

Client
Cadent

Sector
Murphy Applied Engineering

Project start
June 2017

Project end
January 2018

Value
£300k

Date
17/10/18

Author
Andy Harding

Innovation Reference
SI-00059

PROJECT OUTLINE

Design of a 1.5km 18" high pressure gas pipeline diversion as part of the HS2 enabling works. Including a 300m horizontal directional drilling (HDD) section to be installed beneath Harvil Road, Uxbridge.

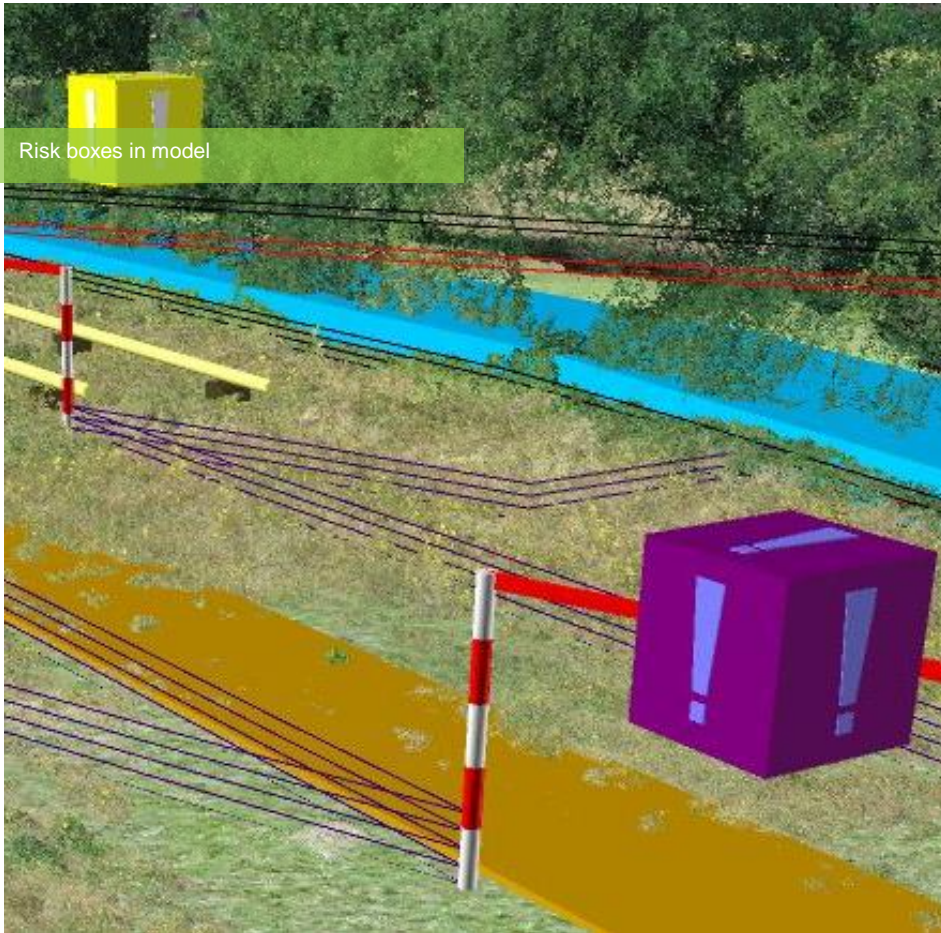
KEY CHALLENGES

Coordinating risk management within the bounds of the project battery limits

Assigning ownership of high risk activities, and the corresponding responsibility for risk mitigation

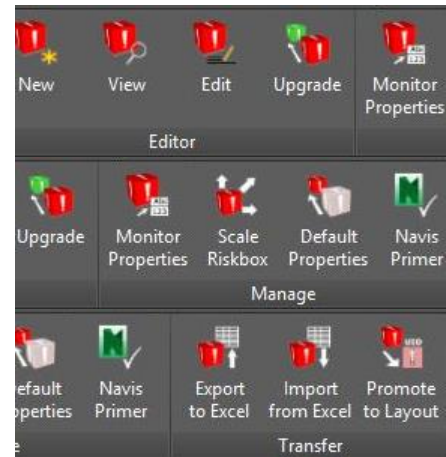
Identifying risk, and successfully managing the risk during the design phase.

