Principal Designer Working Group
Meeting No.22
20th May 2021

Design Close Calls
‘Near Misses’ in the Design World

Transferable best practice from the rail industry

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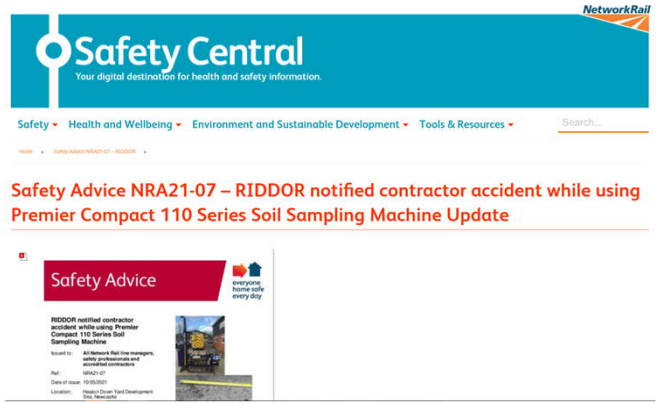
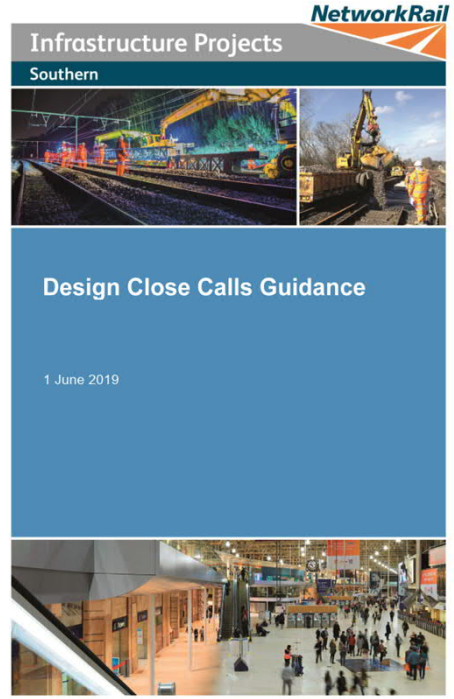
Design Close Calls - Origins

- *Whilst the reporting and monitoring of Close Calls is widely used for site-based activities, they are not currently used effectively for design activities*
- *There is a direct relationship between the number of Close Calls raised and the number of accidents that happen on our projects which should also translate to the development and design stages*





Design Close Calls - What are they?

- A design condition or situation requiring amendment, including errors and omissions, which could have been identified earlier in the design validation process, i.e. a design ‘near miss’
- Something which has been signed-off and subsequently found to have the potential to cause harm or injury to people or to the environment
- A design which harbours a latent hazard - this may be the result of design assumptions or option decisions which have not been adequately tested, managed or communicated
- A combination of parameters which places members of the project team under sufficient stress to endanger or damage their wellbeing or compromise their ability to fulfil their role effectively

Design Close Calls - What aren't they?

- They are not only for health and safety issues, e.g. they may record disruption, environmental concerns etc.
- They are not a process for criticising individuals or companies

Design Close Calls - Why are they a good idea?

- Understanding what hazards and risks are arising from the design process will allow us to take steps to reduce them in the future
- DCCs facilitate Client and Supply Chain collaboration through sharing and discussing them within and across industries
- Strengthen health and safety considerations at design stage
- Recording DCCs provides visible data that enables analysis and consistent learning
- Capture and disseminate observations of unusual hazards and risks
- Additionally enables recording of good and/or innovative practice

Design Close Calls - Examples

Not using all available information – Raised by PM team

Description:

On a Rail project, a Design Review Notice (DRN) was created for a drainage report and one of the comments was questioning whether the Geo-RINM drainage asset information layer had been used to inform the report. The response to the DRN was that the designers were unaware that this information layer existed in Geo-RINM. This indicates that the design team did not know about all survey/existing information relevant to the design solution.

What could have happened:

This could have led to an ineffective drainage design requiring amendment on site and also presentation of land boundaries at consultation showing insufficient land-take into adjacent properties.

Action required:

1) Brief design team on all the different layers available in Geo-RINM information sets
2) Encourage a behaviour whereby designers are checking all sources of data

Putting time pressure on the design team – Raised by the PM

Description:

Undue pressure was put on a design team by the PM to review and issue a design to very short timescales. This meant people were updating models 'live' as opposed to developing them in their own time and then integrating their sections into the overall model. The PM also asked for draft, unapproved designs to be sent out for impact assessing.

