



AUSROCKS
CONSULTING MINING ENGINEERS

Newsletter
Winter 2019

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Welcome!

by Carl Morandy, Managing Director

2019 is already half done, with so much already completed this year it is about time we took stock and reviewed the good, the bad and the ugly. We had a Federal Election that surprised most (including the bookmakers) and it looks like the QLD state elections will be something to look forward to in 2020.

QLD has recently had a very bad run of safety in Mines and Quarries with a 'safety reset' due by the end of August. I hope that all operators take a moment to acknowledge the hazards we face in the industry every day and go the extra mile to improve safety at your site. We don't know yet what drastic changes are going to be introduced by the government to curb the number of fatalities, but we all understand that improvement is required.

One of the longest running Mining Lease projects was finally approved (Adani), it will be interesting to see the central QLD boom created by this and other projects opening up in the Galilee basin. All we need is another flood or cyclone and quarrying activity will skyrocket again.

It seems 2019 has been spent in the field defining new resources, this shows the industry is continuing to grow and plan for the

future. One area we see as an upcoming target for the government is Environmental Authority (EA) compliance. We have noted that there has always been a relaxed attitude to certain aspects of each site's EA conditions, however in recent months we have seen the move to systematic checking against all EA conditions. This means that if you haven't read your EA from cover to cover now might be a good time to review it.

Ausrocks continues to sponsor the Institute of Quarrying (IQA) Australia Young Members Network which holds site tours and networking events throughout the year. This year at the IQA golf day the Ausrocks team were exceptionally average, so much so that we were judged the 3rd most average team on the day and went home with a prize! As usual Alan has taken all the credit for bringing down our team's average score and Dale requested that the 'longest drive' winner be drug tested.

Enjoy the rest of the newsletter, until next time – adios amigos.

What's been happening

An update on the latest from the Ausrocks crew including the Safety & Health Conference, Upcoming IQA Conference in Geelong, QLD Safety Reset and Deemed ERC Decisions.

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What's Been Happening?

by Carl Morandy

On 14 July 2019 Nick and myself attended the IQA Safety & Health Conference at the Brisbane Convention & Exhibition Centre. The event was very well attended by industry with easily >50% mining and quarrying companies in the room. Major topics included the recent safety performance – which has since become a 'crisis' as indicated in my opening welcome. A number of operators reported the 'plateau' effect in their safety performance, with various options for continuing to push to 'zero harm' presented. The Inspectorate presented more detail on the recent fatalities in a bid to assist the industry to identify what went wrong, and hopefully prevent re-occurrence.

Following on from the conference a number of tragic incidents occurred at QLD mines which has prompted immediate action from the QLD Government. On 10th July a Ministerial Forum was held with all key stakeholders, the outcome was a formal **Safety Reset** to be undertaken on every Mine and Quarry site before the end of August 2019. Ausrocks are planning to attend a number of these sessions to assist with running the event and providing insight where necessary. We see this as an important task for all sites to complete and better engaged the workforce are, the better the result.

By now most operations that hold Financial Assurance (FA) will have received a letter titled 'Deemed ERC Decision'. Generally, this is confirming the last known FA amount and detailing that the cash/security is now held by QLD Treasury instead of with DNRME. At regular intervals (between 1 and 5 years) the department will require operators to apply for a new ERC Decision which is essentially a review of the security held to account for changes in disturbed area etc. The deadline for lodgment is 3 months before the ERC period expires, make sure you seek assistance well in advance of the deadline.

From 1-3 October 2019 the IQA Conference will be held in Geelong, Vic. Ausrocks will be in attendance we are sure it will be a fantastic event for all.

Mining & Quarrying Competencies

by Bill Taylor

At the recent IQA Safety & Health Conference Luca Rocchi, Chief Inspector of Mines (at the time) recently provided some clarification around SSE notices. It was stated that the current deadline of **9th Nov 2019** is only for all SSE's to be put on the SSE Register (regardless of training). The new training requirements only kick in on **1st July 2020**. As at **5th May 2019** only 49 SSE's were on the SSE register.

The competencies recognised by the Mining Safety and Health Advisory Committee can be found on the following link:

https://www.dnrm.qld.gov.au/_data/assets/pdf_file/0020/240635/recognised-mining-competencies.pdf

For surface mines and quarries competency requirements increase from training courses through Certificate level to Diploma level relevant to the number of persons employed, with the criteria rising from <5, 6-20 and >20 persons employed. There are also competency requirements where blasting takes place irrespective of the numbers employed.

