



## Strategic Direction for Aggregate & Quarry Association Technical Committee

## **Purpose**

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The purpose of this strategy is to set out the AQA Technical Committee goals and objectives, policies and plans, and priorities for industry liaison, research and the revision and development of standards to improve the quality of aggregates in New Zealand and contribute towards the implementation of visions, goals and objectives as set by the Aggregate and Quarry Association (AQA) strategy and business plan.

## **Aggregate and Quarry Industry**

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Aggregates play an essential part in the lives of everyday New Zealanders. Without an ongoing supply of aggregate; the development of buildings, roads, motorways, all infrastructure and the production of concrete would stop.

So how much does New Zealand produce, what are the economic impacts and how does our consumption compare with other countries?

**In 2007, 46.34 million tonnes of aggregates were produced worth \$592 million.**

**The consumption of aggregates was 10.9 tonnes per person (one truck load per person).**

**Over half is used on roads, and 21% for construction of commercial and residential buildings.**

**Direct, indirect and induced economic impact is \$2.1 billion and nearly 10,000 jobs.**

## **Scope**

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This strategy is one part of several strategies developed outlining AQA's business/intent. The purpose of this strategy focuses on predominantly aspects related to role of the Technical Committee which includes industry liaison, training, research and development/revision of standards, specifications and guidelines in areas related to aggregate resource, production, supply and use. The key focus areas include asphalt, sealing chip and pavement aggregates used for the construction of state highways and local roads, concrete aggregate for bridges, structures and buildings along with aggregates supplied for drainage features, landscaping, and other miscellaneous uses.

## **Vision**

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Aggregate and Quarry Association vision (Strategic Plan 2008):

AQA must work to increase understanding of the need for aggregates by the General Public, Local and Central Government

AQA Technical Committee visions and aims in relation to this Strategy.

## **Technical Committee Vision:**

To promote and support the advancement of technical knowledge, education, and understanding of aggregates and their use for the benefit of New Zealand

## **Technical Committee Aims**

To improve efficiency and quality in aggregate production and supply through research that is implemented via standards, specifications and guidelines.

## **AQA Technical Committee**

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The AQA Technical Committee is the repository of considerable technical expertise to enable leadership in research for the development/revision of standards, guidelines and specifications to implement AQA's visions and aims.

The AQA Technical Committee ensure through research and assisting in the development and use of appropriate standards, specifications and guidelines that aggregates are produced, supplied and delivered to the required quality and are fit for purpose to minimise whole of life costs, improve safety, while utilising more products in the quarry and other sources to minimise waste and ensure sustainability of the industry.

AQA Technical Committee have a key role within the aggregates industry providing an impartial authoritative forum for expression of views on improving specifications, research required and developing innovative ideas. Liaison through meetings, workshops and seminars with the industry members and associated end user industries enables the technical committee to implement, encourage and promote changes to standards, guidelines and specifications that reflect AQA's visions and goals. Standards, guidelines and specifications are often developed cooperatively with other industry groups and government organisations such as New Zealand Transport Agency (NZTA) to ensure final "buy-in and acceptance of any proposed changes in practice".

The AQA Technical Committee currently consists of a total of 4 members all of whom are actively involved in the technical development and quality assurance of aggregates in New Zealand. Main areas of work are the revision/development of standards for concrete asphalt and pavements aggregates: surfacings; asphalt; modified aggregates for high traffic roads; use of recycled materials and industrial by-products in pavements; and skid resistance. AQA Technical Committee Members:

<b>Name</b>	<b>Company &amp; Title</b>	<b>Work Areas</b>
Jason Lowe	Winstone Aggregates National Manufacturing Manager	Concrete, asphalt and pavement aggregates (incl. modified). Recycled products, skid resistance and energy efficiency.
Jayden Ellis	Stevensons General Manager Laboratories	Pavement aggregates (incl. modified), concrete aggregates and aggregate test methods
Robert Patience	Higgins Technical Manager	Skid resistance, asphalt and chipseal research
Greg Arnold	Pavespec Consultant	Pavement performance and aggregates. Recycled and waste products in roads. RLTT research.

