

National Highways
Principal Designer Working Group
Meeting No.34
Teams
Thursday, 25th January 2024 – 9.15 am – 13.00 pm

Agenda

Name	Initials	Position	Organisation
Attended			
Richard Wilson (Chair)	RW	H&S Director C&P	National Highways
Doug Potter (Secretary)	DP	TA HSW Lead - Principal Designer Manager	Arcadis
Tim Goddard	TG	Principal Designer Manager	Arcadis
John Pilkington	JP	Principal Designer	WSP
Pav Singh	PSi	Technical Director / Principal Designer Manager	Arcadis
Mark Lamport	MLa	Technical Director / Principal Designer Manager	Arcadis
Paul Brown	PB	Technical Manager	WSP Group
Liz Brathwaite	LBr	Safety Hub Lead	Skanska
Paul Dennis	PD	A417 Project Manager	Arup
Tim Walker	TW	H&S Manager	Galliford Try
Nick Boyle	NB	Technical Manager	Balfour Beatty
Jonathon Giles	JGi	Principal Designer Manager	Rambol
David Riley	DR	H&S Business Partner	Amey
Iain Reidy	IR	Risk Management	National Highways
Martin Partington	MP	Principal Engineering Man.	Jacobs
Robert Legg	RL	Highways Safety Co.	Motts
Mark Lawton	MLn	Head of Engineering Surveying and GIS	Skanska
Jim Gallagher	JGa	Prin Struct. Advisor (SES)	National Highways
Tim Bowes	TB	Principal Designer Manager	Atkins
Darren Allen	DA	Design Manager (SDF)	Jacobs
Jon Webster	JWe	Safety Lead	Kier
Charlotte Cook	CC	WHS Lead	Arcadis
Dave Olorenshaw	DO	Area Manager	Kier
Tony Lewis	TL	P Designer Man. YNE	Costain
Tom Bolton	TB	Principal Designer Manager	Amey
Alexandra Koutsouki	AK	Senior Engineer/ Transport	Arup
Nina Warminger	NW	H&S Manager SWAD	National Highways
Robert Butcher	RB	Technical Director CDM	Jacobs
Lee Ward	LW	Principal Designer Manager	Arcadis
Roger Swainston	RS	PD / CDM Advisor	Jacobs
Stuart Dawes	SD	H&S Manager A66	National Highways
Neil McKay	NMc	PD Lead	Aecom Highways
Zijing Zhan	ZZ	KTP Associate	Arcadis
Daniel Lacey	DL	Risk Management Team	National Highways

John McGovern	JMc	PD Lead	AtkinsRealis
Sulagna Ghosh	SG	Ass. H&S Rep Leeds	WSP Group
Simon Wilkinson	SWi	Technical Director	AECOM
Nicolas Mitchell	NM	PD Advisor	RPS
Chris Harding	CH	Design Manager	Volker Fitzpatrick
Daniel Hassle	DH	H&S Lead	Galliford Try
Chris Griffin	CG	Design Innovation Manager	National Highways
Noel Gibbin	NG	(CPS Head of Design)	Connect Plus
Alistair Guthrie	AG	CDM Lead	Cowi
Anne-Marie Cobb	AMC	Lead Development Manager	Octavious
Connor McCourt	CMC		Farrans
Harri Drysdale	HD		
Ian McDermott	IMC		Kier
Marcus Anning	MA		National Highways
Simon Allum	SA		
Steven Ward	SW		Arup
Guests:			
Amer Essa	AE	Innovation Senior Advisor Supply Chain)	National Highways
Sophie Willett	SW	Senior Engineer - GIS	Arcadis
John Dowsett	JD	SCSLG Chair	Octavious
Robin James	RJ	Operations Director	Temporary Works Forum
Apologies:			
Darren Prowting	DPr		
Paul Boddy	PB	Director	Interserve
Stephanie Goldsmith	SG	Senior H&S Advisor	Skanska Infrastr.
Katie Swanick	KS	Contracts Manager	Motts
Aimee Blay	AB	Design Manager	Galliford Try
Thomas Merry	TM	H&S Lead Major Projects	National Highways
Ronan Finch	RF	Principal Designer	WSP
Shaun Pidcock	SP	Director LTC	National Highways
Phil Samms	PS	Engineering Man. (Area 3)	Kier
Kevin Morgan	KM	PD / CDM Advisor	Jacobs
Mark Riordan	MoR	Principal Engineering Man.	Amey
Paul Wilkins	PW	Ass. Tec. Director Structures	Arcadis
Jon Horrill	JH	Principal Designer / H & S	WSP Group
John Migoski	JM	Technical Manager	Network Rail
Suryakant Patel	SP	Principal Designer Manager	Costain
Steve Ristow	SR		Transport for London
Sean Connon	SC	Principal Designer Manager	Costain
Ben Moulton	BM	Safety Lead	Balfour Beatty
David Lumb	DL	Health and Safety Business Partner – RIP North	National Highways
Cora Goodman	CG	H&S Manager YNE	National Highways
Mark Bridges	MBr	Former H&S Hub Lead	Galliford Try

Jordan Flint	JF		Kier
Lawrence Weller	LW	Safety Manager	TfL
James Washington	JWa	Safety Lead	Kier
Owaiz Khan	OK	Technical Manager	MGF
Richard Horan	RH		Telent
Glen Matthews	GM		Kier
Robert Mullen	RM	Asset Information Group	National Highways
Marcus Anning	MA		National Highways
David Harris	DH		
Jason Glasson	JG	Asset Information Manager	National Highways
Tarandeep Atwal	TW	Associate Director	Arcadis
Rob Eagles	RE	Temp Works Designer	MGF
Charlotte Taylor	CT		Morgan Sindall
Russell Brookes	RB		National Highways
Greig Houghton	GH	Design HSE Lead	Jacobs
Terry Meadows	TM	Safety Lead	Kier
Paul Watson	PW		Amey
Steve Haviland	SH	Partnership Lead	Farrans
Richard Delaney	RD	Senior H&S Consultant	Capita
Andrew Wedderburn	AW	Principal Designer	Pell Frischmann
Ken Harrison	KH	Principal Engineer	Amey Consulting
Craig Simmonds	CS	Managing Director	Macleod Simmonds
Elliot Galvin	EG		Mott Macdonald
Adrian Shawcross	AS	Rail Associate	Ramboll
Clare Brown	CB	Safety Lead	Link Connex (Bam Nuttall)
Sophie Gwynne	SG	Graduate Highway Engineer	Arcadis
Oliver McMann	OM		Atkins
Philip Farrar	PF	Highways Safety Hub Website	Galliford Try
Sam Roberts	SR	Director	Met Geo Environmental Ltd
Anthony Adu-Gyamfi	AAG		
Stephen Pettifer	SP		Volker Fitzpatrick
Eleanor Brennan	EB		
Matthew Murrell	MM		
Beverley Mears	BM		National Highways
Abbey Featherstone	AF	Technical Lead	Connect+
Ian Nixon	IN	Sector SHE Director Transportation	Costain
Steve Willoughby	SW	Technical Director	Pell Frischmann
Stephen Larkin	SL		Aecom
Andy Robinson	AR		
Alexandra Kouts	AK		Arup
Simon Hawley	SH		Ramboll
Steve Bowen	SB	Technical Director	Stantec
Jim Castle	JC		LTC
Leah Shah	LS		

<i>Alexandrine Bernard</i>	<i>AB</i>		<i>Rambol</i>
<i>Reuel Abrams</i>	<i>RA</i>	<i>Senior Project Manager</i>	<i>Arcadis</i>
<i>Patrick Brady</i>	<i>PB</i>	<i>Engineering Manager M25DBFO</i>	<i>Connect plus /BB</i>
<i>Kevin Stevens</i>	<i>KS</i>	<i>Safety Manager</i>	<i>FM Conway</i>
<i>Gordon Crick</i>	<i>GC</i>	<i>BIM for H&S</i>	<i>HSE</i>
<i>Keith Smith</i>	<i>KS</i>	<i>Group Chief Engineer</i>	<i>Chevron Group</i>
<i>Steve Yates</i>	<i>SY</i>	<i>PD / CDM Advisor</i>	<i>Jacobs</i>
<i>Euan McRobie</i>	<i>ER</i>	<i>H&S Lead</i>	<i>Capita</i>
<i>Nicola Hodges</i>	<i>NH</i>	<i>Project Manager</i>	<i>Keltbray</i>
<i>Adrian Lewis</i>	<i>AL</i>	<i>RHS Manager (East Region)</i>	<i>National Highways</i>
<i>Tony Wallis</i>	<i>TW</i>		<i>Tetra Tech</i>
<i>Josh Hicks</i>	<i>JH</i>		<i>Mott Macdonald</i>
<i>Natalie Mansell</i>	<i>NM</i>	<i>Head of Safety – SR, H&LT</i>	<i>Atkins</i>
<i>David Owens</i>	<i>DO</i>	<i>Digital Manager</i>	<i>WSP</i>
<i>Helen Richardson</i>	<i>HR</i>	<i>NH Regional Lead</i>	<i>National Highways</i>
<i>Katie Harman</i>	<i>KH</i>	<i>SMP Safety Lead</i>	<i>National Highways</i>
<i>Christina Kio-Bennett</i>	<i>CKB</i>	<i>Senior Design Manager</i>	<i>Skanska</i>
<i>Steven Scott</i>	<i>SS</i>	<i>PD Lead</i>	<i>Arup</i>
<i>Elizabeth Bennett</i>	<i>EB</i>	<i>Director</i>	<i>Safety in Design</i>
<i>Liam Burns</i>	<i>LB</i>		<i>National Highways</i>
<i>Florus Georgios</i>	<i>FG</i>	<i>H&S Lead</i>	<i>Skanska</i>
<i>Toria Thomas</i>	<i>TT</i>	<i>Principal Designer</i>	<i>Arup</i>
<i>Graham King</i>	<i>GC</i>	<i>LTC H&S Lead</i>	<i>National Highways</i>
<i>Martin Sherlock</i>	<i>MSH</i>	<i>MP Knowledge Management Team Lead</i>	<i>National Highways</i>
<i>Amjad Farzana</i>	<i>AF</i>	<i>MP Knowledge Management Team</i>	<i>National Highways</i>
<i>Samuel Hogan</i>	<i>SH</i>	<i>Principal Engineering Man.</i>	<i>Balfour Beatty</i>
<i>Sam Allin</i>	<i>SA</i>	<i>CDM Manager</i>	<i>Jacobs</i>
<i>Ali Chaudry</i>	<i>AC</i>	<i>Principal Designer</i>	<i>Galliford Try</i>
<i>Ghayan Briggs</i>	<i>GB</i>		<i>Jacobs</i>
<i>Joanna Goulding</i>	<i>JoG</i>	<i>Head of Health & Safety Risk, Standards and Assurance</i>	<i>National Highways</i>
<i>Nicola Tweedie</i>	<i>NT</i>	<i>SA – Road User Safety</i>	<i>National Highways</i>
<i>Paul Haddon</i>	<i>PH</i>	<i>Digital Lead A19N2W</i>	<i>Balfour Beatty</i>
<i>Elliot Grub</i>	<i>PH</i>	<i>Digital Engineer A19N2W</i>	<i>Atkins</i>

1.0 Welcome - (Richard Wilson)

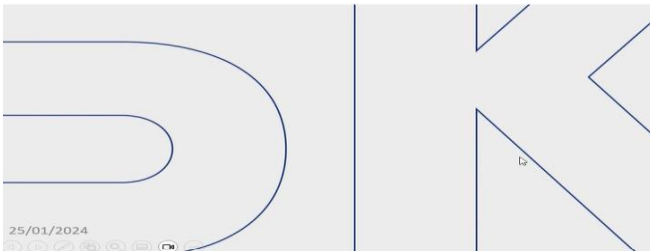
– RW referenced the recent lantern failures on the M25 / M4, where there has been a significant number of lanterns with incorrectly installed Lanyards which are not in accord with the detail set out in CHE Memo 420/18 - Installing Philips Luma Luminaires. Further information was also available within HEI 043 SES Safety Alert dated February 2018 – both documents are attached to the minutes. National Highways are currently working with the schemes to correct the issue. Request that the attendees review where applicable.

