In a bold move aimed at entrenching a culture of global health, safety and environmental (HSE) standards in southern Africa’s bituminous products industry, Sabita used the international stage of September’s Conference on Asphalt Pavements for Southern Africa (CAPSA’07) in Gaborone to launch its Health, Safety and Environment Charter.

Launched at the first ever HSE plenary at CAPSA, the Charter commits all Sabita members to the implementation of best available HSE techniques during the handling and application of bituminous products. The Charter – detailed in the box on page 3 – underscores the now widely accepted principle that worker well being and conservation of the fragile environment is no longer a choice. It is an obligation.

In his landmark plenary session address at CAPSA’07, which followed presentations by international delegates Mike Acott (NAPA), Knut Søraas (Eurobitume) and Jurgen Stürm (EAPA), Sabita CEO Trevor Distin said the principles of an HSE Charter were first formulated by a steering committee, comprising the managing directors of some of the major participants of the bituminous products industry, on 18 June 2007 and subsequently approved by Sabita’s Council.

“The perceived purpose of the Charter was to develop a set of objectives to be used as a framework for developing a schedule of requirements to endorse membership of Sabita, and to formulate an awards scheme to incentivise members to continually strive for improved performance on the health, safety and environmental front.” he said.

“In terms of the Charter, all members of Sabita are obliged to implement the best available techniques to protect the health, safety and well being of all...
employees, and to conserve the environment during the handling and application of bituminous materials. It is understood that the pursuit of this objective will operate in parallel with the pursuit of corporate proficiency and cost-effectiveness.”

Distin said that, in essence, conformance to the requirements of the Charter demanded that members operate in accordance with both the occupational health and safety (OHS) legislation and the constitution of South Africa. Sabita, through its Centre for Occupational Safety, Health and Environmental Conservation (COSHEC) had undertaken to develop the necessary tools to assist its members in the attainment of these objectives. Subsequently, non-compliance with the principles of the Charter could result in the cessation of a company’s membership of Sabita.

The next stage was to develop and implement an award scheme to incentivise members to comply with the principles of the Charter. The introduction of such a scheme would facilitate the advancement of the industry towards self regulation, and the criteria for the award scheme would be based on measurable requirements as and when they are developed by COSHEC. An example of such envisaged criteria would consist of, *inter alia*:

- reporting of all HSE related incidents;
- BitSafe training of all personnel;
- non-use of coal tar products;
- Material Safety Data Sheets for all bituminous products;
- disposal of waste at approved sites only;
- optimal use of RAP and asphalt waste;
- compliance with the hauliers’ code of practice for loading bitumen at refineries;
- loading and receiving asphalt from tippers which are within the legal payload of the vehicle.

“Such criteria will be used to measure conformance, and members achieving the appropriate standards will qualify for an award according to a rating system,” Distin said. “The primary intention is that the award system should encourage members to strive towards voluntary compliance with best practice in HSE, and such members should set industry benchmarks for others to emulate in their efforts towards profitability through safe and responsible practices. Secondary objectives aim at providing members with an appropriate reward through a prestigious annual industry award function, and encouraging Sabita’s consulting engineering members to implement these requirements in their project designs and specifications, and to monitor the results during their supervision of these projects.”

Distin proposed the following timeframe for self regulation on HSE issues in South Africa’s bituminous products industry:

