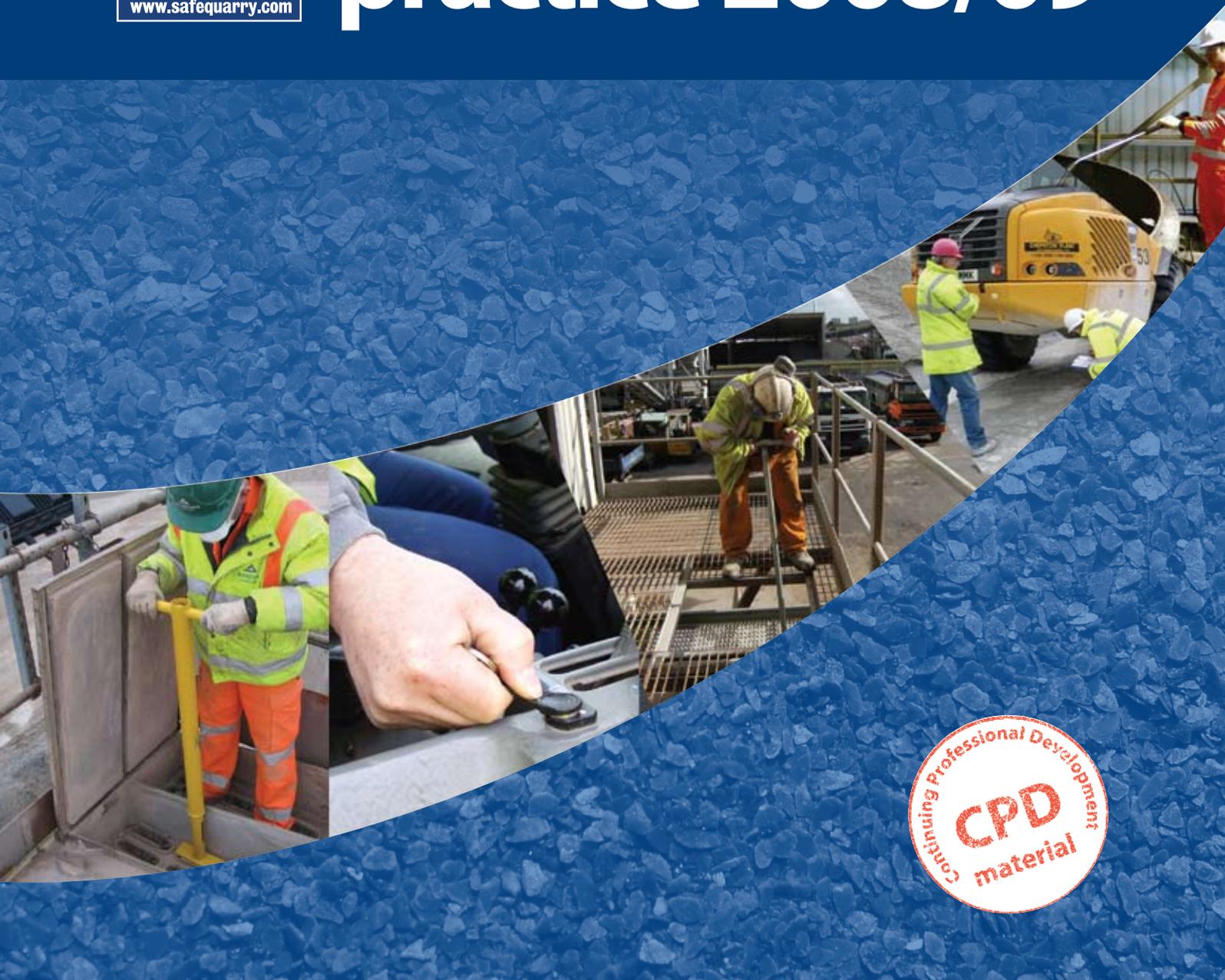




Sharing good practice 2008/09



ENTRIES FROM THE HEALTH AND SAFETY BEST PRACTICE AWARDS





Fast route to:

- Best practice
- Incident alerts
- Hot topics
- Toolbox talks



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When?

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 www.safequarry.com

Foreword

The mineral products industry is committed to achieving the highest standards of health, safety and welfare in all that we do. Health and safety is now established at the top of every agenda of every member company. It pervades our business. It is embedded in our culture.

As we near the close of the industry's second Hard Target period, we note with pride our success thus far in reducing injuries and ill health. Indeed, our statistics show a remarkable 80% reduction in 10 years in reportable injuries - significantly better than for comparable stakeholder groups.



Having succeeded with the 2000-2004 Hard Target, I have every confidence that we will achieve and improve upon the current five year Hard Target by 31 December 2009. From hereon, the targets and the efforts required will get tougher - much tougher, particularly in these challenging times.

To assure future success, we must be able to demonstrate competence. Investment in NVQs - and in the future the more flexible QCF system - when complemented by audited CPD records, is undoubtedly industry best practice. Combining this with visible felt leadership and genuine involvement of the workforce and we have the tools to tackle the future.

This booklet, as with its forerunners, demonstrates vividly this industry's willingness to share knowledge and innovation for the common good. Members of the MPA who continue to contribute to this impressive and growing resource are to be congratulated for their efforts, as is the MPA for collating and communicating this array of good practice so effectively.

I am pleased to commend this publication to you.

A handwritten signature in black ink that reads "P O'Shea". The signature is fluid and cursive.

Patrick O'Shea
Chairman, Mineral Products Association

Introduction

This guide summarises the ideas and innovations to come from the Mineral Products Association's *Health & Safety Best Practice Awards* 2008 and 2009.

In addition, the entries can be viewed at www.safequarry.com, where those from the previous seven years of the awards scheme can also be accessed. The website also features a database of incident alerts, toolbox talks and the latest on the industry's hot topics. By registering on the site, you will receive email alerts when new items are added and an "information basket" where you can store those that most interest you.

The resources are ideal for training purposes and for Continuing Professional Development (CPD). We hope that organisations of all sizes with an interest in quarrying and mineral products will find them useful and accessible. To ensure that your browsing on www.safequarry.com is recorded for CPD purposes, you do need to **log in** every time that you access the website.

How to use this guide

This guide is a compilation of solutions that MPA companies have applied to minimise and, where possible, eliminate health and safety risks arising from their daily operations. The ideas and innovative approaches are often very simple and inexpensive and could readily be applied to a range of common industry problems.

It is hoped that by reviewing this guide, particularly those sections relating to your main area of work, you will recognise solutions that could be applied within your own workplace or that will generate an idea for an alternative solution.

The guide has been divided into nine sections that reflect the most common areas or activities requiring particular health and safety consideration. We have indicated which entries were prize winners, and which have video clips available. To help you locate entries relating to a certain subject, we have provided a *keyword* index.

We welcome your feedback via the Safequarry website. Your involvement is crucial in helping the industry to achieve Target Zero.



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> Safe wheels - safer driving

CEMEX UK > South Ferriby Cement Works, Lincolnshire
> 07795 051761



Wheel loss is a serious issue. In the UK, up to 11,000 wheel fixing defects result in up to 400 wheel detachments every year.

CEMEX UK analysed the wheel loss incidents on its own fleet and initially tackled the problem by prohibiting the tightening of wheel nuts by drivers. If a driver found any problems with his wheels whilst carrying out his daily vehicle checks, a tyre fitter had to be called.

CEMEX UK then took the decision to raise the level of wheel security and invested in a project to modify all wheel nuts on the aggregate tipper fleet with self-locking devices.

These work by fitting a locking device to the original nut. If the original nut should start to loosen, the locking nut or stud will tighten against the original nut on the reverse thread with the locking cap combining both actions, ensuring a fail-safe bolt fixing.

In 2007, CEMEX UK experienced 18 incidents related to loose wheel nuts. Since fitting the locking devices, no incidents have occurred.

> Haulier management system

Lafarge > Mountsorrel Quarry, Leicestershire > 01162 303881



Staff in the weighbridge at Mountsorrel Quarry have incorporated a number of initiatives to ensure that drivers keep their vehicles in good condition, safety equipment is maintained, site rules are observed and risks are reduced wherever possible.

The following have been introduced as part of the Haulier management system on-site:

- Lorry parking area for exclusive use by LGV vehicles.
- Dedicated sheeting, trimming and lorry body access platforms.
- EPIC/MPQC Drivers' Skills Card training for every core fleet driver.
- Random inspections of vehicles on a routine basis.
- Checks on tax discs and trailer weights to ensure compliance with trading standards legislation.
- High corporate vehicle standards. Any vehicle found not to meet the minimum requirements is stood down, irrespective of the customer implications or delivery times. More 'near hits' are raised at Mountsorrel for vehicles falling below standard than other Lafarge Aggregates sites.
- A speed camera system has been installed to reduce the impact of our vehicles at night, reduce the environmental perception of our neighbours and reduce the risk of collisions with pedestrians.
- Vehicle interactive audits.
- Site PPE requirements displayed on a new pictograph sign at the quarry entrance.
- Provision of spare safety equipment such as sheeting straps and cameras. These are issued by the weighbridge at cost. The haulier then returns the item into stock or is charged, at his/her discretion.

The commitment from weighbridge staff to ensure that vehicles are fit for purpose and the reporting of near misses is exemplary.



> Skip lock

Tarmac > Dene Quarry, Derbyshire > 01629 822104



Staff at Dene Quarry noticed that even though there was signage on the approach to the site, unless a physical barrier was in place to prevent access, some drivers would still drive into the site.

In order to better control these contractors, staff targeted the ad hoc collections of skips by waste companies.

Two fitters placed a lock onto the skips so that even if the drivers ignored all of the signage, they would still have to report to a member of the quarry staff before they could attempt to load.

This gives quarry staff the time and opportunity to ensure the skip is correctly loaded and to ensure the driver follows the safe loading procedure.

> CEMEX UK cyclist safety

CEMEX UK > Company-wide > 01788 517000



In May 2003, following the death of a cyclist in Central London, CEMEX UK embarked on a programme to improve driver visibility of its liveried fleet.

The campaign has continued and in recent years several new initiatives have been launched. These include:

- Developing a fact sheet and videos for 'cyclists and lorries'.
- Adopting approved blind spot solutions on all its vehicles ahead of the EU directive implementation deadline in March 2009.
- Retrofitting wide-angle blind spot mirrors on all CEMEX UK vehicles and designing a special portable mat which enables this to be performed almost anywhere.
- Fitting a proximity sensor 'side-scan' system on all concrete truckmixers in London.
- Installing rear view cameras on ALL vehicles.



CEMEX UK also launched a PR campaign to raise awareness amongst vulnerable road users. This included:

- Involvement in the BBC local news programme 'Inside Out'. In it, Emily Thornberry MP, Chair of the All Party Parliamentary Cycling Group, called upon the Government to make blind spot mirrors or camera systems compulsory for all heavy goods vehicles and trucks before 2009.
- Engaging over 300 cyclists in a campaign on Horse Guards Parade with the help of London's Metropolitan Police.
- Involvement in 'The London Programme', an ITV local news programme.

> Isolation of mobile plant

Aggregate Industries > **Croft Quarry, Leicestershire** > **01455 288605**

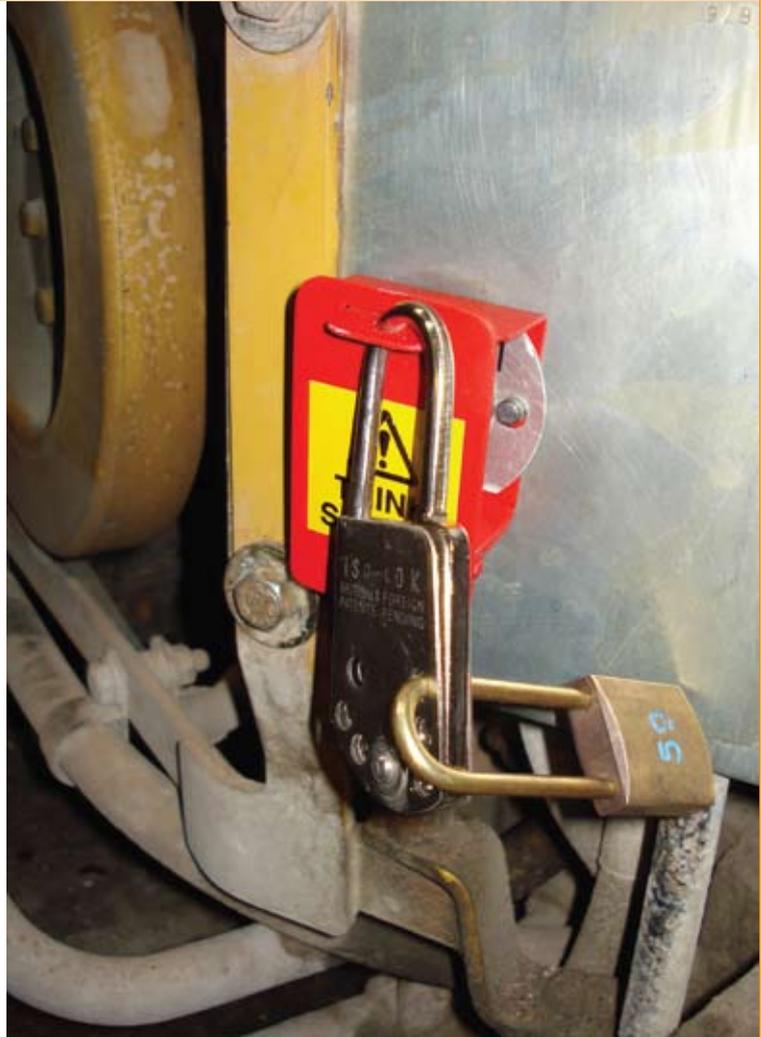
Following a review of Croft Quarry's safe system of work concerning vehicle isolation, in December 2008, keys were removed and locked in a box within the mobile workshop office.

This worked well for light vehicles but was ineffective on larger mobile plant, which have identical ignition keys, enabling defective machines to be activated by operators unaware of the safety implications.

To rectify the problem, a hasp style lock was designed, manufactured and retro-fitted to mobile plant within Croft Quarry.

This simple, cost effective and easy to fit device is bolted around the master switch using the existing fixing nut. The design fits all CAT master switches and can easily be adapted to fit Lucas master switches.

When the master key is removed the hasp can be locked with a multi hasp and individual isolocks used (one lock = one fitter, two locks = two fitters) making isolation to the same standard as static plant.



> Personal isolation of mobile plant

Tarmac > **Fourways Quarry, Cheshire** > **07809 512202**

Due to the number of identical mobile plant keys in circulation, a method was required to ensure the isolation of mobile plant by individuals, so that defective machines could not be activated by operators unaware of the implications.

A steel bracket was fabricated which could be attached to the cab door handle. The opposite end of the bracket would then be attached to the handrail of the vehicle's access steps.

The bracket can then be secured using a personal padlock. A multi-hasps allows more than one padlock to be placed on the bracket, if more than one operator is working on the machine.



> Safety steps

Blasting Services > Exchem Explosives, Derbyshire > 01773 837672

Blasting Services' expertise as drilling and blasting contractors means that its plant is regularly transported to sites across the UK.

A health and safety problem was identified when machinery is loaded on to a trailer for transportation, because the access steps are a metre too short. This made access and egress from the cab potentially hazardous, especially in adverse weather when there is the potential for an operator's footing to slip.

In order to rectify the issue, Blasting Services designed a set of fold-away steps that make access and egress from the cab safe.

The steps take less than a minute to assemble, weigh just three kilograms, can be adjusted to fit various plant and include vent holes so that mud and soil passes through the steps.



> Management of workplace transport

Aggregate Industries > Waste Asphalt, Salford > 07740 934306

The Waste asphalt plant was set up so that the weighbridge was next to the entry and exit gate, with all vehicles stopping on entry.

Following the construction of a concrete plant, vehicle movements increased and a new gate was fitted to enable a one-way system to be followed.

As the plant got busier, communication with the hauliers became poor and shovel drivers were taking full responsibility after tipping until they reach the weighbridge.

It was then decided at a site health and safety meeting that a better way of controlling vehicles and communicating messages onto the site was required.

The following solutions were implemented:

- The weighbridge office was relocated next to the incoming gate. Whoever was manning the bridge would then be able to see all incoming vehicles and control site traffic as necessary.
- A new pedestrian route was installed to allow safe access to the weighbridge, away from moving plant.
- A new cabin was installed at the height of wagon windows, meaning that drivers no longer had to get out of their cabs to report in and get their tickets signed.
- The weighbridge operative gives drivers a tipping card and directs them safely to the correct stockpile.
- If more than one vehicle now arrives, the operator will hold them until the yard is clear.
- The mixing computer has also been remotely linked to the weighbridge cabin, meaning the system can be run as a dual-operating system on nights and weekends without losing any effective site health and safety control.



> Portable reversing camera

Aggregate Industries > Lee Moor Quarry, Devon > 01752 839723



At Lee Moor, it is not unusual for the quarry to suffer poor or very poor visibility due to misty or foggy weather.

The company policy is that all vehicles are fitted with reversing cameras, however many customers who collect material do not have cameras fitted.

Rather than turn them away, customers are loaned a portable reversing camera, which can be fitted within five minutes.

The system consists of a colour monitor with a suction pad, which sticks to the side window, and a magnetic rear camera, which attaches to a part of the rear frame.

A cable clips along the body to the monitor which is powered by the 12 volt cigarette lighter.

> An easy way to fill an auto-greaser

Lafarge > Dry Rigg Quarry, North Yorkshire > 01729 860411

During an interactive audit, a loading shovel operator pointed out that filling the machine's auto-greaser was a major task. It required four cartridges to be manually pumped in order to fill the tank. This had to be done twice a week.

This type of greaser was fitted to two other vehicles at the site, whose operatives experienced the same problems.

After discussions with site maintenance staff, it was decided that a mobile greaser would make the task easier. A 12.5kg grease tub and pump was mounted on to a trolley. The unit uses compressed air and is coupled with a quick release mechanism to the plant's auto greaser reservoir.



> Mobile plant key control

Sibelco UK > Kings Lynn Quarry, Norfolk > 07711 172000



The health and safety advisor on-site was concerned over the control of mobile plant keys.

To address this, a key cabinet was installed as a control point for the mobile plant keys. This was found to be difficult to manage as there are potentially many drivers for the same piece of mobile plant.

The quarry supervisor suggested a driver identification system called 'didBOX'. Following a successful trial, the system has been installed on all front end loaders on the site.

Each authorised driver is issued with a key fob programmed with their identification number and the category of vehicle that they are allowed to drive.

The system limits access to approved drivers and records usage by operator, date and time.

> Mobile plant management system

Tarmac > Blashford Quarry, Hampshire > 01425 478771

Tarmac has introduced the Radio Frequency Identification (RFID) mobile plant management system at Blashford Quarry.

The automated engine management and data logging system is located behind the seat of the operator and will only allow plant to start when it detects the presence of authorised operators, who must be wearing an ID tag.

The system is also capable of setting restricted operating times so that plant can not start outside permitted hours.

If the machine is left idling for five minutes the RFID system will shut it down, saving fuel and preventing unauthorised use.

The system also monitors start up and shut down times, fuel use and records the time the engine is idling or in use.



> Remote discharge tripper activation

Day Group Ltd > Brentford, Middlesex > 07775 821561



Modifications have been made to the conveyor discharge tripper, which has made the process of discharging materials safer.

A remote control system has been installed so that the tripper can now be positioned by the loading shovel operator, from the safety of the cab.

This means employees no longer need to walk up to the tripper to manually operate its controls, which posed an access hazard during hours of darkness.

It has also freed up one employee who used to stand in the tripper whilst discharging trains.

> Safe vehicle and plant jump start

Tarmac > Bannerbank Quarry, Strathclyde > 01419 506476



An injury to an employee sustained whilst jump starting a quarry vehicle was discussed at the weekly safety committee meeting in order to find a safer method of work.

A quarry supervisor suggested fitting safety plugs which eliminate contact with the batteries, whilst a contractor suggested Anderson plugs.

Anderson plugs are a mirror of each other and are simple to assemble. There is no male and female and one simply connects into the other of the same amperage. The plugs push together to form a very solid and reliable connection.

Following a successful trial on a small quarry vehicle, the plugs were fitted to other vehicles and mobile plant around the quarry.

> Job cards

Tarmac > Lingerfield, North Yorkshire > 01423 796863



Within a quarry, activities such as excavating and tipping have a high potential risk of injury if not carried out correctly.

Instructional documents describing how these activities should be completed are often lengthy, only issued periodically and are kept in the office.

To help ensure that the workforce involved with these activities understood the correct procedures, job cards were created as a handy reference to be reviewed before carrying out each specific activity.

Designed to be carried in machinery cabs, they communicate rules and instructions in a straightforward and simple manner, using diagrams and text.

Simplifying and placing these instructions in the workplace reiterates the importance of safe operations.

> Truck mixer workshops

CEMEX UK > Wolverhampton Road, West Midlands > 07795 051761



Year on year, CEMEX UK Operations has successfully reduced the level of personal accidents, with a 91% reduction in incidents over the last five years.