The Technical Committee business plan and day to day activities are developed from both AQA and Industry needs. Often inadequacies in specifications are brought to the attention of the Technical Committee by Industry members and associated groups (e.g. Roading New Zealand) along with NZTA.

For some specifications the technical Committee are pro-active in helping the likes of NZTA organise working group meetings to resolve inadequacies in NZTA specifications and/or identify further work/research required by NZTA to fix the specification in question. Many of the items in the AQA Technical Committee business plan have resulted from Industry working group meetings and member suggestions/requirements.

The AQA Technical Committee are fully supportive of the work that NZTA and other Industry groups are conducting and intend to continue to support this work through influencing and becoming involved in Best Practice groups, such as Skid (STAG) and Stabilisation Working Group (SWG) and by contributing towards implementing specification developments and improvements.

## **Strategies by Topic Areas**

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Direction and ideas for projects are all covered in eight specialist topic areas (Concrete, Asphalt and Pavement Aggregates, Sealing Chip, Safety/Skid Resistance, Environmental, Communication, Research).

### **Environmental (Reduction of Waste and Energy)**

The Technical Committee's contribution to AQA's Environmental objectives and the strategic plan involves encouraging the development of waste and recycled materials and the revision of pavement specifications to allow the use of these materials

Promote ways and research aimed at maximising the use of NZ aggregate resource through improving the options for the use of marginal or alternative aggregates

Support and encourage the use of local aggregates for local roads

The Technical Committee will continue to support NZTA research at CAPTIF (NZTA's Accelerated Pavement Testing Facility). Current CAPTIF research includes testing stabilised materials to show that aggregates previously discarded (because of low quality) can be used with small additions of cement or a similar additive. This will reduce the amount of wastage at the quarry to allow the use of marginal quality materials.

### **Safety/Skid resistance**

Safety is of prime importance to AQA. The Technical Committee are actively involved in the area of skid resistance of surfaces and the improvement to specifications and testing of aggregates to try and ensure greater confidence in the on road performance of skid resistant aggregates.

The Polished Stone Value (PSV) determined in the laboratory is used to determine the level of skid resistance that can be provided by the aggregate. PSV is inherent in NZTA's policy on skid resistance where in general high PSV stone is required on tight corners while a lower PSV stone is acceptable on straight sections of road. However, research has shown that the PSV has in the past been a poor indicator of the level of skid resistance that can be provided by the aggregate when measured by SCRIM on the road. Often a tight corner is sealed using what is thought to be a high PSV aggregate only to find a year later the SCRIM survey highlighted the section as a failure. It has been suggested that the Quarry location was a better indicator of the level of skid resistance on the road.

The Technical Committee are developing a database of AQA member quarries that supply skid resistant materials with additional supplementary test data aimed at giving greater confidence to the Engineer on appropriate material selection. A project is currently underway led by Opus to improve the prediction of the level of skid resistance provided by aggregates to include actual on road performance as measured by SCRIM surveys. The Technical Committee are supportive of this work, along with the research being conducted at Auckland University. The Technical Committee will be looking to integrate the data collected from the research in to promoting a better system of identifying suitable skid resistance aggregates that will ultimately result in safer roads.

### **Increasing life, reducing whole of life costs, ensuring best practice and reducing the risk of early pavement failure**

The focus by the technical committee will be to give Industry guidance to allow Engineers to determine the correct technical solution for pavement, concrete and surfacing aggregates that will meet the design life required, reduce whole of life costs and meet social and environmental requirements. Further, increases in heavy traffic volumes have tested the limits of current standard practices for surfacings and pavements. Review of quality standards are required for high trafficked roads along with guidance in determining the best pavement and surfacing type that will result in the lowest whole of life costs while meeting the design requirements. A key project and focus for the Technical Committee over the next 12 months is to be heavily involved in the review and development of the TNZ M/4 specification and the development of a new T/15 Specification for Repeat Load Triaxial Test.

