



Manufacturing next generation S&C

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MAKING A POINT:

Developments in S&C design, manufacturing, installation & maintenance

18 March, Manchester

Progress Rail
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Presentation overview

Manufacturing next generation S&C



Company overview

- History
- Products
- Manufacturing

Research & technology

- University links
- Digital tools

External factors

- Voiding
- Track Stressing

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Progress Rail UK history

South Queensferry & Sheffield facilities

Early
1900s



Balfour Beatty

2006



1988



2008/09



2011

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Progress Rail UK sites

4 key sites

Austenitic cast manganese crossings
High security bollards

South Queensferry

Flash-butt welded crossings
Machined crossings

Sheffield

Sandiacre

Beeston

Fabricated crossings
Switch & rail work
Cast iron products foundry

Completed layouts for
installation

Modular train loading

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Clients

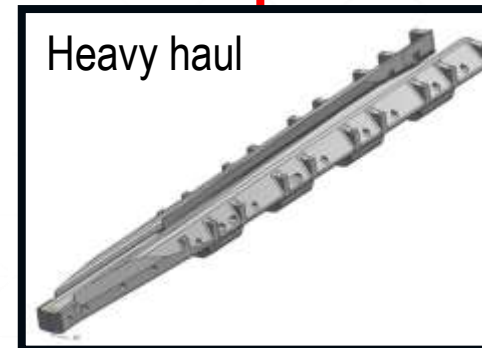
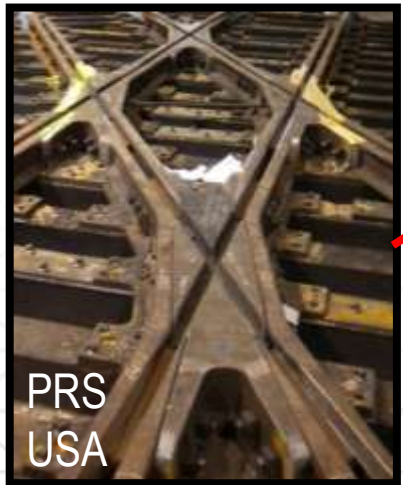
A global product

Tramwork
(UK & International)

Blackpool
Docklands Light Rail
KL Star
Sheffield Supertram
Minneapolis
PATH (Pennsylvania)



WE BUILD A BETTER, MORE SUSTAINABLE WORLD



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The railways

A multi-faceted network



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What is a crossing?

A crossing:

- routinely catches 421 tonnes
- travelling up to 140mph
- & guides it the right way...



...FIRST TIME, EVERY TIME!

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Progress Rail UK supplied products

Specials and mainline crossings up to 12.5m long



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Crossing manufacture

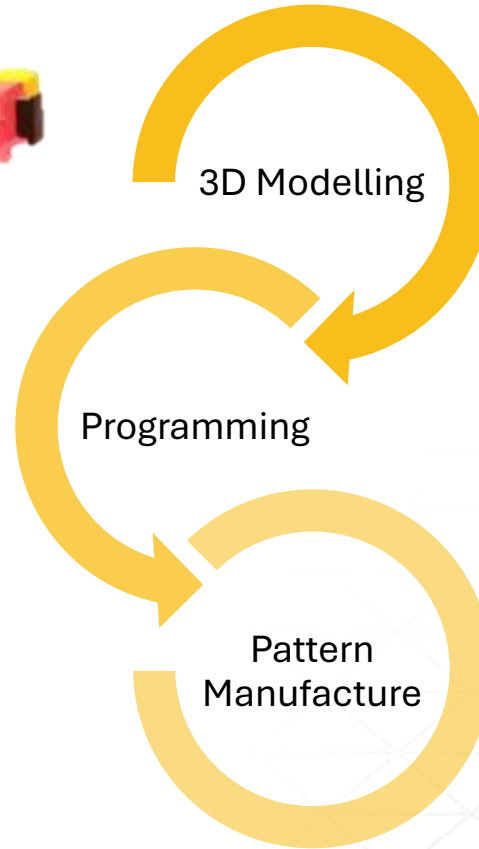
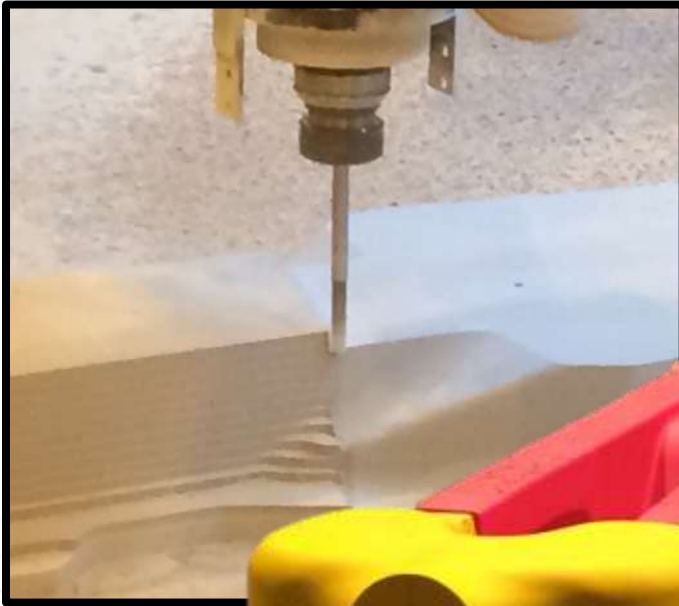
South Queensferry facility



