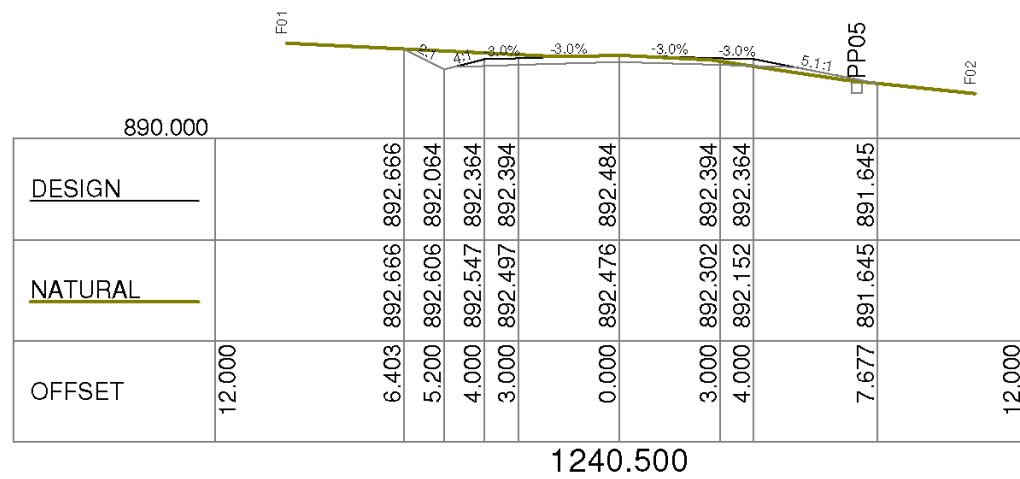
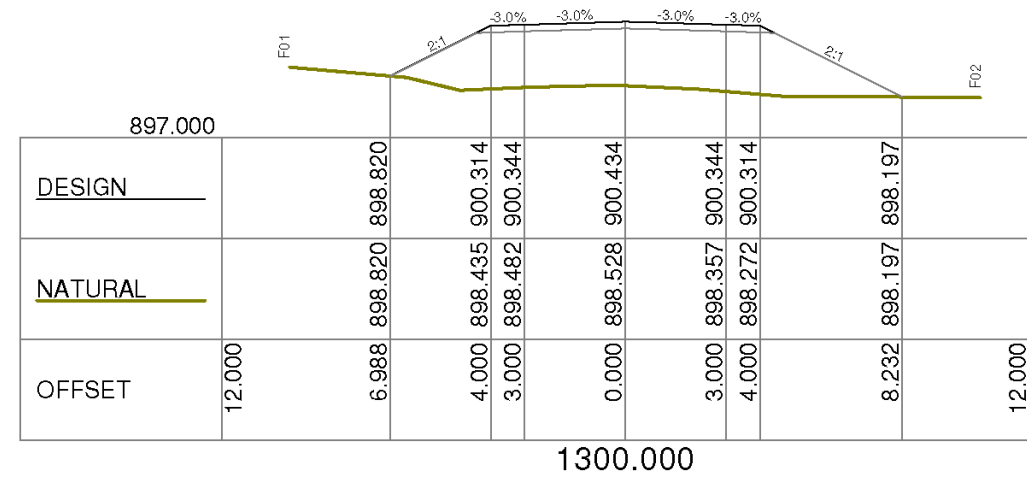
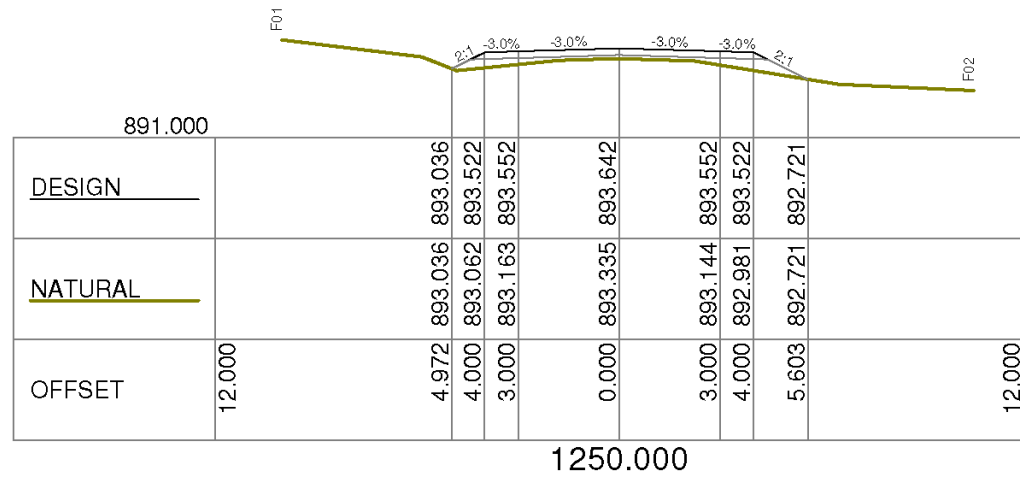
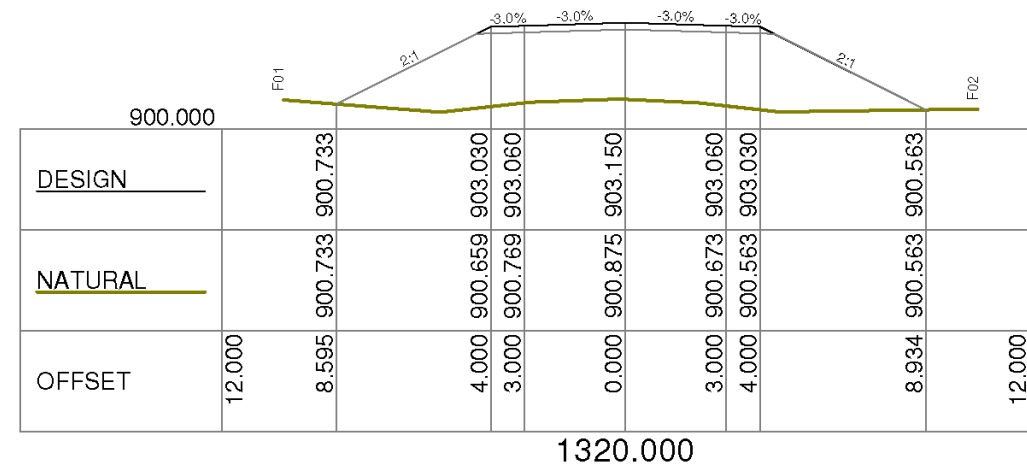
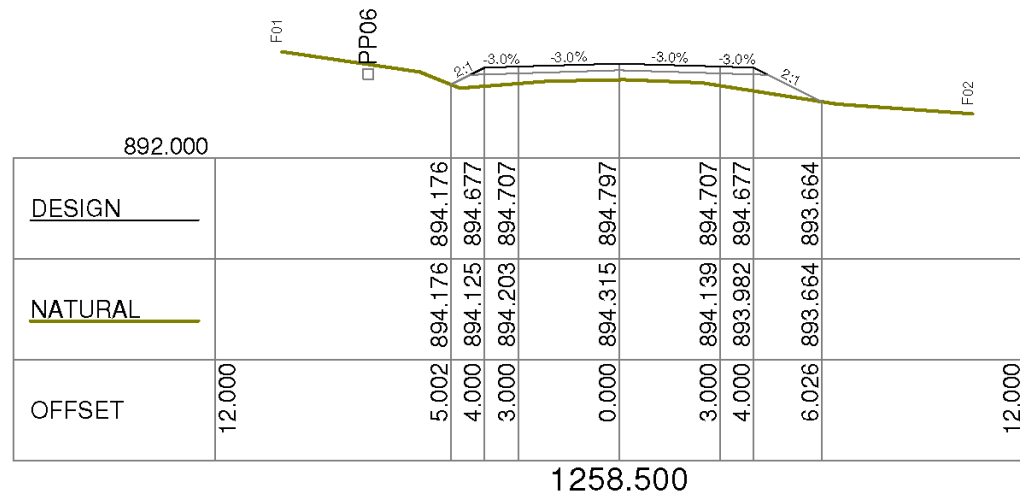
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Scale Horizontal 1:200 Vertical 1:200

