

Exemplar Project
A465 Heads of the Valleys Dualling Section 3

23rd October 2014

Welcome

Chris Craufurd
ICE Cymru

Ed Evans
Constructing Excellence in Wales



A465 Heads of the Valleys Dualling Section 3 Brynmawr to Tredegar



CarillionCan

Exemplar design stage case study

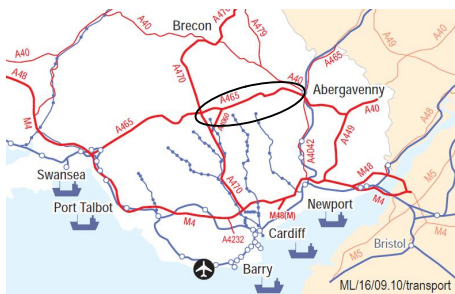
23 October 2014

Martyn Leech
Welsh Government Project Engineer

Mike Cummine
Carillion Project Director



Heads of the Valleys Dualling Programme



A465 – Key East-West route in Wales.
Part of TEN-T network -Important Regional, National & International Link
Access across northern edge of south Wales Valleys
Connectivity to Swansea, Newport and Cardiff
Connects to Ireland via south west ports
Access to English Midlands and beyond

A465 Abergavenny to Hirwaun – Current Conditions

Existing road is 3 lanes – 2 uphill & 1 downhill
Route has poor accident record
Limited opportunity for overtaking
Poor forward visibility in places
Lack of resilience in trunk road network in the area

At-grade junctions along its length
Congestion & unstable traffic flows at peak times – affects journey times & journey time reliability
Passes through area of long-standing area of social & economic deprivation

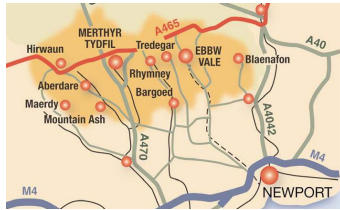


A465 Dualling – Abergavenny to Hirwaun

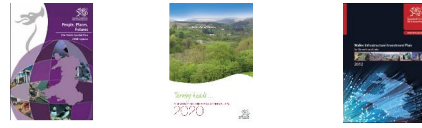
Long-standing severe deprivation

A465 runs through HOV Strategic Regeneration Area (SRA)

SRA – 15 year plan to tackle root causes of poverty and other social problems



A465 Dualling – Abergavenny to Hirwaun



Wales Spatial Plan, Turning Heads & Wales Infrastructure Investment Plan (WIIP) identified regional problems linked in part to poor connectivity –

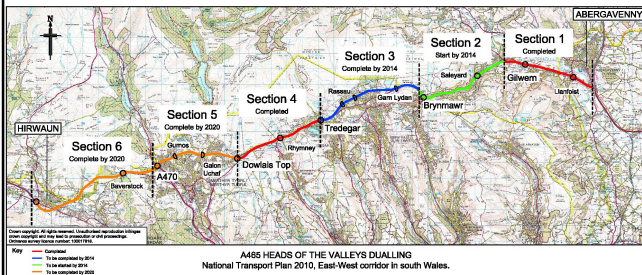
- Physically remote from major south Wales cities – Cardiff, Swansea, Newport
 - Poor access to other cities in the UK
 - Poor access to major ports
 - Poor access within HOV region itself
- Hence the "Dualling of the A465 is a major opportunity for the region"



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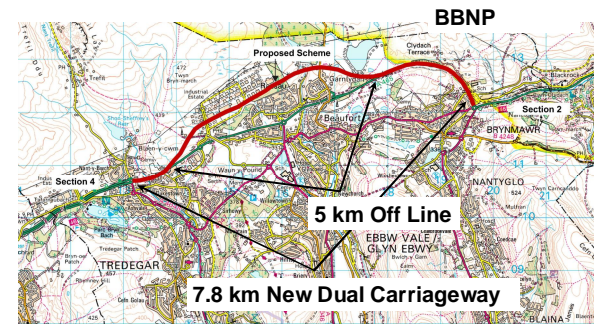
A465 Programme