The key difference in the post 01/07/2020 requirements is the increased competency requirements in all categories. For example, in the case of over 20 persons employed, the previous educational requirements were;

- RIIRIS501D Implement and maintain management systems to control risk, and
- BSBWHS501 Ensure a safe workplace, (or an equivalent or superior qualification).

This will change to;

- RII50113 Diploma of Surface Operations Management (or an equivalent or superior qualification), and
- RIIRIS501D Implement and maintain management systems to control risk (or an equivalent or superior qualification).



Similarly, the 6 to 20 persons employed category will require the SSE to hold a Certificate IV in Surface Operations.

In the case of 5 or fewer category we see the introduction of both an experiential component (2yrs) and training courses in areas such as

- Introduction to Safety Management Systems, and
- Effective Risk Management, and
- Incident Investigation, and
- Electrical Awareness

Below is a selection of Training Organisations in Queensland listed on the myskills website who provide training for the Diploma of Surface Operations Management. The website can also be used to find training providers for both the Cert III & IV training courses;

MinRes Training Institute Pty Ltd

Address PO Box 24 FERNY HILLS QLD 4055, Australia

Website <http://www.minres.com.au>

Performance Training Pty Limited

Address PO Box 713 BUDERIM QLD 4556, Australia

<http://www.performancetraining.com.au>

RII Skills Centre

Address PO Box 142 NORTH CAIRNS QLD 4870, Australia

Website <http://www.riiskillscentre.com.au>

Basalt, The Premier Aggregate

Its chemical, physical and material properties surpass all other rock types.

by Brice Mutton

Basalt is economical to produce and provides a long-term performance and high strength material for the construction and engineering infrastructure industries. The material is important for road and highway pavements, bases and subbases. It's ideal for concrete for major buildings and infrastructure. Where long term strength and durability is crucial, it provides the best material for rail ballast.

Basalt importance is reflected in that it accounts for 55 of Queensland's 184 registered (TMR) hardrock quarries (June 2019 – excl sand quarries), and, 40% of registered Key Resource Areas (KRAs).

The Rock

Basalt is defined by its mineral content and texture and has a strict chemical definition. It typically is a grey to black, relatively featureless, very fine-grained igneous rock. It is composed of mineral grains which are mostly indistinguishable to the naked eye. Plagioclase feldspar (at least 65%) is volumetrically the most important constituent. Basalt may also contain minor olivine, quartz, hornblende and volcanic glass but overall has nil to minimal weak and soft minerals (primary and secondary).

Basalt may be porphyritic containing distinctive phenocrysts, most typically olivine (glassy emerald green colour), hence the often referred to rock name "olivine basalt". The dominance of plagioclase renders the overall colour of the rock when broken, to look like and be referred to by industry as "blue metal".

The physical and mechanical measures of basalt are outstanding. Some important measures include:

- Mohs' Hardness – 6,
- Compressive Strength - 100 to 300Mpa,
- Tensile Strength – 10 to 30Mpa,
- Shear Strength – 20 to 60Mpa,
- Porosity – 0.1 to 1%, and,
- Specific Gravity – average 2.8 t/m³.



As Aggregates

Aggregates are the primary constituent for concrete and asphalt whether it is for roads and highways or for concrete, particularly high strength construction and infrastructure concrete. Basalts high strength/durability, high abrasion resistance, and high bearing ratio are key physical and mechanical properties, higher than almost all other rock types.

For road and highway aggregates pavements, whether it is concrete or asphalt, basalt provides the best rock type to achieve important durable and sustainable wear surfaces. Basalt doesn't deteriorate or disintegrate under the action of weathering via freezing, thawing, variations in moisture and temperature changes, especially extreme high temperature as occurs throughout most of the Australian landscape. A myriad of tests - repeated load triaxial compressive tests, resilient modulus, micro-Deval, impact value, abrasion, frost resistance and California Bearing Ratio test, confirms basalt superior qualities.

Concrete is one of the most important building materials of engineering structures and for construction generally and the quality of concrete is directly related to the aggregate that is most volumetrically used. For major engineering infrastructure ie high rise buildings, bridges etc. requiring high strength or ultra-high strength concretes, then basalts' high compressive strength alone, provides for the best aggregate.

Whilst concrete requires many other attributes, basalt's ability to provide optimum sizes, high bonds between cement paste and aggregate, and surface characteristics such as aggregate shape and surface texture, all add to making a high strength workable plastic mixture and increased slump values. Importantly, basalt is primarily free of deleterious minerals and is chemically inert. Most significant though is its almost total lack of free silica, being unique among almost all other rock types, and therefore not having the critical concrete alkali-silica reactivity (ASR) issues, a primary cause of concrete deterioration and integrity.

