

06 September 2024

To	John McKee	Contact No.	02 9239 7330
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From	Marco Velasco	Project No.	12582654
Project Name	DA2024.109 – Blasting Impact Assessment		
Subject	Additional information requested by Transport for NSW		

1. Introduction

Coral Park Earthmoving & Landscape Supplies Pty Ltd (Coral Park) previously engaged GHD Pty Ltd (GHD) to prepare a Blasting Impact Assessment (BIA) to assess potential airblast, ground vibration, flyrock and air quality impacts associated with Development Application DA2024.109. Blasting is proposed as part of the proposed modification to the existing quarry at:

- Lots 5, 6 and 7 DP252443; and
- Lots 4 and 7 DP252442; and
- Lot 18 DP 851163 (NO.28) Coral Park Road, Wolumla.

Transport for NSW (TfNSW) provided comment on the Development Application (DA) that was referred on 18 June 2024 in a letter to Bega Shire Valley Council, dated 5 July 2024 (referred to as the 'Transport response'). In the letter TfNSW stated that '*TfNSW has reviewed the information provided and does not support the DA in its current form*' citing concerns with the proposed blasting and the impacts it will have on the operation of the Princes Highway.

1.1 Purpose of this report

The purpose of this report is to address the concerns cited by TfNSW and provide the additional information and assessment required as per reason 2 of the Transport response. These are provided below for reference:

Table 1 *Transport for NSW additional information and assessment*

Additional information required	Where addressed
Blasting location: The Environmental Impact Statement (EIS) and supporting information submitted with the DA do not clearly show where the blasting is proposed within the quarry, particularly in relation to the Princes Highway now and over the course of the quarry operations for which blasting will be used, which the EIS indicates will last a minimum of 30 years. To begin assessing the impacts the blasting will have on the Princes Highway, TfNSW requires a plan showing where the blasting is proposed over the quarry's life and to what depth.	A blast extraction plan has been produced by BSE Consulting and is provided in Appendix A and discussed in Section 2.
Flyrock: The calculated maximum flyrock distances in the Blasting Impact Assessment report are a concern for TfNSW given the quarry's proximity to the Princes Highway road reserve (e.g. approximately 107m from the existing quarry face and approximately 53m based on the external excavation area displayed on the Site Layout Plan). The maximum throw distance of 94m, as calculated in the 'Blasting Impact Assessment' report (Appendix E, prepared by GHD, Project No: 12582654, Revision 1 dated 22.5.24), indicates that the Princes Highway could be directly impacted. Although the report references "flyrock control management measures" (Section 4.3), it lacks specifics. TfNSW requires the applicant to outline the intended flyrock management measures for the Princes Highway.	Additional assessment of flyrock impacts has been provided in Section 3.
Vibration: TfNSW records indicate two reinforced concrete culverts located on the Princes Highway, adjacent to the quarry (Culvert No. 612242 and 612243 – refer to Attachment 2). The Blast Impact Assessment report, details that the maximum peak particle velocity of 80mm/s for reinforced concrete pipes as referenced from German Standard DN41. Andrew agreed 50-3 Table 2, is considered acceptable for these structures. TfNSW requires the applicant to outline how vibration monitoring at these structures will be carried out to ensure that this level is not exceeded, notify TfNSW when/if 80mm/s is exceeded	Additional assessment of vibration impacts to the two culverts has been provided in Section 4.

Additional information required	Where addressed
on any blast and detail when dilapidation surveys of the two culverts will be undertaken by the proponent (e.g. once a year) and that approval/advice from TfNSW on the dilapidation survey will be obtained and any works required to repair damage caused completed before blasting recommences.	

1.2 Limitations

This report: has been prepared by GHD for Coral Park Earthmoving & Landscape Supplies Pty Ltd and may only be used and relied on by Coral Park Earthmoving & Landscape Supplies Pty Ltd for the purpose agreed between GHD and Coral Park Earthmoving & Landscape Supplies Pty Ltd as set out in section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than Coral Park Earthmoving & Landscape Supplies Pty Ltd arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

2. Blasting location

Blasting is proposed in three stages to a design depth of 150m AHD consistent with the existing pit floor level. Each stage would occur for a period of 10 years, starting from the southeast of the extraction area and progressively moving towards the northwest of the extraction area.

The blast extraction plan prepared by BSE Consulting is shown in Appendix A and shows the overall extraction area and the horizontal and vertical extents of the Stage 1, Stage 2 and Stage 3 extraction area.