Scale: Horizontal 1:200 Vertical 1:200											
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13/03/2019	HEIGHT DATUM					QUARRY ACCESS ROAD					
	AHD	SURVEYED: D Priestley	DESIGNED: D Priestley	BLAYNEY				PLAN NUMBER		Sheet: 9	

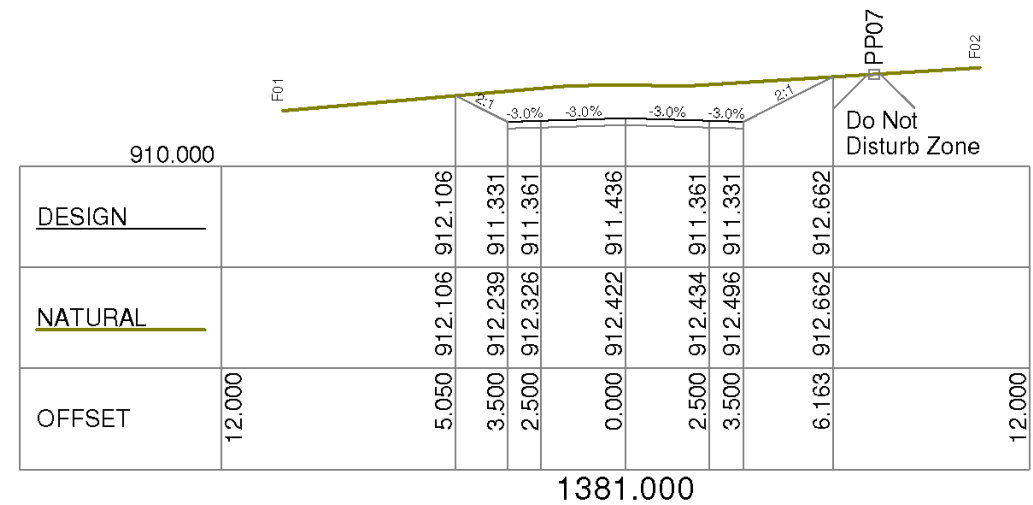
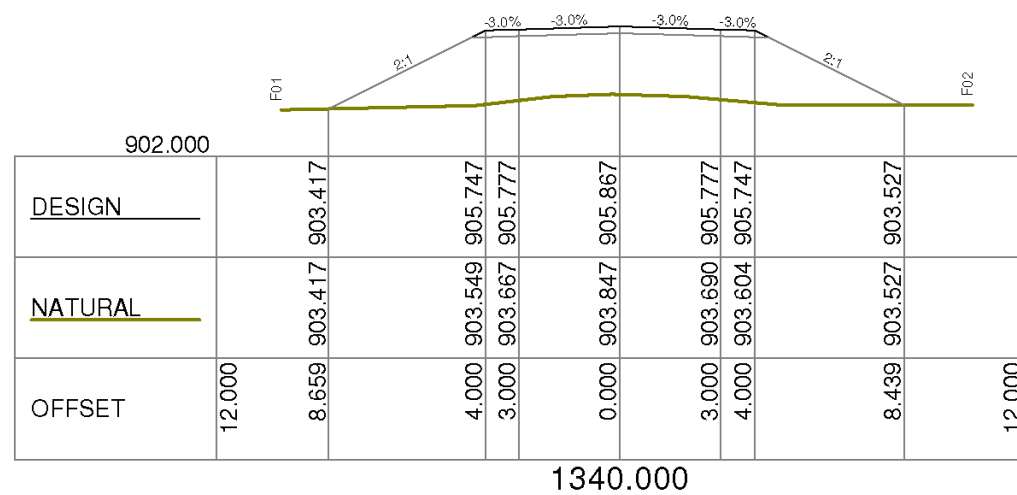
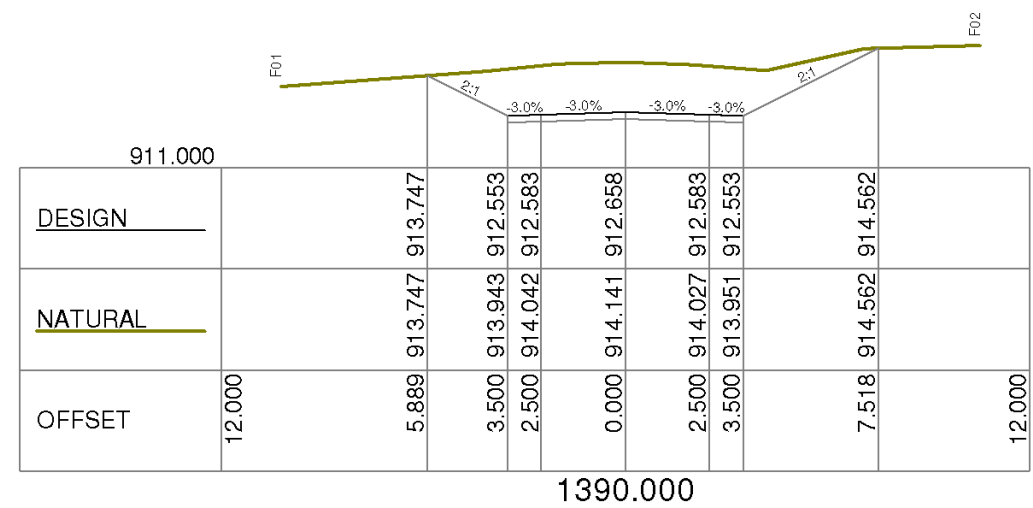