The AQA Technical Committee continue to support the Repeated Load Triaxial (*a device that simulates repeated wheel loadings and with associated analysis can predict the amount of rutting that would be expected to occur within the pavement*) testing that has been conducted on many different aggregates within New Zealand. The aim is to develop a Repeated Load Triaxial test (T/15) for aggregates modified/stabilised or otherwise to determine their suitability for use in high, medium or low trafficked roads in wet or dry conditions. A growing number of quarries are now providing cement-or lime stabilised material, either as a stronger alternative to granular construction or to bring marginal materials up to standard. Modification

is still only a small percentage of the overall material supplied but its use is increasing as a result of a better understanding of the method through research and experience. The demand for aggregate modification is expected to increase further over the coming years due to its ability to withstand the high loads in wet conditions at a lower cost than asphaltic concrete

## AQA Technical Committee Projects

<b>Skid Resistance</b>	<p>To contribute to on-road safety by improving the data available to engineers and specifiers for skid resistant aggregates thus giving more confidence that the aggregates specified ensure the most appropriate skid resistance.</p>	<ul style="list-style-type: none"> <li>• Support investigation into variables associated with the PSV Test.</li> <li>• Support the analysis of on-road performance versus PSV of aggregate</li> <li>• Develop a self regulated PSV Database in conjunction with NZTA</li> </ul>
<b>Pavements</b>	<p>Development and improvement of specifications and guidelines for pavement materials, design and construction to reduce/eliminate the number of early failures and to ensure the lowest whole-of-life-costs.</p> <p>Support the use of alternative aggregate supplies either by using waste materials or marginal quality aggregates modified to improve their performance.</p> <p>Encourage pavement recycling.</p> <p>Assist in the review process for Local Body and National specification reviews where deemed appropriate</p>	<ul style="list-style-type: none"> <li>• Assist in revising M/4 specification to increase the quality of aggregates used on high traffic roads through introducing the T/15 RLTT in the spec.</li> <li>• Be involved in the approval and implementation of a performance test for aggregate T/15 RLTT</li> <li>• Assist in developing plant mix specification for modified pavement aggregates</li> <li>• Assist in determining increase in life/reduced rutting achieved from modified aggregates and develop an associated method for design in M/4 incorporating RLT testing.</li> </ul>
<b>Asphalt and Seal Chip</b>	<p>Develop a greater understanding of the impact of aggregates on Asphalt.</p> <p>Work with associated Industry (Roading NZ) to further develop asphalt aggregates and refine the testing required.</p>	<ul style="list-style-type: none"> <li>• Continue to support and work with Roading NZ on the development of Asphalt Plant Accreditation Scheme (APAS)</li> <li>• Monitor any proposed changes to testing requirements and ensure AQA are involved</li> </ul>
<b>Concrete</b>	<p>Develop a greater understanding of the impact of aggregates on Concrete.</p> <p>Work with associated Industry (CCANZ &amp; NZRMCA) to further develop concrete aggregates and refine the testing required.</p>	<ul style="list-style-type: none"> <li>• Continue to support and work with CCANZ and NZRMCA on the refinement of Concrete Aggregate Specifications</li> <li>• Monitor any proposed changes to testing requirements and ensure AQA are involved</li> </ul>

<b>Research</b>	<p>Monitor research proposals and projects, understand which have a potential impact on the aggregate Industry</p>	<ul style="list-style-type: none"> <li>• Continue to work with Roding New Zealand and University of Auckland on FRST research project linking the geological resources of NZ with the engineering properties.</li> <li>• Support research projects where there are clear objectives that could have benefit to the AQA and its members</li> <li>• AQA Technical Committee members are also peer reviewers for a range of funded research projects. This allows the AQA technical committee to help steer the direction of the research project and review reports to ensure the outputs are relevant to AQA and members needs and objectives.</li> </ul>
<b>Communication</b>	<p>Continue to work at developing strong communication links with AQA members to ensure they are kept up to date on technical developments within the Industry</p> <p>Continue to develop links with other Industry Organisations, (RNZ, CCANZ, NZTA etc..) to work on objectives that have a shared goal</p> <p>Develop links with overseas Organisations to share knowledge and understanding</p>	<ul style="list-style-type: none"> <li>• Develop technical communication tools Newsletter, Website, Tech Bulletins, Conferences &amp; Seminars</li> <li>• Regular contact and sharing of work plans with NZTA, Roding NZ, CCANZ, CETANZ, REAAA and others as appropriate.</li> <li>• Explore benefits of developing links with overseas organisations such as Austroads, QPA, NSSGA and others as appropriate</li> </ul>