All

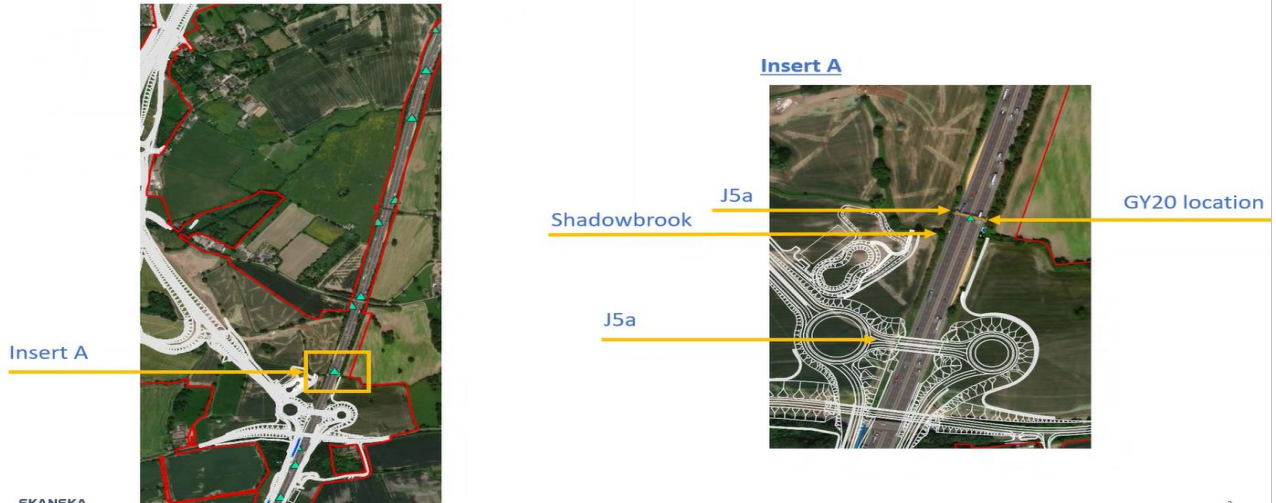
o HSW Moment – M42 Jct 6 Project Change Management – Liz Braithwaite (Skanska)

SKANSKA
SAFETY MOMENT – PDWG
25/1/24
M42 Junction 6 Project
Change Management

Liz Braithwaite CMIOSH IMaPs
 Sector H&S Manager – Highways Major Projects



Service Strike Incident 28/11/23 Location Detail



Background & Incident Summary

During detailed design in 2020, it was identified that some of the existing gantries would not be adequate to support the scheme signage requirements. New gantry structures were identified as required to allow the scheme signs to be erected. Gantry 20 (GY20) was one of these new structures, and was included in the scheme scope in late 2022. The approximate distance between the existing and new gantry structure is c.2m.

A design decision was made to locate the new gantry foundation in the same line as the existing foundations to reduce the likelihood of interfacing with services. **Existing 1970 as-built information was available, via DDMS identifying a concrete carrier drainage pipe** at the edge of carriageway, however the location accuracy of the service was poor on these records.

No GPR or trial hole survey requests were made to verify the presence or location of existing services adjacent to GY20. The design assumption was made that the existing drainage service would not impact the new foundation, and details of this service were not specifically identified on the coordinated design drawings.

Incident Summary

As part of Skanska's permit to break ground process a Sonde survey and CAT and genny survey was completed prior to works commencing. There was a lot of interference with the Sonde survey due to the proximity of the VRS and other metalwork so it was difficult to interpret.

Whilst undertaking a Session Flight Auger, at approximately 1.7m below ground the auger hit resistance. The team assumed a local hardspot / lump has been encountered and carried on working. The pile was completed, following which an observation was made that the concrete level in the pile had dropped. Further investigation the following morning confirmed the drainage service location, and positive verification of the service strike was received that same day.



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25/01/2024

Incident Timeline

2020 – Assumption that existing gantry would be suitable for revised scheme signage arrangements challenged. Determined that existing gantry would be life expired.

November 2022 – The need for GY20 was confirmed and instructed to the design team (CE 143) to incorporate in the scheme design.

September 2023 – Clash detection report sent from Skanska to designer. No feedback regarding clash of proposed foundation with existing drainage run.

28 November 2023 – Piling works commenced on GY20 (Northbound). Auger encountered resistance which led to loss of concrete from the piling operation. Initial observations of adjacent receptors and watercourse did not identify any concrete discharge in this vicinity.

29 November 2023 – Site based assessment into 'void' for concrete loss identified carrier drain run and confirmed blockage in the pipe.

29 November 2023 – Confirmation reported of service strike with full investigation commenced.

January 2024 – Confirmation that the original gantry foundations **ALSO went straight through the drainage channel**

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Post Incident Assessment

- Works stopped on remaining piling operations for GY20
- Visual inspection of the area adjacent to the works location identified a drainage manhole is identified under the existing Vehicle Restraint System
- Communication with the design team post incident confirmed that drainage run existed and was identified from 1970's asset information drawing 442/IB/9.3/10b
- Further dialogue determined that a series of assumptions were made by various members of the design and construction team throughout the identification and implementation of works associated with GY20. These assumptions included those made around identification of existing services, and the requirement for positively proving service locations or clashes with the permanent works



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Root Cause Analysis

Immediate Cause	Underlying Cause	Root Cause
Drainage run was struck by auger during piling operations	Change in original design scope of gantry requirements once confirmation received that existing gantry was life-expired	Conflicting assumptions
	Drainage run was not positively identified and confirmed on permanent works drawings or other construction information	
	Historic service as-built information (from c.1970's) had inaccuracies in geo-location of the asset and was not passed on or verified	

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Key Learning & Action Plan

Learning: Communication of existing service information

- Focus on asking the right questions around existing service information within HAZID process
- Verify the details within DDMS on site during design phase and any subsequent design changes

Learning: Aligning assumptions

- Design team and construction team each made different assumptions on who should lead the identification and specification of site survey requirements

Actions:

- Review change management process through design management, specifically reviewing Principal Designer responsibilities under CDM
- Pre-construction HAZID workshop to draw out design assumptions and construction assumptions for understanding/alignment
- Review of coordinated service plan and permanent works design details prior to starting new phases of work

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- **Matters Arising (PDWG 33 & 33a – 11/10/23 & 9/11/23)**
 - Highways Common Induction – Liz Brathwaite has requested an update from NH. LBR has met with Teresa Moss on this – LBR confirmed there won't be a separate designer module. There will be a separate driver induction. Development ongoing and should be completed within the next 3 months.
 - Martin Partington had attended the November Hub meeting to present on the new 5x5 matrix. There had been good feedback. RW noted that this is now being used by an increasing number of organisations.
 - Mark Lamport - had contacted Nina Warming to discuss the NH CDM documentation review. It is understood that these will be circulated to this group for consultation in due course. MLa indicated he had issued feedback on the removal of IAN105/08 and this had now happened. The implications of this will form part of the review. CDM documentation remains an ongoing issue. MLa will speak with NW.
 - Jason Glasson and David Stone are leading on the NH H&S File Digitisation. David Stone is progressing. RW to provide feedback to MLa post meeting.
 - Annex 15 - RW informed that Annex 15 (use of RtB's on projects) is to take precedence over the MPI 23. MLa to review this offline with RW.
 - GIS - Mark Lawton had asked if NH would consider the potential to form a GIS working group. RW/DP would follow up on this.
 - Mark.bodemeaid@nationalhighways.co.uk
 - Mark.simmnoite@nationalhighways.co.uk
 - Thomas.coleman2@nationalhighways.co.uk
 - Nick Boyle had indicated that at a recent CIRIA meeting there was a discussion relating to setting up a Geo-spatial community of practice, suggestion that RW will speak to Jason Glasson on this.



NW/
MLa

RW/
MLa

RW/
MLa

RW/DP

RW

<ul style="list-style-type: none"> ○ BIM Working Group – RW to confirm with David Stone what the status of this group is. ○ A number of questions raised about the Safety by Design Template and Check Sheet as required by the SQP PCF Product – Picked up at DRM Standardisation T&F Group. ○ Higher safe speeds adjacent to Traffic Management – GD904 to be updated - Will Spur of NH is the person to contact, RW is to contact Will to ensure more a consistent approach is achieved. <p>Daniel Lacey – Safety Risk Team</p> <ul style="list-style-type: none"> ○ NSCRG - M25 TM trial – Mobile TM approach, currently awaiting trial feedback and associated guidance material – DL confirmed this was now accepted by NSCRG as BAU approach to implementing TM by supply chain. Keith Smith is on PDWG and has been leading on this so will know the current state of play, in terms of level and success of use as a technique. ○ Management arrangements for Safety Risk Assessments - there will be further comms by Mike Wilson. DL confirmed that the <u>Management Arrangement</u> had been published in September 2023. Further minor updates planned, including clarity on assurance by Board Safety Committee, and to be published in Spring 2024 to align timing with updated GG 104 Requirements for safety risk assessment publication. ○ Obscuration of Site Fire Radar / CCTV – Vegetation growth issues, review ongoing as to common issues, why is this occurring and what the changes needed will look like – Cyclical maintenance, including vegetation maintenance is a risk being monitored through our NSCRG risk register, with a meeting to discuss with Operations undertaken, to understand current state of play, application of ADAMr etc. ○ Martin Sherlock – has provided PDWG members access to the MP Knowledge Portal and will keep us informed of the latest developments ○ N2W H&S File Digital Handover – Pav Singh asked if a lessons learnt exercise had been completed and if outputs could be shared with the group - so that we could understand what does and doesn't need doing on the next scheme, across all duty holders? Nick Boyle / DP to discuss offline <p>Meet PDWG 33A</p> <ul style="list-style-type: none"> ○ Mark Lawton - felt that a guidance document for designers that set out the requirements for inspections would be of value. MP will update following discussions with OD. ○ RW requested that MP review the examples shown in the Design for Maintenance presentation as they could become case studies in line with the current Lessons learnt – Ongoing. ○ Liz B indicated that she felt also that the current format of RtB 26 doesn't quite translate well from Major Projects into the brave new world of Operations Directorate renewals work and optimising the existing network. She felt consideration needs to be made to review the new emphasis on design for renewals, and how this affects the current structure of RtB26. – To be picked up by the DRM T&F Group. 	<p>RW</p> <p>DP</p> <p>RW</p> <p>NB/DP</p> <p>MP</p> <p>MP</p> <p>DP/JP</p>
<p>2.0 Presentations for Learning Opportunities</p> <p>2.1 SCSLG Update – John Dowsett (Octavius – SCSLG Chair)</p> <div data-bbox="165 1675 1455 1995" style="background-color: #0070C0; color: white; padding: 20px; text-align: center;">  <p style="font-size: 0.8em; margin: 0;">  SUPPLY CHAIN SAFETY LEADERSHIP GROUP </p> <p style="font-size: 2em; font-weight: bold; margin: 10px 0 0 0;">SCSLG</p> <p style="font-size: 2.5em; font-weight: bold; margin: 0 0 0 0;">2024 Update</p> </div>	

Introduction – In 2023

- Ten Significant Risk categories identified through the engagement work undertaken in 2022 across the industry.
- The approach focuses on a system approach to eliminating and reducing these significant risks as opposed to people-based approaches.
- Significant Risk Thinking launched at the Engagement Council on the 15th of March encouraging all businesses to profile their significant risks and prepare a significant risk strategy.
- A series of Technical webinars have been held, split into 3 sessions:-
 - 'Why Significant Risk'
 - How to prepare a Significant Risk Strategy
 - How to Risk Profile
- A number of working groups were established to start to focus on the significant risks and look at ways in which these risks could be managed differently.



Leading Indicator: *Strategic Direction adopted & evidenced throughout the Supply Chain and National Highways*

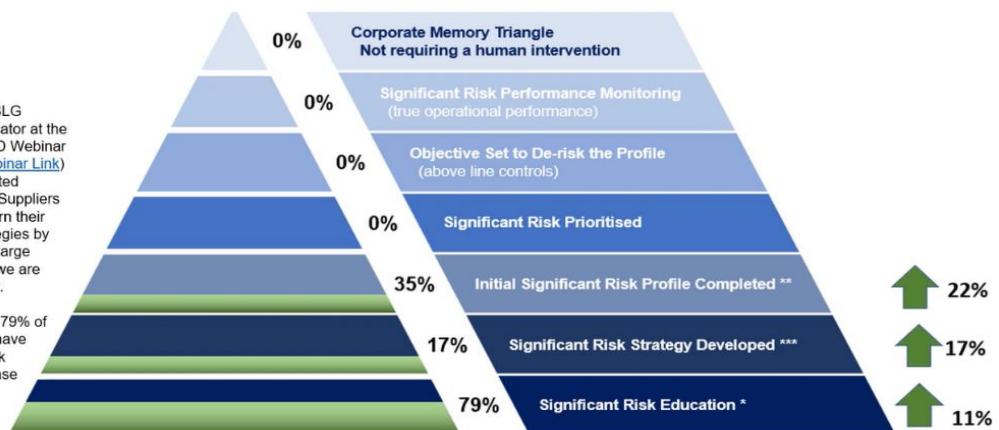


The Supply Chain Safety Leadership Group with our full support, are implementing a Significant Risk approach. This aims to eliminate the significant risks that cause life-changing harm to those working on the strategic road network. Significant risk profiling carried out across the supply chain has identified significant risks of which the top 9 will be focused upon first. This Leading Indicator is the fundamental building block and must be delivered and embedded to ensure success as we move forward with the 9 Significant Risks.

In-month commentary:

On the 15th March 2023 the SCSLG launched their first Leading Indicator at the Engagement Council. A CEO/MD Webinar followed on the 22nd March ([Webinar Link](#)) and [Technical Webinars](#) completed throughout May, June and July. Suppliers were provided a deadline to return their significant risk profiles and strategies by 12th September. The majority of large organisations are engaged and we are reaching out to other individually.