CEMEX UK recognised that the accident rate amongst the 55 company truck mixer drivers and 650 independent contract hauliers had not improved to the same degree.

A decision was made to develop a training workshop designed around real incidents that had occurred both within CEMEX UK and the industry in general.

The workshop content was drafted and agreed by senior management and included:

- Truckmixer accidents.
- Safe driving.
- Company policies and procedures.
- Mixer drum entry - confined spaces.
- Mobile phones, seatbelts, drugs & alcohol.
- New legislation.
- Accident reporting.

Handouts were issued to reiterate the most important sections.

The workshops were well received and the content was judged to be very informative, relevant and worthwhile.



> Pictographic pre-start inspection sheets

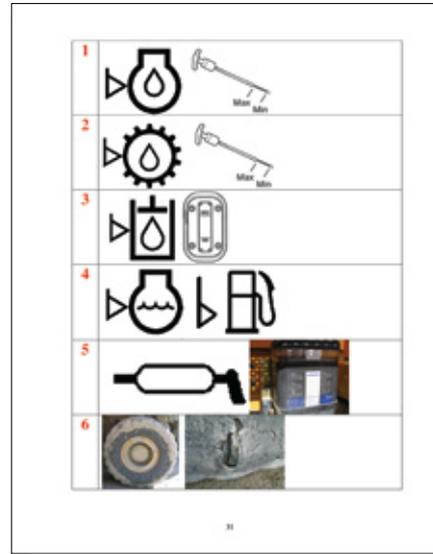
Sibelco UK > Brookside Hall, Cheshire > 01270 752651



Whilst carrying out NVQ training work, it became evident that some candidates had literacy problems which compromised their ability to follow the company's standard pre-start inspection sheet.

Sibelco UK developed more easily understood pictographic-based instructions, which have since been incorporated into operator handbooks for specific items of mobile plant.

The handbooks have been issued to all operators so as not to highlight any individual. They are also proving useful for operators for whom English is not their first language.



> Management of contractors

CEMEX UK > Wolverhampton Road, West Midlands > 07785 778233



As part of CEMEX UK's drive for continuous health and safety improvement, a particular area of focus is the management of contractors.

Whilst larger projects are planned and controlled by the local operations management or under Construction, Design and Management (CDM) regulations, smaller, more routine works and breakdowns, are normally supervised by the site batcher.

Although all batchers attend safety road shows, monthly training sessions and regular tool box talks, the consistency of permits to work and the supervision of contractors remained a concern.

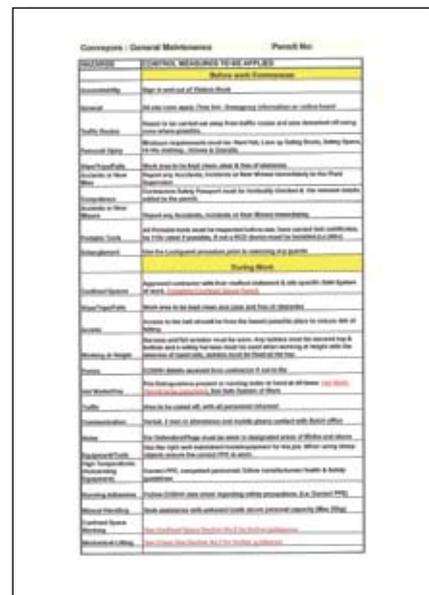
A small working party was tasked with developing a system to help improve the supervision of contractors. As a result, the 'Management of Contractors' manual was produced.

The manual includes:

- A pre-work check list.
- Task-specific crib sheets outlining common hazards.
- Control measures that must be applied both before and during the actual work.

The manual is designed to complement other tools such as site inductions, permits to work, hot work permits, worksafe, risk assessments and any method statements and safe systems of work supplied by the contractor.

The quality of permits to work completed by batchers has dramatically improved and there has been a noticeable improvement in the supervision of contractors across CEMEX UK's sites.



> Confined space access and rescue

Aggregate Industries > **Bardon Hill, Leicestershire** > **07738 134323**



In 2008, the Aggregate Industries board recognised that there were deficiencies in the safe systems of work for quarry based confined space working and appointed a project officer who was tasked to report back within nine months.

Industry best practice was based heavily on the water industry and whilst safe working concepts were similar, the environmental focus was very different.

Working in conjunction with a local training provider, a completely new system of working was devised that borrowed access techniques from the emergency services, roped access industry and the military.

The project officer created a four stage safe working system - environmental survey, risk assessment, entry procedure and permit to work.

A new set of training competencies was formulated and a training system called CONSAR (Confined Space Access and Rescue) was devised.

As part of the package an operational (but closed) asphalt plant was turned into a confined space training centre. This enabled managers, supervisors and workers to train in and on confined spaces that they will be asked to manage and/or enter.

Other measures included a standard confined space access equipment pack.

The confined space guidance, Safe System of Work (SSOW) and training package have now been implemented across the whole of Aggregate Industries UK Ltd.

No accidents or near misses in confined spaces have been recorded since this implementation.

> Training Academy for mobile plant

Lafarge > **Tyttenhanger Quarry, Hertfordshire** > **07734 743021**



A director-lead focus group highlighted the high proportion of incidents involving front end loaders or loading shovels.

The quality of the training for those new to operating mobile plant on Lafarge sites, was identified as an issue.

As a result the Lafarge Training Academy was established to provide:

- Seven days worth of training and assessment for new starters.
- Practical and theory training, supported by demonstrations by manufacturers.
- The use of qualified trainers.
- Retraining and assessment for existing operators.
- An induction in 'The Lafarge way'.
- Training for certain operators, some going on to achieve "Advanced operator" status.



Since the first Academy was held Lafarge has seen a 10 per cent reduction in incidents involving front end loaders. It also estimates that the training has led to an £85,000 annual cost saving.

> Ennstone certificate of proficiency

Ennstone Thistle > Ennstone House, Monfieth > 01382 537600



Ennstone Thistle has a large contracting business in the North of Scotland consisting predominantly of road surfacing squads together with a number of smaller construction and civil engineering squads.

In 2007, it was recognised that there were no formal schemes available to train and assess new and existing employees, particularly with regard to contract surfacing.

Therefore, an in-house training scheme was devised by Willie Oswald who has 47 years' experience in the industry.

The certificate of proficiency provides an entry level training course for new employees and prepares existing employees for assessment at S/NVQ Level 2 in Road Building for surfacing operatives. An S/NVQ Level 2 on Construction Operations is designed for civil operatives.

Ennstone Thistle approached the Scottish Qualification Authority for accreditation for the training scheme, and this was achieved in October 2008.

> Portable electrical isolation training panel

Aggregate Industries > Eskett Quarry, Cumbria > 01524 732261



An apprentice electrician at Eskett was asked by the quarry manager to design a portable electrical isolation training panel, as part of his personnel development.

The panel is now used in the induction process for all personnel and contractors, who must demonstrate that they are familiar with the electrical isolation procedure.

Following this success, the area operational manager asked for a second training panel to be constructed and this has been used at numerous sites within the area to help in the understanding of isolation procedures and to prove competence in isolation systems.

> Mobile plant safety

Lafarge Cement > Head Office, West Midlands > 0845 8126467



Lafarge Cement has identified quarry mobile plant safety as a key area to focus on.

Among the initiatives it has undertaken are:

- Tool box talks on quarry mobile plant and brake system operation, testing and maintenance have been developed in conjunction with the Off-highway Plant and Equipment Research Centre (OPERC).
- A report was prepared on quarry speed limits.
- Plans have been prepared for all sites assessing the gradients and widths of haul roads.
- Spillard Safety has undertaken mobile plant safety checks.
- The initiatives have been publicised internally.

These and other initiatives such as NVQs and traffic circulation plans, have resulted in much safer environments in quarries, and operators being better informed and professional in their daily duties.

> Planning for a safe construction site

Midland Quarry Products > Wednesbury Asphalt Plant, Leicestershire
 > 01530 831000



Over the last five years Midland Quarry Products (MQP) has invested £40 million on capital projects, including a £12 million state of the art asphalt plant on a heavily contaminated foundry site in the West Midlands.

MQP achieved this without recording any lost time incidents during the two-year construction. It also recorded no ill health incidents or enforcement notices.

This was achieved by careful selection of the main contractors, a detailed health and safety plan and thorough inductions for all personnel.

300 employees needed relevant skills cards and site inductions, whilst all equipment was certificated as 'fit for purpose'

All work was carried out under a permit to work with risk assessments and method statements being vetted by MQP. A weekly client/contractor liaison meeting was held with representatives of all trades.

Leading by example with competent team members and business partners, the project was finished safely, on time and with no incidents.

> Pictorial geotechnical excavation

Sibelco UK > Preston Manor Works, Devon > 01626 882298



As part of a review it was decided to replace the text-based documents on tipping and excavation rules, with a pictorial version.

The simple designs are self-explanatory and can be understood by all, including those operators with literacy problems.

The rules are kept in the vehicle for quick reference and have been adopted as best practice for all Sibelco UK quarry sites.

> Ensuring the competence of mobile plant contractors

Tarmac > Torcoed Quarry, South Wales > 01267 275356



A load and haul contractor was introduced at Torcoed Quarry in April 2008. After an initial period it became apparent that the full competence of externally sourced mobile plant operators, especially agency operators, was often difficult to assess using current systems.

Although fully trained in the specific vehicles they were to operate, they were not always experienced in the operations of a quarry.

After discussions with the contractor it was decided to develop an additional training system, over and above the existing system of induction.

A series of site specific competence assessments were drawn up which incorporated risk assessments for the particular machines in question.

A regime was introduced that required every individual to take and pass the assessment criteria for the machine they would be operating, before being authorised to work. The assessments are carried out by fully trained, competent and authorised Tarmac personnel.

> Contractor induction DVD

Aggregate Industries > Ivonbrook Quarry, Derbyshire > 07740 934474



Previously, the induction process had been relatively dull, time consuming and complicated. Not all site personnel felt confident enough to deliver all aspects of the induction and consequently new staff and visitors received different qualities of inductions depending on the presenter.

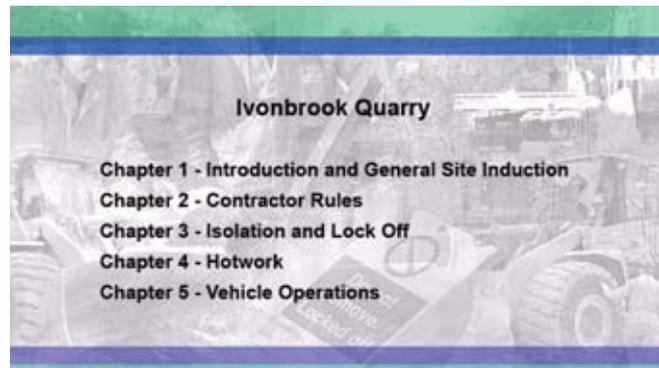
The site supervisor recommended that an induction DVD would help resolve this issue and suggested different chapters so that a contractor could view the section relevant to them.

Staff scripted, filmed, acted and produced the following sections:

- General site induction.
- Contractor rules.
- Isolation and lock-off.
- Hot work procedures.
- Vehicle operations.

The DVD incorporates film and still photography to bring the induction to life. A multiple-choice questionnaire ensures that all contractors have understood the contents.

The DVD has been well-received by contractors and similar DVDs are now being developed at two other sites.



> Closing the loop on 'near hits'

Sibelco UK > Brookside Hall, Cheshire > 01270 752651



Employees are positively encouraged to report 'near hits' by Sibelco UK, who prefer to use the phrase 'internal concerns'. In 2007, a total of 7,280 were reported - an average of 20 per operations employee (exceeding the company's target of 18).

Recognising that reporting is only half the story, Sibelco UK has put in place systems to ensure that every single internal concern is assessed by management; that appropriate actions are delegated and then seen through to completion.

The whole process is facilitated by the Sibelco UK "Workbench" database, which is used for many aspects of the company's Health, Safety, Environment and Quality management system. It helps site managers to keep track of outstanding actions and is a major improvement on the historic paper action logs.

"Workbench" also provides a valuable tool for assessing trends in internal concerns reporting with automated analysis of the data. This allows managers to see which of the company's systems are showing signs of weakness before they result in accidents, incidents or complaints.

> Contractor emergency procedure card

Tarmac > Colchester Quarry, Essex > 01206 332343

Colchester Quarry has a cluster of operations which rely heavily on contractor companies for support.

It was decided by line management that despite the comprehensive inductions, competencies and systems in place, a simple emergency contact and procedure card would be of great benefit to contractors.

The card contains important contact numbers and guidance in the event of an unplanned incident. In this way, precious time will be saved and the appropriate counter measure implemented.

> Contractors course for on-site driving

Aggregate Industries > Glensanda Quarry, Argyll > 01631 568160

Prior to any contractor being given authorisation to drive on-site, they are required to undergo a driving course with practical assessment as part of the induction process.

This course is designed to familiarise them with the features of the site, the hazards associated and the vehicle rules.

It ensures that all drivers on site operate at the same standard. The course addresses:

- Refuelling and defect reporting.
- Hazardous areas.
- Road layouts and gradients.

The practical assessment tests contractors' knowledge of rules and procedures and familiarises them with the site. It also serves to identify areas of concern regarding contractors' driving skills.

> External PPE store for concrete plant visitors

Hanson > Swindon Concrete Plant, Wiltshire > 07977 251115

An external PPE store has been provided in the parking bay at Hanson's Swindon concrete plant to ensure that customers have access to the appropriate PPE.

The PPE store is designed to protect equipment and garments from the weather, dirt and dust, with a shelf and coat hooks. It contains high-vis vests, hard hats and eye protection, which are restocked as required.

The PPE store requires no tools to erect, but has been securely fixed in place. It has proven to be suitable and sufficiently robust and similar stores have been installed at other plants in the area.



> Works' induction pack

Lafarge > Thrislington Quarry, County Durham > 01740 654461

An induction booklet has been introduced for contractors and visitors to the site. The pocket-sized booklet contains useful information about the plant including:

- Emergency contact numbers.
- What to do in the event of an emergency.
- First aider details.
- Fire fighting plans.
- Rules for contractors.
- Quarry Manager's rules.
- Lone-working procedures.
- Spillage procedure.
- A map of the site including vehicle and pedestrian routes.

The booklet also contains a section at the back that gives authorisation to contractors to work on the plant.

Whilst this is only part of the induction process, it helps reinforce health and safety rules on-site.

> SHE training days

CEMEX UK > Norton Disney Quarry, Lincolnshire > 07702 240608

More than 400 members of staff and key site contractors attended three separate training days at geographically convenient locations throughout the region.

Topics covered included confined space entry, fire safety, hand-arm vibration, spill control, isolation procedures, manual handling and mobile plant safety.

The event was a mix of practical and discussion based workshops to keep the day fun and interesting. External presenters from organisations such as Norwich Union Health Care, Chubb, Volvo, Mines Rescue and Vibrock contributed their expertise.

The training groups were kept small and manageable, but were mixed between different business units to help spread ideas.

Very positive feedback was received from the questionnaire completed by attendees, all of whom were provided with a training summary file of the day, a gift bag from the companies involved and a certificate to add to their CPD files.



> Safety instructions' display board

Aggregate Industries > Crich Quarry, Derbyshire > 01773 853224

The safety instructions' display board allows all the relevant risk assessments, safe systems of work and method statements associated with maintenance activity on-site to be displayed close to the workplace.

It has a weather-proof document window mounted on a magnetic board and is placed in full view, on the plant, so it can be viewed at any time.

Once the task has been completed, the documents can be removed ensuring they are kept in good condition for review and re-use next time a similar task is carried out.



> Incident reporting pack

Tarmac > Pilsworth South Quarry, Greater Manchester > 07738 648767



Adequate information is vital when trying to contact people after an incident and in order to prevent a recurrence.

Following an incident in which the reporting detail was very limited, a pack was put together to collect as much information as possible. The pack contains a form, disposable camera, a pen and return envelope. The form is self-explanatory. It includes:

- The relevant information required.
- Immediate contact numbers of the person to whom the incident is to be reported.
- Space for further details.

These packs are located at various points around the site. If an incident occurs, the pack is used to obtain details and photographs before the form is sealed in the envelope provided and kept safe until it is handed to the appropriate supervisor.

> Managing contractors during major site works

CEMEX UK > Barrington Quarry, Cambridgeshire
> 01223 870781

CEMEX UK employed Pryor Contracts to undertake the excavation of 126,000m³ of overburden and in excess of 24,000m³ of unsuitable material to construct a new CKD waste cell.

In order to ensure that all contractors were working to high standards, the following measures were put in place by CEMEX UK:

- A full induction process - including safe working methods and systems, possible risks, reminders of on-site rules and PPE rules.
- Daily site checks - paying particular attention to the faces, benches, haul roads and stockpiles. A checklist was filled out and the findings reported back to the site manager.
- Daily machine check - all mobile plant was checked and had to be signed off by the works supervisor.
- Daily pre-shift briefing - covering the work to be carried out, work areas to be checked for hazards and general reminders on-site safety.
- Toolbox Talks - to create awareness of various health and safety topics and issues.
- Training - all contractors had to be qualified to a high standard. Training records were kept on-site throughout the project for all Pryor employees.
- Subcontractors - had to comply with the same site rules as Pryor Contractors.

Once the task has been completed, the documents can be removed ensuring they are kept in good condition for review and re-use next time a similar task is carried out.



> Operator training and competence

Lafarge > Dowlow Quarry, Derbyshire > 01298 77611

As with many sites, a number of the more experienced workforce are retiring and being replaced by younger, less experienced employees. Some of the less experienced operators have been involved in a number of "near hits" involving mobile plant, so a reassessment of training was needed.

The quarry was closed down and a site meeting called to review the incidents and discuss ways to prevent recurrences. It became apparent that many of the new operatives were being asked to work in areas or conditions unfamiliar to them.

A task group was set up to carry out a review of training methods and a new training package was introduced, which includes:

- Carrying out various tasks during the hours of darkness.
- Operating in fog.
- Tipping on stockpiles, tips, ramps or into a hopper.
- Reversing up to the different types of both mobile and fixed loading equipment.
- Working in the quarry, production plant or stock grounds.

All new employees are now trained in all of these site-specific areas. The employee, his supervisor and the trainer all then sign off the training for each specific area.

In addition to this, a driver identification system was installed on all mobile plant which prevents any person starting equipment that they are unauthorised to use.



> Contractor safety portfolio

CEMEX UK > Hope Street Depot, Greater Manchester > 01617 379981

A file is kept by CEMEX UK contractors, that speeds up the induction process without jeopardising safety. The file contains:

- Contractor's insurance details.
- Health and safety policy.
- Competency certificates.
- Emergency contact list.
- Equipment test certificates (inc. electricals).
- Generic risk assessments.
- CEMEX UK training/induction certificates issued.

The file is kept by the contractor and updated whenever necessary. It is presented to the site manager each time the contractor visits a CEMEX UK site.

Managers have a check sheet to ensure that any contractor arriving on-site has the correct training. If further training is required, this can be carried out and a training certificate is added to the file.

> Dredger safety audit system

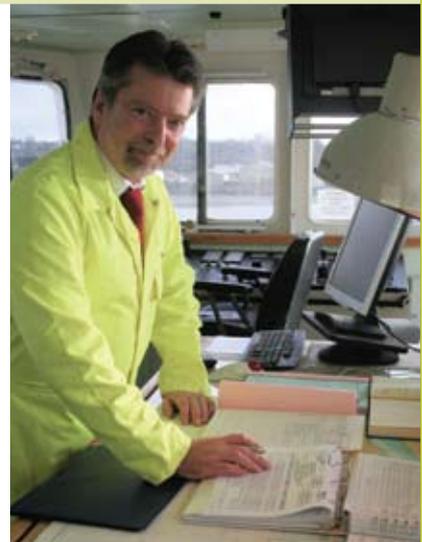
Hanson Aggregates > Burnley Wharf, Hampshire > 02380 828200

A new system to audit both statutory requirements and behavioural safety issues on board Hanson's marine aggregate dredgers has been developed and introduced.

The audits are carried out on standard 'scorecard' forms by an ISM qualified auditor from outside the ship's complement. It allows auditors to save time and cover a wider range of topics while scoring the performance of a ship. It also allows management to review obvious, but important, areas of concern such as staff welfare, leadership and morale, which are key issues for a ship.

To encourage the most accurate and open responses, the assessments are carried out during relatively quiet passages and when they do not interfere with the safe operation of the vessel.

The information gathered is being used by Hanson to guide continuous improvement by highlighting underperforming areas and identifying specific changes to improve safety on board.



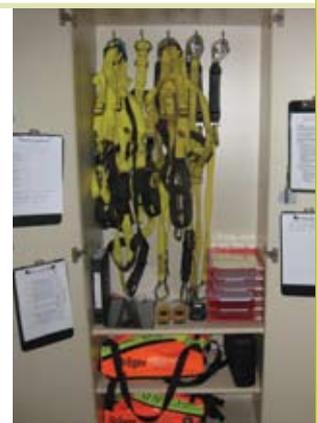
> Specialist PPE store

Lafarge > Elstow Railhead and Asphalt Plant, Bedfordshire > 07803 953563

Recognising the importance of specific requirements when required to work in confined spaces and at height, the foreman fitter introduced a store for the associated PPE that encourages best practice when working in these areas.