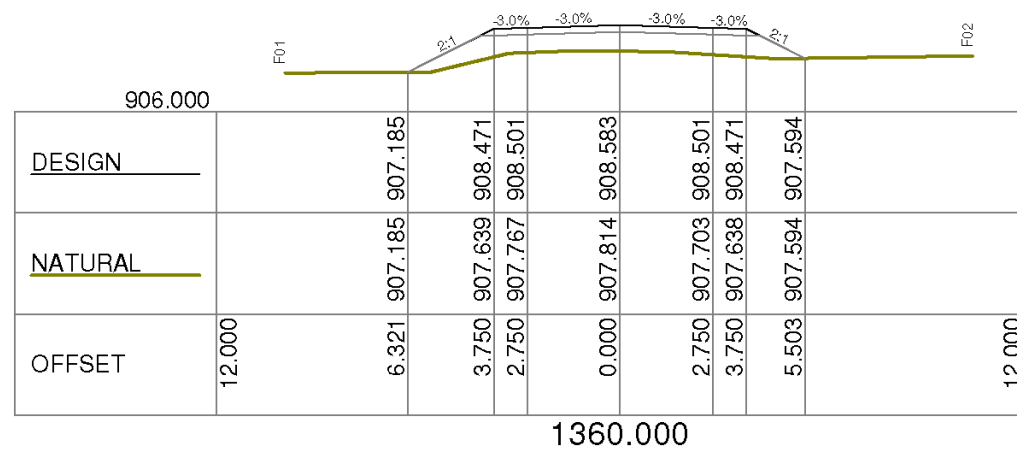
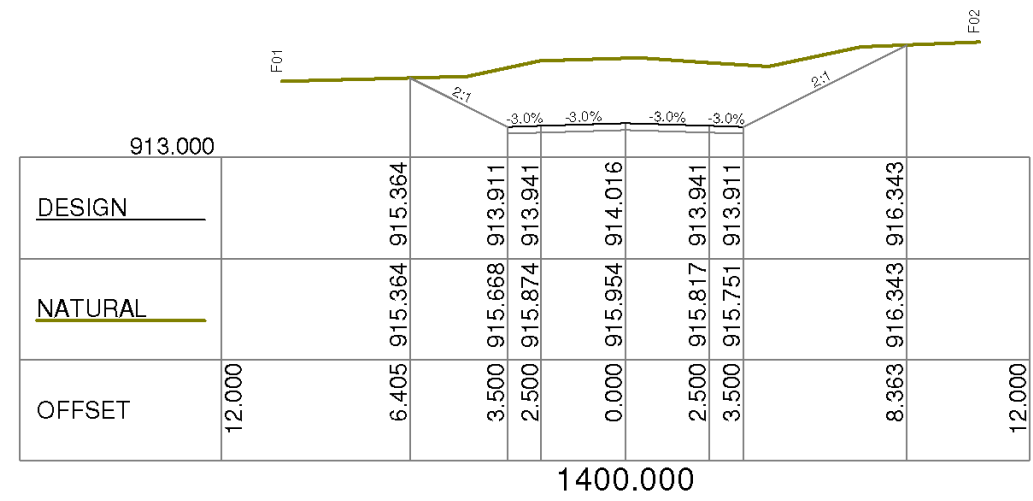
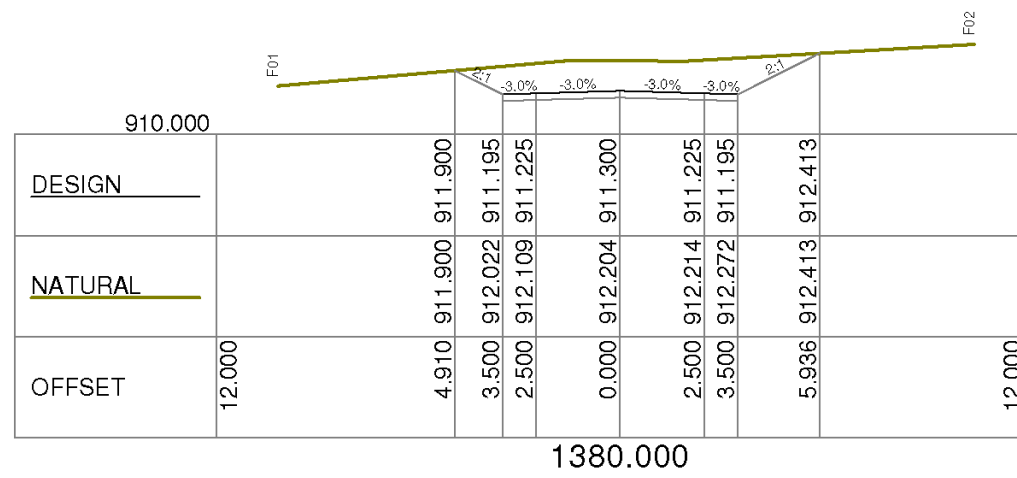
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Scale Horizontal 1:200 Vertical 1:200

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13/03/2019	HEIGHT DATUM			QUARRY ACCESS ROAD		PLAN NUMBER		Sheet: 10	
	AHD	SURVEYED: D Priestley	DESIGNED: D Priestley	BLAYNEY					