In this fourth month of reporting, 79% of suppliers to National Highways have engaged with the Significant Risk Education programme, an increase of 11%



* Significant Risk Education CEO/MD Engagement (113 out of 143 suppliers engaged)

** Initial Significant Risk Profile Completed (51 out of 143 suppliers)

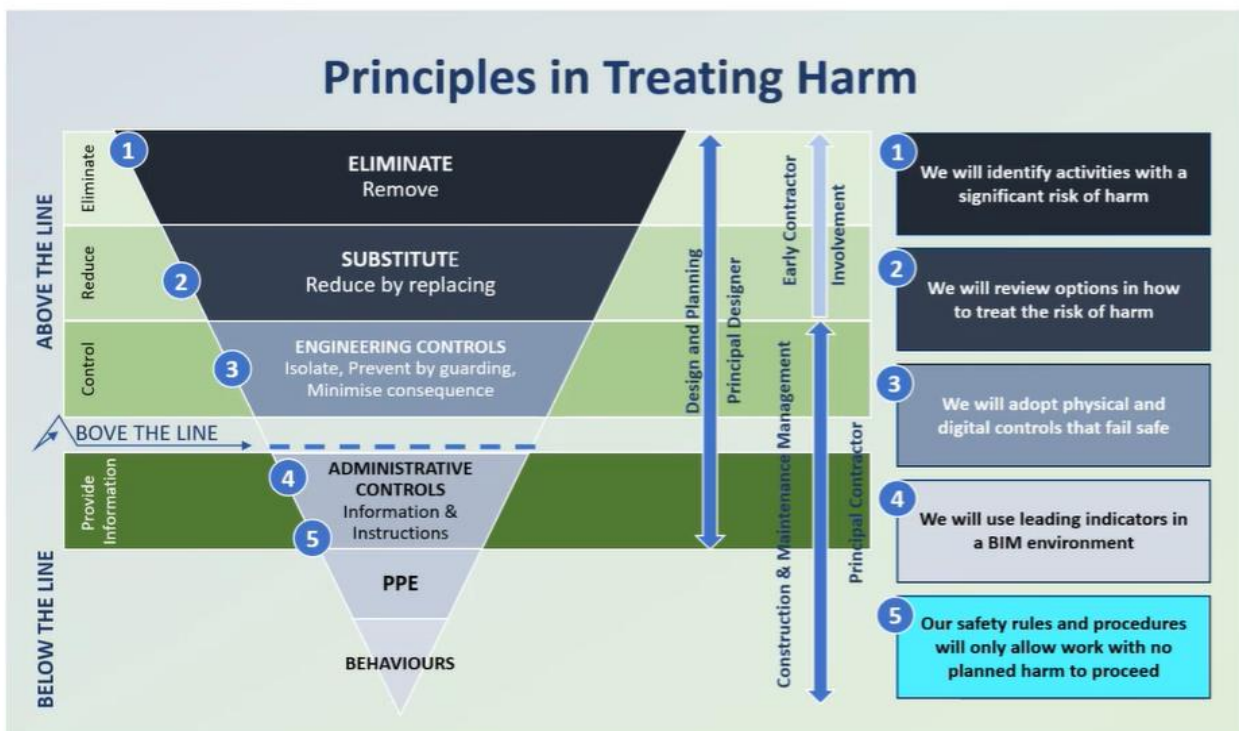
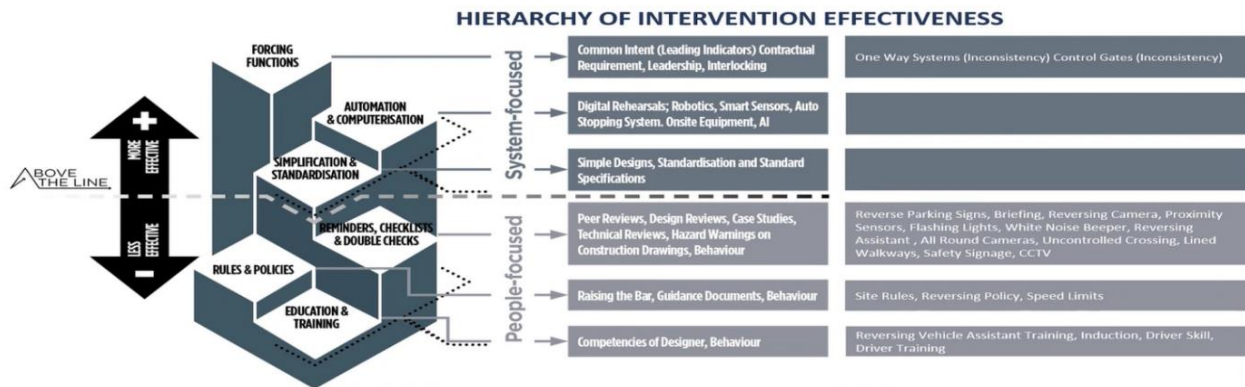
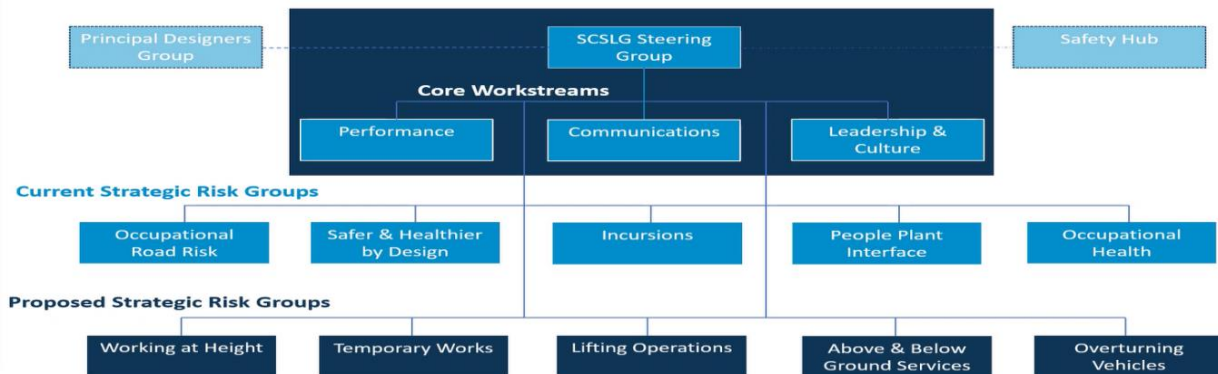
*** Significant Risk Strategy Developed (17 out of 143 suppliers)

John Davenport | Ecoment

Principles

- Build on the successes of the work done to date and ensure that the **Significant Risk Thinking** really starts to impact those people working on our behalf.
- Ensure that the SCSLG feels like a **wider community**, not just those at a monthly meeting.
- Create a structure that has a **SCSLG Steering Group** that provides the leadership and strategic direction.
- **Reduce the membership slightly** to focus on a small number of core roles, with the remaining membership made up of those leading the working groups.
- **Raise the profile** of both those leading the working groups and those that are driving change within them.
- Provide closer links to **Safety Hub** and **Principal Designers Working Group**

Proposed Structure



Healthier and Safer by Design

- Releasing a combined **Common intent** for health and safety design. This due to be released to the SCSLG Steering Group shortly.
- Looking at **standards in design** that could be developed for the for the significant risks.
- Looking to dedicate a section of the **saferhighway website** part of the website for healthier and safer by design to make it easier for designers to find information.
- New lead for the Group in 2024 in **John Pilkington**
- **New membership welcome** – andrew.cox@fmconway.co.uk

- Martin P asked are the SCSLG T&F groups in addition to the existing groups – JD noted the SCSLG T&F groups have initially commenced and will look to completed 2/3 objectives well instead of trying to commence all 10 T&F groups all at once.
- Paul B noted – "significant risk of harm" shown on upside triangle is different from risk of significant harm, which presumably is where we should be focusing, if looking at significant hazards as defined by the SCSLG. JD to review this with the specific T&F group to clarify the approach. JD
- MLa noted – SCSLG information on the Safety Hub website appears out of date, he asked that this to be reviewed. RW noted a discussion needs to be undertaken regarding the Hub webpage or whether a new webpage is created or existing revised. JD/RW
- Robert Butcher noted PDWG members should bear in mind the current significant risks topic areas when reviewing our activities, especially within designer's Design Risk Registers.
- RW noted the approach of the SCSLG aims to be pro-active rather than reactive.

2.2 NSCRG update – Daniel Lacey (National Highways)

- **Matters Arising and current concerns.**

National Safety Control Review Group (NSCRG)

Update for the Principal Designers Working Group (PDWG)

January 2024

NSCRG update for PDWG (1 of 4)

Issue	Decision	Summary
Next generation cyber futures	For NSCRG advocacy and advice	<p>Overview: Emyr Thomas gave a presentation on the relationship between safety and security for a digitally enabled strategic road network (SRN). Highlighting the need to develop suitable and sufficient governance for cyber security, using best practice for how safety governance is fulfilled through GG 104 requirements for safety risk assessment, and from other industry, such as Network Rail.</p> <p>NSCRG feedback/actions included:</p> <ul style="list-style-type: none"> NSCRG members will be promoting 'safe and secure by design' from a cyber perspective. Cyber security should be integral and a golden thread through our processes akin to safety, with clear linkages and handover between directorates. Cyber security may be more mature at the implementation stage, but ongoing management following implementation may not be as rigorous. We will review our consideration of safety criticality in National Highways systems (in accordance with the agreed legal definition) and apply an additional lens of malicious intent for systems to go wrong.
Operational technology performance and availability update	For information only	<p>As part of ongoing monitoring of actions against the NSCRG risk register a high- level overview of current operational technology performance and availability was provided, covering CCTV, signs and signals, ERTs, and SVD. It was agreed that the next update would go into more granular detail and provide an overview in response to the key safety governance questions from NSCRG posed to the business in 2021.</p> <p>1) <i>What do all business areas within National Highways identify as the responsibilities they own, what touchpoints they have and how their function fits into the complex blend of processes / people / technology / infrastructure required to operate, maintain, repair and enhance ALR?</i></p> <p>2) <i>How does the perception <u>we have</u> match their reality?</i></p>

NSCRG update for PDWG (2 of 4)

Issue	Decision	Summary
Signalling for Roadworks update	For information only	<p>A proof-of-concept trial for SfR use in Dynac is planned in the East Midlands and North East regions, with training and monitoring in place in November 2023, prior to national rollout. NSCRG confirmed that a finalised suite of SfR rules/guidance document for Dynac will be presented to NSCRG for acceptance prior to publication.</p>
Traffic Officer Zero Emission Vehicles pilot	For information only (AOB item)	<p>A summary was given for the use of a new zero emission vehicle (ZEV) (Maxus T90) by traffic officers, as a proof of concept. Five vehicles will be trialled in addition to the existing fleet and will be used to better understand ZEV performance and range, amongst other factors. The pilot will take place in three regions where charging infrastructure is most advanced.</p> <p>Evidence of suitable and sufficient safety governance having been applied through a documented safety risk assessment and appropriate consultation was provided. Further iterations of the safety risk assessments will be provided for information/ acceptance as the pilot grows, and updates informed by planned monitoring will be provided.</p>

NSCRG update for PDWG (3 of 4)

Issue	Decision	Summary
CHARM update	For information	<p>Overview: CHARM, the new integrated, advanced traffic management system has been rolled out in five regions, with the Southeast and East planned for October 2024 and February 2025, respectively.</p> <p>Monitoring shows that regions are achieving the 3-minute performance indicator to set signs and signals. However, further work is being undertaken with ROC operators to further improve performance.</p> <p>Previous NSCRG treatments are underway including;</p> <ul style="list-style-type: none"> Issue identification, investigation and resolution via AIMS; HART record review and analysis; new systems releases; Continued engagement with ROC operators to understand the user experience. <p>NSCRG feedback/actions included :</p> <ul style="list-style-type: none"> Lean team to review the signal setting process to identify any opportunities to eliminate waste, and/or work in different ways to improve performance. Continued review of data/intelligence sources utilising wider organisational teams' support. Identify the timeframe for setting blanket signals for unconfirmed incidents within signs and signal setting reporting and timeline. Return to NSCRG in July 2024, with action updates and lessons learnt prior to continued planned CHARM rollout.

NSCRG update for PDWG (4 of 4)

home
safe
and well

Issue	Decision	Summary
Breakdowns safety advice (RAC)	For information (Health, Safety and Wellbeing moment at NSCRG)	<p>Overview:</p> <p>The RAC are promoting safety advice for how to stay safe on high-speed roads during a breakdown scenario, highlighting key considerations, such as where to stand once exiting the vehicle:</p> <ul style="list-style-type: none"> ▪ Dec 2023 news item - Drivers are putting themselves in danger during breakdowns RAC Drive ▪ How to stay safe on a high-speed road RAC - YouTube <p>Key data from RAC:</p> <ul style="list-style-type: none"> ▪ Only 22% of 1,900 drivers surveyed would know the correct action to take in the event of a breakdown. ▪ 11% of those surveyed would stay in their vehicle. ▪ This corresponds with reports that 78% of motorists at incidents attended by the RAC were still in their vehicles on arrival. <p>NSCRG discussion:</p> <p>It was discussed at NSCRG as to whether National Highways messages are therefore getting traction with road users and what more can be done, particularly collaborating with other organisations to have 'one voice' on shared priorities (such as consistent safety advice).</p>



- MLa asked if the RAC currently consider Smart Motorways – DL indicated they don't currently, however National Highways are reviewing this and will cover this in future communication. RW questioned - Do we and our family know what to do in a breakdown (High-Viz, safe exits, where to stand safely) etc?
- DL confirmed there will be a presentation on the status of the update to GG104 at the next PDWG in May 2024.
- DL shared the link to the discussed RAC article & video - <https://www.rac.co.uk/drive/news/motoring-news/uk-drivers-are-putting-themselves-in-danger-during-motorway-breakdowns/>
 - Drivers are putting themselves in danger during breakdowns | RAC Drive indicated 78% of drivers would unknowingly put themselves in danger after breaking down on the motorway and stopping on the hard shoulder, new research reveals.