The specialist store houses all of the authorised harnesses, gas detection equipment and emergency breathing apparatus required when working at height, in a confined space or a combination of the two.

All equipment must be fully inspected and signed out prior to use. To facilitate this, the store also houses the necessary safety checklists and documentation. For more routine tasks a library, containing confined spaces safe systems of work and permits to work, has been developed and is located within the store.



> STOP geotechnical books

Lafarge > Cauldon Cement Works, Staffordshire > 01538 309297

The Stop Think Observe Proceed (STOP) geotechnical book has been introduced as an extra measure to minimise the risks associated with quarry face working.

A generic STOP book has been used for around four years, but mobile plant operators felt that it was not very relevant to the job they do.

The aim of the STOP book is to encourage employees to take time before the start of any new task to assess the risks involved.

A specific geotechnical book was distributed in October 2007. It is A5, with tear-out pages, completed assessments are handed to the quarry manager each day.

Uptake of the book has been very good, with face operators commonly undertaking two STOP geotechnical assessments per day.

> Walk and talk at Moneystone Quarry

Sibelco UK > Moneystone Quarry, Staffordshire > 07841 496440

Many tasks undertaken on Sibelco UK sites have the potential to put people at risk. Some of these tasks are controlled by approved site-specific written systems of work or approved risk assessments.

Tasks not covered are assessed and controlled using the Sibelco UK "Stop and Think" system - effectively a five minute pocket risk assessment. The management team wanted to develop a system to ensure this was being followed.

They introduced "walk and talk", whereby managers walk around site discussing health and safety with staff. "Walk and talk" is not only a health and safety compliance tool, it is also a method of developing continuous improvement of risk assessments and written systems of work. It also looks at environmental and quality implications of the task at hand. Every "walk and talk" must be signed by the manager and employee and a record of compliance or non-compliance is kept. As a result, overall site safety has improved on 2006 and 2005 performance.

> Clever Clok driver identification system

Lafarge > Mountsorrel Quarry, Leicestershire > 01162 303881

At Mountsorrel Quarry, each plant operator is issued with a unique identification tag, which is linked to the Clever Cloks time and attendance system.

Plant can only be started by first touching an authorised operator's I.D. tag onto an electronic 'reader' fixed on the plant.

The system also stores the operational use records of the plant and this information can be downloaded onto a computer.

The software then sorts the data from each operator and plant and provides various detailed reports on:

- Operator hours.
- Vehicle usage hours.
- Plant maintenance.
- Operator training.

Reminders can also be set to ensure that any repeat (or updated) training is carried out in a timely manner.



> Safety, health and environment site plans

Hanson Aggregates > Central Region, Leicestershire > 07976 575682

Site plans at Hanson's plants in the East Midlands were of varying quality and content. Some were contained on a single sheet, others had several plans showing different items.

Improvement was needed and, following a discussion between the operations team, a local electrical contracts manager and a draughtsman, a proposal was tabled to come up with a single comprehensive plan for each plant.

It was decided that colour coding was the simplest method of hazard identification and the size should be increased from A4 to A3.

The new-style plan contains:

- Base plan with GPS grids.
- Site boundary.
- Core PPE area.
- Noise exposure area.
- Combined dust and noise exposure area.
- Chemical and oil storage.
- Hazard areas.
- Confined spaces.
- First aid point.
- Toilets.
- Fire extinguishers.
- Emergency muster point.
- Underground services.
- Isolation lock-off points.

It has now been decided that all ready-mixed concrete plants in the central region will follow this standard.

> A "Do and do not" approach to customer safety

Aggregate Industries > Express Asphalt, Leicestershire > 01455 285200

Management at Express Asphalt noticed that in 2007 the most serious incidents involved injuries to customers.

Compliance with site rules such as the PPE policy, one-way systems and not riding on the back of moving vehicles are fundamentally important to the safety of all who use the site, yet communicating this to customers proved problematic.

In order to get the message across, management commissioned an illustrator to represent the generic site rules as a series of pictures.

These cards, which communicate with customers in a visual way, are signed by every customer who collects from an Express Asphalt site. They form the basis of disciplinary action for those who do not follow the rules.



> Working with contractors - a joint induction programme

Sibelco UK > Headon China Clay Works, Devon > 07770 263903

Sibelco UK has an increasing reliance on the use of contractors, especially in the clay industry.

To ensure the health, safety and welfare of all employees and contractors on-site, the company has developed a joint induction process with Chepstow Plant International that includes a power-point presentation, checklist and quiz sheet. The presentation includes site rules and aspects of legislation presented in "laymen's terms" to help hold attention. A multiple choice quiz ensures that contractors have an understanding of what is presented.



The programme includes a checklist of requirements for all Chepstow Plant operatives which is closely monitored on regular walk and talk audits carried out by site management. The induction process is regularly updated and fine-tuned to improve levels of health, safety and environmental awareness.

> Field technicians van driving pack

CEMEX UK > East Kilbride Laboratory, Scotland > 01355 236611

A powerpoint presentation has been produced as one element of the training programme for a ready-mix field technician.

The "van driving pack" provides a new ready-mix field technician with information on:

- Safe access to batching plants.
- Safe access, movement and preparation for sampling and testing concrete on a customer's site.
- Basic H&S advice on the product and road safety.

Trainees are then assessed in a practical situation to check on their knowledge of the correct procedures when arriving and setting up for sampling and testing on-site. Developed locally, this is supplementary to the overall induction package.

> Health and safety poster campaign

Myers Group > Huddersfield, West Yorkshire
> 01484 535311

In recent years, there has been a constant drive within the company to inform employees of their responsibilities towards Health and Safety and of the hazards they may encounter in the workplace.

In 2006, the company started a poster campaign to increase employee awareness towards safety issues. The posters, which depict situations within the business, are designed and printed in-house and can be downloaded from the Myers Group website.

The posters are regularly redesigned and the contents, as well as standards of presentation, improve with every issue.



> A new way of sampling

Aggregate Industries > Rand Asphalt Plant, Merseyside
> 01515 249740

Site staff at the Rand Asphalt Plant were concerned about the way in which the sampling of filler was carried out from either the top of the silo or from the top of the tanker.

It was suggested that sampling could be carried out when loading tankers by the addition of a simple lockable chute to the inspection hatch of the screw conveyor.

A simple valve and chute were fabricated which have minimised the need for working at heights and the risk of dust being discharged into the air.



> Safe working at height on truck mixers

Aggregate Industries > Ripon City Quarry, North Yorkshire > 01765 603710



An investigation was launched following an accident involving an Aggregate Industries driver on a customer's site, when his foot slid off the access ladder on his mixer truck.

Fortunately he wasn't badly hurt, but it led to a discussion session to find a better way to access the rear of the truck for washing-down purposes.

Prototype steps were installed and, following feedback from drivers, further alterations were made.

The final ladders were retro-fitted to all Ripon based company owned mixer trucks and there have been no further incidents of slipping off ladders.

➤ Easy cleaning concrete loading chute

CEMEX UK > **Guildford Concrete Plant, Surrey**
> **01932 568833**

Cleaning the loading chute at Guildford Readymix plant used to involve a six metre climb and employees wearing harnesses.

A hinged framework and electronic chain block now mean that the structure can be safely lowered, so that cleaning can take place at ground level.

Once the work is complete, the chute can be put back in place and is secured by a locking pin.

The new system eliminates the need to work at height, reduces manual handling issues and the task can be carried out quickly, easily and safely by one person.



➤ Pressure washing at height

Aggregate Industries > **Croft Quarry, Leicestershire** > **01455 288605**

A review of risk assessments for washing down mobile plant at Croft Quarry identified a problem with working at height on some machines.

Operatives had to stand on the wheels or mud flaps when pressure washing the booms of loading shovels. The operators were standing on an uneven, slippery surface with no edge protection.

Following internal discussions it was decided that a mobile, height-adjustable, cantilevered platform would solve the problem.

Ability International UK was approached, but the platform they had was physically too small and would not manoeuvre or level safely, on the wash area's concrete yard.

A new platform was designed, big enough for the largest loading shovel. It has large wheels to cope with the terrain and a jacking system next to each wheel to level out and brake the unit when in position.

The unit is now in use and eliminates the risk of climbing on machines to wash them down.



➤ Tanker loading platforms

Hanson UK (Civil and Marine) > **Purfleet Works, Essex** > **01708 864813**

Tanker drivers previously accessed the top of the tankers via the ladder, meaning that they had edge protection on one side whilst on top of the tankers, leaving them exposed to the risk of falling from height.

New platforms have been fabricated and fitted, which totally remove the need for drivers to access their tankers dangerously.

The platforms offer stair access onto a hydraulically-operated platform, making access to the loading hatches and loading spout considerably safer.

> Fall protection when loading rock armour

Aggregate Industries > Bardon Hill Quarry, Leicestershire > 01530 510066

Bardon Hill occasionally supplies rock armour to coastal defence projects. Historically, this has been loaded using a crane and sling to lift the rock on to flat-bed vehicles.

A risk assessment identified that a safer system of work needed to be adopted.

A hydraulic grab attached to an excavator has replaced the crane and sling method. Fall arrest 'bean bags' and a portable inclined stairway was purchased to ensure that the haulier can gain safe access to the rear of the vehicle and dramatically reduce the risk of injury in the event of a fall from height.

> High-vis harness vest

Lafarge > Whisby Quarry, Lincolnshire > 01522 694342

Lafarge has introduced a harness with an integral high-vis vest that can quickly and easily be put on. The harness has webbing that can be kept clean and free from damage.

Two of these harnesses are kept in the office so that they can be monitored for wear and tear and their usage can be assessed.

Every time they are used, a working at height risk assessment and permit is drawn up for each individual job.



> Assessing and controlling risk when working at height

CEMEX UK > Tannochside Park, Glasgow > 01698 811118

Work at Height Regulations place duties on employers, the self-employed, and any person who controls the work of others.

Following guidance provided by the HSE, CEMEX UK Materials decided that an overall assessment of typical maintenance work carried out on its various sites would help:

- Plan and organise future working at height activities.
- Train and refresh those involved in work at height using specialist equipment.
- Assess the risks from work at height and choose the most appropriate access devices where work at height could not be avoided.
- Ensure that the risks from fragile surfaces are properly controlled.
- Ensure equipment for work at height is properly inspected and maintained.

As part of the process, in-house teams - working in conjunction with the plant supervisors - have introduced a pre-job working at height risk assessment.

During the initial general worksafe assessment, the potential for working at height is identified and a specific pre-job risk assessment completed. This helps identify hazards, select the correct equipment required and follow the appropriate safe system of work.

➤ Robust portable access steps with outriggers

CEMEX UK > Equinox North, Bristol > 07885 778233

The plant management at Equinox North has invested in some ladders which have significantly reduced the risk of working at height.

The portable platforms are made from lightweight aluminium and are therefore easy to manoeuvre. Four outriggers are permanently fixed to each platform and provide stability.

When working at platform level, swivel handrailings are fixed in position to prevent falling from height.

The platforms are quick to erect and easy to transport and have eliminated the need for either a portable ladder or erection of a scaffold tower.



➤ Ground level pipe sand system

CEMEX UK > Eversley Quarry, Hampshire > 07889 315448

Changes have been made to the sand pipework system which previously was about five metres above ground with a platform running alongside.

The pipework now runs at waist height and has quick release clips which attach the pipes together, minimising downtime and greatly reducing manual handling.

Space was left on the feed pipe tray to install a secondary pipework system to further reduce downtime.

The sand tower is galvanised steel pipe because of the acidity in the water. The return pipe is made from plastic, with fused joints to reduce manual handling and the need for maintenance.

The sand tower feed chute and vacuum hose can all be adjusted from ground level.

The new system has eliminated the need to work at height and requires less maintenance, reducing manual handling and down time.



➤ Mobile plant isolation

Lafarge > Dowlow Quarry, Derbyshire > 01298 77611

The recent addition of a telehandler at this site has significantly aided the maintenance department when carrying out working at height tasks.

However, when operating the man-basket fitted to the telehandler the machine had to be left running with the keys in.

The door of the machine could not be locked without a second set of keys and this still did not eliminate the possibility of another set of CAT keys being available.

The solution was to fit a hinged sign that folded over the door so that the operator in the basket could fit his own isolation padlock to the sign, preventing anyone else accessing the telehandler cab.

The operator then keeps the key in his own pocket and thereby ensures that no one else can open the telehandler door and move the vehicle while he is still in the basket.



> Hatch fall protection

CEMEX UK Marine > Baltic Wharf, Hampshire > 02380 720236

There are numerous hatches on marine vessels that regularly need to be either opened or removed, exposing staff and contractors to the risk of a fall from height.

To guard against this, CEMEX UK Marine has adopted a hatch and openings guarding policy - that all hatches have to be physically guarded with permanent handrails.

The rails do not obstruct the removal of the hatch lid and are compliant with guarding regulations. They have virtually eliminated the risk of a fall from height.

> Screen access and egress

Lafarge > Besthorpe Quarry, Nottinghamshire > 01636 892428

The Lafarge group hierarchy of working at height controls is broken down into four key areas: elimination, isolation, engineering and administrative and PPE. Elimination is the preferred control, as it removes the risk by bringing the work from height down to ground level.

At Besthorpe Quarry, the washing and grading screens sit above ground level. When elimination is not possible, working at height needs to be performed from a suitable fixed platform where practicable.

A fixed handrail system and step access has been fixed permanently into position on both screens. This removes the risk of fall from height when gaining access to the screen and ensures a safe enclosed working area.

> 'Moduflex' discharge device

Hanson UK (Civil and Marine) > Teesside Works, Teesside > 01642 446100

Civil and Marine Limited process ground granulated blast furnace slag, a very fine powder which can be used in all types of concrete production.

It is discharged from a 1500 tonne bulk silo into pressurised tankers on a weighbridge, using an extending 'moduflex' bellows unit. To prevent spillage after tanker filling, the unit is fitted with an inverted cone which seals the outlet when the unit is raised.

On occasions the unit can remain full after loading, mainly due to controls failure or over aeration. When this happens, the unit overloads the electric lift motor and can't be raised.

To bring it back into service, the unit has to be emptied manually by using a forklift and man-basket to raise the outer section and empty the material onto the weighbridge from a height of four metres. It is a very dusty job and the residual material has to be manually swept from the bridge.

To overcome this, the site fitters devised an 'opening device' in the shape of a hoop manufactured from scrap material. When required, it is bolted onto the rear of the bucket on a front-end shovel loader.

Using the bucket 'attachment', the lower section of the 'moduflex' is raised to allow the material to slowly discharge into the bucket.

This negates the need to work at height, avoids potential falls and reduces manual handling.



➤ Swing loading chute for collect customer

Lafarge > Whisby RMP, Lincolnshire > 01522 692841



The Whisby Readymix Plant has a dry loading chute designed for six or eight cubic metre trucks. One collect customer has a three cubic metre capacity truck which is three feet lower than the dry loading chute.

The owner driver would climb the rear ladder of his truck whilst carrying a plastic sleeve and insert it into the loading hopper before positioning the vehicle under the plant to load.

After loading, he would climb the ladder again and remove the sleeve. This procedure could take place as often as eight times a day. As the driver could not maintain three points of contact, a new solution had to be found.

A swing-in/swing-out chute was fitted that covered the loading point and fits into the hopper on the three metre truck.

Now all the customer has to do is walk up some steps onto a gantry and pull the chute into place, before reversing under the plant. After loading, the chute swings out of the way to allow the regular trucks to load.

This new chute has not only completely removed the need for working at height and the manual handling risk, but it has also improved the relationship between the customer and Lafarge.

➤ A safe way to clean mobile plant windscreens

Sibelco UK > North Devon Clay Works, Devon > 07738 311701



Cleaning mobile plant windscreens, especially in a ball clay quarry where underfoot conditions can be poor, has always been problematic due to the hazards involved with working at heights.

However, the safety representative at North Devon Clay Works has come up with a simple solution to this problem.

By attaching a snap-on connection to a hosepipe, the mobile plant drivers are now able to use a heavy duty tri-section extending wash brush to clean their windscreens. This operation is carried out from the ground level and has eliminated the need for working at height.

> Storage solution for heavy lifting equipment

Lafarge > Mountsorrel Quarry, Leicestershire > 07896 233188



At Mountsorrel Quarry, heavy lifting equipment was kept in several places across the site.

Finding the correct lifting equipment meant searching through different chains and slings spread throughout the site to find the correct one.

Frequently, this equipment was both difficult to locate and to identify its length and safe working load.

Other problems with this method of storage included:

- The need for the heavy main lifting ring to be lifted manually and manoeuvred onto the gantry crane hook creating a manual handling hazard.
- Poor housekeeping which created a trip hazard.
- Equipment being stored on dusty floors and poorly maintained.

To eliminate these hazards, a maintenance foreman and his team designed and constructed simple boxes to house the lifting equipment.

Each box clearly states on the outside, details of the chain including the safe working load and length, keeping them clean and tidy.

The boxes have been designed to allow easy movement by forklift enabling them to be transported to different areas of the site. This idea has since been communicated worldwide throughout the business.



> The DMP ring

Aggregate Industries > Glensanda Quarry, Argyll > 01631 730441



Glensanda Quarry is the largest granite quarry in Europe producing seven to eight million tonnes of crushed stone per year.

The DMP ring is a large steel ring which is lifted into place via an overhead crane and inserted on the inside of the gyratory crusher rim, preventing objects from dropping into the crusher chamber whilst staff are working in and around the crusher.

The DMP ring keeps maintenance staff safe from any falling objects whilst working below the crusher and prevents people from falling into the crusher chamber during maintenance work in and around the dump hopper.



Safe commissioning of plant

CEMEX UK > Tilbury Grinding Plant, Essex > 01375 843502



CEMEX UK developed a detailed plan to ensure the safe commissioning of their new 1.2m tonne cement grinding plant at Tilbury. The plan, which included the testing of approximately 250 drives, was put in place to ensure the safety of contractors working on the project.

The system uses coloured tags to indicate completion of the various stages of commissioning.

Each of the stages has requirements that must be fulfilled before moving on, and include the elimination of potential hazards associated with the following stage.

Fundamental to this process is a locking system which operates as soon as electricity is available and the equipment can potentially be energised.

The keys to the locks are controlled by a very limited number of nominated company employees.

A piece of equipment can only be energised once the following criteria are satisfied:

- Mechanical checks must be complete.
- Electrical checks and signal testing must be complete.
- Any outstanding safety or functionality issues must have been resolved.
- Control measures must be in place for operation/rotation of the piece of equipment, in accordance with the risk assessment.
- Equipment must be checked to ensure it is clear of unauthorised people.
- Commissioning team members, all in radio contact, must be positioned so that all parts of the equipment are visible.
- The area around the equipment has been closed off with dated warning signs.

It is the responsibility of the nominated company employees to ensure that all of the above criteria are satisfied before any equipment is energised and that the isolation locks are replaced as soon as test operations are complete.

The benefits of the scheme include:

- Identification of key electrical and mechanical hazards at the design and construction stages.
- Quantitative approach to electrical and mechanical hazards clearly recorded and communicated.
- Control of all personnel throughout the end of construction to commissioning programme phases.
- 'Authorised person and permit approach' to both electrical and non-electrical isolation and re-energisation of all plant.



> Rubber plate lifter

Aggregate Industries > Westleigh Quarry, Devon > 07740 934114

During a plant maintenance shutdown it was noted that two of the rubber mats on the primary grizzly feeder screen needed to be replaced. Each mat weighs approximately 150kg and trying to lift out individual mats was impossible, as chains or lifting strops would not fit around them.

The workshop devised the rubber plate lifter. Two lifting plates were made with a lifting eye and six angled holes. The plate is positioned on the rubber and six 200mm long high-tensile bolts are screwed into the rubber mat. Once the plates have been secured the mat can be lifted using a hoist. The angled holes help increase the grip.

This process has eliminated the manual handling risk of replacing heavy mats.



> Crusher mantle cradle

Aggregate industries > Glensanda Quarry, Argyll > 01631 568173

A purpose built mantle cradle, initiated by personnel on the shop floor, was designed, constructed and installed to provide a safe means of loading, securing and transporting these otherwise difficult loads.

Once fitted to the cradle, the crusher mantle can easily be lifted, loaded and secured. Lifting

eyes on the cradle provide easier, safer slinging points whilst ensuring a very level and stable lift.

The flat cradle base is ideal for securing to any trailer without the need for personnel, working in close quarters, to place chocks and blocks under the load.



Old method



New method

> Locking off hydraulic systems

CEMEX UK Marine > Baltic Wharf, Hampshire > 02380 720235

Whilst electrical equipment has been effectively controlled by the use of lockguard systems, this has not been true of hydraulics and pneumatics.



On marine vessels these systems have handle-operated stainless steel valves fitted in various locations so that during routine maintenance the valves can be locked off.

The ship's staff have designed and fabricated a simple lock-off tool that can be used at different locations to ensure that lock-off is secure, preventing potential incidents.