Allowing all design and construction professionals to view a live risk model in their native authoring environments without the need for any additional software proved to be difficult, and no solution existed to do this with ease.



Risk boxes in model

| Item | Riskbox01 | Material | TimeLiner | Entity Handle |
|-----------|--|----------|-----------|---------------|
| Property | Value | | | |
| UID | 015 | | | |
| Status | Active | | | |
| PNum | MME-0111 | | | |
| PName | HP07 Fulmer to Haste Hill Pipeline Diversion | | | |
| Phase | Construction | | | |
| Haztype | Emergency Access | | | |
| Desc | No Access for emergency services during mainlay works. | | | |
| Init_Like | 5 | | | |
| Init_Imp | 4 | | | |
| Init_Risk | 20 | | | |
| Mit | - | | | |
| Res_Like | - | | | |
| Res_Imp | - | | | |
| Res_Risk | - | | | |
| Notes | - | | | |
| LocX | 505822.538 | | | |
| LocY | 187712.562 | | | |
| Keywords | HS2 Cadent HP07 Murphy | | | |



SOLUTION / INNOVATION

Devise a system to visualise risk across multiple document formats, linking to a central risk database. The solution provides a linking mechanism between our current software environments, with a set of visual markers in each one (model blocks, icons, PDF comments, excel shading, etc.).

This “risk box” solution provides the project team with the ability to easily tag Risk Markers to their documentation, add these risks to the central risk model, and keep their own documentation up to date with any changes to that central risk model.

A risk (as a risk model entity) will retain its identity as it passes through the various project cycles (concept, design, construction, operations, decommissioning), and will contain all the history of the risk from discovery to close-out. This means Murphy can ensure that a solid audit trail is provided throughout the project, and that there is a reduction in the likelihood of missed risks between the key stages of the works.

Periodic risk reporting can be automated to streamline the production and dissemination of the risk register.

Eliminates duplication of work as the risk boxes can import and export risk assessments effortlessly, delivering a single source of the truth approach to risk management.

KEY BENEFITS

- Transparent risk management
- Streamline risk identification, visualisation, mitigation and management
- User friendly tool can be used by teams on future projects easily
- Visual representation of risks is much more engaging
- Integration of relevant legislation
- Clear ownership of risks

COSTS / SAVINGS / ROI

By using “risk boxes” on this project, the team have managed to eliminate large amounts of waste within the process of tracking, managing and understanding risks on site. Through the provision of a single source of truth that is visually simplistic, the team can all add risks into their documentation that is merged with a central risk model.

Automation of this process – both import and export of risk information – has completely eliminated entire steps from the process.

This has eliminated the need for wasteful checking and inefficient process steps, as the team can now manage and mitigate risks at all stages of the project with confidence and accuracy.

Riskbox [VIEW] Mode

Unique Risk ID: 006 Status: Active

Project Number: MME-0111

Project Name: HP07 Fulmer to Haste Hill Pipeline Diversion

Phase: Construction

Hazard Type: Utility

Description: Overhead 11kV cable strike. Damage to asset, plant & personnel

Init Likelihood: 4

Init Impact: 4

Init Risk: 16

Mitigation: Segregate overheads, create controlled crossing points, signage, RAMS, Temp Works