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Pattern making

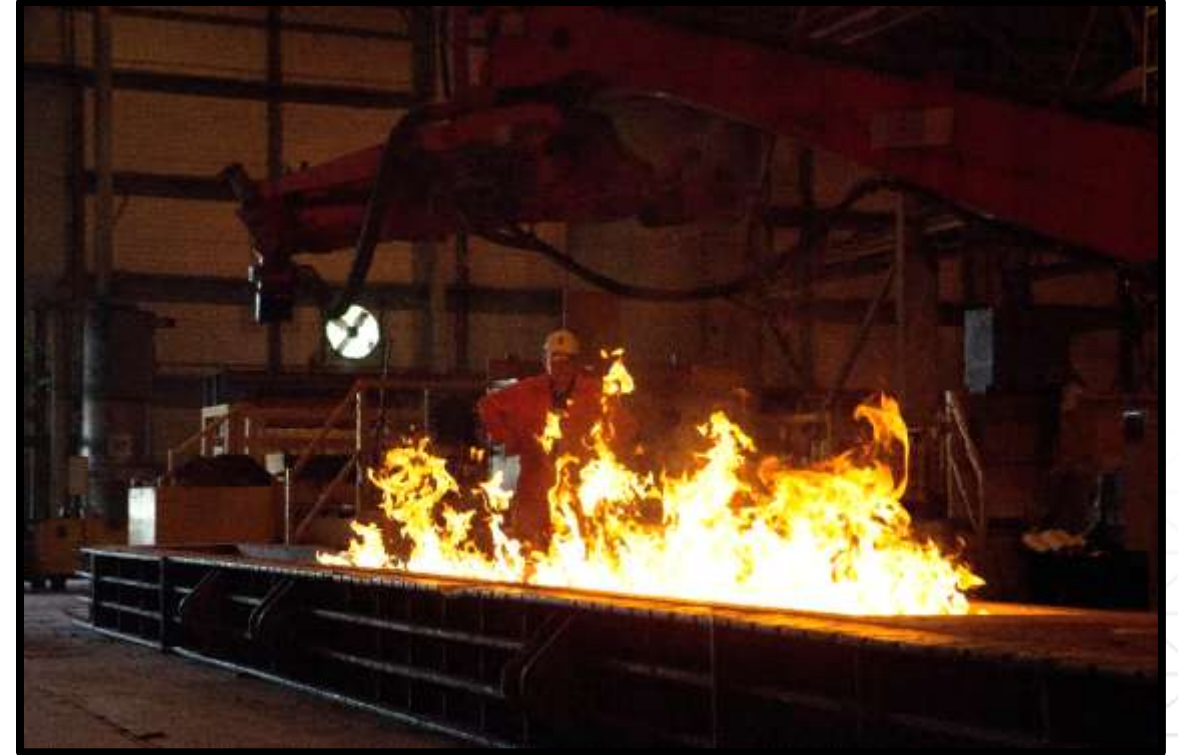
In-house pattern manufacture (5-axis) capability



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Moulding

Boxless moulds



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Steel making

2 electric arc furnaces



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Post-cast – knock off

Riser removal



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Post-cast – heat treatment

Heated to 1050°C



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Non-destructive testing

In accordance with EN 15689 minimum



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Machining and fettling

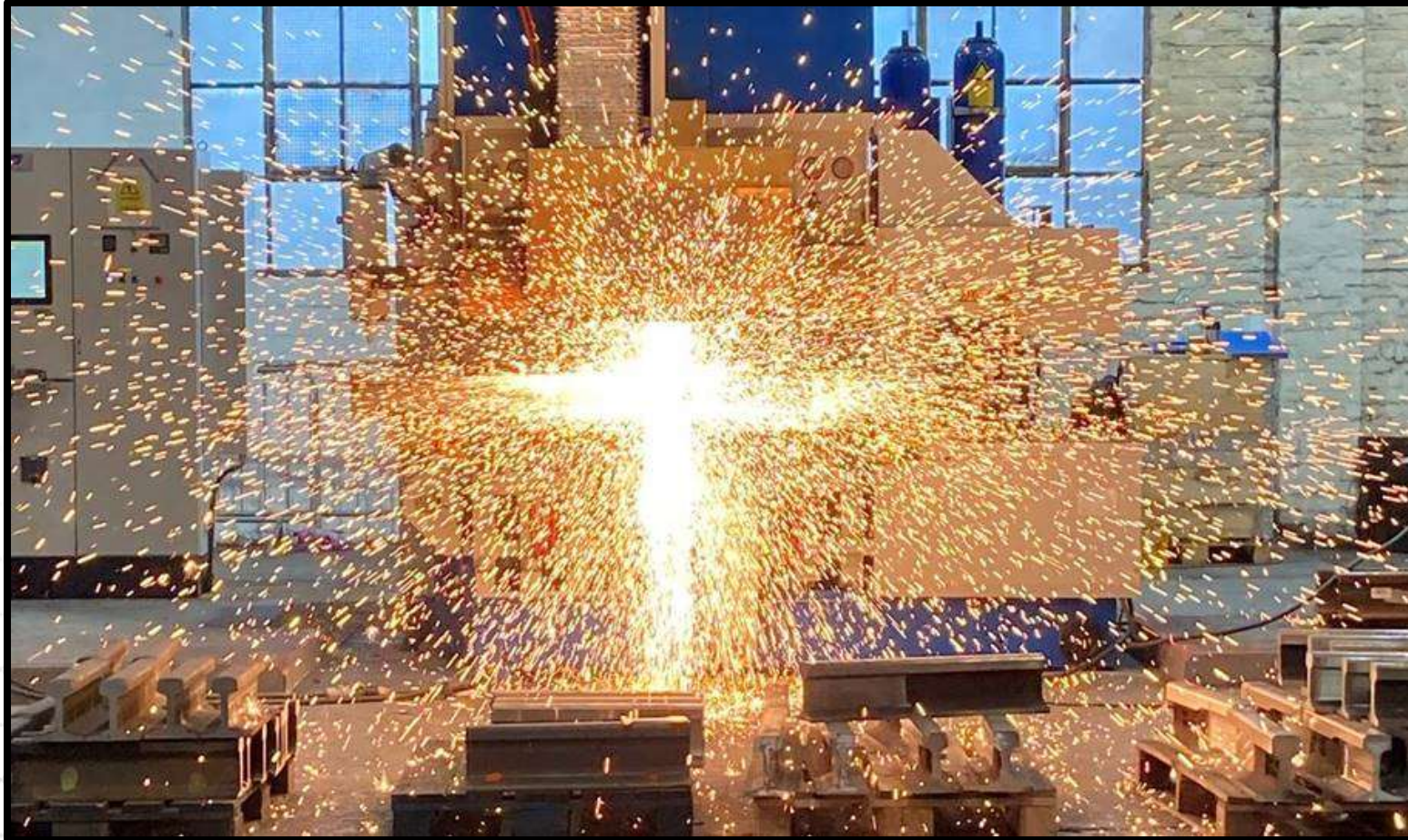
Cast AMS work hardens during machining



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Assembly – flash butt welding