<https://youtu.be/Lmsh50vzqeA?si=CL9V2XWINO3sLvUT>

D
Lacey

2.3 CAP – Supply Chain Innovation – Essa Amer (National Highways)

Connected and Autonomous Plant (CAP) – PDWG 34 Update

Amer Essa
Supply Chain Innovation, Senior Advisor
Thursday 25th January 2024

NH CAP dedicated webpage:
<https://nationalhighways.co.uk/our-work/innovation-and-research/connected-and-autonomous-plant-to-2035/>

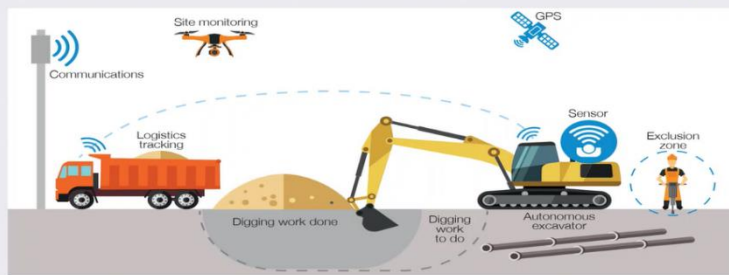
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Contents

- Phase 1 – CAP Roadmap to 2035
- Phase 2 – CAP Levels
- Phase 3 – Design for Machines
- Future**
 - Phase 4 – Trials & Dashboard
 - Phase 5 – Workforce of the Future & Roadmap Review
 - DFT Activities
 - CAP – What success looks like & looking to the future

Connected and Autonomous Site (CAP) – Connected Site

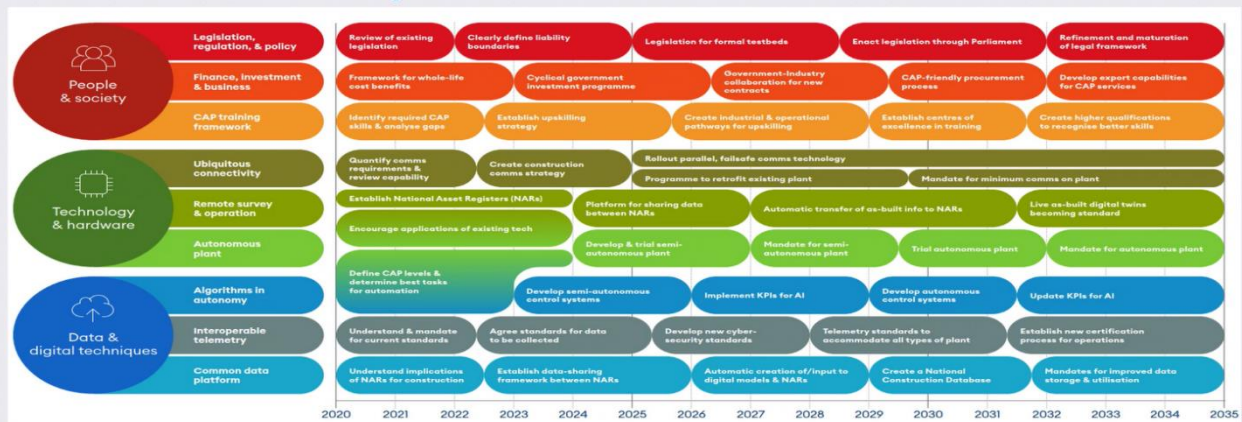
“By 2040, National Highways aspires to realise a step change in efficiency, with roads projects and maintenance delivered 30% - 50% cheaper than today.”



“If the benefits to manufacturing are mirrored in construction, productivity improvements achieved via CAP could exceed £200Bn by 2040.”

Published to industry June 2020 via Webinar

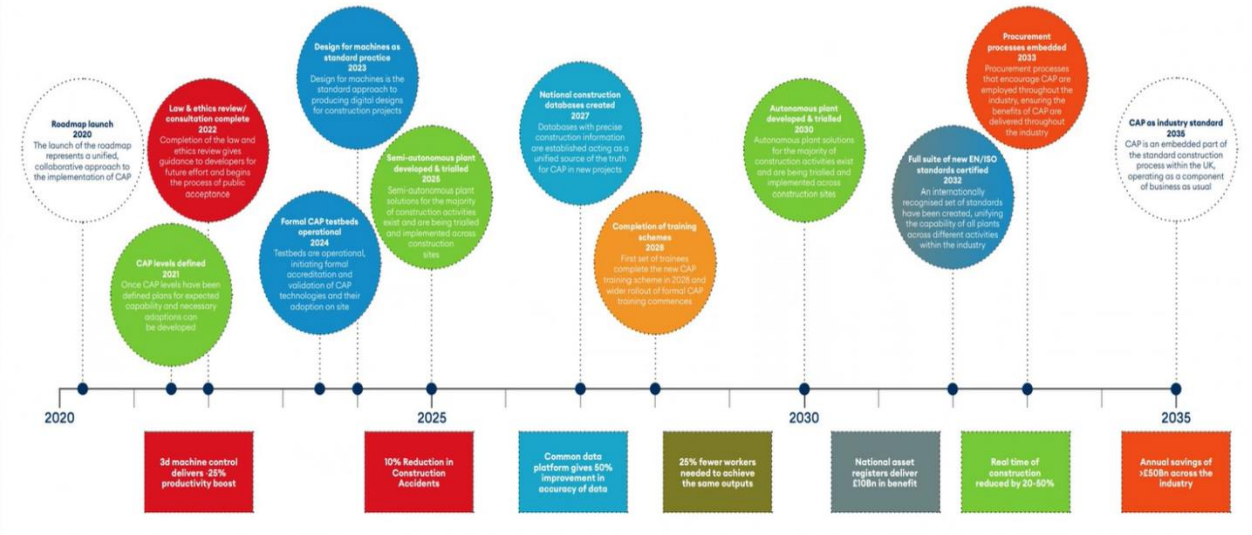
CAP Phase 1 – Roadmap



Published to industry June 2020 via Webinar

CAP Phase 1 – Key milestones

Each milestone marks a turning point in the Roadmap, or the establishment of a key enabler that unlocks the next stage



Published to industry June 2020 via Webinar

Disseminated via webinar to capture wider audience & legacy piece.

i3P served as the conduit to deliver the message to relevant stakeholders.

Why we did it

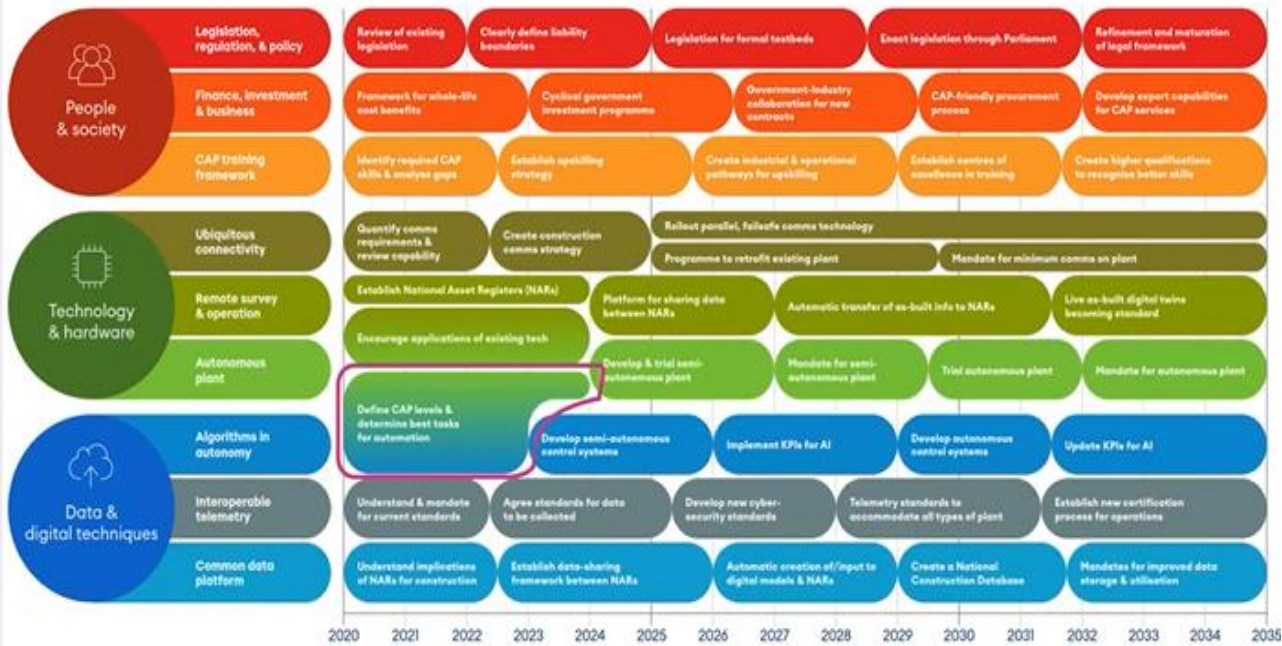
- * Leadership
- * Bring Industry together
- * Set direction of travel

Huge opportunities to improve safety, productivity and carbon agenda



Confidential

2022: Phase 2 CAP Levels



CAP Levels

The levels enable a standardised measure to describe machine capability. They can be used across the industry and through supply chain to track and specify autonomous machines. There are 5 factors that are scored, based on the same process that humans use to carry out tasks - these are described below.



Note: this is the 1st iteration of the CAP Levels. Further work is required to establish their application, including certification scheme.

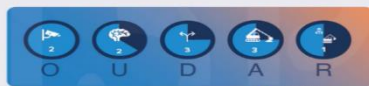
Published to industry March 2022 via *Futureworx* event, Peterborough

CAP Levels – examples

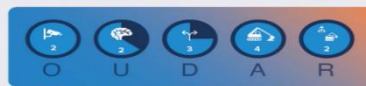
Autonomous Compaction Plant



CAT Command for Compaction



BOMAG ROBOMAG



Published to industry March 2022 via *Futureworx* event, Peterborough

CAP Levels – International Reach

Construction In the 21st Century Conference (CITC) - May 2022, Jordan
(General focus)

International Symposium on Automation and Robotics in Construction (ISARC)
Conference in July 2022; Colombia
(Technical focus)

The 21st International Conference on Construction in the 21st Century (CITC-21)
Amman, Jordan | May 16 – 19, 2022

The Future of Automated Plant in Construction – A UK Perspective

Cormac Browne¹, Ross Walker², Ianto Guy³, Tim Embley⁴, Musser Akhtar⁴, Amer Essa⁴, Annette Pass⁴, Simon Smith⁴, Alex Wright⁴

¹ Transport Research Laboratory (TRL) R640 3GA, Wokingham, UK
² University of Edinburgh, EH8 9YL, Edinburgh, UK
³ Costain, SL6 4UB, Maidenhead, UK
⁴ National Highways, G01 4EZ, Guildford, UK
cbrowne@trl.co.uk, r.walker@ed.ac.uk

Abstract
Within the construction industry, heavy mobile machinery is typically known as plant. Plant has seen a transformation from its earliest, animal powered form, through steam and combustion engine driven machines through to the modern multifunctional devices applied in construction across the globe. However, construction is facing a number of significant social, environmental, and technical challenges. In response there has been a rising interest in the use of digital and automated technologies which can be applied to the construction sector. One particular aspect of this is the use of Connected and Autonomous Plant (CAP) to replace traditional, human operated machinery. Incorporating CAP as part of the wider digitalisation of the construction industry promises to deliver gains in productivity, safety, welfare, sustainability, quality, and cost. However, the achievement of these benefits will require a step change in the approach to the design and construction of plant, and in the way that plant operates on construction sites.
This paper presents a potential future for the deployment of plant on construction sites. It discusses how sites could evolve to accommodate the new role of CAP and how people and CAP will need to work together. It discusses how National Highways have been seeking to drive transformation in construction through the development of a vision and roadmap for CAP, which encourages all stakeholders to collaborate and aims to catalyse the development and adoption of these technologies.

Keywords
Connected Autonomous Plant, Construction, Automation, Autonomy, Digitalisation.

