Global Road Technology India (GRT) is a group company of Australian owned polymer engineering company GRT International with a wealth of experience in the design, construction and maintenance of better urban, rural and industrial roads. GRT solves road stabilisation and surfacing problems, as well as other operational challenges such as dust generation and erosion, with the optimal combination of proven products and total life of asset solutions.

GRT’s capability enables the construction of all types of roads from major highways and freeways to haulage, industrial and rural roads, plus tarmacs, hardstand areas and water resistant pavements. Our technology can be applied into clay, silt, sand and gravel materials.

At GRT, we pride ourselves on offering a superior service, with quick response times.

Our staffing capabilities consist of experienced geotechnical, civil and polymer engineers, plus soil technicians, environmental scientists and industry consultants to ensure we always have the best staff to assist with any project. It’s our goal to keep industries moving, create better roads for rural communities and safer road infrastructure worldwide.

For the resource sector, GRT maximises productivity by supplying products and processes that strengthen and seal haulage and access roads, keeping them open and operational in the wet and dry, 24 hours a day.

In many countries, low quality roads contribute to poor social and economic development and are unsafe for the whole community. GRT is committed to the United Nation’s initiative of “A Decade of Action” which aims to reduce road deaths by 50% in 2020. Presently, road traffic fatalities take 1.3 million lives per year and this is expected to increase to 1.9 million by 2020, unless urgent action is taken.
PRODUCTS

GRT engineers and technicians develop site-specific solutions for our clients, using a range of high functioning, standardised products, focused on minimising the requirement for imported materials. Because every site has its own unique features and challenges, GRT have developed numerous, site specific variants, individually designed to undertake very specific functions. This awareness, technology and expertise is what sets GRT apart from other product suppliers.

FOUNDATION PRODUCTS

GRT:9000 Polymer Soil Stabilisation

GRT9000 polymer soil stabilised pavements display high bearing and tensile resistance. They pose a cost effective alternative to traditional bound pavements such as asphalt and concrete – saving from 50-70% for a laid pavement. GRT9000 is available as either a black or clear stabilisation agent. Materials treated with this environmentally stable, polymer can be used to construct:

- Haul roads
- Rural and farming roads
- Service roads and hardstands
- Base and sub-base layers of major public roads and infrastructure

GRT:8000 (Black) Dust Control Polymer Sealant

GRT8000 dust control solution is a versatile and sustainable modified polymer, engineered to combat the problem of fugitive dust and soil stabilisation on unpaved roads. It has a unique combination of additives, which give it a dark colour but improves its UV resistance. Used by the military, industrial, private and mining sectors, GRT8000 dust control solution provides effective dust mitigation on a range of unsealed surfaces, including:

- Remote installations and accesses
- Low and high volume roads
- Car and truck parks
- Haul roads
- Hardstands/lay down yards
- Construction or military camps

GRT:7000 Polymer Sealant (Environmental)

A specially formulated liquid polymer, GRT7000 is a widely used solution that dries clear and is environmentally friendly. Engineered for use in civil construction, it can act as a clear polymer sealant as well as a high performing stabilisation agent.

GRT:7000 (D) Dust Control

Polymer sealing with GRT7000 works differently. After initial works, maintenance applications are required once every 12 to 16 weeks, depending on traffic loading. With each application an accumulating number of silty dust particles are bound together, preventing them from becoming airborne. Due to the cumulative residual nature of the product, over time, the rate...
of application of GRT7000 reduces, becoming more economical each year. Simply sprayed from a water truck, the results are:

- Elimination of dust and its impacts (visibility, health, surrounding areas)
- Stable, waterproof surface preventing corrugation and potholing
- Improved skid resistance and decreased rolling resistance
- Costs savings of 30-40% due to removal of daily watering and grading, less wear and tear on vehicles, improved haul times, elimination of downtime during and after wet weather (cost savings independently verified by Deloitte).

**GRT:7000 (S) Soil Stabilisation**

As well as a clear, environmentally safe and aesthetically pleasing polymer seal, GRT7000 is a highly effective polymer soil stabilisation agent. Used on its own or in conjunction with traditional soil stabilisation agents it achieves extremely high UCS results with relatively low dosage rates. GRT7000 works by physically and chemically bonding soil or pavement particles leading to improved compressive strengths, high tensile resilience and water impermeability.