The approximate nearest distances from each extraction area to the Princes Highway road reserve, Culvert No. 612242 and Culvert No. 612243 is shown in Table 2.

Table 2 *Nearest distances to the extraction area*

Indicative timing	Extraction area	Approximate nearest distance to Transport for NSW infrastructure		
		Princess Highway road reserve	Culvert no. 612242	Culvert No. 612243
First year to 10 th year	Existing face of the quarry	105 metres	155 metres	205 metres
	Stage 1 extent	55 metres	115 metres	165 metres
11 th year to 20 th year	Stage 2 extent	45 metres	90 metres	180 metres
21 st year to 30 th year	Stage 3 extent	55 metres	95 metres	275 metres

2.1 Blasting management

The management of potential blasting impacts (flyrock, airblast overpressure, ground vibration) would be through the Blast Management Plan (BMP) for the quarry and would be developed to once the development conditions are known. Prior to each blast, a pre-blast plan would be prepared to detail the blast location, the risk reduction mitigation and management measures, the monitoring requirements and blast design details for each shot. After any use of explosives, a post-blast record would be completed to document the blast design parameters, the environmental monitoring results, any observed flyrock and any feedback measures that would need to be incorporated into the BMP.

The indicative contents and timing for each document are summarised in Table 3. The standard management measures recommended in the EIS Blasting Impact Assessment will be integrated into the BMP and are provided in Appendix B for reference.

Table 3 *Blast management documents*

Document	Timing	Required contents (subject to consent conditions)
Blast Management Plan (BMP)	Post-approval and during quarry operation	– Objectives and outcomes – Approved hours – Licences and consent conditions – Key personnel and responsibilities – Approved extraction area – Surrounding residences and sensitive structures – Airblast overpressure and ground vibration limits – Blast design guidance – Monitoring requirements – Mitigation measures – Dilapidation reports – Reactive management measures – Complaints register
Pre-blast plan (PBP)	To be completed by the shotfirer prior to any use of explosives	– Blast location – Distances to residences and structures – Flyrock risk management – Exclusion zones – Environmental monitoring details – Security arrangements / warning details – Initiation method – Explosives used / charging details – Blast design
Post-blast record (PBR)	To be completed by the shotfirer within 24 hours after any use of explosives	– Weather conditions during blast – Environmental monitoring equipment – Post-blast monitoring report and analysis – Blast layout plan

3. Additional flyrock assessment

3.1 Flyrock predictions

Flyrock would normally originate from incorrect selection or application of burden, stemming length or by blast holes being initiated out of sequence. If the fly rock management requirements of AS2187.2-2006 (Explosives – Storage and use Part 2: Use of explosives) are followed, flyrock is anticipated to only occur in the area local to the blast.

There are three mechanisms due to lack of confinement of the energy in the explosive column adjacent to the blast point, being:

- **Face burst:** burden conditions usually control flyrock distances in front of the face
- **Cratering:** if the stemming height to hole diameter ratio is too small or the collar rock is weak, flyrock can be projected in any direction from a crater at the hole collar
- **Rifling:** if the stemming height is adequate to prevent cratering, flyrock at a high trajectory can result from rifling. This is the ejection of stemming material and loose rocks from the collar if there is insufficient stemming height or inappropriate stemming material is used.

The maximum predicted flyrock throw distances are presented in Table 5 estimated based on the blast design parameters in Table 4. The primary design parameters influencing the potential flyrock throw are highlighted in **bold**. These details are based on the *Coral Park Quarry Blast Plan* (Tablelands Explosives.2, 2022). The predicted maximum throw distance is 91 metres due to a face burst.

Table 4 *Blast design parameters*

Parameter	Description
Ground type	Granite
Total quantity of explosives	7.1 tonnes
Prime	150 g megaprime
Powder factor	0.78
Number of holes	140
Diameter of holes	89 mm
Spacing of hole	2.4 m
Depth of hole	10.2 m
Height of stemming	2.7 m
Stemming type	14 mm stemming
Charge mass per delay (MIC)	51.3 kg
Burden	2.6 m
Delay per hole	400 ms
Charge mass per linear metre	7.9 kg/m

Table 5 *Maximum predicted flyrock throw distances*

Item	Maximum throw distance, m	Flyrock generation mechanisms (illustration)
Face burst	91	
Cratering	83	
Stemming	53	

At the commencement of blasting the extraction area (at the existing quarry face), the Princes Highway road reserve would be outside the maximum predicted flyrock throw distance (approximately 110 m from the Princes Highway). Portions of the Stage 1, Stage 2 and Stage 3 extraction areas are within the 91 metre maximum predicted flyrock distance based on a blast charge mass of 7.9 kg per linear metre. The closest extraction area location is the western boundary of the Stage 2 extent which is 45 metres from the Princess Highway road reserve. To reduce the maximum flyrock throw distance to below 45 metres, the blast charge mass would have to be reduced to 5 kg/m.