Res Likelihood: 2

Res Impact: 3

Res Risk: 6

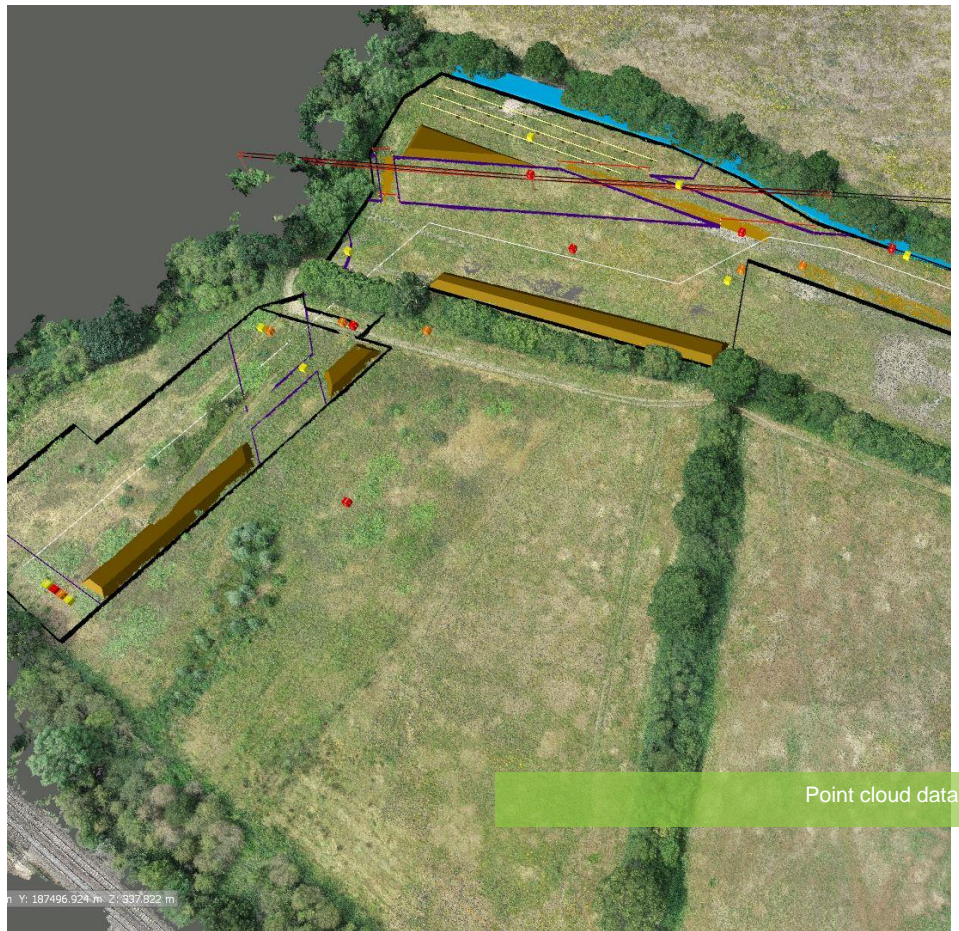
Notes: CDM18 CDM19

Location X: 505757.601

Location Y: 187700.782

Keywords: HS2 Cadent HP07 Murphy

Buttons: < Set as Default > Cancel Close



IDEA ORIGINATOR

Tim Shepherd, Senior Cad Operator working on the Murphy Applied Engineering Team, designed and developed the tool himself.

“Getting bogged down in repetitive and monotonous work wastes time that could be spent on being creative and passionate about your job. Automation doesn’t get bored, it doesn’t skip lines and it doesn’t misread data. It gets certain things done faster, cheaper, more accurately that we do. As long as we identify the correct set of instructions for it to follow, we can get on with the fun stuff of creating better worlds.”

CHAMPIONS

Tim Shepherd himself is an innovation champion and recognises the value in capturing, sharing and replicating examples of best practise across the business. Murphy’s diverse work streams result in large potential for replicated efficiency across sectors, for multiple projects and clients.

Building on an idea witnessed at an Institute of Civil Engineers event, Tim spent his spare time testing and trialling a solution fit for Murphy’s systems using existing software to produce a global risk model that works across multiple software environments

FEEDBACK

Whilst this solution is still in its infancy, it has been incorporated into the project to great reception from clients and contractors alike. Feedback from the client, Cadent, has been incredibly positive.

The risk boxes have been very useful in design review meetings. It has helped confirm client confidence that we are taking risk seriously. In collaboration with photo-realistic point cloud modelling, it puts reviewees 'on-site', and gets them engaging with the details of construction/ops before it happens - generating the right questions, early.

FUTURE OPPORTUNITY

Future opportunities may be to further encompass other software solutions, plugging directly into 3rd party design and client risk registers for quicker hazard resolution, and applying the risk marker concept to Augmented/Mixed reality for better on-site/O&M safety.