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Section 3



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Section 3

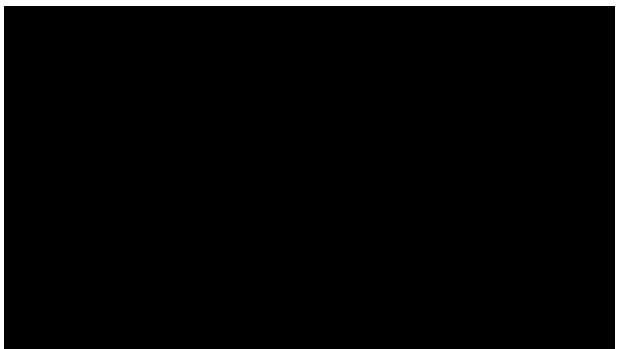


4,813,169 900,000m³ Earthworks
400,000m³ Rock



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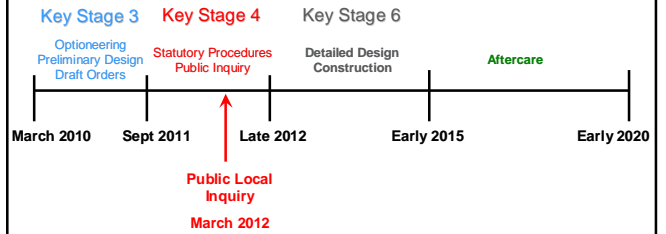
Post Contract



Llywodraeth Cymru
Welsh Government

- ECI Project
- Awarded in March 2010

Welsh Government ECI Process



Customer and Contract



Llywodraeth Cymru
Welsh Government

- ECI Project
- Awarded in March 2010
- 70:30 Quality Financial Split
- Financial Element made up of:
 - Fee
 - Key Stage 3 Target Price (Preliminary Design)
 - Key Stage 6 Target Price (Construction and Aftercare)

Contract

Key Stage 3

- NEC Professional Services Contract
- Pain Gain incentive mechanism

Key Stage 4

- Continuation of PSC no incentive

Key Stage 6 and 7

- Engineering and Construction Contract Option C (Target Cost)
- Pain Gain incentive mechanism
- FTC with inflation mechanism £116m (Jan 2013)

Risk Transfer

Tender

Tender model required bidders to submit a mid tender budget assumptions report this highlighted areas of uncertainty (risk).

Client team took this uncertainty out of the tender by including a small number of Mandatory Budget Assumption for all bidders to follow.

- Mine workings
- Earthworks disposal (handling, haulage and fees £30/m3 £22.5m)

Shared Risk Management Process

Collaborative approach explored opportunities in road alignment & landscape mitigation to bring disposal down

- March 2010 – 750,000m³
- December 2010 – 400,000m³
- June 2011 – 150,000m³
- March 2012 – 50,000m³

Client View

Final Target Cost Earthworks 50,000m³ = £4m disposal cost

Transferred to Contractor's risk allowance - party best able to influence the outcome for £4m increase in Target Cost

Contract pain/gain mechanism – WG only exposed to a max. 50% of any overspend & recovers min 50% of any under spend – Extra protection

Risk reduction £22m to £4m – Achieved through a proactive shared ownership approach to risk management.

Collaboration



What the Client really wants

- Make the economic and environmental case for the road
- Safe, on time, on budget delivery
- Deliver real and measurable benefit in the community

Aligned Objectives



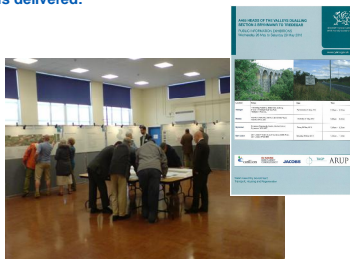
Reduce waste responsibly, source materials and protect the environment

Make real contributions to the communities we work in

Community Engagement

Making sure the right scheme is delivered:

- 4 public information exhibitions
- 5 targeted community information days
- A 'meet the buyer day' for local businesses
- Personal visits with 83 landowners and 39 businesses
- 4 Orders exhibitions



Community Engagement

- 4 supermarket road shows
- 9 presentations to local interest groups
- 8 local schools events



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Community Engagement

- Newsletters
- Project website
 - averaging 64 hits per day and rising
- project flythrough on 'you tube'



A465brynmawr2tredegar.co.uk



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Community Engagement

Resulting Benefits:

- 14 Objections only 3 remaining to be heard at Public Local Inquiry
- 8 letters of support
- 6 day Inquiry - Inspectors report received in only 4 weeks

Happy Client

"Thanks for listening to people and showing interest in people's issues. Thanks for good consultation and two way dialogue. The design has been improved by listening to the public" – Tredegar Town Council Member.