<table>
<thead>
<tr>
<th>Activity</th>
<th>By when</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Develop measurable criteria for and implement an award scheme</td>
<td>January 2008</td>
</tr>
<tr>
<td>2. Implement an incident reporting scheme</td>
<td>January 2008</td>
</tr>
<tr>
<td>3. Discontinue use of coal tar primes and stone precoating fluids</td>
<td>January 2008</td>
</tr>
<tr>
<td>• Loading bitumen at refineries;</td>
<td></td>
</tr>
<tr>
<td>• Off-loading bitumen;</td>
<td></td>
</tr>
<tr>
<td>• Heating and storing of bitumen.</td>
<td></td>
</tr>
<tr>
<td>6. Implement a load accreditation programme for asphalt tippers as part of Sabita’s award scheme</td>
<td>January 2008</td>
</tr>
<tr>
<td>• Developing guidelines and specifications;</td>
<td></td>
</tr>
<tr>
<td>• Target recycling of 50% of total RAP produced in HMA (i.e. use up to 15% in new mixes);</td>
<td></td>
</tr>
<tr>
<td>• Recycle 80% of total RAP (i.e. use up to 30%).</td>
<td></td>
</tr>
<tr>
<td>8. Develop guidelines for safer alternatives and processes for cleaning and conducting binder content and extraction of bitumen tests.</td>
<td>December 2008</td>
</tr>
<tr>
<td>9. Conduct assessments and make first award for achieving the requirements of the award scheme</td>
<td>March 2009</td>
</tr>
<tr>
<td>10. Host the first industry conference on HSE in RSA with international speakers</td>
<td>July 2009</td>
</tr>
</tbody>
</table>
This charter depicts a set of objectives that will be used as a framework for developing a schedule of requirements to endorse membership of Sabita and to formulate an awards scheme to incentivise members continually to strive for improved performance on the health, safety and environmental front.

In terms of this charter, all members of Sabita undertake to implement the best available techniques to protect the health, safety and well being of all employees and conserve the environment during the handling and application of bituminous materials. In order to achieve this objective in the pursuit of corporate proficiency and cost-effectiveness all members will undertake to:

1. Be compliant with the relevant requirements of South African legislation.
2. Compile a written company policy which embraces the principles contained within this charter.
3. Induct all new recruits in HSE policies and procedures and train all employees in the risks and hazards associated with the handling and application of bituminous materials.
4. Issue all employees with the required personal protective equipment.
5. Conduct risk assessments and develop and implement safe work practices.
6. Report all incidents and report measures taken to prevent the incident from recurring.
7. Use, manufacture and apply materials and products in a manner which is not harmful to the environment or pose a health hazard to workers and communities in the proximity of the site or operation.
8. Reduce waste through recycling and disposing of waste at approved land fill sites.
9. Transport bituminous materials on vehicles which are legally compliant.
10. Store bituminous binders in suitably designed and constructed facilities.
11. Operate and maintain application plant so that it does not pose a danger to life or impact negatively on the environment.
12. Limit the generation of greenhouse gases and conserve energy.

Please take note that the conformance to these requirements means operating in accordance with the laws and constitution of South Africa. Sabita undertakes to develop the necessary tools to assist its members in the attainment of these objectives. Non-compliance to the above principles could result in the cessation of a company’s membership of Sabita.

Some scenes from the highly successful CAPSA’07

A plenary session at CAPSA’07

Tutu Tsiang, Botswana’s Deputy Permanent Secretary, Ministry of Works and Transport

Delegates enjoy a drinks break between sessions
During the closing session of the 9th Conference on Asphalt Pavements for Southern Africa (CAPSA’07), held from 2 - 5 September 2007 in Gaborone Botswana, the technical content of the conference was appraised in terms of how well the challenges raised during previous CAPSAs had been met by the southern African road building industry in accordance with the conference theme of “consolidating best practice”.

The presentation covered a record of the progress made in five areas which had remained largely unresolved up to the present. Problem areas identified by Piet Myburgh were:

- Proper accounting of variability and risk in quality management and pavement design;
- Cognisance of, and progress, on health, safety and environment (HSE);
- Progress on improved methods for hot mix asphalt design;
- Structural pavement design issues, including better modelling approaches and proper assessment of material shear strength; and
- Issues related to surface seals.

In his assessment of the progress made, Fritz Jooste asserted that significant advances had been made to consolidate best practice through the creation of an awareness of issues at hand and the development of the knowledge needed to address current and future problems.

Growth in human resources - a challenge

Overall, the review of CAPSA’07 outcomes has shown that implementation of available knowledge on the one hand, and tools for their implementation on the other, are the domains in which most challenges still remain, and in which the least progress had been made. A central cause of this is the lack of appropriate growth in human resources, and the associated loss of experienced practitioners for various reasons. It was clear that any progress sought with respect to asphalt pavements for southern Africa was critically dependent on human resource development, and on the development of design tools and technology transfer mechanisms suitable to the current human resource realities.