> Used oil trolley

Lafarge > Dry Rigg Quarry, North Yorkshire > 01729 860411

The removal of oil from mobile plant carries numerous hazards, including manual handling, slips, trips and falls, COSHH issues and concerns over access and egress.

To eliminate the problem, a custom-built oil removal trolley was purchased. The trolley is on wheels and the container is pushed under the vehicle's sump. The oil is released into the tray and wheeled to the used oil tank where it can be emptied using the trolley's connectors.

> Quarry booklet for consistent plant naming

Tarmac > Pilsworth South Quarry, Greater Manchester > 07738 648767

For the purposes of maintenance, housekeeping and plant inspections, Pilsworth plant has been split into zones - each of which has been broken down into individual sections.

In order to help both employees and contractors to have a good understanding of the site, a booklet has been produced which gives a brief description of:

- What each section does.
- What part it plays in the production process.
- Where the section of plant is isolated.
- Photos of each section for easy identification.

The booklet is used for induction purposes and a copy of the relevant section is given to contractors and auditors to make sure they work in, and refer to, the correct areas in the quarry.

> Access improvements and safer blockage clearing

Aggregate Industries > Rand Asphalt Plant, Merseyside > 07740 934306

The asphalt plant at Liverpool is a Parker Blackmix 1620.

It has a long collecting conveyor that feeds directly into the dryer. There was no safe means of access to the dryer or the head of the conveyor for inspection and maintenance.

Several incidents occurred when larger rocks came through the grid bars and managed to lodge at the inlet of the dryer. This caused three issues:

1. The rocks split the belt, meaning increased downtime and cost.
2. To remove the blockage meant climbing up the belt and working from ladders.
3. Access into the dryer also needed ladders, compromising confined space entry rules.

A site solution was required to improve access and stop large rocks blocking the dryer feed.

A new platform was fabricated and installed to allow much safer access from a purpose-built area. Small grids were also fitted on the outlets from each of the cold feeders to catch any large rocks before they reach the conveyor belt. This meant that oversized rocks could be stopped from reaching the plant and causing damage to the belts, reducing downtime. Blockages could be removed safely from ground level, eliminating all working at heights.



> Elstow kickers

Lafarge > Elstow Railhead and Coating Plant, Bedfordshire > 07803 953563



Keeping a clean and tidy site is a priority for the team at Elstow asphalt plant - not just for the sake of appearance but in an attempt to reduce slips, trips and falls. Having a hard surface area allows for spillages to be removed more easily using a loading shovel or road sweeper.

A loader is used on a daily basis to remove the bulk of the spillage and a road sweeper is brought in weekly to thoroughly clean the area. Using a loader for the larger spillages is not ideal as generally they require something to push against when filling the bucket which, more often than not, results in damage to the structure being pushed against.

To overcome this problem, the Elstow team incorporated a number of 'kickers' throughout the site, typically located adjacent to the plant load-out points. These kickers, made of reinforced concrete, are essentially low walls that the shovel can safely push against when scraping up spillage. The kickers have allowed for spillage to be cleared from areas that in the past were notoriously difficult to clear.

> Safety lock on rotary valve

Hanson UK (Civil and Marine) > Purfleet, Essex > 01708 864813

A rotary valve is a method of allowing raw material into the grinding mill whilst preventing large quantities of cold air from passing down the same inlet. It consists of a shaft with vanes which fill with material through the port in the top of the rotor. Due to the rotation of the 'paddles', the material is transported to the bottom of the rotor body where it falls out of the outlet port.

The rotary valve has to be cleaned once a week. Access above the rotary valve is via a side door. As one section is cleaned out, the rotor becomes out of balance - forcing the heavy, uncleaned part of the rotor to the bottom of the valve, making it impossible to clean unless the rotor shaft is rotated and wedged in position. The rotary valve has a coupling connecting it to a motor and gearbox, which are fully guarded. Previously, the guard had to be removed to enable a bar to be wedged into the coupling and jammed against the base plate.

A simple lever and actuator handle, complete with padlock position and electrical limit switch, has been installed to slide into the coupling shaft. It is then locked in place when the rotor has been turned into the correct cleaning position. The rotary valve motor, which has been locked on the isolator for cleaning purposes, cannot be restarted on completion of the work until the locking lever has been removed, which allows the electrical limit switch to reset. This safety locking arm allows the rotary valve to be cleaned safely without having to remove the guards and jam a bar in to prevent the rotor turning.

> See, be seen and be safe

Fintrade > Dundee, Scotland > 01382 731547

Fintrade UK are the UK distributors of LED safety headgear, which has been successfully trialled in a number of MPA member quarries.

The LeDitSee unit fits on to the brim of an existing safety helmet and is tightened using two small screws. The LEDs are positioned on the front of the brim so that the light beam is directed at its target rather than being absorbed or deflected by the brim, a problem with many head torches. The LEDs allow the user to work hands-free in conditions of total darkness. As the unit has a long working life and because it is separate from the helmet, it can be easily transferred between helmets.



> Shockwave generator

Hanson UK (Civil and Marine) > Scunthorpe Works, Lincolnshire > 01724 282211

Civil and Marine processes ground granulated blast furnace slag to produce a very fine powder for use in all types of concrete production.

The raw material is dried using a flash drier. As it can contain up to 14 per cent moisture, it sticks extremely easily to the chute feeding the flash drier. Over a relatively short period of time this creates a blockage that requires manual cleaning.

Various methods were used to clean the chute including air vibrators, reciprocating vibrators and air cannons, with little or no success. Cleaning also created various hazards including manual handling, confined space working, the use of vibratory tools, dust inhalation and moving machinery.

Civil and Marine was contacted by a company from the University of Manchester which had designed a 'shockwave generator' which was trialled and eventually purchased. A gas/air mixture is ignited, creating a controlled explosion focused on where the material builds up. The system delivers a shockwave to the area, but allows the process to continue. The equipment has delivered excellent results and the innovation has since been rolled out to other Civil and Marine sites.



> High-tech risk assessment wizard

Hanson > Allington Depot, Kent > 01622 679461

A computerised handheld risk assessment 'wizard' for walk-round inspections has been developed by Control Net Solutions and Hanson Aggregates.

The monitor is sufficiently robust to withstand the depot environment and guides the operator through all the steps needed to thoroughly risk assess a task. The question base is designed to ensure the task is fully analysed and all risks are properly considered.

When a risk has been identified, the wizard prompts the operator for the safety measures that must be applied. All identified risks must have a control measure attached before the assessment can be completed. All risk assessments generated are automatically placed in a task identification register, giving the operator rapid access to completed risk assessments.

The monitor has also been developed to support task management by using a built-in bar code scanner. The operator must go to the equipment location to scan the bar code; the monitor will identify the equipment and present inspection tasks that must be completed. It can also be used to take pictures of any problems found and attach them to the inspection task.

> High visibility signs at Milton Quarry

Brett Aggregates > Milton Quarry, Kent > 07710 589973

The quarry supervisor at Milton was concerned that staff, contractors, customers and visitors often ignored or did not notice site signage.

Having considered both new signs and periodically moving them, he decided that a high visibility backing, similar to that seen on high-priority road signage, would decrease the 'blindness'. The quarry staff updated and backed all signage around the plant.



> A fresh approach to the maintenance of large goods vehicles

Myers Group > Vehicle Maintenance Workshops, West Yorkshire > 01484 535311



The size of the fleet had grown to some 70 vehicles, which included double-deck curtain-sided trailers which had to be sent to an external facility for maintenance due to their height. So, in 2006 it was decided that the entire maintenance facility needed to be upgraded. The changes include increasing the working height of the building and its thermal efficiency.

More complex were the problems associated with the inspection pits. These were rarely at the right depth for the varying height of employees, many drivers lacked confidence in driving over them and this caused a major bottleneck. It was decided that a 21st century

solution needed to be found to this problem. As a result, a pair of 28 tonne capacity vehicle lifts were installed.

The units allow maintenance engineers to work in an upright position rather than crouched down, on knees or laid on their back on a damp cold floor.

> Multi-purpose lamp and extension

CEMEX UK Materials > Equinox North, Bristol > 07885 778233

The first light:

- Is made from shockproof polycarbonate.
- Does not give off any heat and is ideal for confined space work.
- Is totally waterproof.
- Is 110v, has a low energy bulb, and comes with five metres of cable.

The second:

- Has a fully adjustable stand.
- Has two 110v female sockets fixed to the rear of the unit. These can be used for other lights or portable tools, eliminating further extension leads.

The third:

- Has an adjustable fixed strap.

The new lights should lead to better working conditions and less cabling, reducing the risk of a slip, trip or fall.



> Safety communication

Aggregate Industries > Glensanda Quarry, Argyll > 01631 568173



Glensanda employs over 200 employees and contractors on site.

The site continues to make good progress in safety performance and key to maintaining this progress is feedback on all aspects of safety performance and, in particular, the closing out of any concerns.

By looking at all of the information, it is possible to identify where the key issues, hotspots and activities are. These areas can then be proactively targeted.

To enable this process to be communicated to all employees a 'standard board' was created that has a strong visual impact. The boards are now in place in each area of the site and reflect the issues and activity in that specific area.



Safety performance has continued to improve and all personnel can see progress against area and site objectives.

> Supervisor training event 2008

Tarmac > Northern Region, Co. Durham > 07778 367190



Feedback from the 450 Tarmac employees who attended Safety Week 2006 identified a strong desire for a separate event which would allow greater time and detail to cover specific areas of safety awareness.

It was agreed that a supervisor training event would be held at Scorton Quarry over a two week period allowing 100 company supervisors to attend. The event was hosted by members of the Tarmac northern management team.

The key topic areas covered at the event were:

- Risk assessment - each person completed a risk assessment of a given scenario. Feedback was then given on their completed assessment.
- Hazard spotting - numerous hazards were set up within an old workshop area with attendees tasked with identifying as many as possible.
- Task auditing - A staged task audit was completed with attendees observing the process. They then completed their own task audit of an activity.

The common theme across the day was the influence that personal behaviour and culture could have on all these aspects.

A similar event was held in April 2009 with other events planned later in the year.

> 'Hot Topics' safety initiative

Lafarge > Watermead Business Park, Leicestershire > 07803 953569



On landfill sites the volume of customers in the operational areas is recognised as a significant area of risk. To minimise and mitigate this, site processes and procedures are constantly being reviewed and developed.

The team recognised that although the business explained the overarching health and safety requirements at the weighbridge, extra information on the 'key issues of the day' needed to be relayed effectively to members of the public.

As a result, the 'Hot Topics' scheme was devised which involves the site team identifying two topics per month that are highlighted to customers and site visitors.

A flyer is placed in the in-bound weighbridge window and customers are made aware of it on arrival. Site staff engage with customers as they move around the site and the weighbridge operator collates feedback which is either actioned immediately or discussed at team meetings.

The 'Hot Topics' initiative has now been rolled out to other non-hazardous landfill sites across the group.

> A supervisor leading safety with passion and belief

Lafarge > Hope Works, Derbyshire > 07843 296254



Since taking over as supervisor in charge of the two contractor cleaning gangs, John Millen has completely transformed the housekeeping standards at Hope Works.

Under his direction, cleaning standards on site have improved dramatically. John takes a 'hands on' approach and works alongside his men, leading by example at all times.

John is also very actively involved in promoting Health and Safety at Hope Works and regularly carries out contractor safety inductions.

Through the use of eye catching safety signs, he has introduced an innovative and effective way of reminding everyone of the importance of working safely.

Whatever the task he demonstrates leadership with a proactive, pragmatic approach to workplace safety.

> New process plant project management

Hanson > Frindsbury, Kent > 01622 679461



The knowledge and experience of production workers at Hanson's Frindsbury Wharf on the Medway in Kent played a vital part in incorporating safety improvements into a new sand and gravel processing plant at the site.

The site-based personnel outlined their requirements, focusing on problems they had experienced with the old plant and would want to see improved. These were passed on to the designers.

The project team visited other sites, seeking best practice. Once contractors were appointed the project team met monthly, with continued involvement from production staff.

Improvements included easier access to all areas, facilities for eliminating manual handling, additional power points to eliminate trailing cables and protected areas to prevent falls from height. The project was completed on budget and during the demolition and erection phases there were no lost time injuries.

> Total safety involvement

Singleton Birch > Melton Ross Quarries, Lincolnshire > 01652 686000



Singleton Birch has for many years had a reporting system for hazard spotting and the recording of near hits. But, because the system involved the completion of a four page form, very few were formally recorded.

In late 2007, a new system was introduced which demonstrated visible management support and a desire on site to reduce accidents and incidents.

To enhance reporting an A7 pocket booklet was introduced. The reports are actioned by the relevant department, the data entered on a spreadsheet and discussed at monthly meetings.

In 2008, the information gained was used to initiate additional training for drivers and the development of a simplified approach to PPE requirements, in particular, education on the need to wear the correct gloves.

The benefits of this 'new' proactive approach resulted in an increase in near hits reporting from five in 2006, 85 in 2007 to 215 in 2008.

This increased awareness has produced a significant improvement in safety culture and reduction of the number of major incidents each year.



> Executive committee health and safety sponsorship

Lafarge > Portland House, West Midlands > 07843 296254



In the United Kingdom, the members of Lafarge's executive committee have identified the top priorities in the Group's safety standards. The eight priority areas include issues such as working at height, contractor management and PPE.

An executive committee member has taken responsibility for directing each priority area and setting up a working group at business unit representative level to address each priority.

The groups must:

- Hold a minimum of four meetings per year.
- Take responsibility for applying procedures relating to its area of competence.
- Exchange information on topics or matters of interest to other working groups.

Following these meetings, the groups must provide a progress report on each safety standard at executive committee meetings and circulate safety information every month to all personnel.

Amongst the benefits of this method of managing safety are:

- Significant best practices from the working groups.
- Closer links to the sites implementing the procedures.
- Exceptional progress and commitment to deploy new standards.
- True safety leadership from the top.

> Mobile plant access survey

Hanson > Criggon Quarry, Shropshire > 01938 570215

A company-wide survey within Hanson Aggregates, which encouraged operators and maintenance personnel to put forward and share ideas for reducing risks when getting into and out of mobile plant, has resulted in major improvements in both equipment and attitude.

Across the company, over 550 hazards were identified on a total of 260 items of mobile plant. These were collated on a spreadsheet, from which common issues were identified. Management compiled a full report and put together some best practice alerts and a presentation showing detailed solutions.

Major concern has been expressed that 70 of these hazards highlighted design inadequacies relating to machines no more than two years old.

Modifications ranged from cheap-fix ideas such as extending the autolube filler points down to ground level, to remotely-operated lighting systems and purpose-built maintenance platforms.

The exercise also provided useful information in identifying weak or poor performing equipment fitted to new plant. The results have been widely circulated within the company and have brought about changes in attitudes by operators and fitters alike.

Editor's note: Hanson's survey reinforced the need for the MPA-led "Safer by Design" project, see page 84.



Before



After

> Improved communication of SHE matters

Brett Group > Head Office, Kent > 07764 822475



As part of a behavioural SHE training programme, Brett Group carried out a survey of the vast majority of its staff. It identified that there was a perceived shortfall in communication on SHE issues.

A group was formed from across the businesses to see how this could be improved. It was decided that the information should be collated in one place on-site and that a monthly meeting should be held between the site supervisor and all plant staff so that information could be communicated verbally.

Folders covering seven different topics have been placed in every location. These cover:

- Near hits - to include site, area and business near hits.
- SHE report - a simplified copy of the monthly board report.
- Statistics - graphs showing how the area and business are performing.
- Alive and well - to include any issues arising from behavioural SHE discussions.
- SHE alerts - including company and **www.safequarry.com** incident alerts.
- Improvement - an update on the area and business SHE improvement plans.
- Other - for the site to add any specific issues or a toolbox talk from the Brett intranet.

This information is updated on a monthly basis. The new format is popular with both employees and management and helps to keep 'SHE' uppermost in people's minds.

➤ Daily risk prediction

Aggregate Industries > Carnforth, Lancashire > 07803 968112



Aggregate Industries introduced a wrap-up board as a major initiative for developing inter-dependency and worker involvement in health and safety.

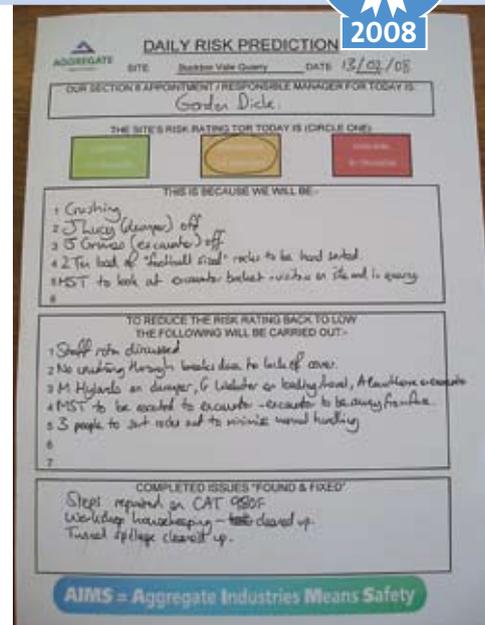
At the end of each working shift, the team gathers around the board and discusses what could have been done more safely.

The northern region felt that there was an opportunity to further develop this process and it was decided to introduce a system of previewing the following day's work and determining any high-risk activities in the wrap-up meeting.

The workforce would determine the control measures required to ensure that they stayed safe during the forthcoming working day. The process worked as follows:

- During the wrap-up and risk prediction process, consider what activities are taking place on the next working shift and what triggers may exist to affect the work you will be doing (low staffing, adverse weather etc).
- Determine the highest risk activities that will be carried out, then implement the correct control measures to reduce the risk to an acceptable level.
- Share the findings of the risk prediction and the high-risk activities.
- Post the site-risk rating and the high-risk activity sheet with the control measures on the wrap-up and Risk Prediction Board.
- Carry out the work as detailed in the risk prediction.
- Retain the used Daily Risk Prediction sheet for future reference and discussion in the site safety meetings.

This process helps generate ownership for health and safety by the workforce. It promotes better communication and gives an opportunity for all employees and contractors to contribute to Health and Safety on a daily basis.



➤ Assessing and controlling risk in non-routine situations

CEMEX UK > Regional Readymix, Glasgow > 01698 811118



It is recognised that non-routine tasks can increase the risk of injuries. To counter this, a Work Safe book which should be completed prior to work commencing has been issued to all sites.

The Work Safe document has been used within CEMEX UK for a number of years and is constantly evolving to become more user-friendly. It has its own training package delivered by plant managers and is designed to provide practical examples.

The assessment form has been made into a booklet and is posted at various locations around the quarry. Used in the correct manner, it is a quick and easy to use document which asks everyone to "stop and think" prior to starting a task which is outside their everyday job description.

In many cases, this stops the task from proceeding or leads to other control measures being put in place - such as a "working at height" risk assessment, hot work permit and permit to work.

The process also involves a colleague checking over an employee's findings. This second pair of eyes ensures that all hazards have been identified, the risks assessed and effective control measures introduced.

> Workforce developed lock-off and isolation training

CEMEX UK > Wenvoe Quarry, South Wales > 07711 912470



The dangers of conveyor entanglement have long been recognised within the quarrying Industry. CEMEX UK recognised that even with good systems in place there remained a need to provide ongoing isolation training.

Previously every employee was required to attend a health and safety workshop. These were meeting room based and, whilst active employee involvement was encouraged, they didn't provide any physical applications.

In 2007, a new series of roadshows were developed, to be held at one of five quarries across the region. The final roadshow took place at a Tarmac quarry where there was opportunity to share good practice between employees of the two companies.

A range of topics was agreed upon, with conveyor lock-off and isolation being the main focus. Taking a lead from Health and Safety guidelines, two members of staff were tasked with developing a visual, practical and interactive presentation on conveyor lock-off and isolation. It was also decided that the presentation should be delivered by the employees who had developed it.

Each presentation involved a video on conveyor safety, a wooden board with various types of isolation switches mounted on it and a demonstration on how different types of multi-padlock lock-off clasps can be used on different isolation switches.

Delegates were given an A4 laminated card covering the discussion points and invited to take part in a question and answer session before being tested on correct lock-out procedure.

Plans are now in place to record this presentation onto a DVD which will be shown throughout the whole of CEMEX UK.

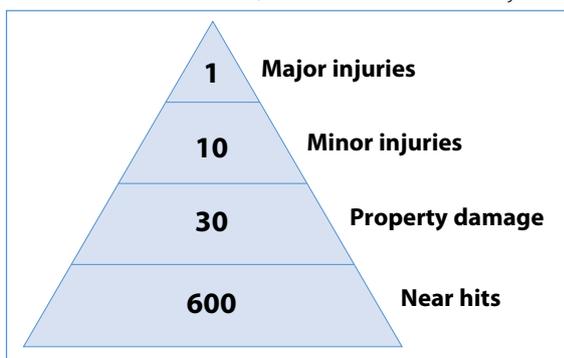
Since the introduction of this training, no "failure to isolate" accidents have been reported from within the region.