3.2 Flyrock risk management

In addition to the standard management measures in Appendix B, the following additional mitigation measures are recommended to be implemented by the blast contractor:

- A minimum burden of 2.6 metres and stemming height of 2.7 metres should be maintained for all blasts
- A 100 m buffer distance from the Princes Highway road reserve will be adopted, where:
 - Blasts within 100 m from the Princes Highway road reserve will not have a charge mass greater than 5 Kg per linear metre.

- For all other areas within the extraction area, blasts will not have a charge mass greater than 8 Kg per lineal metre
- Any observed flyrock is to be documented in the post-blast report. Should any flyrock be observed outside the predicted maximum flyrock distances (91 metres for 7.9 kg/m and 45 metres for 5.0 kg/m), the flyrock risk management measures are to be refined.

4. Additional vibration assessment

4.1 Predicted ground vibration levels

Ground vibration is the pressure wave produced by a blast and transmitted through the ground. The ground vibration that is transmitted is complex and can propagate at different velocities depending on the medium it is travelling through.

The ground vibration generated from a blast can be estimated using the following equation outlined in Appendix J7.3 of AS2187.2:2006:

$$V = K_g \left(\frac{R}{Q^{\frac{1}{2}}} \right)^{-1.6}$$

The variables of the equation above are detailed in Table 6. Values for the site constant (K_g) are based on 'average site conditions' outlined in AS2187.2:2006.

The ground vibration that is generated is dependent on the maximum instantaneous charge (effective charge mass per delay) and not the total charge mass assuming that the delay interval has been selected appropriately.

Table 6 Ground vibration variables

Variable	Description	Units	Range
V	Peak particle velocity	mm/s	-
R	Distance from blast	Metres, m	50 to 2000
Q	Maximum instantaneous charge	Kilograms, kg	5 to 50, in 5 kg increments
K_g	Site / rock property constant	-	1140 for 'average' conditions

Predicted ground vibration levels are based on a charge mass of 51.3 kg as defined in the *Coral Park Quarry Blast Plan*. The distance at which a ground vibration level of 80 mm/s would be exceeded is predicted to be 38 metres and is shown in Table 7.

Table 7 Ground vibration impact distance for the Culvert 612242 and 612243

Source	Item	Limit, mm/s	Potential vibration impact distance, m
DIN4150	Road infrastructure, public utilities	80	38

Based on the minimum distances from each extraction area to each culvert, the predicted ground vibration level is presented in Table 8. The maximum predicted ground vibration level at a culvert is 20 mm/s during Stage 2 extraction (distance of 90 metres) and is well below the vibration criteria of 80 mm/s.

Table 8 Predicted ground vibration level at each culvert

Indicative timing	Extraction area	Approximate nearest distance to Transport for NSW infrastructure		Predicted ground vibration level, PPV mm/s	
		Culvert no. 612242	Culvert No. 612243	Culvert no. 612242	Culvert No. 612243
First year to 10 th year	Existing face of the quarry	155	205	8	5
	Stage 1 extent	115	165	13	8

Indicative timing	Extraction area	Approximate nearest distance to Transport for NSW infrastructure		Predicted ground vibration level, PPV mm/s	
		Culvert no. 612242	Culvert No. 612243	Culvert no. 612242	Culvert No. 612243
11 th year to 20 th year	Stage 2 extent	90	180	20	7
21 st year to 30 th year	Stage 3 extent	95	275	18	3

4.2 Culvert risk management

The predictions outlined in Section 4.1 suggest that the risk of damage to the two culverts is low, with a maximum predicted PPV level of 20 mm/s at Culvert 612242 and 8 mm/s at Culvert 612243. However, in the interest of caution and to ensure ongoing compliance, the following mitigation measures will be incorporated into the Blast Management Plan. These measures will remain in place until Transport for NSW is confident that ground vibration levels will consistently remain well below the 80 mm/s limit for the duration of the project.