Two welders in the Sheffield facility



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Research and technology

3 primary components:

Rolling
Stock

Track

Support
Conditions

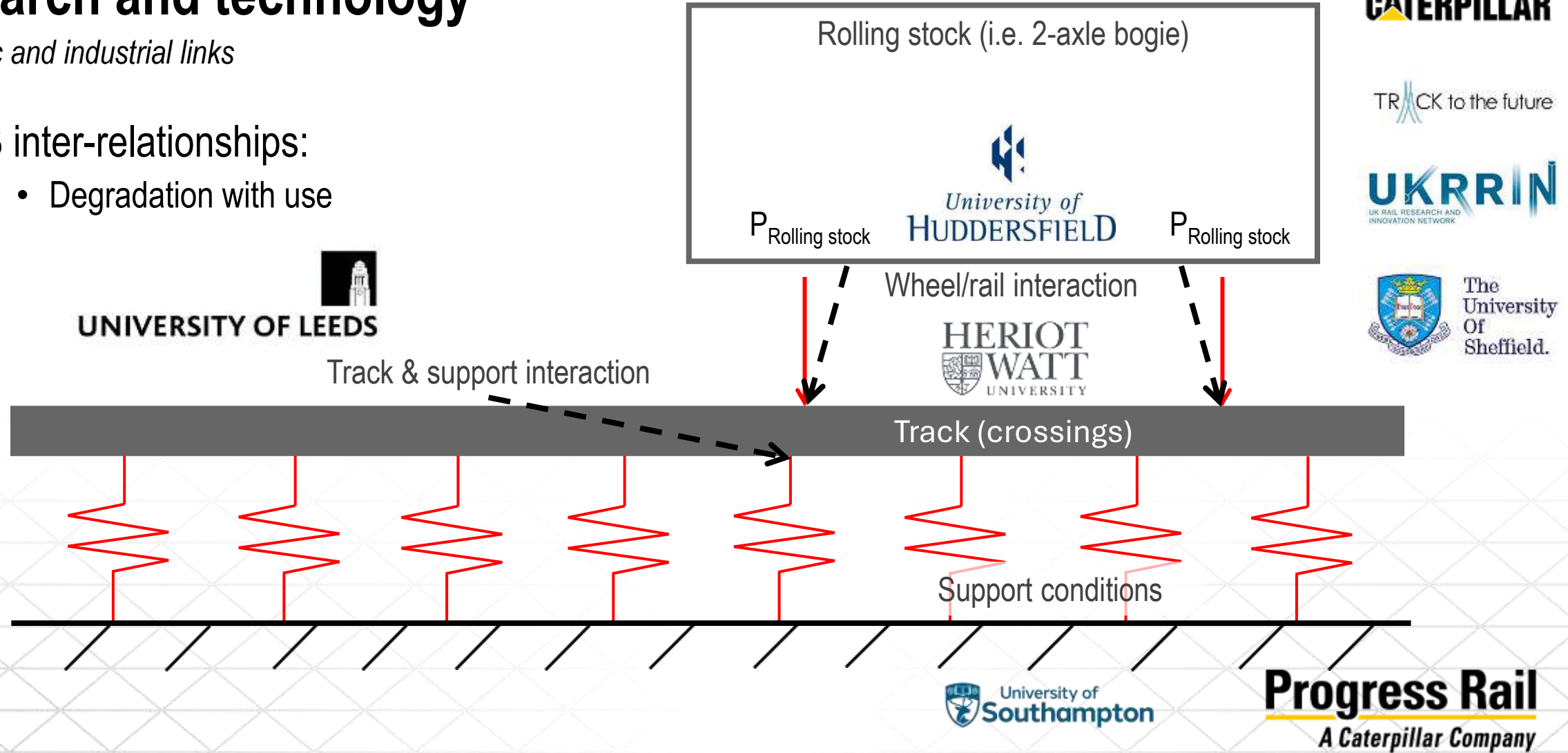


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Research and technology

