SHARING GOOD PRACTICE
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Sharing good practice

HEALTH & SAFETY ACROSS THE QUARRY PRODUCTS INDUSTRY

Incorporating QPA's Health & Safety Best Practice Awards for 2005

and selected best practice from the previous 8 years

'05 Extending the Culture

Training Professional Development CPD material

M·I·S·T Mineral Industry Sustainable Technology

A publication funded from the Aggregates Levy Sustainability Fund

Foreword

Mike Pert
Chairman
QPA Health & Safety Committee

The historic safety record of the quarrying industry has been very poor, but in more recent times, and particularly over the last five years, we have witnessed a sea change in attitudes to safety as a result of a determined and highly visible campaign by the Health and Safety Executive (HSE) and the leaders of the industry. This has resulted in a 52 per cent reduction in reportable incidents, an achievement in which we can all take some satisfaction but with no cause for complacency.

Our ultimate aim must be to have no accidents. As a step on that journey, the quarrying industry has signed up with the HSE to a further 50 per cent reduction in incidents over the next five years.

What will it take to achieve this essential goal? A further change in culture, ridding the industry of any remnants of its macho, risk-taking approach; providing a better working environment; taking a professional approach to all we do; and the refusal to accept risk as an inevitable consequence of occupational hazard.

I hope that this guide (and the soon to be available sister website www.safequarry.com), provide a distillation of some of the best practices in the industry and thus will help us towards that goal. I commend it to all of you from site staff to Managing Director.

Let us create an industry in which we would be happy and proud for our children to work.

March 2006

Introduction

This guide is one element of a package of resources that encourages the sharing of health and safety knowledge across the quarrying and quarry products industry. It contains many ideas and innovations to come from the Quarry Products Association's annual *Health & Safety Best Practice Awards* scheme over the past eight years.

The other key resource – a website at www.safequarry.com – will be available from summer 2006. It is a sister site to the University of Leeds' www.goodquarry.com and will contain a fuller selection of entries from the *Health & Safety Best Practice Awards* and will be updated with new entries to the scheme in the coming years. It will also feature a database of incident alerts, toolbox talks and the latest on the industry's hot topics.

The resources are ideal for training purposes and for Continuing Professional Development (CPD). We hope that companies of all sizes will find them useful and accessible.

How to use this guide

This guide is a compilation of solutions that 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 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 they 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. At the beginning of each section, you will find a summary of the information contained, as well as some facts, figures and quotes from key figures in the industry. Each section contains entries from the 2005 QPA *Health & Safety Best Practice Awards,* as well as those from previous years of the scheme, which were selected by a group of representatives from aggregate companies of varying sizes. The chosen entries were deemed still to be relevant examples of strong health and safety practice. Many have now been widely adopted across the industry.

We have indicated which entries were prize winners, and which have video clips available. These are accessible on the DVD which you will find in the inside back cover of this document, or via the safequarry website. To help you locate entries relating to a certain subject, we have provided a *keyword* index. You can also search for entries by *product* type, such as concrete or asphalt. We welcome your feedback – either via the cards at the back of this document, or the safequarry website. Your involvement is crucial in making this initiative work and helping the industry to achieve its ultimate target of zero incidents.

Contents

TRANSPORT

This section has been divided into three sub-sections: On-highway, Site design and Mobile plant.

Key issues covered include: vehicle maintenance; safer loading and unloading; safer deliveries; driver and pedestrian safety; signage; weighbridges; access platforms; and measures to prevent unauthorised use of mobile plant.

Across all industries in Great Britain, about 2,500 people are seriously injured every year as a result of accidents involving vehicles in and around workplaces. Nearly half the falls from tipper lorries occur during sheeting and unsheeting.

On-highway

Access platform into lorry body

Hanson Aggregates > Northampton Coated Plant, Northamptonshire > 01604 402174

A mobile platform that delivers personnel safely into the back of lorries has been developed at this Northampton coated plant. The platform, complete with handrails, is wheeled into position. The casters are then locked by means of a floor brake, the driver climbs the ladder, lowers the platform using a cantilever mechanism and can then spray the floor and sides of the vehicle body with anti-sticking agent.

ON VIDEO

Accessing tanker tops – fall arrest system

Tarmac Central > Ballidon Quarry, Derbyshire > 01355 390301

In the past, operators at this quarry in Ashbourne accessed the tops of tankers to load powdered limestone via a horizontal walkway with a collapsible hand rail on one side. This meant leaning across to release the fill hatches. The Health and Safety Executive recognized the activity as potentially hazardous and requested that all tankers had hand rails on both sides by March 2006.

Ballidon Quarry has developed the idea and designed a fall arrest system. It comprises three parts: a fixed running rail above the tanker access point; a free-wheeling bogey secured within the web of the running rail and fitted with a retractable inertia reel; and a harness to be worn by the operative.

For occasions when clearance is insufficient between the tanker top and the loading point, purpose-designed "de-hatching" points have been constructed. These comprise a steel gantry frame with a running rail within the confines of the frame.

Improvements to sheeting bay platform

CEMEX UK Materials > Raynes Quarry, North Wales > 01492 517378

The following improvements have been to the sheeting bay platform at Raynes Quarry, reducing the chances of accidents for drivers using the facility:

- the platform was fully enclosed by guardrails of a minimum 1100mm height on all sides to reduce the risk of the driver falling between the platform and the side of the vehicle
- the platform was widened to provide increased working room
- the space between the guardrails and the platform was enclosed with a heavy mesh material to prevent drivers climbing upon the guardrail or going underneath the rail
- any changes in level on the platform were navigated by ramp rather than steps to reduce the risk of tripping whilst pulling on the sheeting rope
- leverage aids have been installed on the platform in order to reduce the effort required to pull on the sheeting rope. As a consequence, the sheets are pulled up and over (as opposed to through) the load, reducing the manual handling effort and the potential hazard of a rope snapping under tension
- all light timers have been checked to ensure the area is lit during hours of darkness.

Platform-based lorry body wash-out facility

Hanson Aggregates › Mountcastle Quarry, Fife › 01337 810473

The Kingdom of Fife is host to Hanson Aggregates' Mountcastle Quarry, near Cupar. In common with many quarries, Mountcastle utilises a significant proportion of "back-load" bulk haulage. Such vehicles may have been carrying coal, ash, vegetables, grain, etc, so ensuring the cleanliness of the interior of the body is vital to avoid contamination of the subsequent load.

Hanson's system, developed by the Quarry Foreman, removes the need for the driver to enter the lorry body to sweep/hose out. Instead, operations are carried out from the safety of a raised and rail-guarded platform fitted with a water "monitor" which can be directed into the partially raised body. The wash-outs drain into a settlement pit, connected to an interceptor and ultimately to the silt lagoon. The whole operation takes a matter of minutes and benefits safety, environment and product quality assurance.

Cyclists – reducing the risk of a collision with lorries

CEMEX UK Materials › 0207 3844900

CEMEX, as a major operator of lorries, was concerned about the vulnerability of cyclists on London's busy streets, particularly when cyclists were at the nearside of the vehicle as it turned left.

In response, the company has made a number of improvements to its lorries, including:

- new "fish eye" mirrors which improve visibility
- signs on the rear nearside to warn cyclists not to pass down the side of the vehicle
- proximity sensors on the nearside. These are operational when the left indicator is activated, giving a verbal warning to any cyclists on the nearside and an audible alarm for the driver.

In addition, CEMEX has increased cyclist awareness by sponsoring a section of the RoSPA cyclist handbook and also driver awareness through a video, poster campaigns, and revised induction and training courses.

Improved all-round vision for vans

Hanson Aggregates › Tytherington Quarry, Gloucestershire › 01454 416161

Site management at Hanson Aggregates' Tytherington Quarry have tackled the problem of all-round vision for drivers of vans with no rear side windows. By the simple expedient of a convex mirror mounted on the inside of the passenger-side sun visor, the nearside blind spot is overcome.

Tipper driver not in cab, then 'No Load'!

Caledonian Quarry Products › Daviot Quarry, Inverness › 01463 772210

With the participation of the regular hauliers, the loading shovel operator has been instructed not to load vehicles if the driver is not in the cab. Vigilance is required, along with reporting systems to ensure any breaches are addressed.

Tipping exclusion zone

Bardon Concrete › High Road Works, Lancashire › 01524 738858

The overturning of tippers during discharge is a recognised hazard for the quarrying and quarry products industry. In order to raise awareness of the problem and attempt to reduce the likelihood of an incident, Bardon Concrete's Carnforth site has declared an exclusion zone around vehicles that are unloading. The area is clearly demarcated and signs warn others to keep clear.

Loading haulage vehicles – guidance documents

Aggregate Industries UK › Rochdale, Lancashire › 01706 853296

Conscious of incidents involving lorry overturns whilst discharging their loads, Aggregate Industries decided to take action.

Investigations by the company's health and safety advisors identified a number of factors which contribute to vehicles toppling over, from the consistency of the material being loaded, to overloading and partial tipping off.

In addition to an existing hauliers' rules document, Aggregate Industries has developed a comprehensive set of procedures to be implemented at all sites in northern England. It includes guidance for managers, haulage drivers and contractors; rules to control the loading operations of potentially problematic materials; and tipping area guidance.

Driver competence and vehicle improvements

Day Group › 020 8380 9600

Day Aggregates devotes great effort to ensuring the competence of its drivers, as well as to maintaining its fleet of vehicles and improving their safety features. Bonus schemes are in place for drivers to reward careful paperwork management and vehicle monitoring. The company also provides a detailed induction process, regular training and quarterly health and safety meetings.

Significant investment has been made in safety features for new trucks, such as automatic engine cut-off if a vehicle is left idling for a certain period; close proximity mirrors; rear-view cameras and alarms; and near-side warning lights for passing cyclists.

Every vehicle is covered by a comprehensive five-year "repair and maintenance" contract taken out with the vehicle supplier at time of purchase, which includes an overnight preventative maintenance inspection every six weeks.

Road rollers – collision avoidance system

Tarmac Group › Ettingshall, Wolverhampton › 01902 382855

AWARD WINNER

ON VIDEO

Tarmac set out to find a technical solution when an experienced operative, working in the group's Dubai contracting operation, was killed after stepping into the path of a reversing 17-tonne roller. A meeting was arranged with the roller manufacturers and the suppliers of collision avoidance systems and a challenge set to come up with a system that protected an area as wide as the roller and five metres fore and aft.

The solution lay with the Vehicle Collision Avoidance System (VCAS) which uses ultrasonic sensors mounted on the front and rear of the roller. If a person or object comes within five metres, an audible warning is given to the driver. At three metres, the roller is brought automatically to a halt.

The £4,500 system has now been retro-fitted to the entire Tarmac fleet of 150 rollers in the UK and United Arab Emirates. It is also available commercially.

Improvements to road haulage safety

Tarmac Northwest › Area 3 Concrete, Cheshire › 01260 223477

Tarmac has a number of rules in place to promote road haulage safety. Area 3 Concrete has taken various measures to ensure that this corporate commitment is fulfilled, including:

- internal training by a full-time SHE officer on improving knowledge of safe working practices and procedures for delivery
- truck mixer operator competence scheme / driver passport
- external courses for LGV drivers
- aids to safer reversing for truckmixers, such as cameras, warning alarms and beacons
- controls by plant supervisors to avoid overloading vehicles, including recipes within computer systems
- anti-fall arrest barrier on redesigned working platforms for truckmixer units and contract hauliers.

Truck mixer drum stabilisers

Tarmac Northern › 0191 492 4000

ON VIDEO

Tarmac Northern North Area (Concrete & Mortar) has devised a simple and ergonomically efficient system to eliminate the entrapment risk during truck mixer drum maintenance.
At such times, removal of residue concrete causes the balance of the drum to change, giving the drum the potential to turn. Traditionally, to immobilise the drum, wooden chocks are wedged underneath either side. However, the chocks are cumbersome and awkward to handle. Availability is not always ideal!

Tarmac's system comprises of two flat steel bars, which are fitted and bolted in position either side of the bell end of the drum. The bolts are attached to the drum and vehicle chassis.

Access platform for drum mixers

CEMEX › Carlisle Concrete Plant, Carlisle › 01768 860816

CEMEX's area operations manager was concerned about the procedure of entering drum mixers for cleaning and maintenance. He designed a platform prototype at the Carlisle plant in Cumbria, identifying the need for such items as:

- a water supply linked to a water meter
- a 110-volt power point for power tools and a 12-volt supply for lighting
- airline feed
- signage and light to indicate man in mixer
- ideally location of the bay in view of batch cabin
- all hoses and cables on retractable reels
- two way radios aiding communication with the driver in the drum
- pipe lagging material for covering sharp edges
- access at two levels.

The prototype was reviewed by truck operators, transport representatives and regional staff, and minor alterations made. CEMEX is considering accepting the design as the best practice across its UK operations.

Safer volumetric concrete delivery

CEMEX UK Materials › Glasgow › 0191 378 7711

CEMEX conducted a series of trials with a volumetric vehicle in order to determine potential operational benefits. As part of this process, operational and maintenance personnel began to identify potential hazards and to look at where these could be reduced or eliminated.

Hazards were identified relating to working at height, dangerous moving parts, manual handling, access/egress, and pedestrian and cyclist safety. Improvements included developing a full emergency stop system, which stops the control circuit, the "donkey engine" and the vehicle engine; the addition of further guarding from moving chain drives and conveyors; and fitting a magnetic stop switch to the hinged ladder to prevent access to aggregate hoppers with either the truck or donkey engine running.

Truck mixer entry hatch

Tarmac Northern, Lanarkshire › 01698 575503

A new truck mixer entry hatch is preventing the need for drivers to enter drums through the loading point away from the depot and the sight of the depot supervisor.

The largest obstacle was the number of bolts which had to be undone before the removal of the inspection hatch door. In conjunction with its drum manufacturer, came up with the solution of a hatch with only one bolt. The original version was built in 2003 and fitted to an 8 cubic metre drum. This also included an easy access, fold down platform, which eliminated any requirement to use steps or ladders. The drum manufacturers also launched a lightweight version for 3 cubic metre trucks in March 2005.

Chute handle for truck mixers

Tarmac Southern > Westbury Concrete, Wiltshire > 07739 772826

ON VIDEO

During one of the regular SHE committee meetings at this Westbury concrete plant, an idea was developed for a device that eliminates the need for a truck mixer driver to stand at the rear of the truck as it unloads. The site Fitter and Batcher designed a folding handle that could easily be retro-fitted to the chutes of all truck mixers irrespective of the type.

The handle removes the driver from the crush area completely but also enables him to move the chute to fully load a back-acter bucket or the skip of a site dumper. It takes seconds to extend and folds away neatly on the side of the chute, or can be removed easily entirely. The simple design completely removes the risk of crush injury and is cost-effective. The handle can be home made or fabricated, at a cost of around £50 per unit.

Accessing drum mixers

Tarmac Southern > Westbury Concrete, Wiltshire > 01934 623862

ON VIDEO

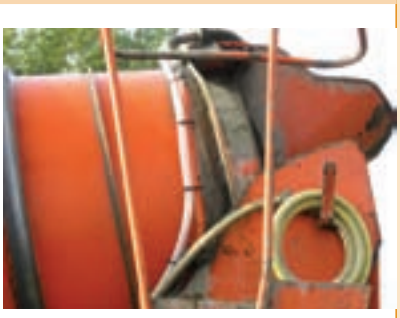
When introducing a new safety procedure, it is vital for it to be realistic and to go for what is achievable. Tarmac recognised this when developing a drum entry procedure for its truck mixers. Drivers were required to remove inspection hatches prior to entry to avoid climbing above the handrails.

However, the SHE committee at Westbury Concrete was concerned that drivers would be reluctant to do so due to the frequency – and time-consuming nature – of the task.

The area fitter, therefore, designed an access platform with input from drivers and management, complete with a trap door entry system, wide access steps, power points and water. The design also incorporated an acid cleaning platform that raises the drivers above ground level to prevent hydrochloric acid running down the handles of the brushes used to clean the outside of drums and discharge chutes. So successful is the design that it has been rolled out to a number of other sites.

Truck mixers – pump system for additives

CEMEX > Carlisle Concrete Plant, Cumbria > 01768 860816



Operators and owner-drivers of this Cumbria plant were concerned about the need, mainly on customers' sites, to add products to concrete / mortar after mixing. Drums filled with up to 25kg of liquid chemical had to be carried up a set of ladders before being tipped into the drum mixer.

The solution was a simple and effective pumping system, which can be adapted to fit all makes and models. It can also be fitted without welding or drilling to any chassis or original steelwork by careful design of the carry case brackets.

Two 25-litre containers, held in place by a ratchet strap and hooks, were incorporated into the design – one for the add mix and one for water to flush the entire pump and pipe work. The galvanised bund tub is made to hold any spillage or – in the case of a ruptured vessel, all the contents – to prevent highway contamination. In addition, a 12mm threaded bung is fitted to the galvanised tub for drainage purposes if needed.

Site design

Isolation and emergency stop location signs

Ronez > Les Vardes Quarry, Guernsey > 01481 256426

Staff at Les Vardes Quarry recognised a need to efficiently communicate to visitors the locations of the various isolator switches and emergency stop buttons situated around the plant.

Photographs were taken of them and then superimposed onto layout plans of the quarry. The photos were also scanned onto plastic sheets to create weatherproof copies, which were framed and mounted in prime locations. Copies of the signs were also printed and are now provided to all visitors as part of the quarry induction process.

Pedestrian safety

Hanson Aggregates > Chipping Sodbury Quarry, Bristol > 01454 314400

The busy dry stone and asphalt load-out areas have long benefited from carefully controlled traffic movements with a well-signed routing system.

On-site safety has been improved further in recent years by dedicated pedestrian footpaths, along with high visibility yellow posts and signs at road crossing points.

A site layout map showing the new routes has been posted at the visitors' car parking bays.

On-site driver safety

Tarmac Northern > Nosterfield Quarry, North Yorkshire > 01677 470209

A revised system for travelling around Nosterfield Quarry requires drivers to remain in their cabs as much as possible, other than whilst using safe areas for sheeting and unsheeting loads. For example, at the weighbridge, there are two-way intercoms and a Lamson Pod air system, which delivers a ticket to the driver's window.