> Near hit reporting

Tarmac > Retford Office, Nottinghamshire > 01777 703891

Studies of accidents resulting in major or lost time injury, minor injuries, property damage and near hits over many years have produced a number of accident/ratio models. One example, the Bird model, is shown below:

In Tarmac Midlands' area, the number of minor injuries reported as a ratio to major injuries reported correlated accurately



to this model, telling us that both minor and major injuries are being reported.

However, it was found that reporting of property damage incidents was less than the "accident triangle's" prediction and very few 'near hits' were being reported.

In May 2007, all site managers in the area carried out briefings to the workforce outlining what a near hit was and encouraging them to report any they see in a 'blame-free' environment.

Pocket-sized Near Hit reporting booklets were given to the workforce and near hit boxes placed around the site for them

to post their near hit reports into.

In the seven month period from June to December 2007, there were more than 850 near hits reported in the Midlands area, a 16-fold increase on the previous year. As a result, the Midlands area sites are becoming safer places to work and the company has seen a 50 per cent reduction in lost time incidents in 2007 compared to 2006.

➤ Getting yourself seen

Hanson > Southfields Way, Bristol > 01454 316000



Hanson Contracting is a level two supply chain partner to InterRoute for the delivery of road surfacing on behalf of the Highways Agency.

To prevent traffic hold-ups at peak times, there is a drive to undertake as much work as possible at night. So far over 85 per cent of the material laid has been during night-time closures.

There are inherent risks with the process that are exacerbated by reduced visibility.



To mitigate as much of this risk as possible, Hanson involved workers at all levels to develop a concise minimum standard that could be communicated easily to all parties. The minimum requirement has been set out as:

- All personnel must wear clean yellow high-vis long-sleeve jacket or coat and trousers.
- Head lamps are provided for occasions when operatives may be away from well-lit areas.
- Vehicles and plant are marked with reflective chevrons and provided with visible amber flashing beacons.
- The use of conspicuous colours for all plant is encouraged.
- Working areas should be provided with 'balloon' type lighting for individual operations.
- In the case of surfacing operations on the Highways Agency network, the site should usually consist of one unit at the works entrance, one mounted on the paving machine and one for a 'clean out' area at the end of the works.

An initiative has also been developed to assist visibility of the banksman's signals by use of machine mounted or hand-held red and green lights.

The result of the exercise was an agreed set of standards developed by the workforce which everyone working on-site could expect as the norm. It has led to a marked improvement in safety standards.

➤ New pedestrian walkways around weighbridge and office block

Tarmac > Port Talbot Works, West Glamorgan > 01639 883052

New walkways were introduced as part of Tarmac's 'Management of workplace transport' SHE standards.

This specifies that where possible there should be separate routes to keep pedestrians segregated from site transport and prevent them from walking into traffic routes.

A safety committee consisting of employees and contractors based on-site was set up. They decided to assess the area around the main office, laboratory, canteen and workshop - deemed high risk areas with the greatest pedestrian activity.

After completing a risk assessment of the existing controls and routes, a meeting was arranged to discuss the findings and compose an action plan. Hauliers based at the site were invited to the meeting to gain their perspective on the current system.

It was decided that there should only be one crossing point for the main traffic route through the works. This was at the rear of the weighbridge, between both car parks. Extra lighting was also introduced to illuminate the walkways and crossing point.

This designated pedestrian route has helped create a safer working environment.

➤ End of shift wrap-up

Aggregate Industries > Bardon Hill Quarry, Leicestershire > 01530 510066

At the end of each shift or the completion of a significant task, each section supervisor takes a few minutes to talk to the team to identify any tasks that could have been carried out more safely.

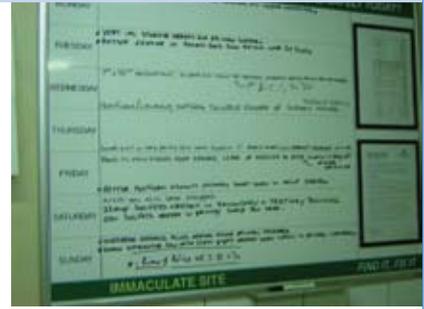
Employees are encouraged to input in to the process and suggest safer systems of work.

Dry-wipe boards are located at various points around the works where employees congregate. Comments made are entered on to the board and, if practicable, the quarry manager ensures that the improvements are implemented.

Actions that can't be implemented within a week are transferred to the site safety plan, where an individual is allocated with the task of introducing the changes.

Copies of the plan are distributed and attached to the end of shift wrap-up board so that employees are able to track the progress made.

The measures have been championed by Bardon Hill Quarry to other Aggregate Industries sites which have taken the initiative on board.



➤ Brett aggregates emergency drills

Brett Group > Faversham group of quarries, Kent > 07710 589973

Brett's production manager, Derek Knight, challenged site supervisors to come up with a scheme that involved everyone on their sites in an emergency drill.

At subsequent safety meetings it was decided that quarries would work together to stage a scenario at another quarry, so that all four of the region's quarries would be covered.

The first scenario revealed a weakness at the chosen site. Keith Tupper from Faversham Quarry and Jamie McCann from Milton Quarry turned up on-site and went to the weighbridge, Keith deliberately 'forgetting' his PPE.

When he went back to his car he 'collapsed' - the weighbridge attendant responded well. He 'called' the emergency services and then summoned the first-aider, only to find that there were none on-site.

Without carrying out a 'real' drill, such issues wouldn't be identified. All staff on the quarry have now been first-aid trained.

The drills have been extended across the other sites in the Brett southern region.



➤ Pedestrian walkway and welfare facility improvements

Tarmac > Basildon Concrete Plant, Essex > 01268 590648



The paving at Basildon Concrete Plant had deteriorated rapidly over recent years, with large areas of paving lifting and cracking. The wire reinforcement was exposed, creating a trip hazard for pedestrians and the risk of tyre damage to both road and site vehicles.

During the resurfacing work, site staff took the opportunity to incorporate a new pedestrian walkway from the welfare facility and car park to the office. A wedge pit to catch water run off from the truckmixer loading bay was also included.

Alongside this, two employees completely refurbished the existing tired welfare facility, including fitting a new kitchen, converting the adjacent small office into a drying room, revamping the toilets and fully repainting inside and out.

A full signage review also took place, resulting in new and improved signage on-site.

These changes have created a better working environment for all and somewhere that employees can be proud of.

➤ Interdependent logo on PPE

Tarmac > King's Cross, London > 0207 7136502

Two initiatives have been introduced in the London Concrete business as part of Tarmac's 'One' safety campaign.

High-visibility PPE, with the slogan 'If you think I am working unsafely then stop me!', printed on the back have been issued.

A laundry provider provided samples which ensured that the standard of the PPE was not being compromised.

By wearing the PPE, site staff are openly inviting colleagues to challenge them - making this process more comfortable.

A doormat informing people of their duties and responsibilities has also been placed in site offices.

Both have been successfully trialled at King's Cross and Battersea Concrete plants. Staff and contract hauliers have willingly worn the PPE and orders have been placed for enough sets for the entire workforce and all contract hauliers.



➤ Conveyor maintenance tools

Hanson > Penmaenmawr Quarry, Conwy > 01492 622256

A potentially dangerous task to maintain an overhead conveyor at Hanson's Penmaenmawr Quarry in North Wales has been made safer by two special tools designed by members of the workforce.

Despatch foreman Terry Midgley has designed a tool to remove and replace idlers. It works by using a simple lever system and can be operated from the walkway, eliminating both manual handling and working at height risks. It also reduces the risk of personal injury to the operator.

The second tool is a simple jack system designed by fitter Gwyn Edwards to clear the conveyor out of the way for maintenance to idlers and tail drums. The jack can also be operated from the walkway, eliminating manual handling and working at height risks.



> Site emergency plan at Moneystone Quarry

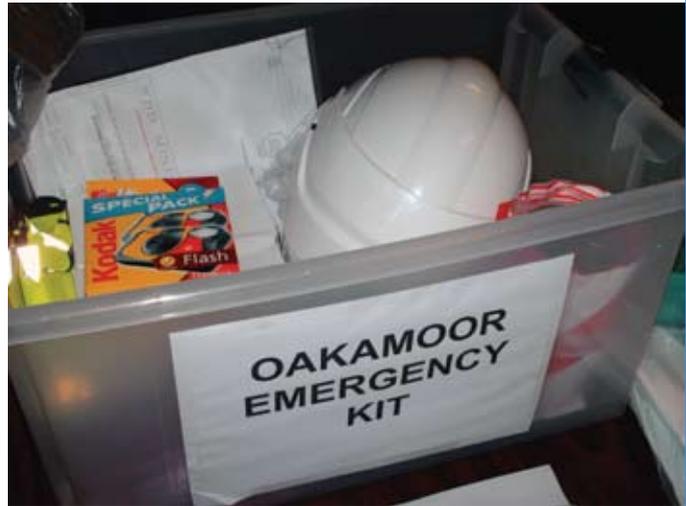
Sibelco UK > Moneystone Quarry, Staffordshire > 07841 496440

An incident occurred at Moneystone quarry that led to a review. Management and employee representatives concluded that the site's readiness to manage a major incident was not easily available in a concise and clear format.

In addition, responsibilities and communication channels on what to do in an emergency were confusing.

Through a series of site meetings, an emergency plan was drawn up which covered how to deal with the following:

- Introduction and definition.
- Roles and responsibilities.
- Injuries and fatalities.
- Summoning emergency services.
- Raising the alarm and evacuation.
- Assembly Point location list.
- Fire/explosion.
- Protests and demonstrations.
- Environmental pollution to water circuit.
- Environmental pollution to land.
- Environmental pollution to air.
- Public relations/media response.



The following information is also kept in an accessible location:

- | | |
|------------------------------------|---------------------------------|
| • Media request log. | • Incident log sheets. |
| • Communications and reporting. | • Incident control log sheet. |
| • Contact numbers for 3rd parties. | • Incident control log book. |
| • Internal telephone numbers. | • Management of major incident. |
| • Downstream farms location map. | • Emergency kit. |

All employees were given comprehensive formal training on the procedure over a four week period. The procedure is now live and has been tested by real incidents.

> Pedestrian walkway canopy

Lafarge > Walsall Plant, West Midlands > 07803 953562



Walsall plant was rebuilt in 2006 and serves a considerable number of customers who enter the site to collect aggregate.

The site became aware of the problem of stones falling from the aggregate feed conveyor when the belt runs empty.

A driver raised a number of 'near hits' and was concerned that although site staff were protected by hard hats, collect customers could potentially be at risk.

Following discussions on-site, the idea of providing a canopy to protect visitors, contractors and site staff was initiated. The canopy was designed, built and installed by employees.

It has been a great success, with no near hits raised following its installation. It also highlights the fact that implementing employee ideas is the best way of encouraging further improvements to the site for the benefit of all.

> Guardian goalposts

Northstone (Q&A Division) NI Ltd. > **Head Office, Coleraine**
 > **02870 322231**



A need was identified for a practical, reliable and easy to use system to warn of the presence of overhead power lines and to assist in identifying and maintaining a safe stand-off distance to prevent overhead line strikes.

Extensive research and development within the company led to a system similar to that used by the military in Finland.

It uses lightweight glass reinforced telescopic poles with stable bases. The poles extend to 6m in height and are very easy to erect.

A version has also been developed with fairy lights for night-time work on motorways.



> Asphalt plant safer by design

Midland Quarry Products > **Wednesbury Asphalt Plant, Leicestershire**
 > **01530 831000**



Midland Quarry Products (MQP) designed and built a state of the art asphalt plant and aggregate storage facility, to replace an aging asphalt plant.

Discussions with design engineers, bitumen manufacturers, delivery suppliers, operational staff and SHE representatives collaborated in the design for a £12 million plant that was safer for delivery drivers, operational and technical staff, hauliers and visitors.

Among the measures introduced are:

- A centralised office, weighbridge and control room.
- A dedicated traffic route to a well lit and signposted loading point.
- A holding lagoon for any spills.
- Ground based pumps.
- High and low level alarms and telemetry tank indicators.
- An additional tank coupling flange developed by MQP to prevent discharge pipe incidents.

MQP hopes that the designs incorporated will become industry standard.

> A mobile field hopper

Hanson > **Needingworth Quarry, Cambridgeshire** > **01509 503161**



The heavy-duty field hopper at the quarry was a skid mounted feeder which proved time-consuming, awkward and hazardous to move.

A new machine was specially designed by the company's engineers working closely with Hassel Engineering of Stoke-on-Trent. It is tracked and controlled remotely allowing it to be moved at a distance by one operative.

Because it is much easier to move and set-up, the new equipment has significantly increased production efficiency, whilst the level of risk at the quarry has noticeably reduced.

It allows excellent all-round ground level access, reducing the need for any work at height. It has high-quality fixed guarding with a significant reduction in noise levels.

The lip of the hopper is at eye-level for the excavator driver, allowing greater control and understanding of the operation, further improving the safety environment.



> Bitumen tank monitoring system upgrade

Hanson > Leeds Asphalt, West Yorkshire > 07881 900146



During October 2008, the site recorded a near miss incident involving a minor bitumen spill. An investigation established that the equipment monitoring levels on tank one had dropped out of calibration.

A review was made of level monitoring equipment available, the best of which incorporated a highly visible and audible "traffic light" system. However, the site opted to develop its own improved audible and visual device. A site meeting was held with their electrical contractor and details were agreed for a practical and cost-effective solution.

The system includes single and double beacon audible and visual alarms, and tank contents gauges. All are positioned in clear view of the driver at each tank.

Following installation, the bitumen supplier conducted a safe delivery site audit, confirming high compliance of the new procedures and systems.

> Asphalt plant loading display

Aggregate Industries > Colemans Quarry, Somerset > 01373 836130



A television monitor has been installed at Colemans Quarry to ensure that loading at the asphalt plant is managed safely.

Encased in a specialised weatherproof box, the monitor is located within a guarded-off area to the front of the plant giving lorry drivers a perfect view of the screen.

The information displayed includes tonnage of load, material being loaded and also has a timer to count down to when the next batch will be dropped from the mixer.

The system stops drivers pulling out from under the plant prematurely, increasing driver safety.

> Sheeting bay for small vehicles

Hanson > Builth Wells Quarry, Powys > 01982 553716



Builth Wells Quarry has a high proportion of collect customers using small vehicles and it was identified that many were climbing onto the back of their pick-up to sheet the load.

This method of sheeting was subsequently banned, but customers found it difficult to pull the sheet over from ground level.

An onsite fitter designed and built a sheeting bay for small vehicles comprising a sheeting cage into which vehicles reverse, stopping when they touch the 'bump' stops at the back of the cage.

The back of the vehicle is accessed through a 'one way' gate at the top of the steps and handrails around the side of the sheeting cage protect the customer from falling.

The sheeting bay is now in use at a number of the company's quarries and has been very well received by customers.

> Space-saving vertical bitumen tankage allows site re-design

Hanson > Bradford Asphalt Plant, West Yorkshire > 01274 606479



Hanson’s Bradford asphalt plant serves a busy local collect trade and several resurfacing contracts which involve extensive night work.

A new electrically-heated vertical bitumen tank storage system has replaced the old oil heated tanks and has resulted in major improvements in safety and operating conditions. The saving on space has permitted a re-design of the site, such that bitumen tankers no longer have to undertake lengthy reversing.

The key advantages of the system are:

- The electrically-heated tanks are insulated and thermostatically controlled to a level which sets the new benchmark for reducing energy requirements.
- RBA-approved “traffic light” system for high level and ultimate high level control.
- Triple lip mechanical seals on the bitumen pump, eliminating bitumen weepage.
- The old ring main bitumen delivery system has been replaced by a single bitumen pipe, minimising the chance of bitumen leakage.
- The tankage has been reduced from a cluster of four conventional oblong tanks to three in-line tanks with the introduction of a blending system.
- The space saved by having three in-line tanks has been used to significantly improve associated traffic management, eliminating a lengthy reversing manoeuvre.

> Bitumen delivery improvements

Hanson > Northampton Coating Plant, Northamptonshire > 01604 402174



A number of initiatives have been introduced to make bitumen deliveries safer.

On arrival, the delivery driver is issued with a hand-held radio to ensure constant communication. Among the improvements are new lockable anti-splash boxes fitted to the end of filler pipes, which prevent discharge into the wrong tank. There have also been improvements to the high-level alarm system at the site.



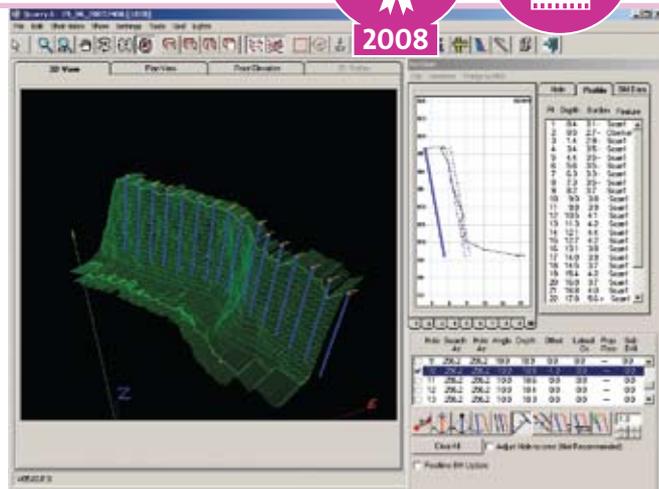
> Face profiling software

Co-ordinated Surveys > Llandudno, North Wales > 01492 870277

QUARRY.6 or Face Pro 3D has been developed to utilise data from the new breed of fast-scan lasers to provide better quality information about burdens at any point on the face.

All the data is formatted into easily read and clear reports. Improved graphics allow the user to be confident that the laser survey has detailed the face accurately.

The system reports on the distances between adjacent surveyed shotholes so that the blast design can take into account all weak burdens on the face, both in front of and, importantly, to the sides of the shothole. Allowances can also be made for shotholes found to be converging or diverging, and geotechnical anomalies can be factored into the reports.



> Cradle for dipper arm changes

Hanson > Ripon Quarry, North Yorkshire > 01765 635484

Ripon Quarry contains alluvial and terraced gravels up to 20 metres below the surface. The quarry is dewatered to six metres below natural levels. Wet extraction was traditionally by dragline, with the upper dry benches worked by hydraulic excavator or front end loader.

As part of a project to upgrade production equipment at the site, the opportunity was taken to improve efficiency by replacing the dragline with a 360 degree excavator. This has interchangeable dipper arms to operate at long reach below the water and standard reach on the upper dry benches.

Changing the dipper arms clearly presented a potential risk, so a number of design improvements were incorporated into the machine to facilitate safe and efficient changeover. These ideas were developed during close consultation by the supplier and quarry team.

Three aligned concrete plinths have been cast to house two dipper arm cradles, with the other used to create a stable base for the machine and attachments. The operator can manoeuvre the boom in an arc between each cradle without tracking or moving position. The cradles allow safe access to the hydraulic pin extractor and dipper ram alignment jacks permanently fixed to the machine. The whole changeover process can be safely carried out in 45 minutes with no manual handling requirements.

In addition to these improvements, the excavator has been fully equipped to a high specification with particular attention paid to access and egress.



> Plant motion detector

Blasting Services > Exchem Explosives, Derbyshire > 01773 837672

When moving a drillrig (with integrated control cab) between shotholes, operators have a restricted view - relying on their mirrors to safely manoeuvre the rig.

To alleviate this, Blasting Services have fitted rear-view cameras to all such plant. Whilst this gives the operator excellent rear vision, concerns were raised that personnel could still enter the restricted area unbeknown to the operator.

In order to address this, a motion detection system was installed that notifies the operator if vehicles, obstacles or site staff come within six metres of the rear or side of the plant. Four LEDs light up as the object or approaching person gets closer and an audible warning is emitted when all four LEDs are lit, so that the operator can take proactive action by interrupting operations in order to maintain safety.



> Asphalt plant swing pyrometer

Aggregate Industries > Westleigh Quarry, Devon > 07740 934114

On asphalt plants the temperature of the feed material is critical to the final quality of the product. Many plants use a pyrometer positioned just above the flow of the material in the dryer discharge chute to ensure an accurate reading. However, there is limited clearance - which means that when a piece of oversized material leaves the dryer there can be insufficient room within the chute around the fixed pyrometer sensor, resulting in a serious plant blockage.

In the past, this often led to operators subjecting themselves to the following risks:

- Confined space working.
- Excessive heat exposure.
- Manual handling of any spillage on the floor beside the discharge chute.
- Burns, fumes and fire risk from any spillage.
- The risk of slips, trips and falls from any spillage.

To overcome these issues, many plants have moved the pyrometer out of the chute, removing the potential for a blockage but increasing the risk of poor quality control of the product.

A simple swing-mounting arrangement was developed for the pyrometer, directly above the chute. As a result, any oversized material travelling down the chute is able to push the pyrometer out of the way before the pyrometer swings back into position. The 'Swing Pyrometer' was fitted to the plant in June 2007 and has to date totally eliminated any blockages.