Basalt is ideal for rail ballast where the main functions are to distribute the load from sleepers or ties, to damp dynamic loads and to provide lateral resistance and rapid drainage. Quality ballast is achieved from basalt due to its high specific gravity, high shear strength, high strength (toughness and hardness), high resistance to weathering, rough surface and minimum hairline cracks.

Its Occurrence

Basaltic rocks are an igneous extrusive or volcanic rock occurring as a lava flows (individually up to 15m thick) and formed by rapid cooling at or very near to surface. Whilst basalt can have some inferior forms, thick flows exhibiting columnar jointing by far produce the best quality basalt. Unique columnar jointed bodies may also occur as lava pools around intrusive centres to lava outflows. Both columnar-jointed types have concentrated footprints, are readily exploitable and prominently quarried.

Such quality occurs as fresh, young Tertiary Age (15-30Ma) basalt, which is prevalent as crustal hot spot outpourings throughout the length of Eastern Australia, from Cape York down through to SE Queensland into NSW, all the way into eastern and western Victoria. Its young geological age, freshness (unweathered) and prominent surface presence make it ideal to exploit.

Summary

Some of the key benefits and virtues of basalt are;

- All round high physical and material properties,
- High strength, durability and abrasion resistance are standouts,
- Readily occurs and is available in large volumes with consistent quality,
- Provides for the highest strength concrete, near nil internal impurities and nil silica (ASR),
- Lower equipment wear and operating costs due to the absence of silica,
- Environmentally more favourable with minimal respirable crystalline silica issues, and,
- Overall is economically the most cost-effective - highest quality material to exploit.

Basalts' all-round high qualities and engineering performance make it – "the premier aggregate".

Ausrocks has built a large database and expertise on basalt occurrences including future deposits. For further information contact us on (07 3265 3399).

New Tunnelling Projects for Brisbane

by Alan Robertson

During the completion of the three recent major Tunnelling projects in Brisbane, now known as the Clem 7, Airport Link and Legacy Way (initially called the Northern Link) from early 2000 to 2014, our city stole the title of "Tunnel Town" from Sydney. With a suite of potential new tunnel projects likely for Brisbane in the next few years, this title may again come across the border. The great positive resulting from these three motor vehicle tunnel projects was the continuity of tunnel planning, the concentration of international tunnel expertise in Brisbane for nearly a decade and the technical advances made in the complete Tunnelling process.

Future tunnel projects in Brisbane are more aligned to public transport and include:

- The Cross River Rail,
- The Brisbane Metro,
- The Western Ring Road
- The East-West Link

The Cross River Rail is underway under the Cross River Rail Delivery Authority (CRRDA) and is a \$5.4B 10.2 km rail line from Dutton Park to Bowen Hills which includes 5.9 km of tunnel under the Brisbane River and CBD. There will be 4 new underground stations at Boggo Road, Woolloongabba, Albert St and Roma St as well as upgrades to Dutton Park and Exhibition Stations.

The Brisbane Metro Subway System. (Brisbane Metro). This public transport system costing around \$1B was proposed by the Brisbane City Council as a high frequency rapid transport system to service the Brisbane CBD. The two-line system was proposed to utilise 60 bi-articulated trackless rubber tyres buses each with a capacity of 150 persons arriving every three minutes at the bus stations during peak traffic times. 21 km of existing busway will be utilized between the Royal Brisbane Hospital and Eight Mile Plains. The project currently includes 18 bus stations, two of which will link with the Cross River Rail. Tenders were called for construction, but the State Government intervened, and a re-design is underway.

The Western Link (or Western Bypass) originally in TransApex is currently part of the State Government's Western Transport

Network Strategy and is now called the Western Ring Road (Project 13) from Toowong through Everton Park to Aspley. The tunnel component is called the Inner Orbital Tunnel and connects into the North West Transport Corridor and Stafford Road at Everton Park.

The East - West Link road tunnel from the South East to the Toowong roundabout was part of the original TransApex Project in the early 2000's which had input from myself. It was proposed to link the Western Freeway at Toowong to the Pacific Motorway at Buranda. With the imminent completion of the Kingsford Smith Drive widening, this project may come back on the infrastructure agenda.

Ausrocks was a major contributor to the design and operation of the tunnel boring machine spoil disposal from the Legacy Way project into Mt Coot-tha Quarry in conjunction with the Quarry management and the tunnel contractors.

Interesting Signs & Safety Procedures



If you come across any weird or wacky signs, feel free to email them through to info@ausrocks.com.au

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