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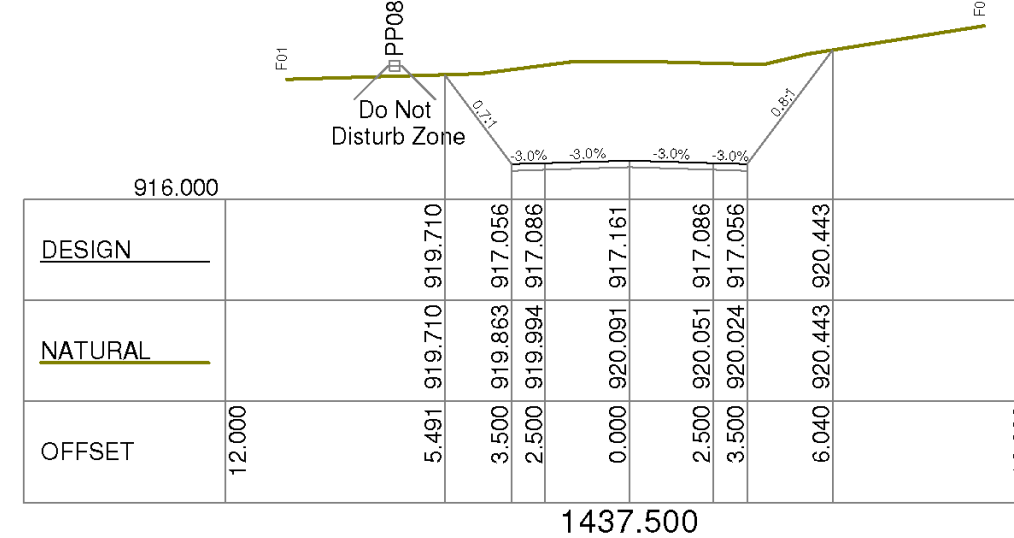
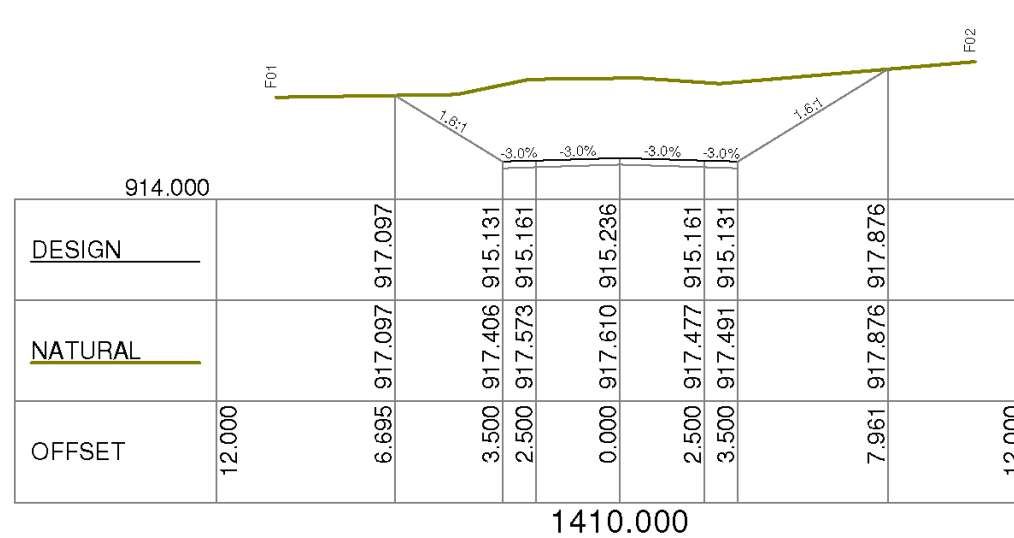