Also, technology development could no longer be pursued without due cognisance of the impact of engineering practice on the wellbeing and safety of employees and other affected parties, and the need to mitigate the impact on the environment. This demanded that more sustainable practices be adopted in the provision and maintenance of road networks in the region. The hope was expressed that this topic field be incorporated in the programmes of future conferences.

Attendance from southern Africa

CAPSA remains a “well-branded” conference, and its success in 2007 was closely associated with the realism and practicality stemming from the theme of “consolidating best practice”. The highly successful format, characterised by plenary sessions in which invited speakers presented state-of-the-art reports, augmented by structured workshops in which key industry challenges were discussed, offers a framework, at least partially, for the structure of future CAPSAs. A lively contact and exhibitors’ programme facilitated further discussion and interaction amongst delegates.

While attendance was again most satisfactory with approximately 400 delegates present, the challenge remains for future organisers to market the conference more vigorously in southern Africa (excluding South Africa) to attract more delegates from the region.

Delegates Fenella Long, Elzbieta Sadzik and Les Sampson in discussion between sessions
Following nationwide Society for Asphalt Technology (SAT) workshops in July and August on the use of recycled asphalt pavements (RAP) in new mixes, and further examination of the issue at CAPSA’07, a report-back on the way forward is planned for the upcoming Road Pavements Forum (RPF) meeting in November.

“South Africa is lagging behind the rest of the world in optimising the use of this valuable engineering material,” Sabita CEO Trevor Distin said. “This failure compromises our ability to achieve a sustainable industry and to protect our environment for future generations. In an effort to correct this shortcoming, the intention is that input from the SAT workshops and from CAPSA’07 be used by an RPF task team to update the current TMH 21 guideline specification for the use of RAP in hot mix asphalt (HMA), and to formulate a way forward for optimum utilisation of RAP in new mixes.”

He referred to the CAPSA’07 presentation by Mike Acott, president of the National Asphalt Pavement Association (NAPA), which noted that the USA uses 80% of their RAP in varying percentages, depending on factors such as the type of layer and mix type.

“There is some confusion in the minds of practitioners that while asphalt is 100% recyclable, our industry is not advocating that new mixes should contain high percentages of RAP. The reason for this is that we do not recover enough RAP to meet the demands of new mixes. In fact, if we were able to recover 100% of our RAP, there would only be enough to incorporate small percentages in new mixes. This is one of the main issues that will have to be addressed by the RPF task team.

“However, our position should be one of advocating a cautious starting point with a low percentage of RAP, e.g. 15%, and treat it like black aggregate. This way we can build our confidence before we move on to using higher percentages, depending on various parameters,” Distin said.

He added that the percentage of RAP that can be used in HMA depended, inter alia, on the following factors:

- The new layer in which it is intended to be used – i.e. wearing course, base, sub-base etc.;
- The type of new mix used: for example, a lower percentage can be used in stone mastic asphalt, open graded and modified bitumen mixes;
- The quality of the RAP available: i.e. if 15% RAP is exceeded in the new mix, the aged binder could influence the selection of the new binder;
- The moisture content of the RAP and the type of mixing plant available.

Typical specifications in USA for using RAP in new HMA:

<table>
<thead>
<tr>
<th>Type of layer or mix</th>
<th>Percentage mass of new HMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wearing course</td>
<td>18</td>
</tr>
<tr>
<td>Binder course</td>
<td>23</td>
</tr>
<tr>
<td>Base course</td>
<td>27</td>
</tr>
<tr>
<td>Polymer modified wearing course</td>
<td>12</td>
</tr>
<tr>
<td>Stone mastic asphalt</td>
<td>3</td>
</tr>
</tbody>
</table>

The treatment of RAP as black aggregate in the manufacture of HMA
Guideline for the amount of RAP that can be incorporated into HMA based on plant type according to local experience:

<table>
<thead>
<tr>
<th>Type of asphalt plant</th>
<th>Percentage RAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Batch plant</td>
<td>Up to 30%</td>
</tr>
<tr>
<td>Parallel flow drum plants</td>
<td>Up to 15%</td>
</tr>
<tr>
<td>Counter flow drum plants</td>
<td>Up to 40%</td>
</tr>
</tbody>
</table>

“It is important that we change our mindset and begin to think of RAP as a valuable resource, and not as a waste product,” Distin said. “RAP is more valuable today than when it was originally placed, and should be seen as an appreciating asset – particularly at a time when bitumen prices make it vital to make optimum use of all resources, including funding. We also need to change the completely false perception that HMA containing RAP is in any way inferior to that made with virgin materials.