Other improvements to road haulage safety include issuing each driver with the Tarmac haulier code of practice, a site guide and monthly vehicle checks. These ensure that hauliers are keeping their vehicles in good working order and that all safety equipment works correctly.

A card warning system is in place for drivers who fail to comply with safety requirements. After a yellow warning, a re-offender will receive a red card and will be banned from all plants for at least two weeks.

Pedestrian management

Bardon Aggregates › Heights Quarry, County Durham › 01388 517 381

Heights Quarry, near Bishop Auckland in County Durham, is operated by Bardon Aggregates. Amongst the various safety features are good examples of two types of pedestrian segregation.

Chain-linked vertical angle-irons where width is limited, and oversize blocks where it is not.

Protected pedestrian routing

Bardon Aggregates › Croft Quarry, Leicestershire › 01629 650275

At Croft Quarry, routes for both vehicles and pedestrians have come under scrutiny. The outcome has been a new walkway from the parking area to the railhead, complete with handrails, signs and an overhead cover under the conveyor to protect pedestrians from falling objects.

Everyday activities have also been made safer for the drivers of dump trucks with the grading and resurfacing of two parts of the haul routes.

Cement delivery controls and procedures

Aggregate Industries › Marybank Quarry, Isle of Lewis › 01851 703227

Delivering to the remote Hebridean Isle of Lewis proves time-consuming and expensive. Major improvements in all these areas have been made since five specialist vessels with a cumulative storage capacity of 1,000 tonnes have been installed on site. This means that cement can be delivered in bulk by boat, and taken the short remainder of the journey by road.

The new system has raised several safety concerns – all of which have been comprehensively dealt with. Road tankers deliver cement into the top of the new vessels – at a height of 12 metres and close to the quarry face. For the safety of personnel, a protective barrier has been installed next to the quarry face and road barrier sections enclose the work area around the delivery pipes.

Delivery pipes are marked to identify their silo number and contents, and a repeater panel has been installed. Delivery and emergency procedures are clearly posted. A walkway with a lockable gate provides access to the top of the pressure vessels, avoiding the need for a ladder.

Design criteria for all haul roads

Foster Yeoman > Glensanda Quarry, Argyll > 01631 730441

AWARD WINNER

Foster Yeoman has implemented a package of improvements that has transformed its record of workplace transport at this famous quarry near Oban. In particular, comprehensive design criteria have been developed for haul roads, that include:

- creation of bunding
- use of mobile floodlights and snow poles with reflective panels
- installation of colour-coded reflective lights to indicate the edges of the roads and junctions
- purchase of a grader to spread aggregate onto snow and remove loose material on corners
- investment in drainage and culverts alongside roads
- creation of roundabouts on major junctions.

Amongst the other major projects on site are improvements to the visibility and maintenance checks on Land Rovers and competency tests for all Land Rover drivers.

Traffic management system

Tarmac Central > Bestwood, Nottinghamshire > 01777 703891

Bestwood, to the north of Nottingham, was a pilot for Tarmac Central in a drive to improve traffic management and pedestrian safety. A review highlighted a general problem with a poorly positioned single weighbridge, which made a one-way traffic system impracticable.

The answer lay in relocation of the weighbridge onto a newly-surfaced road, together with installation of a second weighbridge – one handles incoming traffic and the other outgoing. Both are controlled from one office, are at a height that avoids drivers leaving their cabs, and afford the weighbridge clerk a good view of proceedings. The quarry road has been asphalted and a special area provided for sheeting with platform and roller device to facilitate the process. A defined visitors' car park and segregated pedestrian walkways with lighting and crossing points complete the new layout.

Entry awareness by photo-electric beam

Tarmac Northern > Concrete & Mortar, Yorkshire > 01423 796800

One-man depot operators are often unaware that a truck mixer (or visitor) has entered the depot if, at the time, the operator is in a loading shovel, filling storage bins, out of sight, and without the benefit of being able to hear the arrival.

Tarmac Northern's Concrete & Mortar, Yorkshire, have therefore set up a photoelectric beam on one gate post and a reflector on the other. When the beam is interrupted, a time switch is activated which operates a flashing beacon for a preset period. The beacon is placed within vision of the storage bins area, thus alerting the depot operator.

Vehicle movements: improvement programme

Midland Quarry Products > Edwin Richards Quarry, West Midlands > 0121 561 4400

At Edwin Richards Quarry, a comprehensive package of improvements has been made to vehicle and pedestrian movements, including:

- introduction of a company safe working transport guidance booklet for all hauliers, including guidance for safe reversing
- enforcement of agreed traffic routes out of the quarry and away from the majority of the local residential areas
- introduction of a cab 'seat belt worn' light.

Vehicle maintenance and traffic control system

Bardon Aggregates > Warmwell Quarry, Dorset > 01929 522496

At Warmwell Quarry in Dorchester, a comprehensive programme of vehicle maintenance and traffic management is in place, including:

- risk assessments – created using the computer system, 'Envoy'. The records are accessible by all other employees and a date for review is flagged up
- sheeting rack – avoids the need for hauliers to enter the body of the trucks to skim the load or to climb on the body to sheet
- traffic marking – at the start of the access road to direct visitors to either the landfill, concrete plant or the quarry.

Traffic light controls to safeguard pedestrians

Tarmac Northern > Cruicks Quarry, Fife > 01383 413241

The weighbridge at Cruicks Quarry in Inverkeithing can only be accessed by crossing the busy main road coming into the quarry. A risk assessment highlighted the potential hazard and a pedestrian walkway with traffic lights was installed.

This same system was installed in three further parts of the quarry, including an internal haul road, which crosses the main incoming road. Although the latter generally has right of way, the mobile plant operators can change the light from red to green using a hand-held remote control unit.

Traffic management upgrades

Tarmac Northern › Coxhoe Quarry, County Durham › 0191 3770611

Coxhoe Quarry has taken strides in three key areas over recent years:

External quarry traffic – a new entrance road is now well established. The previous road has been upgraded to a bridleway, interlinking with a local village network of bridleways.

Internal quarry traffic – to reduce vehicle movements: all stock shovels now operate with digital bucket weighers, which have been linked in with a numerical stockpile system, the main stock grounds have been reduced in size and a haulier safety policy has been introduced, through which the traffic route programme has been trialled.

In addition, quarry vehicles are fitted with safety systems, such as Vehicle Motion Sensors (VMS) and, in order to ensure that seat belts are in operation, indicator lights have been fitted to windscreens. The main haul road access has been reduced from a five-bench system to four, to allow for new haul road ramps. Consultation with staff was vital, as was the use of 3d modelling to forecast effect of the planned changes.

Parking facilities – parking areas are now centralised and sectionalised into key areas, all of which operate a 'reverse-in' policy.

Safe deployment of lab sampling platform

Aggregate Industries › Peterborough Coated, Peterborough › 01733 563081

Aggregate Industries' Peterborough Coated plant has a "drawbridge" type lateral extension to an access gantry, to permit access for testing and sample taking. It was recognised that the tipper driver might possibly pull away unaware that the drawbridge was down and that the laboratory technician was testing the load. As a consequence, an automatic system has been installed whereby deployment of the drawbridge causes a barrier to be lowered in front of the tipper, a traffic light to show red and an audible alarm to sound.

Car park design improvements

Johnsons Wellfield Quarries › Crosland Hill, West Yorkshire › 01484 652311

Johnsons Wellfield Quarries has introduced a series of improvements to on-site car parking, with the aim of improving safety for company personnel, visitors and contractors.

The car park has been redesigned to encourage drivers into reverse parking via a one-way system. Additional signage has been erected, along with security lighting and CCTV management equipment.

The second phase of the project will see final landscaping and grassing of surrounding areas, complemented by selective tree and shrub planting. A vintage derrick crane and sand-producing pan roller mill will also be sited to provide visitor attraction and seating areas.

Design features for managing traffic

Tarmac Northern > Douglasmuir Quarry, Glasgow > 0141 953 4217

Working a quartz conglomerate deposit, Douglasmuir Quarry is close to Milngavie, on the northern approaches to Glasgow. Here, as elsewhere, Tarmac Northern has employed the following design features into its revised traffic management system:

- 'No Entry' signs to keep traffic away from unauthorised areas
- one way system; 'give way' signs
- goal posts
- small vehicles bay (segregated load area, away from HGVs)
- site/route maps for new drivers (plus safety notes)
- extra site lighting.

Safety lines at road work sites

Foster Yeoman Contracting > Northfleet, Kent > 01474 333186

To reduce the number of injuries resulting from incorrect deployment of safety lines at road work sites, Foster Yeoman has developed a new policy for their use.

In the absence of a national standard on the use of safety lines, the company sourced a 25mm wide highly visible nylon tape, which is wound round the top of the cone and then back wound from the other direction to lock off the tape. This prevents the entire length of tape unravelling should it become broken.

Vehicle segregation automated

Bardon Concrete > Preston Plant, Preston > 01524 736933

An innovative barrier system has been developed at Bardon Concrete's plant in Grimsargh to keep pedestrians safe around the loading shovel. The production team came up with the idea of a barrier remotely operated by a transmitted signal from the loading shovel ignition system. When the loading shovel ignition is switched on, the barrier automatically goes down, and when it is switched off, the barrier raises.

ON VIDEO

Mobile rail buffer

Brett Aggregates > Brett House, Kent > 01795 594027

ON VIDEO

Brett Aggregates has devised a new way of stopping slow moving wagons – without using a large concrete block put in place with the loading shovel prior to shunting.

The solution was to construct a steel frame that sits on the track, anchors to the sleepers, and has end stops of the same diameter as the wagon wheels.

Mobile plant

Inclined stairways for mobile plant

Martin Isles > Director, Health & Safety > Quarry Products Association

'Slips, trips and falls' during access to or egress from mobile plant, remain, regrettably, all too frequent a category of accident in the quarrying and associated outdoor industries. Data from one of the large international quarrying companies, collected over a 10 year period, has demonstrated that this category accounts for one in every eight lost-time incidents.

Manufacturers of mobile plant have a duty of care to design their equipment to minimise these risks. This responsibility is all the more important as the plant is used routinely in all weathers and in all ground conditions, thus access/egress surfaces are commonly wet, muddy, or frozen. This consideration applies not only to operatives and trainers requiring access to the cab and to clean the external glass areas, mirrors and camera lenses, but also all those who require access to the engine compartments, batteries, dipsticks, fluid filler points, etc.

To borrow the 'BAT' phrase commonly used in environmental legislation, 'best available techniques' comprise an evolving set of expectations reflecting minimum standards to be achieved by industry. Those equipment manufacturers who are sufficiently flexible to rise to the challenge of meeting their customers' evolving needs, ie. BAT for health and safety, will benefit the most. Illustrated are some generic examples of user-friendly access systems currently available in Australia. Although most of the items of plant are large, the technology is eminently transferable to medium and small items of mobile plant typical of the majority of UK quarries, depots, railheads, wharves, etc.

Continued overleaf

Inclined stairways for mobile plant (cont'd)

The message is clear – QPA member companies have a growing expectation that access to mobile plant of all types needs to be radically improved. Specifiers and purchasers of mobile plant can now press for improved access to be provided as standard in the knowledge that the technology exists and is proven. Inclined stairway access systems can now be considered to comprise 'best available techniques'.

In summary, the industry is looking to the manufacturers/suppliers of all new and re-engineered/re-built mobile plant to:

- supply inclined access stairways instead of vertical ladders
- provide handrails the full length of the access stairs
- provide hand-railed platforms adjacent to the cab
- ensure all steps are of equal rise, including the bottom step.

Footnotes:

Readers should note that this article is not intended to imply any form of endorsement either of Hedweld Engineering Pty Ltd or its products featured above. Systems illustrated on this page were demonstrated to the HSE-chaired Quarries National Joint Advisory Committee in October 2004.

The D11 images also show that all-round visibility can be affected adversely. Access designers should avoid this limitation where possible, or include compensatory visibility aids, as required.

Upgraded steps for mobile plant

Lafarge Aggregates › Whitwell Quarry, Nottinghamshire › 01909 726200

All the treads and handrails have been upgraded at this quarry in Worksop in a bid to improve access to mobile plant. The slippery treads have been replaced with open style anti-slip treads. The difference between the old and new step areas can be seen in the before and after pictures.

BEFORE

AFTER

Loading chute for heavy mortar bags

CEMEX UK Materials › Haydock Plant, Merseyside › 0780 121 6825

The CEMEX Mortar Plant at Haydock has devised a simple modification to existing equipment to improve the method of loading one tonne bags from the central mixer unit.

The company was concerned that its forklift operators had to position the bags below the discharge bowl of the mixer, which was five metres above the yard. There was a risk that, if the product was discharged too quickly from the mixer, the momentum of the product hitting the bag could over-balance the fork lift truck.

The company decided to utilise an existing pneumatic system used to bring a wash-out chute under the plant. A frame was fabricated, on which was mounted a seamless rubber sock supplied by the Conspare Company. This new chute arrangement also had the added benefit of enabling a more accurate loading of the mortar into tubs that had been brought in by customers on the back of their vehicles.

Quick-fit release for loading shovels

CEMEX UK Materials › 0121 552 6699

Loading shovels should no longer be used with a lifting bracket if the bucket remains attached, due to visibility problems etc. Therefore, CEMEX has installed a quick release attachment, replacing the bucket with a telescopic arm, used as a lifting attachment. It can be adapted for loading shovels, provided they have parallel action loading arms.

Remote door operation from dumper cab

Aggregate Industries › Stoneycombe Quarry, Devon › 01803 872193

Aggregate Industries' Stoneycombe Quarry, not far from Newton Abbot in Devon, is credited with reducing operator fatigue and risk of cab access & egress slips, trips and falls on the "bins-to-stockpile" cycle. The repetitive requirement was for the dumper driver to have to dismount to access the air-operated chute doors, re-mount to load the dumper, then dismount again to close the door. The solution being an infra-red remote control system with which to operate the loadout controls from the comfort of the dumper cab.

Measures to prevent unauthorised use

Tarmac Northern, North Yorkshire > 01423 796800

Tarmac Northern has introduced a series of new working practices to prevent both the unauthorised use of mobile plant and to limit idle time.

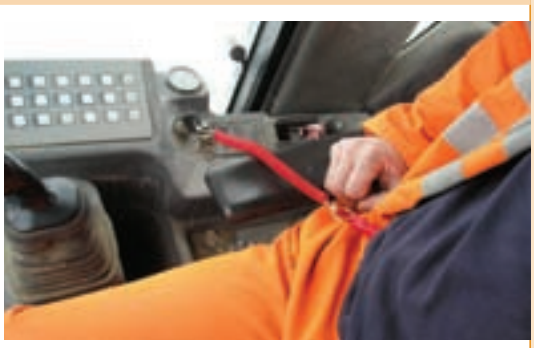
To prevent unauthorised start up of mobile plant, keypads have been fitted to the electronic computer installed in the mobile plant. To start up the mobile plant at the beginning of the day or after the engine has been cut out, the ignition key has to be turned and also a unique PIN code typed into the keypad. If an incorrect PIN code is entered three times, an audible alarm will sound alerting others to the failed attempts.

To prevent mobile plant being left running whilst unattended, and limit idle time, a movement sensor within the cab of the mobile plant detects occupancy. If the machine operative leaves the vehicle unattended for a given time period whilst the engine is running, the sensor will automatically shut down the engine. Another advantage of this method is the significant cost savings regarding fuel and engine wear due to idle time on the engine when left running.

A secondary measure to ensure that the vehicle is not left running when unattended is attached to the handbrake. If the handbrake is applied for a given time period, the same electronic computer – this time linking the sensor on the handbrake with the stop solenoid on the engine – will shut down the engine.

Removal of keys from mobile plant

Aggregate Industries > High Roads Works, Lancashire > 07803 968112



Following a fatal incident where an unqualified individual attempted to move a heavy vehicle, the team at this works decided to implement a simple control system to prevent operators leaving their keys in mobile plant.

The company purchased a batch of plastic covered key chains which were then attached to the belt or loop of the operators' trousers, and fed through the pocket opening of the overalls. At the end of the shift, the key chains are removed and stored in the key safe.

Tarmac North West addressed this issue in a similar way. In addition, the company installed a secure key box which was wall-mounted in the depot supervisor's office.

On-board brake test meters

Tarmac Western > Cornelly Quarry, South Wales > 01656 746568

Cornelly Quarry, part of Tarmac Western, now specifies on-board brake testing equipment as standard for new rubber-tyred plant. All mobile plant operatives have been trained in the brake testing regime. EPIC (or equivalent) qualifications are required of mobile plant operators, be they employees or contractors. The site enjoys the record of no mobile plant related accidents in the last ten years.

Safer inflation of tyres

Hanson Aggregates › Whatley Quarry, Somerset › 01373 452515

ON VIDEO

A blow-out while inflating a tyre in the workshop at this Frome quarry led to prompt and decisive action by the safety representative and site management.

Following a review by the safety committee, a new tyre inflation bay was designed and built with a risk assessment and new safe system of work. The bay has a red flashing beacon which starts automatically when air is in the line, and is outlined by a red / white chain with a simple gate system, that removes the vehicle from any of the site's traffic routes and prevents any vehicles from parking in or around the area.

Battery jump leads

Hanson Aggregates › Horton Quarry, North Yorkshire › 01729 860301

This quarry at Horton-in-Ribblesdale has developed a system for mobile plant which engineers out the complicated and potentially hazardous procedure involved in traditional jump-starting vehicles.

The system works by simply connecting leads via two jack plugs (one positive and the other negative) into a receiver box on the vehicle, which are in turn connected to the batteries. The plugs have one male and one female connection at each end of the leads, making it impossible to connect them to the wrong terminal. Once the plugs have been connected, the procedure for starting and disconnecting is the same as with normal jump leads.

Engine bay bulkhead light

Aggregate Industries › Buckton Vale Quarry, Cheshire › 01457 835323

At Aggregate Industries' Buckton Vale Quarry, the absence of suitable lighting for daily inspection checks of oil levels, etc, has been overcome on their rigid dump trucks by the fitting of a small bulkhead light underneath the platform beside the engine cover. This allows both hands to be free, rather than juggling with torches. Power to the light needs to be independent of the ignition, so that the driver may retain the keys until the checks are complete, to prevent accidental starting.