**GRT:6000 Trench Compaction**

When added to trench backfill materials, GRT6000's unique properties allow full compaction with much fewer passes than is normally necessary. Once the soil is compacted, GRT6000 will cure and bond the particles of soil together. This mitigates issues related to subsidence, particularly when trenching through transport corridors. It also provides an environmentally stable alternative to traditional stabilised backfill products such as flowable fill, cement stabilised sand and lean-mix concrete.

**GRT:5000 Liquid Tarping**

GRT5000 is a polymer based liquid tarping process that suppresses up to 95% of all dust particulates. It can be applied through existing or specially designed spray bar systems or water trucks. The GRT tarping process combines a blend of water and liquid GRT5000 to amalgamate the small particles of coal or ore, encapsulating them into a tough surface membrane.

**GRT:4000 Pothole Patch**

GRT4000 is a revolutionary polymer solution used to repair a wide variety of road failure types, from filling small potholes to large continuous patches. Repairs can be made in granular pavements with a variety of different surface treatments and can be engineered as temporary or permanent repairs. Compared to conventional patching and repair products and processes, GRT4000 Pothole Patch:

- Improves safety for workers by eliminating hazards such as hot works and cement burns associated with asphalt or cement-based repairs
- Offers tensile strength properties lacking in cementitious repairs
- Provides immediate cost benefits
- Requires only water, in-situ or local materials and a compactor
- Repairs can be accomplished by as little as one labourer
- Process is easily translated into developing countries with unsophisticated equipment
- Has a very low toxicity (to both staff and the environment), particularly compared with traditional bitumen, asphalt or cement based repair products.
THE GRT PROCESS
Five steps to success

1. STABILISE
2. COMPACT
3. TRIM
4. SEAL
5. SURFACE

GRT:3000 Self Healing
Inspired by nature and currently still in the development phase, GRT3000 is a novel biomimetic formulation designed to facilitate rapid construction of tactical and emergency self-healing pavements.

GRT:2000 Aerial Deployed Dust Control
GRT2000 is an aerial deployed, military grade dust control solution. It is capable of establishing dust free temporary landing zones and is particularly useful for insertion and extraction activities where the required landing zone consists of uncontained fine particulates that can result in brownout conditions.

GRT:1000 Counter Terrorism Landmine Clearance Technology
Relying on commonly available and standard issue equipment, GRT1000 is an expeditionary product with unique morphology that aids in the detection of sub-surface threats, such as landmines and IEDs.

GRT-ENVIRO (1) Effective Soil Erosion Control
GRT-ENVIRO1 is an organic soil conditioner based on a water-soluble polymer. This product can be added to irrigation water to reduce soil erosion by agglomerating fine particles that otherwise would be carried away by surface water runo.

GRT-ENVIRO (2) Effective Sand and Dust Abatement
Dust abatement and soil stabilisation is difficult to achieve in arid environments due to high winds and high temperatures. GRT-ENVIRO2 is a unique product designed to tackle this problem. Based on a water-soluble polymer, GRT-ENVIRO2 soil conditioner penetrates into the soil and forms a complex interconnected structure with loose granular particles. After the polymer dries a tough, durable surface is formed.
GEOTECHNICAL ENGINEERING

Located at Pune headquarters, GRT have at its disposal a fully equipped state of the art geotechnical laboratory. This, coupled with combined geotechnical experience totalling well in excess of one hundred years, we are able to investigate every aspect of a soil’s characteristic and how it responds with the vast array of treatment options now available through our cutting edge technology. Test methods utilised are:

- Indirect Tensile Resilient Modulus
- Repeated Load Triaxial Test.
- Flexural Beam
- Unconfined Compression Strength (UCS)
- California Bearing Ratio (CBR)
- Falling Weight Defectometer (FWD)
- Atterberg Limits
- Soak Testing
- Capillary Rise

Internationally, GRT have formed alliances with governments and commercially operated soils laboratories to assist in quick turnaround of solutions. The GRT geotechnical team are versed in international standards such as: ASTM, AASHTO, BS, and EN. Our engineers are frequently providing hands on support for our international clients by accommodating their needs in their respective countries. This direct involvement ensures turnkey solutions are delivered as per the GRT design and specifications.

CIVIL ENGINEERING

GRT civil engineers have broad experience across both the private and public sector in the planning, design, construction and maintenance of civil infrastructure including:

- Highways, haul roads, and arterials
- Bridges and structures
- Major earthworks and drainage
- Developments and hardstands
- Dams and rural infrastructure
- Service corridors (HV Electrical, Gas, Sewer, Water)
- Retaining structures and reinforced earthworks
- In-situ and plant mixed materials stabilisation
- Sealing and surfacing works.