> Safe bitumen deliveries

Ennstone Thistle Ltd > Ethiebeaton Quarry, Angus > 01382 534611



Ethiebeaton Quarry is a hard rock quarry near Dundee that includes a high production asphalt plant.

The following measures have been implemented to ensure that bitumen deliveries are carried out in a safe and controlled manner:

- A one-way system for delivery trucks is in place.
- There is a designated walkway for delivery drivers, including a barrier directing all personnel away from the area.
- The 80 tonne vertical tanks have gauges that are visible to delivery drivers and can be viewed remotely by the plant operator.
- Independent high-level alarms are set at 72 tonnes, ensuring a safe capacity.
- A padlock system prevents discharge into the wrong tank.
- The driver is issued with a two-way radio to ensure constant contact with the plant operators.
- Emergency showers are located within 20 metres of the delivery point.
- After discharge, the hose drainage is sanded and disposed of in compliance with the quarry's ISO14001 procedures.
- After delivery, all drivers must report to the office, return the flange padlock key and sign off the delivery documentation.



> Aggregate delivery improvements

Lafarge > Great Yarmouth RMP, Norfolk > 01603 746564



Aggregates were delivered to the plant at Great Yarmouth in 20 tonne loads by road tipper and backed up a ramp, round a 90 degree turn and into a receiving hopper three metres above ground level.

The driver then raised the tipper body to its full height to empty the vehicle. At this point the vehicle body was 10 metres above ground level with the plant and its normal workings on one side and the neighbouring Biffa site on the other. Although we could control our operations with an exclusion zone whilst tipping, we could only advise our neighbours of the potential issues in the event of a failure.

Following internal reviews, a scheme was proposed to the executive board to remove the ramp and replace it with a ground level receiving hopper which would be fed by a wheeled front end loader, running on a concrete hard standing. The tippers were to tip in purpose-made stock bays.

The plant was shut for six weeks to remove the ramp and receiving hopper, pave the yard and build the stock bays. All ramp materials were removed from site and recycled.



> Skip track safety catch

Aggregate Industries > Peterborough Asphalt Plant, Peterborough > 07740 934550



A potential hazard was identified at Peterborough Asphalt Plant. When the skip track was lifted to provide access under the mixer, it was only supported by the chain hoist and had no back-up safety catch.

A safety catch was fabricated and installed to act as a back-up should the hoist fail, preventing possible serious injuries.

> Bitumen ground pumps and safety shelter

Aggregate Industries > Weaste, Manchester > 01618 726071

The Aggregate Industries asphalt plant at Weaste has made a number of changes to make the delivery of bitumen safer:

- Traffic routing has been changed to increase the visibility of the weighbridge when overseeing the discharging of tankers.
- Bitumen delivery has been changed from a pressurised delivery system to pump delivery.
- A safe area, fitted with an emergency stop button, has been erected where drivers stand while tankers are discharging.
- A new ground pump system and level indication has also reduced the likelihood of overfill.



> Wash out waste control

CEMEX UK > CEMEX UK Floors, Bristol > 01788 542111



Since the change-over to self compacting concrete, the Teka 1850 mixer and discharge chute on-site require more regular cleaning between batches.

This has created a problem with controlling spillage and the disposal of both the water used to wash down and the cement paste slurry.

The old system was to wash down into the transport skip and transport the water and slurry to the settlement tanks.

However, following the installation of a flume, the mixer can be washed down at any time, with water and fine paste discharging straight into the settlement pit.

The front end of the batching plant was redesigned with a rubber sock replacing the large steel discharge chute enabling waste water to be directed into either the transport skip or the wash down flume.

This has eliminated the slip hazard from the area, reducing the risk of injury.

> The safe delivery of hot bitumen

Aggregate Industries > Astley Plant, Lancashire > 01942 878031

Aggregate Industries asphalt plant at Astley has made a number of changes to make the delivery of bitumen safer:

- The pressurised bitumen delivery system has been replaced with a gravity fed, ground transfer pump from the tanker. The system is fully automated, and allows the user to select any one of four storage tanks.
- Tank levels are displayed at the point of delivery and all tanks are fitted with high level alarms with warning lights and a siren alert.
- Delivery is constantly monitored from the mixer cabin using CCTV and a cold water drench shower is adjacent to the tanker in case of an emergency.



> Safe management of bitumen

Aggregate Industries > Greystone Quarry, Cornwall > 01566 772392

At Greystone Quarry, a number of improvements have been made to the asphalt plant to ensure the safe management of bitumen delivery, storage and sampling.

The following changes have all proved beneficial:

- Signposted pedestrian walkway - In order to ensure safe pedestrian access to the mixer cabin, a walkway barrier has been installed with clear signage. The barrier allows bitumen tankers to safely discharge their load and keeps unauthorised people away from the delivery point.
- Bitumen tank levels and alarms - A Vegaflex 61 level has been fitted to the bitumen tank. It uses a guided microwave which is not affected by temperature and is amongst the most reliable type of level available. Level gauges with a "traffic light" system and alarms have also been fitted.
- Bitumen sampling - Progressive sampling valves that work on a screw thread have been installed. When closed, the valve body sits flush with the bitumen in the pipe to prevent clots. A shelf for the sample pot and an additional shield for protection during sampling have also been fitted.
- Signage and shower - A shower, which is clearly signed and regularly tested, has been installed close the bitumen delivery point. Relevant safety signage including RBA guidance, dealing with bitumen burns and work procedures have also been placed in the area.



These changes have been brought about following discussion with plant operatives, equipment and bitumen suppliers and the company has received several positive comments about the changes made.

> Improved labelling of electric cabinets

Aggregate Industries > Rand Asphalt Plant, Merseyside > 07740 934306

The Asphalt Plant at Liverpool is a new Parker Blackmix 1620, with a purpose-built switch room to house all the plant electrics.

As there is no site electrician, a variety of the manufacturers' electricians as well as available outside contractors have had to be used to rectify a number of teething problems. The switch room is filled with a series of uniform, anonymous cabinets - causing delays whilst electricians familiarise themselves with the plant.



A common practice of photographing with mobile phones and digital cameras was developed. This involves:

- Downloading and storing all photos as a record for the future.
- Emailing photos to design engineers or off-site electricians to cut out ad hoc workarounds by site electricians.
- Printing, laminating and posting up enlarged photos on the cabinet doors to give both new and existing staff clear familiarity.

Any modification made at the end of production can be photographed, digitally labelled and posted on a cabinet door before the next day's start-up. An electrician can gain a full understanding much quicker than in the past, without opening a number of cabinets to assess the situation.

> Wire rope saw

Ennstone Concrete Products Limited > Doseley Works, Shropshire > 01952 630300



At Ennstone's site in Telford there is a 'Specials Shop' which produces items such as bends and junctions, made to customer's individual requirements, from straight lengths of precast concrete pipe.

This work involved cutting large diameter reinforced concrete pipes and manholes using powered hand-held saws and chisels, which carried with it occupational health issues.

Manual cutting operations and the associated risks have been greatly reduced since the installation of a diamond-coated wire rope saw.

The saw is designed for use in quarrying, but was adapted by mounting it on adjustable steel runners, with a cradle on to which pipes can be secured.

Once the pipe is set up, correctly aligned and all guards are in place, the sawing operation is initiated and continues without operator intervention until completion, thus eliminating virtually all risks to the operator.

> Articulated dump truck inclinometer

Tarmac > Blashford Quarry, Hampshire > 01425 478771



After an incident on-site where the articulated dump truck (ADT) overturned, a sensor was fitted to the rear axle just below the skip body, which is connected to the display in the cab.

If the skip is raised when the dumper is positioned at an angle greater than nine or ten degrees, an audible warning goes off in the cab and a message is displayed on the unit.

The system is being developed so that it stops the tipping activity when activated.

> Isolating Aging Plant

Lafarge > Finningley Quarry, South Yorkshire > 01302 772358

Because of their age, the mobile dry screening units and conveyors at this site didn't have isolation points or emergency-stopping mechanisms. Should an incident occur, the only emergency stop method was the removal of the ignition keys.

A risk assessment was carried out to produce a system whereby the mobile screening unit and conveyor could be both isolated and fitted with an emergency tripping system.

A tailor-made system was designed by electrical contractors for each unit and a pull wire system was fitted to all sides of the plant.

If the pull wire system is activated, the supply of fuel is immediately cut off to the engine, causing the units to stop instantly.

Fixed isolation points have also been fitted, meaning that more than one person can carry out maintenance.

> Remote shot firing system

Aggregate Industries > Croft Quarry, Leicestershire > 01455 288605



Following an incident where a rock from behind the blast entered the blast shelter, various options were considered to safeguard shot firers.

The solution was to use a radio controlled DynoRem firing system by Dyno Nobel. This has two uniquely matched boxes - one stays in the blast shelter, whilst the shot firer remains in control of the other.

Normal pre-firing checks are carried out before the starter line is connected to the main firing box. The system is then turned on, but at this point nothing can happen for five minutes - allowing the shot firer to retreat.

A unique key held by the shot firer is inserted into the remote unit, turning the firing unit on. As long as line of sight is maintained, the shot can then be fired. This system now means that the shot firer can stand completely out of the danger zone.

> Segregation of vehicles by lighting

Aggregate Industries > Croft Quarry, Leicestershire > 01455 288605

Following a move by Croft Quarry to fit amber beacons to all vehicles, it was identified that smaller vehicles did not stand out sufficiently in areas such as the stock ground, where loading shovel, dump trucks and lorries all travel around at the same time.

Following internet research, a different coloured flashing beacon was sourced. These use LEDs and were fitted at the front and rear of site Land Rovers.

The lights alternate between amber and red and have different flashing settings, which help the Land Rovers to stand out from other site plant.



> Safe aggregate sampling system

Lafarge > Mountsorrel Quarry, Leicestershire > 01162 303881



There are inherent risks of taking samples off belts - including manual handling issues, coming into contact with large mobile equipment near stockpiles and the risk of an individual not locking off if he has to access a conveyor belt to take an in-line sample.

Quarry staff identified in their risk assessments that the current method needed to be improved to reduce the risk to employees.

A variety of companies were contacted to develop and install a suitable system of auto-sampling, which would dramatically reduce the risks to which employees are exposed.

The new system takes a 40kg scoop of material without having to stop the conveyor and discharges it into a splitter box which halves the sample into two receptacles. The samples are then ready for a technician to take to the local laboratory.

The system has not only eliminated the risks associated with the manual method, it has also generated savings for the quarry. It has reduced conveyor downtime by 83.3 hours a year, therefore increasing production.

The system has not only eliminated the risks associated with the manual method, it has also generated savings for the quarry. It has reduced conveyor downtime by 83.3 hours a year, therefore increasing production.

> Safe sheeting in high winds

Tarmac > Wensley Quarry, North Yorkshire > 01969 622342

Wensley Quarry on the edge of the Yorkshire Dales is an exposed location, where strong prevailing winds make simple tasks much more difficult.

The sheeting of wagons was a particular concern, as vehicles would leave the sheeting area to find shelter from the wind. At a safety meeting, it was decided that a solution needed to be found.

In consultation with a local fencing supplier and with motorway fence designers, Tarmac looked for a practical solution and decided upon a 14 feet high L-shaped fence, with solid concrete anchors. Drivers have responded positively and have thanked Tarmac for considering their needs. The idea is now being considered by a neighbouring quarry.



> On-site delivery of explosive accessories

Exchem Explosives > Alfreton, Derbyshire > 07831 899947

Exchem Explosives has introduced a delivery system in which accessories, such as detonators and primers, are delivered directly to the blast site in a specially constructed trailer.

The trailer is towed behind the bulk explosives vehicle. This eliminates the need for on-site storage of explosives and reduces the manual handling risks associated with the movement of explosive on-site.

All of the explosives are delivered in one vehicle, reducing the number of vehicle movements and as a result the company's carbon footprint.



> Blow bar flipper

Aggregate Industries > Westleigh Quarry, Devon > 07740 934114

Rotary impact crushers utilise wear parts known as 'blow bars'. These need to be regularly turning or replaced to ensure effective and efficient crushing.

Each bar weighs 220kg, so manoeuvring them has always been difficult.

When bars were due to be changed they would be placed on the floor and flipped over using long bars, eliminating the possibility of trapped fingers. This still required manual handling with the potential for sprains, strains and back injuries.

Westleigh's workshop team designed and built the 'blow bar flipper'. The device consists of two lifting attachments fixed on opposite ends of the blow bar. The bar is then lifted and moved using a hoist.

The device has been tested and certificated by an external company and inspected by our own insurance company to confirm its compliance with the necessary requirements.



> Nordberg concave change lifting rings

Aggregate Industries > Glensanda Quarry, Argyll > 01631 568112



Modifications to the primary crusher at Glensanda, a Nordberg 54-80, resulted in the fixed wear package now consisting of three rows of concave segments.

These segments require regular replacement, causing considerable difficulties in access and manual handling.

The engineering team sought to find a more efficient, safe and cost effective method of installing the replacement segments. The solution was to design a series of three lifting rings which allowed all of the segments to be lifted and installed as a group.

The rings were manufactured to be capable of lifting the specific number of concave sections for each row of segments into the gyratory machine.

> Mixer chute electric winch system

Tarmac > Retford Concrete Plant, Nottinghamshire > 01777 713506

Retford Concrete Plant produces concrete through a Miller's mixer, discharging through a chute into a mixer truck.

The chute is suspended below the mixer by a frame and must be lowered to ground level for maintenance or cleaning two to three times a day.

The only access to clean the chute was through the mixer door necessitating the chute to be lowered using a scaffold tower. The chute's securing bolts then had to be removed and a block and tackle used to secure the chute. This was very time consuming and required substantial manual handling.

A modification was carried out to enable the chute to be lowered using a winch and bearings attached to the frame.

The operator now releases the frame by unscrewing two securing nuts and then pressing a button to lower the chute.



> Heavy-duty chain maintenance

Aggregate Industries > **Halton East Works, North Yorkshire**
 > **01756 709219**



In 2007, an incident occurred during which a contractor was injured whilst assisting in the removal of a steel pin from the link of a heavy-duty chain. At the time, the extraction of an in-situ chain involved two people, two 14lb hammers, a steel 'drift' and a lot of brute force. The cause of the injury was the use of heavy hammers and steel 'drifts'. Although the method used was considered by many within the industry to be normal practice, the injury sustained could and should have been avoided.



In an effort to reduce the likelihood of similar instances, a jig has been developed that allows link pins to be removed using a portable impact wrench, whilst the heavy chain is held secure. The procedure can now be performed safely by one person, using no hammers or drifts.

Above: Old method

Left: New method

> Mixer maintenance safety beam

Midland Quarry Products > **Ettingshall Works, West Midlands**
 > **01902 495483**



Whilst carrying out routine maintenance to replace a paddle arm inside the asphalt mixer, a contractor sustained a minor injury. The incident was discussed at the joint site safety meeting, attended monthly by both contractors and employees, and it was decided that a more robust safe system of work was required.

A lift beam assembly was mounted within the mixer body. This allows the positioning and mounting of the mixer castings in a safe and controlled manner. The lift beam supports a manual trolley and pull lift system which traverses both internally and externally, providing improved safe handling and access for maintenance. It allows the maintenance operative improved manoeuvrability within the mixer body, helping to reduce potential slips, trips, falls, manual handling and crushing injuries.



> Safer core extraction

Tarmac > **Region-Wide, Scotland** > **07753 813188**



Specifications for asphalt performance testing require 200mm diameter cores, to a depth of 300mm, to be removed from bituminous pavements. This procedure creates manual handling issues when trying to remove the sample, as the core can weigh in excess of 25kg and, initially, can be awkward to grip.

Two methods had previously been used. The scissors method requires tremendous force to grip and lift the core and has the potential to cause major manual handling injuries or muscle strains. The alternative was to wrap a 'fishing line' around the core and pull it out. This creates a manual handling risk and the potential for cuts to the hand.

A specially adapted core barrel has been developed which, once the core has been cut, grips the core as you begin to lift it out. To help with the removal, the core barrel has a lightweight extension and two handles, so that two people can lift the core from knee level. This creates a safe, inexpensive and quick method to improve a potential high-risk operation.

➤ Improved access to final screen bottom decks

Aggregate Industries > **Holme Park Quarry, Lancashire** > **01524 781441**

Following the installation of three new purpose-built Hewitt Robins double deck final screens, a safety audit identified problems with access to the bottom decks for inspections, cleaning and maintenance.

The original design allowed access to the bottom decks by removing 26 friction grip bolts and lifting off the steel back plate weighing approx 150kg. With limited room and no provision for mechanical lifting, the removal of this backplate would become a manual handling issue due to the weight, postural constraints and restricted movement in the work area.

A site committee looked at the issue and recommended a removable rubber flap to allow inspection and access. This idea was passed onto Hewitt Robins design engineers for approval to ensure it did not affect the structural integrity of the screen. This simple, low cost solution has led to easier access for inspection, cleaning and maintenance and has removed a hazardous manual handling issue.

Editor's Note: This is an excellent example of a design inadequacy being addressed jointly by User & Manufacturer. If you have similar design problems on-site, have you involved the manufacturer in finding and effecting a solution?

➤ Metal automated removal system

Aggregate Industries > **Duntilland Quarry, Lanarkshire** > **01698 870811**

In the past, areas of the site that are now being quarried have been used as storage areas. As a result, foreign objects - such as pieces of scrap metal and bucket teeth - were causing stoppages on the secondary system, so that objects could be removed. This involved stopping production and a manual handling risk, as operators removed the objects.

The quarry investigated an automated solution and installed the Metal Automated Removal System (MARS). This detects metal on the belt and uses a snowplough-type barrier that drops on to the belt and deflects foreign objects into a pen on the quarry floor. This decreases the risk to employees and also means that the plant works more efficiently.



➤ Safe mooring of sand dredger

Hanson Aggregates > **Newport Wharf, South Wales** > **01633 290484**

The installation of two electrically-driven capstans, one on each end of the jetty, has made mooring ships at Hanson's Newport Wharf on the River Usk substantially safer.

Two operatives traditionally moored the aggregate dredgers by receiving a heaving line from the ship, and pulling it manually onto the jetty to be tied off on a bollard. It was clear that this operation jeopardised safety. Dangers included manual handling injuries from pulling the heavy ropes, being trapped between the ship and the jetty and slips, trips and falls, particularly during bad weather.

Installation of the electronic capstans means the operatives no longer have to pull on heavy ropes and eliminates potentially dangerous work.

> Manual handling zip line

Aggregate Industries > Bardon Hill, Leicestershire > 07740 934436

The Standard Havens dryer drum located at Bardon Hill is a considerable length with lifters and other heavy parts located internally.

Parts such as 30kg lifters had to be carried by hand whilst negotiating various trip hazards within the dryer.

To reduce the associated risks, a zip line arrangement was fitted inside the dryer to allow the lifters to be hooked on and moved into position. This has greatly reduced the manual handling risk.



> Stores winch

Aggregate Industries > Croft Quarry, Leicestershire > 01455 288605

The stores at Croft Quarry are located in an old building and split over two floors, with the upper floor accessible by an open mesh steel staircase. Small, light, less frequently used items are kept on the first floor. During an audit of site safety, the storeman pointed out that any deliveries for the upper floor had to be carried up the stairs and that three points of contact couldn't be maintained.

In order to rectify this, a 125kg winch and basket was installed. The winch has a drop-down side, eliminating manual handling issues, and has wheels so that items can be transferred to the correct storage area. A temporary barrier on the ground floor and a mechanically interlocked double gate and pen, on the first floor, ensure that the process is carried out in a controlled, safe manner.



> Replacing hydraulics with electronics

Sibelco UK > Headon China Clay Works, Devon > 07770 263903

China Clay is extracted using high pressure water jets that are controlled by operatives based in "monitor" huts. These huts are traditionally equipped with hydraulic monitor panels that control the direction and flow of the water. The panels are heavy, robust pieces of equipment that need regular maintenance. This was carried out by removing the panels from the monitor huts and needed a two-man lift in cramped conditions.

To address this, the mechanical and electrical teams decided to completely change the hydraulic system to incorporate electronics, drastically reducing the weight of the panel and increasing the efficiency of the system. The technology also improves the operators' working environment, as the new system is programmable allowing variable washing patterns. Plans are now in place to modify all of the monitor huts and to develop a central control system where several monitor huts can be controlled from one point.

Safe crusher prodding pole

Patersons Quarries > Dunduff Quarry, Lanarkshire > 01236 433351

A quick-hitch 'prodding' pole has been introduced to clear blockages at the jaws of a mobile jaw crusher.

The use of this 'prodding' device completely removes the temptation for an operative to use a hand-held 'pinch' bar to clear blockages at the jaws of a running mobile crusher.



Life raft cradle eliminates manual handling problem

CEMEX UK Marine > Baltic Wharf, Hampshire > 02380 720236

During a refit of marine vessels, CEMEX UK had to install an extra six-man life raft at the bow of the dredger, for deployment in the event of people being trapped and unable to reach the stern of the ship in an emergency.

This raised the following issues:

- The location needed to be protected from the elements.
- No mechanical lifting aids could be fitted due to confined space.
- The life raft and casing weighs 85kg, which would normally require three or four people to lift over the 1.5 metre apron at the front of the ship.

