NJUG

Delivering the Vision Day

Sponsored by United Utilities (helping life flow smoothly) & amey

14th May 2014 at The Museum of Science and Industry, Manchester.

WELCOME

Minimising Road Occupation

Bob Gallienne
CEO NJUG

NJUG

NJUG Overall Vision

“ To create in partnership with government, authorities and stakeholders, a self regulated environment which motivates our members to deliver the highest standards of street works at minimum cost and disruption to their customers and to the overall benefit of UK Plc”

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Street Works

- Scale is generally underestimated
- Every work carried out by Utilities and their contractors in the road has a street works cost
- Over 2 million jobs carried out each year and rising.
- Costs of managing and administering street works is rising each year
- Direct cost “hidden” in the capital and maintenance programmes
- No one knows the real cost
- Major impact on everyday life, both business and personal

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What is the biggest contribution we can make to UK Plc?

- Minimising Road Occupation
  - Increases productivity and quality at all levels
  - Fully utilises innovative products, methods and service
  - Positive environmental impact
  - Reduces risk and enhances safety for all road users
  - Improved sustainable use of resources
  - Improves delivery timetables
  - Reduces costs to Utilities, Highway Authorities and the local and business community.

Vital for business, commercial and public benefit

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NJUG's Key Strategic Objectives for next 5 years

- Greater co-operation and co-ordination in the delivery of street works
- To develop a shared view on what the sector should be delivering in 10 years time
- To seek parity of treatment between Utilities and Highway Authorities
- Establish and maintain a fully evidenced data baseline
- Provide a focus for innovative products and practices
- NJUG to evolve as an organisation to enable it to pro-actively influence and drive policy

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How do we transition to the next Phase?

- Period of stability
- Underpinned by true understanding of cost / benefit impact of current legislation
- Measure and incentivise minimising road occupation
- Create parity between Utilities and Highway Authorities – ideally, including through an independent Commissioner
- Jointly work together to make the right behaviours the “norm” for the benefit of the whole community

NJUG

How is NJUG changing to meet this challenge?

- Strengthening its ability to influence
- Changing our organisational structure
- Broadening our alliances
- Improving our cost based evidence
- Increasing our focus on innovation
- Updating the NJUG Vision for Street Works & Awards
- Creating stronger partnerships with our stakeholders
- Upgrading our communication strategy
- Evolving as an organisation to better deliver the needs of our members and the country as a whole.

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NJUG Vision for Street Works – Minimising Road Occupation

Making street works in the UK world class by focusing on:

- Safety
- Quality
- Working in Partnership to reduce disruption
- Sustainability
- Improving Communications before and during works
- Minimising Damage to Underground Assets
- Innovation

NJUG

TODAY

- Focusing on NJUG's Vision for Street Works
- Many innovative presentations
- Chance to network with industry and authority colleagues
- Exhibitors – with interesting stands
- First of a number of HAUC(UK) / Regional HAUC / NJUG Events aimed at sharing good practice and innovation TO:

MINIMISE ROAD OCCUPATION

NJUG

Street Works –
Doing It Right First Time

Steve Fraser

United Utilities
helping life flow smoothly

United Utilities

helping life flow smoothly

Think Safe Be Safe

Our journey To Comply With The Safety Code

Cate Cartledge &
Campbell Crawford

Need for change…

Key issues:

- Poor reputation
- Poor relationships with Highway Authorities
- Poor compliance on signing, lighting and guarding of works
- On Improvement Notices
- Lack of understanding of the Safety Code
- Poor behaviours and attitudes towards safety

United Utilities
helping life flow smoothly
Street Works:
Getting it right first time...
... on the road to success
Define Strategy
CUSTOMER FOCUS
INTEGRITY
INNOVATION
One company - one team
- Drive high performance culture
- Clear policies and proceedures
- Manage and embed change
- Continuous improvement
Minimise disruption
- Do it right first time
- Focus on compliance
- Customer Service
- Understand our performance with scorecard/league table
Quality and Compliance
- Safe working practices/zero accidents
- Audit programme
- Contracts to drive right behaviour (KPI)
- Manage legacy issues/contracts
- Benchmark/adapt best practice
INTEGRITY
CUSTOMER FOCUS
Working with the Highways Authorities
- Seek feedback
- Improve relationships
- Engage stakeholders
- Be easy to contact
- Promote a positive legacy
Innovation
- Promote use of new technology
- Lead on works co-ordination
- Influence legislation and regulation changes
- Look for new improved ways of working
- Drive use of recycled materials
- Apply our learning
INNOVATION
End
End

Think Safe Be Safe

Our Approach

Four phased approach to compliance:

1. Training and Equipment
2. Culture and Behaviour Changes
3. Technology
4. Audit & Performance Monitoring

Think Safe Be Safe

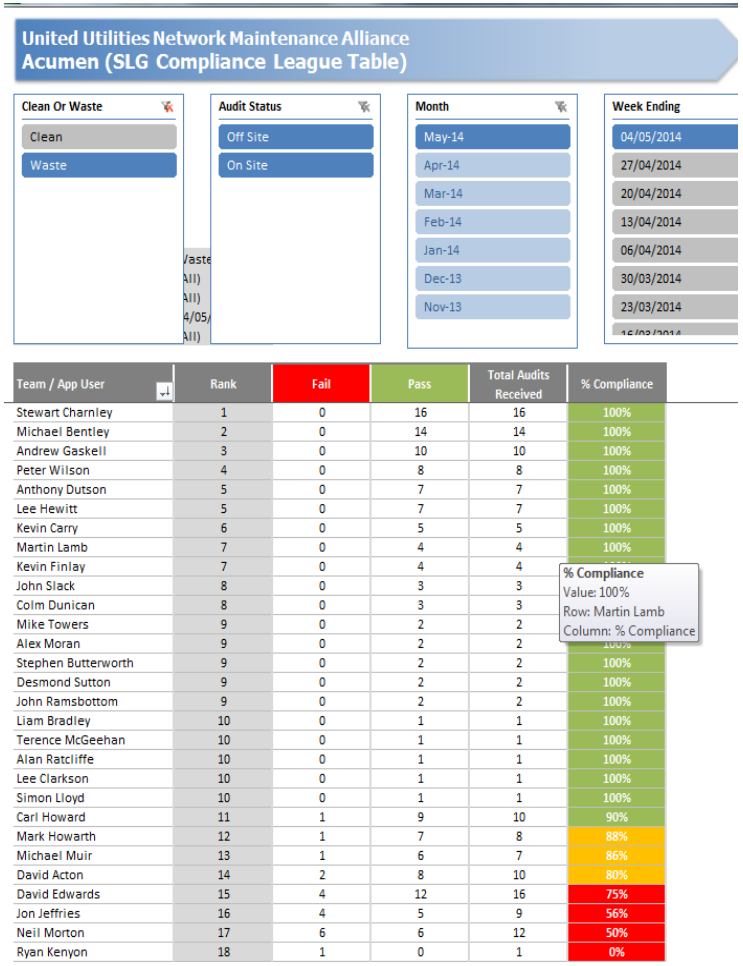
Training and Equipment

- Rolled out joint UU-Amey Safety Stand-down days lead by H&S and Street Works Managers
- Up-skilled teams with enhanced Street works training
- Upgraded Training Matrices
- Invested in support vehicles and additional equipment
- Developed guides for “red book” compliance
- Monitored and investigated route cause on all ‘High Risk’ SLG failures

Think Safe Be Safe

Culture & Behaviours

- Intense focus on the importance of SLG to safety
- Created safety groups & idea sessions with champions from gang level
- League Tables of audit compliance published to drive competition
- A shift in mentality to understand the safety code is a fundamental part of the role



United Utilities Network Maintenance Alliance
Acumen (SLG Compliance League Table)

Clean Or Waste	Audit Status	Month	Week Ending
Clean	Off Site	May-14	04/05/2014
Waste	On Site	Apr-14	27/04/2014
		Mar-14	20/04/2014
		Feb-14	13/04/2014
		Jan-14	06/04/2014
		Dec-13	30/03/2014
		Nov-13	23/03/2014

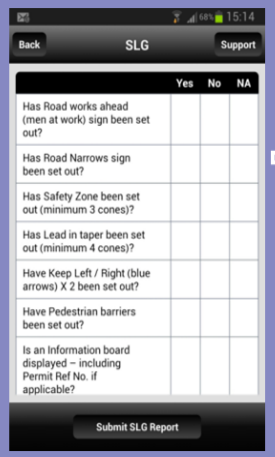
Team / App User	Rank	Fail	Pass	Total Audits Received	% Compliance
Stewart Charnley	1	0	16	16	100%
Michael Bentley	2	0	14	14	100%
Andrew Gaskell	3	0	10	10	100%
Peter Wilson	4	0	8	8	100%
Anthony Dutson	5	0	7	7	100%
Lee Hewitt	5	0	7	7	100%
Kevin Carry	6	0	5	5	100%
Martin Lamb	7	0	4	4	100%
Kevin Finlay	7	0	4	4	
John Slack	8	0	3	3	
Colm Dunican	8	0	3	3	
Mike Towers	9	0	2	2	
Alex Moran	9	0	2	2	
Stephen Butterworth	9	0	2	2	100%
Desmond Sutton	9	0	2	2	100%
John Ramsbottom	9	0	2	2	100%
Liam Bradley	10	0	1	1	100%
Terence McGeehan	10	0	1	1	100%
Alan Ratcliffe	10	0	1	1	100%
Lee Clarkson	10	0	1	1	100%
Simon Lloyd	10	0	1	1	100%
Carl Howard	11	1	9	10	90%
Mark Howarth	12	1	7	8	88%
Michael Muir	13	1	6	7	86%
David Acton	14	2	8	10	80%
David Edwards	15	4	12	16	75%
Jon Jeffries	16	4	5	9	56%
Neil Morton	17	6	6	12	50%
Ryan Kenyon	18	1	0	1	0%

% Compliance
Value: 100%
Row: Martin Lamb
Column: % Compliance

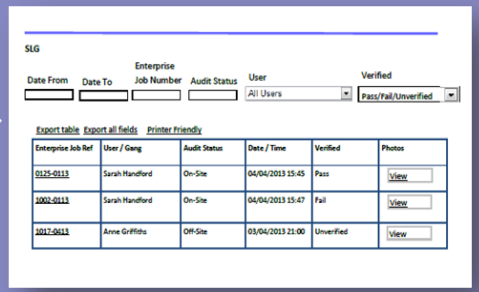
Think Safe Be Safe

Technology

- Developed the Acumen Street works App
- Implemented Contract-wide through smart phones
- Created an Internal Audit Team for 100% inspection and real time response to risks/ failures



SLG data captured live on site via smartphone app



Audit data and images reviewed live by Compliance team. M.I also driven from portal

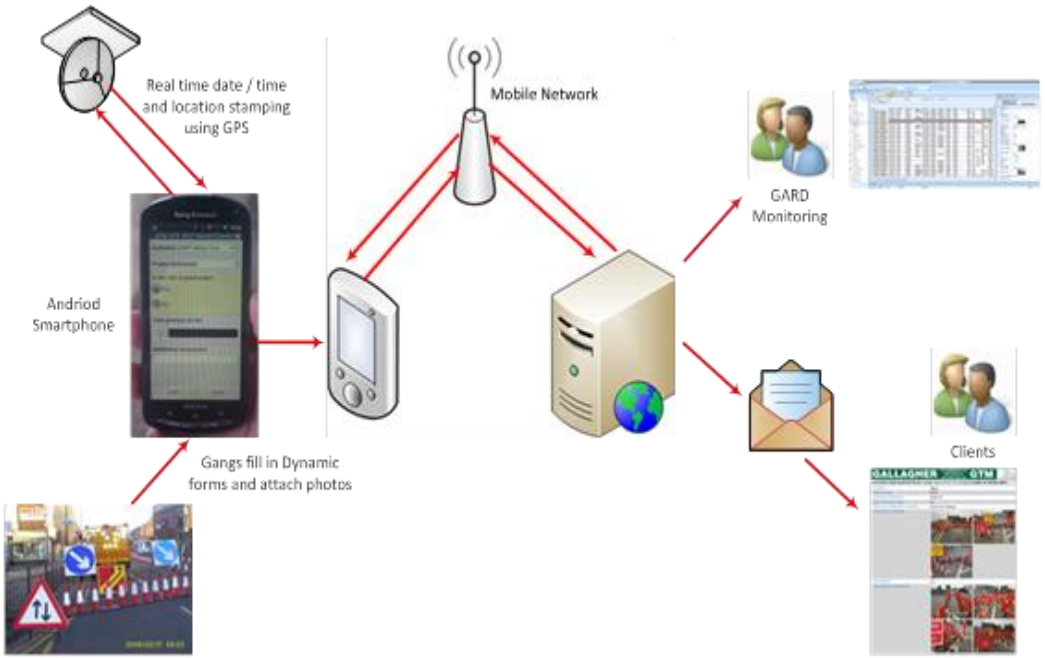
Non compliance is immediately fed back to gang on site

Gang correct non-compliance and resubmit audit

Think Safe Be Safe

Technology cont.