COMPETENCE ASSURANCE

Key issues covered include: competence of employees and contractors; training programmes and inductions; task auditing; overcoming language barriers, driver training; and safety events.

Effective training can help businesses avoid the distress and financial costs of accidents and occupational ill health.

There are an increasing number of workers from EU member states employed directly or as contractors on site. Companies should consider whether they have ensured that their language skills are sufficient to understand health and safety information in English – or whether they need to provide translations.

> *"Competence assurance means a simple system of assuring you, your work colleagues, the contractors you work with and everyone else associated with a quarry knows what to do, how to do it correctly and maximizes benefit for all concerned. No truly professional manager should want to manage any quarry without such a system in place."*
>
> Clive Webb, EPIC

Drivers' training programme

CEMEX UK Materials > 0151 424 5521

AWARD WINNER

CEMEX has developed a new training programme for LGV drivers and hired hauliers throughout the UK that is specific to their concerns and needs.

An NVQ (level 2) training programme has been developed via the Valuable Skills Project, which helps formalise the framework already used by CEMEX and provides a quality-assured methodology for improving competence skills. A pilot scheme was run throughout the Derbyshire region for all company fleet drivers.

Through the new training programmes, CEMEX believes it has enabled drivers to improve vehicle fuel efficiency and, therefore, reduce emissions, such as by driving "in the green band"; block changing the gears (ie moving from a high to a low gear without engaging each gear in between); and ensuring correct tyre pressures. The training also aims to help drivers avoid road traffic incidents through the application of defensive driving techniques and effective pre-start vehicle checks.

Defensive driving training

Tarmac Group > 01902 382855

Defensive driving training has become a key element of Tarmac's road safety policy, which is part of a wider commitment to eliminate lost time injuries at work. The course, which teaches how to recognise dangerous situations and avoid them, is aimed at those who drive high mileages, are inexperienced, have poor driving records or drive crew buses or LGVs (including contracted hauliers).

Folgate Safedrive was appointed as the training provider because it has instructors who hold LGV licences. In the past year, over 1,700 people have taken part in the half-day course.

In addition, Tarmac has produced the document *Roadsense*, which is issued to all employees on joining the company and during the defensive driving course. There are separate SHE guides for drivers of tippers, truck mixers, tankers and block delivery vehicles which advise on the importance of driving in a safe and courteous manner.

Toolbox talks for hauliers

Tarmac Western > 01902 230711

Tarmac Western has developed a two-hour toolbox talk aimed at its contract and regular hired haulage. During 2005, a total of 600 hauliers attended a number of sessions, covering:

- Tarmac's principle of *Zero Tolerance Target Zero*
- *Tarmac Golden Rules* video
- *Tipper Haulier Guide*
- *Transport Safety Health & Environmental Guide* for hauliers
- *Safety Rules for Tarmac Contracting*, including reversing
- near hit reporting
- vehicle specification.

At the end of each session, the EPIC video, *Driving Down Accidents*, is shown. The concrete and mortar business has adapted the toolbox talk for truck mixer drivers.

Mobile plant training and competence

WBB Minerals > East Golds Quarry, Devon > 01626 322326

ON VIDEO

WBB Minerals has established a dedicated mobile plant training team. All members had achieved or were working towards their NVQ A1 assessor qualification. Each has also gained EPIC competency certificates on a number of items of mobile plant.

As part of the EPIC Instructional Techniques course, the instructors had to produce individual training breakdowns. Since then, they have amalgamated the individual breakdowns to create one company training breakdown for each vehicle, as well as one company training plan which covers all vehicles.

As well as introducing new standards for training, initial training now takes place in designated training areas, away from the pressures of production. Until the instructor is confident the trainee has demonstrated an acceptable level of control and knowledge of the vehicle, he will remain in the training area. Once this level has been achieved, training can continue in the production environment under supervision until the trainee reaches the required standard. At all times, the instructor is in contact with the trainee using voice-activated two-way radios.

In Devon, it's been possible to establish a dedicated training area. Using standard traffic cones, basic and advanced steering exercises can be carried out by the trainee to gain confidence in general (and more precise) vehicle manoeuvring. These exercises are laid out to represent actual areas on site. One area is a bay made of four cones 3m wide by 7.5m long – this represents the distance between the steel legs holding up a powder silo.

Translation of hauliers' rules

Hanson Aggregates > 01454 316000

Language barriers are no longer an obstacle in safety training for haulier drivers. Although over 1,200 delivery drivers have now been trained, the concrete business in London employs many Romanian contractors who have little or no English.

The company translated the training presentation and hauliers' rules into Romanian to allow the course to be successfully delivered to 24 drivers. They were all individually assessed and there was a 100 per cent pass rate.

A refresher course is planned and also a similar exercise in the central region for Polish delivery drivers.

Handbook for drivers

Brett Concrete > Divisional office, Kent > 01622 793800

Brett Concrete has produced a handbook for drivers covering safety, environmental quality and business considerations – from ensuring that drivers have correct loads, to authorising maintenance on their trucks; and from personal protective equipment (PPE) requirements to guidance on approaching plants at low speed to minimise noise and disturbance to residents.

The company closed its business units over two days and trained all company and owner-drivers and plant staff on the contents of the booklet.

Video to support induction programme

WBB Minerals > 01270 752752

AWARD WINNER

A 30-minute video that uses a fun concept to communicate a serious safety message has greatly enhanced WBB Minerals' induction process. The video, which is shown to all new and current employees and contractors, involves a computer-generated character which works its way around a board game. Each square on the board has a different health and safety topic, such as emergency procedures and incident reporting. When the character lands on a risk square, video users are asked a number of questions to test their knowledge of the issues.

The video is part of a wider induction programme, prompting discussion and a deeper exploration of site-specific safety issues.

Induction programme for hauliers

Tarmac North West, Cheshire > 07753 772814

When selecting hired hauliers, Tarmac North West ensures that the company can meet the following criteria:

- commitment to health and safety
- previous experience within the industry
- training of employed/self employed drivers
- evidence of training
- location of operating centre
- size and condition of fleet.

Companies employing five or more people are requested to submit a written statement of safety policy for their business.

After this initial vetting process, Tarmac produces an approved list of hired haulier operators. New operators of mixing vehicles undergo an induction programme. Firstly, checks are made on their driving licence; previous experience; vehicles; and personal protective equipment (PPE). Then Tarmac provides information on the company's safety policies; principal hazards on supply depots; the control of hazards on customer sites and environmental issues and controls. On completion of the induction process, driver passport cards are issued, and the names are added to an electronic approved list of drivers.

The induction package is reviewed by the safety health & environmental training officer on an annual basis or whenever significant change takes place.

Induction for contractors

Lafarge Aggregates > 07740 563244

A procedure manual has been developed which introduces contractors to site-based risks, appropriate control measures and the forms that they are required to complete. Personnel at each site are also trained in induction procedures for contractors. Initially developed for the southern region, the improved induction process is now being rolled out across the company.

Safety education programme

Aggregate Industries UK › Health & Safety Department, Derbyshire › 01463 773100

Aggregate Industries UK (AI) engaged the services of DuPont to assist the company in assembling a major re-education programme for all employees in every aspect of the business.

AI then embarked on a major training programme for employees over the next four to five years. This programme involved addressing key issues to change the overall culture of the business, and included presentations, seminars and videos.

The company adopted a procedure from DuPont which encouraged operatives to audit behavioural influences (interactive auditing) and causation. This process looks at unsafe acts, unsafe conditions and safety rule violations. Training was carried out to all levels of management, from board level down to supervisory level.

Safety Awareness Day

South East Quarries & Landfill Group › 01206 330795

For many years, the Health & Safety Executive has worked in partnership with the South East Quarries & Landfill Group to organise an annual safety awareness day. The 2004 event was held at Tarmac's Colchester Quarry in Essex. Almost 100 attendees were given a tour of the quarry and landfill operation, with discussions held at a number of "topic stations", each highlighting key issues such as workplace transport, manual handling and water safety.

Delegates are charged a nominal fee to attend and profits donated to local charities.

Electronic database of contractors

Tarmac Central › Tunstead House, Derbyshire › 01298 768494

A database of information on contractors has been developed for use across the Tarmac Central region. The data is held on a central "SQL Server", which is straightforward to use, cost-effective and allows easy accessibility via an Internet Explorer front end.

Information is provided for both employees and contracting companies. It includes:

- names and contact details
- contractor competencies and external certification
- company authorised activities and sites
- details of in-house inductions and training.

Anyone with a password can access the information and use the search facility to locate an appropriate contractor for a given situation. The data is regularly updated by authorised individuals.

Workshops to discuss safety issues

CEMEX Materials › West Midlands area › 0121 569 7833

All employees and drivers in the area have been invited to the monthly West Midlands Safety Workshop in 2005. Each meeting involves at least 30 people across a range of disciplines, from drivers to fitters.

The principal focus is behaviour and hazard management, and content varies according to the needs and interests of attendees. The sessions include presentations from guest speakers and interactive exercises culminating in the delegates producing a set of safety commitments that they agree to achieve that year. These commitments, together with those from senior management and a group photo, are displayed on a team poster and sent to each attendee.

Competency of contractors

Tarmac Northern › County Durham › 07836 507203

Tarmac Northern has introduced a variety of measures aimed at ensuring that all contractors share the company's health and safety values and commitment.

A thorough selection procedure for new contracting companies includes the gathering of information on employees, their task lists and training certificates, as well as insurance details for the company and PAT testing certificates / records for tools to be used on site.

Depot supervisors and team leaders are all trained on "depot task" – a document that ensures risk assessments and method statements are completed before work begins and that the contractor is competent to carry out the relevant task.

A zero tolerance procedure ensures that contractors found acting in an unsafe manner, or carrying out tasks that they are not authorised to handle, will be asked to leave site and are stopped from working for Tarmac in the future.

Video of isolation and lock off procedures

Hanson Aggregates › Central Area › 01827 874326

A video raising awareness of Hanson Aggregates' isolation and lock off procedure was the brainchild of a company operations manager and site electrician. It began as a training course for site employees, followed by a stand at a few quarry safety days. So successful was the presentation that it was delivered to over 200 employees, managers and contractors at locations all over Central Area for European Week for Safety and Health. To increase the number of people exposed to the information, the session was video taped and a management briefing pack prepared and distributed to company health and safety advisors.

'Get a Grip' campaign

CEMEX UK › 01932 568833

CEMEX has embarked upon a campaign that it believes will reduce the number of slips, trips and falls across the company.

The 'Get a Grip' campaign is the brainchild of a departmental head and aims to remind employees that three-points of bodily contact need to be maintained when carrying out certain activities, such as climbing a ladder. A design illustrating this message can be seen on stickers and posters around sites, such as on vehicles and at the bottom of stairwells.

Programme of improvements

Tarmac Northern > Concrete and Mortar North, County Durham > 0191 4924000

AWARD WINNER

Following a thorough re-assessment of all procedures, Tarmac Northern's Concrete and Mortar North division made a raft of improvements to ensure site assured competency. These include:

- employing only approved contractors
- developing up-to-date site specific and generic risk assessments and safe systems
- re-structuring the department and creating a team leader role: now team leaders, operations coordinators and a transport supervisor report to operations managers
- making planned plant closures for maintenance
- creating a manual used by all staff that demonstrates the procedures for compliance and safety assurance during maintenance work
- expanding training programmes and modules and putting all operational staff back through the induction process.

Cautionary warning notes

Foster Yeoman > 01373 456762

To provide proof to HSE Inspectors that managers had consulted staff and contractors on breaches of health & safety, Foster Yeoman has introduced a Cautionary Warning Note system.

Foster Yeoman is in the process of integrating its warning note system with its in-house training system. One transgression triggers a re-examination of the individual on the relevant training module; the issue of two notes requires the individual to re-attend (and be tested on) the full two-day induction programme. Finally, it was agreed with the workforce more than three notes in a calendar year would trigger a counselling process with that individual's line manager.

Training – confined spaces

Tarmac Group > 01793 698600

When no training course for entry into confined spaces could be found that was tailored to the quarrying industry, Tarmac created its own. A meeting was arranged with Mines Rescue and EPIC where the concept of three courses, aimed at quarry management, their employees and contractors, was established:

- 1-day: managing confined spaces
- 2-day: entry into confined spaces
- toolbox talk for all site operations.

The management of confined spaces course covers the identification of confined spaces, their assessment, categorisation and the safe systems and precautions that need to be adopted, including emergency situations. On completion of the course, each delegate is provided with a briefing pack and PowerPoint presentation to enable them to provide awareness training to other employees.

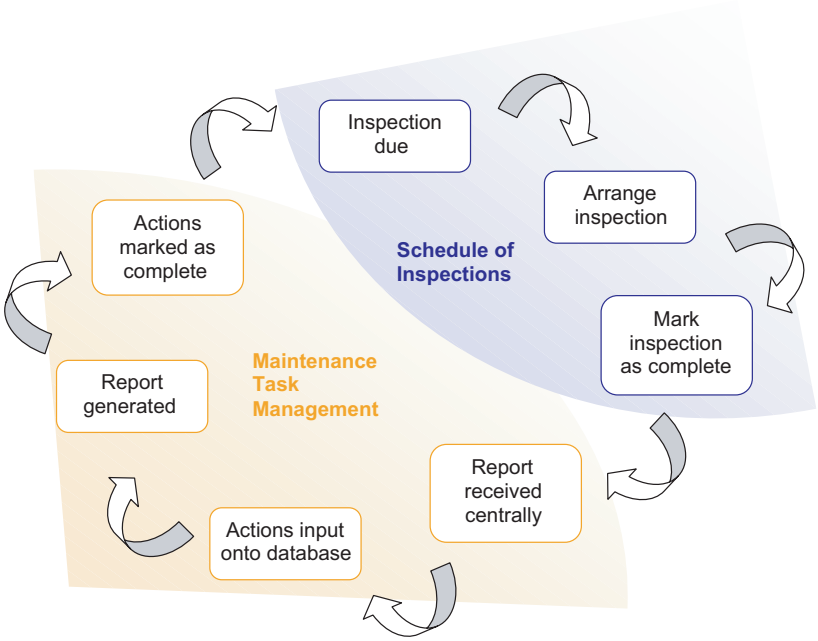
The courses have proved successful with the operatives as, although they embrace legislation, they also make learning interesting and interactive wherever possible. The training has received EPIC accreditation and is now available to the whole industry.

Schedule of inspections and maintenance task management

CEMEX UK Materials > West Midlands > 0121 569 7833

CEMEX UK Materials West Midlands has developed a task management system to improve management control for the completion and close-out of actions generated by audits and statutory inspections.

The system schedules the audits and inspections, and also records actions, their progress and due dates. This not only improves management control, but allows all production employees to record and manage actions. It also allows senior management to monitor progress and identify any serious issues that have been missed.



The system involves an Outlook-based schedule that tracks the inspections and audits. Once the report is submitted, the action information is entered into an Access database, which allows the production of weekly and monthly progress reports. The information is always live and can be reported at any time.

Interactive training package

Tarmac North West, Cheshire > 07753 772814

Tarmac Central has developed an interactive computer-based training package which addresses the typical hazards that personnel working on a concrete or mortar depot may be exposed to. The training package is supplied on CD to run on any PC or laptop and contains a video introduction outlining the principles of the programme.

The candidate identifies hazards by clicking the mouse over the identified area. A score section allows a printable evaluation of the candidate's performance (including hazards identified), and is linked to a final certification upon successful completion of the programme.

Training for slips, trips and falls

CEMEX UK Materials > 01527 575777

CEMEX has developed a bespoke computer-based training package which addresses a serious accident category: the prevention of slips, trips and falls.

Delegates view an interactive presentation at their own pace, and then complete a test on what they have learnt. Assuming that they reach the minimum requirements, the package provides a personalised certificate which can be included in the delegate's Continuing Professional Development (CPD) folder.

Managing contractors during major construction

Bardon Aggregates > Bardon Hill Quarry, Leicestershire > 01530 510066

Careful management of contractors throughout the process of installing an asphalt plant at this quarry has ensured that the project has run smoothly and safely.

A project co-ordinator was appointed to act as a point of contact for contractors and Bardon employees. Before work began, the workforce visited other recently constructed asphalt plants to learn from the experiences of site managers, particularly in respect of health and safety issues.

Contractors, all of whom hold a quarry passport, were given a full site induction and take part in weekly progress meetings where health and safety is a key area for discussion.

Task auditing

Tarmac Central > 01260 223477

AWARD WINNER

In-depth analyses of accidents led Tarmac to deduce that a remarkably high percentage of injuries in the quarrying industry are due to unsafe acts, rather than unsafe conditions. This reality spurred Tarmac into developing a management task auditing system for its Area 3 business, which is incorporated into a safety, health and environment strategy. The key steps are:

- stop and observe work activity
- put operatives at ease by introduction and explanation of the process
- ask about the work that is being done and the stages involved
- ask what is the worst that could happen and how this is prevented
- praise safe behaviour
- question unsafe behaviour
- discuss corrective action required
- gain commitment to act.

WORKING AT HEIGHT

Key issues covered include: safer access for ladders, stairways, silos and sand towers; and management systems and practical measures to prevent slips, trips and falls.

Falls from height are the second most common cause of major injury to employees. (Source: HSE)

Access platform for portable silo

Tarmac > Silomate Croxden, Staffordshire > 01538 724236

Croxden Quarry has improved safe and secure access to its portable silos by introducing a purpose-designed mobile access platform.

The platform is fitted with four braked wheels that allow positioning over the silo access hatch when the silo is placed in a horizontal position. A large platform area above the silo entry point provides a large working area, and a small hinged flap in the "Flow forge" floor gives controlled access into the silo. A rigid and tested lifting beam above the access point facilitates the use of a recovery winch to allow safe access and emergency egress from a designated confined space.

The platform can also be used to inspect the interior of the silo whilst the latter is in the upright position. The platform has been designed so that it is at the correct height to allow opening and inspection through the side hatch on the silo. The unit is wheeled into position against the silo with a curved section on the platform matching the curvature of the cylindrical silo.