With this deep knowledge the engineering team has worked with GRT polymers to understand, test and develop the product’s capacity and application in infrastructure development. Leading this team, GRT has RPEQ and CPENG staff with the capacity and experience to certify and verify engineering designs and works. Engineering advice is provided with the view of ongoing support right the way through from initial concept to asset maintenance.
With our unique, dynamic formulations developed in our own laboratory we are able to adapt to situations from severe weather conditions to limited budgets. GRT is a solution provider. Compared to other competitors, we not only offer infinite solutions based on customer needs, but also the commitment to find the right solution for our customer. Each year we invest a particular share of our budget on laboratory and field research. This is aimed to develop and further optimise our products and ensure that we are the leading specialists in the market.

Our Polymer team is able to investigate all characteristic requirements for polymer formulation through our close collaboration with leading university laboratories. There are vast areas of testing that are performed in the process of design and/or optimisation of formulation. These tests range from standard concepts such as wettability and surface tension to molecular level characterisation such as TEM.

Typical polymer science and engineering tests that may be undertaken in the GRT laboratory include, but are not limited to:

- Colloidal stability
- Sedimentation response
- Particle size distribution
- Dry Rubber Content (DRC) and total solid content
- Stability
- Water resistance and wet adhesion strength
- Viscosity
- Density
- Sludge content
- Coagulum content
- pH
- Tg
- Mechanical properties (tensile strength, modulus, elongation at breakage)
- Flexural strength
- Compressive Strength
- Adhesion
- Water absorption
- Water permeation
- Ageing and fatigue
TECHNICAL PARTNERS

GRT also have commercial arrangements to further complement its highly skilled staff and engage external expertise to assist in the continued improvement of products and processes.

SIMTARS

Simtars, a commercial arm of the Queensland Department of Natural Resources and Mining (DNRM), is a safety in mines testing and research organisation. Simtars are expert providers in the analysis of adverse effects when considering measurables such as dust and driver fatigue on rural and industry roads. GRT employs the services of Simtars in monitoring GRT maintained roads. When measured periodically, GRT can optimise the maintenance of unsealed roads to provide our clients with the most efficient dust control operation possible.

GRT have partnered with Simtars to further develop existing products in the application of dust control and polymer sealing. Through the support of the Health and Safety Trust, Simtars and GRT are striving to develop the benefits of efficient dust control. Together we specialise in the continuous improvement of solutions for our resource industry clients. The following being the main focal points of this combined research:

- Fatigue
- Mental health
- Musculoskeletal disorder
- Vibration
- Noise
- Dust particulates

SMEC

SMEC is a company with an iconic reputation for excellence. Their success is built on providing high quality client solutions; while delivering cost effective, practical project outcomes.

SMEC is an industry leader within the Transport sector, providing innovative solutions for transport infrastructure projects across the globe. The company leverages both national and international expertise to deliver high value, low cost services in the areas of roads and highways, traffic and transport planning, bridges and structures, rail infrastructure, ports, airports and Pavement Management Systems.

Augmenting GRT’s design and project delivery capabilities is a close working relationship within the SMEC professional framework. Design optimisation may require many iterations, however it is GRT policy to encourage the opportunity for fresh ideas and critical consultation with our business partners before the final draft. The ultimate outcome can be guaranteed for our client knowing that SMEC provides GRT with the reassurance that every aspect has been considered and every opportunity has been thoroughly exploited.
RESEARCH AND DEVELOPMENT

Research and Development (R&D) is one of GRT’s core strategic pillars. Towards this, all business units and processes feed back into the research and development team, allowing GRT to have directed and mission critical R&D objectives. The research team consists of experienced technologists and researchers in the fields of polymer, geotechnical and civil engineering, as well as chemical, soil and environmental sciences. They work closely with sales and marketing teams who have regular contact with clients. GRT’s aim is to provide solutions to better satisfy clients’ needs.

The GRT research team currently consists of Polymer Engineers, Geotechnical Engineers, Civil Engineers, Physical Chemists, Analytical Chemists, Macromolecular and Material Chemists.

GRT has state of the art chemistry and geotechnical laboratories. GRT also maintains substantial research and development cooperation agreements with major universities such as Queensland University of Technology (QUT), University of Sydney and University of Queensland (UQ). The R&D team also have constant contact with relevant resources at MIT and Harvard.

GRT support scientific research and are always looking for the latest technologies in the fields of organic chemistry, geotechnical engineering and civil engineering. GRT has committed to show its support by sponsoring postdoctoral research and through funding a GRT Fellowship at QUT.