Way forward

He added that the RPF task team would attempt to:

- establish protocols for processing, stockpiling and adding RAP to new mixes;
- develop specifications for varying percentages of RAP, i.e.
  - Low (up to 15%, treated as black aggregate);
  - Medium (15-30% fractionate RAP and using a softer bitumen);
  - High (30%, monitoring incoming RAP and special mixing plant required);
- promote confidence by starting with low percentages of RAP and achieving consistent quality;
- develop a policy to drive this initiative until plant has been amortised, at which time the market will dictate the most cost efficient RAP content of new mixes.

Sabita’s membership continues to grow

Among the latest additions to Sabita’s membership are:

Kwezi V3 Engineering, established in 1977, is a South African based consulting engineering company offering multi-disciplinary engineering and project management services

KV3 operates from 33 offices across South Africa, Africa and the Middle East, with a staff of nearly 600. Services are offered in engineering-related disciplines ranging from, inter alia, roads, railways and bridges, pavements, materials and geotechnical engineering to transport planning, water and waste water treatment, project management, electrical and mechanical engineering, hydrology and technology transfer. The philosophy of Kwezi V3 engineers is to supply an exceptional and cost-effective service through:

- The utilisation of the best available professionals.
- Ensuring that the client’s needs and requirements are addressed.
- Close consultation and co-ordination with all stakeholders.
- Compliance with all national and provincial legislation.
- Completion of projects within the agreed time and budget constraints.
- Providing a comprehensive after-sales service.

KV3 has implemented the ISO9001 quality management system to meet the expectations of clients. SIMLAB (Pty) (Ltd), associated with the firm, has fully equipped materials laboratories at Bloemfontein and Bellville, utilising the latest available technology and techniques to provide a complete site investigation and geo-technical testing service as well as the latest design and drawing computer programmes for executing the design and documentation work.

With its head office in Windhoek, Namibia, Namibia Technical Services cc is an independent company specialising in the investigation and testing of civil engineering materials.

Services offered include geotechnical investigations, and the design and analysis of materials for the construction of buildings, roads, bridges, dams, runways, railways and pavements, as well as topographical and engineering survey, aerial photography and the provision of site laboratory services.

Tests are conducted in accordance with a wide range of test specifications, including the standard test methods and codes of practice specified by South African and international standards bodies such as the British Standards Institute, the American Society for Testing and Materials (ASTM), the American Association of State Highway and Transport Officials (AASHTO).

Some recent projects include:

- Site laboratory services for the production of railway ballast at Tsumeb;
- Hozea Kutako International Airport investigation;
- Geotechnical investigation at the proposed new Obib substation for Skorpion Zinc.
- Site laboratory services for the construction phase of the railway line between Tsumeb and Ondangwa;
- Aerial photography for the Oshakati – Ongango canal, Luderitz Aerodrome, and the Namibia Northern Railway Extension: Ondangwa to Skeleton Coast; and
- Topographical surveys for the upgrading of Walvis Bay Airport, for proposed new sites for Kudu Gas to Power project, and for Skorpion Zinc.
In response to industry-led initiatives to discourage the use of coal tar primes and the publication of Sabita’s Manual 26: *Interim guidelines for primes and stone precoating fluids*, Sabita member TarSpray cc recently undertook a research programme to develop a bitumen-based prime that eliminates pollution, poor penetration and drying times, and the limitations caused by coalesced “oil-in-water” emulsions.

Known as ENVIO PRIME™ and currently being evaluated for Agrément certification, the product development sought to fulfil the primary functions of a prime coat while eliminating the health, safety and environmental drawbacks of tar-based or conventional cutback primes. These primary functions were noted as:

- minimising the water permeability of the pavement structure;
- binding and thereby protecting the surface against raveling due to traffic; and
- providing a dust-free, sound surface receptive to binding with bituminous seals.