When in position, the wheels are locked in place and an opening gate in the platform handrail permits access to the hatch and internal inspection of the silo. However, in this position, the platform is not used for entry. Another advantage of the platform is safe cleaning of the silo. These are frequently returned from site in a heavily contaminated condition. With the platform placed over the horizontal silo, the upper surface can be easily jet washed from the platform, avoiding the use of any other improvised access arrangements.

Improving access to sand towers

Hanson Aggregates > Whiteball Quarry, Somerset > 01823 672421

ON VIDEO

Climbing up a sand tower to change the chute position every day is a difficult and potentially dangerous task. Hanson Aggregates has developed a safe solution at this quarry on the Devon and Somerset border, working with the plant supplier Linatex to automate the process.

Access to the top of the tower is typically by a ladder from the centre of the tower base. During production, access to the ladder is often blocked by wet sand, which can be shifted for occasional maintenance, but presents a hazard for daily access.

The company decided that the best and safest solution would be to automate the process, allowing the operator to change the chute without leaving the plant. Hanson contacted Linatex and developed an automatic chute turner which could be retro-fitted to the sand tower, and driven by a valve actuating motor to move the chute remotely. The cost was around £15,000 for each tower.

See *Linatex chute pulley* below.

Linatex chute pulley

CEMEX UK Materials > Aylesford Quarry, Kent > 01622 791301

Aylesford Quarry in Kent produces 150,000 tonnes of fine sand per annum. The sand is discharged from a 15 metre high Linatex tower, which necessitates changing the discharge chute on daily basis.

To reduce the risks of operatives working at height, the company decided to develop a method of changing the discharge from ground level using a pulley system and a cleat for securing the chute in place.

See *Improving access to sand towers* above.

Handrails around the screen deck platform

Lafarge Aggregates > Little Paxton, Cambridgeshire > 01480 474721

The handrails around the screen deck platform offered no protection when working on top of the screen deck itself when changing the meshes.

The foreman fitter designed several extra sections of platform with removable rails at the ends to allow protection from falling over the end of the deck. Access when working on the drives and shaft assemblies was improved by positioning the extra platforms opposite the shaft housings. Maintenance activity was also improved by creating more room to work.

Drill rig fall arrest

Foster Yeoman > Torr Works, Somerset > 01373 456724

ON VIDEO

The engineering department has developed a drill rig fall arrest device which is fitted to the top of the mast and provides a safe means of access for staff climbing the rig.

An inertia reel block allows free movement up and down the mast, but locks immediately in the event of a slip, thereby preventing a fall. The locating device ensures that the support point is always immediately above the working position, which keeps the wire free from snagging on the mast.

Stairway improvement

Tarmac Southern > Hothfield Works, Kent > 01233 611611

A steep staircase with a narrow tread and short risers led to several incidents of stumbling at Hothfield Works in Ashford. At first, a handrail along the length of the internal side of the stairway was fabricated – but this alone did not solve the problem. After consultation with the company's SHE department, alternating offset fall restriction barriers were extended into the stairway to reduce the risk involved.

Access to belt press

Huntsmans Quarries > Bishops Cleave Quarry, Gloucestershire > 01451 850555

The silt at this sand and gravel plant is dealt with via a belt press. In order to access the main working parts of the press, an operator had to climb a vertical set of ladders many times per day. To improve safety, the company decided to replace these with a wide set of stairs with non-slip treads.

In addition, the plant's belt press requires the addition of two flocculants – one in liquid form and the other in powder. The powder needs to be placed in a hopper at shoulder height. This had previously been done using 25kg bags, but after reviewing this practice with its supplier, the company changed to using 15kg bags at minimal cost difference.

Fixed ladder safety bar

Foster Yeoman > Botley Depot, Hampshire > 01489 784438

The access ladder to the winch deck on the hot storage bins was equipped with a safety chain to prevent operatives inadvertently stepping over the edge. However, this was reliant on staff replacing it once they had passed through, and also forced them to release it while stood at the top to gain access to the walkway again.

To improve safety, a one-way spring-loaded control barrier was installed at the top of the ladder, removing the possibility of staff leaving the ladder unguarded. The barrier also pushes easily out of the way when stepping from the top of the ladder back onto the walkway, removing the need to let go of the ladder in order to move the barrier.

Improving plant access

Huntsmans Quarries > Naunton Quarry, Gloucestershire > 01451 850555

The Huntsmans Quarries plant at Naunton Quarry, Gloucestershire has introduced a progressive programme to replace frequently used vertical ladders with stairs where possible.

Whilst in good condition, the plant is old in design, and many of the existing stairs and walkways were narrow, with steps and running boards made from wood.

To improve safety, the company replaced narrow stairs and walkways with wider units including steel open mesh flooring. This enables easier access and reduces the build up of material, as well as being easier to keep clean.

Sheltered staircase to silo roofs

The Appleby Group > Caledonian Slag Cement, Glasgow > 0141 4405200

The staircase running between the two silos, allowing access to their roofs, is subject to high winds due to the height and riverside location. Cladding the uppermost section of the staircase has provided shelter from the elements at a modest cost.

Systematic approach to working at height

Tarmac Central > Gawsworth, Cheshire > 01260 223477

Tarmac's Area 3 Concrete (at Gawsworth, near Macclesfield) has applied special diligence in their approach to working at height. This included:

- risk assessments by management
- drawing up of safe systems of work
- where a work platform is required, ladders are never used.

Key factors of note include:

- summary assessment of all Topmix personnel who were regularly involved in working at heights – primarily fixed plant maintenance personnel
- tailored training course for maintenance crews. Attendees needed to be in reasonable health, not suffering from vertigo, and have good binocular vision.

The EPIC-approved training course covered:

- competent use and inspection of safety harnesses
- safe use of ladders
- safe erecting, use, moving and dismantling of mobile access/scaffold towers
- safe set-up and operation of mobile elevating working platforms.

Inspections and audits focus particularly on standards of handrails and toe-boards, as well as access equipment. Records and reports are produced monthly.

Preventing unauthorised ladder access

Tarmac Northern > Concrete & Mortar Yorkshire > 01423 796800

For sites still using vertical access ladders, an example of effective prevention of unauthorised access has been demonstrated by Tarmac Northern's Concrete & Mortar Yorkshire.

- where there is no access to the rear of the ladder, a sheet steel door, vertical hinged, is closed across the face of the ladder and padlocked
- where there is access to the rear, a sheet steel housing is attached to the rear of the ladder, in addition to the steel door at the front.

MAINTENANCE & HOUSEKEEPING

Key issues covered include: gates and guarding; housekeeping and site design; safer access; preventing slips, trips and falls; and maintenance of conveyors, crushers, mixers, hoppers, screen decks and spray bars.

Slips and trips are the most common cause of major injuries at work, accounting for a third of all reported major injuries across all industries. 95% of major slips result in broken bones, and can also be the initial causes for a range of other accidents such as falls from height. (Source: HSE)

Jaw crusher maintenance indication system

Ronez › Les Vardes Quarry, Guernsey › 01481 256426

Maintenance staff at Aggregate Industries' Guernsey quarry are required to enter the primary jaw crusher to perform routine wear part replacement and clear blockages. Operatives identified a potential hazard within the jaw flywheel which, if stopped at the centre at the top, could begin moving when the jaw was worked on, due to the release of stored potential energy.

The maintenance team manufactured an arrow indicator from sheet metal and painted it red to aid visibility. The crusher was then shutdown and observed on rundown until it had stopped at the bottom of its stroke. The arrow indicator was then tapped to two of the flywheel cap bolts to indicate the safe position of the jaw.

Cleaning out below primary crusher

Huntsmans Quarries › Naunton Quarry, Gloucestershire › 01451 850555

The area below the impact primary crusher, around the conveyor tail drum, regularly builds up with dust and debris. To clear the space, an operative had to lock off the machinery and enter a restricted area to shovel out the waste in a crouched position.

To improve safety, the company designed a sump hole in the well and inserted a submersible pump, capable of pumping up to 20mm in size. This enables the area to be hosed down on a daily basis without entering the restricted space, and for the material to be pumped to a safe location for removal by a skid-steer loader. Only on rare occasions does an operative need to enter the restricted area when maintaining the tail drum, at which point the few larger pieces of material can be removed.

Tipper body props

Hanson Aggregates › South East region › 01622 679641

Hanson Aggregates identified a trend in the company's South East region of tipper vehicle drivers inspecting or maintaining their trucks with the body raised, but without employing sufficient safeguards against a hydraulic failure. This was discussed at the area safety representatives' meeting and a suggestion was put forward to provide purpose-built body props at all sites.

The props are lightweight and easy to handle to both encourage their use and allow them to be placed in position without undue effort. They are also universal and will fit all body types. Prior to their issue, the driver is talked through the safe working practice and issued with a set of instructions.

Now all quarries and asphalt plants in the region have two body props, held in the weighbridge, for use by delivery drivers as and when required.

Body prop for tipper vehicles

Midland Quarry Products › Edwin Richards Quarry, West Midlands › 0121 561 4400

ON VIDEO

At Edwin Richards Quarry in the West Midlands, Midland Quarry Products recognised that a problem existed at the "lorry wash station", when the underneath of the body and chassis of road vehicles were being cleaned, inspected, or worked upon. There was a lack of a suitable body prop, which could be used for all makes, types and sizes of vehicles.

The remedy entailed a steel beam which can be wound across the underside of a vehicle body by a hand-cranked chain pulley system. The beam is then located onto support steelwork on the other side.

Lifting tool for changing conveyor feed drums

Hanson Aggregates > Mountcastle Quarry, Fife > 01337 810473

Changing conveyor feed drums has always posed manual handling risks at Mouncastle Quarry in Cupar. A lifting tool, fabricated by site personnel using scrap steel, has been the answer. It slides onto the forks on the fork lift truck and lifts the conveyor drum by the drum shaft.

Safer access for maintenance

AWARD WINNER

Lafarge Aggregates > Greenhithe Wharf, Kent > 07740 563336

ON VIDEO

During a ship-to-shore conveyor reconstruction at this wharf, staff identified issues governing the lack of access to both the conveyor rollers and the motor for the Gravity Take-up Unit (GTU), which resulted in difficulties carrying out standard maintenance.

Lafarge Aggregates, in conjunction with its conveyor construction company, decided to lower the GTU to floor level for ease of maintenance, and to construct a travelling platform at the top of the conveyor structure so that all the conveyor rollers could be accessed for cleaning and maintenance. Significantly wider walkways were also a feature of Lafarge's specification.

Fitting of conveyor belting

ON VIDEO

Aggregate Industries UK > Peckfield Quarry, Leeds > 01132 877482

Following an incident involving a hoist chain slipping off the end of a metal tube used to lift a replacement reel of conveyor belting, this quarry designed a secure support arrangement for the conveyor belting roll.

The newly designed equipment consisted of a 1.3m long tubing of 75mm O/D with a wall thickness of 5mm. Fitted to each end of the tubing were locking collars each secured by means of two 12mm bolts. Two lifting eyes were attached to the tubing, made from profiled cut 12mm plate with machined bores to slide on the tubing so that any width of belting could be accommodated.

Plastic caps were fitted over the ends of the tubing to stop dirt entering, causing internal corrosion. The equipment was treated as an item of lifting equipment and was tested to a SWL of 2 tonnes, with an appropriate certificate issued. Seven of these supporting beams were manufactured by Selby Engineering, and distributed to quarries within the area at a cost of only £130 each.

Conveyor blockage access platform

Lafarge Aggregates > Kiplin Hall Quarry, North Yorkshire > 01748 812117

Staff at Kiplin Hall Quarry have addressed the potential safety hazards involved with clearing the clay blockages which occur when the jaw crusher flattens the material which then builds at the base of the conveyor chute.

The team designed and constructed a portable access platform, situated at the base of the conveyor where the blockage arises, and provides a safe, raised level surface from which operatives can work on the blockage. This reduces the need for stretching and overreaching, thus lowering the risk of injury.

Safety gates prevent unauthorised access

Aggregate Industries UK > Haughmond Quarry, Shropshire > 01743 709287

Safety gates have been installed at this Shrewsbury quarry to prevent unauthorised access around the plant. The red gates come complete with signs to remind personnel that PPE should be worn and equipment isolated before entering the area.

Maintenance for dryer drum

Tarmac Northern > Coxhoe Quarry, County Durham > 0191 3770611

Tarmac Northern has developed a system for improving the routine maintenance task of tracking the dryer drum. Manufacturers' recommendations stipulate that the drum must be tracked under load and whilst in operation. This requires personnel to stand within the perimeter/distance guarding whilst the dryer is in operation.

Tarmac Northern designed and installed a remote hydraulic tracking system. The system utilises a pair of hydraulic rams, installed to both feed end trunnion bedplates. The rams are connected to a centralised hydraulic power pack, positioned under the dryer. Operation of the system is achieved by remote control from outside of the guard.

This system could have major benefits to the whole industry as most older (and even some newly designed) plants still incorporate manual adjustment equipment which cannot be accessed unless personnel access the inside of the perimeter/distance guarding surrounding the dryer position.

Safer hanging of hoses

Lafarge Aggregates > Marlow Readymix Plant, Buckinghamshire > 07740 563244

The safety team identified a risk of slips, trips and falls caused by drivers and plant supervisors not re-hanging water hoses used to fill up ready-mix trucks after use.

Firstly, the company introduced bungees on each hose so that, once removed, the hose is gently pulled up into the air and out of harm's way. Whilst this solution worked successfully, the bungee ropes proved not to be very long lasting. In response, the west London cluster also introduced retractable hoses which were more durable and have been introduced throughout the southern region.

Safer fume cupboards

Tarmac Southern > Somerset > 01373 812800

Due to the risks of inhalation and splash / irritation, all processes using methylene chloride are carried out within the confines of a fume cupboard. However, this does not entirely eliminate hazards, as human error can lead to fume cupboard doors being left open.

The team at the Halecombe Quarry laboratory has developed a cheap and simple adaptation for fume cupboards which further reduces hazards – by creating an automatic "shut off" when the doors to the fume cupboard are opened.

The use of isolation switches on the cupboard doors enables the air supply to the pressure filter to be cut, and the pressure in the filter released whenever the cupboard doors are opened – preventing splash and inhalation hazards. Isolator switches are fitted to the fume cupboard door, which allow the air supply unit to function only when the cupboard doors are shut. When the doors are shut, the electric circuit is complete and the valve can be opened, allowing air to pass into the pressure filter. When the doors are open, the valve closes, allowing the air to drain from the filter and release the pressure.

Lids for settlement tanks

CEMEX UK Materials > Borough Green Landfill, Kent > 01622 791301

ON VIDEO

As part of its site operating plan, CEMEX's Borough Green Landfill has to provide a vehicle wheel wash which recycles all water without discharge.

To allow free flow of water and silt, the settlement tanks were placed into the ground, but this presented obvious safety issues. As an alternative to handrails – which could not guard against incidents outside of working hours – CEMEX installed three weld mesh lids on rails which were both transparent for operational reasons and strong enough to support pedestrian traffic. When the tanks need to be emptied, padlocks are removed and the lids are moved back and forth to enable the removal of the material in each compartment.

Pan mixers – high-pressure wash system

Tarmac Northern > Cambusnethan House, Motherwell > 01698 575503

The need to enter the mixers at this Bellshill plant for their daily cleaning has been dramatically reduced with the trial of an automatic wash system. High pressure water from spray heads cleans all areas of the mixer with lids in position. As well as avoiding the dangers associated with entering the mixer, the new process is also far less time-consuming – taking 15 minutes, rather than one hour. Servicing is also required more infrequently and the life of the wear plates has doubled.

Changing bucket toe-plate

Tarmac Southern > Park Farm Quarry, Bury St. Edmunds > 01284 728931

At Park Farm Quarry (Tarmac Southern, Bury St. Edmunds), the manual handling risks involved in changing a toe-plate have been substantially reduced, principally by the purchase of a torque multiplier (10:1 gearing) and the fabrication of a stand to support the toe-plate at waist height.

Skip system for storage bins

Lafarge Aggregates > Little Paxton Asphalt Plant, Cambridgeshire > 01480 474721

ON VIDEO

The skip that runs up an incline track to storage bins at this plant in St Neots caused concern for Lafarge Aggregates. Some asphalt inevitably remained in the bottom of the skip and required manual jack-hammering to remove. Access was difficult and the risk of slipping, or receiving burns was considered too great. An onsite fitter designed the solution – a new skip with a sub-frame that stays in position on the incline track and an inner skip that can be removed easily, using the crane jib attachment on the loading shovel. Development is already in the pipeline – a second inner skip will allow the one with build-up to be replaced with a clean one in a matter of minutes and thus minimise downtime.

Preventing trip hazards in the wet

Foster Yeoman > Glensanda Quarry, Argyll > 01631 730441

Glensanda Quarry is situated on the Morvern Peninsular, where there is no road access. As a result, employees, contractors and visitors all have to travel to site by boat.

The company identified that its jetties contained multiple trip hazards, particularly in the wet. The wooden gangways were covered with wire mesh to assist footing, but were still a concern when boarding and landing.

The company purchased fibreglass decking and gangway installation was carried out in-house. In addition, the original steps were replaced due to their potential hazards and restrictions.

Lever tap for sand pump

Tarmac Southern > Bittering Quarry, Norfolk > 01793 698611

ON VIDEO

After a blockage in a sand pump at this East Dereham Quarry posed a danger to the workforce, a simple solution has been found. Although pumping stopped when the blockage built in the pipeline, the impeller continued to turn, heating the water and producing steam. No outward signs were obvious, but an operative who released the bung to check the pump could be scalded with hot water and steam.

A SHE sub-committee was formed to discuss solutions. It was decided that a nipple should be screwed into the casing and a lever tap fitted to the nipple. Although care is still needed, the risk of scalding is now significantly reduced, as the angle of the tap is such that it can be turned with the operator's hand out the way of the flow of water.

Lone working: emergency system

Lafarge Aggregates > Northampton Railhead > 01604 632896

Unless sales demand increases, only one man is required to operate the Northampton railhead. Following concerns about the welfare of the lone worker should an accident occur, he now wears a device that not only detects whether he has become unconscious, by body angle and movement, but can also be manually activated in a 'panic situation'.

The device then dials pre-determined emergency contact numbers and sets off an audible alarm and flashing beacon on the site.