It is the Company’s commitment to innovation and excellence that sets it apart from its competitors. GRT polymers are molecularly designed and tailor-made for specific soil types and environmental conditions. All products have been extensively tested by ERM, a leading international third party environmental testing laboratory, and certified environmentally friendly.

TRAINING AND SERVICES

GRT Road Safety Training Services

This commitment to ensuring clients have access to our ongoing support has driven GRT to develop a safe road system model as part of the services provided to the mining industry.

Global Road Technology Road Safety Training Services program seeks to facilitate clients with road safety training and provide ongoing data and information with the aim of reducing hazards and preventing accidents before they occur.

By supplying innovative training and consulting advice to the mining industry, GRT works with clients to help safeguard their employees and promote the reputation of their safe work practices.

GRT have worked closely with world-leading experts in developing proprietary methods to measure and classify road-safety-related activities that can aid in identifying and solving safety issues before they occur.

This information is then fed into the mine road network database and made available to clients. This provides clients live information on data such as the impact mine haul trucks have on road friction and allows GRT to better address hazards and manage risk.

GRT’s road safety consulting services will see us provide our clients with the following assistance:

- Mine road surface friction assessment and profiling
- Water cart application (ground rate) calibration
- Mine road water application management advisory services
- Mine road network safety audit services
- Mine road incident investigation and analysis (reconstruction) services
- Independent expert representation on mine ICAM committee investigations/reviews and Road Safety audit implementation meetings.

Part of this work has included developing an innovative world-first methodology for profiling wear and tear caused by friction on mine haul roads and ramps for heavy vehicles. The road surface friction analysis process is correlated with mine road-watering protocol and rain events.
Incident Investigation Course

- Mine specific content targeted at supervisor level
- Highly experienced facilitators who are active workplace incident investigators
- Course is two (2) days duration
- Tailored content and cost details

Vericom Training

- Operational Road surface friction assessment device aimed at OCE and supervisor level
- Vehicle related incident investigation purposes
- Dynamic Brake testing of heavy vehicles
- Road safety, signage and design criteria analysis
- Road maintenance – roughness measuring
- Tailored training solutions

Public Road Safety Awareness Sessions

- Aimed at all company employees (45 min duration)
- Those road safety myths answered by highly experienced and current road safety practitioners
- This is not your average road safety talk; all our presenters have walked the walk
- Tailored presentations

GRT ROAD MAINTENANCE SYSTEM (RMS)

GRT Road Safety Service is offered in tandem with GRT’s groundbreaking Road Maintenance System (RMS). It provides ongoing support to clients and customers through its unique infrastructure delivery model. This approach sees GRT provide clients with the ability to monitor their road performance information in real-time, allowing them to predict where issues may occur prior to happening and solve the problem before it even occurs.

The RMS is a web-based program that can be used in the design, construction and maintenance phases of an assets’ life. It takes inputs from geospatial mapping, sourced from aerial survey information and maps existing roads or along new alignments. This information can then be used to design the road and then plan ongoing maintenance strategies for the road, highlighting high-risk (in terms of maintenance requirements) areas such as intersections, inclines or watercourses.

This end-to-end approach to road building is underpinned by a company-wide dedication to road safety. Road Safety training service allows GRT to work with clients in an ongoing manner to ensure that hazards and risks are managed and resolved before they become an issue.

A world leader in providing cutting-edge infrastructure solutions, GRT understands that building better roads ultimately makes them safer for users, with potentially life-saving results.

Offering these services, GRT seeks to provide an unmatched technical road safety service, delivered in a simple and client-friendly manner.

TRACK RECORD
THERE'S A GRT SOLUTION FOR EVERY PROJECT
GRT products and processes have been applied in hundreds of kilometres of road and hardstand projects worldwide. With offices in Hong Kong, Malaysia, China, Singapore and the Netherlands, GRT currently has active projects in India, Indonesia, the United States of America and Australia.

Some of GRT’s major clients include:

- Public Works Department (PWD)
- British Gas
- MSRDC
- Municipal Corporations
- Austrade
- Australian Government
- Local Government
- Melbourne International Airport Corporation
- Glencore Xstrata
- Defense Force
- Indonesian Military
- Indonesian Government
- USA renewable energy sector
- Brazilian Government
- Resource Sector
- Major multi-national and private companies around the world

Utilising the GRT RMS program, GRT reliably monitors all product installations and also provides access to clients for data collection purposes. This means clients can maintain and track the quality and performance of treated surfaces and can easily schedule product orders and maintenance as required.