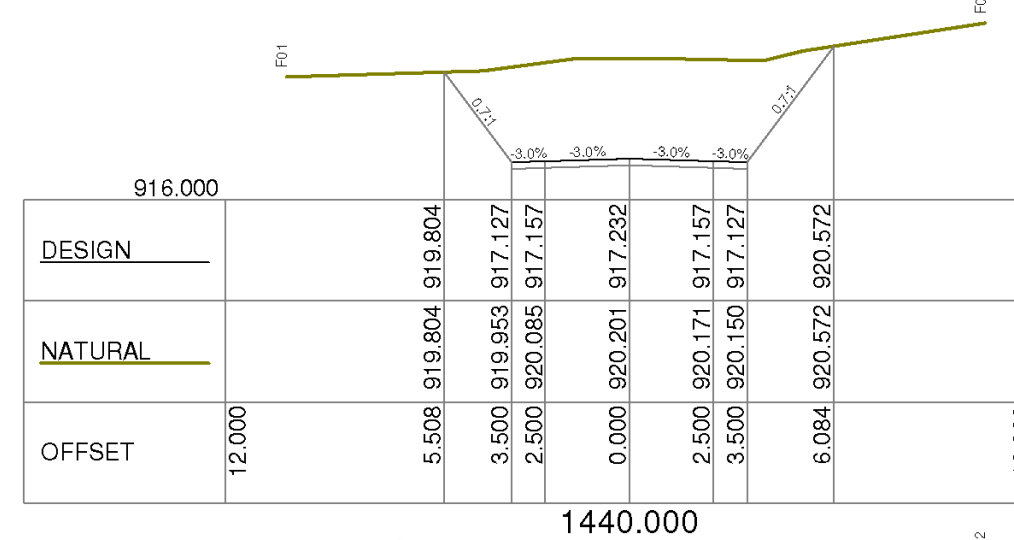
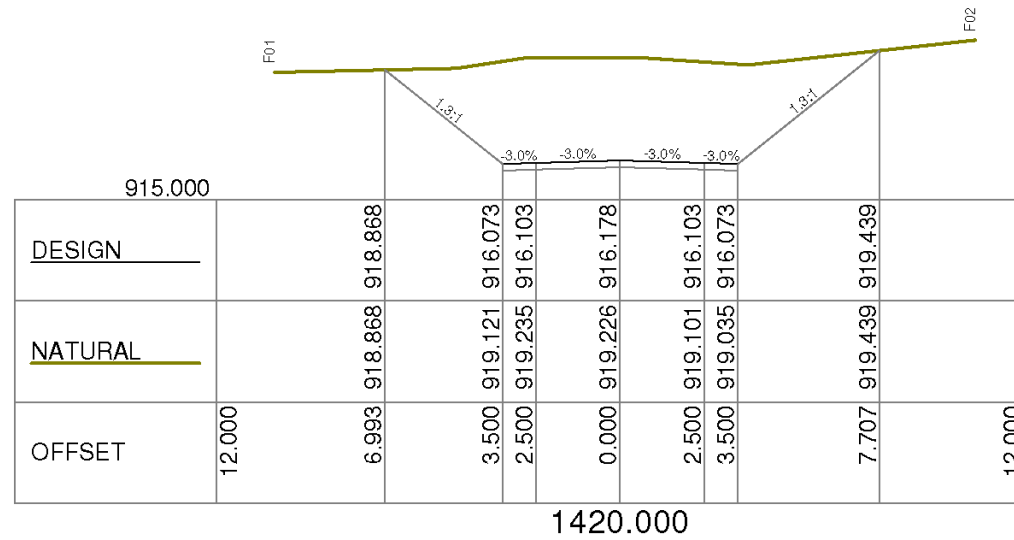
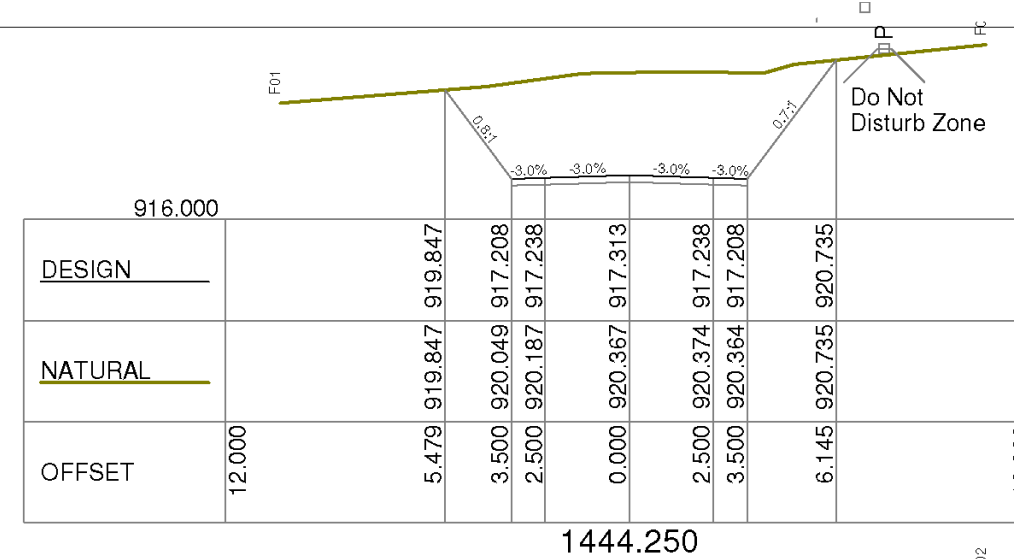
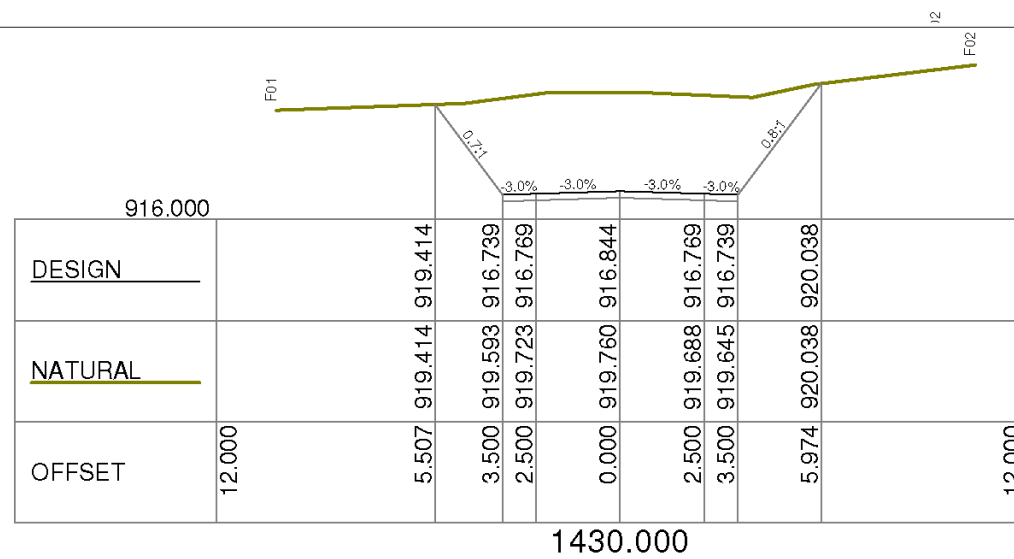