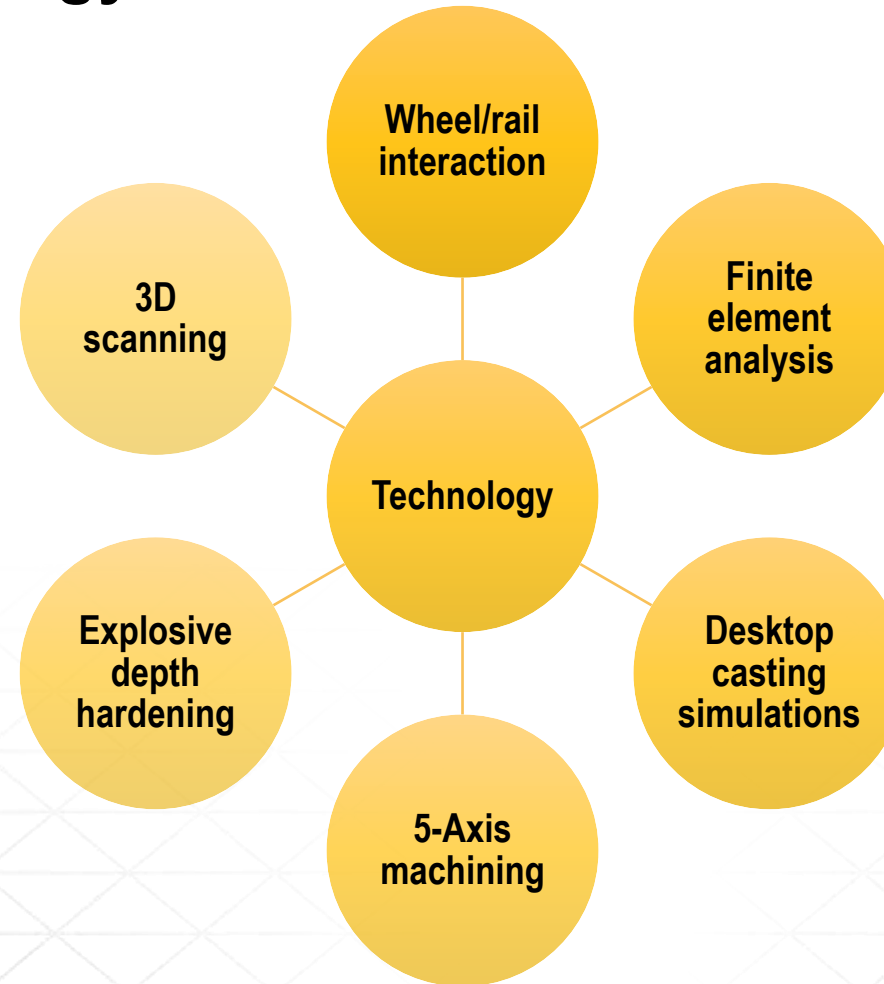
Academic and industrial links

- 3 inter-relationships:
 - Degradation with use



Research and technology

Digital tools & innovation

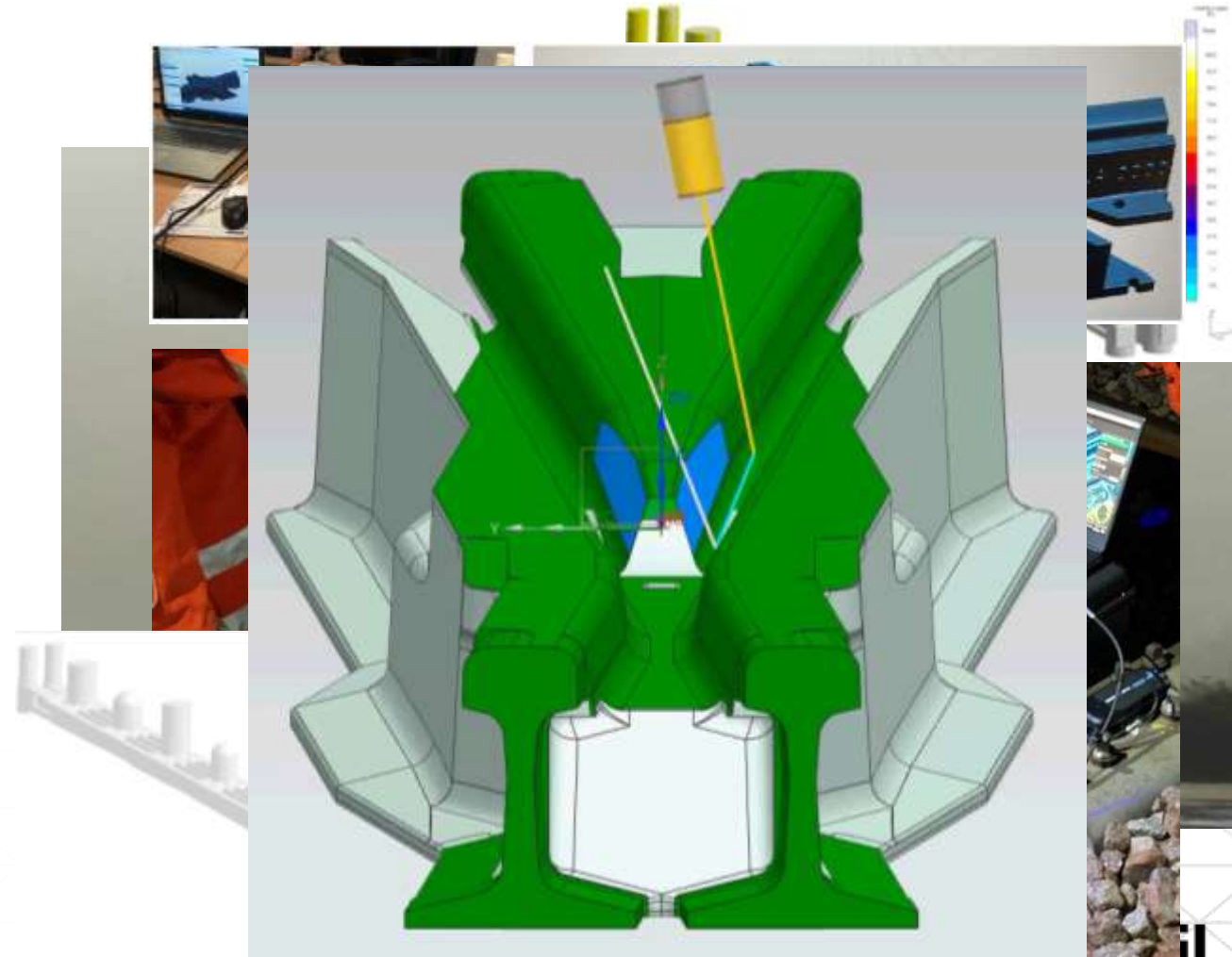
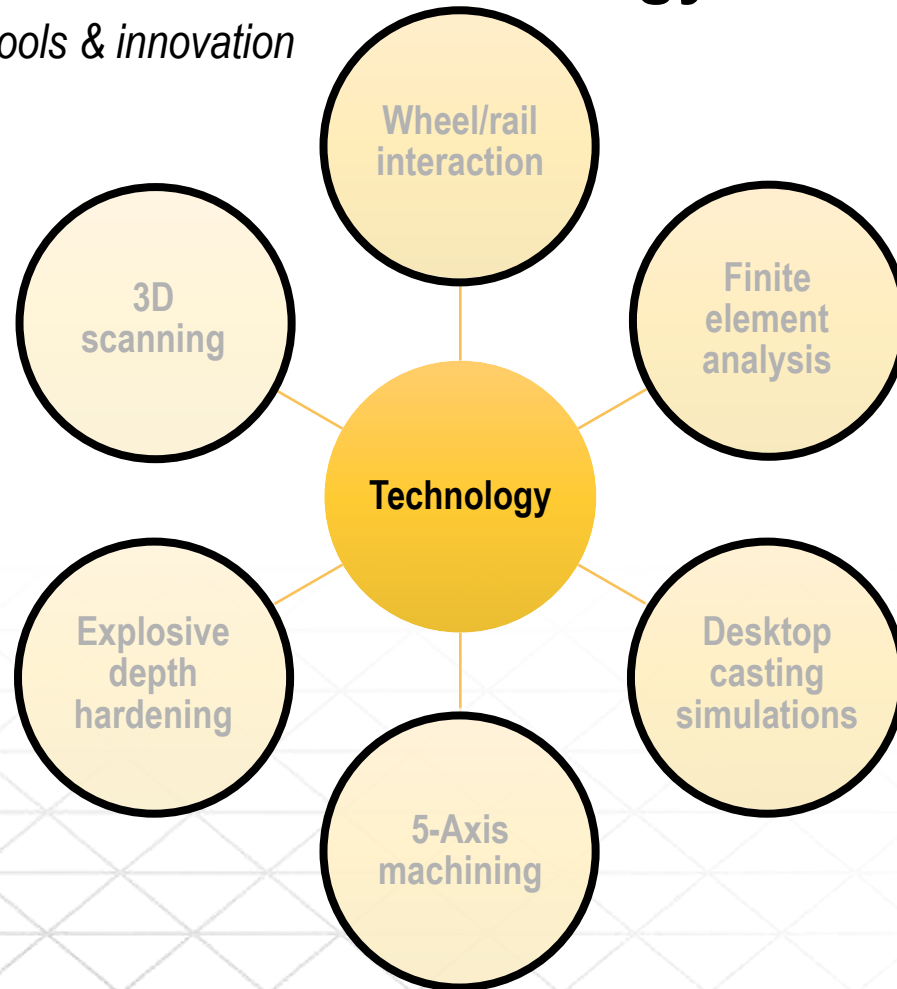