**MANAGEMENT SYSTEMS**

GRT has a comprehensive, integrated Quality Management System (QMS). This system functions within the ERP described previously. The QMS provides overarching guidance on all business areas such as risk, safety, environment, HR, estimating, project management, production, auditing, construction and maintenance. Underlying this system is an extensive Quality Management Plan based on ISO 9000, which is the overarching document for the products and services that GRT provides to its clients. Included in this is the GRT RMS system, which allows both GRT and its clients to monitor and schedule consistent maintenance for treated surfaces and acts as the repository for GRT’s quality documentation.

Safety management is one of GRT’s core values. GRT has a comprehensive safety management system, outlined in the GRT Health and Safety Policy, which encourages a safety culture where employees acknowledge and take responsibility for their personal safety and that of co-workers. The GRT Safety Management Plan, written in accordance with ISO 4801, is a document that discusses the framework and outlines procedures for the company’s approach to health and safety related issues. The GRT RMS system allows for close monitoring of staff performance, maintenance and installations, warehousing and shipping. The system also allows for real time upload of hazard identification and incident reporting. GRT is always seeking new innovations to improve safety management – for example, engineered innovations in product dispensing techniques to reduce the potential for spillage during mixing.

To manage our place within the environment, GRT has an Environmental Policy based around reducing impact on the environment, high quality performance practice in environmentally sensitive areas, recycling and effective reuse of waste products. From this Policy, GRT operates under an Environmental Management System consistent with ISO 14001 and is working towards full accreditation. The GRT system focuses on best practice environmental outcomes and includes auditing functions to constantly improve. As GRT products essentially assist clients with their environmental management needs, this type of undertaking resonates well with the ethos of the company.

GRT’s approach to Risk Management is undertaken in a similar manner to the oil and gas industry, with a Policy incorporating risk analysis into every strategic planning, design and operational aspect of the business. Risk assessment in GRT, like other aspects of the business, is reviewed on a regular basis to ensure best practice and the carrying forward of business learning.
CUSTOMER SERVICE AND MARKET RESPONSE

GRT places high priority on relationships and communication with all stakeholders involved in and around our projects. Our technology is site specific; each project has a solution designed specifically for its functional environment. Complementing this, our designers work in close consultation with clients to develop solutions and identify opportunities. Communication with the client is maintained at all stages of the project to ensure that their requirements are met and where appropriate, exceeded.

Continuous improvement and innovation is one of the company’s core values. GRT is always looking for more sustainable or economic ways to install and use its products. And our technicians work hard to constantly develop products for varying applications on unsealed surfaces. So far GRT’s innovation has led the company to contracts involving the military, local councils, governments, the oil and gas industry, the mining industry and agriculture alike, generating much interest internationally for the capabilities of its products.

GRT have a team of highly experienced civil and geotechnical engineers and project managers. GRT also employs Dr Babak Abtahi, previously from the Aerospace Mechanical and Mechatronic Engineering faculty of the University of Sydney. Dr Abtahi specialises in polymer processing and polymer characterisation and is working in conjunction with prestigious institutions such as Harvard University and MIT (Massachusetts Institute of Technology) to undertake development of new products, keeping GRT at the industry forefront.

WORKING WITH GOVERNMENT, INDUSTRY AND COMMUNITIES

GRT has close connections with international government and military ambassadors, receiving accolades for the performance of products in India. This in turn assisted to secure more infrastructure projects in the United States of America. The association of GRT products with sustainable and economical road safety solutions is an attractive option for clients to address important social, safety and environmental outcomes.

Apart from the international affiliations described above, GRT is a sponsor of Roads Australia and a member of Indian Roads Congress, the Surface Coatings Association of Australia. GRT is also currently engaged in the TIPES approval process for its polymer sealing and stabilisation products and processes for the ARRB.

GRT’s focus extends further than just product and service provision – our most recent campaign, the Road Safety Initiative, aims to generate awareness about all forms of travel in and around the journey. The initiative focuses on safety when walking, riding and driving and provides lower socio-economic communities with high visibility backpacks, helmets and baby seats. This enables safer road travel and reduces child fatalities, in alignment with GRT’s greater ethos.

GRT has developed the Road Safety Initiative as a response to the United Nations Decade of Action for Road Safety. In partnership with the Gold Coast Titans, GRT aims to bring this cause to the local communities.
Global Road Technology is an international company with a wealth of expertise in the creation and maintenance of better urban, rural and industrial roads.

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