39th International Symposium on Automation and Robotics in Construction (ISARC 2022)

A Taxonomy for Connected Autonomous Plant

Cormac Browne¹, Ross Walker², Tim Embley³, Musser Akhtar⁴, Amer Essa⁴, Annette Pass⁴, Simon Smith⁴, Alex Wright⁴

¹Transport Research Laboratory TRL, UK
²School of Engineering, University of Edinburgh, UK
³Costain, UK
⁴National Highways, UK
cbrowne@trl.co.uk, r.walker@ed.ac.uk

Abstract
National Highways commissioned the development of a Roadmap for Connected and Autonomous Plant (CAP), which proposed a programme of activities which would also deliver the widespread deployment of CAP. A particular sub-theme within this is an early target within the Roadmap was the development of a taxonomy for understanding the capability of construction plant for operating without human intervention. This would provide a unified language to understand how plant can be used to achieve tasks with reduced or no human intervention. This paper presents an overview of the process used for developing a taxonomy to achieve this purpose, including the principles underpinning the taxonomy, and the taxonomy itself. This builds on previous automation taxonomy work and applies it to the construction context and is further applied to the example of autonomous construction plant. It is concluded that the development of a unified language for the capability of autonomous construction plant, this will support and catalyse the development of roadmaps through plant and technology manufacturers, enable government processes that accelerate the deployment of CAP in construction, and support innovation practices by providing an understanding of the safety and operational implications of deploying autonomous construction sites. It is also identified that the application of this taxonomy is not limited to the construction environment.

Keywords
Connected Autonomous Plant (CAP); Taxonomy; Autonomous Construction Plant.

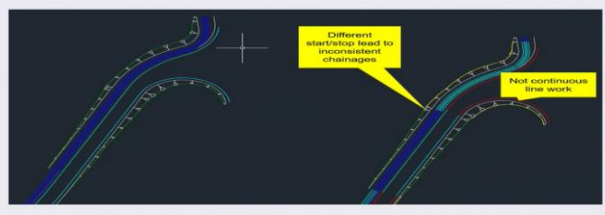
Also presented to Brussels Knowledge Day (March 2022), publications in ICE/NCE, CIHT, etc.

These are available for review by members of PDWG.

All

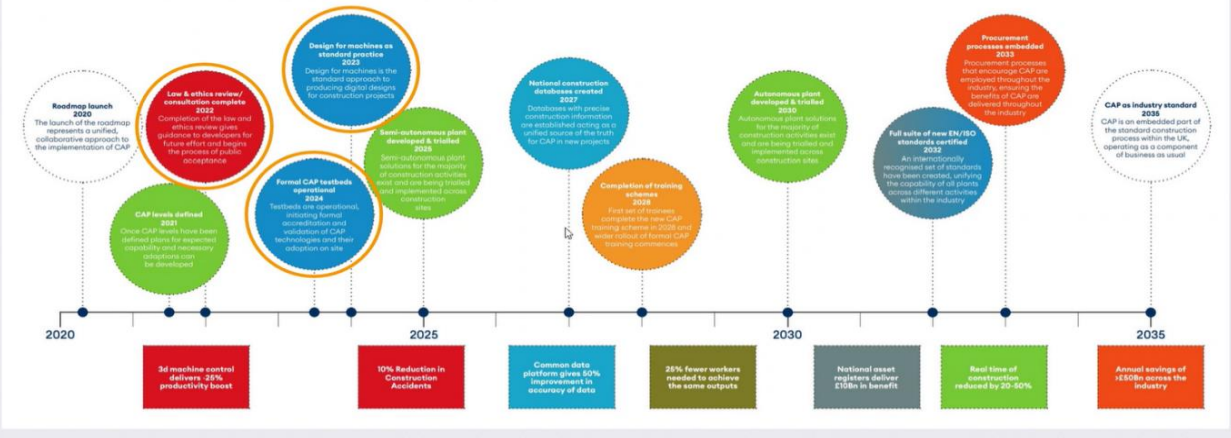
CAP – (Current) Phase 3; Northstar statements

- Task 1: Legislation & Ethics / Commercial & Standards Review**
To answer... *If a fully autonomous plant fleet was available tomorrow, what would the barriers be to adoption in terms of standards and commercials?*
- Task 2: Design for Machines**
To provide good practice guidelines to maximise adoption of 3D machine control, removing barriers to getting compatible designs into machines.
- Task 3: Virtual Testbed creation**
To provide a real-time and over-time view of CAP maturity on National Highways sites.



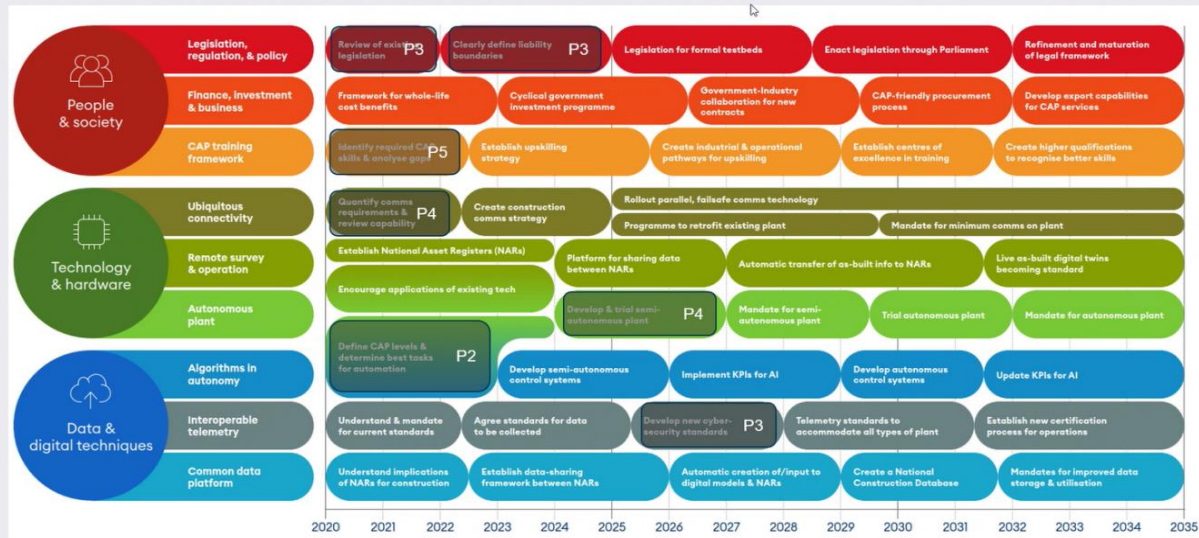
CAP Phase 3 – Key milestones

Each milestone marks a turning point in the Roadmap, or the establishment of a key enabler that unlocks the next stage



CAP So Far – at a glance

Note: this is not a comprehensive view of all developments in industry, only where NH work has focused.



Phase 4 & Phase 5

(As anticipated...)

Phase 4 – Trials & Dashboard

The below workstreams will provide NH with a real-time and overtime view of CAP maturity at an organisational level. This could inform future policy around mandating CAP adoption on schemes, once the benefits are evidenced.

Workstream A: Launch Virtual CAP Testbed

- Launch a virtual, living lab testbed & Dashboard connecting the knowledge and learning from the supply chain's trials of CAP and facilitate access to available testing facilities (e.g. the Manufacturing Technology Centre or NH Development Centre at Moreton-in-Marsh)
- Deliverables: stakeholder engagement, virtual CAP testbed & dashboard

Workstream B: CAP Site Trials

- Targeted, co-funded support to promote pilots and trials with our supply chain, utilising Design for Machines specification developed in Phase 3. We will not be investing in development of any specific CAP technology.
- Gather and utilise data from site trials to populate the Virtual CAP Testbed with real world data
- Deliverables: stakeholder engagement; match funding for 3 site trials; augmentation of site trial data into dashboard

Workstream C: Engagement with Industry through CAP Community

- Engage with Government stakeholders and the CAP community to stimulate the market
- Participate in regional events and exhibitions to identify industry relevant launch events for deliverables
- Deliverables: stakeholder engagement; case study published; dashboard demonstrating current CAP maturity on NH sites.



Phase 5 – Roadmap Review & Workforce of the Future

The deliverables will clarify how the responsibility on NH for site operatives will evolve over time, whilst also allowing operatives to appreciate a realistic view of how their role will develop with an increase in CAP deployment.

Key considerations:

- Is NH on track to realise CAP sites by 2035?
- What will the future operative 'look' like?
- What training will be required?
- Can we diversify the workforce?
- H&S implications of remote working / working from home?
- Does NH have a role in this?
- Where is the duty of care if we remove operatives from hazardous site environments? Display Screen Equipment Assessments & allowances?

High level outputs & outcomes:

- Reviewed CAP Roadmap, assessing current achievement against ambitions
- A trend report highlighting the evolving role of operatives up to 2035 and how this impacts NH business as usual activities, relating to delivering schemes.
- Recommendations report suggesting the measures NH needs to adopt to ensure organisational resilience.



DfT Activities

Past:

Commissioned BSI Group to develop PAS 1892
Defining and specifying the use of Connected and automated plant (CAP) in construction and maintenance works for the purposes of procurement and deployment. (July 2023)

Present:

CAP Market Analysis
To understand the marketplace and appetite for CAP in the construction sector. From a UK vs. Global perspective. (Nov-23 to Mar-24)

Future:

Centre for Connected & Autonomous Plant
Dependent on the outcomes of CAP market analysis.

PAS 1892:2023 Connected and automated plant (CAP). Defining and specifying the use of CAP in construction and maintenance works for the purposes of procurement and deployment. Specification

Source: BSI
 Committee: Z24 - Generic committee reference used for BSI Standards Solutions projects
 Categories: Safety, Machinery | Construction equipment

Supporting Documents:

Filename	Description	Size	
PAS 1892 Draft for Public Comment.pdf	PAS 1892 Draft for Public Comment.pdf	825.33 KB	Download

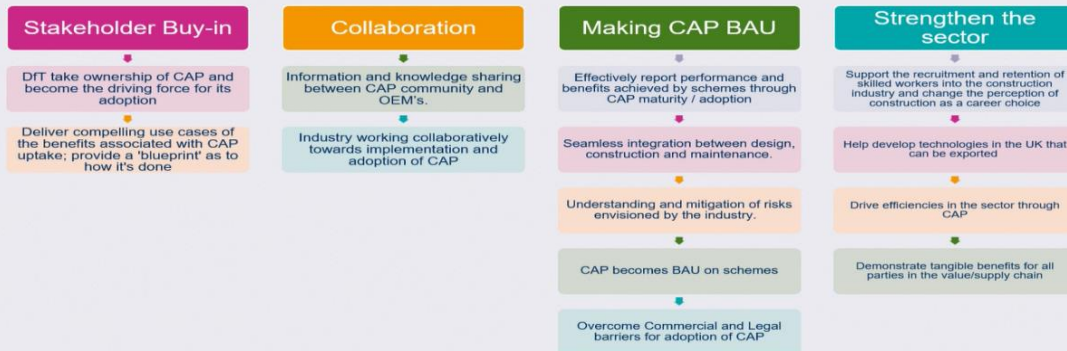
[Buy standard](#)

Follow

Standard timeline

- 1. Proposal (Complete)
 - 2. Draft (Complete)
 - 3. Public Comments (Complete)
 - 4. Comment Resolution (Complete)
 - 5. Approval (Complete)
 - 6. Publication
- Publication start date: 17/07/2023

What does success look like for the CAP Programme?