What could have happened:

Different items could have been missed (such as worksites potentially not being suitable to construct the design) as no time was given to fully understand the impact of any changes on each discipline. Further, had the designs been shared for impact assessing in draft, items could have been missed, and potentially have had a knock-on impact further along the design/construction process.
In addition to all of this, it is against the design review and approval process which ultimately exists to ensure all designs are fully integrated and safe.

Action required:

Postpone programmed meetings that could curtail design timescales and allow sufficient time for the control of change and a robust design process

Design Close Calls - Examples

Challenging the design specifications – Raised by Contractor

Description:

Contract documents were written for a road scheme such that the maximum manhole spacing along a drainage pipe network was 90m. This contract specification limitation was to ensure that the pipe runs were of a length that could be flushed out by a jetting machine

What could have happened:

As a result of this specification, the Contractor identified that a manhole would be required within a section of embankment that would mean it would be approximately 8 metres deep, introducing potentially significant risks to both construction workers and maintenance crews

Action required:

Consider relaxations of design specifications to mitigate excessive risks. In this instance, the 90m requirement was relaxed so that the manhole could be placed at an increased spacing with the next manhole located at an earthworks interface with a shallower 3m deep dig.
This was done with agreement from the maintenance contractor that a bigger jetting machine could be used to effectively clean the longer run

Failing to co-ordinate across disciplines – Raised by Designer

Description:

The designing of concrete drainage channels and vertical restraint barriers on a motorway project were undertaken as separate activities. As the design was going out to site it was found that the two alignments overlapped and the VRS posts would be in the concrete V-channel

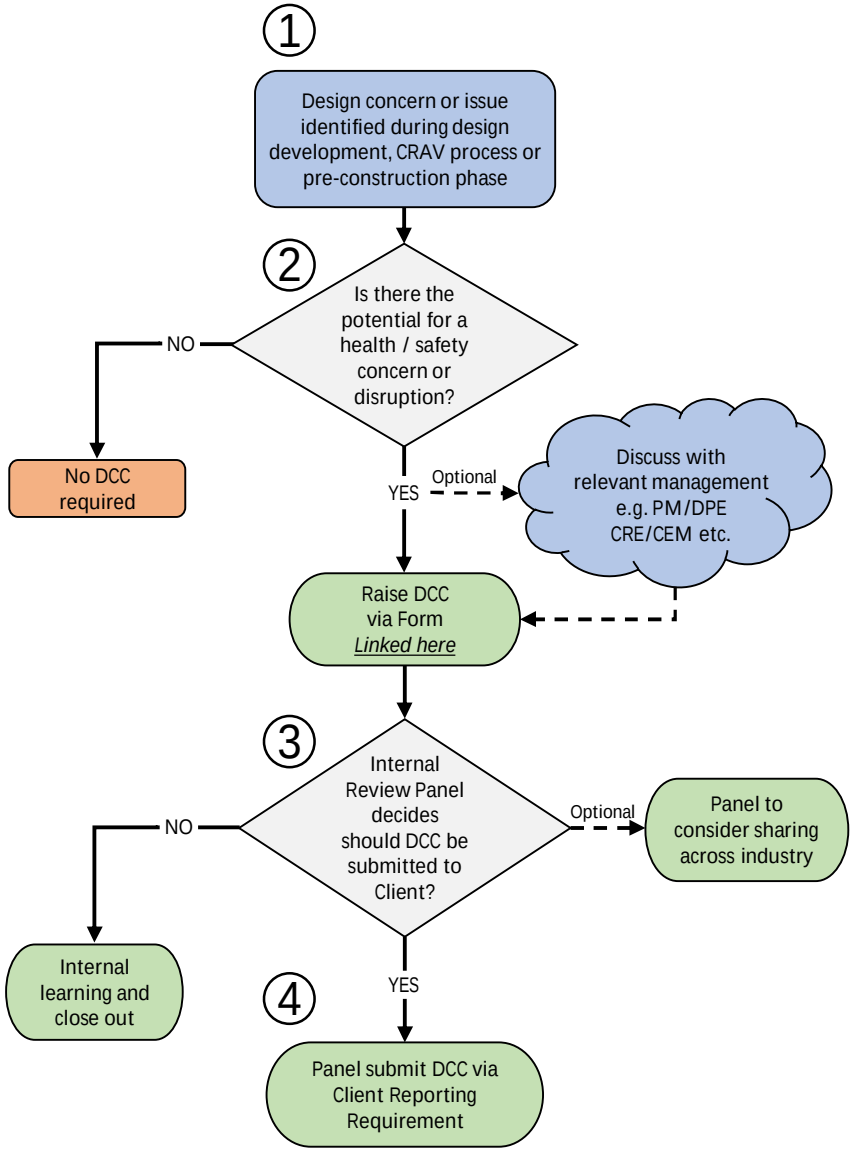
What could have happened:

The width of the drainage channel was essential for the design flows and the barrier could not be set back because its position was fixed by the span of a signage gantry procured on a long lead time. This would have meant coring into the channel to set the barrier posts - creating an ankle injury hazard

Action required:

Undertake Design Co-ordination Sessions during design development and also an Interdisciplinary Design Check towards the end of a design stage. The objective of these sessions is to co-ordinate the design to solve emerging engineering issues, eliminate clashes so that the design is ‘right first time’ and to ensure that all disciplines are unified within scope

Design Close Calls - Reporting Process



① Identify a Design Close Call – During Design Development, Checking, Reviewing, Approval or Verification stages

② Is there a potential to cause a health/safety concern or disruption?

- No - DCC not required
- Yes - Raise DCC
- Option at this stage to discuss with Project Management if unsure

③ Internal Review Panel assesses submissions and outcomes

- Internal close-out of DCCs
- Learning Shares created
- Monitor metrics and trends

④ Internal Panel submits Design Close Calls via Client Reporting Requirements and Portals

Design Close Calls - Engagement: Smart Form Reporting

Design Close Call Reporting Form

This form is to be used for all Design Close Call reporting.

Hi Ben, when you submit this form, the owner will be able to see your name and email address.

1. Name

Enter your answer

2. E-Mail Address

Enter your answer

3. Business Unit

- Rail
- Highways
- Aviation
- Other

4. Project Name

Enter your answer

5. Project Number

Enter your answer

6. Event Date

Please input date in format of dd/MM/yyyy

7. Event Time

Enter your answer

8. Who/what area would be responsible for the closing out this close call?

Enter your answer

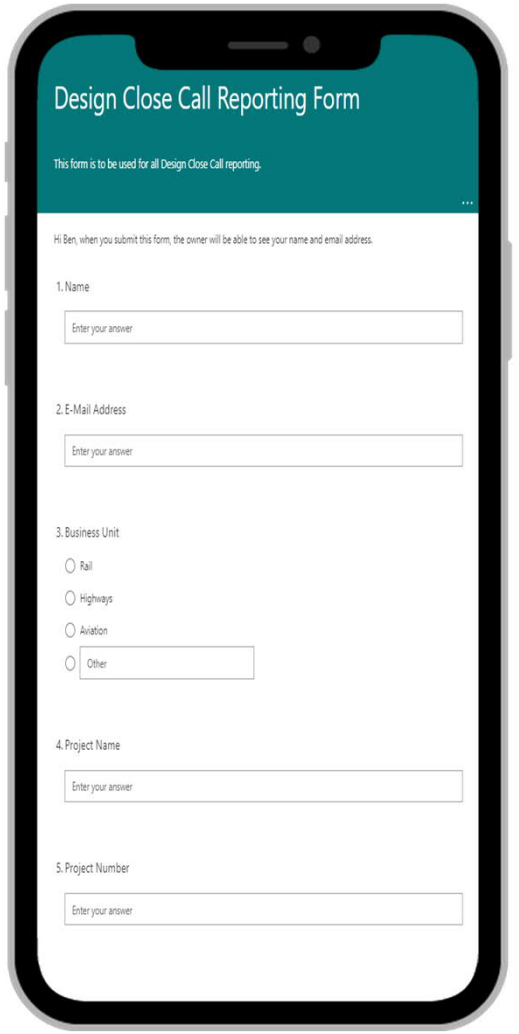
9. Location:

(Please provide as much detail as possible. ELR, Mileage, Address, Project Name)

Enter your answer

10. Which category/categories relate to this Design Close Call?

- Behaviours (Poor beahviours in communicating with the designer or team)
- Constructability (The design does not enable it to be built safely. The design does not consider adequate mitigation of construction hazards.)
- Design integrationg or deficiency (The design has not been adequately integrated or has errors and omissions that lead to the possibility of injury or an unacceptable hazard.)
- Time Pressure (Designer(s) has not been given adequate time to complete their tasks effectively and safely)
- Temporary Works / Condition (Hazardous temporary conditions have been created and not adequately mitigated in the design or the temporary works design is not sufficient to be safely implimented)
- Requirements and/or Scope (The requirements or scope are poorly defined)
- Survey Information (Survey information is inadequate or missing)
- Other



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Q&A / Thank you

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