Self-cleaning hopper grid

CEMEX UK Materials > Pendean Quarry, West Sussex > 01730 813950

ON VIDEO

Following a risk assessment of gaining access to the hopper grid to remove clay and deleterious material, a self-cleaning hopper grid has been designed and manufactured by the workforce, which avoids manual handling and can be adaptable to any type of hopper.

The loading shovel approaches the hopper and puts the bucket blade under the lifting bar. The operator then flicks the bar with the bucket blade causing the grid to pass the point of balance, which causes the finger bars to move forwards, removing clay and deleterious material before the spring mounted stops cause the grid to return to its seating.

Isolation procedures

CEMEX UK Materials > Wenvoe Quarry, Cardiff > 02920 593378

Following a review of isolation procedures and site rules, this quarry has introduced a new training package and a series of practical innovations.

The safety team purchased a new lock-out station consisting of numbered and colour-coded locks for issuing padlocks to contractors and employees when multiple point isolation was required.

All employees were issued with a unique numbered padlock and instructed to retain the key at all times. The team also issued isolation identity tags to determine who has isolated the plant and on what part they are working.

Workshop parts cleaner trolley

Foster Yeoman > Botley Depot, Hampshire > 01489 784438

The parts cleaner at this site was located within a bund to catch any spillage, but this made it difficult to change over the barrels, and meant that all parts and tools had to be carried from the work area when they needed cleaning.

To improve safety, a cut-off drum was fitted with braked castor wheels to make the cleaner mobile. This enabled the cleaner to be moved to where it was required – removing the need to carry oily and greasy parts and tools across the workshop. The parts cleaner could also now be moved to a safer position to change the barrel with mechanical lifting equipment, reducing the amount of manual handling involved in its maintenance.

Cleaning the cement discharge pipe

Lafarge Aggregates > Aldershot Readymix Plant, Hampshire > 07803 953990

The staff at this plant have devised a method to reduce the manual handling risks associated with clearing the excess build up on the cement discharge pipe from the cement weigh hopper. The heavy pipe was originally only accessible at height, and built up cement had to removed with a hammer.

To reduce both weight and handling risk, the metal pipe was removed and replaced with a Linatex pipe. The material properties of the Linatex mean that cement does not now build up so quickly, and that the pipe can be regularly replaced rather than just cleaned.

Safety improvements for inspecting screen decks

Hanson Aggregates > Dagenham Wharf, Essex > 020 8984 1900

New equipment has been designed to access and inspect screen decks at this wharf on the Thames in Essex. The result enables easy and safe access to the screens via a platform and ladder, with the risk of falling into the access chute at the bottom of the screen removed by installing folding covers.

Maintenance workers no longer have to gain access to the screen by clambering over the sides but can use the platform and access ladder. Furthermore, the person working on the screen can have tools and spares passed from the side, or heavier items can be lowered from the platform.

The covers are operated by releasing a simple locking mechanism and are then lowered into position, with very little effort involved. This means the person on the screen does not need to wear fall prevention equipment, making the task far less cumbersome. As a result, the employee maintains comfort and flexibility, which in turn aids the manual handling aspects of tasks where access is required.

Retractable spray bar mechanism

Aggregate Industries UK > Bardon Concrete, Liverpool > 01524 738858

Bardon Concrete in Liverpool has designed a device to improve safety in the maintenance of dust suppression spray bars used to control the dust emissions around the site. The nozzles of the spray bars are situated around the loading point of the plant and need to be above the loading sock – necessitating the use of a ladder or scaffold to remove the nozzles for cleaning.

The company's low-cost solution was to design a device which would retract the spray bar assembly to ground level to enable the cleaning and replacement of the nozzles. This featured a release mechanism to allow the spray bar assembly to be retracted via a winch or chain block, and did not involve any dismantling of the sprays.

Window cleaning on wheel loaders

Aggregate Industries UK > Jamestone Quarry, Lancashire > 01706 831454

Jamestone Quarry has devised a solution to the potential hazards of operators standing on top of the load frame parallel lift arms when cleaning the front windscreen of wheel loaders.

The company purchased a brush fitted to a telescopic handle and a water supply, and then constructed a raised access platform from which operators can wash and clean wheel loader windows, as well as steam clean other equipment.

Preventing cable strikes

Brett Concrete > Kent > 01227 712401

Brett Aggregates' electrical department uses Durite Canterbury Spar Sand – a bi-product manufactured by its sister company Brett Specialized Aggregates – to indicate buried cables.

Due to its distinctive colour, the sand makes itself easily identifiable and helps prevent cable strikes by machine operators and hand digging. Once located, the sand makes it simple to follow the line of the cable, and provides good protection for cables with coverings of 22 cm to 30 cm deep.

Pulley winding handle for elevators

Aggregate Industries › Express Asphalt Stockport, Cheshire › 01601 4069321

A pulley winding handle for turning elevators at Express Asphalt Stockport has eliminated the danger of trapped fingers and muscle strains. These were real dangers of the previous method – turning the gearbox pulley by hand or pulling the drive belts. The design for the tool is simple: a clamp plate fixes the handle to the pulley spokes and is welded to a redundant starter handle for a generator.

Battery charging station

Hanson Aggregates › Allerton Park Quarry, Harrogate › 01423 323311

ON VIDEO

A risk assessment for charging batteries at this Knaresborough quarry identified that a new charging station was needed with the following criteria:

- protection for operatives should there be an ignition of gases
- good ventilation
- battery away from sources of ignition
- clear definition
- positioned away from work areas
- bench at a suitable height to reduce the risk from manual handling
- clear instruction and training for the new facility.

Thus a well-ventilated charging cabinet with twin compartments was installed. The battery to be charged is placed on one side of the cabinet, with the charging equipment and electrical switchgear on the other. An extractor fan mounted in the battery-charging compartment provides ventilation.

A sliding door made from a shatterproof plastic draws across the front of the cabinet and allows only one of the two compartments to be open at any time. The top compartment is a window to view the operation and the lower part contains two hand holes that enable the charger grips to be connected and disconnected from the battery with the operator safely behind a protective screen. The power to the charger is only turned on or off with the door closed.

Handrailing around screen tops

Midland Quarry Products › Cliffe Hill Quarry, Leicestershire › 01530 239 458

The screen tops at Cliffe Hill Quarry are regularly used as work platforms. Although less than two metres above the ground, these slightly sloping surfaces were deemed to present significant risks of tripping and/or falling.

Handrailing components were anchored to the “fixed” sections of the screen support structure to avoid heavy vibration and unbalancing the screen drives.

Temporary guarding

Hanson Aggregates › Builth Wells Quarry, Powys › 01982 553608

At Hanson Aggregates’ Builth Wells Quarry, the problem has been addressed of ensuring the safety of personnel during periods when sections of flooring or permanent guarding have to be removed for maintenance access, etc. The “Builth Barrier” is easily adjustable in length, width, height, and shape (fully hinged). The flexibility of the design also allows folding flat and therefore easy storage.

Grid replacement for trapdoors

Aggregate Industries UK › Croft Quarry, Leicestershire › 01455 288296

The screenhouse trapdoors at Croft provide access to aggregate storage bins some 40 feet below. Built originally in wood, they no longer fitted perfectly due to warping. When opened during clean-up operations they posed the risk for slips and trips with a potential major fall through the metre square trapdoor. The problem has been overcome by installing metal grids which allow stone to be dropped into the bin without having to be lifted.

Sliding beam aids changing wash barrel wheels

CEMEX UK › Postern Park Quarry, Kent › 01732 366855

At Postern Park Quarry (near Tonbridge), a moveable overhead beam has been installed to give mechanised lifting assistance to either side of their wash barrel, to ease replacement of wash barrel wheels. Torque wrenches are used on the wheel studs to prevent over-tightening and strain on the fitter.

Inspecting bucket elevators

Tarmac Central › Ballidon Quarry, Derbyshire › 01335 390301

ON VIDEO

Tarmac Central's Ballidon Quarry is situated near Ashbourne, the southerly gateway to Derbyshire's Peak District.

Re-evaluation of working practices had highlighted a heightened risk whilst inspecting bucket chains, with elevator panels removed. The risk of entrapment was potentially high as the "inching" button could be held/depressed, which would enable the elevator to turn at full speed.

To remove the need for "live working", the appropriate panels of the elevator were replaced by purpose-made mesh guards. Necessary repairs are then carried out under isolation procedures.

Return roller replacement tool

Purfleet Aggregates › Essex › 01708 865410

At the Hanson / CEMEX joint venture wharf on the Thames at Purfleet, employees have designed and manufactured a unique and inexpensive tool that greatly enhances the ease and safety of replacing return rollers on an elevated conveyor.

The simple tool removes the need to climb under or over the frame to lift out the roller, preventing a potential fall-from-height hazard and reducing manual handling risks.

The tool was designed by the site foreman and made by the fitter in the workshop. Costs were minimal, as existing materials were used. Using the tool is safe and simple: once the belt is lifted away from the rollers to provide access, a flexible hook attaches to the near side of the conveyor frame and the other end supports the roller as it is levered out of its mounting. The operator then simply grasps the roller and manoeuvres it to allow him to lift it over the frame with ease. The reverse operation is used to replace the roller.

Locking guard nut

Aggregate Industries › Back Lane Quarry, Lancashire › 01524 733512

At Aggregate Industries' Back Lane Quarry, each guard is now subject to improved security through the use of a sheathed locking nut which requires a specific tool to remove it. With the correct tool, removal is quick and easy. The nut does not necessarily need to be tightened completely, as a retaining nut on the sheath prevents rotation. A protective gromet prevents the ingress of dust. The guard nut tools can be subject to controlled issue, hence allowing management to exercise greater control. The locking guard nuts cost around £1 each and the specialist tool £30-£40. The system is eminently transferable.

Vehicles: wheel-locking nuts

Foster Yeoman › Glensanda Quarry, Oban › 01631 730441

ON VIDEO

Wheel nuts coming off Land Rovers posed a serious safety concern at Glensanda Quarry in north-west Scotland. Due to the nature of the location, some vehicles have to travel over rough terrain and so have been fitted with extra large tyres. The mild pressed steel wheel rims rubbed against the stainless steel nut, causing the latter to work loose very quickly.

After trials with several other solutions, a specially designed wheel-locking nut has been settled upon. Only trained fitters have the key to fit and tighten the nuts. For maximum performance, a rigorous regime of wheel nut inspections and checks is also in place.

Permanent jump-start connectors

Aggregate Industries › Venn Quarry, Devon › 01271 830831

Management at Venn Quarry, (Aggregate Industries, at Barnstaple, Devon) has addressed the risks associated with conventional jump-starting by requiring the installation of permanent jump-start connectors on all mobile plant. These connectors are permanently wired to the vehicle batteries with heavy-duty battery cable, terminating in a socket (easily accessible from the ground) into which the "plug" can only be inserted with the correct polarity. Risks of battery explosion are thereby greatly reduced, as is the risk of severe damage to the vehicles' electrics.

Pole-mounted CCTV camera

CEMEX UK › Wickwar Quarry, Gloucestershire › 01454 294 521

ON VIDEO

At CEMEX's Wickwar Quarry in Gloucestershire, there is now an enhanced ability to carry out preventative maintenance inspections as well as plant problem-solving activities.

A pole-mounted camera system enables visual appraisal of places that are difficult or impossible to inspect by direct human vision. The system comprises a CCTV camera affixed to the end of a lightweight pole, which also carries a halogen light. The camera is connected to a portable colour monitor.

Examples of uses are for inspections of:

WORKER INVOLVEMENT

Key issues covered include: setting up and running safety committees; seminars and presentations; and management training programmes.

An actively engaged workforce is one of the foundations of any company's health and safety strategy. It ensures that all those involved with a work activity are participating in managing the risks.

Workers are most at risk of having accidents or experiencing ill health, and they also know the most about the jobs that they do. Workers are in the best position to help managers develop effective and successful safe systems of work.

> *"Workers who are encouraged to have a voice and are given the ability to influence health and safety are safer and healthier than those who do not. A universally involved and consulted workforce would be a major achievement and contribute to getting health and safety recognised as a 'cornerstone of a civilised society.'"*
> Health and Safety Commission and Executive joint statement

Safety committee – a re-evaluation

CEMEX UK Materials > Dove Holes Quarry, Derbyshire > 01298 77531

AWARD WINNER

A review of the health and safety committee at this Buxton quarry has made it more dynamic and tailored its approach to fit the company's focus on positive safety culture, and on attitudes and behaviours. In the past, much of the committee's time was spent on creating lists of maintenance tasks, but the physical standards of the site were not being fully addressed.

The committee is now involved in development and review of risk assessments and safe systems of work. It has also supported the introduction of behavioural initiatives, such as the self-policing "stop & think questionnaires", and developed "near hit" (near miss) and hazard reporting.

Where necessary, smaller working groups will be set up to investigate individual issues and report back to the committee with proposals for action.

Role of safety committee

Tarmac Central > Holme Hall Quarry, Yorkshire > 01709 814491

This quarry near Rotherham has an established and effective safety committee, chaired by the quarry manager, made up of representatives across departments and regularly attended by senior management.

The committee meets regularly to discuss such issues as incident reports and statistics; site inspections; surveys and risk assessments; and suggestions for safety improvements. The minutes are displayed on quarry notice boards and circulated to senior management and action points noted.

Workforce safety representatives have received training by the trade union safety department as well as from the company, and have completed the IOSH Supervising Safely Certificate as a minimum. Many are also trained in carrying out task audits. Separate sub-committees are formed where necessary and a permanent transport sub-committee exists.

In 2004, the safety committee's duties were extended to helping ensure that the construction of a new processing plant was carried out safely. That involved acting as a main channel of communication for employees and contractors. They also created and implemented a planned preventative maintenance scheme for their new plant, as well as a traffic management scheme; drew up risk assessments, safe systems of work and a training manual for the new equipment; and selected the personal protective equipment (PPE) to be used on site.

Roving committee meetings

Hanson Aggregates > Whatley Quarry, Somerset > 01373 452515

The safety committee at this large quarry, near Frome, has stepped up its role in recent years by increasing the regularity of meetings and the number of attendees, who are elected by the workforce. The committee members are hands-on and hold "roving meetings", where they visit locations around the site to discuss particular issues. They find it easier to discuss how to tackle a problem when it can be visualised in this way.

The committee has been responsible for introducing a new method of labelling and identifying hazards found on safety inspections, and for devising a system for employees to report unsafe acts using a pocket-sized notebook with tear off slips.

Regional safety committee

Hanson Aggregates > North West Premix, North Wales > 01978 356244

Despite representing a wide geographical spread, a safety committee for Hanson Premix operations throughout north Wales and north west England is successfully generating and spreading good ideas, adopting best practice and communicating and explaining national policies.

The committee is driven by the supervisor of the Wrexham concrete plant and represents a wide range of disciplines – from batchers and hauliers to operations managers, salesmen, not forgetting contractors. The geographical spread of members makes the task of convening meetings and following up on action points more challenging than those committees which represent a single site. However, there are definite benefits. The meetings are hosted by individual representatives, allowing members to take a first-hand "fresh pair of eyes" look at sites which they would not otherwise have the opportunity to visit.

One initiative driven by the committee was to review nationwide policy regarding wearing shorts in a concrete plant. Another idea to emerge, which was adopted across the region, was to standardise and colour-code lock-off stations at every concrete plant, which brought major safety benefits for staff and contractors working at more than one site.

Setting up a safety committee

Hanson Aggregates > Tams Loup Quarry, Lanarkshire > 0845 601 4466

AWARD WINNER

Health and safety meetings are not new to the workforce at this quarry in Harthill – they have been running every month for four years. However, more recently the site has put forward two members of staff to be trained as safety representatives, and has set up a dedicated safety committee. In order to involve as wide a range of people as possible, the members – who can be rotated on a yearly basis – include a laboratory worker.

The achievements made by the committee include a programme of improvements to site lighting and housekeeping, as well as the identification of potential hazards in the plant and haul roads. This led to the replacement of some of the ladders with stairs and walkways and the development of pedestrian routes.

Safety representative's initiative

Hanson Aggregates > Vaynor Quarry near Merthyr Tydfil, South Wales > 01685 723355

Known within Hanson as "The Vaynor Initiative", credit goes to Colin Evans, coated stone plant operator at Vaynor Quarry (near Merthyr Tydfil, South Wales) who took it upon himself to organise, with the support of management, a full week of training as a contribution to the European Health & Safety Week.

Colin is also a T&G Union appointed safety representative and the idea emanated from a TUC mailshot. Each day, for a week, a talk was organised by Colin at 3pm in the quarry canteen. Speakers included Hanson safety specialists, the local HSE Inspector, a superintendent physiotherapist from a nearby hospital, and a speaker from the TGWU.

The success of this initiative was taken up by other Hanson units in South Wales. Hanson and Colin Evans have been presented with both a regional and national Award by the HSE for the Vaynor Initiative, and Colin has since been awarded with an MBE.

Target Zero

Tarmac Central > 01298 768494

Tarmac's target of zero lost-time injuries acts as an umbrella for the many initiatives and changes aimed at gaining and improving worker participation.

A Safety Charter has been developed. Each employee and their manager are asked to sign it on a one-to-one basis, after discussion of common guidelines. Directors and senior managers have nearly all attended a 1 day "Directing Safely" IOSH-accredited training course, whilst managers have taken a 4 day IOSH-accredited "Working Safely" course.

These training opportunities were followed up by a Safety Training Review which involved a series of interviews with a large number of employees at all levels, to identify both good and bad practice with regard to safety training. There is also a programme of training for all employee representatives. Safety promotion is considered important to keep the messages fresh. In additional to mugs, pens, etc, (for the sites); posters, screensavers, and mouse mats help to convey the message.

Safety Task Audits have been based on the Du Pont system, which can be summarised thus:

- stop and observe work activity
- discuss activity with operatives
- ask what is the worst that could happen
- praise aspects of safe behaviour
- question unsafe behaviour
- identify corrective action
- gain commitment to act

By ways of results, Tarmac Central (approximately 2,400 employees) recorded 74 lost-time injuries in the year 2000. This reduced to 53 in 2001 and 36 in 2002.

PRODUCTION & PROCESSING

Key issues covered include: bitumen delivery and emergency procedures; conveyors; crushers; concrete production; face activity and inspections; preventing fuel fires; fibre addition and sampling; preventing crush injuries; dust disposal; and maintaining and checking safety bund heights.