CAP - Looking to the future



CAP Questions:

Nicolas Mitchell asked - Will designers be given guidance on how to best prepare designs for automated machines/design for the capabilities of a given machine? [There will be guidance within a report being completed by TRL. General guidance will be available going forward.](#)

Robert Butcher asked - I'd suggest this is part of the BIM Management plan for how the model is produced - a specification for what the final model data will comprise. (knowledge exhausted). [This is the aim and working with TRL to achieve the outcomes, leading to an adoptable specification and guidance.](#)

<p>Sulgana Ghosh asked - Will there be guidance available for temporary works design to use this machinery? There is an ambition to cover construction and maintenance, and TW will form part of the objective.</p> <p>David O asked - Does this require two sets of models, one for the use of humans and a separate for machine use. After all this choice of equipment can change at the drop of a hat (even on the day of construction - break downs etc). No, this will not be required - the designer must understand the remit of "machines" information requirements.</p> <p>Butcher, Robert asked - We can imagine that the future involves less of large volume earthworks of a uniform profile / uniform cross-section or large volume construction envelope. Our current projects are a mix of offline AND online working. Has the machine operation advanced or been developed to cope with this more fragmented work type? This requires the correct data being inputted so that the machine can understand the profiles required.</p> <p>Daniel Hassle asked - How does this differ for example from Machine Max and Cubic Technologies powering the intelligent jobsites i.e. Product sensors on plant which provide performance data which can be used on any type of plant and is focused on larger plant with potential to be used for carbon reporting as well? Machine Max relates to the performance of the machine, design for machine work is the design to drive the machine to provide an optimum output.</p> <p>Alexandra Koutsouki asked - Have we considered the risk of the automated digging machine finds asbestos for example in the soil and works need to be stopped immediately until the asbestos is removed safely from the site? Or what happens if an unexploded WWII bomb is found? Is the machine smart enough to stop? (unforeseen circumstances on site!). EA indicated this has not been considered to date, the failsafe part of the machine is currently being reviewed and will be prioritising operators / safe operations. Noted if fully autonomous the danger to humans has been removed.</p> <p>Robert Legg noted - General thought - removing operatives from plant/earthworks has health benefits too, (eliminate exposure to noise/dust), in addition to safety benefits. All agreed</p> <p>Mark Lawton noted - Remember designers are welcome to the CAP group.</p> <p>Alexandra Koutsouki asked - Also on the human perspective, human resources keep changing daily on a site (different groups of workers, new staff, new management, visitors etc..). How will they be briefed on site on the same day about this highly intelligent system and avoid any accidents/near misses? Phase 5 will review the potential workforce and the training / competence requirements. It is highly likely that the future workforce will be from a gaming type background.</p> <p>Roger Swainston asked - Is any work being done with the likes of Autodesk / Bentley to ease the transition? Yes, they have been invited and have participated in the workshops and are willing to consider improved WHS management in the development of their future products.</p> <p>Pav Singh asked - Are we looking at CAP that can be part of the operation and maintenance phase of projects? How can the design integrate space for supporting plant to be used remotely including investigation and survey? We will be reviewing the development of future versions to ensure they support the various phases in the asset life cycle.</p> <p>Nicolas Mitchell asked - Removing operatives from plant/earthworks has health benefits too, (eliminate exposure to noise/dust), in addition to safety benefits. What level of training would operators need to recognise situations where hazards are discovered? There will be requirements for the machine systems to be sufficiently developed to ensure the remote operator is made aware of the plant/machine circumstances (e.g., stability, etc)</p> <p>Robert Butcher asked - What is the governance thinking for "gamifying" to ensure the process is understood to be real-life - that the work doesn't have 4 lives and a re-boot solves any problem? Currently the proposal is too early in it, development lifecycle to currently capture this.</p> <p>Robert Legg asked - Playing devil's advocate - Is an incident a safety issue if the plant falls over, but nobody is around to get hurt? Guess the technology will be able to detect reckless operators before damage is done? The proposal is for safe operation to be within the equipment's intelligence envelope so that it will react accordingly.</p> <p>Nicolas Mitchell asked - Would automated plant be used on brownfield sites/sites where there could be ground contamination? Can equipment be safely cleaned/decontaminated? EA felt that this appeared achievable and / or would form part of the different working practices adopted in the future.</p> <p>Ian Reidy noted – Noted his department has previously reviewed automation on highways and drones. IR asked what has been completed to date around risk assessment / hazard identification. EA indicated that little work had been undertaken in this area at this time. IR offered the services of his department to assist National Highways with this task.</p> <p>EA – Thanked all for their time and interest, some excellent points had been raised - which will help shape future activities on CAP (should they go ahead).</p>	<p>All/MLo</p> <p>EA/IR</p>
--	-----------------------------

2.4 Safety by Design Planning – Phil Gregson (Volker Wessels) - This will presented at a future meeting.

3.0 SCSLG Initiatives & Safety Hub Update

3.1 ○ SCLG Healthier and Safer Design WG – Update - (John Pilkington – WSP)

SUPPLY CHAIN SAFETY LEADERSHIP GROUP

Supply Chain Health & Safety Leadership Group (SCSLG)

PDWG Update 25th January 2024

IDENTIFYING THE RISKS 9 BOVE THE LINE

Vision

To eradicate any occurrences of fatal harm from “**significant risks**” throughout the complete lifecycle of all National Highways assets by 2030 and prevent occupational health life-changing harm by 2040, by elimination, substitution, isolation and/or engineering controls.

SUPPLY CHAIN SAFETY LEADERSHIP GROUP

Background

- SCSLG formed in 2019 with new members in 2022
- Some existing Common Intents and Raising the Bar documents not adding value as anticipated – especially for Designers
- Need to consider construction AND maintenance

SUPPLY CHAIN SAFETY LEADERSHIP GROUP

Health and Safety In Design Working Group



Change in group membership – John Pilkington is now (Chair), Ian Spellacy has been replaced Rob Allen, Jonny Giles has left replaced by Tom Gibson, Toria Thomas has left the group awaiting confirmation of replacement

Common Intent Document/Update – the common intent has been drafted and reviewed currently awaiting submission to the SCSLG steering group for sign off/publication

Health and safety in design working group vision document – The vision document has been drafted and will be submitted shortly to the SCSLG steering group

Health and Safety In Design Working Group



Progress so far:

- Initial focus on **Noise, Dust & Vibration** as the first topic
 - How are design safety decisions made from the outset by
 - Eliminating
 - Substituting
 - Or through engineering controls?
- Input from design organisations into the Design Matrix - thank you!
- Development of a new Common Intent

Next step –

- Development of Case studies/Guidance notes
- Review of Raising the Bar 26 (RtB) – to include Health and focusing on **above the line** solutions

Health and Safety In Design Working Group



Guidance/case studies

Proposal to use the existing PDWG template

Topics:

Noise/Dust/Vibration Topics	Material Processing
Cleaning/Sweeping	Mixing Materials
Coring/Boring	Piling
Drilling/Fixing	Vegetation
Handling Products/Materials	Planing

Chose a topic and complete the Guidance/Case Study template and return back to the SCSLG by next PDWG

Safety Hub Update – 25th January 24



- Our December and January meeting agendas covered:
- Lots of sharing: legionella risks shared by Costain; AI traffic monitoring to inform design of TM presented by Kier and smart hearing protection successes shared by Amey
- Plan for 2024; continue to support the SCSLG on key significant risk areas
- 3 task and finish groups set up to address issues and share best practice:
 - One for live lane working and live carriageway crossings and assessment of safe working methods to be deployed
 - One for a review of RtB 12 looking at safety critical medicals and the difference between NH requirements and Network Rail, plus potentially a review on D&A tests
 - Final group on identification and recording of NRTS by-pass cables and other hazards in the verge

What have we learnt?



Following the monthly outlet temperature testing, the site team identified that for consecutive months a sink tap wasn't reaching the required temperature. As a result, the team requested samples to be taken by the legionella service provider. On the 08 November, Costain were informed by the service provider that the sample had returned levels of Legionella bacteria.

No reports of any illness to date.

Key lessons learnt

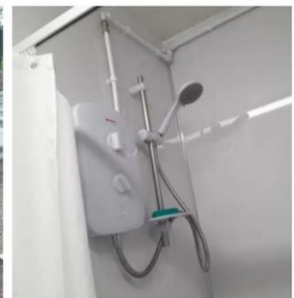
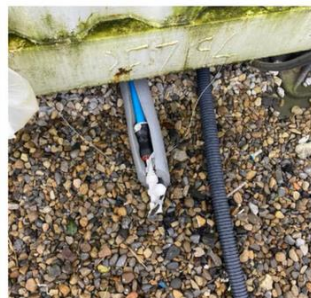
- **Appointing Responsible Persons & Duty Holders**
 - Ensuring persons have clearly defined roles & responsibilities for the key individuals and deputies
 - Ensuring suitable & sufficient training for named roles
- **Change Management**
 - Ensuring the legionella risk assessment is updated when installing or modifying temporary buildings
- **Assurance**
 - Ensuring various assurance checks are being undertaken



Common examples of causes



- Dead legs – redundant pipe work
- Significant length of water supply pipe work – the standard length of flushing the taps is potentially not enough
- Instant hot water boilers in kitchens that are out of order – which act like a dead leg
- Changing the use of the cabins e.g. Canteens to offices
- Disused showers



Ullenwood Manor / A426 junction arrangements opposite A417 main Site Office Entrance



- Use of AI cameras including vehicle incident detection and traffic speed/counting system identified unsafe acts and near misses.
- This entailed one solar powered CCTV tower being installed for a period of 28 days, with the video set for detecting vehicles encroaching a specific point. A full detailed report was provided by Clearway which then went on to inform the future design of the scheme.

Raising the Bar Guidance under review

Raising the Bars 1&3 Plant Standards and People/Plant Interface are being reviewed by the Plant and Earthworks Community (PEC) Step Change Programme. 9 key initiatives have been identified that will support the drive towards step change in plant & earthworks sector during RIS2, these include:

- • Eco-operator Training
- • **3D Machine Control**
- • **Design for Machines**
- • Intelligent Compaction
- • HVO
- • Electrical plant
- • Hydrogen plant
- • Hybrid plant: fossil + hydrogen
- • Robotics / Connected autonomous plant

4.0 Information and Discussion

4.1 Temporary Works Forum – Background, current issues and concerns – (Robin James - TWf Operations Director)

Background – TW Forum have been meeting quarterly for approximately 15 years and has 250+ member companies. Their focus is on the importance of TW within construction. One of the groups aspirations and aims is to have TW included within the University syllabus at construction / temporary works teaching Universities.

RJ proposed that at the next meeting he would focus on the following:

- Euston Box propping - Research
- Tenser Tyre Pressure - Research

RJ highlighted that TWF fund research projects and scholarships within universities.

The group are currently running a number of working groups, to develop industry guidance on Low carbon (WG32), Mesh Fencing (WG42 – guidance due within the year). They are also looking at issues around site hoardings and use of rebar. These could be future topics to discuss at subsequent PDWG meetings.

RJ indicated that TWf run a number of E-Learning Courses – Effective Management of Scaffolding to BS5975, is to be issued ASAP – These are free courses.

5.0 T&F Groups – Updates

5.1 Suicide Prevention Design Tool – Update by DP. The draft Suicide Prevention standard has been issued to the Technical Standards committee for consultation on the 5th January 2024, with consultation running through until 16th February. The expectation is for the standard to be released later in 2024 / or early 2025. In the meantime, the team will be rolling out training and completion of the review / update of all the other related standards. A more detailed update is expected at the May PDWG.

5.2 Knowledge Management T&F Group - (Martin Sherlock – National Highways had sent his apologies)

- Update by Mark Lamport indicated that the next T&F Group meeting is on 21st Feb 2024, current progress is as follows:

Terms of Reference

Key Definitions:

Knowledge Management

Knowledge management is the systematic management of information and learning. It turns personal information and experience into collective knowledge that can be widely shared throughout an organisation and a profession.

Source: Association for Project Management Body of Knowledge (7th edition 2019)

Designer

Designer meaning any person (including client, contractor or other person referred to in these Regulations [CDM 2015]) who, in the course of furtherance of a business -

- a) prepares or modifies a design; or
- b) arranges for, or instructs, any person under their control to do so,

relating to a structure, or to a product or mechanical or electrical system intended for a particular structure, and a person is deemed to prepare a design where a design is prepared by a person under their control.

Source: [CDM 2015](#) (L153), Regulation 2

Design Risk Management

Design risk management (DRM) is a means by which designers can demonstrate that their designs can be built, used, maintained and eventually demolished without negatively affecting the safety, health and wellbeing of those involved in the construction process or those who may be impacted by the structure.

Source: [ICE Guidance for Design Risk Management](#), March 2020

Purpose of the group

1/ To identify, agree and take action on common goals to capture, share/communicate and apply learning from experience to improve health, safety and wellbeing in design project and programme outcomes across our sector.

Potential sources of learning identified by the group include:

- [National Highways Safety Alerts](#)
- Outputs from NH HART incident management system
- Learning and findings from [POPE Reports](#)
- Outputs and findings from Lessons Learnt Logs
- Existing data stored on [Highways Safety Hub Website](#), [NH Home Safe and Well Website](#) and [MP Knowledge Website](#)
- [HSE construction bulletins](#) (need log-in?)
- [Cross UK](#)

2/ To align our work with the PDWG Terms of Reference [November 2023 version] and Major Projects Knowledge Management Strategy [[RIS2 strategy](#)] and Supply Chain Safety Leadership Strategy [check with John Dowsett]; and share relevant documents from other workstreams / groups where appropriate to avoid rework and duplication. Our intention is to ensure end users find it easy to find knowledge content they trust that will enable them to make better informed decisions on the back of that knowledge content.

3/ To agree initial objectives and priorities for the first 6 months, then review.

T&F Group Membership, Meeting Frequency, Agenda and Action Tracker

- T&F Group membership: doug.potter@arcadis.com, richard.wilson2@highwaysengland.co.uk, mark.lamport@arcadis.com, iim.gallagher@nationalhighways.co.uk, tony.lewis@costain.com, john.pilkington@wsp.com, sophie.gwynne@arcadis.com, roger.swainston@jacobs.com, stuart.dawes@nationalhighways.co.uk, martin.sherlock@nationalhighways.co.uk, philip.farrar@gallifordtry.co.uk
- Meeting frequency: – 6-weekly for now.
- Standard agenda items:
 - HS&W Moment,
 - Review of Minutes from last meeting and Action Tracker,

- Ongoing and new actions,
- Any Other Business,
- Date of next meeting
- Tracker with owners and deadlines for actions
- Set up shared space on Knowledge Site.

Provisional outline objectives / activities for group:

Think about what we already have, what is current, what is worth promoting now as a hot topic . . . that will make it easier for end users to use what we have.

5.3 WLD Safety Shares & Design for Maintenance T&F Group - (Martin Partington – Jacobs)

PDWG Task Group – Safety Shares

Summary on a page

Purpose of the Meeting –

- to review draft shares that have been developed, to get them to finalise/publish state
- to review status of other draft shares that have been potentially identified.