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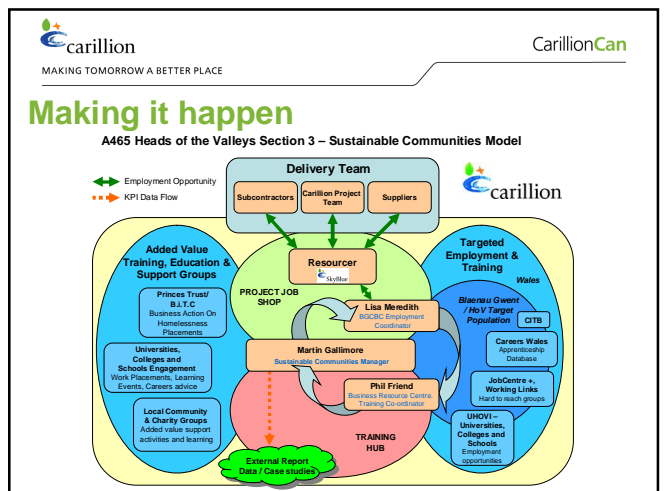
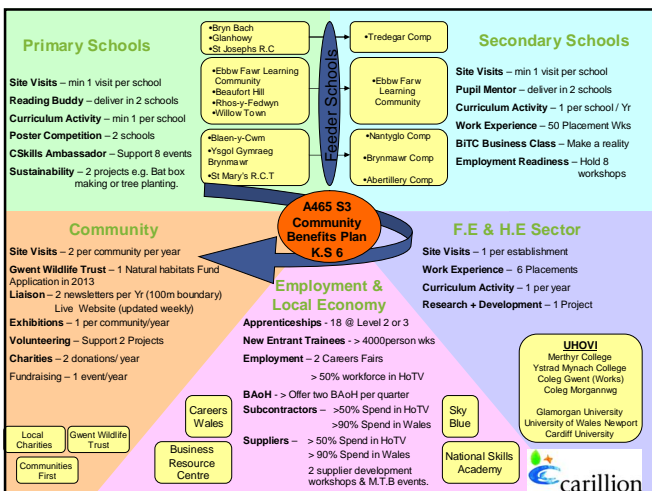
Moving to Construction

- Employment – Targeted Recruitment and Training
- Delivering Added Value
- Community Benefits

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Commitment

- Carillion
 - the largest employer of young apprentices in the construction sector
- Contract
 - 52 additional new jobs
- Targets
 - 18 Apprenticeships
 - 50% Local (HOV) Employment and Supply Chain
 - 90% Welsh Employment and Supply Chain
 - Supporting education and inspiring young people



Maximising local employment

- Employed 660 Welsh people
- Equates to 15,000 weeks
- Almost 45% from HoTV.

Supporting Sustainable Communities



Up-skilling tomorrow's workforce

- Wales' 1st National Skills Academy for Construction



Leading the Way in our Sector



Up-skilling tomorrow's workforce

- 27 Apprenticeships
- A465 Apprenticeship Academy– 50 New Apprentices
- Employment to 70 New Entrant Trainees

Supporting Sustainable Communities



Inspiring the next generation

- Engaging them in the 'world of work'
- Supporting and delivering curriculum
- Inspiring them to achieve more