The solution was to design and fit a cradle that enabled one operator to deploy the life raft. The cradle is hinged to the apron of the ship. Weight is distributed across the cradle and handles allow sufficient leverage so that the raft can be lifted safely and swiftly over the side of the dredger by one person. The cradle has been inspected and approved by Maritime Coastguard Agency Surveyors. It has reduced the risk of manual handling injuries, significantly speeded up the deployment of the life raft and improved safe operating procedures.



Storage improvement for diesel bowser

Lafarge > Whisby Quarry, Lincolnshire > 01522 694342



To assist in keeping tools and equipment along the field belt line tidy, storage bins were added to the bowser.

The storage bins have a mesh bottom to allow any dirt or debris to fall away and prevent water buildup. These changes have reduced the slip, trip and fall hazard caused by equipment being left around the plant.

> HAVmeter

Tarmac > National Contracting, Derbyshire > 01773 815100



Tarmac National Contracting is the first UK contractor to develop, trial and roll-out an innovative system to provide 'live' data on tool operators' daily exposure rates to Hand Arm Vibration (HAV).

The company collaborated on two years of testing with 'Reactec', a leading noise and vibration specialist, to develop the HAVmeter. It records cumulative real-time vibration data across all vibratory tools used by an employee throughout the working day.

The HAVmeter system features a durable, colour-coded tool tag on each piece of equipment, a magnetic swipe card for each operator and a base station within the team's crew bus.

Each tool is allocated a tag - colour coded green, orange or red - to signify the general level of vibration produced and the recommended safe daily exposure. Using a personal swipe card, each operator signs out a HAVmeter from the base station, this attaches magnetically to the tool tag on the equipment.

When the operator is approaching their maximum daily exposure level, the HAVmeter provides a visual warning.

At the end of each working day, the HAVmeter is returned to the base station where the unit is recharged and the vibration data automatically saved to the station's internal memory. This information is then downloaded onto Tarmac's health and safety database, where operator exposure records and HAV trends are analysed.



> Healthy Working Lives

Barr Quarries > Killoch Depot, Ayrshire > 01290 700700



In September 2008, Barr Industrial made a commitment to introduce the Scottish Executive initiative, Healthy Working Lives (HWL) into its workplaces.

The aim of introducing this programme was to promote a healthier and safer workplace. This was achieved by reviewing the working environments and implementing good health, safety and welfare, as well as employment policies and practices.

The HWL programme forms part of Barr's overall occupational health strategy to:

- Reduce and prevent work related injury and disease.
- Reduce short and long term absences.
- Maintain its health surveillance programme to detect potential problems at an early stage.
- Promote health and well-being in the workplace.

The health issues that were of concern to employees were identified through an employee survey.

Each month a different health initiative is tackled. Healthy eating, no smoking, common cancers, physical exercise and stress in the workplace have all been addressed so far.

An example is the healthy eating initiative. Barr arranged for fresh fruit to be available each day to all employees and a Weight Watchers advisor held information talks for employees with a weight problem.

To increase employee participation in physical activity a team walk was organised from Land's End to John O'Groats.

> Barr Quarries health and safety drive

Barr Quarries > Killoch Depot, Ayrshire > 01290 700700



As part of a health and safety drive Barr Quarries took part in an occupational health and safety initiative, with the aim of highlighting occupational health and safety related issues to the whole of the workforce.

Due to the geographic area to be covered, Barr hired a double-decker bus specially fitted out as a mobile information centre.

Information regarding occupational and general health was available, including:

- Testicular cancer.
- Stress.
- Obesity.
- Healthy eating.
- Healthy living.



Various information leaflets were made available and an occupational health nurse was able to carry out individual health checks testing blood pressure, cholesterol, BMI and diabetes. She offered confidential advice regarding general health and, as a result, a number of employees were referred to their GP for further investigation.

Members of the PPE supply chain were on hand to discuss any issues relating to hand, eye, respiratory and hearing protection.

The drive has helped raise health and safety awareness and improved communication at all levels.

> Better backs

Brett Group > Robert Brett House, Kent > 01227 829000



Brett recognised that musculoskeletal problems played a significant part in many site injuries and lead to both lost time and RIDDOR injuries.

It was decided that the traditional approach to manual handling training was not working and a radical change was needed.

Many ideas were explored before a physiotherapist was asked to give practical training to Brett staff. Whilst this involved significant cost to the businesses, the benefits were believed to outweigh this.

The training was very well received and the results have been self evident with musculoskeletal injuries now significantly lower than in the past.

Before the training, musculoskeletal injuries were the cause of a quarter of RIDDOR and lost time injuries - this has dropped to six per cent.

> RCS study and prevention of Silicosis

CPI Mortars Limited > Springvale Business Park, West Midlands
 > 07771 913689



CPI Mortars produce and supply cementitious materials to the construction industry, employing 180 staff at nine sites.

The company commissioned a survey to ascertain if respirable crystalline silica (RCS) dust existed in the workplace and, if so, to evaluate if the existing control measures were adequate. The study was carried out by an occupational hygienist, and covered all of the company's operational staff from laboratory technicians to tanker drivers.



The study found RCS dust in the workplace. To rectify this, several measures have been implemented including:

- All plant vehicles were evaluated for integrity and leaks and a number of repairs took place.
- Local exhaust ventilation was subject to a planned preventative maintenance programme, filters were changed and new captor hoods were installed.
- A new position of maintenance manager was recruited to improve aspects of maintenance on-site.
- Vacuum systems were installed to eliminate the need for manual sweeping.
- A 'face fit' programme was rolled out to ensure that the correct dust masks are being used.
- All employees are now subject to medical examinations looking at lung function, dermatitis and hearing.

A re-test has been carried out and found that levels were significantly below the Workplace Exposure Limit for RCS.

> Excavator mounted buried service avoidance system

Cable Detection Ltd > Trentham, Staffordshire > 01782 654454



EZiDIG is an excavator mounted buried service avoidance tool. The system reduces the risk of damage to detectable buried services, such as gas pipes and electricity cables. In doing so it helps protect excavator operators, decreases project downtime, enhances productivity and protects assets.



A sensor attached to the excavator dipper arm detects electromagnetic signals emitted by buried metallic services and communicates in real time with the excavator driver, via an in-cab display indicating the proximity of the source signals. The EZiDIG has a maximum detection range of two metres from the tip of the sensor unit and is designed for excavators up to 10 tonnes.

> Management system to control hand arm vibration

CEMEX UK > Nottingham Coated Stone, Nottinghamshire
> 07702 240608



Following the discovery that two members of staff had developed Stage 1 hand arm vibration syndrome (HAVS), it was decided that a review of current systems should be held. The review led to the development of a traffic light identification system, which highlights an operator's exposure to vibration.

The system includes an information pack and guidance notes, an employee assessment questionnaire, risk assessments and safe systems of work. Although not new, it incorporates best practices already established in quarrying and other sectors.

Because the use of vibration inducing tools is low, it was decided that logs of operators' exposure would be expressed in minutes and not the points-based system that many sites have adopted. This decision was influenced by the operatives at locations where HAVS had been identified who found the 'minutes' system easier to understand.

However, shortly after implementation, it became clear that employees were significantly underestimating the operational time that they had used the tool. For example, if a fitter was fabricating a guard and using a grinder to dress the steel and a drill to form the mounting holes and the task took four to five hours, they would log two to three hours, splitting the operational time between the drill and the grinder.



Following a brainstorm session, a simple "Trigger Time Data Logger" was developed. Either portable or wall mounted, the logger plugs it into the power socket and the tool plugs into the data logger. A timer registers when the trigger is activated and logs multiple uses of the tool. It provides a simple accurate management system and is easily adaptable to any location and to different tools

> Filter cage replacement tool

Aggregate Industries > Halton East Works, North Yorkshire
> 01756 709219



The dust collection system at this asphalt plant consists of hundreds of filter bags and wire cages, which require regular maintenance and replacement. Replacing filter bags involves lifting filters from foot level. To dislodge the cages regularly proved physically difficult due to contamination and heat distortion. Staff often commented on the risk of back strains during this arduous task.

Discussions took place and the maintenance team designed and built a simple tool for the job. The filter cage replacement tool now means that the cages can be loosened and removed from a standing position with minimal effort, whilst the same tool is used to tamp down the replacements.



A recent filter change was completed in half the usual time, with positive feedback from the crew carrying out the task.

> Reduction in levels of respirable dust

Aggregate Industries > Bardon Hill Quarry, Leicestershire > 01530 510066



During routine monitoring of occupational dust levels, it was identified that the respirable crystalline silica (RCS) levels in the primary crusher control room could be reduced further.

The wet suppression system was not considered sufficiently effective and the health of the operator was being compromised. Trials were held using an inert chemical in the water which, when combined with compressed air, generated a foam suppressant. This was injected in to the chamber beneath the crusher and had the effect of adhering the smaller dust particles to the course aggregate. The measure has made a visible difference and has led to a 36 per cent fall in RCS levels, which are now well below the legal limits.

> Eliminating exposure to respirable silica dust

Hanson > Builth Wells Quarry, Powys > 01982 553716



The secondary crushing and screening plant at Hanson's Builth Wells Quarry in South Wales was built in 1966 and has changed very little since. The processing plant operator was located inside this building in a control room located next to the three cone crushers.

The operator raised concerns about the levels of dust and noise in the control room.

Despite independent testing showing that noise and dust exposure levels were below the legislative exposure limits, it was felt by both the employees and site management that it would be much better if the operator could be relocated outside the processing plant building.

It was clear that this was going to be a significant project and the challenge was made greater by the current financial pressure that all quarrying companies are under. This prompted the employees to tackle the project themselves.

A steel container and second-hand control cabin were sourced from other Hanson sites and a steel frame was constructed for the control room to sit on. The site electrician and fitters installed a new wiring system for the control and monitoring of the processing plant.

The employees pulled together and at very little cost to Hanson, erected, refurbished and rewired the new control room allowing the operator to control the processing plant remotely and in a clean and quiet environment.

> Whole body vibration measurement

Lafarge > Dunbar Quarry, East Lothian > 01368 861300

Research was undertaken to identify a solution to the problem of measuring whole body vibration for mobile plant operators working on quarry roads.

Occupational exposure to vibration had potentially contributed to the deterioration in the health of a number of operators at other sites, who had retired early due to ill health.

A provider of monitoring devices was identified and a device was purchased for trial from Thomas Scott Seating. It clips to the seat of the dump truck through which the vibration is transmitted to the operator.

The data is collected by the device and is downloaded via a USB connection. This has led to reduced exposure by improving seating and road conditions.



> CEMEX UK Health Essentials

CEMEX UK > Wolverhampton Road, West Midlands > 07711 537523

CEMEX UK has made significant advances in the safety of its operations. In 2008, it decided to apply some of the principles used in safety management to help improve the health of its employees.

It introduced "Health Essentials", 12 key health messages for employees. The health messages were introduced over a 12 month period focussing on a different message each month.

The programme was designed to be informative rather than prescriptive and the information was distributed through channels such as the in-house newsletter, notice boards, safety meetings and tool box talks.

Packs were developed including self assessments and quizzes designed to make people think about their lifestyle.

The 12 Health Essentials are:

- Healthy heart.
- Safeguard your back.
- Eat and drinking wisely.
- The benefits of regular health checks.
- Eye and hearing protection.
- Protect your skin.
- Preventing stress.
- Vaccines.
- Safe hands.
- Ensuring good air quality and use of respiratory protection.
- Drug awareness.
- Sleep well.

Awareness of health issues has risen amongst the workforce. Absence levels are falling and take up of voluntary health surveillance is increasing.

> Health risk management

Midland Quarry Products > Leicester Road, Leicestershire > 01530 831000

Midland Quarry Products (MQP) has strived to ensure that 'team members' are free from exposure to risks that may affect their health. The company's vision is of a healthy, happy work force 'fit for work'.

At MQP, each team member's job category is risk rated to ensure that they receive the right health care management.

When an individual applies to join the company, they receive a full prestart medical to determine their health risk baseline. This continues throughout their career by receiving regular risk based health surveillance to ensure they remain healthy and thus 'fit for work'. All new starters also receive a drug and alcohol test.

MQP cross-references with other business partners on such hazards as whole body vibration (WBV), hand arm vibration (HAV), noise, respirable crystalline silica (RCS), dermatitis and radon to ensure that it successfully manages staff exposure.

Assessments are also carried out on staff who enter confined spaces, work shifts and are exposed to HAV. This often leads to individuals being redeployed.

When health risks are identified, the correct PPE is provided free of charge and to a specification that ensures it is used.

These measures all help MQP achieve its goal of a healthy work force.

> Be safe, be seen

Aggregate Industries > Mepal Quarry, Cambridgeshire > 01354 691401

As part of Aggregate Industries "Go look and see" initiative, the site manager observed that poor visibility was hampering several routine tasks that must be carried out at the end of shifts.

Even with adequate yard lighting, shadows were often cast - making it difficult to see when operators were checking fixed and mobile plant. Hand torches were used but were often lost or damaged.

In order to resolve this, site staff were issued with head lamps. The head lamps have two settings - red light is used when employees are walking around site and white light is used when greater visibility is required for carrying out maintenance tasks on-site. The head lamps also mean an operator has two hands available to carry out the maintenance.



> Noise alert system for laboratory

CEMEX UK > East Kilbride, Scotland > 01355 236611



Following a noise assessment, it was shown that when the concrete pan mixer was in operation approximately two-thirds of the ready-mix technical laboratory exceeded the 85 decibel noise limits.

A noise action plan was devised and as an interim measure it was decided that the exposed areas of the lab would be designated as a Hearing Protection Zone when the mixer was in use, rather than trying to "zone off" specific areas on a permanent mandatory basis.

To ensure that hearing protection was used, a system was put in place so that staff carrying out the trials would switch on a warning light for the duration of the trials. Further improvements regarding the suitability of the equipment and room partitioning will be examined as a longer term control measure to reduce the hazard and numbers exposed.

> Eliminating personal exposure to high silica dust

Hanson > Ystrad Meurig Quarry, Ceredigion > 01974 282606



In 2007, Hanson purchased a mobile crushing and screening plant for the quarry, which extracts a high silica gritstone.

The filters on the plant must be cleaned daily by blowing the dust from the inside using compressed air. Although the person carrying out the task would be wearing a dust mask and goggles, exposed areas of skin would become covered in dust, as would their overalls. This could easily be breathed in when changing or removing the overalls.

The issue was discussed at the monthly health and safety meeting and it was agreed that an alternative method of cleaning the filters had to be found. The idea of using a 'bead blasting cabinet' that would allow the filters to be cleaned inside a sealed unit was put forward.

A vacuum was purchased and a purpose-built cabinet designed by employers and made from steel and Perspex was constructed. This allows screening and crushing plant filters to be cleaned safely without exposing the operator to silica dust.

> Replacing the primary crusher cabin

Hanson > Gelligaer Quarry, South Wales > 01443 410886

Gelligaer Quarry extracts Blue Pennant gritstone which passes through a series of crushers to produce single-size aggregate.

Traditionally, the primary crusher operator worked in a cabin directly above the crusher. This cabin was positively pressurised to exclude airborne dust particles, particularly respirable crystalline silica (RCS). However, the operator had to walk through a very dusty area and dust often tracked into the cabin on entry.

Although it complied with the previously accepted Maximum Exposure Limit (MEL) of 0.3 mg/m^3 , it was felt that improvements should be made, both for the well-being of the operator and to ensure that new lower limits could be comfortably achieved.

A decision was made to relocate the control room to a building remote from the crushing area. The operation of the crusher, material feed, and the "pecker" were all carried out using CCTV cameras. The new control room is well away from dust and test results have shown that the Workplace Exposure Limit (WEL; successor to the MEL) in this area is now well below 0.1 mg/m^3 .

This measure has greatly reduced the risk of exposure to airborne dust created by the crushing process.



> Powerpoint toolbox talk reduces noise risks

Lafarge > Spixworth Quarry, Norfolk > 07896 233111

Following site noise monitoring at Spixworth sand and gravel quarry, high levels of noise were identified associated with the washing and screening of materials, which was sub-contracted to APS Finlay.

A program of noise reduction, warning signs and noise level plans was drawn up for the site by Lafarge and the main contractor. However it was clear that the level of training of sub-contracted staff was not of a suitable standard.

As a result, management decided to create a Powerpoint toolbox talk called 'Noise in the Workplace'. This has since been delivered to all site staff, Lafarge employees and all contractor staff at three quarries in the Norfolk area. Since then, the sub-contracted staff at Spixworth have noticeably improved their use of ear protection and have worked together with Lafarge staff to reduce high noise level sources.

The presentation has been forwarded to Lafarge Group Safety department to be made available to all sites.

> Health and safety text messages

Aggregate Industries > Express Asphalt, Leicestershire > 01455 285200



The management team at Express Asphalt launched a major health and safety drive for 2008. One of the initiatives they introduced is the delivery of regular Health and Safety messages by SMS. These are sent out on Monday mornings and tend to reflect recent events, the time of year or any incidents or 'near hits' within the business. This message is followed up with an e-mail and the messages are also displayed on notice boards and in various locations around the site.

This initiative has been well received and employee feedback suggests that it has helped to focus on a different subject every week and has created discussion within the team at each site.

> Entry into asphalt plant dryer

Aggregate Industries > Kennedy Asphalt, Lancashire > 01942 878031



A new access platform, walkway, staircase and entry door have led to significant safety improvements for accessing the asphalt plant dryer.

- The stairways, walkways and enlarged entry door allow improved access into the dryer.
- Tools and equipment can be taken easily into the work area.
- There is sufficient room for the person controlling the entry to stand immediately to the side of the door allowing direct sight of and good communication with the person inside.
- Should an emergency arise, action can be speedy and safe without fear of falling from the platform.
- There is sufficient room for emergency equipment to be set up if required.



> Raised crushing and screening platform

Barr Quarries > Tincornhill Quarry, Ayrshire > 01290 700 700



The following issues were identified as areas of concern in the use of mobile crushing and aggregate screening equipment:

- Plant can be buried by excess stockpile material.
- Spillage of material can lead to slips, trips and falls.
- Adverse weather conditions can lead to excess water and potential accidents.
- During maintenance procedures, there is little demarcation between wheeled plant and pedestrians leading to an increased risk of collisions.



Barr proposed the use of precast panels to raise the aggregate processing plant onto a dryer, cleaner environment.

Handrails were added with controlled access points, segregating the process operational staff and the maintenance team from the wheeled plant and in addition, preventing slips, trips and falls. The raised island also reduces risks associated with adverse weather.

The crushing and screening plant can be tracked off the platform to allow mechanical cleaning of spillage, eliminating any risks associated with manual handling. The freestanding precast panels can also be moved as the quarry develops.

> Safe exit from asphalt rotary drier

Aggregate Industries > Melbur Asphalt, Cornwall > 07738 134680



The average asphalt rotary drier is 10 metres long and 2.25 metres in diameter. They incorporate approximately 120 lifters, each one being a potential snagging point.

As most entries in to the drier happen at the feed end, confined space rescue equipment is set up by way of a CSR pulley system and safety line.

Once personnel are in the drier it is neither practical nor safe to stay connected to the safety line whilst working.

Staff at Melbur Asphalt Plant devised a system to retrieve a casualty in an emergency. A 6mm wire rope complete with eyelets and shackles is secured to the front and rear bulkheads of the drier framework. This is mounted in the drier and tension is achieved by a 250kg handy hoist pull lift. A second, similar handy hoist is then attached to the tighrope by the suspension hook, in readiness for any emergency.

In the event of an emergency the suspended pull lift is attached to the casualty's harness, who is then lifted off the drier floor and slid along the tighrope to the rescue point for retrieval.

> Anti-slip walkway around trucks

Tarmac > Sunderland Concrete Depot, Tyne and Wear > 07843 069854



The increased risk of a person slipping due to standing water around the mixer truck loading area was identified as a potential problem at concrete plants.

Although channels are in place to drain water from the area, ice can form in winter months as water takes time to drain away.

At a district SHE meeting, "Rocbinda", a non-slip material which was being used on walkways, was discussed.

During August 2008, the product was trialled in the mixer truck loading area and it went on to withstand a particularly harsh winter.



There were no complaints or reported incidents of slips and "Rocbinda" has now been laid around the mixer truck loading area at other concrete plants.

> Automatic door opener for mobile plant

Aggregate Industry > Croft Quarry, Leicestershire > 01455 288605



The design of the site's Volvo 180D loading shovel was deemed inadequate, as the operators were unable to maintain three points of contact when opening or closing the cab door from the access ladder. Compounded by having to lean back whilst swinging the door open, the operator was vulnerable to slips and falls.

An automatic door opening system has been fitted which enables operatives to open the door safely, from the ground.

A small remote-controlled 12-volt door opener was fitted to the vehicle using a roof-rack type structure. The existing door lock was replaced by a magnetic lock and to avoid unauthorised entry a key-operated emergency stop system now activates the machine.

Should the remote control fail, an emergency exit push button cuts the power to the magnetic lock - enabling the door to be opened.