GARD App - Our Supply Chain are on the same journey with us



GARD
Gallagher Access to Remote Data

Think Safe Be Safe

Technology

Example Acumen audits following site set up:

“Pride in what we do”

Think Safe Be Safe

Change in Behaviours

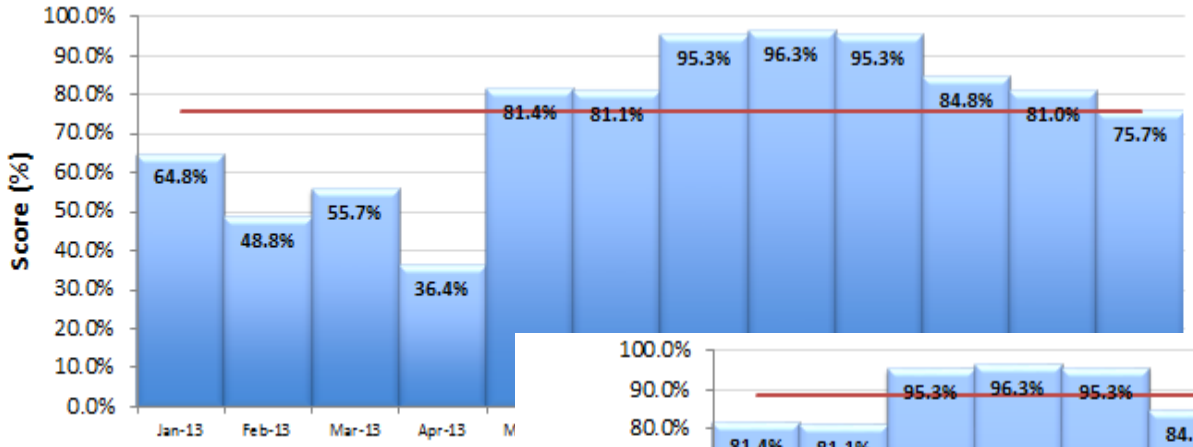
Example Acumen audits following off site:

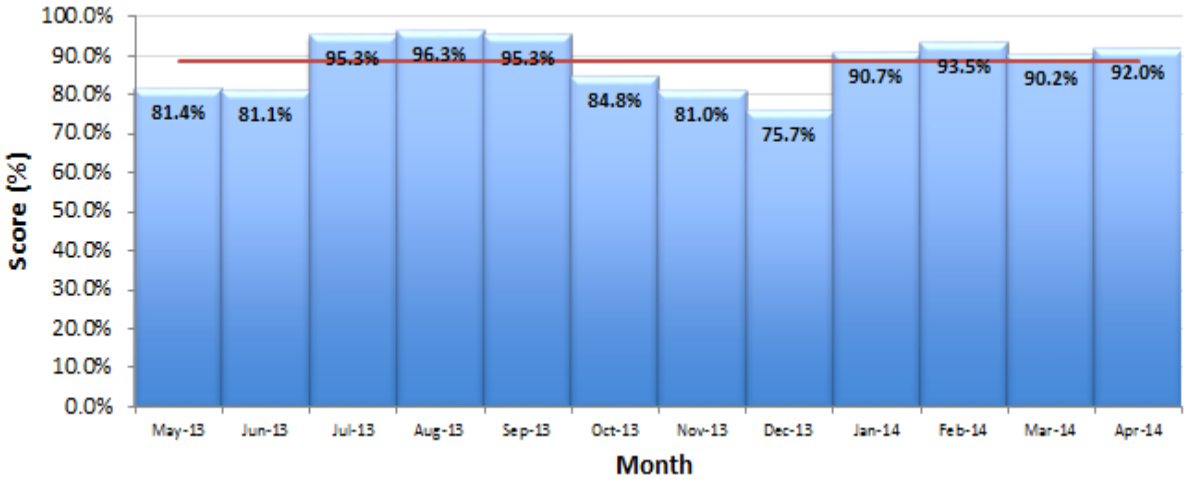
"Checking you are checking!"

Think Safe Be Safe

Results

Third party auditing across all works:



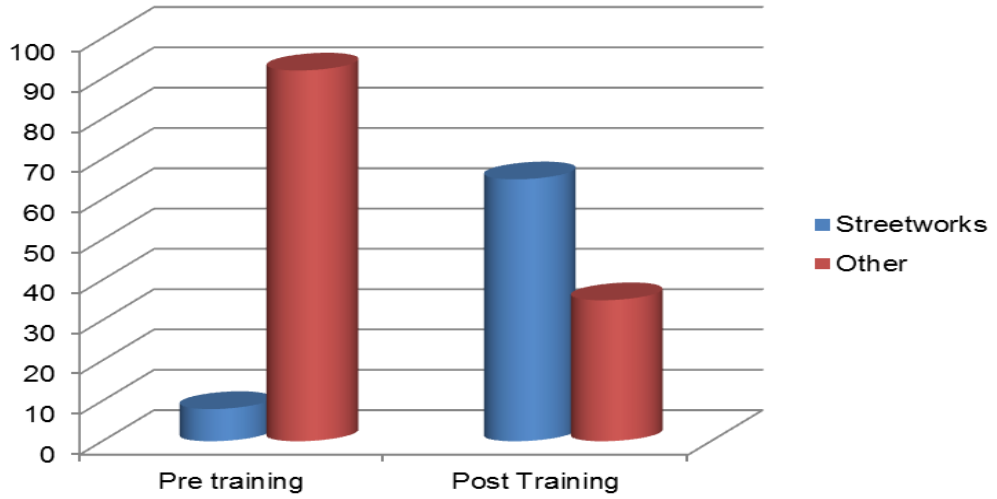


From sub 50% compliance to sustained 90%+

Think Safe Be Safe

Safety Focused

- Zero RIDDORs on Water activities in the last 18 months
- Close Call Reporting has changed dramatically with an historical 8% of reports being Street works related now increasing to 65%



Next Steps

- Virtual Supervision with 100% audit regime
- Technology to be implemented across the whole of Amey’s Utilities contracts
- Looking to provide self assurance evidence for all works through EToN6 attachments facility

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Delivering the Vision Day

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Questions?

Micro-Trenching

for Fibre Broadband Deployment

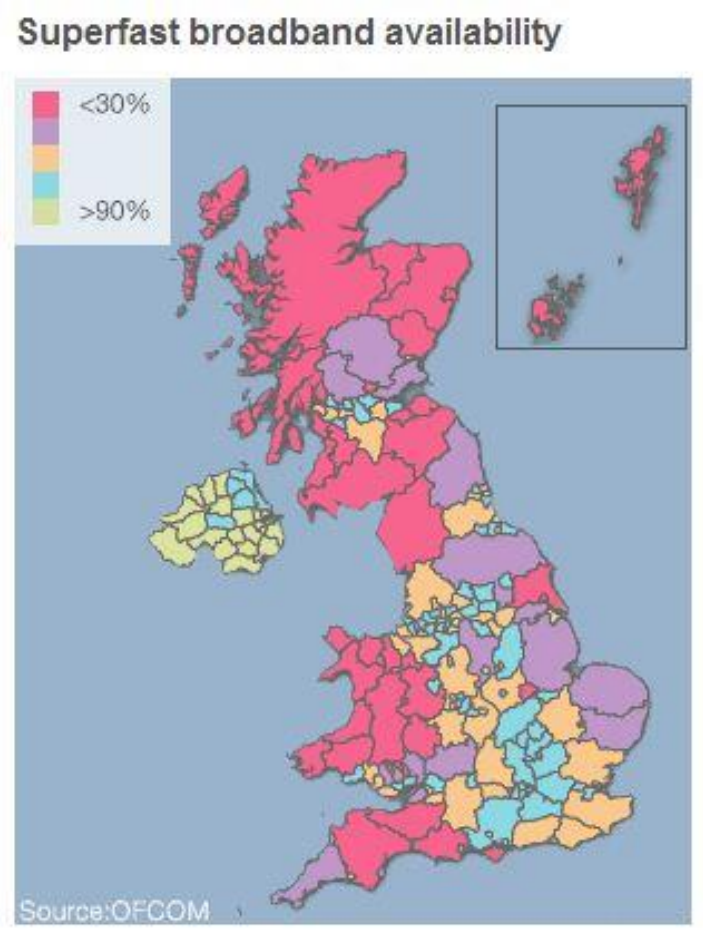
Mike Harper – **Development Director, Stirling Lloyd**

Chairman - RSTA Crack Sealing & Joint Repair

k® Microtrenching Reinstatement

- Why Micro-trench?
- Limitations of traditional reinstatement
- Incorrect approaches
- What's required?
- New HAUC Guidance
- Step by step examples

What is the issue?



- Time is running out … UK committed to 90% homes passed by 2015
- We're getting there …… but not fast enough
- It is getting harder (and more expensive) to pass each home

(July 2013)

The pressure is building for network rollout

"Rural Broadband Verdict – Too Little Too Late" BBC News September 2013

"Whole programme 2 years behind schedule" National Audit Office, July 2013

"Only 9 of 44 rural areas would reach targets for high speed internet by 2015 – 4 could also miss the 2017 target"
National Audit Office, July 2013

What is the issue?

- FTTC was the obvious choice
- What comes next?
- How is the balance of the infrastructure installed?
- Is traditional trenching suitable / acceptable / desirable given the size of the task?

k® The Micro-Trenching revolution

Superfast deployment

- Typically 6x faster than open trenching
- 600 ln m per day typical on a trunk route
- Less disruption to the public
- Less traffic congestion

(Fibre deployment, Shetland, 2010)

Why Micro-trench?

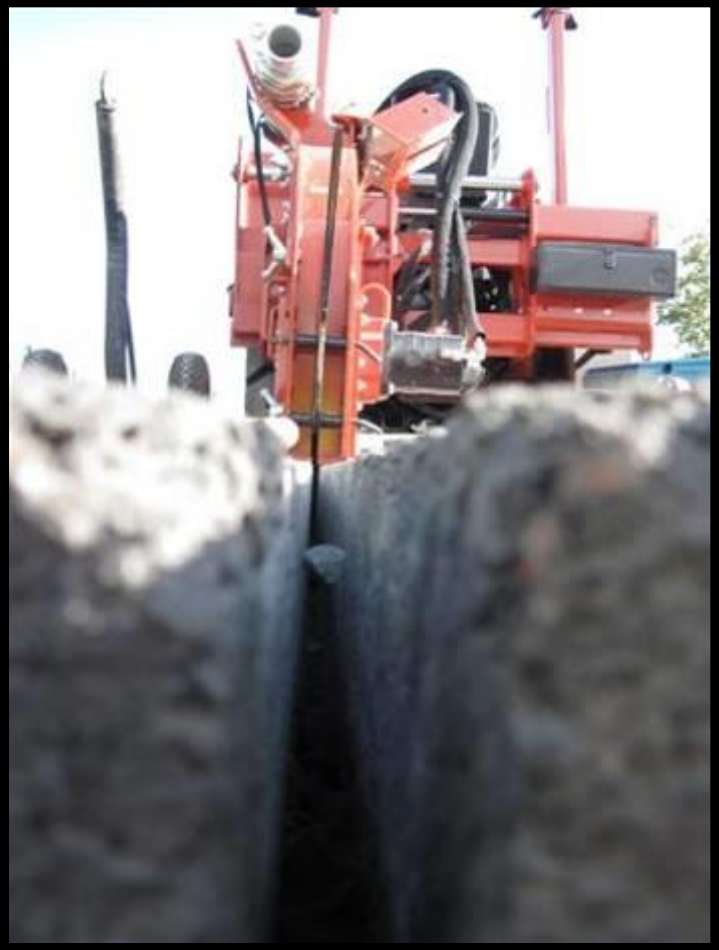
2 - Lower Environmental Impact

- Significantly less waste created to be disposed of
- Less new materials imported
- Fewer truck movements
- Less traffic congestion

- All this means lower CO_2

(Fibre deployment, Galway, 2011)

Why Micro-trench?



3 – Lower Impact

- Lower long term maintenance costs - no secondary compaction / sunken trenches
- Less damage to the highway asset (shallower – less impact on sub-base and other services)

All desirable ….. So what's the problem?

What is the problem?

- Traditional reinstatement materials (macadam & asphalt) were not designed for this.
- Can't place hot asphalt / macadam in a 20mm wide slot
- Can't compact adequately in a slot
- Pouring neat bitumen is not the solution (no strength or skid resistance)
- Trying to tamp cold lay asphalt? Early failure due to lack of compaction
- Most methods will let water into the pavement!!

Incorrect approaches and why?