Supporting Sustainable Communities



Inspiring the next generation



Site Safety Talks



Environmental Projects

Primary Schools

Supporting Sustainable Communities



Inspiring the next generation



Concrete Challenge



Careers Awareness

Secondary Schools

Supporting Sustainable Communities



Inspiring the next generation



Delivering Curriculum

Further Education



Site Visits

Higher Education

Supporting Sustainable Communities



Supporting local Communities



Glanhowy Primary



Festival Park Refurb

Inspiring the next generation



Keeping it Equal Event

Challenging Gender Stereotypes

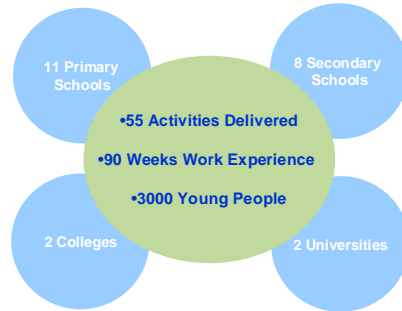


Girls into Construction

Supporting Sustainable Communities



Inspiring the next generation



Supporting Sustainable Communities



Welsh Government

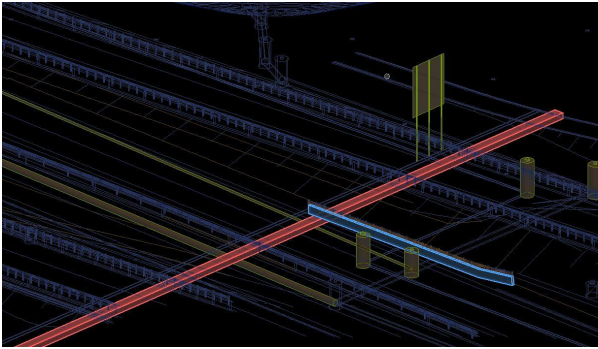
Jane Hutt, Finance Minister

"The dualling of the A465 is an ambitious project which the Welsh Government is fully committed to. **Transport has a critical role to play in improving Wales' economic competitiveness and it is vital that we get the most out of the construction phase of these projects.**

"This is exactly what we want to see from public sector construction projects and Carillion should really be congratulated on the work they have done to ensure local businesses and people are benefiting from the project.

Application of BIM on highway Infrastructure Projects

Clash detection



Communication Tool

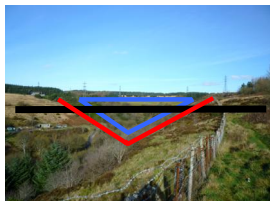


Capability Development

Benefit/Outcome

- Sequence - RC works with piling not an option
- Design - Value Engineering to delete piles
- Communication – Visual aid to explain intent at sensitive cemetery location

Carno Underpass & Embankment

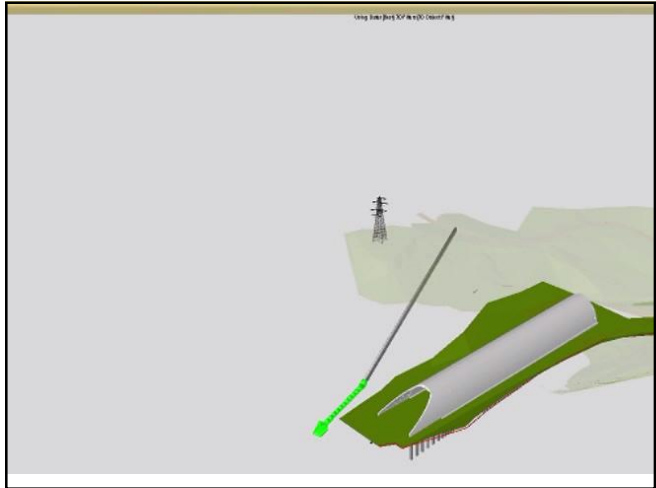
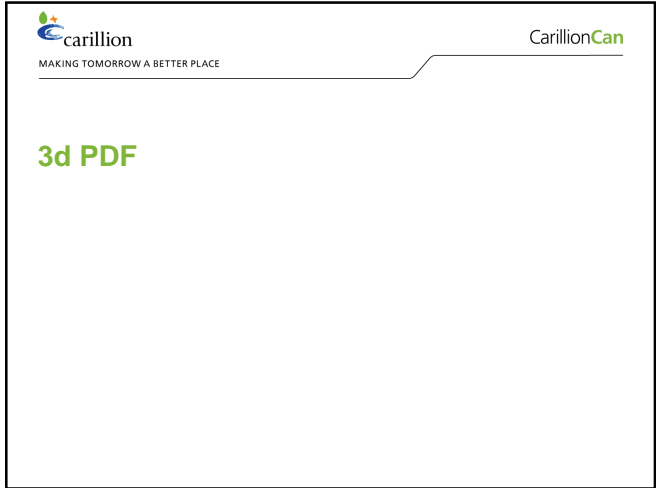
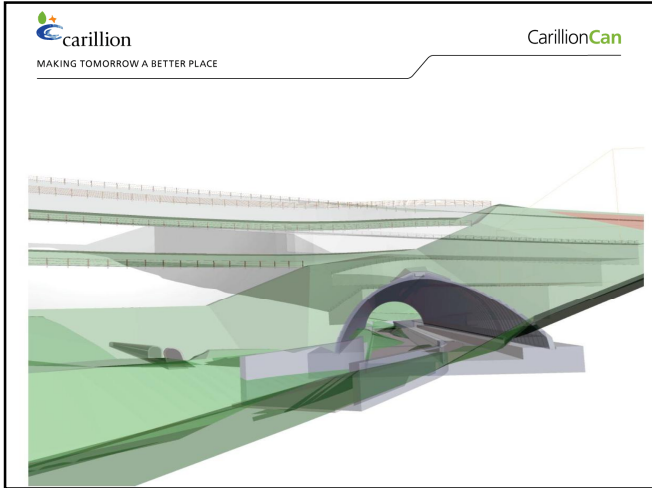