4.2.1 Dilapidation surveys

- A dilapidation survey of the two culverts (612242 and 612243) will be conducted prior to the commencement of blasting activities to establish a baseline condition of the structures.
- Subsequent annual dilapidation surveys will be undertaken to monitor the condition of the culverts throughout the life of the project. These reports will be submitted to TfNSW for review.
- While no damage is expected, should any damage be identified as a result of the project, repairs will be undertaken in accordance with TfNSW's guidance. All necessary repair works will be completed before blasting activities are resumed.

4.2.2 Blast Vibration monitoring

- Vibration monitoring will be conducted at the culverts during blasting events to demonstrate compliance with the 80 mm/s vibration limit.
- Should the 80 mm/s threshold be exceeded during any blast, TfNSW will be notified promptly, and appropriate mitigation measures will be implemented before any further blasting proceeds.

5. Conclusion

Blast Management Plan

The Blast Management Plan (BMP) will be developed to outline all necessary measures for controlling potential impacts associated with blasting, including pre-blast planning and post-blast reporting. The BMP will detail the blast location, risk reduction strategies, monitoring requirements, and mitigation measures, ensuring that operations adhere to the relevant consent conditions.

Flyrock Assessment and Mitigation

Flyrock risks have been assessed, and the predicted maximum throw distance is 91 meters. To ensure the safety of nearby infrastructure, including the Princes Highway, the blast charge mass will be reduced in areas within 100 meters of the Princess Highway road corridor. Additional mitigation measures, such as maintaining adequate burden and stemming height, will be implemented. Ongoing monitoring and adjustments will be made based on observed flyrock behaviour to mitigate risks further.

Ground Vibration Assessment and Mitigation

Ground vibration levels have been assessed, with the maximum predicted peak particle velocity (PPV) at the culverts being 20 mm/s—well below the 80 mm/s threshold. Vibration monitoring will be conducted to confirm compliance with vibration limits, and any exceedance of the threshold will be immediately reported to Transport for NSW, with corrective actions taken before further blasting.

A dilapidation survey of the two culverts (612242 and 612243) will be conducted prior to the commencement of blasting activities to establish a baseline condition of the structures. Subsequent annual dilapidation surveys will be undertaken to monitor the condition of the culverts throughout the life of the project. These reports will be submitted to TfNSW for review.

These measures ensure that blasting operations are carried out safely and in accordance with TfNSW's requirements, with minimal impact on surrounding infrastructure and roadways.

Project name		DA2024.109 – Blasting Impact Assessment					
Document title		Additional information requested by Transport for NSW					
Project number		12582654					
File name		12582654_LET_Response_TfNSW_Wolumla Gravel Pit.docx					
Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S4	0	M.Velasco	E Milton	*on file	E Milton	*on file	06/09/24

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Appendix A

Blast Extraction Plan

ORIENT: TRUE NORTH
MCA NORTH

BLASTING PLAN

Coral Park Road Wollumbi NSW SCALE 1:1500



LEGENDS:



BOUNDARY OF PRINCES
HIGHWAY ROAD CORRIDOR



100-METER OFFSET FROM
HIGHWAY CORRIDOR



EXTRACTION AREA



CADASTRAL BOUNDARY



LOCATION OF BOX
CULVERTS NOS. 612242
AND 612243

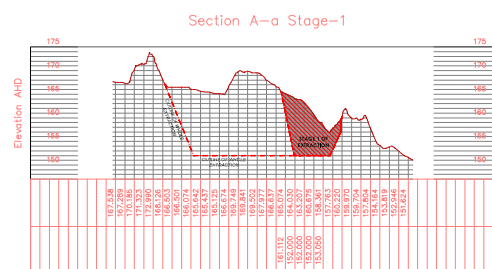
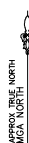
STAGES IN YEARS

STAGE 1: 1ST TO 10TH YEAR
STAGE 2: 11TH TO 20TH YEAR
STAGE 3: 21ST TO 30TH YEAR

NOTES:

- The Blasting Impact Assessment Report adopts a 100m buffer distance from blasting in the quarry to the Princes Highway Reserve, recommending appropriate blasting charge masses and flyrock mitigation measures. Outside of the 100m buffer zone blasting charge mass should be 7.5kg/m. Within the 100m buffer zone blasting charge mass should be reduced to 5kg/m and further flyrock mitigation measures to be implemented.
- AS2187.2 provides flyrock management measures, which if followed should in most cases confine any disturbances to the local blast area. Other controls, besides reducing charge mass, include the use of blast mats as per AS2187.2 or traffic controls on Princes Highway.
- Vibration monitoring devices are required to be installed at the location of concrete box culverts 612242 and 612243 to ensure vibration from blasting does not reach a maximum particle velocity of 80mm/s at these locations.