1. Cement grout (tried in Israel)
   - Not flexible
   - No bond to asphalt
   - Cracking / water ingress
   - Slow strength gain

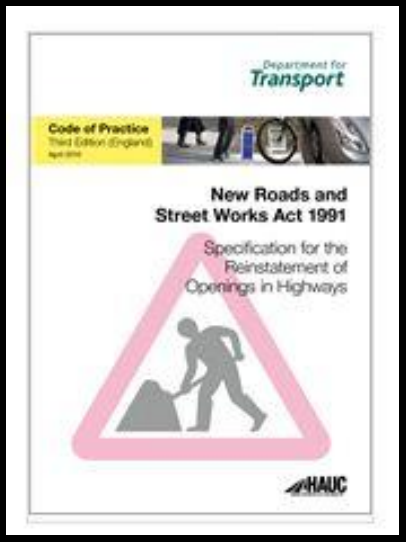
2. Epoxy Mortar (tried in Bournemouth 2008/09)
   - Not flexible
   - Long cure time = greater disruption
   - Cracking / water ingress

2. Cold lay macadam (tried in Dublin)
   - Needs adequate compaction to achieve cohesion
   - Little bond to cut asphalt edges
   - Ineffective seal – water ingress
   - Lack of cohesion

So what do we need to reinstate a micro-trench effectively

- A fluid material that will penetrate - needs no compaction
- Good bond strength to the cut asphalt
- Supports the cut edges of the asphalt
- Compatible flexibility with asphalt
- No shrinkage
- Waterproof seal
- Skid resistance
- Dimensional stability under traffic
- Fast return to service
- BBA / HAPAS approval

New HAUC specification



HAUC (UK)
HIGHWAY AUTHORITIES & UTILITIES COMMITTEE

- New HAUC documents – supplement to the Specification for Reinstatement of Openings in Highways:

1 – New / Designed Roads

2 – Shallow Construction & Evolved Highways

- Publishing May 2014

Successful Safetrack Microtrench Installations

- **South Wales** – Safetrack approved for use by the Welsh Assembly for microtrenching on trunk roads
- **Shetland –** Safetrack products successfully used on all 4 phases
- **Galway** – Safetrack products used in several phases
- **Bournemouth** – multiple products tried without success. Safetrack products were the only ones accepted by Bournemouth CC.

Also in use in Israel, South Africa, Sweden currently

Micro-trenching

Step by step through the process

k® Cutting

- Cutting machine type is very important
- Match the duct to the cut size
- Avoid oversize cutting
- 20mm cut / 16mm duct is ideal where possible

k® Cutting

- Dry cutting is a clean process - no slurry waste from wet cutting
- Vacuum extraction "hoovers" dust from the slot
- Cutting depth is constant
- Overbreak along the cut is minimal
- This Marais machine is narrow for pavement working
- Cutting speed is the rate determining process

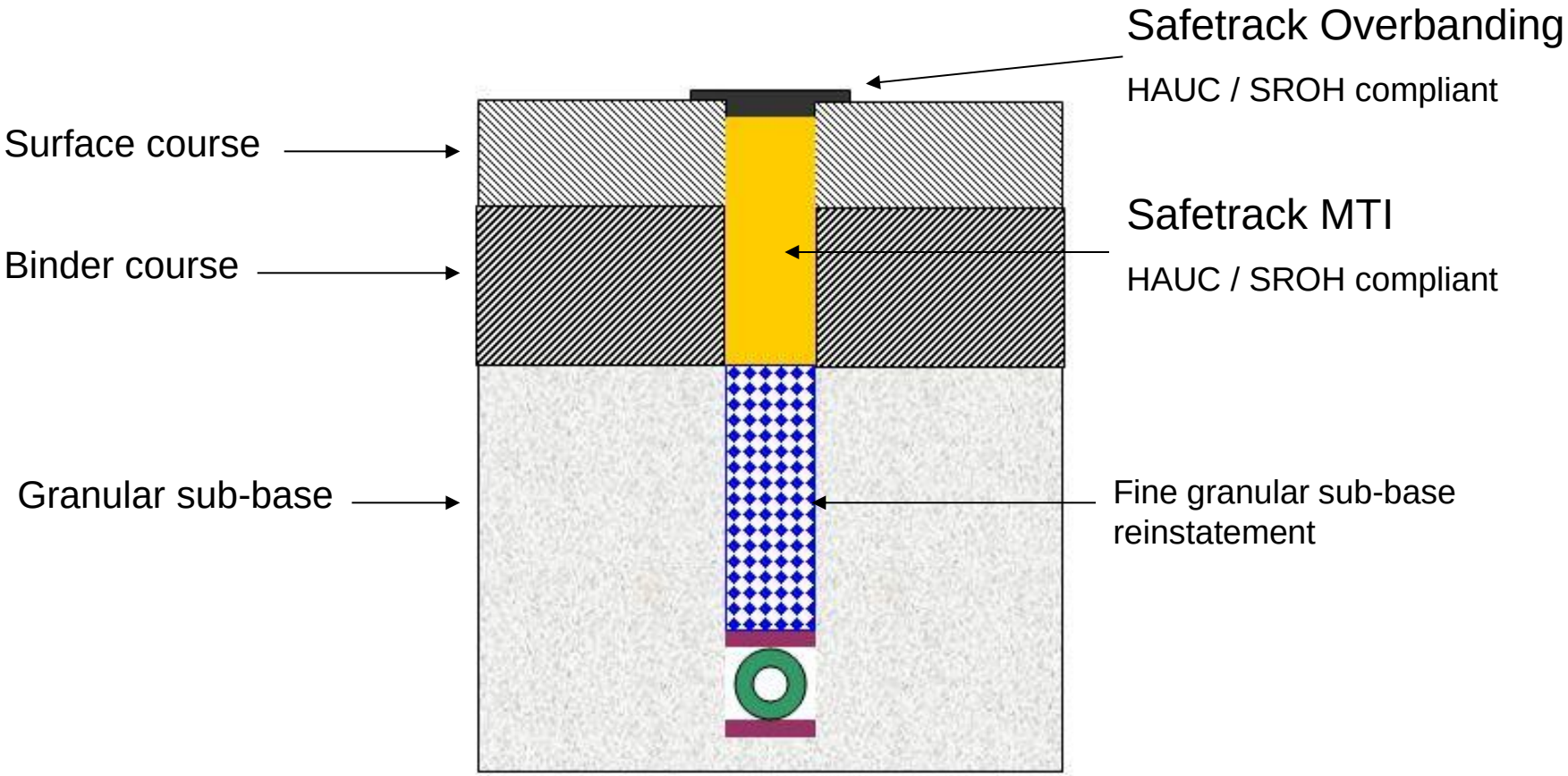
k® Installation

- Protection strip into the bottom of the micro-trench
- Microduct – with or without fibres – is installed
- A protection strip is applied over the duct
- The microtrench is now ready to be permanently reinstated

k® Reinstatement

- Installing Safetrack MTI into the microtrench
- Cold process – simple and accurate placement
- Can use yellow indicator below the surface to avoid future damage
- BBA / HAPAS approved product

Micro-trench reinstatement specification (evolved road example)



k® Reinstatement

- Process train approach moves continuously along the road
- All the processes are in this image
- Rapid cure of the reinstatement means minimal traffic management behind the works
- 600 ln m per day complete installation

k® Reinstatement

- Completed micro-trench
- Fibre duct installed at 150mm deep
- Safetrack permanent reinstatement (HAPAS approved – HAUC compliant)
- Up to 600 ln m per day completed and returned to service same day (Shetland rural roads)

The alternative?

- Traditional trench dig would be 6x slower
- Would create much more disruption for residents and road users
- Uses far more material and creates much more waste
- Far higher carbon footprint
- Much greater damage to the road or pavement asset and likely requirements for more long term maintenance liability (secondary compaction etc)

Final Thoughts ……

Utility firms could be charged £2,500 a day for roadworks

- Just because we have always done it that way…..
- The scale of the task – we need innovative techniques
- Permit schemes mean faster installation required
- New techniques require suitable materials

Thank you

mike.harper@stirlinglloyd.com

Come and see us at our stand

MULTIduct™

Faster, easier and more economical ducting networks

Billy Fairhurst, Business Development Manager

CUBIS
it's about time

Who is CUBIS?

CUBIS is the European market leader in access chamber systems

- Manufacturer of **access chamber systems** and **cable protection systems**
- **£40m turnover** (2013)
- 4 manufacturing sites in the UK and Ireland
- Active in more than 20 countries worldwide
- Accredited to ISO 9001, 14001 and 50001

CUBIS
it's about time

CRH

CUBIS forms part of CRH plc

What CUBIS do

Innovative preformed products for underground network access

Access Chamber Systems

- STAKKAbox™ Access Chambers
- Access Covers
- Accessories
- Security

Cable Protection Systems

- MULTIduct™
- RAILduct™

CUBIS' Customers

CUBIS is active in more than 20 different countries.

Some of our customers include:

Telecoms

BT

Virgin media

france telecom

Rail

NetworkRail

SNCF

Highways

HIGHWAYS AGENCY

Local Govt. Authorities

Power

EDF ENERGY

Water

United Utilities

Scottish Water

YorkshireWater

What is MULTIduct™?

- Multiple duct bank system
- 1m lengths that join to form long runs
- Manufactured in HDPE
- 4, 6 or 9 way options
- Equivalent to 110mm or 160mm duct

What is the alternative?

- Single duct - uPVC, Twinwall
- Spacers

- Replaces installations such as this:

What are the limitations of this?

On certain applications:

- Requires wide excavations to accommodate the duct spacers
- Requires deep excavations due to low-strength of the duct
- Requires specialist backfills and surrounds
- Difficult to pull cables through – cables snag due to imperfect levels

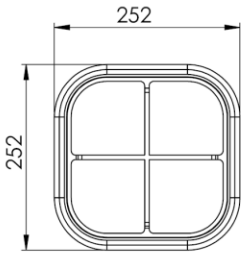
MULTIduct™

The modern system for building multiple duct banks

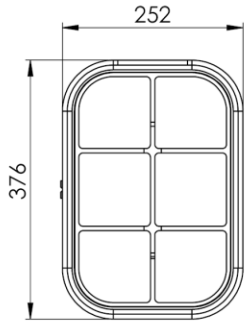
- Fast
- Safe to use
- Economical to install
- Flexible

Product Range

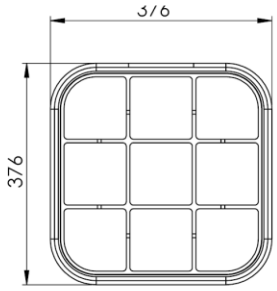
- Four profiles
- Equivalent to 110 or 160mm duct
- Total length is 1120mm
- Lay length 1070mm



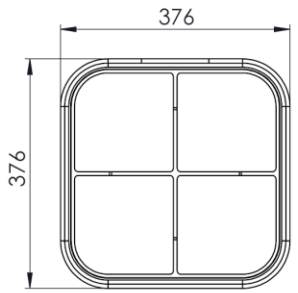
4 way



6 way



9 way



4 way XL

Product Range

MULTIduct™ Unit

Single
Duct
Adapter

Double
Socket

Socket
End Cap

Spigot
End Cap

Product Accessories

Fabricated Units

Flexible Duct

'Y' Lateral

- **used to navigate obstacles and break out**

Connection Method

Standard Steel Clip Assembly Method

1.

2.

3.

4.

Push-Fit MULTIduct™ Assembly Method

1.

2.

3.

- fast
- easy
- secure

Material

- MULTIduct is manufactured from **Nitrogen Foamed High Density Polytheylene**
- High strength to weight ratio
- High UV Stability performance
- Excellent chemical resistance
- Uses up to 70% recycled material

Current Users

NetworkRail

Under Track Crossing

Buried Cable Routes

United Utilities

Telemetry Ducting

Metrolink

Under Track Crossing

Buried Cable Routes

UK Local Authorities

Under Road Crossing

NET

NOTTINGHAM EXPRESS TRANSIT

Under Track Crossing

Buried Cable Routes

HIGHWAYS AGENCY

Bridge Crossings

Under Road Crossings

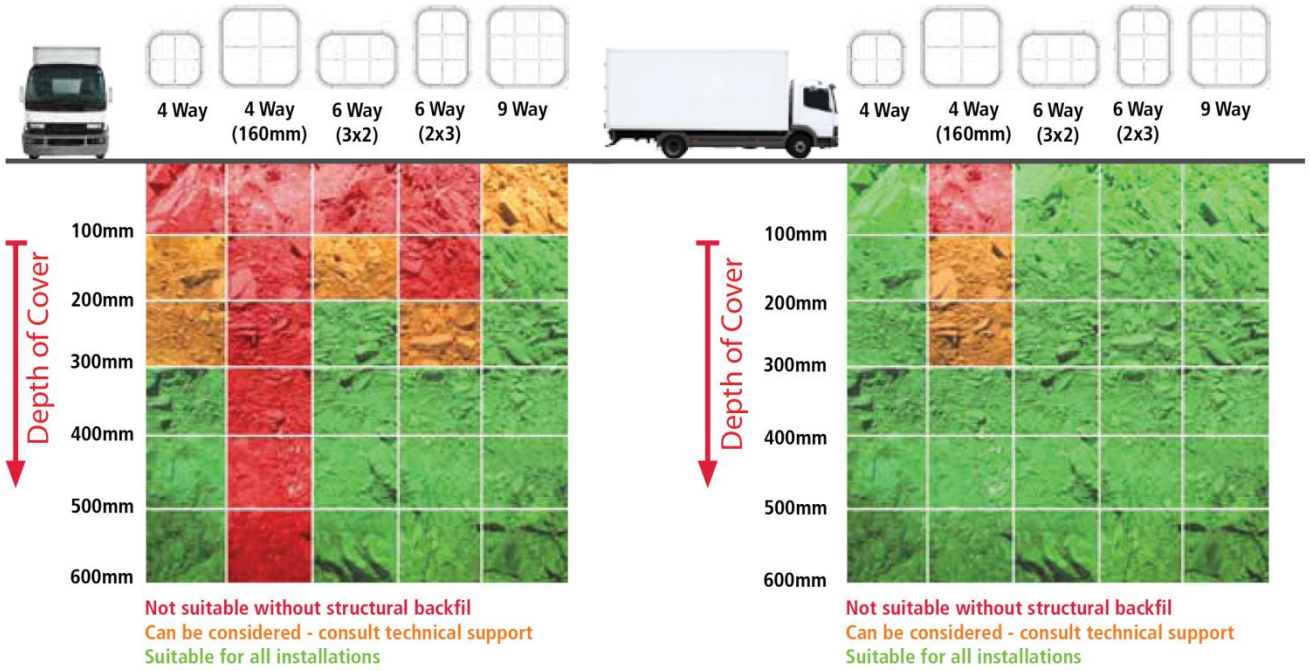
The benefits

Strength

- Can be buried much shallower than conventional duct
- More robust – less breakages and waste on site

The benefits

Strength - potential depth of cover



The benefits

Lightweight

- All parts below 25kg
- Reduced health and safety issues.
- Easy to handle on-site.
- Rapid installation

The benefits

No spacers required

- Narrower trench required.
- No graded backfill between ducts.
- Reduced cost of fitting spacers.