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Research and technology

Digital tools & innovation

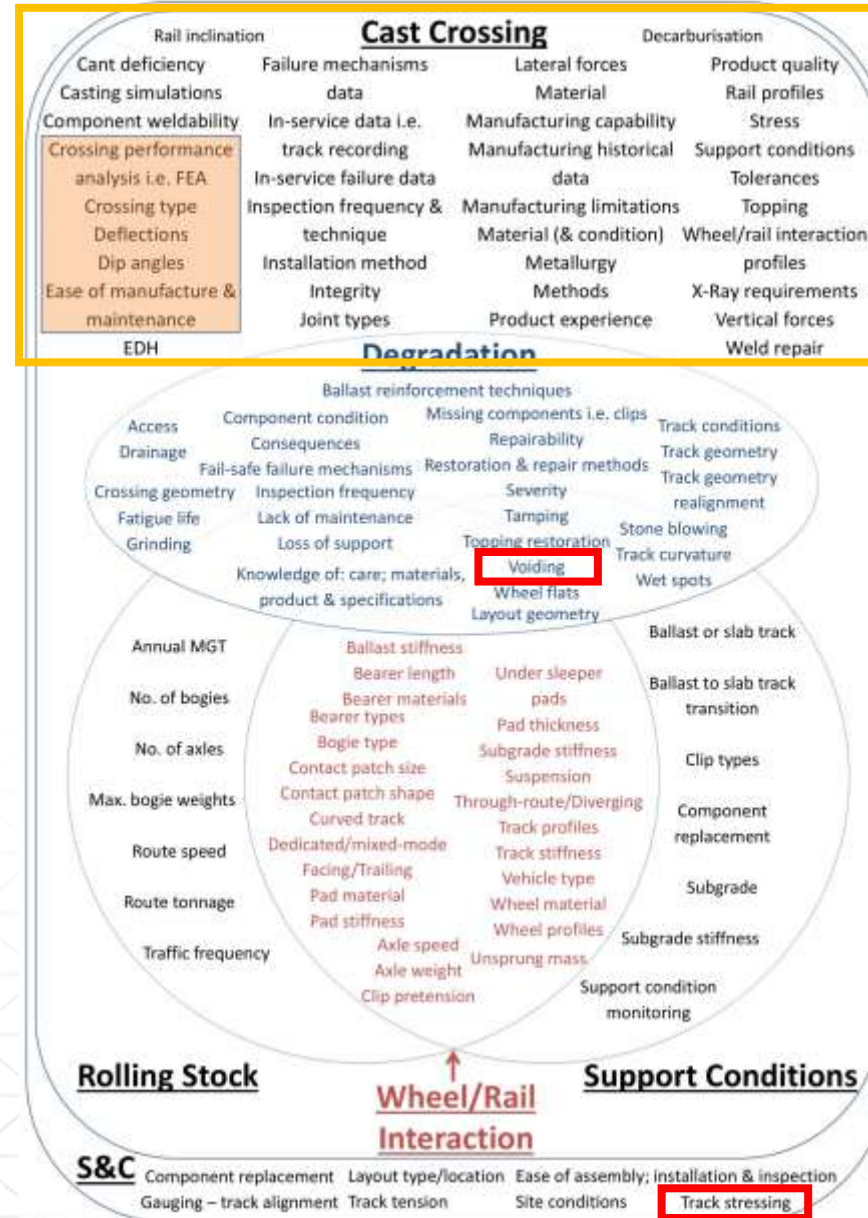


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External factors

Cast crossing framework



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External factors

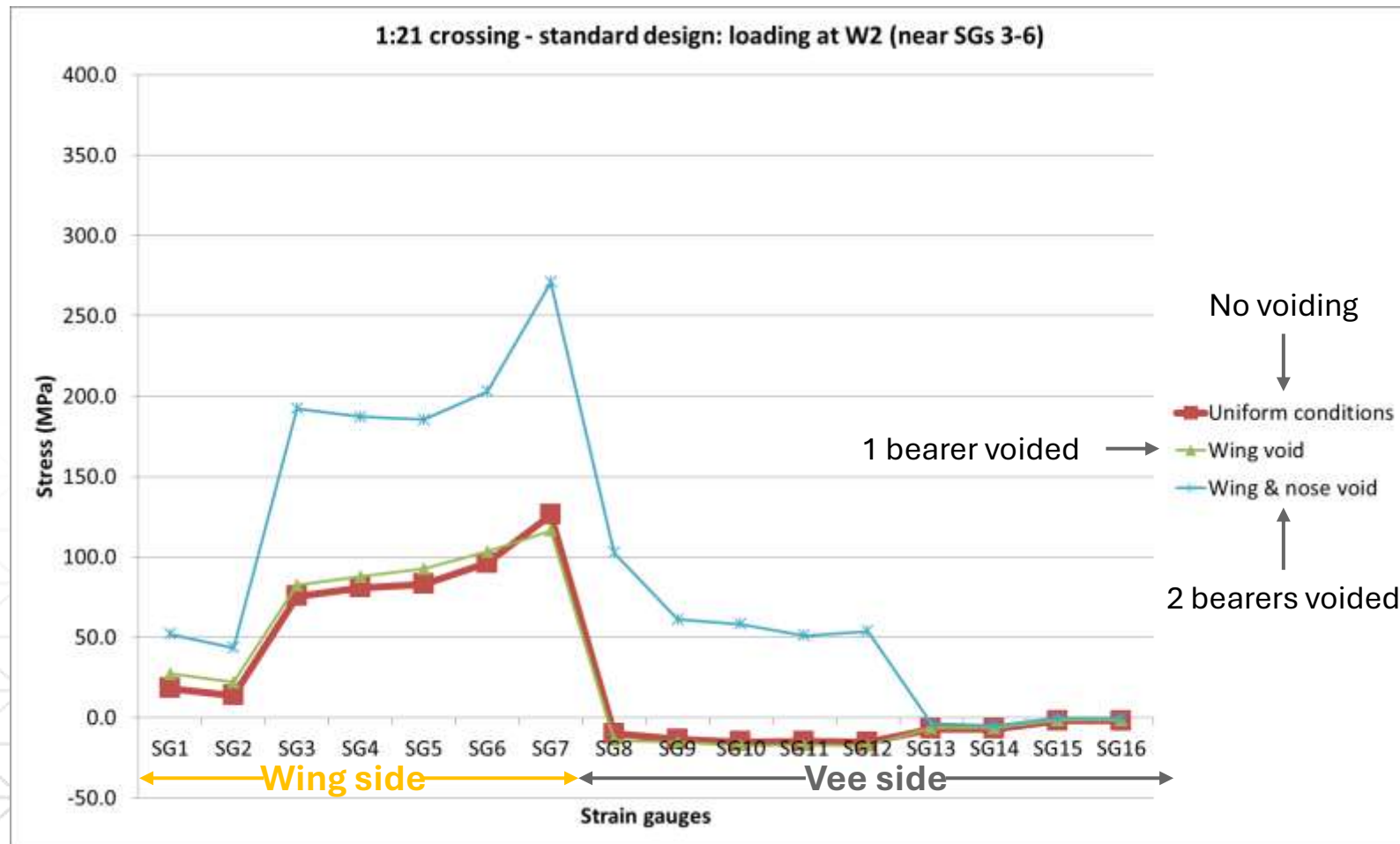
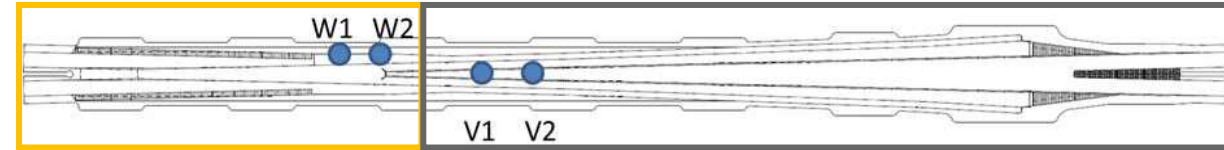
Voiding

- Voiding scenarios
 - Remove 5mm EVA pad
 - Select supports
- Base design:
 - 'as designed' support conditions
 - No voiding present



External factors

Voiding



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External factors

Stressing: multiple manufacturers affected

edinburghlive NEWS TRAFFIC AND TRAVEL CRIME

NEWSLETTER SIGNUP FUNERAL NOTICES PUBLIC NOTICES JOBS

Edinburgh train passengers warned 'don't travel today' after major railway fault

Passengers are being strongly advised 'not to travel' today' following a broken rail on a major line that has impacted London - Edinburgh train services.

f X c Comments 1



Colton junction

A track has broken on the major line (Image: LNER)

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Passengers thanked as full train service resumes on Midland Main Line

Michael Holden Posted: 6 years ago Add a comment
Last updated: 24th October, 2019 at 8:08 am