Further guidance on face operations and stockpiles will be published by the Quarries National Joint Advisory Committee (QNJAC) later in 2006.

Face activity

A new approach to face inspections

Bardon Aggregates › Ivonbrook Quarry, Derbyshire › 01629 650275

Bardon Aggregates has devised a new system to improve the effectiveness of daily face inspections.

The original inspection was conducted by the face loader operative using a tick sheet. This was handed to the quarry manager who would make any comments and file for record. However, the operative had no specific training, and the simple tick sheet did not capture all relevant information. In addition, it did not provide any guidance to the operator on what action to take in the event of an unsafe face condition. If an incident occurred, it placed an unfair responsibility on the operative.

The company's new inspection sheet incorporates guidance for action and commitment to identify dangerous conditions rather than just using a tick list. The inspection is carried out in accordance with a Safe System of Work. It includes an inspection of the crest in addition to the face, and is now carried out by the quarry supervisor with the face operator. This increases the communication between the operator and the supervisor enabling any safety issues to be highlighted before work commences.

XYZ QUARRY

ROCK EXCAVATIONS INSPECTION REPORT

DAILY
MONTHLY
QUARTERLY

Weather | Date

Features | Yes | No | Yes | No | Yes | No | Yes | No

Crest (all benches)
Face (all benches)
Toes (all benches)
Haul Roads
Other Observations

Note: If any of the boxes are ticked 'YES' the Quarry Manager must be notified.

Name of person carrying out this inspection

Signature | Date

XYZ QUARRY – ROCK EXCAVATIONS DEFECTS SHEET

RECORD OF DEFECTS AND REMEDIAL WORKS

- This record shall be completed for each defect observed and retained for reference.
- The location of the defect shall be marked on a copy of the relevant part of the survey plan
- If no remedial action is deemed necessary or undertaken, enter NONE
- Include references to any investigations, reports or other relevant documents

Nature of defect observed:

Name of person entering this record | Date

Agreed remedial action:

Name of person entering this record | date

Remedial works actually undertaken:

Name of person entering this record | Date

Were the remedial works undertaken and completed satisfactorily?

Name of person entering this record | Date

Drill rig safety barrier

Hanson Aggregates › Chipping Sodbury Quarry, South Gloucestershire › 01454 314400

Hanson's Chipping Sodbury Quarry (near Bristol) utilises a drill rig with a fully enclosed cab. When drilling post holes for face barriers, the driller (if he has to leave the security of his cab) is potentially exposed to the unguarded face edge.

The drilling operator suggested welding a horizontal pole on to the front of the drill rig frame to act as a physical barrier. This protective system is a considered as a suitable alternative to the wearing of a full fall-arrest harness, but only whilst moving between cab and hole top.

Edge protection: bund height markers

Hanson Aggregates > Baston Fen Quarry, Nr Peterborough > 01778 348546

At Baston Fen Quarry in Market Deeping, the problem of maintaining and checking safety bund heights has been overcome with some simple physical markers.

The minimum height markers, made by placing a tube in a 45-gallon drum and backfilling with rejected asphalt, are placed at regular intervals along the bund.

This is particularly important at Baston Fen, where lagoons exist on either side of a haul road. Should the bund level drop too low, the lagoons are in danger of flooding, potentially causing a road accident.

Gritstone filler disposal

CEMEX UK > Gilfach Quarry, West Glamorgan > 01639 643751

Gilfach Quarry's coating plant produces significant amounts of extracted fine filler dust, which is not economically viable for re-use as a saleable product and is, therefore, stockpiled for long periods for future restoration. The need to manage the tip and carry out geo-technical assessments, combined with restrictions on operating space and the problem of wind-borne dust, meant that the only sensible answer was to dispose of the product.

CEMEX has found a solution that is not only environmentally sound, but also has major safety benefits. The dust is used to create bunds at the foot of old quarry faces. This area becomes prohibited and is designed to catch and retain any rock fall. By moving the stockpile to a more sheltered location, wind-entrained dust has also been dramatically reduced.

Processing

Conveyor belt cleaning tool

Hanson Aggregates > Stanton Harcourt Quarry, Oxfordshire > 01865 882210

The processing plant at this Oxfordshire quarry is fed via a conveyor belt line measuring around 1.2 kilometres. A major issue for production staff is to prevent the belt line and head becoming clogged up with as-dug sand and gravel.

Traditionally, this was conducted by hand with a shovel, with the potential for back strains and other injuries. To both save time and reduce the risk of injuries, the plant supervisor designed a cleaning bucket attachment for a telehandler, already present on site, to mechanise the process at a cost of only £300.

Plough removal of snow from conveyer belts

Tarmac Central > Lound Quarry, Nottinghamshire > 01777 818325

Throughout winter, when snow or rainwater falls on field conveyor belts, it collects in the trough of the belt, freezes and turns to ice overnight. The following morning when the conveyors are started, the snow and ice is carried along the belt and is deposited into the drive-head transfer chutes, which frequently become blocked and need to be cleared before work can begin.

Operatives have to be deployed to manually dig out the blocked chutes using shovels and scrapers, exposing them to manual handling risks as well as the risk of slips, trips and falls from working on frozen ground or from climbing onto icy conveyor structures to gain access to the chutes.

At Lound Quarry, Tarmac designed and built a snowplough that could be fitted to the conveyor. The plough is mounted permanently on the conveyor structure, and consists of a box-section steel frame mounted over the belt and a hinged-arm with a plough attachment fitted on the end fixed to the frame. 'Skirting-rubber' is used for the face of the plough to prevent risk of damage to the conveyor belt. When the plough is needed, the arm is lowered onto the moving belt and the plough then deflects snow and ice off the conveyor before it can reach the transfer-point. When not required, the plough is locked out of the way in its raised position.

Compare with entry 30 on page 14 of the 2002 Quarry Products Association *Health & Safety Best Practice Awards Guide.*

Conveyor belt ice and water shedder

Tarmac Northern > Newbigging Quarry, South Lanarkshire > 01555 840361

ON VIDEO

In South Lanarkshire, an interesting and effective innovation has been developed at Tarmac Northern's Newbigging Quarry where, in winter, overnight, snow creates delays starting up field conveyors. At any time of the year, there can also be significant accumulations of water in the troughed belt conveyors.

A return roller has been fitted above the conveyor with a two-position fixing on one ride. When secured in the lower position, the belt on that side is forced downwards allowing the trapped water to flow off the belt. The simple system precludes manual intervention with its attendant risks.

A second device, integrated with the water shedding top roller, is effectively a snow/ice plough shaped and angled such that it scrapes the snow or ice onto one side of the belt from where it falls to the ground due to the action of the lowered top roller.

Reduced glare for crusher operator

Aggregate Industries › Buckton Vale Quarry, Cheshire › 01457 835323

At Aggregate Industries' Buckton Vale Quarry, low sun angles significantly reduced the crusher operator's view of the process. The remedy entailed the fabrication and fitting of fully adjustable external steel louvres. The gauge of the steel used was sufficient to withstand occasional flying rock fragments which, although the control cabin was fitted with toughened glass, had the potential to give the operator a shock.

Modified return roller bracket

Midland Quarry Products › Edwin Richards Quarry, West Midlands › 01530 230530

Described as a "Near Hit", a return roller weighing 25kg fell approximately 10m to the ground, having worn through the roller's supporting bracket. Steve Noot, a Plant Fitter at Midland Quarry Products' Edwin Richards Quarry, came up with the bright idea of modifying the brackets by welding on steel ribs, thus effecting a 'prevention' rather than relying on an underslung meshwork or netting 'cure'.

Roller frames for crusher conveyor

Day Group › Day Aggregates, Brentford › 0208 380 9600

ON VIDEO

The transom roller frames for the jaw and impact crushers have been redesigned. As large objects struck the impact area, the conveyor rollers took the full force of the impact and gradually folded under the pressure. Because of the tightness of the rollers against the discharge chute, it was difficult to change them when they became damaged or worn out.

The company fabricator was set the task of devising a transom roller frame which could withstand repeated high impact, allow easy access to the rollers for maintenance, and be easy to use. The fabricator redesigned the transom roller frames and their mounting points, incorporating large section channel runners mounted directly onto the crusher frame. The frames were also designed to mount onto the new runners and have replaced the conventional conveyor framework.

Tail pulley guard

Foster Yeoman › Southampton Docks, Hampshire › 01373 456724

Staff at this processing and wash plant have redesigned the conveyor tail pulley guard to allow larger material to pass through. The plant's original guard was made of the standard 40mm aperture mesh. This mesh caught the heavier material which then needed to be removed by hand during cleaning.

The modified guard was constructed from sheet metal sloped into a locked letterbox opening of a large enough size to allow the material to pass through. The locked aperture prevents access to the conveyor nip point. To reduce overspill, the wooden sides of the conveyor were also replaced with larger and more flexible redundant sections of old conveyor rubber.

Guard for collecting conveyor

CEMEX UK Materials › Tunstall Wharf, Stoke-on-Trent › 01782 814418

Staff at this coating plant have identified a solution to the problem of adjusting and tracking the main collecting conveyor, when it is housed in a shed protected by a Castell lock and limit switch to an end door which can only be opened from inside.

To improve safety, the company created a guard to prevent access down the building towards moving machinery and extended the adjusting bars to allow access outside of the guard. In addition, remote greasing points were fitted to allow greasing from outside the guarded area to the bearings on both sides.

Value-added

Bitumen emergency shower alarm

Ennstone Thistle > Daviot Asphalt Plant, Inverness > 01463 773100

Two new bitumen tanks have been installed at this asphalt plant with improved access for tanker deliveries, including softened bends, reduced gradients and a clear, unobstructed area of hard standing. The bitumen discharge procedure has also been improved with a new alarm system.

A red beacon and audible alarm connected to the emergency shower are situated on top of the bitumen tanks to alert the operator and fully trained first aid representative of an incident.

In addition, Ennstone Thistle provided additional training on the correct methods to shut down the bitumen supply safely, and installed a safety cabinet containing a helmet, neck foil, face shield and heat resistant gloves to equip the first-aider with the mandatory personal protective equipment permitting him to enter the bitumen delivery danger zone.

Modified flange for bitumen delivery

Midland Quarry Products > 01530 239451

After an incident where a tanker driver received serious burns when his hose became detached from the pipe during a bitumen delivery, the industry began recommending that a 'Stokes Flange' was fitted to each fill-line. However, this in itself brought problems – bitumen pipelines and fill-lines needed to be altered and this could often meant accessing high-level pipe joints.

Midland Quarry Product's asphalt maintenance supervisor developed a loose adapter flange, or 'Fairbrother Adapter' that has the benefits of the 'Stokes Flange' in preventing the two hose flange bolts from moving in the horizontal plane, but allows you to retain the original flange. It is secured to the pipeline by chain so it is always available, and is easily fitted by the bitumen delivery driver as he connects his hose to the tank fill-line.

The concept of MQP's adapter could also be applied to the tanker, where it connects to the hose, and also to any other bulk-fluid tanker. The safety, environmental and cost benefits that derive from the reduced number of spillage incidents extend beyond the quarrying industry.

Bitumen emergency procedure

Foster Yeoman > Botley Depot, Hampshire > 01489 784 509

An emergency procedure for bitumen burns has been implemented at this Southampton depot. When a member of staff pulls the cord to activate the emergency water shower, others are alerted by a green flashing beacon above the shower and a beacon and alarm in the mixer cabin. They can then initiate an emergency response using the telephone numbers and use advice on treating bitumen burns clearly displayed nearby.

Tanker gasket failures

Foster Yeoman > Crawley Depot, West Sussex > 01293 538669

As a result of near misses caused by tanker gasket failures, a working party was assembled at this depot to analyse bitumen handling.

One problem lay in the fact that intake points are located next to the main traffic route that customers use to access the asphalt plant load-out facility. This was addressed by installing fixed barriers to enable traffic to be diverted via an alternative route during the discharge process. This diversion route is detailed on an information sheet issued to customers on arrival.

The close proximity of the emergency shower to the discharge connection point was addressed by fixing a steel fender with 60-degree deflectors to either side of the discharge point to catch any bitumen spills as a result of failed gaskets.

The intake points, previously obscured from view of the plant operator, can now be monitored using a fixed camera.

Other developments include training for all personnel in receiving bitumen and the issuing of procedures for safe delivery of bitumen to all delivery drivers.

A distance splash guard is shown on the left of the photo.

Alarm system for drench showers

Bardon Aggregates > Hulands Asphalt Plant, County Durham > 01833 628320

A new alarm system activated by the drench showers at Bardon Aggregates means that the workforce is aware of an accident immediately and help is at hand for the injured person. The audio / visual alarms are situated in the laboratory, the mixer cabin and in an elevated position above the bitumen tanks. Toolbox talks have been carried out with all personnel to train them on procedures following a bitumen incident.

Bitumen delivery controls

Tarmac Central > Caldon Low Quarry, Staffordshire > 01538 308282

Tarmac Central's team at Caldon Low Quarry near Stoke-on-Trent have evolved a comprehensive new system for controlling bitumen storage and delivery. Key elements include:

- locked off delivery pipes with key only available from control cabin
- drip tray incorporates slide rails so that it can be moved and emptied by fork-lift rather than manually
- parking of delivery vehicles controlled to allow unobstructed access to emergency shower
- high-level audible and visual alarms with camera to allow plant operator to monitor driver during discharge
- delivery procedures clearly posted at delivery site with fire extinguishers for emergency use.

Fibre blowing system

CEMEX UK Materials > Axminster Concrete Plant, Devon > 07808 731626

The safety team has devised a solution to the problems associated with the addition of polypropylene fibres to concrete and screed mixes.

A one-man system now transfers the fibres from the batch cabin into the mixer, consisting of a cone with a lid located in the batch control room. When the fan is switched on, the fibres are put into the cone and the lid is shut and sealed. The cone joins onto an electric fan blower located under the floor of the batch cabin, and the fibres are blown along a duct into the pan mixer.

Guarded area to circular saw

Huntsmans Quarries > Naunton Quarry, Gloucestershire > 01451 850555

A form of distance guarding with lock-off has been developed for the large circular saw used for cutting block stone. It prevents access to the saw whilst it is working but still allows easy operation.

Automation of fibre addition

CEMEX UK Materials > Bangor Concrete Plant, Gwynedd > 07712 486818

ON VIDEO

As part of a risk assessment process, staff at this plant identified a series of potential hazards involved in the manual addition of polypropylene fibre bags to the mixer. In order to add fibre, the batcher had to leave his control room, descend ten steps, walk to the rear of the batch belt, ascend ten more steps, and then manually place the bags of fibre on the batch belt.

To reduce both the frequency and difficulty of this operation, the team fitted a carousel which could hold up to twenty fibre bags (enough for an entire day's production) and would index by one bag each time a button was pressed in the control room.

Portable additive dispensing system

CEMEX UK Materials > Mansfield Concrete Plant, Nottinghamshire > 07771 878373

ON VIDEO

The safety team has devised a portable additive dispensing system (PADS) to enable concrete mixes to be safely dosed with additives at the production unit or delivery site, minimising manual handling and other hazards.

The PADS system is quick to assemble, lightweight and easily stored in the boot of a car. It enables the user to dispense additives remotely at floor level with the minimum risk of slips, trips and falls due to spillages or working from height.

The system utilises a steel box to house the arrangement of the pump, a flow-meter, battery and associated flexible pipe-work. The pump draws additive stored in nearby containers via a flexible plastic pipeline supported by a 'Shepherd's Crook' arrangement, and dispenses into the mixer truck at a rate of approx 5 litres per minute at a head of approximately three to four metres.

Mechanical scoop belt-sampler

United Marine Aggregates > Greenwich Wharf, London > 0208 305 0978

ON VIDEO

United Marine Aggregates at Greenwich Wharf carries out daily routine testing of aggregates being loaded into rail wagons. To facilitate regular joint sampling with rail-fed customers, remotely behind safety guarding, a robust pivoted sampling scoop was designed and installed.

Samples can now be taken from the moving conveyors, by lowering the scoop (pivoted centrally) into the stream of moving material, then pivoting the device, thus sliding the sample down the short integral chute into a sampling bag on the ground, thereby minimising manual handling. The ease of use of the finished device has increased customer confidence in the conformance of the end product.

Preventing burner fuel fires

Tarmac Central > Mancetter Quarry, Warwickshire > 01827 712324

Kevin Alsop, Coating Plant Foreman at Mancetter Quarry has engineered a system to substantially reduce the risk of coating plant fires due to fuel leaks or incomplete combustion.

Based around two (25mm bore) pressurised ball valves – one for the gas oil supply, the other for the 'reprocessed' oil supply – these valves (and pipes) are encased in red nylon tubing. 60psi pressure acts against a spring to keep the valve open to supply fuel to the burner.

If there is a fire, the nylon tubing heats up and bursts, reducing the pressure to atmospheric level which automatically closes the fuel valves. There are also separate fuel valve leak detectors which can sense the presence of unburnt fuel on the non-pressure side of the valve. Upon detection, an alarm is raised, thus preventing the build-up of unburnt fuel in the dryer or bag filter unit.

MANUAL HANDLING & STORAGE

Key issues covered include: lifting and sampling; safer storage of liquids and gas; dealing with spillages and splashes; handling lids and moulds; safer crusher maintenance; and bitumen delivery and emergency procedures.

Musculoskeletal disorders (MSDs) are the most common occupational illness across all industries, affecting more than one million people a year in the UK. They include problems such as low back pain, joint injuries and repetitive strain injuries of various types.

www.safequarry.com

Bund pump innovation

Foster Yeoman > Botley Depot, Hampshire > 01489 784438

The bund for the Methylene Chloride still system has a drain sump in one corner which requires emptying of rain water on a regular basis. This requires either a permanent electric pump, or a mobile pump with leads to be transported and set up.

Foster Yeoman has developed a venturi device, used in conjunction with a copper U pipe, to set up a siphon effect to empty the rain water once it has been checked for any Methylene Chloride content and confirmed safe. The venturi is activated with a simple push-button air switch and, once the siphon effect is broken, it cannot be restarted without an operator pushing the button again. This removes all manual handling and electrical apparatus from the task.