The benefits

Lays straighter and flatter in the trench

- No twisting of individual ducts.
- Cabling easier to carry out.

The benefits

High Capacity inside duct

- Longer cable installations possible.
- Less internal bore surface in contact with a cable.
- Lower pulling forces acting on the cable.

The benefits

Large radius of corners

- Rodents cannot bite through the duct and gain access to the cables.

The benefits

Flexible during installation

- Full range of accessories to overcome bends, break out of runs and interface with standard duct.
- Easily cut on site for termination.

The benefits

Partnership

- Can be shared between utility operators
- Spare capacity could be rented to other operators, providing additonal income

Thank you for your attention

Any questions?

Innovation

Introduction of QR Codes in Utility Street Works

Pradeep Chaubey

Senior Consultant

Email: uk.enquiry@enzen.com

NJUG Delivering the Vision Day

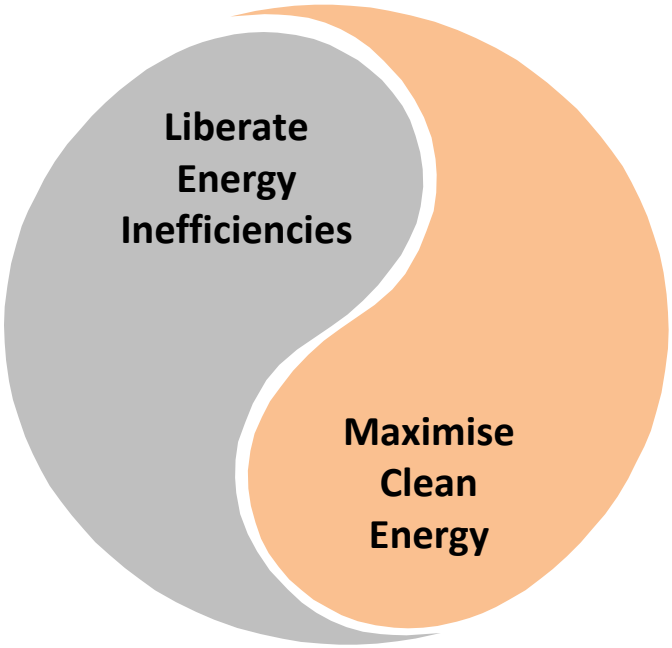
14th May 2014

Agenda

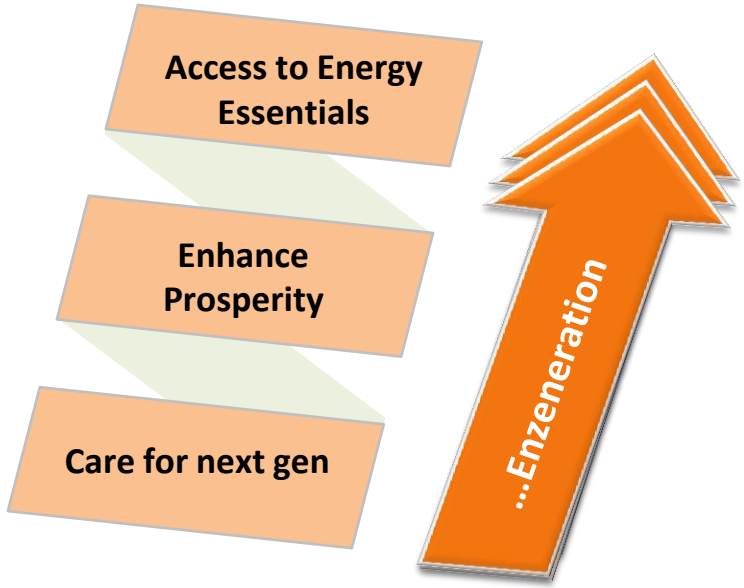
- About Enzen
- What is a QR code?
- NG Innovation Project – Trial phase
- How to use QR Codes
- Expected Benefits
- Future Plan

Enzen Vision

Enzen Focus



The Enzen Way



Enzen Vision is to make energy and water available, affordable and sustainable

- to support economic and social growth

Journey so far

Exclusively focussed on Energy & Utility sector

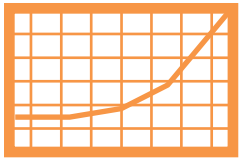
Industry specific Expertise & Frameworks

400+ UK Knowledge Practitioners

Cost effective services delivering customer value

Revenue Growth

Compound annual growth rate (CAGR) of 102% since inception

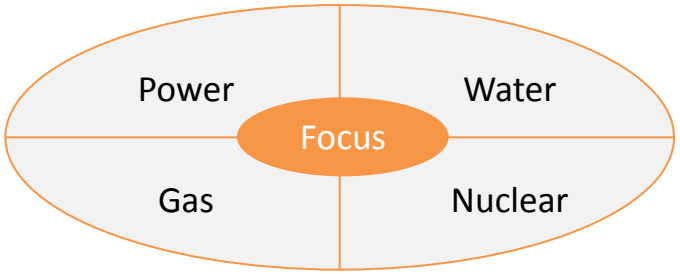


Headcount

Globally: 3,500+

UK: 400+

Industry orientation



Locations

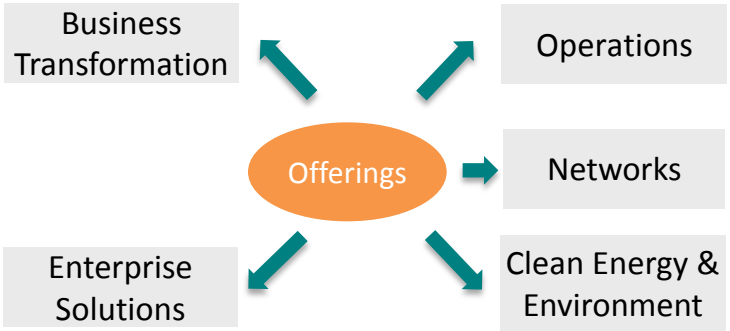
Globally: 25+

UK: 14+

Customers

UK: 40+

Centre's of Excellence



Our approach to Street Works

Focus is on customer, sustained efficiencies, continuous improvements – all drive down costs

Enabler	Operational area of focus
Optimise process capability	• Maximise Grabs utilisation incl dispatch, logistics, etc • Accuracy of information on job cards regarding sites, materials, etc • Operational scenario modelling with forward visibility of planned jobs and materials at depot level to drive better resource management, team productivity and better job response times • Eliminate wastage in operational transactions to maximise productivity e.g. job aborts, interims, etc • Optimise logistics execution e.g. urban/ rural divide, static/ mobile hotboxes and associated depot strategy, etc
Information/ enablement	• Real time operational decision support covering the end to end process • Models that auto-correct and govern the process variances e.g. age profile of jobs, proactive flags for notice expiry, auto escalation mechanisms for inaction on non-compliance, etc • Target cost model approach with stylised jobs; enabled by accurate tracking between requested & actual volumes, self billing with tolerance level tracking, etc
Business Support efficiencies	• Rationalise back office across utility and sub-contractor incl planning, engg support (logistics), scheduling & dispatch, co-ordination, etc • Optimise contractor overheads
Independent quality assurance visible and shared with customer	• Improve operational performance behaviour via league tables and continuous site audits • Customised tool box talks & best practice guides with continuous performance improvement rigour
Governance arrangements	• Joint governance model with business sponsor drives forward decisions across all stakeholders • Reduce contractor side risk overheads • Monitor operational and financial performance against targets
Health and Safety	• Is a given

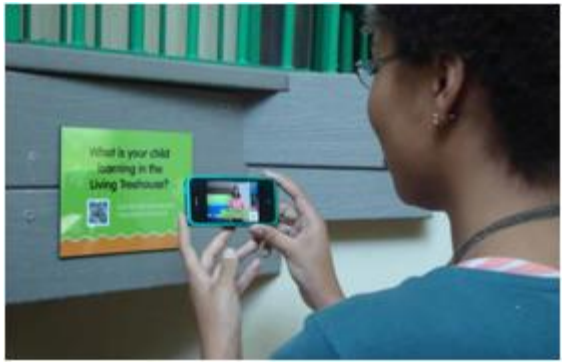
What is a QR Code?

QR Codes

Quick Response Codes – better known as QR Codes:

- First introduced in 1994
- Help guide people to specific information on websites, without the need for typing in full URLs and then stumbling around the site to find the information you want.

Customers can scan the code, using any free QR code app downloaded on their Smart Device



NG Innovation Project – Trial

- Enzen is helping National Grid & their contractors, tRIIO to carry out a 3 month trial posting QR Codes on street work barriers in North London.

- This will help provide more information about those specific works to the public & customers (i.e. Gives **INFORMATION ON DEMAND**)

- The public can simply use any **FREE** QR Codes application on their smart devices to scan the image. This will take them directly to information about the works on roadworks.org.

- Meets a key NJUG objectives in its vision to improve communications for customers.

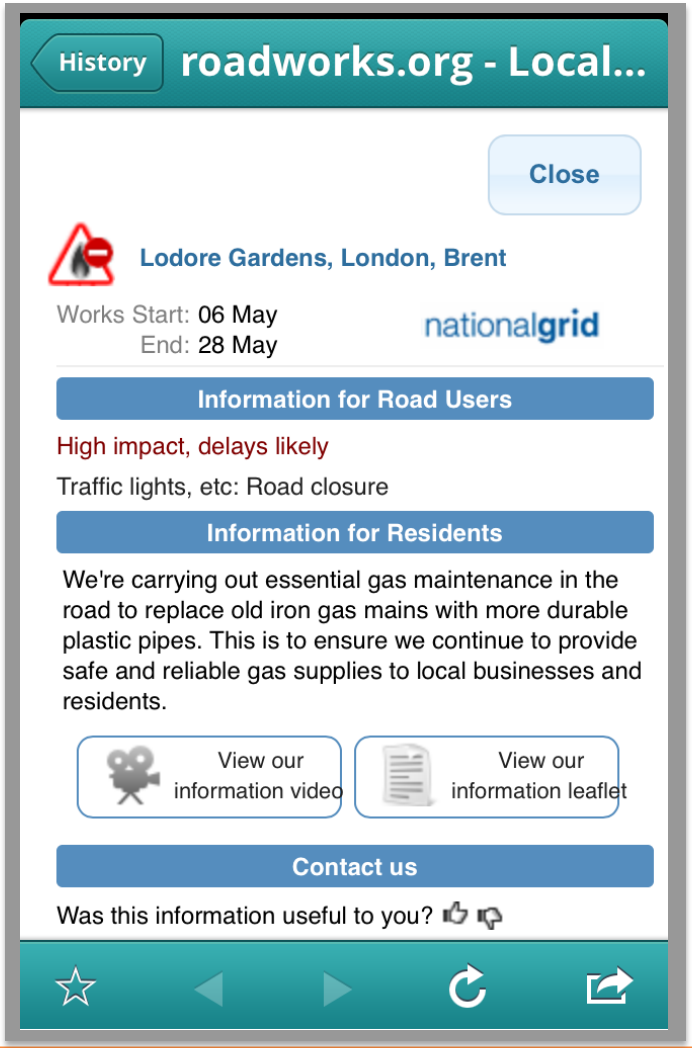
How to scan and retrieve the information

Using any free app on your smart device:

1. Scan the QR Code

2. This will take you directly to the information for those works in Roadworks.org

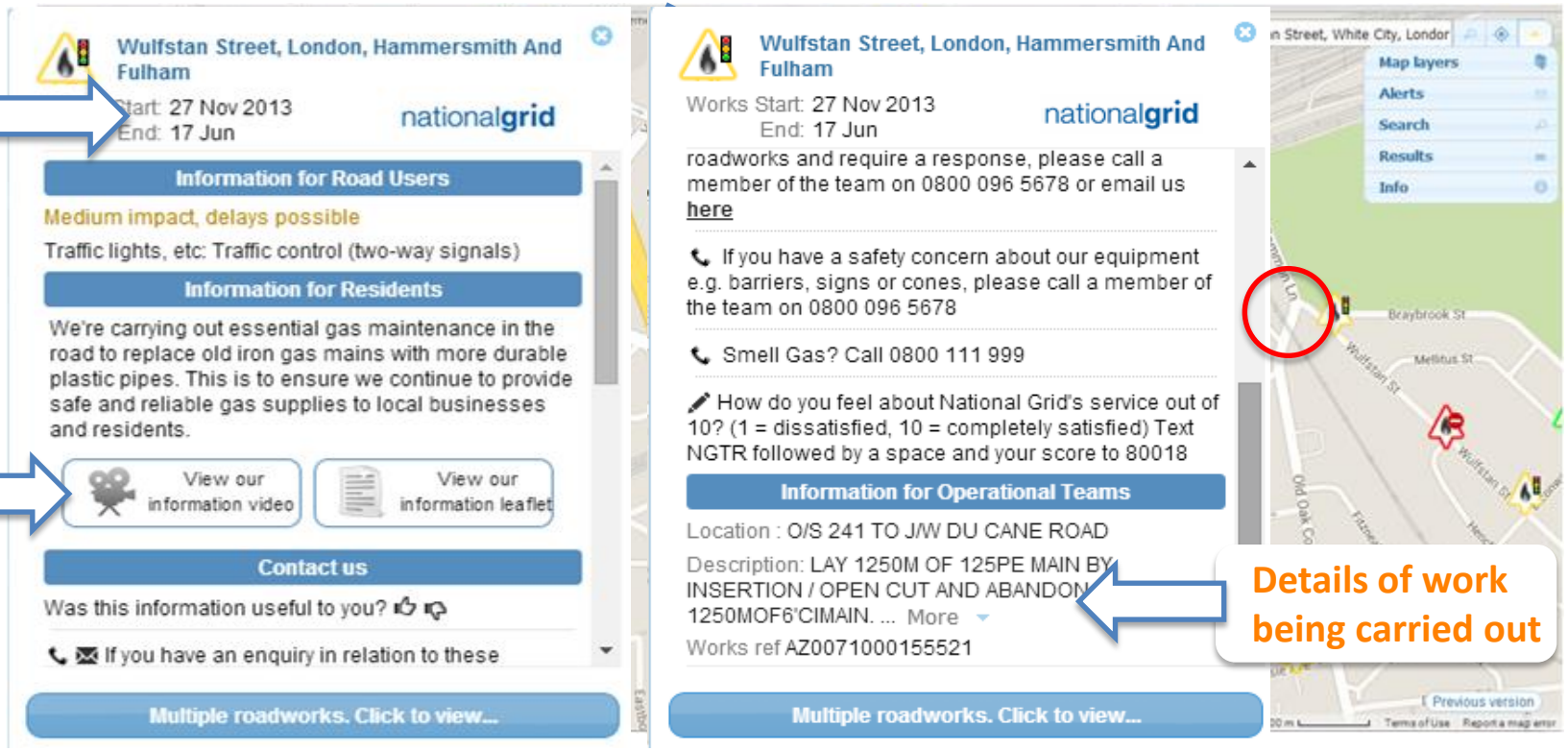
3. (If it does fail to display, it will default to your current location on the map. Select the job from the map and view the information)



What you see when scanning the QR Code

Start & end dates

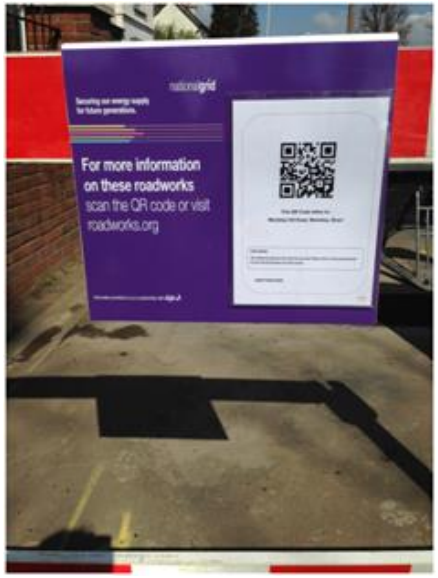
Press here for video



Expected Benefits

Why are we trialling the use of QR Codes?

- Simple to use and a free app for customers
- Provides easy access to information about the works for customers
- Gives information on demand
- Puts the control of information back in the hands of the public
- Improves customers satisfaction ratings
- Reduces phone calls/complaints to utilities, contractors & Local Authorities
- Improves the reputation of utilities
- Helps utilities meet the NJUG Vision for Street works



Stakeholder Engagement

- ✓ Ofgem - Meets their criteria for Network Innovation Allowance initiatives to improve customer engagement
- ✓ Initial discussions with DfT with regard to boards. Further discussions taking place with TfL, HAUC on the scope and objectives of the trial
- ✓ Enzen will discuss progress & feedback with teams & Local Authorities during the trial
- ✓ Enzen will talk to customers to receive feedback, suggestions and any other helpful information they would like to be made available
- ✓ Enzen will meet with other utilities & authorities to see how it could benefit their customers too

Future Plans

- Roll out across the rest of the National Grid & consider how it can also be applied to smaller works
- Discuss with other utilities to see how it can help their customers
- Consider other innovative uses of QR codes that can deliver effectiveness e.g. Gas Replacement letters, customer care cards, Asset Management, Material Management etc.

Will anyone use them?

- 50% of the UK population has a Smart phone (in 2013)
- 44 million Smart phones in UK at end of 2013
- 1.7 Smart phones per household in the UK
- 50% of 55-64 age group will have a Smart phone in 2014
- More people moving away from computers to tablets and Smart phones
- In 2012, 3.3 million users scanned QR codes in the UK
- By end of 2013, 20% of Smartphone users in the UK have engaged with QR Codes (8.7 million people)
- QR codes are an affordable technology

All facts are from the DECC feasibility study on the use of QR codes in the energy sector; January 2014

Summary

QR Codes on Street works will:

- ✓ Provide the public with a simple and free tool to let them find out more about works, on demand
- ✓ Give the public enhanced information & awareness about the works
- ✓ Improve Customer Satisfaction ratings
- ✓ Reduce operational costs for utilities, contractors and Local Authorities as they will need to deal with less enquiries and complaints

QR Codes are simple to use, yet very effective

Thank You

Pradeep Chaubey

Senior Consultant

For any queries, please email me at:

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Tel: +44 (0) 121 506 9270 l Web: www.enzen.co.uk

NJUG

Delivering the Vision Day

Sponsored by United Utilities (helping life flow smoothly) & amey

14th May 2014 at The Museum of Science and Industry, Manchester.

Questions?

NJUG

Delivering the Vision Day

Sponsored by United Utilities (helping life flow smoothly) & amey

14th May 2014 at The Museum of Science and Industry, Manchester.

LAFARGE TARMAC

GALLAGHER

NJUG Vision: Quality – Utilities deliver consistent high quality

Surface Course Air Voids - Road to Compliance

Matthew O'Sullivan (T&K Gallagher Ltd)

Dave Hardy (LafargeTarmac)

Start of the Journey

Objective set in 2011

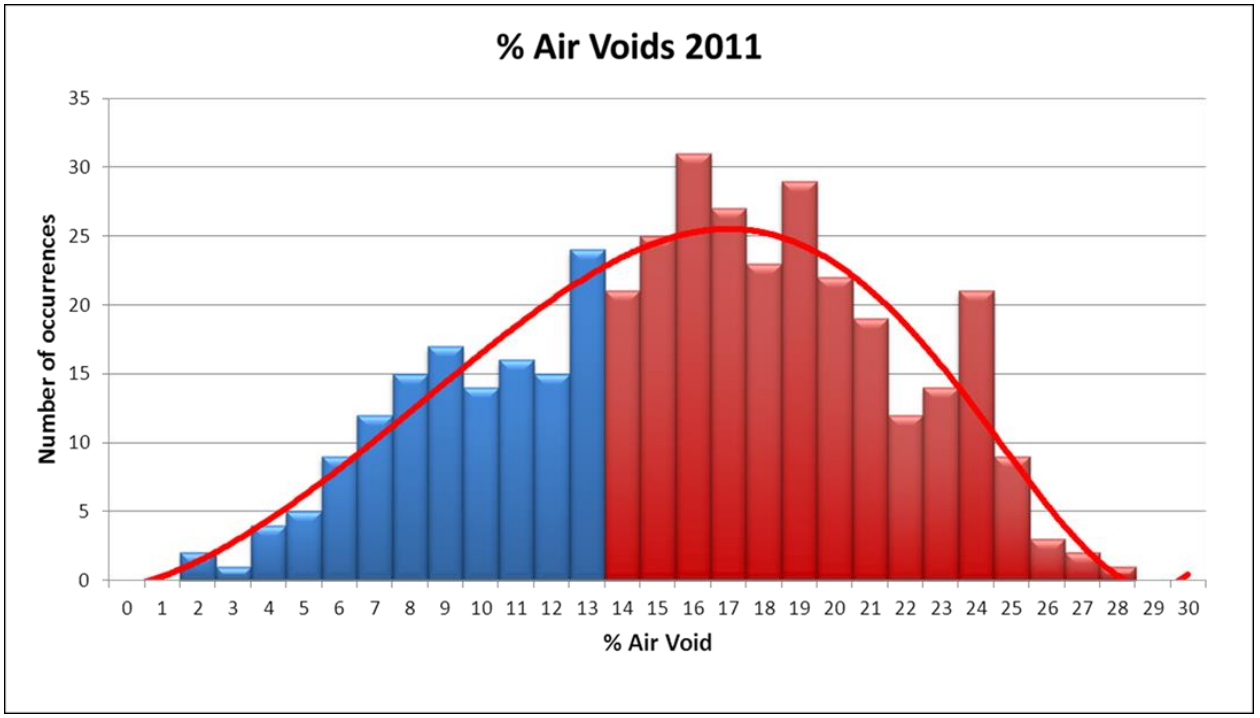
Achieve 100% compliance with the New Roads and Street Works Act in 1991 Specification for the Reinstatement of Openings in Highways (SROH).

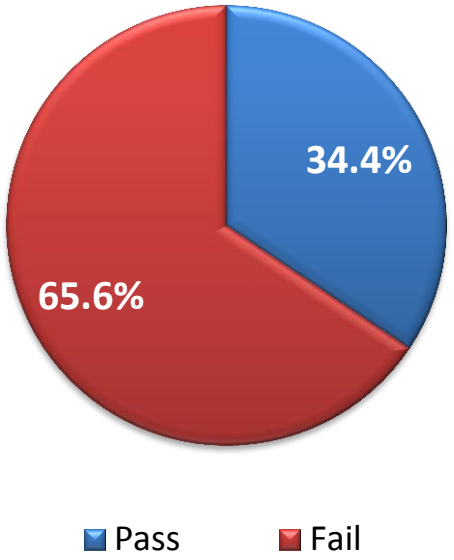
The challenge

Eliminate air void 'cost of failure' with a focus on AC 6mm Dense Surface Course.

REINSTATEMENT
GET IT RIGHT FIRST TIME
REDUCE FAILURES AND AVOID COSTLY, DISRUPTIVE REMEDIALS

Start of the Journey





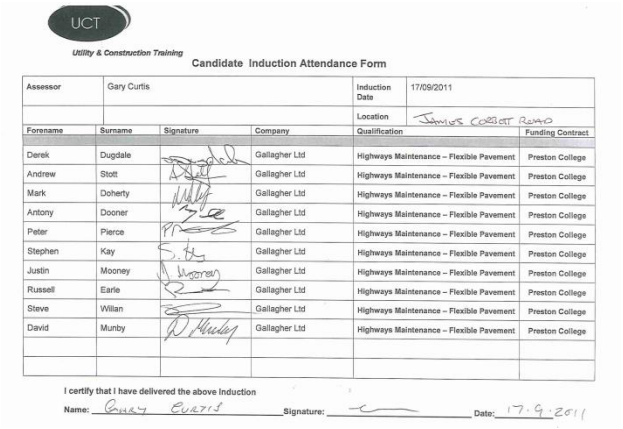
2011 - Key Facts

- 34% compliant
- Range of results from 2% to 28% air voids
- A long way out of specification – even spread of failures between 13% and 24%

Training & Competence

2011 – Training and Competence Focus

- Movement of Operational Control to Compliance.
- Increase in the number of quality inspections completed on every team, followed up with review sessions with teams not complying.
- Production of a training kerb for competency checking of new starters and existing personnel.
- Reinstatement personnel completed a NVQ2 in Highway Maintenance in Flexible Highway Construction.
- Competence checks on grabs and reinstatement teams.
- Backfill and reinstatement in control conditions independently audited by Exova to determine whether the backfill and reinstatement teams were conversant with the SROH.