“After application, conventional cutback prime often pools and sits on the surface in depressions or on a very dense base,” according to Robin Dryburgh, Managing Director of TarSpray. “This does not present a problem during fine weather or if surfacing is to take place a few days later. However, under cooler conditions the curing process can be delayed, and the base may require a layer of binding sand or dust to soak up the surface liquid. This reduces the effectiveness of the prime coat.”

**Flammable cutbacks**

He added that conventional cutback primes, which may be flammable and thus endanger the safety of workers, were also vulnerable to washout if rainfall occurs soon after application. This often results in the staining of kerbs and gutters, which represents a significant environmental contamination concern.

“In view of the above concerns, we took up the challenge to develop a genuinely environmentally friendly prime and precoating fluid with enhanced performance characteristics that is nevertheless safe to handle and does not endanger the health of those involved in its application,” Dryburgh said.

TarSpray’s product specification sheet identifies their new product as a specially formulated proprietary bitumen emulsion prime designed as a replacement and reliable alternative to tar-based and high emission cutback primes. Tests indicate that the product will penetrate within 20-30 minutes and will cure within 12 hours while offering sufficient penetration and providing superior adhesive surface with minimum emissions. However, actual drying or curing time may depend on porosity of base and application rate.

**Benefits**

Other benefits include:

- faster curing than conventional cutback primes;
- greater penetration than conventional cutback primes;
- very low solvent emissions, making its use operator and environmentally friendly;
- non-flammable;
- can be applied in colder weather.
Application rates should be based on existing methodology, and application temperatures are specified at 40°C – 60°C for bulk bitumen distributors, and ambient temperature for hand application. Classified as non-dangerous under current Dangerous Goods legislation, storage and handling of the product is similar to procedures for conventional emulsions.

“On the issue of primes coalescing to form a skin on the road surface, we have manufactured and sprayed in excess of 4 000 000 litres of this product since September 2006, and have received only one complaint that the product was too viscous. We suspect however that the prime may have been contaminated due to inadequate flushing of the contractor’s distributor,”

Dryburgh said. “Aside from that, we have received no reports of skin formation, even on densely compacted bases.

**No petroleum cutters**

“Our products are manufactured with SANS 307 base bitumen materials supplied by the various refineries, and we do not cut back our products with any hydro-carbons prior to or after the manufacturing process.”

He added that in researching international trends in this field, he was assured that “we have developed a prime and precoating material equal to anything being used elsewhere in the world in similar climatic conditions to those of South Africa.”

**Specifications:**

<table>
<thead>
<tr>
<th>Property</th>
<th>ENVIRO PRIME</th>
<th>Test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density @ 25°C</td>
<td>0.945</td>
<td></td>
</tr>
<tr>
<td>Kinematic viscosity @ 60°C, cSt</td>
<td>5 - 30</td>
<td>ASTM 2170</td>
</tr>
<tr>
<td>Distillation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% (v/v) of total distillate to 360°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Binder residue from distillation</td>
<td>40 - 60</td>
<td></td>
</tr>
<tr>
<td>Water in distillate</td>
<td>38 - 42</td>
<td></td>
</tr>
<tr>
<td>Oil in distillate</td>
<td>12 - 17</td>
<td>ASTM D402</td>
</tr>
<tr>
<td>Penetration @ 25°C (100g/5s), on residue from</td>
<td>160 - 200</td>
<td>ASTM D5</td>
</tr>
<tr>
<td>distillation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water content (Dean &amp; Starke) % (v/v)</td>
<td>40 maximum</td>
<td>ASTM D244</td>
</tr>
</tbody>
</table>

**Events calendar 2007-08**

**2007**

Nov 13 Launch of TG1 in Cape Town

Nov 14 Launch of TG1 in KwaZulu-Natal

Nov 15 Launch of TG1 in Gauteng

Nov 20-21 Road Pavements Forum (RPF) Gauteng

**2008**

Apr 14-15 3rd European Asphalt Technology Association (EATA) Conference, France

Apr 21-24 Second Transport Research Arena - Europe 2008. Ljubljana, Slovenia


May 21-23 Eurasphalt & Eurobitume - 4th Congress. Bella Centre, Copenhagen

June 24-28 ICMPA 7th International Conference on Managing Pavement Assets. Calgary, Canada

July 27-29 1st International Sprayed Sealing Conference. Adelaide, South Australia

July 30-2 ARRB Conference. Adelaide, South Australia

Oct 20-24 6th Symposium on pavement surface characteristics. Organised by PIARC, Slovenia
A draft guideline on asphalt reinforcement (AR), initiated at a Road Pavements Forum (RPF) meeting in November 2003, has been released by Sabita on the Students CD distributed at CAPSA'07, and will be workshopped by the Society for Asphalt Technology (SAT) before final revision and editing.