Credit: Network Rail

THE STANDARD

Southern delays set to last all day after broken rail sparks travel misery



DAMAGE: THE BROKEN RAIL NEAR EAST CROYDON STATION
NETWORK RAIL

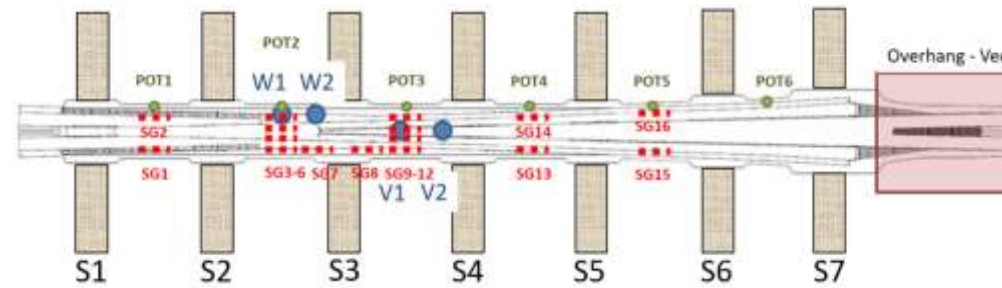
HATTY COLLIER
5 DECEMBER 2016

COMMENTS

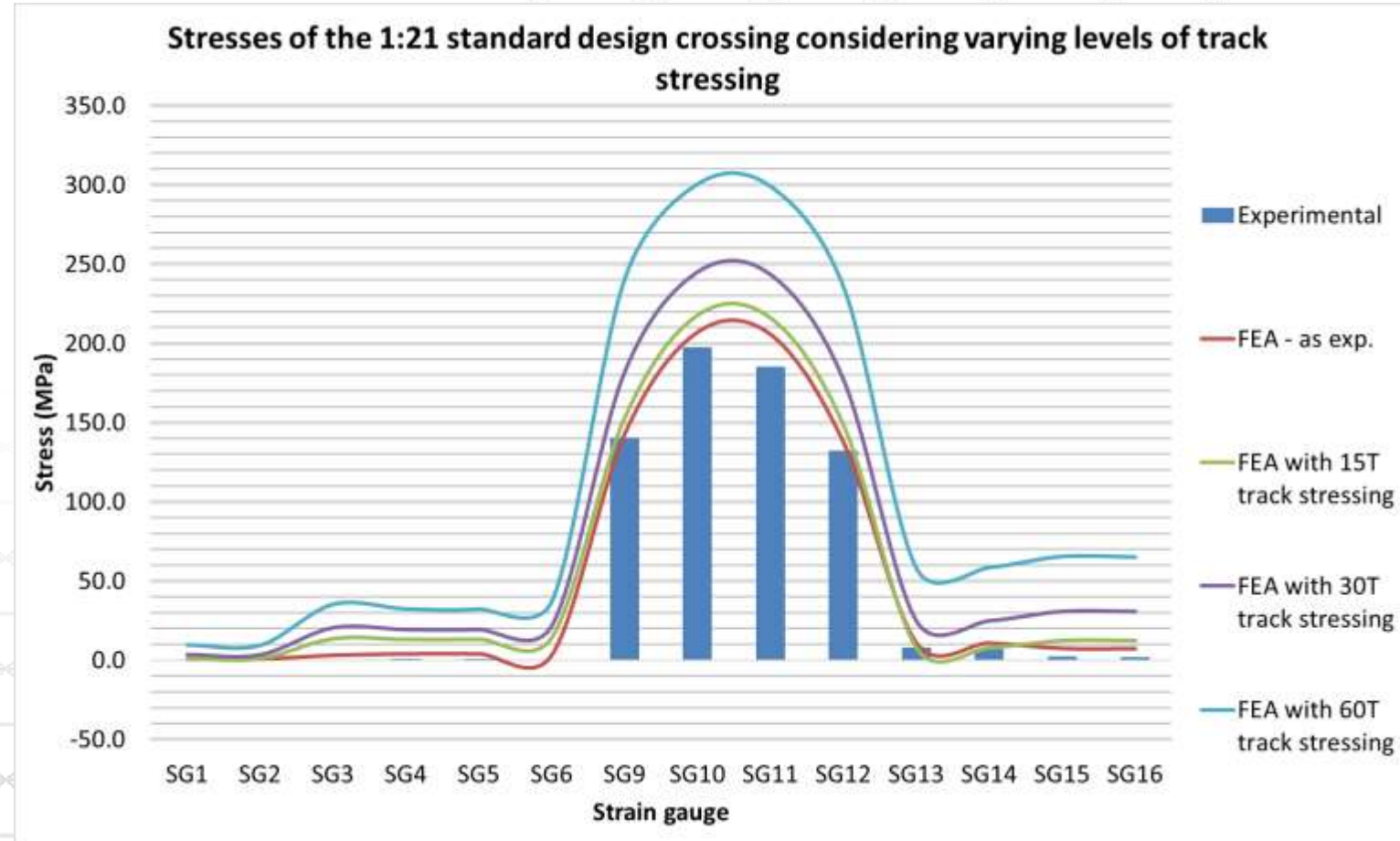
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External factors

Stressing



95MPa (NR/L2/TRK/012)
130MPa (EN 15689)



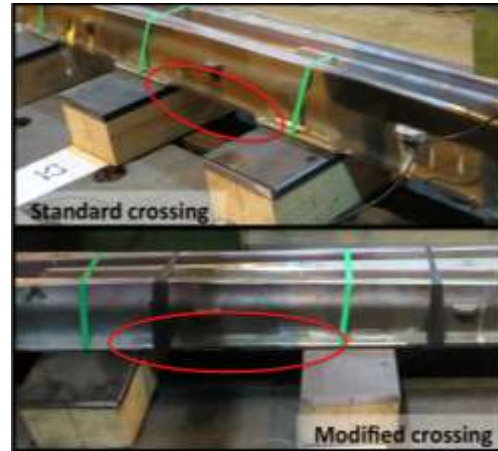
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Key developments