UCT

Utility & Construction Training

Candidate Induction Attendance Form

Assessor	Gary Curtis			Induction Date	17/09/2011	
				Location	James Corbett Road	
Forename	Surname	Signature	Company	Qualification		Funding Contract
Derek	Dugdale		Gallagher Ltd	Highways Maintenance – Flexible Pavement		Preston College
Andrew	Stott		Gallagher Ltd	Highways Maintenance – Flexible Pavement		Preston College
Mark	Doherty		Gallagher Ltd	Highways Maintenance – Flexible Pavement		Preston College
Antony	Dooner		Gallagher Ltd	Highways Maintenance – Flexible Pavement		Preston College
Peter	Pierce		Gallagher Ltd	Highways Maintenance – Flexible Pavement		Preston College
Stephen	Kay		Gallagher Ltd	Highways Maintenance – Flexible Pavement		Preston College
Justin	Mooney		Gallagher Ltd	Highways Maintenance – Flexible Pavement		Preston College
Russell	Earle		Gallagher Ltd	Highways Maintenance – Flexible Pavement		Preston College
Steve	Willan		Gallagher Ltd	Highways Maintenance – Flexible Pavement		Preston College
David	Munby		Gallagher Ltd	Highways Maintenance – Flexible Pavement		Preston College

I certify that I have delivered the above Induction

Name: Gary Curtis Signature: Date: 17.9.2011

Binder Course Materials	How Measured	Compliant
6mm DSC 100/150	Recording from collection ticket & lab recording of aggregate size & binder content	YES
Surface Course Materials	**How Measured**	**Compliant**
6mm DSC 100/150	Recording from collection ticket & lab recording of aggregate size & binder content	YES

Layer Depths	Material	Layer (lift) Depth (mm)	Compliant	No. Passes	Compliant
Binder (lift 1)	AC 6mm Dense Surf 100/150	30	YES	5*	YES
Binder (lift 2)	AC 6mm Dense Surf 100/150	30	YES	5*	YES
Surface	AC 6mm Dense Surf 100/150	30	YES	10**	YES

Notes: * – SROH requirements

Compaction equipment used: *56kg vibrotamper, **751kg Single drum vibrating roller

Reinstatement surcharge placed prior to compaction (each layer)	Surcharge depth (mm)	% Surcharge	As per manufacturer guidelines
	15	50%	YES

Reinstatement surface profile assessed	Compliant
	YES

- *Air Void Test Results*

Tests undertaken by UKAS accredited test laboratory (full UKAS testing test reports available upon request – see copy below)

- *All air void testing was carried out fully in accordance with the requirements of the SROH, 3rd edition.*

Layer	Material	Bulk Density	Maximum Density	Air Void %	Compliant
Layer 1 (Binder)	AC 6mm Dense Surf 100/150	2242	2465	9.0	Yes
Layer 2 (Surface)	AC 6mm Dense Surf 100/150	2005	2381	15.8	No

Notes: * – SROH requirements

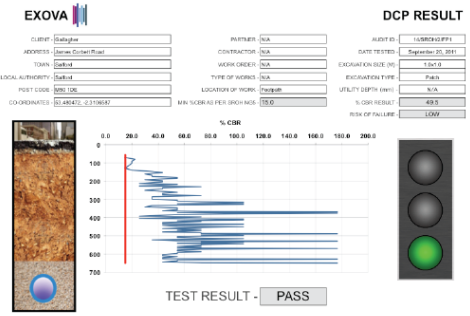
- *Layer 1 (Binder Course) was deemed as Compliant as the air void level was measured to be within the permitted range.*
- *Layer 2 (Surface Course) was deemed as Non-compliant as the air void level was measured to be in excess of the permitted range.*

Changing Techniques

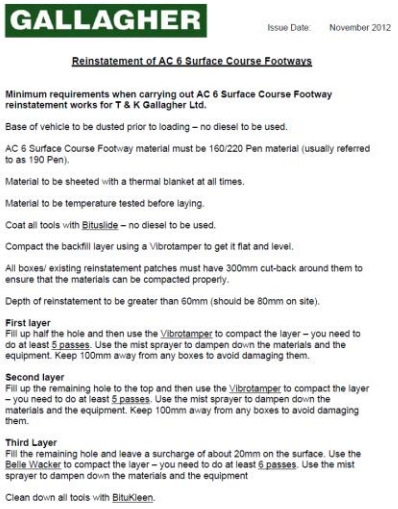
2012 – Techniques Focus

- Exova independent on-site audit compliance checks and DCP testing.
- Testing completed on virgin and recycled backfill materials.
- Gallagher Access to Remote Data (GARD) system introduced to focus on self-regulation.
- Recipe cards introduced with ‘over-specification’ rules to grabs and reinstatement teams

Before	After
1 x 40mm layer 1 x 20mm layer	3 x 30mm layers
AC 6mm DSC 100/150	AC 6mm DSC 160/220
MBR71 Roller Breakers	PCLX320 Belle Streetworks Plates



- *Note – Excavation preparation prior to backfilling was audited and it was recorded as in accordance with S.R.O.H. 3rd edition Appendix 3*
- *Accreditation for all operatives was audited against the NRSWA requirements and recorded as “acceptable”.*
- *The location of the excavation selected was in a controlled environment. It was under cover and protected from the elements throughout the audit.*
- *The weather was fine and dry with an ambient temperature of 14°C.*


GALLAGHER

Issue Date: November 2012

Reinstatement of AC 6 Surface Course Footways

Minimum requirements when carrying out AC 6 Surface Course Footway reinstatement works for T & K Gallagher Ltd.

Base of vehicle to be dusted prior to loading – no diesel to be used.

AC 6 Surface Course Footway material must be 160/220 Pen material (usually referred to as 190 Pen).

Material to be sheeted with a thermal blanket at all times.

Material to be temperature tested before laying.

Coat all tools with Bituslide – no diesel to be used.

Compact the backfill layer using a Vibrotamper to get it flat and level.

All boxes/ existing reinstatement patches must have 300mm cut-back around them to ensure that the materials can be compacted properly.

Depth of reinstatement to be greater than 60mm (should be 80mm on site).

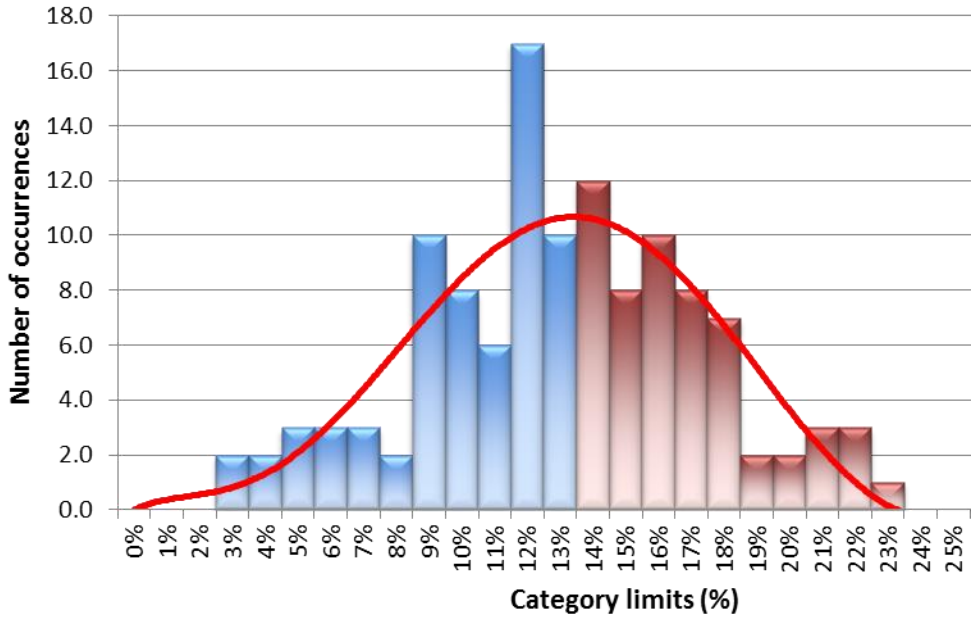
First layer
Fill up half the hole and then use the Vibrotamper to compact the layer – you need to do at least 5 passes. Use the mist sprayer to dampen down the materials and the equipment. Keep 100mm away from any boxes to avoid damaging them.

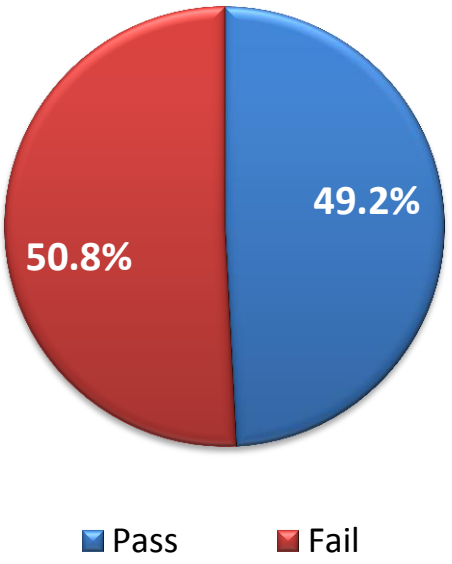
Second layer
Fill up the remaining hole to the top and then use the Vibrotamper to compact the layer – you need to do at least 5 passes. Use the mist sprayer to dampen down the materials and the equipment. Keep 100mm away from any boxes to avoid damaging them.

Third Layer
Fill the remaining hole and leave a surcharge of about 20mm on the surface. Use the Belle Wacker to compact the layer – you need to do at least 6 passes. Use the mist sprayer to dampen down the materials and the equipment

Clean down all tools with BituKleen.

2013 – Still Not 100% Compliant





2013 - Key Facts

- 51% compliant
- Range of results from 3% to 23% air voids
- Reduced failure range - most failures between 13% and 18%

Improving Materials

Focus on Materials

- High levels of air voids failure is common across the Industry using standard AC 6mm Dense Surface Course (DSC).
- SROH Prescribes materials permitted on footways – usually AC 6mm DSC.
- Alternative materials require approval for use – difficult with so many highway authorities across the UK.
- Can ‘standard’ materials be made more user friendly to help reduce failure levels?
- Investigate air voids in AC 6mm DSC mixes using laboratory sample preparation and testing:
  - 50 Compaction blows at standard temperature.
  - 20 Compaction blows at minimum delivery temp.
  - 20 Compaction blows at lower temperature.

- Optimise mix composition to achieve lower air voids.

S8 Footways, Footpaths and Cycle Tracks

S8.2.3 Alternative Reinstatement Materials

Alternative Reinstatement Materials may be laid at sub-base level, in accordance with Appendix A8.

S8.2.4 Reinstatements Adjacent to Roads

Where road construction layers, foundation platforms, structural courses, kerb beams and/or backing providing the edge support to the road structure are found to extend below an adjacent footway, footpath, cycle track or verge, any reinstatement therein shall take account of such provisions.

In such cases, the sub-structure of the footway, footpath, cycle track or verge shall be reinstated to match the existing layer thickness with similar or equivalent materials.

S8.3 Surface Reinstatement

S8.3.1 General

Surface reinstatement options are shown in Appendix A7, subject to the following exceptions:

S8.3.2 High Duty and High Amenity Areas

1) The Authority shall register all high duty and/or high amenity footways, footpaths or cycle tracks and shall identify a suitable source or supplier of reinstatement materials.
2) The Undertaker shall reinstate all registered High Duty/High Amenity footways, footpaths or cycle tracks with matching materials from the identified source or supplier.
3) Where aggregates of an especially distinctive colour are encountered and the local custom and practice has been to complete all previous surfacing in a similarly matching material, the reinstatement shall be in accordance with S6.4.5.4.

S8.3.3 Areas Surfaced with Asphalt Concrete

Footways, footpaths or cycle tracks surfaced with Asphalt Concrete shall be reinstated with an AC6 dense surf, unless the existing surface is an asphalt that is significantly finer than 6mm nominal size, in which case it may be regarded by the Undertaker as either Asphalt Concrete or Hot Rolled Asphalt and reinstated accordingly.

S8.3.4 Other Asphalt Areas

1) Where the Authority has maintained a policy of using and reinstating with a specific type of asphalt surfacing on footways (e.g. mastic asphalt, sand asphalt, etc.), unless otherwise agreed with the Authority, the Undertaker shall take all reasonable measures to reinstate excavations with such material.

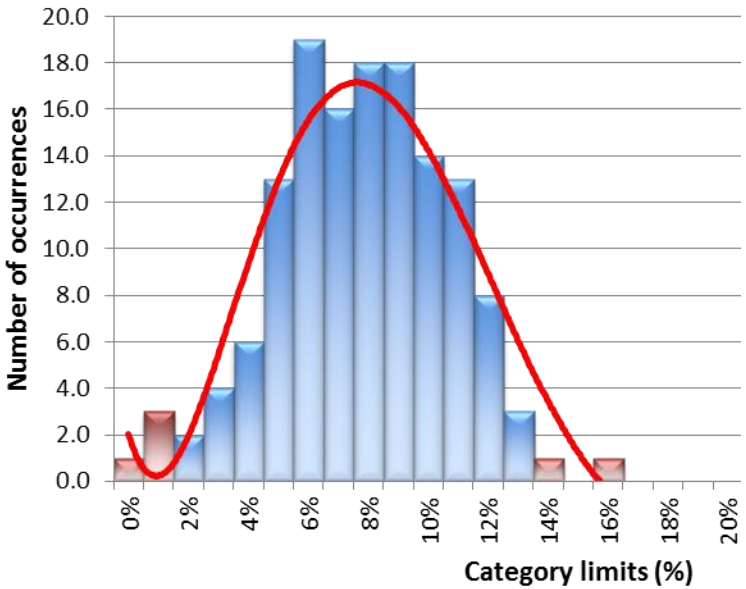
69

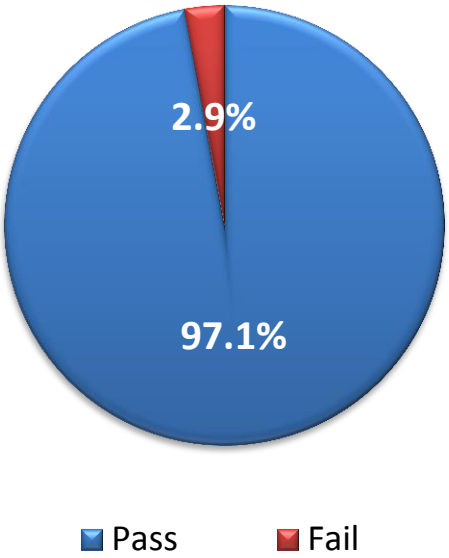
‘Enhanced’ AC Materials

New Materials

- Mix composition can have a big impact on compactability.
- Fully compliant material can be hard to compact, particularly under non-ideal conditions resulting in high levels of failure.
- Aggregate grading and binder content have a significant impact on compactability.
- Optimised materials could be compacted to lower voids under the same conditions.
- For AC surface course in carriageways AC10mm Close Graded 100/150 specified.
- Mix optimisation process repeated for the 10mm product.
- Enhanced range of AC materials launched in late 2013.
- AC 6mm Dense Surface Course 160/220 or 100/150.
- AC 10mm Close 100/150.
- Comply with PD6691 composition limits – meet SROH requirements.
- 3% lower voids compared to ‘typical’ mid-specification mix.