It is anticipated that the workshops will be held nationwide (see page 12), and feedback from these workshops will be presented at the next RPF and will be used to finalise the guideline document. The finalised document will be published as an Asphalt Academy technical guideline during 2008.

Prepared by a technical working group made up of representatives of the CSIR, the asphalt industry, roads authorities, asphalt producers and consulting engineers under chairman Philip Joubert, the guideline covers selection, specification, design, construction and quality control issues on the use of asphalt reinforcement to:

- prevent or reduce reflective cracking from underlying layers;
- protect asphalt layers against traffic induced cracking; and
- avoid or reduce development of rutting in asphalt layers.

**Purpose**

The main purpose of the guideline is to provide a synthesis of practical, state-of-the-art approaches to the use of AR, based both on international best practice and regional knowledge and experience. The primary goal is to contribute towards a reduction in the cost of rehabilitating and maintaining asphalt pavement layers, leading to more sustainable road infrastructure provision in the southern African environment.

The guideline covers the following materials and types of reinforcement:

- All types of materials for interlayers;
- Interlayers placed in or under asphalt layers.

The guideline is aimed at a wide range of practitioners, including consultants, contractors, materials suppliers, road owners and researchers who, in various ways, are all involved in different but complementary aspects of provision and maintenance of asphalt pavement layers. Emphasis has been placed on guiding the practitioner towards evaluating the AR options and considering their pros and cons as a basis for decision making and application to specific situations. This is achieved by collating together in one document key background knowledge and experience of the application and performance of both tried and tested, and new and innovative solutions in all aspects of the utilisation of AR.

Issues covered by the guideline include:

- Requirements for good performance (e.g. material composition, geometry, constructability and boundary operating conditions);
- Design guidelines;
- Specification guidelines;
- Product performance guarantee;
- Standard conformance testing.

**Experienced input**

The guideline does not deal with loose fibres added into the asphalt mixes, nor with interlayers under surfacing seals (this is covered in the TRH3 document). However, it does provide a source of comprehensive references covering additional details and examples of local and international experience and research results.

The guideline was compiled using the accumulated knowledge and practical experience of the working group and others who have long experience of working in the field of AR. It also includes inputs from key experts from European countries. The guideline was developed through “local”...
participation. As a result, it has been possible to capture and incorporate a significant amount of local knowledge in the document. This beneficial approach has produced a document that:

• reflects the needs of the region;
• places an emphasis on local ownership;
• facilitates wider application; and
• improves prospects for sustainable implementation.

As AR technology is continually being researched and improved, it will be necessary to update the guideline periodically to reflect improvements in practice. To facilitate this process the intention is to develop a database of projects where AR products have been used. The objective of the database is to consolidate the available information (on both successful and failed projects) with as much available information on each of the projects and product applications as possible. This will enable the database to be used as a learning tool to ensure the best use of AR products. Specifiers and users of these AR products are encouraged to contribute to this database. The current address for this database is shown in the box below, and the guideline has also been posted on the Sabita website (www.sabita.co.za).

ftp://ftp.csir.co.za/BE/Infrastructure_Engineering/Asphalt

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**Sabita's membership of the IBEF aims at improved international contacts and service for members**

In an initiative aimed at forging new international linkages, facilitating the inflow of global experience to southern Africa and improving service to its members, Sabita has become a member of the International Bitumen Emulsion Federation (IBEF).