Attendees

- Martin Partington (Jacobs) - Chair
- Doug Potter (Arcadis)
- Sophie Gwynne (Arcadis)

Attendees

- Rob Butcher (Jacobs)
- Stuart Dawes (National Highways)
- Tim Goddard(Arcadis)

Apologies

- Jim Gallagher (National Highways)
- Paul Brown (WSP)

Meeting Summary -

- The group agreed after discussion to not split out a further Designing for Maintenance sub-group, as the Safety Shares already identified specific issues , that identified designing for maintenance improvement options. Setting up another group would just be duplicating what the safety shares team already does. However the group would keep this in mind in case it was more beneficial to split.
- The group reviewed two more shares:
 - **High Voltage Cables under Construction Areas** – linked this back to PAS 128 and the levels A-D that reduce the risk
 - **Danger to member of public from poor site security** – The link to the alerts database helps raise the profile of what may seem innocuous issues, in this case the statistics identify potential fatality impacts for an activity that is reducing impact on the environment and helping others
- Sophie advised that after two years supporting the group with preparing the Shares, she was now moving on to other work. However other graduates from Arcadis would support. The group thanked Sophie for her valuable input and support, and she was welcome to stay or link into it.

Next Meeting: Next meeting on Tues 30th Jan 2024, 2.30-4pm

Other Points:

- Martin has reached out to the YNE Maintenance Community with Andrew Stagg (Premier TM) requesting to join the group.

**PDWG Task Group – Safety Shares
Draft Safety Share around high voltage underground cables**

		<p>HIGH VOLTAGE CABLES UNDER CONSTRUCTION AREA</p> <p>WLD.0XX</p>													
<p>Description of Event Pavement coring was undertaken close to 2 275kV cables which were unmarked on the utility plans</p>															
<p>Population at Risk Construction and Maintenance Workers</p>															
<p>Hazardous Activity and Residual Risk Description</p> <ul style="list-style-type: none"> • Construction Workers on site were exposed to the serious risk of being electrocuted or damaging equipment and the potential of doing so has an assessed risk of an almost certain likelihood of potentially multiple fatalities. • Coring was undertaken within 1m of high voltage cables which had not been identified by the design team during the pre-construction phase or construction team once site. 															
<p>Potential consequences of this event</p> <ul style="list-style-type: none"> • HSE reported that yearly there are over 1000 received injuries with 30 being fatal. 															
<p>Safety Hub Alert Database</p> <ul style="list-style-type: none"> • Sub-category 1 Electrical Safety with Sub-category 2 Electrocutation and sub-category 2 Unsafe Act/Condition has 19 incidents with 4 fatality and 7 injuries. 															
<p>Photo of Plans for the Cores with Nation Grid cables (Purple) added.</p>		<p>Potential Mitigation Measures</p> <p>Design</p> <ul style="list-style-type: none"> • Always follow the NRSWA procedures for Utilities identification. • Make sure that utilities packs are properly prepared during the planning and design phase and comprehensive pre-construction information gap analysis is undertaken. • Where possible undertake site investigation, in advance of construction activities, to obtain missing Statutory Undertaker information. • Hazard triangles should always be located on drawings and within 3D models with reference to PAS 128. <p>Construction</p> <ul style="list-style-type: none"> • Safe Systems of Work including scanning and trial holing should always be undertaken before any invasive works are carried out. <p>Maintenance / Operations</p> <ul style="list-style-type: none"> • When receiving as-built information as part of project Handover ensure the information has been reviewed and checked by the Principal Designer and Principal Contractor prior to transferring to the H&S File and databases. • As-built records should always be checked in-line with the NRSWA procedures. <p>Further Guidance and Reading</p> <ul style="list-style-type: none"> • RIB 9 – Utility Avoidance • RIB 26 – Safety by Design • NRSWA Act • PAS 128 – Specification for underground utility detection • NUAR - 													
<p>Please send ideas for Whole Life Design safety shares to wellbeing@nationalhighways.co.uk</p>															
LEAN	Material	Alternative	Reduced	Alternative	Reduced	Reduced	Reduced	Reduced	Improved end user	Reduced Activity	Reduced	Reduced	Reduced	Reduced	Repeatable

PDWG Task Group – Safety Shares

Draft Safety Share around endangering members of the public and site security

DANGER TO MEMBER OF THE PUBLIC – POOR SITE SECURITY

Member of the Public collecting timber from the access ramp on an active site

WLD.0XX

Population at Risk
Member of the Public, Workers Entering Site

Hazardous Activity and Residual Risk Description

- A Member of the Public (MoP) was observed on site collecting material being stored on an access ramp. As they were unsupervised, there was the potential for them to be injured or struck by a vehicle using the access ramp, which has an assessed residual risk of and almost certain likelihood of severe harm.
- Additionally, should an incident occur on-site, the MoP may be placed in further danger as they were not accounted for, had not been given a site induction and were not wearing appropriate PPE.

Potential consequences of this event

- HSE reported that in 2022/23 - 68 MoP were killed in work related incidents.
- MoP could have been seriously injured whilst accessing site without the awareness of the site team to provide assistance.

Safety Hub Alert Database

- Category 1 Security with Sub-category 1 MOP and sub-category 2 Unsafe Act/Condition has 4 incidents with 2 fatalities and 1 injury.

Potential Mitigation Measures

Design

- Potential access locations should be considered during design development and concerns captured within the pre-construction information.
- Construction sites should be **secure** at all times, and the Principal Contractor should be made aware of those specific areas of concern, and particularly issues locally which may lead to the increased risk of trespass e.g., schools, or proximity to residential areas, which may make it more likely for people and particularly children to enter the site unsupervised.

Construction

- The Principal Contractor is specifically required under the CDM Legislation to ensure sites are secure and measures are put in place to prevent trespass.
- The Principal Contractor should set out their site security measures within the Construction Phase Plan and undertake regular inspections of the site to ensure that security measures are maintained in good condition with construction materials properly stored in areas away from sight.
- All incursions should be reported on HART.

Maintenance / Operations

- The maintainer should ensure that all security measures are kept in good order and that maintenance depots or specific infrastructures assets are adequately fenced.

Further Guidance and Reading

- [B23 – Site Inductions](#)
- [B27 – Managing Incursions](#)

5.4 Design Risk Management T&F Group – (Doug Potter - Arcadis)

Principal Designer Working Group

Event No 34

DRM Standardisation Task and Finish Group

- Terms of Reference / Outputs

Doug Potter, Arcadis
25th January 2024

Terms of Reference / Outputs

- Support SCSLG Healthier and Safer by Design T&F Group
 - Review the Health & Safety by Design Common Intent
 - Ensure alignment with SCSLG's Significant Risk Initiative
- Update of RtB 26 in line with the Common Intent
 - Reduce in size and highlight key focus / guidance areas:
 - Design Risk Management Standardisation
 - Review of ICE DRM Guidance
 - DRM Terminology
 - Review outputs from the A66 Risk Standardisation exercise
 - Include the new 5x5 Matrix (for guidance)
 - Review HSE BIM4H&S and Uniclass Risk Classification outputs
 - Training
 - RAG List links
 - Review Health and Safety by Design Plan Templates – PCF/3D process
 - Support development of Case Studies / Safety Shares
 - Link with Knowledge Management and WLD & Design for Maintenance T&F Groups

Common Intent Document

SUPPLY CHAIN SAFETY LEADERSHIP GROUP

Health and Safety by Design

Introduction

In 2022/23 135 workers were killed in work-related incidents in Great Britain with construction accounting for the highest deaths (42). There were 3,000 serious cases of injury reported with 200,000 lost days. Being struck by a moving object (17) and being struck by a moving vehicle (20) are the most common causes of fatal incidents.

National Highways have a vision to eradicate any occurrence of fatal harm by 2030 and prevent occupational health life-changing harm by 2040 by automation, substitution, isolation and/or engineering controls.

To enable us to achieve this vision, we must think differently, and projects must ensure a healthier and safer by design standard is implemented from the outset of the project. This is critical to being able to deliver national resilience for workers and customers.

To embed an 'above the line' approach from the concept stage of all National Highways projects to support the overarching vision:

Health and Safety by Design standard is implemented from the outset of the project. This is critical to being able to deliver national resilience for workers and customers.

Objectives of the Health and Safety by Design Standard

As a supplier community we have agreed to adopt the following principles as a common standard to ensure all Designers embed the above the line approach. We will identify the approach we take to our procedures, aligned to the minimum standard included here, and will address (as a minimum):

1. Hazard Identification
2. Risk Profiling
3. Hierarchy of Protection
4. Effectiveness
5. How we will apply the Hierarchy of Controls
6. Performance Monitoring
7. Design/Principal Contractor Success
8. Leading Indicators

Health and Safety by Design Common Intent Page 23

Highways Safety Hub

Raising the Bar 26

Safety by Design

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5.5 Asset Data Management - H&S File Digital Development - (Mark Lamport – Arcadis)

Principal Designer Working Group Event No 34

Health and Safety File Digital Development Mark Lamport, Arcadis

25th January 2024

Task and Finish Group – Action Summary

SUB-TASK NUMBER	SUB-TASK DESCRIPTION	SUB-TASK ACTION OWNER	CURRENT STATUS/CONCLUSION
1	Establish which other National Highways group(s) are working on H&S File digitalisation and liaise with them to avoid duplication.	Richard Wilson/Jason Glasson	Completed. Conclusion: no other NH groups are working on H&S File digitalisation.
2	Establish what progress consultant organisations who are members of PDWG have already made with respect to Health & Safety File digitalisation.	Saskia Lear + representatives of PDWG consultant organisations	Survey undertaken and results reported previously by Saskia Lear. Conclusion: responses indicated a broad variation with regard to progress on Health & Safety File digitalisation, some appearing to claim H&S Files are being provided in digital form.
3	Establish end-user requirements – clients, operators, maintainers, designers (of future modifications and upgrades), decommissioners/demolishers. <ul style="list-style-type: none"> What information do they need from the H&S File? In what format? On what platform? 	Mark Lamport (transferred from Andrew Finch)	Completed. Conclusion: there appears to be significant misalignment and incompatibility between the way that H&S information is stored, managed and communicated during the pre-construction design and construction stages and the way that the end-users store, manage and communicate H&S information.
4	Identify which of the National Highways H&S File content requirements set out in the H&S File PCF product guidance can be presented in digital form. Is this all or some of the content?	Tim Bowes/David Owens	Completed. Conclusion: all of the H&S File information required by CDM2015 Appendix 4, and that which is additionally required by National Highways, is capable of being tagged to assets on a GIS platform.
5	Produce a draft process map – to help ensure consistent approach and format of data and risk tagging for point, linear and areal hazards (including shape, size and colour of hazard symbols [?triangles, polygons] and fields within the associated tagged data set).	Mark Lamport	Work in progress – target date for completion: 29/2/2024.

Task and Finish Group – Action Summary

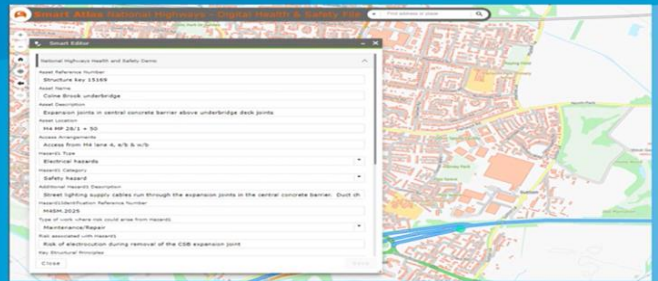
SUB-TASK NUMBER	SUB-TASK DESCRIPTION	SUB-TASK ACTION OWNER	CURRENT STATUS/CONCLUSION
6	Identify any specific requirements of the National Highways Digital Delivery and Digital Roads documents which would be relevant to H&S File digitalisation.	Rob Butcher	Completed. Conclusion: the broad inference from these documents is that digital capability of common data environment enables HSF features such as Digital Twins and Handover, but there is no specific guidance or detail. The content is supportive of HSF digitalisation as part of the digital handover asset data process.
7	Produce Outputs and Deliverables	Mark Lamport	Work in progress – target date for completion: 29/2/2024.