State-of-the-art facilities



2012



2015



2019



2022

1999

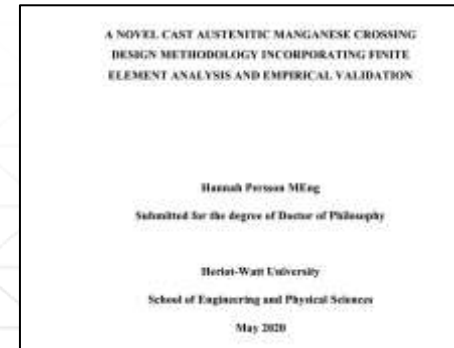


2013
Running
profile
adaption on
CCBs

2017



2020



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Biodiversity

Progress Rail South Queensferry

Adult male and female toads



Toadlet



Roe deer

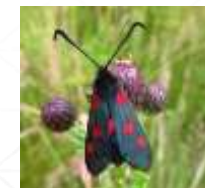
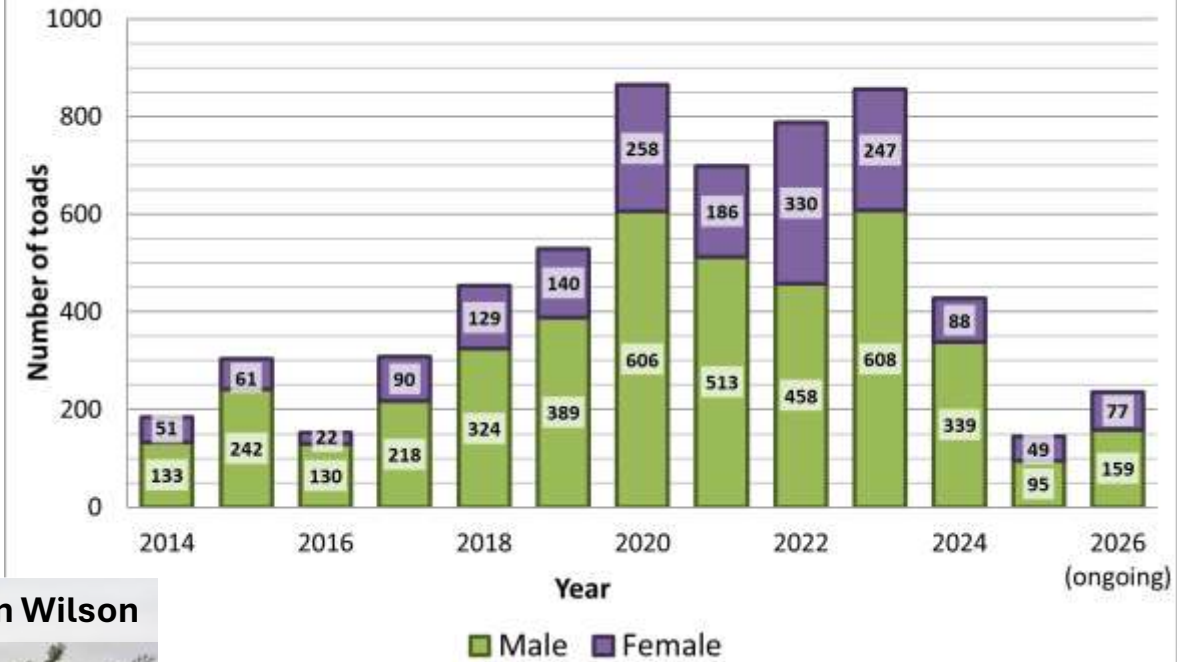


Brown hare



Lochan Wilson

Number of rescued toads per year



Narrow winged 5-spot burnet moth

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Our biodiversity report

Available on Progress Rail UK's website

South Queensferry

Our biodiversity journey 2024



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Habitats

- Initially several areas of grassland were left as no-mow to create suitable for invertebrates and small mammals (field and bank vo) proved successful with increased numbers of ringlet butterflies such as the grey partridge, kestrel and tawny owl.
- Several small tests areas were also cut to create small pools with drying out. The small pools created habitats for aquatic invertebrates. Swallows and house martins were seen collecting mud building from the edge of a pool.
- In 2018 a new dew pond was developed to encourage newts, keeping them away from the fish-stocked lochan. Within days a frog had taken up residence and by the following spring frog spawn was evident, but some tadpoles were still present in autumn. This was suspected to be attributable to the lack of food but was noted not to be unusual with some even being known to overwinter into the next again year.



Dew pond

Frog visiting

Flora

- Over the various seasons a diversity of flora exists onsite, from forget-me-nots & daffodils to tufted loosestrife & pale willowherb.
- They provide a welcome food source for both pollinators & birds.
- The next few pages demonstrates the variety.



Tufted loosestrife

Daffodil ice lilies



Primrose and forget-me-nots

German

Fungi

- We also have the turkey tail mushroom growing, a multicoloured fungi adopting a disc-like shape, which is found on dead or decaying hardwoods.
- It has been found on felled logs adjacent to Lochan Wilson.



Turkey

Insects

- Within the south bank we have introduced wooden boxes to provide an alternative habitat. In one we have the beginnings of a black ants nest.
- We have experienced robin's pin cushion, also known as the 'bedeguar gall' onsite. It is an abnormal growth on dog-rose stems that is caused by the gall wasp.
- The adult wasp lays eggs in the bud or developing leaves during the mid-summer period. The eggs then hatch into small white larvae that secrete chemicals causing the abnormal growth.



Black ant nest



Black ant nest



Wasp on flower



White-tailed humbug



Robin's pin cushion



Hoverfly on flower



White-tailed humbug

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26

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10

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5

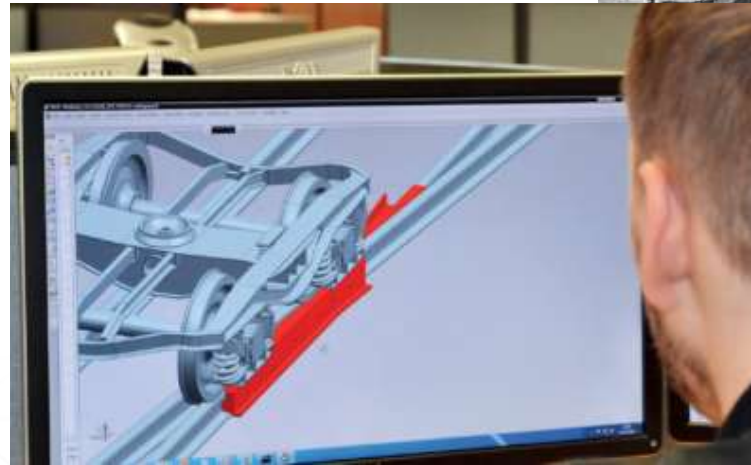
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Conclusions

Over our past 130 years we have strived to improve:

- products,
- processes,
- innovation, and
- safety.



1999-2024: 25 years of tri-metallic flash butt welding

“To solve our customers toughest challenges”

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Thank you

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