A	BLASTING PLAN	JJ	16 Aug 24
REV	DESCRIPTION	BY	DATE
STATUS: ISSUE 01			
BSE Consulting STRUCTURAL CIVIL ENVIRONMENTAL ENGINEERS www.bseconsulting.com.au			
CLIENT: Murray Walsh			
PROJECT: Proposed Quarry Expansion			
SITE: 28 Coral Park Road Wollumbi NSW 2550			
TITLE: Blasting Plan			
SCALE AT A1: 1:1500	DATE: 16 Aug 24	DRAWN: JJ	CHECKED: MV
PROJECT NO: KEE01-05	DRAWING NO: C04	REVISION: 01	



STAGE 1: 1ST TO 10TH YEAR

New face of quarry, area within hatched area blasted and extracted down to 150mAHD; Roughly 1/3 of the total extraction.

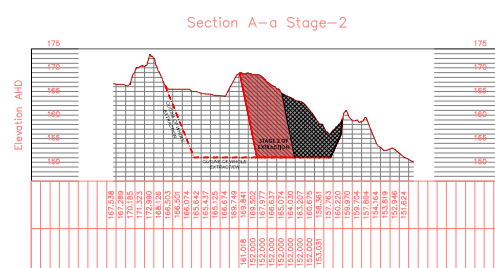
LEGENDS:

- | | |
|---|---|
|  | BOUNDARY OF PRINCIPES
HIGHWAY ROAD CORRIDOR |
|  | 100-METER OFFSET FROM
HIGHWAY CORRIDOR |
|  | EXTRACTION AREA |
|  | STAGE 1 OF EXTRACTION
WITHIN 10 YEARS |
|  | AREA WITHIN 150mAMD |
|  | CADASTRAL BOUNDARY |
|  | LOCATION OF BOX
CULVERTS NOS. 612242
AND 612243 |

NOTES:

- The Blasting Impact Assessment Report adopts a 100m buffer distance from blasting in the quarry to the Princes Highway Reserve, recommending appropriate blasting charge masses and flyrock mitigation measures. Outside of the 100m buffer zone blasting charge mass should be 7.5kg/min. Within the 100m buffer zone blasting charge mass should be reduced to 5kg/min and further flyrock mitigation measures to be implemented.
- AS2187.2 provides flyrock management measures which if followed should in most cases confine any disturbances to the local area. Other control measures such as reducing charge mass, include the use of blast mats as per AS2187.2 or traffic controls on Princes Highway.
- Vibration monitoring devices are required to be installed at the location of concrete box culverts 612422 and 612423 to ensure vibration from blasting does not reduce the remaining service life of 80m's at these locations.

A	ELASTING PLAN		JJ	16 Aug			
REV	DESCRIPTION		BY	DATE			
1	ISSUE 01						
 BSE Consulting STRUCTURAL CIVIL ENVIRONMENTAL www.bseconsulting.com.au							
CLIENT: Murray Walsh							
PROJECT: Proposed Quarry Expansion							
SITE: 28 Corral Park Road Wolumba NSW 2550							
TITLE: Boasting Plan							
SCALE AT 1:15000	DATE: 16 Aug 24	DRAWN: JJ	CHECKED: MV				
PROJECT NO: HE001-05	ISSUING NO: C05			REVISION: 01			



STAGE 2: 11TH TO 20TH YEAR

New face of quarry, area within hatched area
blasted and extracted down to 150mAHD;
Roughly 2/3 of the total extraction.

LEGENDS:

- | | |
|---|---|
|  | BOUNDARY OF PRINCIPES
HIGHWAY ROAD CORRIDOR |
|  | 100-METER OFFSET FROM
HIGHWAY CORRIDOR |
|  | EXTRACTION AREA |
|  | STAGE 1 OF EXTRACTION
WITHIN 10 YEARS |
|  | AREA WITHIN 150mAHd |
|  | CADASTRAL BOUNDARY |
|  | LOCATION OF BOX
CULVERTS NOS. 612242
AND 612243 |

NOTES:

- The Blasting Impact Assessment Report requires a 100m buffer distance from blasting in the quarry to the Princes Highway Reserve, recommending appropriate blasting control measures to reduce flyrock mitigation measures. Outside of the 100m buffer zone blasting charge mass should be $\leq 5\text{kg/m}$. Within the 100m buffer zone blasting charge mass should be reduced to $\leq 3\text{kg/m}$ and further flyrock mitigation measures to be implemented.
 - AS2187.2 provides flyrock management measures, which if followed should in most cases prevent construction of a significant blast area. Other controls, besides reducing charge mass, include the use of blast mats as per AS2187.2 or flyrock controls on Princes Highway.
- Vibration monitoring devices are required to be installed at the location of concrete box culverts 612242 and 612243 to ensure vibration from blasting does not cause a maximum particle velocity of 80mm/s at these locations.

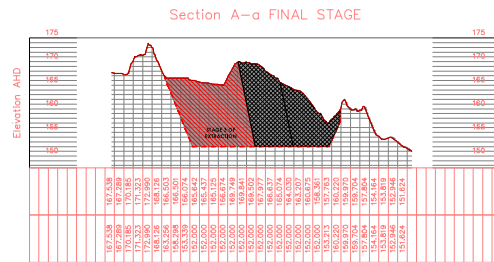
A	BLASTING PLAN						JJ	16 Aug	
REV	DESCRIPTION						BY	DATE	
ISSUE 01									
			BSE Consulting CIVIL & STRUCTURAL ENVIRONMENTAL www.bseconsulting.com.au						
CLIENT: Murray Walsh									
PROJECT: Proposed Quarry Expansion									
SITE: 28 Corral Park Road Wolumba NSW 2550									
TITLE: Blasting Plan									
SCALE AT	DATE	DWG NO.	DESIGNER	CHECKED					
1:15000	16 Aug 24	04	MMV	MMV					
PLOTTED BY	DRAWING NO.				REVISION:				
HEE01-05	C06				01				

APPROX. TRUE NORTH
MCA NORTH

BLASTING PLAN: STAGE 3

Corral Park Road Wollumbi NSW

SCALE: 1:1500



Appendix B

Standard management measures to be incorporated in the Blast Management Plan (from the EIS)

A Blast Management Plan should be prepared by the blast contractor and include the following management measures:

- The blast contractor must use explosives in accordance with AS2187.2:2006
- The blast design shall be consistent with the details provided in Section **Error! Reference source not found.** of the Blasting Impact Assessment (BIA) with adequate burden, stemming and stemming material for blast confinement
- Blasting shall be undertaken during the recommended standard hours:
 - Monday to Friday: 9 am to 5 pm
 - Saturday: 8 am to 1 pm
 - Sunday or public holidays: no blasting
- Blasting operations will be completed by a suitably qualified and licenced personnel to ensure all blasts are designed, located and initiated in a safe and competent manner
- All blasting personnel should be informed of the timing for the blasts, locations of the nearest sensitive receivers and the expected overpressure and vibration impacts
- Non-authorized personnel shall be excluded from the blasting work areas
- Exercise strict control over the spacing and orientation of all blast holes.
- An exclusion zone should be established for plant and blasting personnel. It is assumed that the exclusion zones for mobile plant/equipment and for workers will be managed through the Blast Management Plan for the quarry site.
- The stemming aggregate size of 0.1 x blast hole diameter should be selected, or in accordance with AS2187.2:2006, and properly tamped
- Any flyrock should be reported as part of the blast records in the Blast Management Plan and appropriately managed with the controls in AS2187.2:2006 Appendix E3.
- Sequential firing so all shots initiate from the face backwards
- Blast faces should be appropriately surveyed to avoid underburden
- Radio and visual communications between controllers and sentries
- Explosives are not to be stored on site.
- Blasting should be undertaken during favourable weather conditions. Favourable weather conditions could be visually determined via installation of a wind sock or similar device.
- A complaints register should be created and maintained to record all blasting related complaints. The complaints register will include the following details as a minimum:
 - Date and time that the complaint was received and date and time that the complaint occurred
 - Prevailing meteorological conditions when the complaint occurred
 - Description of all onsite operations that were active when the complaint occurred including a detailed description of all blasting activities undertaken when the complaint occurred.
 - Description of all investigatory actions that were undertaken in relation to the complaint. Actions should aim to identify the source of the complaint and examine potential mitigation options.
 - Any proposed mitigation measures or lessons learnt to minimise the risk of future complaints.
- All details of the blast should be recorded in the Blast Management Plan