2014 – The Results





2014 – Key Facts

- 97% compliant to date
- Range of results from 0% to 16%
- April 2014 – 100% compliant in independent random testing

End of The Journey

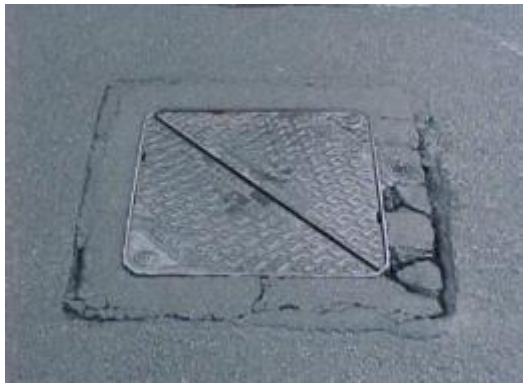
Summary

We have only achieved this level of compliance by:

1) Increased Training and Scrutiny
2) Changing Behaviours and Mind-sets
3) Introducing Non-Industry Standard Equipment
4) Adopting Alternative Methods
5) Using Previously Unavailable Materials

STREET IRONWORK INSTALLATION BEST PRACTICE

"Reducing cost through collaboration"



PAM SAINT-GOBAIN

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SAINT-GOBAIN - 1000 companies in 64 countries 190,000 colleagues

Innovative Materials

Flat Glass

- N
- N
- C
- C

High-Performance Ma

- N
- C
- N

21%

of 2013 consolidated net sales

Construction Products

n 55

25%

of 2013 consolidated net sales

Building Distribution

45%

of 2013 consolidated net sales

Packaging Verallia

- **No. 2** worldwide bottles and jars
- Operations in **14** countries
- **14,000** employees

9%

of 2013 consolidated net sales

PAM SAINT-GOBAIN

is the global brand of the pipelines division

Construction Products

- **No. 1** worldwide in ductile cast iron pipe
- **No. 1** worldwide in plasterboard and plaster
- **No. 1** worldwide in insulation
- **No. 1** in Europe for wall facings
- **No. 1** worldwide for tile adhesives
- **No. 2** in the United States in siding products
- Manufacturing operations in **55** countries
- Nearly **47,000** employees

Pont a Mousson

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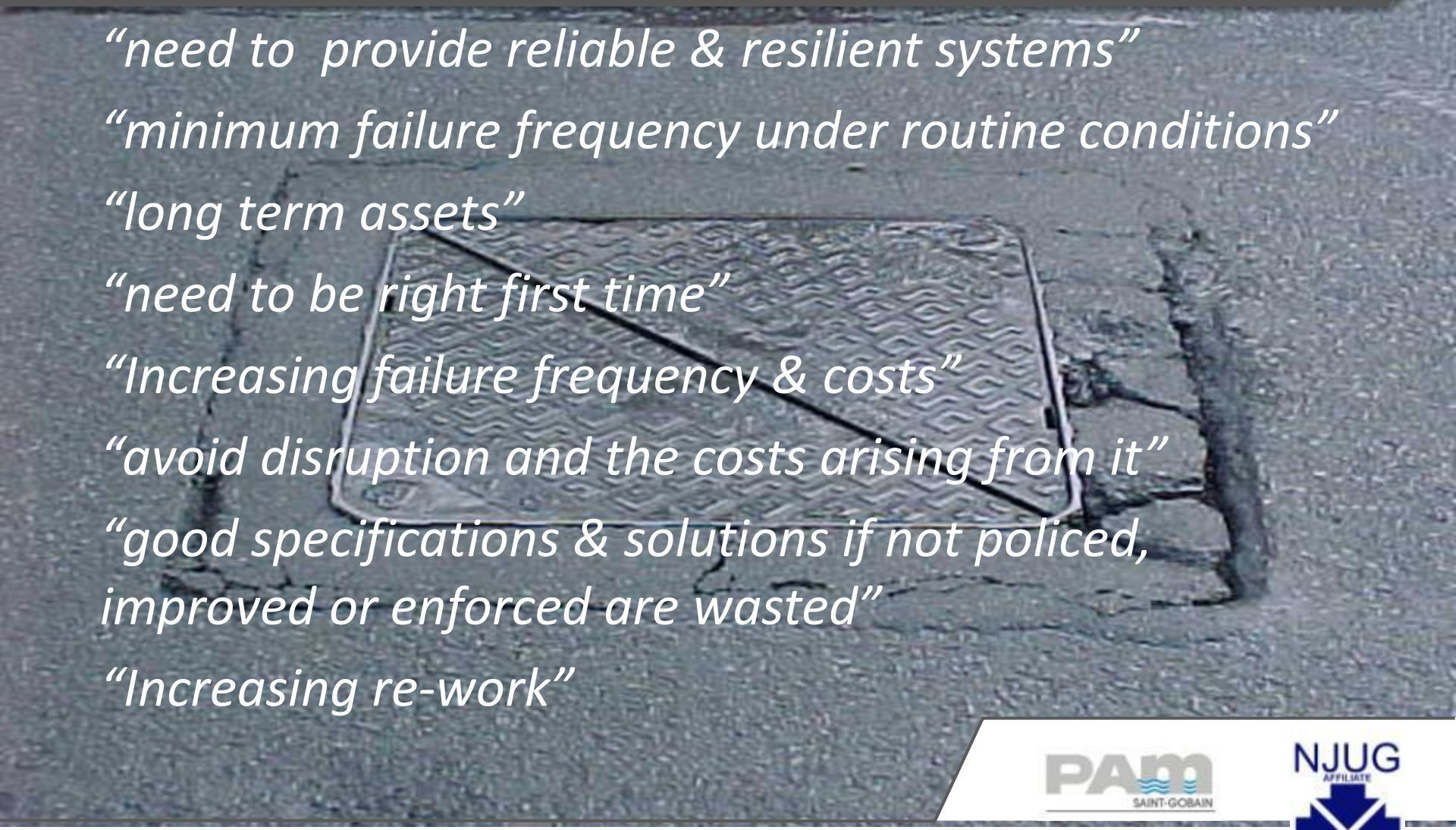
What do you say about street ironwork ?



“need to provide reliable & resilient systems”

“minimum failure frequency under routine conditions”

“long term assets”

“need to be right first time”

“Increasing failure frequency & costs”

“avoid disruption and the costs arising from it”

“good specifications & solutions if not policed, improved or enforced are wasted”

“Increasing re-work”

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A changing environment

As traffic speed and intensity increases the solutions and methods used to install and maintain street ironwork needs to evolve in order to provide a resilient and reliable network

Typically c.£200m is spent on replacing or reinstating ironwork each year

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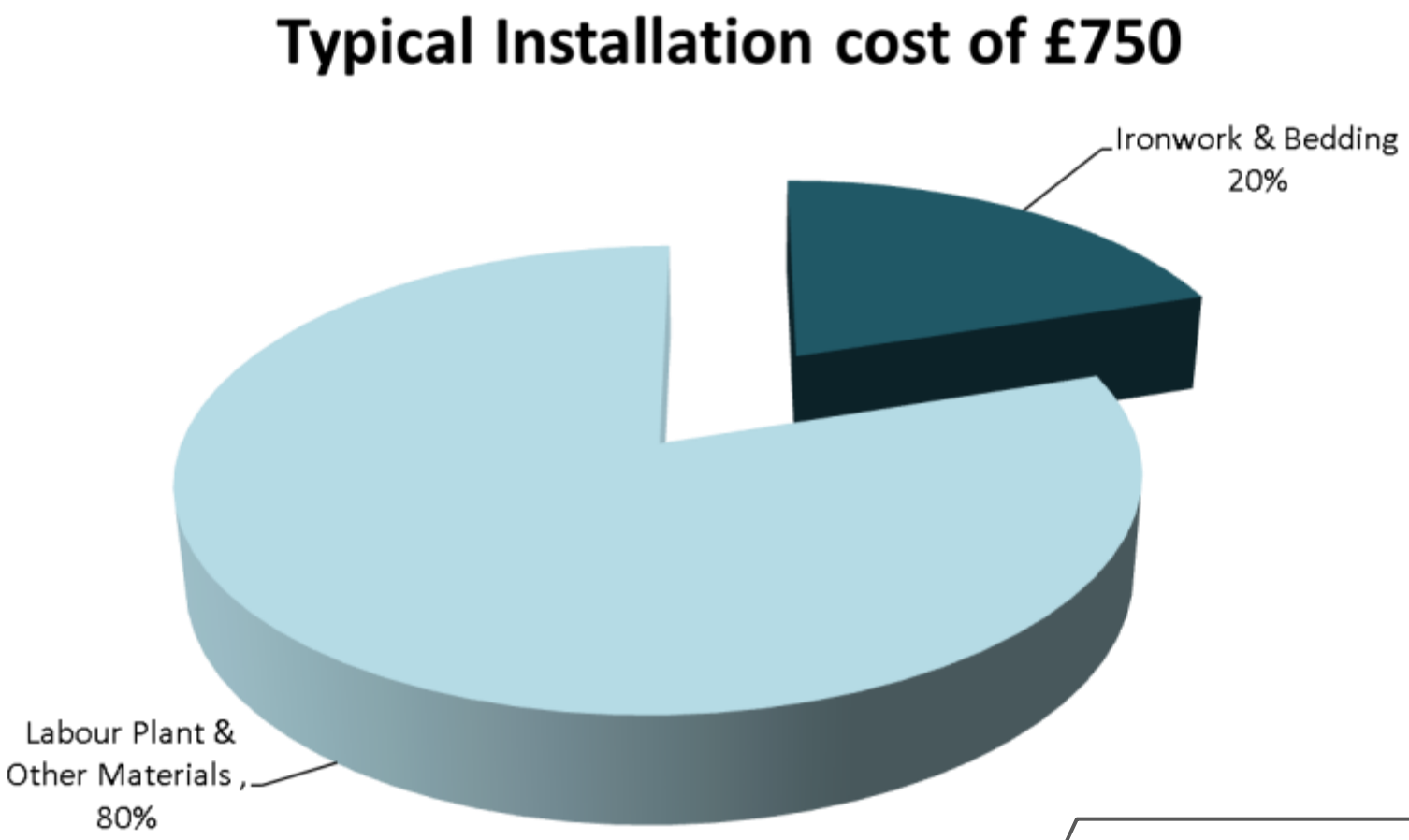
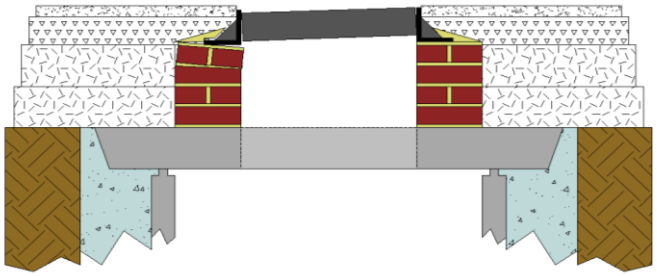
Whole Life Cost v Purchase Price



What causes an installation to fail ?

Failure of Bedding and Jointing Mortar

Sunken Cover and Frame



- Poorly designed or poor quality castings
- Incorrectly specified or selected products
- Use of high inferior bedding materials
- unstable or damaged chamber or sub-structure
- Time

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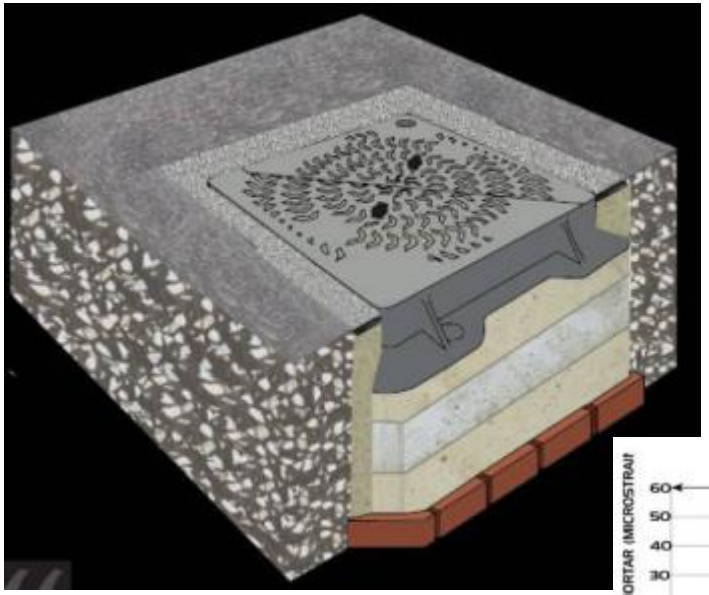
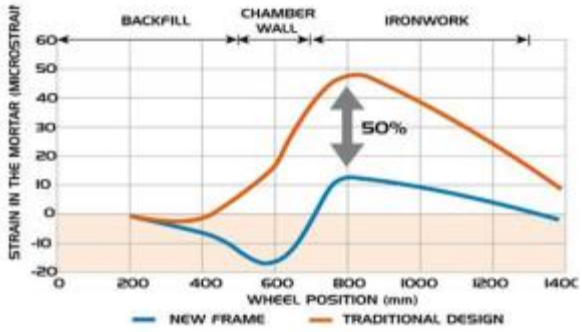
How can failure be avoided ?