Blow bar replacement to secondary crusher

Huntsmans Quarries > Huntsmans Quarry, Gloucestershire > 01451 850555

Huntsmans Quarries has designed and implemented an improved method of replacing the blow bars of the secondary crusher. The original method involved manually handling the bars in a restricted space out of the crusher housing onto the adjacent walkway and onto a waiting forklift and pallet.

To minimise the amount of manual handling and reduce the risk of trapped hands and fingers, the plant team constructed a tower mounted gantry so that the bars were lifted from ground level and swung straight into place in the crusher.

Bunded area for storage of liquids and oils

Foster Yeoman > Crawley Depot, West Sussex > 01293 538669

Foster Yeoman's Crawley Depot has developed a series of measures to improve the safe storage of liquids in the bunded area.

The old bunded area was redesigned to accommodate all stored liquids, including a waste oil tank. A steel construction was erected within the bund to accommodate the large barrels, with room underneath for further storage. The front wall was lowered to allow storage of smaller containers within easy reach. A storage area was attached to the bund wall for attaching equipment to lift barrels from the bund. Steps and handrails were erected for safe entry into and out of the bund for both customers and personnel.

New signage was attached, to help distinguish different products. A new spill kit container was placed to the side of the bund, with large signage highlighting its whereabouts in the event of a spill. A new lamp post was installed, with two high powered lights attached for working in dark conditions. A new sump was made to accommodate a pump for the extraction of water. A ladder was fabricated, and attached to the steel construction, to enable movement from the bund floor level to platform level, with a safety drop bar attached. A safety chain was also run across the front of the steel construction.

Barrel transport device

CEMEX UK Materials Scotland > 0191 378 7711

ON VIDEO

CEMEX UK Materials Scotland has devised a simple but effective system for transporting 210 litre barrels of gas oil around the site for the refuelling of heavy plant and engine driven pumps, whilst maintaining compliance with both environmental and health and safety legislation.

The company decided to make use of its existing barrel transporter, which consisted of a meshed frame with two lifting lugs, which in the past had been used by suspending the cage from a loading shovel. A false bottom was created onto the existing cage and a frame constructed so that the cutting edge of the loading shovel could slot in beneath the cage. Once the bucket is engaged, it is then tilted back fully, allowing the barrel transport device to be held within the bucket of the machine. No restraining is required as the weight holds the device safely in place inside the bucket.

The meshed sides of the transport cage were removed and replaced with steel plates, which were welded into place. The transport device was then filled with water and left overnight to ensure no leakage. The company fitted a 24-volt transfer pump to the transport device to minimise risk of contamination. This allowed CEMEX to maximise use of its hired plant by reducing the amount of time spent fuelling, leading to a more efficient site. As the transport device is bunded, there is less risk of contamination to the environment and personnel.

Electric hoists for internal handling of screen mats

Lafarge Aggregates > Mountsorrel Quarry, Leicestershire > 0116 2303881

Mountsorrel Quarry has installed a series of lifting beams with electric hoists to minimise manual handling risks associated with fitting large screen mats and motors in its screen house. Runway beams and platforms give direct lifting access to all areas of the screens and conveyors.

Improvements to the sampling arm

Lafarge Aggregates > Mountsorrel Quarry, Leicestershire > 0116 2303881

ON VIDEO

A safe system of work has been developed for taking samples from lorries without technicians having to enter the lorry body.

Lafarge sought the advice of a specialist company supplying hydraulic lifting arms. They recommended the use of a Bonfiglioli L2300 arm but also stated that the structure would need additional strength to accept the new arm.

As part of the system of work, the need to carry the 25kg sample down a flight of stairs to the sampling room was eliminated. The company extended the sampling room, adding a stainless steel chute for the grab to drop the 25kg sample into the chute which delivered it directly to the quartering table, ready for further processing.

Manual handling improvements programme

CEMEX UK > Raynes Quarry, Clwyd > 01492 517378

Recognising the hazards that go with manual handling, this quarry near Colwyn Bay in North Wales has instigated a raft of measures that include:

- purchase of vacuum cleaning system to avoid spadework in restricted spaces in crushing plant
- use of light, wheeled welding screen
- modified engine hoist to remove electric motors from store where there is no fork-lift access
- installed travelling gantry to handle 205-litre oil drums
- charging primary crusher bearing with grease using pumped system.

Portable goal posts

Bardon Aggregates > Cambusbeg Quarry, Stirlingshire > 01877 331104

ON VIDEO

The use of goal posts made of barrels filled with ballast and a length of painted box section is a long-established method of reducing the risk of coming into contact with overhead power lines. However, once filled with ballast, the barrels become very heavy and need a loading shovel to move them. Furthermore, if the cross beam is dislodged by high winds, a cherry picker is required to replace it.

The safety team at Cambusbeg Quarry have devised an alternative set-up, using second-hand wagon wheels and standard drainage pipe. The wheels provide a secure base and can be easily rolled into a new position. The use of a standard drainpipe as a cross beam means that the structure is both lightweight and cheap to construct and repair.

Manual handling of mixer lids

CEMEX UK Materials > Redruth Readymix Plant, Cornwall > 01209 218550

Redruth Readymix Plant has devised a method to reduce the risks associated with manual handling whilst lifting the mixer lids for cleaning and maintenance purposes.

Operators were originally required to manually lift and prop up the covers, which were heavy and often laden with concrete residue from the day's production.

To improve safety, the team devised a pneumatic control system consisting of individual switches for a series of pneumatic rams which lift the covers to a fully open position. Safety chains are then attached to hold the covers up should the rams fail.

Dust pan and mini-digger

Kennedy Quarries > Kennedy Quarry, Londonderry > 01480 472673

Beneath a cone crusher, between two concrete walls, spillage used to have to be removed manually by Kennedy Quarries' personnel within a confined space and subject to inhalation of dust. Now, both ends of the 'tunnel' are enclosed and a dust pan tray placed longitudinally under the product conveyor, allowing the tray to be removed and cleaned mechanically on a weekly basis by a mini-digger.

Dust collection skip

Foster Yeoman > Botley Depot, Hampshire > 01489 784438

Each day, up to 400kg of dust is produced from the back of the batch heater drums. This dust was originally collected in plastic dust bins which were then emptied through a hatch in the floor into a raised loading shovel bucket. The dust bins were hard to move because of their weight, and staff were exposed to potential inhalation of dust when emptying them.

To improve safety, a metal chute was constructed to collect the dust from the batch heater drums and feed it down pipes into a tipping skip – fitted with braked castors so that it could be moved by hand. A lid was also manufactured to cover the skip and contain all the dust.

Bitumen lines replacement

Johnston Roadstone > Leaton Quarry, Shropshire > 01952 777910

At Leaton Quarry, Johnston Roadstone replaced 20-year-old bitumen pipework on their Millar Coating Plant. Three main health and safety benefits were accrued:

- previous leakage eliminated
- original secondary hot oil system replaced by thermostatically controlled electrical trace heating
- inspection and repair of all structural pipework supports.

Companies who are still using (or perhaps who have inherited sites using) secondary hot oil systems should be aware of the potential fire and burn hazards. Reliability and maintenance schedules can also be improved by the removal of the associated burner system and hot oil pump.

Bitumen spillage: capture and removal

Hanson Aggregates > Chipping Sodbury Quarry, near Bristol > 01454 314400

Hanson Aggregates' Chipping Sodbury Quarry, near Bristol, has addressed the issue of containment and mechanised removal of bitumen spillage.

All bitumen filler pipe flanges are brought together, above a removable grating. A steel lined concrete catchment pit (slightly wider than the bucket of skid-steer loader) was constructed under the bitumen delivery point. It has an angled bottom plate and vertical back plate to allow the skid-steer loader to dig out the bitumen. The grate is easily lifted off and replaced manually. The pit is lined with dust or sand to prevent sticking.

Splash guard for delivery flange

Aram Resources > Carnsew Quarry, Cornwall > 01326 375660

ON VIDEO

Following an incident at Carnsew Quarry where a bitumen delivery driver caused a spillage, the safety team decided to design and manufacture a splash guard to fit over the delivery flange.

Two different prototypes were built by John Hudson, in consultation with Shell Bitumen's delivery drivers. The preferred design included a hinged cover secured with a safety bar to allow the pipes to be easily connected. Once the pipes have been connected, the cover is lowered into place and locked by the safety bar. A "belt-and-braces" solution.

Enhancements to delivery of bitumen

Hanson Aggregates > Yorkshire Asphalt, West Yorkshire > 01274 606479

The workforce at this asphalt plant has worked together with management and suppliers to devise a number of improvements to the bitumen delivery system. Personnel now receive better training, a clearer key control system for the storage tanks is in operation, new signage is in place and the coupling points for the delivery pipe have been enhanced. The new-style flange coupling involves a "drop in", square-shaped slot arrangement. The male connection on the delivery hose is lowered into a female connection on the tank inlet pipe. Once in place, the driver can secure the fixing bolts without needing to hold the pipe, hence reducing the physical effort that was necessary previously.

The relatively inexpensive measures taken have generated positive feedback and will be rolled out to other Hanson sites.

Improvements to bitumen delivery/storage

Tarmac Northern > Cairneyhill Quarry, North Lanarkshire > 01236 842351

Following internal safety audits, Tarmac Northern has made a number of improvements to its process of delivering and storing bitumen. They include:

- a walkway from the filler silos allows access direct from the plant tower, which has no vertical ladders (compare with entry 98 on page 31 of the *QPA Health & Safety Best Practice Awards Guide* 2001)
- laying a binder course covered by a high stone content surface for tankers to safely manoeuvre. New drainage channels have also been cut
- the route between the delivery point and the weighbridge has been improved by removing water tanks. Plans have also been made to extend the amount of surfaced roads in this area
- independent high level alarms have been installed on each tank. The system sends an email to the manager and coating plant supervisor if an alarm is triggered.

Bitumen delivery – shielding fill points and providing PPE

Tarmac Central > Ballidon Quarry, Derbyshire > 01355 390301

The close proximity of fill points for bitumen tanks to other activities on site was recognised as a potential hazard. A plant supervisor also felt that suitable protective equipment for discharge of hot bitumen should be immediately to hand.

The solution to the first problem was to install substantial Perspex screens enclosing the fill point and bitumen tank, so that any spillage or discharge would be contained by the screen, but the delivery process could still be monitored. The protective equipment, including helmet, full face visor and neck guard, suitable gloves and guidance on dealing with bitumen spillages, is now housed in a weather-proof, highly visible plastic grit box.

Centralised manifolds & warning systems

Bardon Aggregates > Morrinton Asphalt Plant, near Dumfries > 01387 820892

The asphalt plant at Morrinton, near Dumfries, is operated by Bardon Aggregates which has instituted a number of improvements:

- all four bitumen delivery pipes have been brought to a centralised manifold point. For sites requiring split loads, this has the mutual advantage that the delivery tanker does not have to move to deliver to another tank
- all tanks have been fitted with both “high” and “ultimate high” warning lights, the latter being accompanied by audible warnings. These warning lights and siren are located immediately above the clustered delivery pipe flanges
- fire extinguishers are located in a protective, rapid-access, cabinet adjacent to the manifolds
- the emergency shower is now connected to the mains water supply.

NB: Header tanks should not only be insulated to stop freezing, they should also have some form of rudimentary heating system. Dousing a person with near-freezing water is likely to exacerbate the shock resulting from a bitumen splash – Editor

Gated delivery area and night-time deliveries

Midland Quarry Products > Cliffe Hill Quarry, Leicestershire > 01530 239458

Where possible, Cliffe Hill Quarry (Midland Quarry Products’ flagship unit, near Coalville), schedules bitumen for night-time delivery when there are less vehicle movements and dedicated supervision is easier to arrange. All operators associated with the coating plant are trained for safe receipt of bitumen.

To facilitate deliveries of bitumen, fuel and filler, a gated area has been designated.

The delivery driver has the comfort of a safe area in which to work, in the knowledge that neither personnel nor other vehicles can interfere with the discharge process.

Cold bitumen mechanical applicator

Tarmac Group > Tarmac National Contracting > 01902 382855

Eliminating many of the hazards connected to the heating and applying of hot bitumen was the challenge that Tarmac National Contracting set itself. The main concerns arose from sealing joints on road surfacing contracts, where workers walked backwards to distribute hot bitumen from a watering can – hazards included manual handling, tripping, fire and occupational health due to the posture of the worker.

ON VIDEO

Following extensive tests and the correct permissions, the company now uses cold bitumen and has developed a new application procedure. The safety of its application has also advanced with a mechanical applicator. A miniature compressor forces the bitumen down a discharge pipe and onto the joint.

Alarms for bitumen tanks

Midland Quarry Products > 01530 230530

Midland Quarry Products has improved upon the already high standards of its bitumen tank alarms. The tanks were fitted with integral level indicators with audible and/or visual high and low level alarms. However, as the Refined Bitumen Association recommends, high-level alarms independent of level indicators are also in place for a fail-safe system. This eliminates any overfilling.

To further enhance the system, and ensure that all members of staff can be made aware of an incident, a separate alarm has been installed within the PC control systems.

Admixture addition on concrete plant

Huntsmans Quarries > Naunton Quarry, Gloucestershire > 01451 850555

This Gloucestershire quarry has a ready-mix plant with a pan mixer and a dry leg. When conducting specialised mixes with unusual additives, the heavy drums in use have to be carried upstairs for addition by hand.

To improve safety, the company created a lockable gate that only opens inwards on the mezzanine level, so that drums could be lifted up by telehoist. This eliminated the need for a separate storage area on the ground to protect from frost.

In the event of a leak, the leakage would be onto the mixing bay of the concrete plant which is totally contained, removing the potential for pollution.

Reducing the risks from manually-fed additives

Lafarge Aggregates > Aldermaston Readymix Plant, Berkshire > 07803 953990

The value-added materials produced at the Aldermaston Readymix Plant require the plant supervisor to add materials during the mixing process by hand, often at height in a dusty environment. The pan mixer has to be opened to add the fibres, which used to require the plant to be locked off for each load.

To improve safety, the company added a slot to the aggregate intake chute of the pan mixer. This now allows bags of fibres to be hand added from a designated safe working platform without the supervisor needing to access the pan mixer or to halt the mixing process.

The design of the slot incorporates a mechanism to prevent dust being blown back into the working area through the addition of a simple sliding draw. In addition, hand added materials can now also be delivered directly to the correct height by a fork lift truck.

Transfer of steel fibres into concrete plant

Tarmac > Gawsworth, near Macclesfield > 01260 223477

The introduction of steel fibres into concrete at the mixing stage can be a strenuous and repetitive task. Tarmac Area 3 Concrete, at Gawsworth, near Macclesfield, has produced a safe system of work that includes the use of a forklift truck to move pallets to a 110 volt conveyor.

Manual handling of the bags was the subject of discussion with site personnel, with the outcome being an agreed frequency of work rotation.

Asphalt sampling platform

Aggregate Industries UK > Haughmond Hill Asphalt Plant, Shropshire > 01743 709287

When this asphalt plant was built, Aggregate Industries took care to include a modern and safe sampling platform in its design. The following points have been considered:

- traffic management: one-way system for wagons travelling to platform, designated parking bays, positioning of platform to prevent technicians coming into contact with moving traffic
- access: a drawbridge leads to the platform. A flashing light and alarm indicate when it is in the drop-down position
- lighting
- barriers: vertical lift road barrier in front of parked wagon
- manual handling: avoided with a chute on the platform for samples
- temperature devices: currently being trialled. If successful, will reduce the need for the technician to climb on the loads.

Air-operated microsilica pump

Tarmac Northern > 0191 492 4000

ON VIDEO

Conventionally, microsilica is transferred into the truckmixer drum by a submersible pump attached to a hose. It is a two man job with attendant risks due to usage of the truckmixer ladder; the moving drum; cable and hose tripping hazards; and manual handling of liquids and equipment.

Tarmac Northern North Area (Concrete and Mortar) has solved this problem by developing (in conjunction with Derwent Measurement Ltd) an air-operated diaphragm pump with 110 volt remote control facility. Features include:

- one-man operation
- pump located in plant (operator in batch cabin)
- quick release couplings.

Handling cube moulds

CEMEX UK Materials > Ely Coating Plant, Cambridgeshire > 01603 675000

ON VIDEO

Staff at this coating plant have devised a simple carrying tool which reduces the potential risks of foot injuries during the manual handling of standard 100mm cube moulds.

As an alternative to carrying the moulds by gripping the slim upper flange, a simple clip-on and quick release tool allows the moulds to be carried alongside the body, providing improved balance. As an added benefit, staff are also able to carry two moulds at the same time, whilst still complying with manual handling regulations.

Manual handling improvements

Tarmac Northern > 0191 492 4000

Tarmac Northern's North Area (Concrete & Mortar) has taken the following initiatives to reduce risks associated with manual handling:

- a decision has been taken to ban the use and ordering of materials stored in 205 litre drums, with bulk tanks put in place to accommodate additional products
- a mobile conveyor was purchased to facilitate the addition of steel fibres into the production process or truck mixer
- further development work has continued with the truck mixer admixture dispenser and the dispenser will soon be available throughout the industry
- liquid pigments are now in use at both mortar factories, replacing bagged powder pigments, which created an 'at risk' activity due to their size and production methods in producing coloured mortar.

Drum lifting mechanised

CEMEX UK > Powburn Quarry, Northumberland > 01665 606061

Around ten miles west of Alnwick is Powburn Quarry, belonging to CEMEX. Full 205 litre oil drums, weighing 185kg each, do not now present a manual handling risk at Powburn. The fitting in the roof of the oil store of three fixed channels supporting a travelling lifting beam (which can move side to side, on runners) has provided an ideal solution. The beam extends outside the store. The lifting tackle is fitted with purpose-designed drum-lifting tongs.

Safer storage of bottled gas

Foster Yeoman > Crawley Depot, West Sussex > 01293 538669

Foster Yeoman's Crawley Depot has devised a method of preventing the potential for cross-contamination caused by storing different types of gas bottles in a single cage.

By making the cages to suit the size of the bottles, with a fixed sized entrance gate at the opening of each cage, the company was able to reduce the risk of potential hazards with minimal cost – as the entrance gates were actually made from off-cuts of steel that were already on site.