Existing



Proposed





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SYNCHRO
SOFTWARE

Changing the way construction is delivered

**Visual Planning Awards
Roads & Bridges
Category Winner
2014**

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Hopes

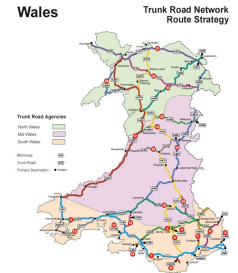
- Creation of ideas and innovation
 - early and invest in 3D
- Clash detection particularly of services and drainage
 - supporting full GPS machine control
- Improved communication and understanding of plan
 - standardised Client handover information
 - realising the real value in asset management

Fears

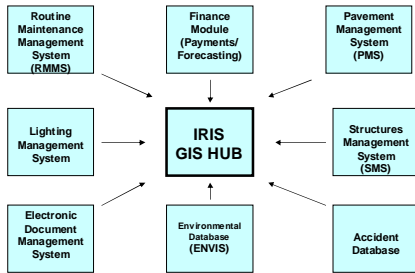
- Planner (who can model) or Modeller (who can plan)?
- IT Constraints
 - Internal barriers and external constraints
- Value on highway schemes
 - Client's intention for Asset Management
 - Match model detail to complexity

Asset Management of the Trunk Road Network

- 1000 miles Trunk Road; 75 miles of motorway;
- 5% of road length; One third of traffic
- Asset Value approx **£16 billion**
- Over **3200** structures, 1400 retaining walls and 10 tunnels
- Local Road Network over 32,300km – all classes



Managing of the Trunk Road Asset



- What role is there for BIM?