Headquartered in Paris, the IBEF is a grouping of national bituminous products associations from all over the world, and its objectives are defined as:

• to promote the use of bitumen emulsions throughout the world;
• to learn about and exchange information on the use of bitumen emulsions in member countries;
• to exchange data on standardisation and specifications for emulsion products;
• to share technical information relevant to the production and use of bituminous binders among its members;
• to organise periodic world-wide technical symposia on bitumen emulsions for roadworks.

**Structure**

The IBEF is made up of full and associated members under the chairman Jean-Claude Roffe, executive director Alain Le Coroller, and a board of directors appointed at a general meeting held every year. Two-thirds of the board is made up of permanent members, these being delegates of the founding member associations and of those associations producing in excess of 100 000-tons of emulsion annually. The general assembly also elects the non-permanent directors making up the remaining third of the board.

The chairman of the board is elected for a two-year term of office.

Full membership of the IBEF is open to associations whose emulsion manufacturing represents a significant activity and who declare themselves, for the purposes of IBEF membership, as an association of Bitumen Emulsion Manufacturers, although they may also be involved in other activities. Other than associations, informal groups of companies that engage in the business of producing bitumen emulsions for road construction may also become full members, with the same rights and privileges.

Associate membership is made up three tiers:

• users of bitumen emulsions and their associations;
• producers of chemical products or manufacturers of equipment relating to the production and application of bitumen emulsions and their associations; and
• other professionals engaged in business related to the production or use of bitumen emulsions, including academics, consultants, road authorities etc.

The IBEF has recently assisted Sabita by supplying the latest global best practice on specifications and procedures for the design and application of slurries and microsurfacings as well as information on emulsions used as bond coats for UTFC’s. This information will be used in the updating of specifications for modified emulsions and a new guideline document on The design and use of slurry seals in Southern Africa.
A new Sabita manual - *Guidelines for the use of thin layer hot mix asphalt wearing course on low volume roads* has been completed and will be introduced for industry review by year end. Publication of the final document is scheduled for early 2008.

This manual specifically applies to urban residential areas, where such layers would be required to meet the functional requirements of low speed light traffic, rather than to contribute to the structural capacity of the pavement. It is anticipated that a more uniform, rational approach to the design and construction of such layers would be furthered by this manual.

High volume, high speed applications served by stone mastic asphalt and proprietary products, for example, are explicitly excluded from the scope of the manual.

**Definition**

Within the context of this document thin layer hot mix asphalt is defined as a layer that:

- Offers a direct contact stress interface between traffic and the base layer of the pavement;
- Has sufficient resilience to provide a durable surface;
- Protects the underlying pavement layers against the ingress of water; and
- Provides an appropriate degree of skid resistance.

As these layers constitute functional asphalt layers they should be constituted to optimise their functional performance characteristics and quality management procedures instituted accordingly. Layers of specified thickness less than 30mm, irrespective of mix type or usage, are considered to serve functional requirements predominantly and fall within the ambit of thin layer asphalt.

**Scope**

The manual covers the following:

1. A review of current practice in design and construction;
2. Recommendations on appropriate applications;
3. The influence of existing pavement conditions;
4. Mix selection criteria;
5. A review of risks involved;
6. A proposed, rational approach to mix design; and
7. Guidelines for the construction and on-site quality control.

**Mixture types**

For urban applications - the predominant area of application of thin layer asphalt - it is recommended that the designer approach manufacturing plants in the proximity of the site to review the mixes available to meet key functional performance requirements. Alternatively, where the specific circumstances dictate that a new design needs to be developed, the manual proposes a rational design procedure that addresses aggregate packing to optimise the composition of the mix to meet compactability, low permeability and durability requirements and to counter segregation.

**Key mix components**

For the layer thicknesses being considered i.e. < 30 mm, it is strongly recommended that the NMAS adopted should never exceed 9.5mm. Also, as proper compaction of the mat is of critical importance to provide a suitably textured and impermeable layer, it is recommended that a softer grade of bitumen e.g. 80/100 penetration be considered as it will lower the required mixing and paving temperatures by about 10°C compared to, say, those relevant to 60/70 pen bitumen. This will significantly increase the compaction window.

Mixes with appropriate binder contents and lower, dispersed air voids are also advocated to improve durability, impermeability and compactibility of thin layer asphalt wearing courses.