Scale Horizontal 1:200 Vertical 1:200

ISSUE STATUS		COORD SYSTEM		SURVEY		DESIGN		DUNCAN PRIESTLEY CIVIL ENGINEERING		DRAWING		Total Sheets: 14
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13/03/2019		HEIGHT DATUM						QUARRY ACCESS ROAD		PLAN NUMBER		Sheet: 11
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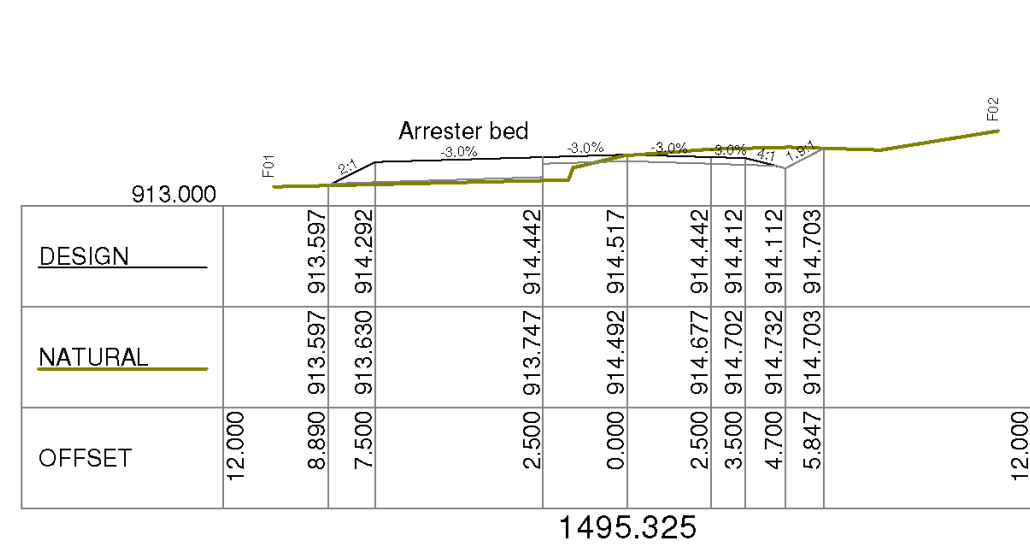