What a digital H&S File could look like

H&S File text

Contents	
1	Introduction..... 5
2	Location and Address of Project..... 5
3	Project Description..... 5
4	Project Client and CDM Dutyholders..... 5
5	Consultants and Specialist Sub-Contractors..... 5
6	Previous Health and Safety Files and Other Information Sources..... 6
7	Digital Health & Safety File Information..... 6
8	Design Information..... 8
9	As-Built Information..... 8

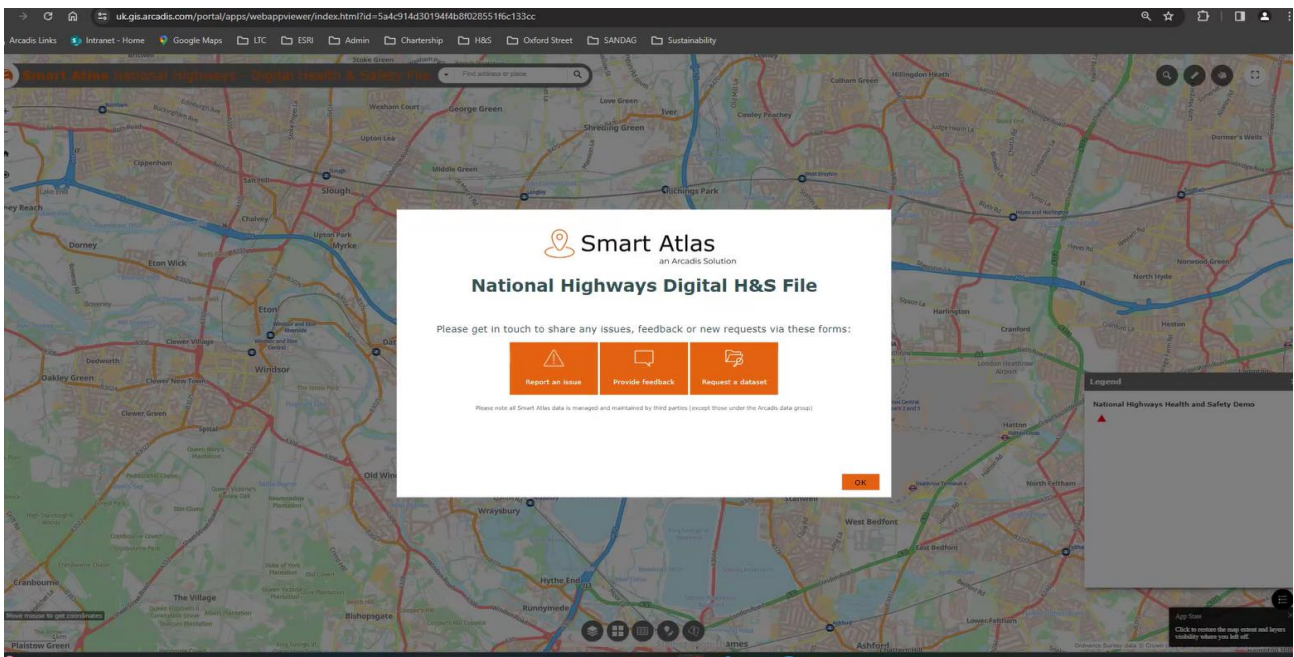
GIS-based data



Two types of hazard marker data

- Asset-specific H&S File information
 - for a structure, lighting column, feeder pillar, drainage chamber etc which may have one or more significant hazards associated with it
- Hazard-specific H&S File information
 - point hazards: eg mineshafts
 - linear hazards: eg water pipe, gas main, electricity cable
 - Areal hazards: eg areas of contaminated land, unstable ground

These require slightly different data schemas



Smart Atlas National Highways - Digital Health & Safety File

Smart Editor

National Highways Health and Safety Demo

Asset Reference Number: Structure key 15169

Asset Name: Colne Brook underbridge

Asset Description: Expansion joints in central concrete barrier above underbridge deck joints

Asset Location: M4 HP 28/1 + 50

Access Arrangements: Access from M4 lane 4, e/b & w/b

Hazard Type: Electrical hazards

Hazard Category: Safety hazard

Additional Hazard Description: Street lighting supply cables run through the expansion joints in the central concrete barrier. Duct chambers containing

Hazard Identification Reference Number: H4SH.2025

Type of work where risk could arise from Hazards: Maintenance/Repair

Risk associated with Hazards:

Close Save

Smart Atlas National Highways - Digital Health & Safety File

National Highways Health and Safety Demo

Filter by map extent

OBJECTID	Asset Reference Number	Asset Name	Asset Description	Asset Location	Access Arrangements	Hazard Type	Hazard Category	Additional Hazard Description	Hazard Identification Ref Number	Type of work where risk could arise from Hazard	Risk associated with Hazard	Key Structural Principles	Info for maintaining the asset	Information for removal or dismantling of the asset	Significant Services	Additional information and any special requirements	Links to reference documents	GlobalID	created_user	created_date	last_updated	last_edited_date
3	Structure key 15169	Colne Brook underbridge	Expansion joints in central concrete barrier above underbridge deck joints	M4 HP 28/1 + 50	Access from M4 lane 4, e/b & w/b	Electrical hazards	Safety hazard	concrete barrier. Duct chambers containing re-entrable cable joints have been installed on the top of the CBE, on both sides of the expansion joint, to enable the section of cable to be withdrawn before the expansion joint is lifted out.	H4SH.2025	Maintenance/Repair	Risk of electrocution during removal of the CBE expansion joint	No stored energy (as the barrier and expansion joint is not under tension)	expansion joint will need to be isolated and disconnected at the adjacent re-entrable cable joints before the expansion joint can be removed for replacement of the joint or dismantling of the central reserve concrete barrier.	expansion joint will need to be isolated and disconnected at the adjacent re-entrable cable joints before the expansion joint can be removed for replacement of the joint or dismantling of the central reserve concrete barrier.	Street lighting supply cables (running through the expansion joints). Electricity isolation points are shown on drawing XXXXXXXX	None	Documentation	(DP20421-CBE-KC21-B41428943DC	arisha.jy@nhs	1/23/2024 9:10 AM	sophia.willett	1/24/2024 3:24 PM

Smart Atlas National Highways - Digital Health & Safety File

Layer List

- National Highways Health and Safety Demo
- National Grid Electricity Transmission Cables (England and Wales)
- 3rd Party Rail Dataset
- 3rd Party Road Network Dataset
- Road
- National Charge Point Registry (February 2021)
- Road Accidents 2019
- Road Network - Ordnance Survey

Hazard marker data schema for Hazard-specific H&S File information (1)

DATA FIELD TITLE	DATA ENTRY TYPE
Hazard Location	M4 MP 62/6-75
Hazard Type/Descriptor	Underground services
Hazard Category	Safety hazard
Hazard Extent	Linear hazard
Additional Hazard Description and Details	MP, IP & HP gas mains, 16" & 24" cross transversely beneath the M4
Hazard Identification Reference Number	M4SM.0730

Hazard marker data schema for Hazard-specific H&S File information (2)

Type of work where risk could arise from the hazard	Future construction/alteration
Associated risk	Risk of electrocution, fire and/or explosion
Additional information and any special requirements	Asset owner is SGN. Construction in the vicinity of the SGN mains is subject to the SGN PS6 approval process. Work must not commence in this area until formal PS6 approval has been received from SGN and all conditions have been complied with.
Links to reference documents	Link to services drawing

Key Conclusions

- Proof of concept of H&S File digitalisation has been demonstrated
- Design organisations are already adopting and utilising GIS-based tools and platforms for storing and communicating health and safety information during the pre-construction and construction stages – so this is just an extension into the handover stage
- Buy-in needed from end-users (eg OD) for wider adoption
- The current mis-alignment between the design community and the end-user maintenance community appears to be the principal significant challenge to be overcome

Next Steps

- Produce process map for management and communication of hazard and risk information from design through construction and handover into maintenance
- Finalise report to summarise T&F Group findings, conclusions and recommendations

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2	Task and Finish Group Objectives Overview 5
3	Objective 1 5
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5	Objective 3 5
6	Objective 4 6
7	Objective 5 7
8	Objective 6 7
9	Objective 7 7
10	Conclusions 7
11	Recommendations 7

Alisdair Guthrie asked – For future designers taking H&S Files and taking this into the next scheme as Pre-Construction Information, how will this information be shared? **MLa** indicated that it is hoped that a digital twin is developed, and that the residual hazards are available in an evidential GIS platform which would be taken straight into the PCI.

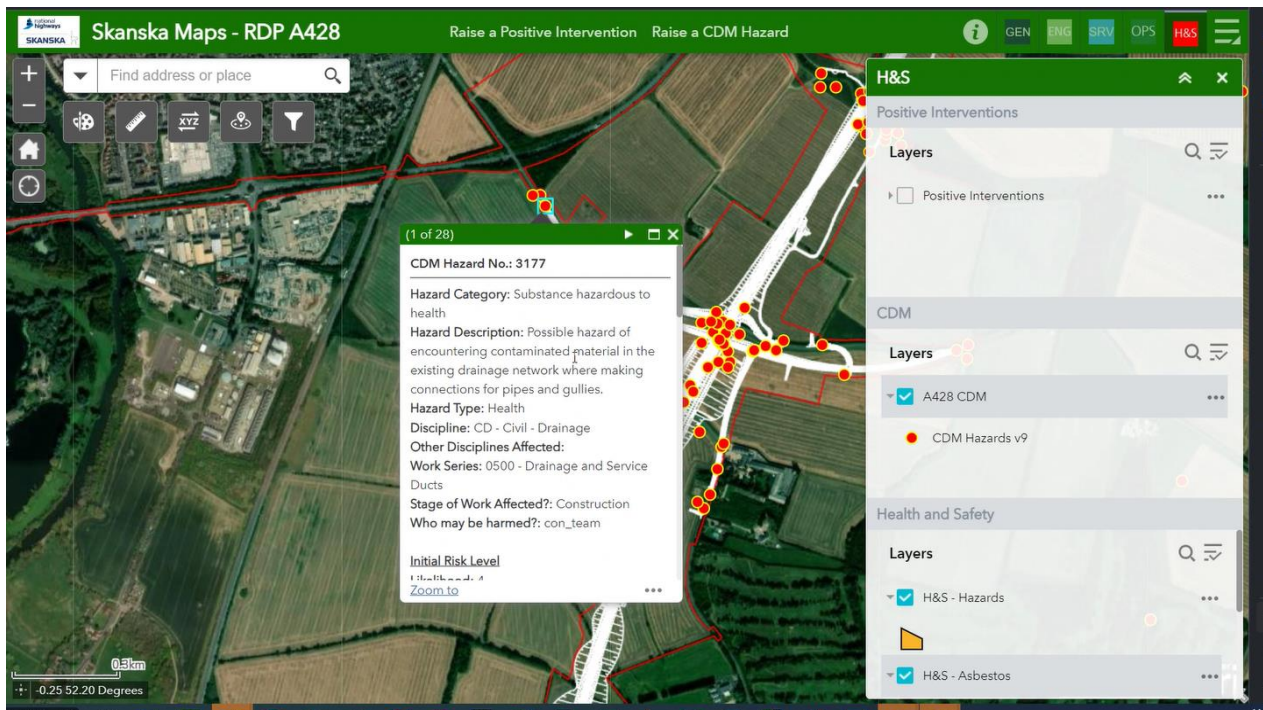
David Olorenshaw noted - Sophie and Mark. Having worked with Opps, this is exactly the level that would work for maintenance. Assume this would be set up nationally and owned by NH. Presume we would need to create this in addition to BIM model and traditional H&S file.

Nicolas Mitchell asked - How do you collect residual risk information - through an excel sheet / upload to the GIS data system? **MLa** indicated that this will be set out within the proposed process map. **Sophie W** highlighted that particular example was from excel to GIS, however there are definitely workflows that could collecting risks out on site, and these be uploading into the live GIS platform (also options would be available to output report etc).

Mark Lawton noted - The lack of a geospatial community is stopping the increase in the adoption of geospatial information. Skanska are doing much in this area, and he expected others too. **Doug P** noted he has obtained a number of potential NH geospatial community contacts and is going to investigate the potential for setting up a GIS Community and feedback. **Liz B** indicated there are mirrored geospatial hazard gathering exercise with working groups in consultation with HSE, to the new ISO standard currently ongoing on Lower Thames Crossing. NH engagement is essential to ensure the correct handover standard for information is set.

MLa

DP





Mark Lawton provided the above 2 Skanska GIS screen shots. He referenced again the current lack of Geospatial community in the industry – DP to feedback.

DP

Nicolas Mitchel noted – TYP SA Design group producing logistics and structural designs on HS2) using CDM registers in excel set up to record data in a specific format that is directly uploaded to the GIS system - includes residual risks and location data. GIS data can be set up to filter and display construction, maintenance and operation risks for specific locations/assets etc. As-built GIS data should be designed to be the single point of truth but can be updated by authorised design/project team members to remain as a live data source.

Rob Butcher noted - Absolutely and all working to BIM standards in CDEs such as the Jacobs tie up to Projectmapper / Track Record Safety and 3D modelling in Revizto - the A12 Chelmsford to A120 Widening has been primarily recorded in a 3D model environment linking the hazards identified by the Design team into the model.

6.0 AOB

6.1 Nick H had asked previously how designers should ensure that we maintain utility access / 3rd party rights on highways, verges, etc. MP highlighted a utility box which could only be accessed via a convoluted access route. In this case access was better from the LA road rather than the SRN. RW flagged that access incidents / situations (gantries, etc) need to be raised with the relevant maintenance operations team. Where applicable alternative forms of access should be reviewed / and if necessary, changed.

6.2 Demobilisation – DP questioned if CPP's were including full or part demobilisation plans. This detail/information should be included within the CPP. RW said that in all instances there is a requirement to consider remaining welfare, emergency requirements, ongoing services / testing etc as a project moves toward conclusion.

7.0 Next Meeting – 9th May 2024 – Via Teams.