**Dissemination to practice**

Discussions are underway between Sabita and the Society for Asphalt Technology (SAT) on a workshop programme before year end to introduce this manual to practice. Comments gleaned during this programme will be considered in finalising the document.

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The manual suggests that the adoption of fine-grade, sand-skeleton mixes together with softer bitumen grades will advance the achievement of the design objectives as demonstrated in the matrix below:

<table>
<thead>
<tr>
<th>Design objective</th>
<th>Sand skeleton</th>
<th>Softer grade of bitumen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low permeability</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Compactibility</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Low speed skid resistance</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Flexibility</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Durability</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>
Sabita membership: November 2007

Ordinary

AG Thomas (Pty) Ltd
A J Broom Road Products (Pty) Ltd
Akasia Road Surfacing (Pty) Ltd
Astec – Asphalt Technology
Bitumen Construction Services (Pvt) Ltd
Bitumen Supplies & Services cc
Black Top Holdings (Pty) Ltd
BP Southern Africa (Pty) Ltd
Brisk Asphalt Surfacing (Pty) Ltd
Chevron SA (Pty) Ltd
Colas SA (Pty) Ltd
Concor Roads & Earthworks
Engen Petroleum Ltd
Jayseal (Pty) Ltd
Milling Techniks (Pty) Ltd
More Asphalt
Much Asphalt (Pty) Ltd
National Asphalt (Pty) Ltd
Nyanga Roads (Pty) Ltd
Phambili Road Surfacing (Pty) Ltd
Polokwane Surfacing (Pty) Ltd
Power Construction (Pty) Ltd
Rand Roads (a division of Grinaker-LTA Ltd)
Roadmac Surfacing (Pty) Ltd
Roadsmart (Pty) Ltd
Sasol Oil (Pty) Ltd
Shell SA Marketing (Pty) Ltd
Spray Pave (Pty) Ltd
Tarfix (Pty) Ltd
Tarspray cc
Tosas (Pty) Ltd
Total SA (Pty) Ltd
Van WykTarmac cc
Zebra Bituminous Surfacing cc

Arcus Gibb (Pty) Ltd
Asch Professional Services (Pty) Ltd
BCP Engineers (Pty) Ltd
Beosumbar & Associates
BKS (Pty) Ltd
Cape Peninsula University of Technology
Dick King Lab Supplies (Pty) Ltd
GMH/CPP Consulting Engineers
Goba (Pty) Ltd
HHO Africa
Iliso Consulting (Pty) Ltd
Jeffares & Green (Pty) Ltd
Kantey & Templer (Pty) Ltd
Kaymac (Pty) Ltd t/a Kaytech
Kwezi V3 Engineers (SA) (Pty) Ltd
Lafarge South Africa Ltd
Lidwala Consulting Engineers (SA) (Pty) Ltd
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PD Naidoo & Associates (Pty) Ltd
Rankin Engineering Consultants
Sasol Technology Fuels Research
Sasol Wax SA (a div of Sasol Chemical Industries)
Siyenza Engineers cc
Specialised Road Technologies
SSI Engineering & Environmental Consultants (Pty) Ltd
TPA Consulting cc
Tshepega Engineering (Pty) Ltd
Unitrans Fuel & Chemical (Pty) Ltd
Vaal University of Technology
Vela VKE Consulting Engineers (Pty) Ltd
WSP SA Civil & Structural Eng (Pty) Ltd

Affiliate

DMV Harrismith (Pty) Ltd
Luchrisdebar Surfacing cc
Mdubane Energy Services
MTTC (Pty) Ltd
Salphalt (Pty) Ltd

Some scheduled Society for Asphalt Technology (SAT) events for the coming months:

• A general meeting of SAT members after the first day of the RPF on 20 November;
• A series of workshops to launch the draft guideline on asphalt reinforcement. The workshops will be held in Durban and Johannesburg before the end of 2007, and in Cape Town in 2008. Dates will be announced shortly;
• A workshop tour on the draft guideline: The design of thin layer asphalt for low volume residential roads will be held in Cape Town before December, and in Durban and Johannesburg in 2008;
• A workshop on the design and application of slurry is planned for 2008;
• A series of workshops on bitumen rubber asphalt is scheduled for mid 2008;