Low Carbon Economies – Reducing Emissions at The Heads of the Valleys



Highway Construction Phase Carbon

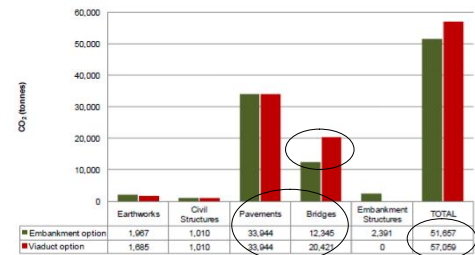
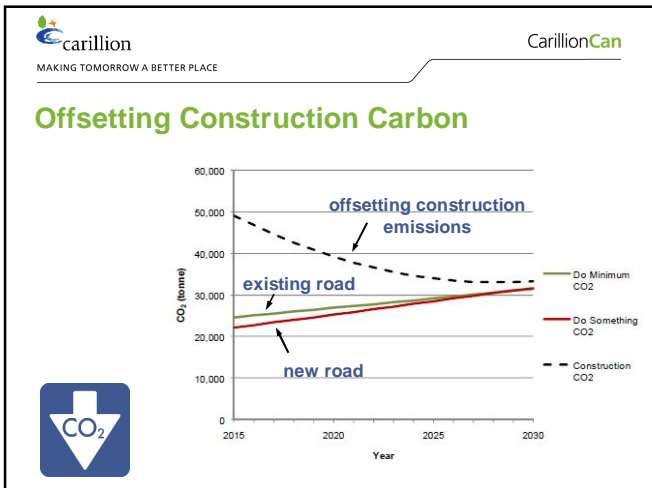
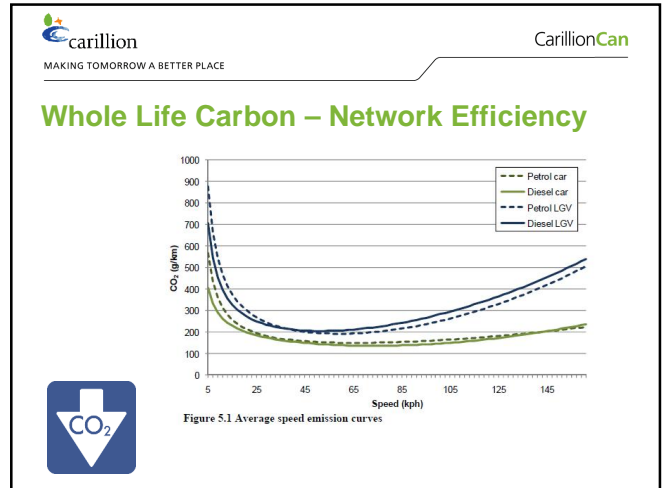
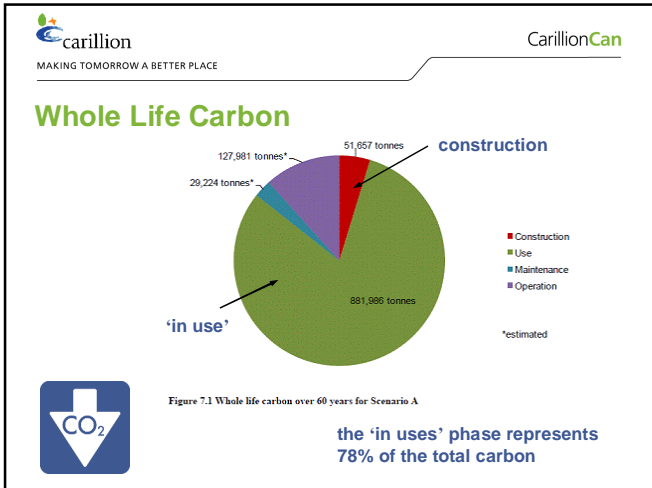


Figure 4.4 Carbon break-down by construction element





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- ## Environmental Benefits
- Reduced construction carbon by 10% or 5,400t
 - Reduced in services carbon by 18,300t in the first 15 years
 - Effectively offsetting 35% of the construction carbon

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- ## Carillion Lessons Learned
- Engage with the designer - Efficient construction will never recoup inefficient design
 - Understand where the real long term carbon cost lies
 - Target high carbon materials

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Earthworks

Overemphasis on construction phase carbon efficiency may be miss placed ?

Should we adjust the alignment to make it as fuel efficient as possible to drive rather than to balance the earthworks ?

Reduce waste responsibly, source materials and protect the environment

Vs



Questions ?

A465 Dualling Section 3 – Stage D – Design Development 1

Project Rules - Visitors

- You must be escorted at all times.
- If you lose your escort – Black Hat - return to the Site Office.
- Follow all instructions given by your escort and traffic marshals.
- Mobile Phones are only to be used in designated areas.
- Beware of activities going on around and above you.
- Smoking is only permitted in designated smoking areas.

Minimum PPE

As a Visitor going onto site you must wear:

- Safety Helmet
- Safety footwear including steel toe and mids protection and laces. S3 Only
- Long sleeve High-viz vest or coat
- Task Specific Gloves
- Light eye protection at all times and over glasses if wearing reading glasses.