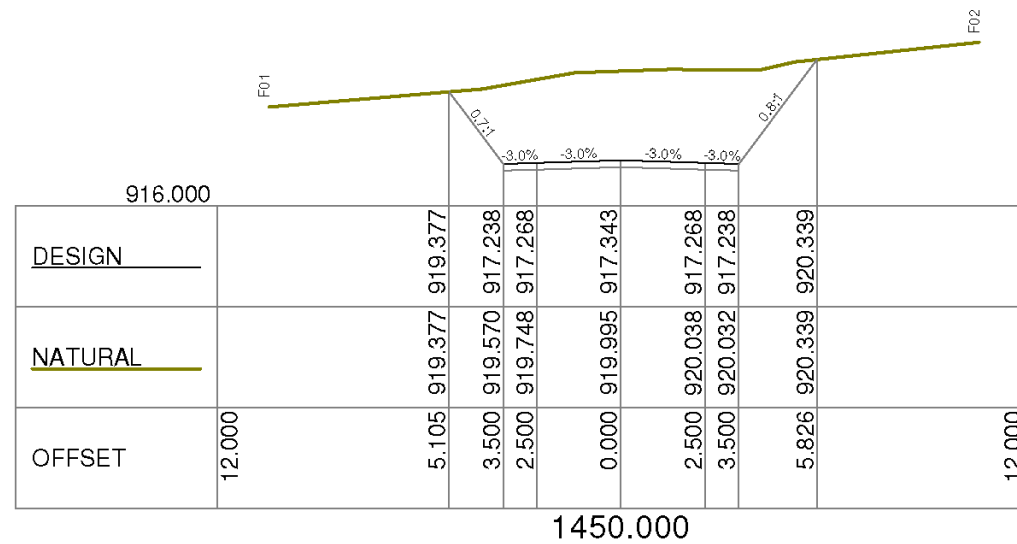
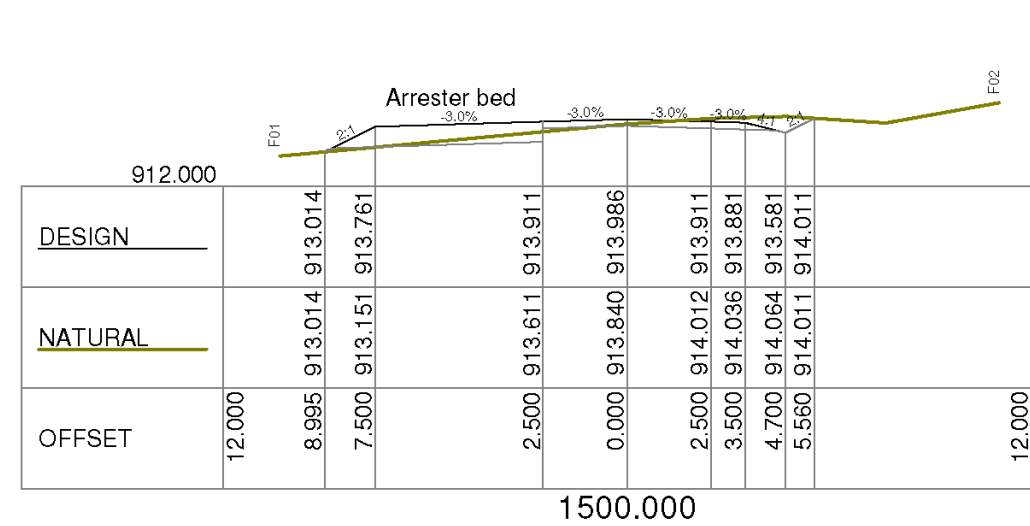
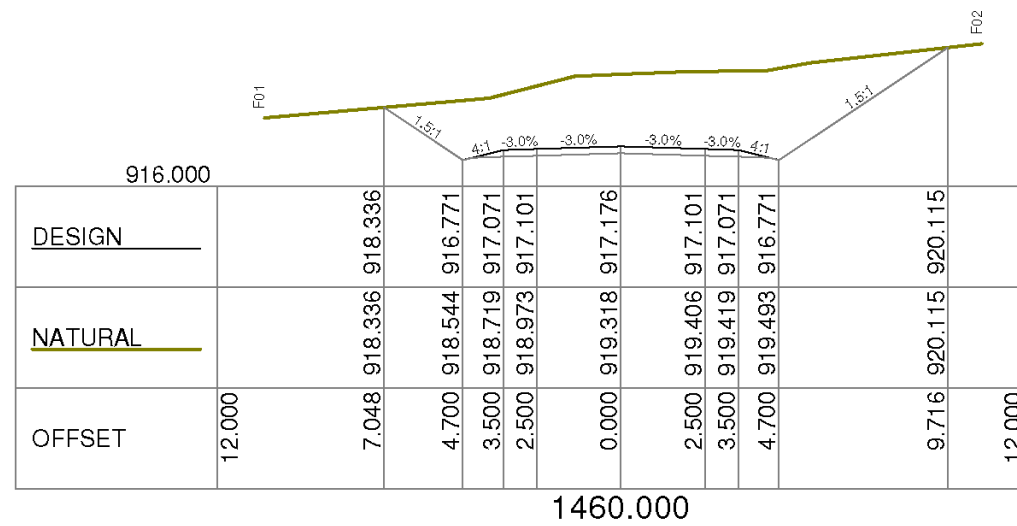
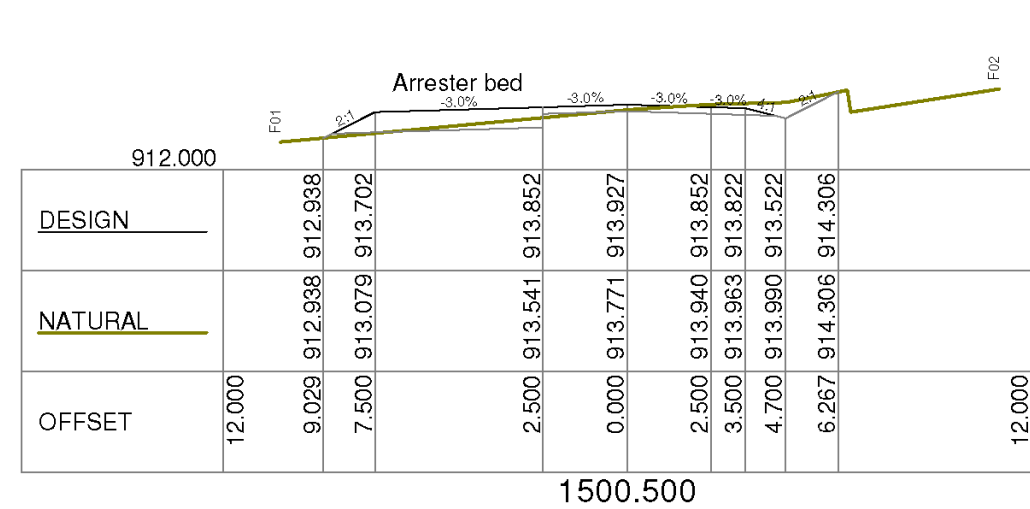
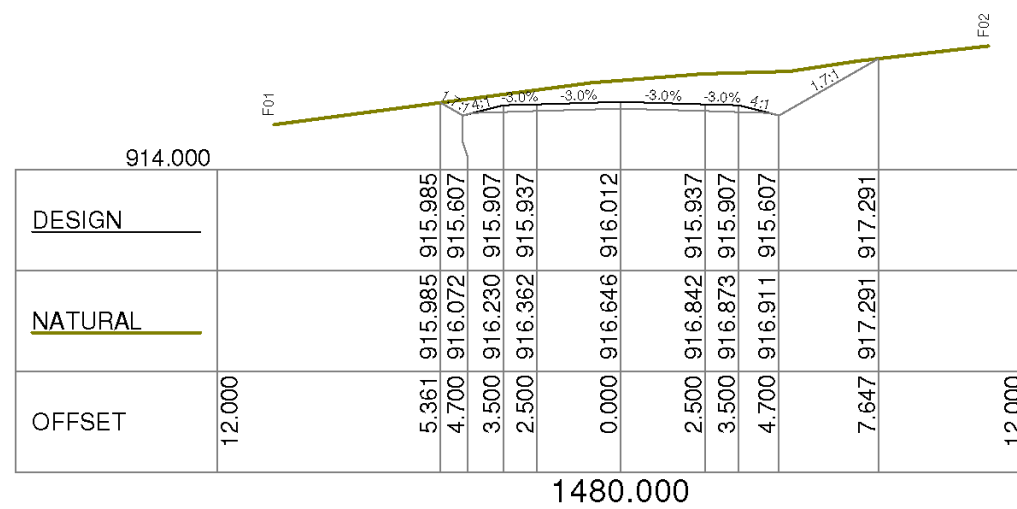
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Scale Horizontal 1:200 Vertical 1:200