Each cage was split into two halves, with one side for empties and the other for full gas bottles. Warning signs were attached to front of cages and the cage floors were constructed of galvanised steel on a concrete surface to allow good drainage and prevent bottles and cages from rusting.

The roofs of the cages are made from tepee-shaped galvanised steel to keep weather from penetrating bottles and the sides are mesh to allow for good ventilation. All cages can be padlocked and the keys are held by authorised personnel only.

Transporter for gas bottles

Hanson Aggregates > Chipping Sodbury Quarry, Bristol > 01454 314400

The fitting department at Chipping Sodbury Quarry has designed and fabricated a transporter that makes handling heavy gas bottles a far safer process. A trailer with a winch at the rear lifts the bottles from ground level on a base plate that can be fixed in position. The design incorporates a holster to prevent the gas nozzles being damaged during transit, a bracket to store a fire extinguisher and protruding brackets to keep the hoses neatly stored.

ON VIDEO

Automatic recovery system for engine oil

Johnston Roadstone > Leaton Quarry, Shropshire > 01952 777910

At Leaton Quarry, Telford, Johnston Roadstone's previous system entailed manual handling of waste oil buckets. The new system was devised to garner the following advantages in respect of used engine oil:

- to eliminate virtually all requirements for manual handling
- to prevent potential for skin-related problems
- to eliminate oil spillage, thus reducing risk of slips/trips/falls.

All quarry vehicles have had their sump plugs replaced with a type that has a non-return valve. A new 2,500 litre tank is located adjacent to the work area with a fill pipe fitted and attached to an automatic hose reel. An air suction pump is fitted to a trolley, which can be wheeled around the workshop. On attaching the hose to the sump, the valve is automatically opened and the used engine oil is sucked out direct to the collection tank.

PUBLIC PERCEPTION

Key issues covered include: community relations; entrance improvements; visitor and pedestrian safety; site design and security.

"As a responsible industry, it is essential that both visitors to our sites and our surrounding neighbours are treated with the same concern as our own employees. Proactive initiatives which respond to and engage with our local communities can only improve the public perception of our industry."

Elizabeth Clements, Quarry Products Association

Access road tunnel

Johnsons Wellfield Quarries > Crosland Moor, Yorkshire > 01484 652311

When the residents of Crosland Moor in Yorkshire expressed concerns over quarry vehicles crossing local roads, Johnsons Wellfield Quarries considered whether they could pass underneath. The condition of the roads, noise, and proximity to pedestrians were just some of the issues raised by local residents.

The haul road between certain quarries has been diverted and a tunnel constructed beneath the road. The construction method employed was a 'cut and backfill'. The use of proven pre formed steel structure sections, which were assembled on site, provided the tunnel profile. The retaining of the backfilled material was achieved by a combination of steel reinforced concrete and engineered gradients, all faced off with quarried block stone. The end result is that the quarry remains active and competitive, whilst being considerate to local and environmental concerns. A closer relationship has been built with local residents, who have shown genuine interest in the progress of the project.

Entrance improvements

Aggregate Industries > Marybank Quarry, Isle of Lewis > 01851 703227

When the local community began making environmental improvements to the village, Marybank Quarry decided to make its own entrance more attractive – and safer.

The original entrance was narrow and at a slight angle to the adjoining road, making visibility a problem. The situation has been remedied by removing several metres of stone walling and re-aligning the road. Other improvements include new kerbs to ensure that surface water drains away, stone walling, a resurfaced road entrance, and new timber gates.

The 'Rock Shop' at Mountsorrel

Lafarge Aggregates > Mountsorrel Quarry, Leicestershire > 0116 230 4350

Lafarge Aggregates' flagship quarry near Loughborough had recognised the growing market for sales direct to the public, of decorative stone. A specially designated area was therefore set-up for the 'Rock Shop'. The area chosen is well away from the routes used by the Cat 777's and most of the tippers. Signs are clear and set at car height. Cars are weighed in and out on the same weighbridge, which is close-by, so risk of a driver becoming disorientated is negligible.

Visitor safety

Lafarge Aggregates > Barham Quarry, Suffolk > 01473 831737

Barham Quarry enjoys a significant collect/retail trade. To ensure that visitors can view the products in one safe place, rather than touring the busier parts of the quarry, the site manager has come up with a novel method of displaying the materials produced at the quarry – by housing them in recycled tyres.

Dealing with public trespass

Tarmac Southern > Sevenoaks Quarry, Kent > 01732 468930

Tarmac Southern's Sevenoaks Quarry suffered considerably from trespass, vandalism, dumping of stolen vehicles and so on, which was ascribed to a small section of the residents of a nearby housing estate. Mindful that there is also deep water on the site, and the recent drowning tragedies involving members of the public elsewhere in the UK, the quarry manager developed a proactive approach with two key objectives.

Firstly, a set of on-site systems and procedures were formulated for protection of the workforce from the effects of the intruders. Amongst these are the fitting of safety glass to mobile plant (to prevent injury to operator from missiles), and the issue of medical gloves with which to remove discarded syringes. Secondly, in co-operation with the local community, a number of communication initiatives have been actioned.

These include:

- formation of a Police and Housing Association Committee
- employment of security guard
- regular warning letters to local residents
- local community liaison group (six monthly meetings)
- publicity via local newspaper
- QPA "Play Safe – Stay Safe" video shown to and left with local schools
- CCTV installed on site.

These actions are believed to have significantly reduced the potential for a serious accident and the attendant negative publicity for the site and the industry in general.

OCCUPATIONAL HEALTH

Key issues covered include: health screening; hand arm vibration; PPE; noise; air filtration and dust monitoring.

Readers are invited to study the publication entitled *Occupational Health Management in the Quarry Industry* which can be found at: http://www.hse.gov.uk/aboutus/meetings/qnjac/qnjac-ohg.pdf

"We have been much encouraged by the reductions achieved. I sense a step-change in the commitment at the top of the Industry, as well as involvement of the workforce, but we need to take 'Quarrying' down the league table of incidence rates. For the future, the HSE would like to see particular emphasis placed in the health area."
James Barrett, Health and Safety Executive

Occupational health strategy

Tarmac Group > Wolverhampton, West Midlands > 01902 382855

Tarmac Group's occupational health strategy is part of a long-term goal to eliminate occupational disease and health impairment due to workplace health hazards.

The strategy incorporates the Anglo American Occupational Health Guidelines, the Quarries National Joint Advisory Committee's document, *Occupational Health Management in the Quarry Industry* (which can be accessed at http://www.hse.gov.uk/aboutus/meetings/qnjac/qnjac-ohg.pdf), and elements of the Tarmac safety strategy.

A key element is to ensure that occupational hygiene; occupational health and risk assessment are fully integrated. Activities include:

- public reporting of SHE performance in the annual SHE and Social report
- publishing guidance documents, such as *A Guide to Good Health* [1]
- educational campaign to raise awareness amongst the workforce of both occupational and general health issues
- development of policy on the management of stress in the workplace.
- health surveillance using mobile screening units
- development of a baseline of occupational hygiene data (eg workplace noise, dust and vibration levels)
- assessment of each worker exposed to occupational health hazards.

[1] **QPA has available an authorized cover version – available singly or in bulk at 85p per copy from Dawn Grant: dawn@qpa.org**

Managing occupational health

Tarmac Northern > Uddingston, Glasgow > 01698 804900

Good housekeeping to improve health and hygiene standards is given due prominence at this ready-mix plant in Uddingston. It has installed reverse jet filters, fan assisted reverse jet filters, and a central vacuum system to significantly reduce dust.

On a company-wide scale, Tarmac has produced *Environmental Good Housekeeping Best Practice Guide,* which covers areas such as site entrance; offices and welfare facilities; and fuel, oil and chemical storage areas. The company's SHE policies and guidance, accessible from the intranet system, includes guidance on first aid; the risks of drug and alcohol misuse; and how to manage stress.

Induction programmes and risk assessments also target occupational health issues. Risk assessments are broken down into four parts:

1 possible hazards associated with the task

2 measures to reduce or remove the hazard

3 persons most at risk from this activity

4 personal protective equipment (PPE) to be used.

The severity of the risk and the likelihood of harm occurring are calculated using a scale from one (severity: nil; probability: improbable) to five (severity: high; probability: likely). If the score falls into low risk then work can then be carried out. If the score falls into medium or high risk, further measures must be taken.

Occupational health

Tarmac North West > Cheshire > 07753 772814

Tarmac North West has focussed on three main areas in the drive to improve occupational health standards: task auditing; health screening; and on-the-job coaching.

Auditing

The five principles are:

- observe and contact
- comment on safe behaviour
- discuss consequences of unsafe act, and safer ways to do the job
- achieve agreement to work safely
- discuss other safety issues.

Health screening

Pre-employment medicals and health screening programmes are carried out by Private Health Care. The latter tests hearing; vision; lung function, etc. A general summary is provided to managers to help them determine the general heath of the workforce and any trends that may have cause for concern.

On-the-job coaching

As well as regular meetings and toolbox talks, help and advice is offered through mail shots distributed via pay slips and induction packs. The employee assistance programme employs a third-party confidential hotline to provide independent advice on matters such as safety, stress and work-related health issues.

Health screening programme

Tarmac North West > Cheshire > 07753 772814

A screening programme is helping Tarmac North West to identify and respond to any health problems amongst its workforce. The programme, carried out by an independent company (Private Health Care Ltd), is specifically focused on respiratory and lung function issues that could be caused by exposure to respirable crystalline silica dust and includes blood and urine analysis and a lifestyle questionnaire.

Although individual results are confidential, an overall summary allows managers to prioritise high-risk occupational areas. For example, they can ensure that respiratory and lung function complies with COSHH and the Management of Health and Safety at Work regulations.

In addition, some of the practical measures that are put into place to reduce dust particulates at the source include:

- environmental dust suppression, water sprays and sprinklers, on traffic routes and aggregate storage areas
- vacuum / cyclone filter extraction on truckmixer loading bay
- silo filters / pressure relief systems on all silos
- the provision of power hose equipment to all yards for damping / washing down.

Reducing hand arm vibration exposure

Tarmac Group > Wolverhampton, West Midlands > 01902 382855

As the second most commonplace industrial disease within the Tarmac Group, hand arm vibration exposure poses some serious challenges. Tarmac has been looking to control the risk of pneumatic powered breakers in particular.

The company has been working with GE Equipment Services to develop a small Tractaire fitted with a hydraulic breaker on a remote arm. Exposure to hand arm vibration is reduced by 80 per cent for break-out work; manual handling is eliminated entirely; noise levels are reduced dramatically; and there is no danger of whiplash injuries from pneumatic hoses parting.

The main disadvantage is that operators are unable to gain access to all work areas, but this is being addressed through the development of a revised version with an integral portable hydraulic breaker.

Hand arm vibration – addressing the risks

Lafarge Aggregates > Lafarge Contracting, Leicestershire > 0116 230 4041

AWARD WINNER

When Lafarge Contracting conducted a thorough survey of plant and equipment to identify and categorise the exposure rates, it decided that more needed to be done to raise awareness about – and hopefully reduce – hand arm vibration.

The safety department at this Mountsorrel site was set a number of tasks, which it responded to with the following changes:

- purchasing improved equipment, such as a replacement for the heavy duty breaker and a vibration meter
- reviewing current work methods and amending to reduce operatives' exposure to hand arm vibration
- identifying those in the workforce who may have symptoms of hand arm vibration and carrying out further medical examinations and monitoring with the help of an occupational medical company
- developing a toolbox talk
- developing a training package
- making presentations at national safety days.

Safety boots with metatarsal protection

Tarmac Western > Herefordshire > 01544 230711

As a result of a lost-time incident when a jackhammer was inadvertently operated on an operative's foot, Tarmac Northern National Contracting has introduced site safety boots with metatarsal protection.

Whereas traditional safety boots with steel toe-caps do not completely protect the top of the foot, the new boots provide additional protection to the operative's feet from impact from above, such as that of a heavy object dropped during handling. Each pair of boots costs approximately £53, compared to approximately £30 for a pair of standard boots.

Personal protective equipment pouch

CEMEX UK Materials > Wenvoe Quarry, Cardiff > 02920 593378

With the need to wear safety spectacles and carry extra personal protective equipment (PPE) at all times on site, the safety team at Wenvoe Quarry issued operatives with an easily-identifiable 'PPE Pouch' to provide a safe and convenient method of keeping the necessary equipment to hand at all times.

Air filtration system

Hanson Aggregates > Craig yr Hesg Quarry, Mid Glamorgan > 01443 493841

Hanson Aggregates' Craig yr Hesg quarry near Pontypridd in South Wales is a gritstone deposit with a silica content of 70 per cent. All the mobile plant is fitted with air filtration systems to protect drivers from respirable crystalline silica dust, which offer adequate protection, but there is no way of telling when the filters need replacing.

Eastfield Engineering from Wolverhampton was commissioned to design and install new High Efficiency Particulate Arrestor external air filtration systems to the cabs of two dump trucks and a loading shovel. Crucially, they incorporate a cab warning light which tells the operator when the filter needs replacing.

Modified bitumen flange

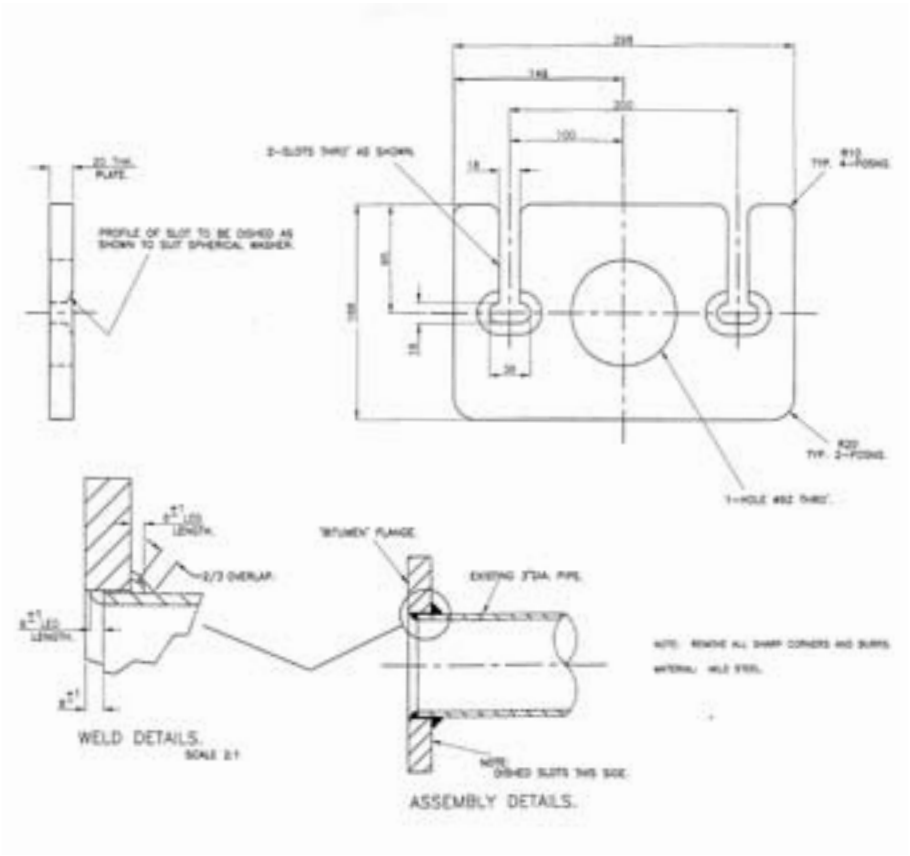
Bitumen spillages at aggregates sites can have serious safety and environmental consequences. The Refined Bitumen Association (RBA) reported that 80 per cent of safety incidents at delivery sites in 2003 were due to spillages – an increase of more than 20 per cent in four years. It is an issue about which the industry cannot afford to be complacent.

A number of practical measures can be put into place to avoid an incident, as outlined in the RBA's Code of Practice, available from bitumen suppliers. One key recommendation is to use the new style delivery flange (see diagram and photo). Its vertical slots entrap the bolts within the flange itself. Countersunk oval terminations accommodate the convex-shaped contact edge to the nuts.

It is strongly recommended that it replace the horizontally-slotted oval shape "elephant's foot" flange where the hinged action of the flange bolts on the armoured flexi-hose makes them susceptible to splaying outwards during tightening, hence particular care needs to be taken if you are still using this old-style flange.

"Spray spillages" caused by loose or loosened connections are eliminated by fitting the flange perpendicular to the ground and 0.5 to 1 metre above the ground, in order to minimise the physical effort needed to effect the connection. Care should taken when fitting, particularly to assess the risk of fire due to heat input to the pipework during welding operations. This should be complemented by reactive systems in the event of fire.

Martin Isles, Director of Health & Safety for the Quarry Products Association, keenly supports the use of the new flange: "This is a significant development that will have major safety benefits. The QPA highlighted this new valve in its *Health & Safety Best Practice Awards Guide* three years ago after an eight tonne spill at one of our members' sites. It is important that companies move towards replacing every flange at every asphalt plant with the new design."



The RBA-recommended flange costs around £25 each excluding the cost of fitting. It can readily be fabricated on site, alternatively contact your bitumen supplier for advice.

The new-style flanges are shown in practice in the Hanson entry, *Enhancements to delivery of bitumen* on page 59.
A "distance splash-guard" accompanies the Foster Yeoman entry, *Tanker gasket failures* on page 52.

Index – products

Entries submitted from quarries run throughout the length of the guide. Entries from other operations are listed below with page numbers:

	Coated stone and asphalt	Ready-mix and mortar	Rail and wharf	Company initiative	Other
Transport	3, 13	5-8, 11, 14, 17	6, 14	5	6, 14
Competence assurance	28			21-28	
Working at height		32			31
Maintenance & housekeeping	37, 40	35-36, 38-39	34, 37-39, 41		36
Worker involvement		44		45	
Production & processing	51-52	53-54	50		
Manual handling & storage	58-62	57, 61, 62	55, 58, 63		
Public perception					
Occupational health		67		67-69	

Note: competence assurance and occupational health initiatives have not generally been developed on a site-specific basis and are often applicable across different operations.

Index – keywords

***Vehicles** continued overleaf*

VEHICLES (cont'd)

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