This initiative makes it possible for operatives to maintain three points of contact whilst entering and exiting mobile plant.

> Mixer access platform and emergency procedure

Hanson > Cardiff Premix Plant, South Wales > 07773 313161



An access platform is being developed as part of the practical emergency procedure for the on-site recovery of a casualty from inside a truckmixer drum.

The development involved trials of various PPE, harnesses and rescue systems.

A definitive PPE and harness list was drawn up whilst a practical rescue system, which requires only two persons, has been added to the emergency procedure.

From these trials it has been identified that the current platform requires certain modifications.



It is intended to modify the trial platform and film the full emergency procedure. This will be shown as a part of training towards the EPIC haulier training courses and local inductions.

> Trip prevention railing and hose point

Tarmac > Oldbury Concrete Plant, West Midlands > 01902 382321



A step in the concrete yard - where drivers filled their water tank - had the potential to cause a trip, which could result in injury.

The area fitter and depot supervisor decided that railing along the edge of the step would prevent this. However, fitting the railing created another trip hazard, as the hose trailed across the walkway.

To rectify this, the hand rail was modified so that the top rail was used as a water pipe, with two connection points. At the same time a timer was fitted which prevented excess water from escaping the truck overfill pipes, removing a potential slip hazard in freezing weather.

> Cone crusher safety platform

Tarmac > Bittering Quarry, Norfolk > 01362 687602



Due to the highly abrasive nature of the high silica stone at Bittering Quarry, the cone crusher mantles need to be changed every ten working days.

In order to make this process safer the works fitter has developed a hinged platform which folds into position and locks in place, therefore avoiding having to lift the platform.

The platform lends itself to the mantle lifting device, developed at site, to overcome safety issues involved with welding fixings onto dissimilar metals, a process that had been known to fracture when being lifted.

Both items have enhanced site safety and also reduced the risks associated with safe lifting and access at height.



> Access improvements to rotary dryer

Aggregate Industries > Peterborough Asphalt Plant, Cambridgeshire > 07740 934550



At Peterborough Asphalt Plant the only means of access to the rotary dryer was through the burner opening, making access for maintenance and inspections difficult.

Following the fabrication of a second access point via a hatch at the input end of the dryer and the installation of a catwalk, access and egress have been significantly improved. Lifting of parts and tools has been made much easier with improved ventilation of the dryer whilst work is being carried out.

> Cleaning asphalt burners in a confined space

Aggregate Industries > Stoneycombe Quarry, Devon > 01803 874428

The Parker asphalt plant at Stoneycombe Quarry is nearly 40 years old. It consists of a fixed Sturdy burner inside a 5 metre x 2 metre dryer drum.

The plant burns both reclaimed fuel oils and gas oil and, as a result, there is a regular build up of slag inside the burner cowling. If the slag is not removed regularly, it will gradually deflect the burner flame and cause irreparable damage to the burner chamber.

The only means of cleaning was to gain entry through the dryer drum. In this confined space the operator was working in poor light and was at a high risk of injury from slipping or tripping.

After discussion with the plant operator and the maintenance team, it was suggested that if the burner chamber could be moved away from the dryer drum, cleaning of the burner chamber could be carried out from outside the dryer, avoiding the need to work in a confined space.

A frame was constructed below the burner to support it in its normal operational position and to allow the whole burner assembly and controls to be slid back.

The new arrangement allows the assembly to be pulled in and out of position using a single pull-lift and creates one metre of clearance from the dryer. This operation is carried out at ground level, allowing it to be completed single handedly and in just a few minutes.



Burner in operation



Burner withdrawn for maintenance

> Lorry access system

Lafarge > Mountsorrel Quarry, Leicestershire > 01162 303881

At Mountsorrel Quarry, operatives increasingly needed to get to the back of empty LGV vehicles to apply sealing grit or to dig out bitumen residues and cold asphalt.

Site staff decided to modify a 'Sealink' container to enable safe access, whilst keeping costs low.

The counterbalanced stairway makes access easy, and two lorries can use the system at the same time, thereby reducing the likelihood of hauliers becoming impatient and accessing the vehicle elsewhere in a rush.

Tools can be safely carried into the rear of the truck body, maintaining three points of contact and a camera is placed on the platform so that any incidents are monitored.

The new platform has created a safe system of work and made accessing lorry bodies very easy.



> Safe maintenance of screen decks

Sibelco UK > Preston Manor Works, Devon > 07738 311701



Following a site safety inspection of the recently installed sand plant at Preston Manor, a number of near hits were reported by the plant operators.

They detailed hazards associated with the maintenance of the two screens, which involved working at height and the possibility of slips, trips and falls.

The near hits were logged on the company's 'workbench' system and the Quarry Manager was assigned the responsibility for addressing the issues.

A simple set of steps, handrails and additional guarding was designed. A local engineering company made the modifications.

> Pedestrian routes

Aggregate Industries > Bardon Hill Quarry, Leicestershire > 01530 510066

Consultants specialising in highway schemes were employed to improve pedestrian and vehicle access on-site.

A plan of works was implemented, including:

- Asphalt and curbed paved footpaths.
- Clear signage.
- Segregation by barriers.
- Fall protection from overhead conveyors.
- Provision of salt/grit containers.
- Highway standard street lights.
- Light-controlled pedestrian crossings.

The existing walkways were extended so that safe access was provided to each workstation on-site.

A plan of routes was established and posted at various locations around the site and pedestrian routes are now inspected on a daily basis.

These changes have significantly improved pedestrian access around site.

> Working platform

Hanson UK (Civil and Marine) > Port Talbot Docks, South Wales > 01639 885205

Maintenance employees at Civil and Marine's Port Talbot works have designed a small working platform to allow safe working at height on various parts of the plant.

The platform was initially designed to overcome a problem encountered by operatives trying to access a section of rollers on a conveyor. After a shift meeting, staff came up with the idea of fabricating a working platform to make the job quicker and safer.

The platform was designed in such a way that it could easily be moved around the site to access other problem areas. It has proved to be very useful and has dramatically reduced the risk of falls from height.

➤ Mobile plant access platform

Tarmac > **Caysbriggs Quarry, Grampian** > **07753 813188**

A review of access and egress was undertaken, due to a recent incident at the Cloddach Quarry involving an operator exiting a loading shovel.

It was suggested that a platform should be built to enable operators to pull alongside to access and egress their machines safely.

This platform ensures three points of contact are maintained when accessing or egressing the machinery and will reduce the number of slips, trips and falls - which is one of the principal causes of injury within the industry.



➤ Safe burner adjustment at asphalt plant

Hanson UK > **Coldstones Quarry, Harrogate** > **01423 711356**

The burner on a continuous mix asphalt plant can only be successfully adjusted while the plant is running, as the various flame strengths need to be observed during the adjustment. This means that it is possible for the actuator to move when someone is working on the oil/air mixture control levers.

All burners can be locked off, but this tends to cut off the whole burner system - which also puts out the flame. Discussions were held with burner maintenance contractors and the manufacturers, but no 'off-the-shelf' solution was to hand. A way needed to be found to safely adjust the flame without putting the maintenance engineer in contact with parts that could move.



An additional lock-off was installed on the power supply to both the up and down drive circuits supplying power to the actuator. When locked off, it is impossible for the actuator to move. Yet the flame will stay alight in a fixed position.

Adjustments to the air/oil mixture can be made on the levers in the locked position. On completion of the first adjustment, the lock is removed and the flame is moved up to a higher burn, then locked off again to adjust it in that position.

The burner ignition and propane circuits were put through the same lock-off to eliminate the possibility of automatic re-ignition if the flame goes out during adjustment.

The lock-off has been placed within reach of the actuator, so it is easily accessible while adjustments are being made.

The changes have not only reduced the risk to operators, but have also led to more efficient working and less downtime.

➤ Fibreglass non-slip conveyor walkways

Ennstone Thistle > **Capo Quarry, Grampian** > **01764 840415**

Following an inspection, it was decided that the processing plant walkways should be replaced. A meeting was called to discuss the available options

A like-for-like wood replacement was ruled out as it became very slippery when wet and was perishable. Metal was also considered, but the agreed option was to use fibreglass. This has a long life span, is cost-effective and, with the addition of slip protection, it reduces the risk of slips, trips and falls.

A programme of fitting this material to other quarries and ancillary walkways has begun.

> Hand-operated mechanical sampling

Aggregate Industries > Blackwater Quarry, Isle of Wight > 01983 524822



The hand-operated grab can be used to sample asphalt from a loaded lorry without the need for the operator to climb into the back of the vehicle.

The grab is adapted from one used primarily for gully cleaning and is cheap to purchase and modify.

The versatility of the grab allows the operator to sample all sizes of asphalt from 3mm up to 32mm and also adjust the increment amount to suit the needs of the individual operator.

> Lighting our way

Tarmac > Colchester Concrete, Essex > 01206 332348

At Colchester Concrete, during the hours of darkness, the path separating the car park and the plant has very low visibility - a problem made worse by overhanging trees which create a potential slip hazard at certain times of the year.

Solutions such as permanent floodlights and diesel-powered portable lights were discussed, but solar powered lighting was agreed as a low cost option that could be easily installed and would not require cabling.

The lights, which are on a motion sensor so that the battery does not run down overnight, have improved the area's security.



> Removable handrail on rotary conveyor

Tarmac > Colchester Concrete, Essex > 01206 332348

The rotary conveyor on-site is pivoted in the middle and swivels so that a number of bins can be filled at one time.

There is an access platform with handrails and kickboards around the entire deck. The rotary conveyor has to move beneath the handrail; therefore there is no mid-rail where the conveyor traverses.

Spillage can build up beneath the conveyor, which requires regular cleaning. Grease ports at the base of the conveyor need to be serviced once a week. In addition, sporadic maintenance must be carried out on the conveyor.

To access under the rotary conveyor, an operative must kneel down below the height of the upper rail. From this position there is a risk that an operative could fall into the bins.

The subject was raised at two safety meetings and the management team discussed possible solutions.

The conclusion was to have a removable safety barrier that fits over the upper handrail and over the kickboard and is bolted into position to secure it.

This solution has eliminated the working at height risk.



> Safer truckmixer refurbishment

Myers Group > Vehicle Maintenance Workshops, West Yorkshire > 01484 535311

For the past 30 years, Readymix Huddersfield has refurbished its truckmixers when they need a drum replacement. This refurbishment generally involves shot-blasting and a complete re-spray.

Both require the operator to wear unwieldy PPE which, combined with the trip hazards from the necessary airlines and pipes, makes working at height particularly challenging.

The new Work at Height Regulations prompted a review, which showed clearly that a change in working practices was needed.

On-site crane facilities are now employed to lift the mixer unit, providing easier access to the chassis and dramatically reducing the working at height risks. A suitable electric motor is provided to revolve the drum, aiding the refurbishment processes.

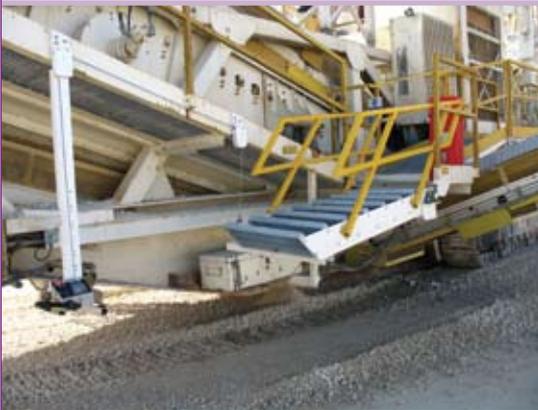
This system is also now employed when new truckmixer units are being assembled by the company's in-house team.

The safety improvements have been welcomed and are seen as a positive contribution to improving workplace safety.



> Mobile primary crusher access steps

Tarmac > Holme Hall Quarry, South Yorkshire > 01709 814491



Access steps to the Gipo 170 mobile primary crusher would often be damaged or even sheared off during plant moves due to the machine's low ground clearance. This could leave a one metre gap between the bottom step and the ground, posing a slip, trip and fall hazard.

To avoid a recurrence, staff at Holme Hall Quarry fabricated a set of stairs that can be wound up and down to avoid damage when the crusher is being moved.

> Control room barrier and walkway

Lafarge > Dry Rigg Quarry, North Yorkshire > 01729 860411

The control room at Dry Rigg Quarry is very close to a road used by dumpers and other road haulage, which would often splash mud and dirt on to the windows.

Cleaning the windows was dangerous due to the moving traffic and it was suggested that a barrier be erected.

Fitters connected a hand rail system to several concrete pipe sections, with hi-vis markings.

The barrier keeps the operator safe when cleaning the windows and also stops plant driving too close to the building, helping to stop the windows getting dirty in the first place.

> LGV tipper body access

Lafarge > Elstow Railhead and Coating Plant, Bedfordshire > 07803 953563

The cleanliness of tipper truck bodies and the correct application of release agent, prior to a truck loading with asphalt, is essential if an operation is to remain compliant with quality systems and procedures.

Historically drivers have used the truck's dedicated access point (usually over the truck body bulk head) to gain the necessary access to truck bodies.

As fall protection is only achieved through the driver maintaining three points of contact, carrying shovels or brushes is difficult. This can deter the driver from checking the truck body in the first place.

The solution was to install a fixed platform that effectively deals with three basic requirements:

1. Safe inspection.
2. Safe and easy truck body access.
3. A means of safely and accurately distributing the release agent.

From the platform, a driver can clearly see into the truck body and check for any contamination. If required, they can lower the counter-balanced access steps and gain safe entry into the truck body.



> CCTV control of haulage contractor traffic

Aggregate Industries > Holmescales Quarry, Cumbria > 01539 736195



Due to the difficult access, layout of the weighbridge and small compact stock yard area, Holmescales Quarry needed to improve the safety for LGVs when arriving to load at busy periods.

CCTV was installed at the entrance ramp, in the yard and the weighbridge areas. This allowed the weighbridge operator to monitor and record the arrival times of vehicles and to prevent congestion by use of traffic lights.

A retractable lighting tower was positioned at the top of the entrance ramp to allow the installation of low level lighting and CCTV cameras. An audible blasting/emergency siren was also installed. These measures were designed to ensure that planning restrictions were not breached.

Light vehicles and visitors arriving on-site are also monitored to ensure that pedestrians follow the correct safe route into the office/weighbridge.

Both the cameras and the manual control of the traffic lights are safer for quarry personnel and hauliers.

> Pedestrian segregation at Milton Quarry

Brett Group > Milton Quarry, Kent > 07710 589973



The quarry supervisor at Milton had reviewed segregation of pedestrians from vehicles on a number of occasions and implemented various schemes, all of which had one common failing - that repairs were costly.

The problem was again analysed in 2007 to see if there were any new solutions.

The highest risk area was the walkway from the weighbridge and offices to the maintenance shop. Metal pads were bolted to this stretch of road and fluorescent markers were fitted to the pads to form a pedestrian walkway. The markers are both moveable and easily replaced as they 'pop off' if struck. This has provided a clearly marked walkway requiring minimal maintenance.

> Barrier for safe cement delivery

Lafarge > Region-wide, Scotland > 08706 092401

Lightweight utility barriers have been introduced across Lafarge's Scottish region in order to prevent access to the overfill pipe during cement deliveries.

The barrier runs from the tanker to the silo fill inlet pipe and is inspected by the plant supervisor prior to permitting the feed of cement to the silo.

The barrier gives a clear indication that the fill pipe is on the ground, minimising a trip hazard. It also reinforces that nobody should try to cross the pipe during the filling process.

The measures also reduce the possibility of people being injured if the coupling at either end was to fail and cause a blow-out.



> Drill rig access

Aggregate Industries > Croft Quarry, Leicestershire > 01455 288605



Access on to the top of the drill rig is often needed when carrying out various maintenance tasks.

Previously this was via two small steps and there were no handrails at the front of the machine to prevent falls from height.

To overcome this, a set of handrails was installed. They have a hinged section which, when shut, completely encloses the top of the rig.

A set of hinged ladders was also fitted, which can be folded away when not in use and turned through 90° when access to the engine bay was needed.

The system has greatly reduced the chance of an accident whilst working at height on the rig.

> Non-slip handrails

Aggregate Industries > Croft Quarry, Leicestershire > 01455 288605



Numerous solutions were investigated to try to make handrails safer in damp conditions.

Eventually an adhesive coating, which comes in 50mm and 100mm rolls, was cut to size and applied to the railings.

The improvement in grip was striking and operatives requested non-slip handrails in other instances too.

Since applying the non-slip coatings to the handrails, there have been no instances of slipping whilst accessing and egressing mobile plant.

> Filler tanker top access improvement

Aggregate Industries > Back Lane Asphalt, Lancashire > 01524 738829

To ensure continuous operation, the Back Lane Asphalt Plant discharges around five loads of filler from the silo into bulk tankers every week.

Previously, this involved two higher risk operations:

1. Accessing the silo discharge outlet pipe via a five metre vertical hooped ladder.
2. Accessing the tanker top using the tanker ladders and walkway, without any fall arrest protection.

During an annual health and safety site audit it was decided to devise a new safe system of work.

The solution was completed in two parts:

1. The hooped ladder access was removed and replaced by a stepped access.
2. An access platform was fabricated adjoining the filler silo. This gives an extra access area, which includes a purpose-built enclosure with sides that drop down to the tanker top to prevent falls from height. The opening is wide enough to allow the tanker lid to be hinged safely in its open position, prior to loading. A loading card is also given to all drivers as they enter the site, instructing them of the correct procedures.



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Safer by Design

In a recent Mineral Products Association survey, "Purchasing and Design" factors proved to be the second most important Root Cause of injury. This work confirmed the conclusions of the German Institute of Mining, at the Clausthal University of Technology, where 1,125 accidents were analysed.

Systemic Shortcomings

Whilst supporting national, European and international Standards, it is apparent that the majority of new mobile plant placed legally on today's market, CE-marked and therefore in compliance with the EU Machinery Directive, is not considered to reach the levels of safety required currently by many purchasing companies, without the addition of a significant list of User-specified "extras".

In recognising the fact that Standards will always lag best practice, organisations such as the MPA - and in Australia, the 'Earth Moving Equipment Safety Round Table', EMESRT - have concluded that there is a need to accelerate the development and adoption of best practice in machine designs to minimise the risk to Health and Safety through a process of end user engagement with the Original Equipment Manufacturers (OEM) and suppliers. MPA, EMESRT and others have a moral and professional duty to collate and disseminate best practice for the benefit of all stakeholders, not least to protect the lives and limbs of those individuals whose daily job is to operate or maintain mobile plant.

MPA's Hard Target has an overarching expectation of Zero Injuries - this will not be achieved without the widespread adoption of best practices in the design of safer mobile plant. Although commendable progress has been made by the manufacturers in recent years, there remains much to be done. Lowest common denominator solutions are not helpful.

A Voluntary Code of Best Practice for Mobile Plant

With financial support from the Aggregates Levy Sustainability Fund, a *voluntary* Code of Best Practice has been developed that defines the minimum recommended range of safety features for new and re-engineered mobile plant. 'Safer by Design' involves working constructively with aggregate producing companies; the British Aggregates Association; Coalpro; and, vitally, around a dozen manufacturers and suppliers of mobile plant. Whilst concentrating on the mineral products industry, there are closely analogous implications for construction and civil engineering.

Focusing on loading shovels; excavators; bulldozers; dumptrucks; and mobile crushers & screens, the Code is divided into 5 categories:

- Access systems
- Visibility
- Security
- Maintenance
- Environment, Welfare and Health

For each category, a range of criteria forms the nub of the resulting document identifying, for each machine group & size, whether an individual criterion is "Best Practice"; "Optional"; or "Not applicable".

Proactive Mitigation of Risk

The 'Safer by Design' spreadsheets now form the basis of a special new section on the Industry's acclaimed health and safety website, www.safequarry.com. This presents a user-friendly, interactive approach to guiding Manufacturers, Suppliers, Users, Regulators - and, importantly, the workforce - as to best practice. The Code was launched in the UK at the MPA Health & Safety Awards, in London, on 6 October 2009.

Examples of 'Safer by Design' best practice recommendations.



Retractable access stairs and engine cover 'boxing ring' edge guarding

The illustration shows a retrofitted solution. 'Safer by Design' aims to encourage these types of solution to be incorporated into the original design of the machine.

www.safequarry.com



Safer by Design - Dumptrucks rigid

Access Systems

Access Systems	CPD	CPD	CPD	CPD	CPD
Steps (all workplaces)					
If new stair has steps, access by an mobile system (i.e. with an angle of inclination from the horizontal no greater than 60 degrees)					
First step to be 1000					
First step to be no more than 200mm off the ground					
All steel steps likely to be damaged. The hardware (handrail and) must be retractable out of frame way					
Powered retractable steps external alarm to give prior warning of activation					
All stairs to be of constant height and all intermediate inclinations between landings					
Primary access system and side door to be 11.7 tall platform height is 200					
Primary access system and side door to be 11					
Light activation shall be from ground level and call with manual switch off					
Light activation shall be from ground level and call with auto switch off					
Light activation shall be remotely from a key fob or sensor					
Continuous alarm shall be issued from ground level manually					

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