Scale: Horizontal 1:200 Vertical 1:200											
ISSUE STATUS	COORD SYSTEM	SURVEY		DESIGN		DUNCAN PRIESTLEY CIVIL ENGINEERING		DRAWING		Total Sheets: 14	
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13/03/2019	HEIGHT DATUM					QUARRY ACCESS ROAD		PLAN NUMBER			
	AHD	SURVEYED: D Priestley	DESIGNED: D Priestley	BLAYNEY						Sheet: 12	

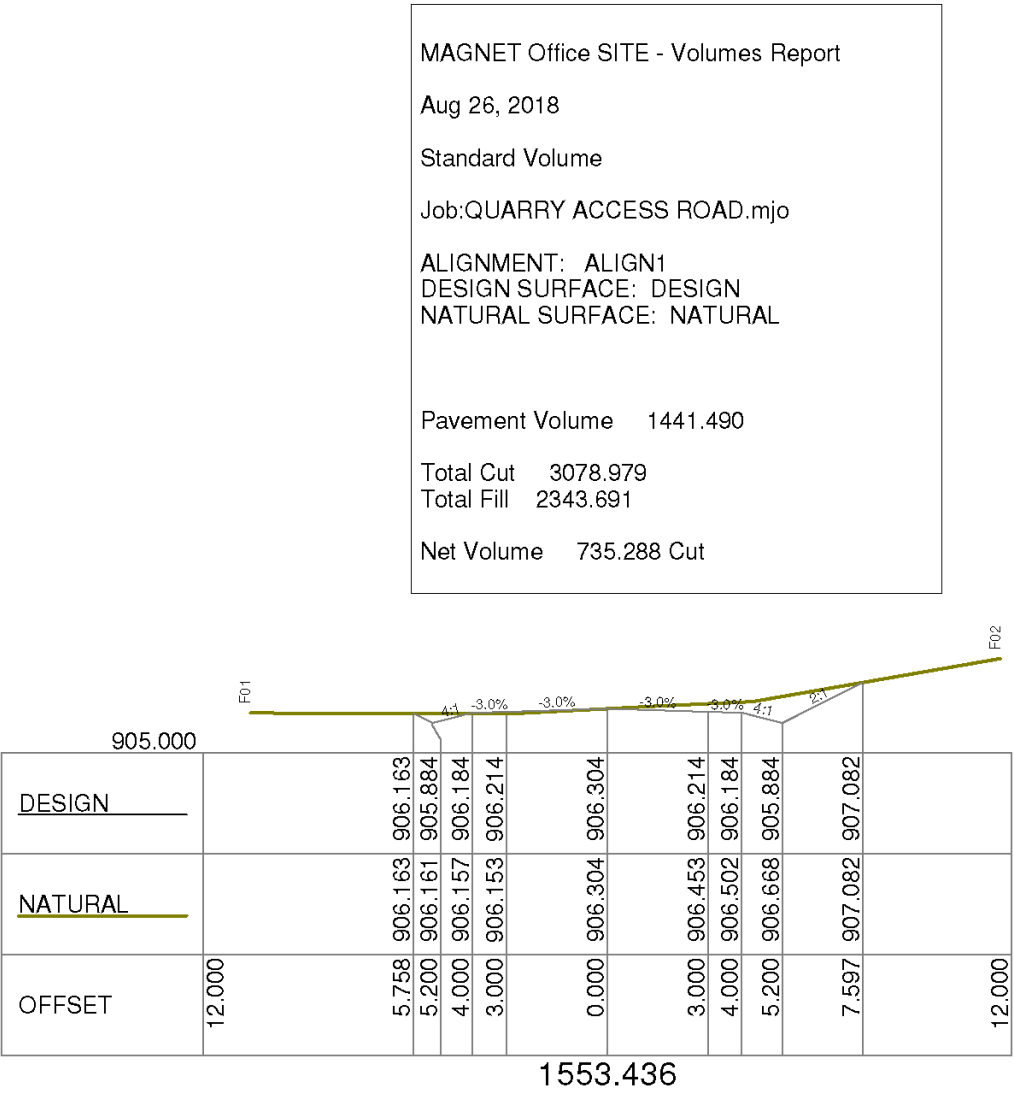
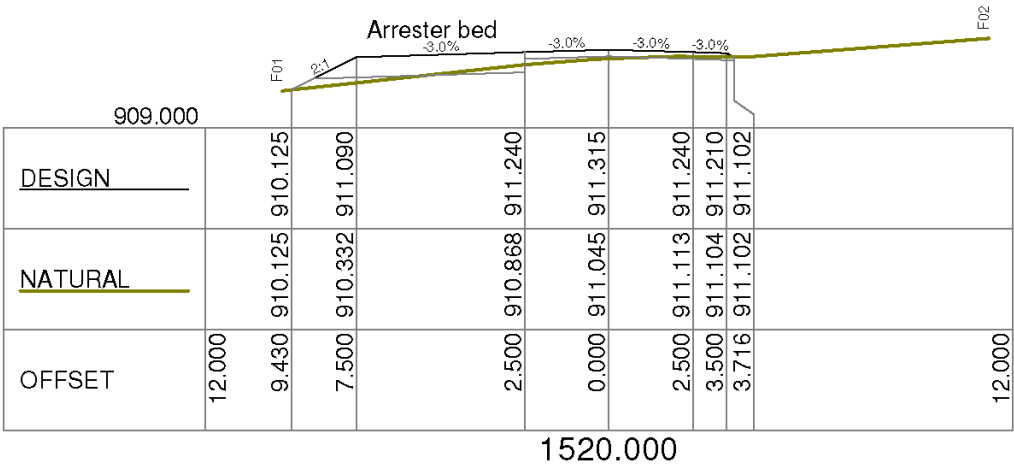
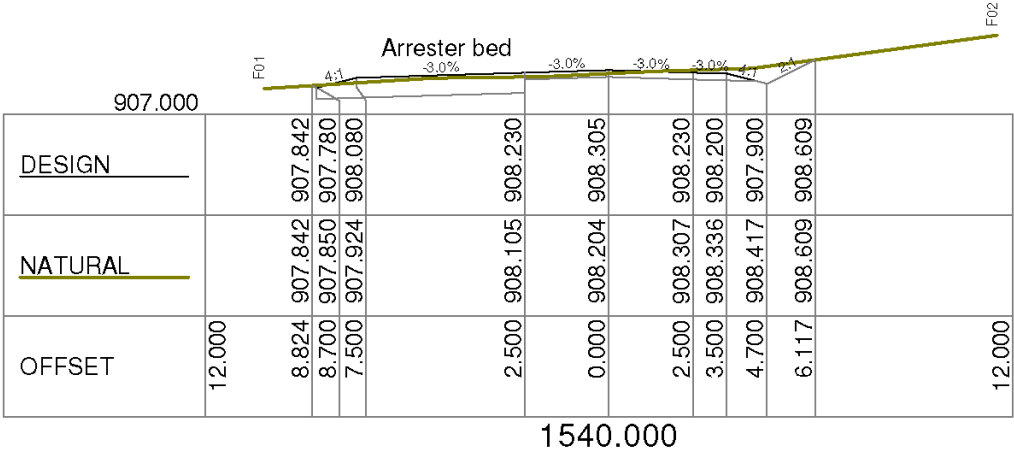
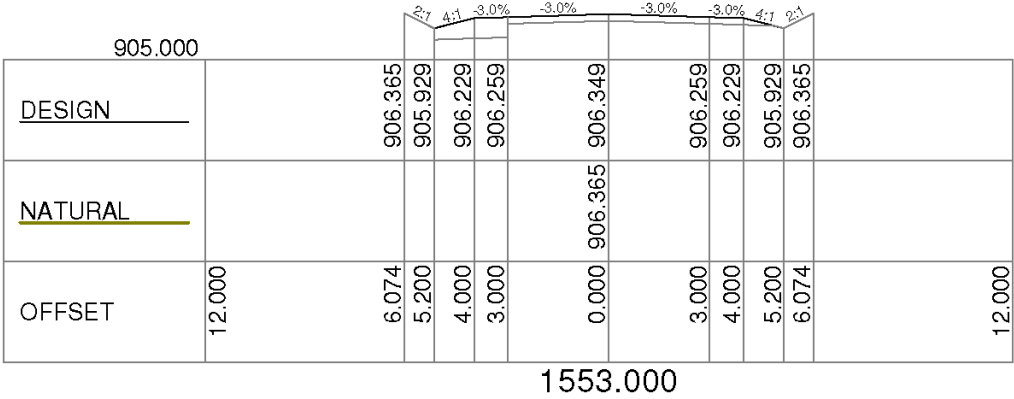
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Scale Horizontal 1:200 Vertical 1:200

ISSUE STATUS	COORD SYSTEM	SURVEY	DESIGN	DUNCAN PRIESTLEY CIVIL ENGINEERING	DRAWING	Total Sheets: 14
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13/03/2019	HEIGHT DATUM			QUARRY ACCESS ROAD	PLAN NUMBER	Sheet: 13
	AHD	SURVEYED: D Priestley	DESIGNED: D Priestley	BLAYNEY		

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MAGNET Office SITE - Volumes Report

Aug 26, 2018

Standard Volume

Job:QUARRY ACCESS ROAD.mjo

ALIGNMENT: ALIGN1
DESIGN SURFACE: DESIGN
NATURAL SURFACE: NATURAL

Pavement Volume 1441.490

Total Cut 3078.979

Total Fill 2343.691

Net Volume 735.288 Cut

Scale Horizontal 1:200 Vertical 1:200

ISSUE STATUS	COORD SYSTEM	SURVEY	DESIGN	DUNCAN PRIESTLEY CIVIL ENGINEERING	DRAWING	Total Sheets: 14
	MGA Zone 55	DUNCAN PRIESTLEY CIVIL ENGINEERING	DUNCAN PRIESTLEY CIVIL ENGINEERING	PASTORAL HELICOPTERS	QUARRY ACCESS ROAD V2 - MP	
13/03/2019	HEIGHT DATUM			QUARRY ACCESS ROAD	PLAN NUMBER	Sheet: 14
	AHD	SURVEYED: D Priestley	DESIGNED: D Priestley	BLAYNEY		

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