The University of Nottingham





- Quality & design of the casting
- Use of high performance bedding materials
- Stable and robust sub-structure
- Reinstatement to recognised standards

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INSTARMAC®

NJUG AFFILIATE

INSTARMAC COMPANY OVERVIEW

- Instarmac is a Times Top 100 ‘Best Small Companies to Work For’
- Founded in 1977
- Operates to the highest quality management standards ISO 9001, ISO 14001 and OHSAS 18001
- Products are manufactured in the UK in Tamworth, Staffordshire
- Instarmac products are market leading

THE SUNDAY TIMES 100 BEST SMALL COMPANIES TO WORK FOR 2014

best company 2014

GREAT PLACE TO WORK Best Workplaces 2012 Category: Medium United Kingdom

midlands excellence specialist category awards highly commended

INVESTOR IN PEOPLE

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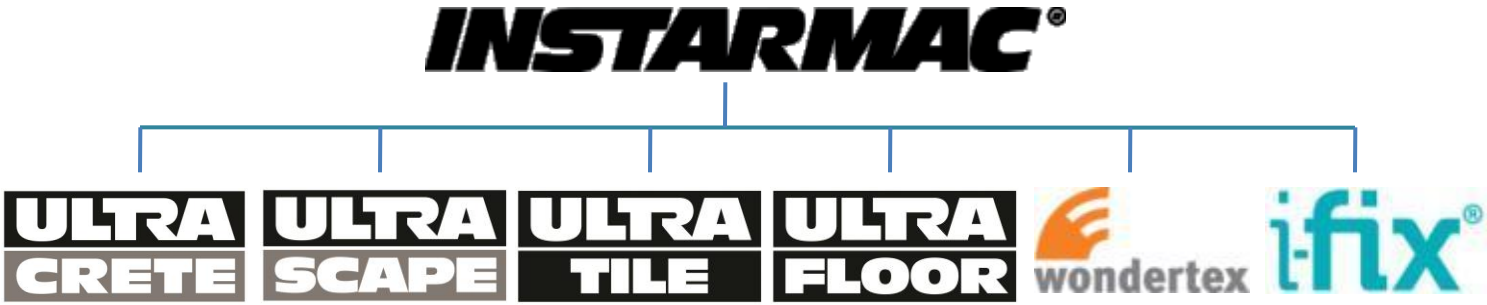
INSTARMAC COMPANY OVERVIEW



- UK manufacturer of cement, bitumen and resin based products
- Leading supplier to professional sectors
- State of the art manufacturing facility in Tamworth

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HIGHWAY MAINTENANCE SPECIALISTS

ULTRA CRETE

Highway Maintenance Products

Cold lay asphalt • ironwork reinstatement • anti-skid • line marking

HAPAS
Roads and Bridges
Agrément Certificate

BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

PAM SAINT-GOBAIN

INSTARMAC®

NJUG AFFILIATE

HAPAS

The **HIGHWAYS AUTHORITY PRODUCT APPROVAL SCHEME**

- Clear and consistent UKAS testing methods
- Ensures products are ‘fit for purpose’
- Minimises potential workmanship issues
- Assures against costly repeat visits
- Ensures investment and commitment
- Real ‘in the ground’ assured results

HAPAS
Roads and Bridges
Agrément Certificate

IT HAS TO BE
HAPAS
MATERIALS THAT ARE
PROVEN, TRUSTED, CERTIFIED

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NJUG VISION: SAFETY

Failed manhole covers, polished and worn ironwork and potholes are all known safety hazards. All can be improved with the use of proven and durable materials.

Ultracrete's HAPAS Approved Manhole Reinstatement System

HAPAS
Roads and Bridges
Agrément Certificate

BBA APPROVAL INSPECTION TESTING & CERTIFICATION

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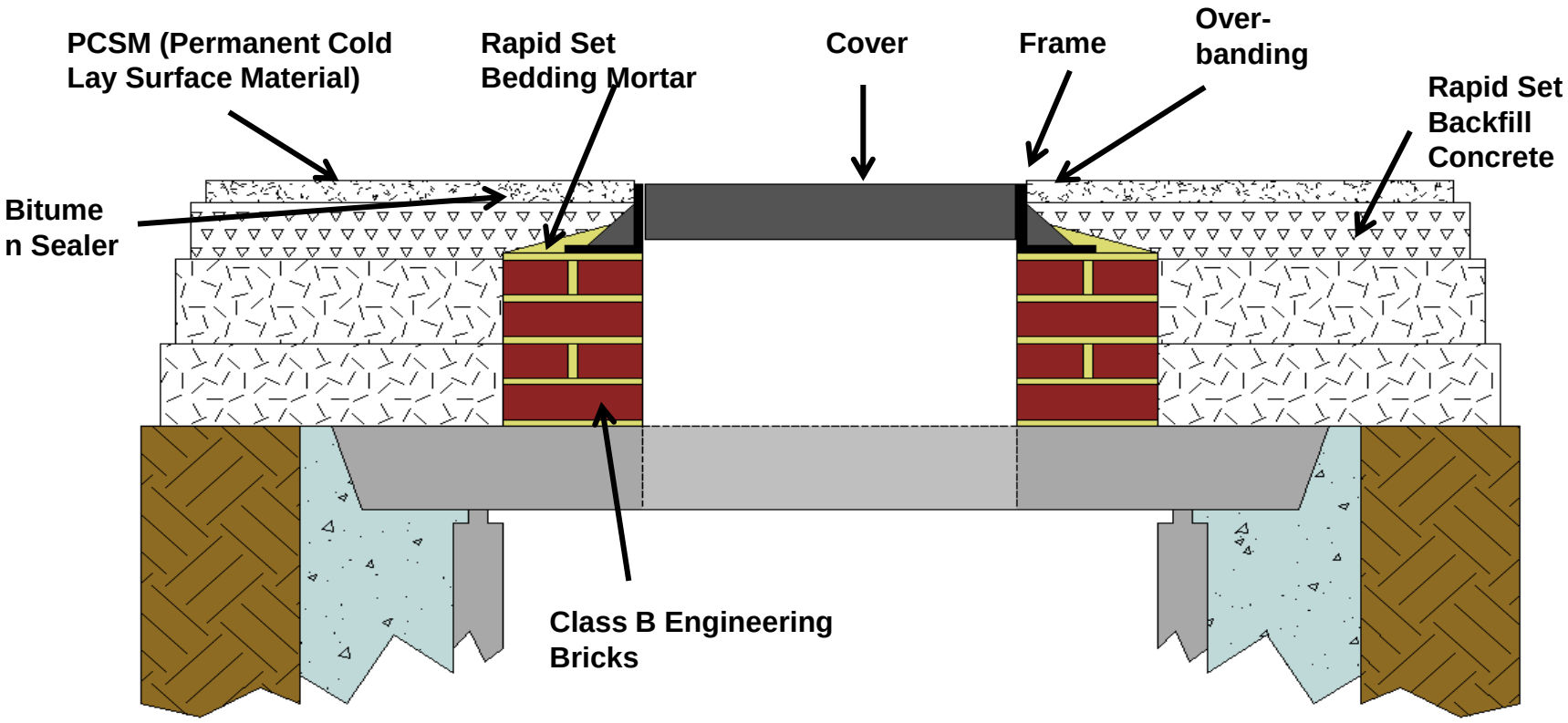
INSTARMAC®

NJUG AFFILIATE

HAPAS APPROVED FULL SYSTEMS



NJUG VISION: QUALITY

Quality of installation and repair will be assured with the use of Ultracrete's HAPAS approved materials:

- Reduces 'whole life costs'
- Passport across the network
- Protects professional indemnity insurance
- Reduces personal injury claims
- Trusted by the construction industry
- Exceeds a 5 years service life
- Eliminates split liability
- Compatibility

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INSTARMAC®

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NJUG VISION: QUALITY

SUPPORT & TRAINING AT INSTARMAC

- **Material Awareness Days**
- **Site support**
- **Tailored workshops**
- **‘Toolbox Talks’**

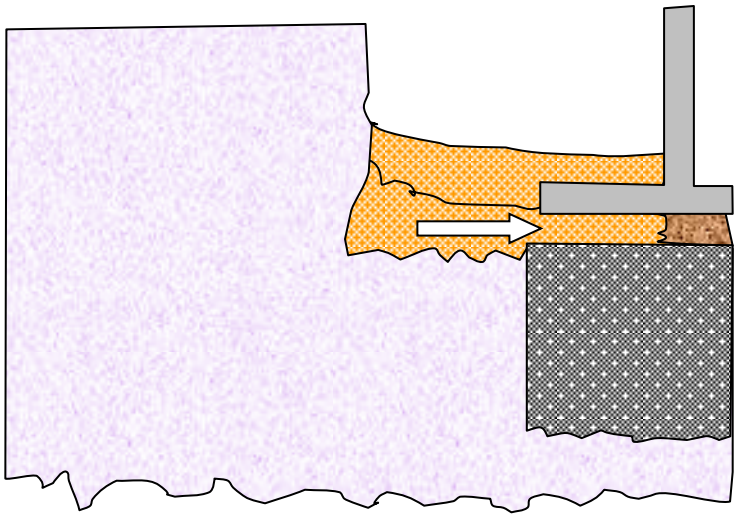
ULTRA CRETE

INSTARMAC®

NJUG VISION: QUALITY

"Pour in Flowable HA104 bedding mortar until it flows over the frame haunching to a depth of 15 to 20mm.

Allow to set hard. Check after 1 hour with hammer".



Source; CT/Openreach Supervisors Guide for the installation of carriageway frames & covers

NJUG VISION: PARTNERSHIP

A partnership between Instarmac and Saint-Gobain, as industry innovators with a passion for best practice methods and education.

NJUG VISION: COMMUNICATION

Instarmac have recently developed the Campaign for HAPAS Awareness – promoting the use of HAPAS Approved products ***only*** in the highway

NJUG VISION: SUSTAINABILITY

The use of long-term sustainable products that are proven to be durable will extend any repair life and manage whole life costs

ULTRACRETE'S ENVIROBED HA104®

•BASED UPON 15 YEARS OF RESEARCH IN CEMENT TECHNOLOGY.

•OVER 10 YEARS OF EXHAUSTIVE TRIALS, ZERO RECORDED FAILURES:

- Compressive strength: **51N/mm² in 3 hours**
- Tensile strength: 5.8N/mm² in 3 hours
- Flexural strength: 9.8N/mm² in 3 hours
- Workability: 15 minutes
- Set time: 30 minutes

'EXTREME CONDITIONS CALL FOR EXTREME PERFORMANCE'

HA104 SPECIFICATION:

Workability: 15 mins

Tensile Strength: 5N/mm² in 3 hours

Compressive Strength: 30N/mm² in 3 hours

Non-shrink

PAM SAINT-GOBAIN

INSTARMAC®

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NJUG VISION: PARTNERSHIP

Not one organisation in isolation can change an industry, we must;

Cooperate

partnerships that have overlaps of responsibilities, common objectives, balance cost v need and benefits

Collaborate

One team methodology, with a co-ordinated plan for solution delivery that involves all stakeholders

Educate

Change attitudes and perceptions and train, train and train again

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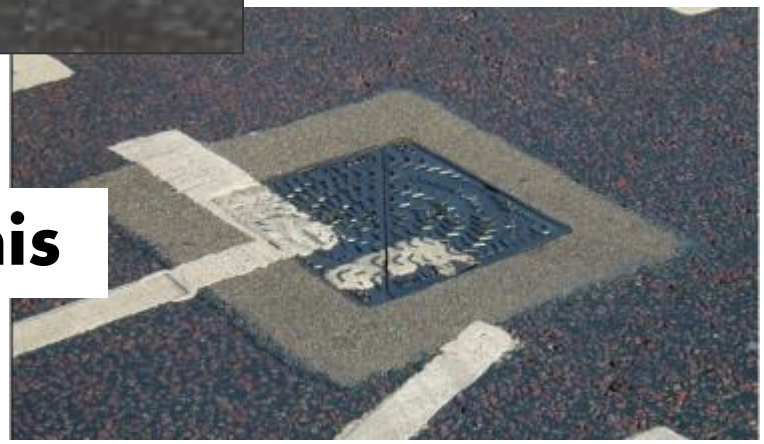
Avoiding This



Helping Achieve This

PAM SAINT-GOBAIN

INSTARMAC®

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“If you always do what you always did, you will always get what you always got”

Albert Einstein

Thank you for listening

NJUG

Delivering the Vision Day

Sponsored by United Utilities (helping life flow smoothly) & amey

14th May 2014 at The Museum of Science and Industry, Manchester.

Questions?

NJUG

Delivering the Vision Day

Sponsored by United Utilities (helping life flow smoothly) & amey

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Thank you