

SKANSKA

Digital Rehearsals – M42 Junction 6 Improvement Scheme

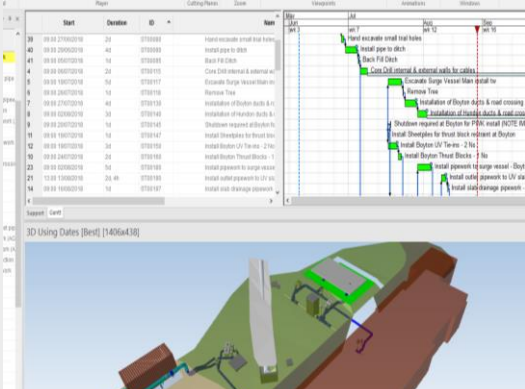
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What is a Digital Rehearsal?



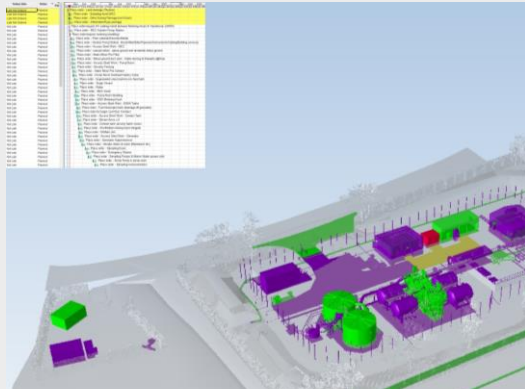
Digital Rehearsal: Using the virtual world to review the delivery of designs, processes, programme and construction works.



Planning Validation



Health and Safety



Procurement



Construction



Commissioning



Scope Clarity



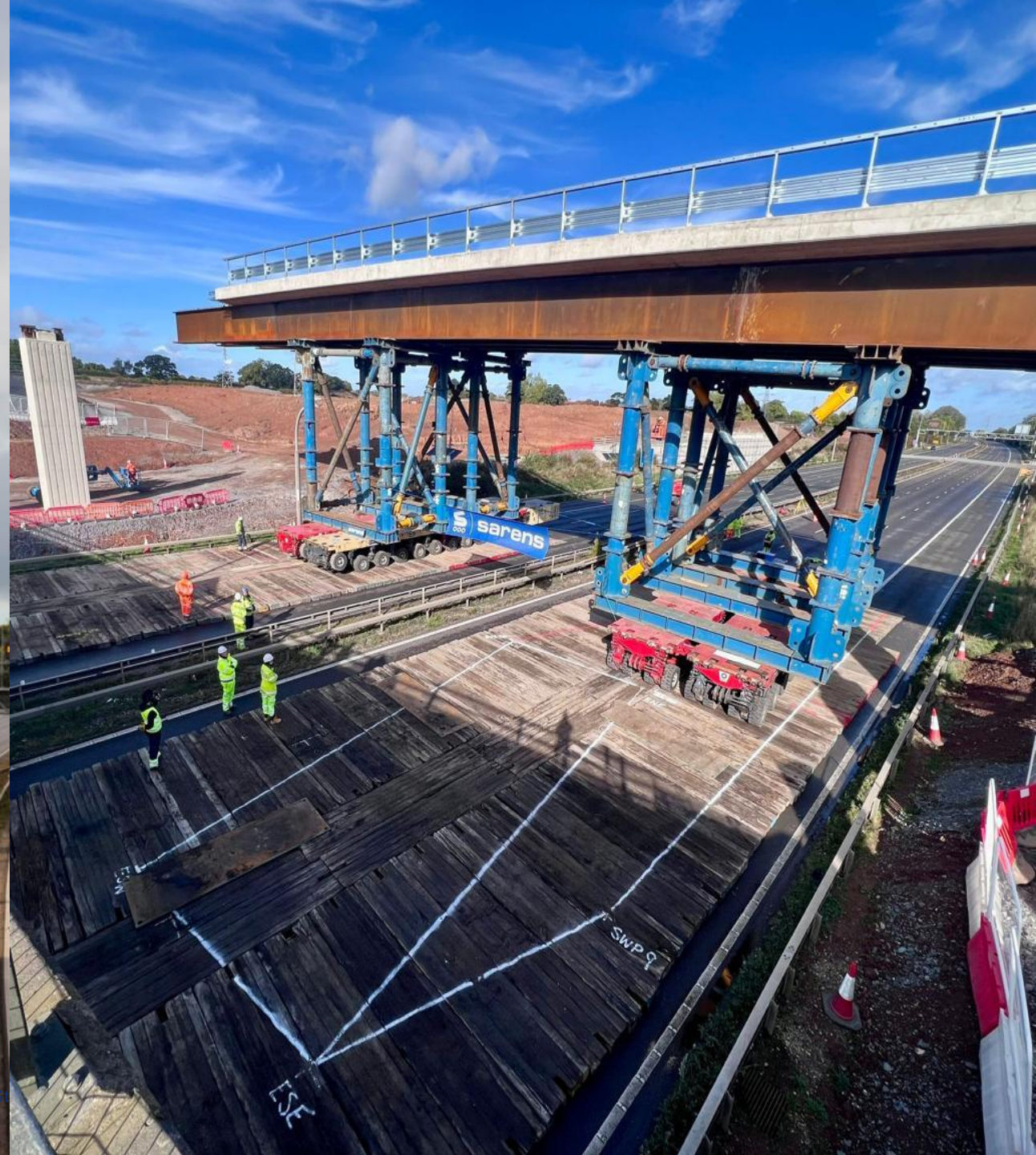
Risk Mitigation



Empowerment through Information

4D Rehearsal Case Study

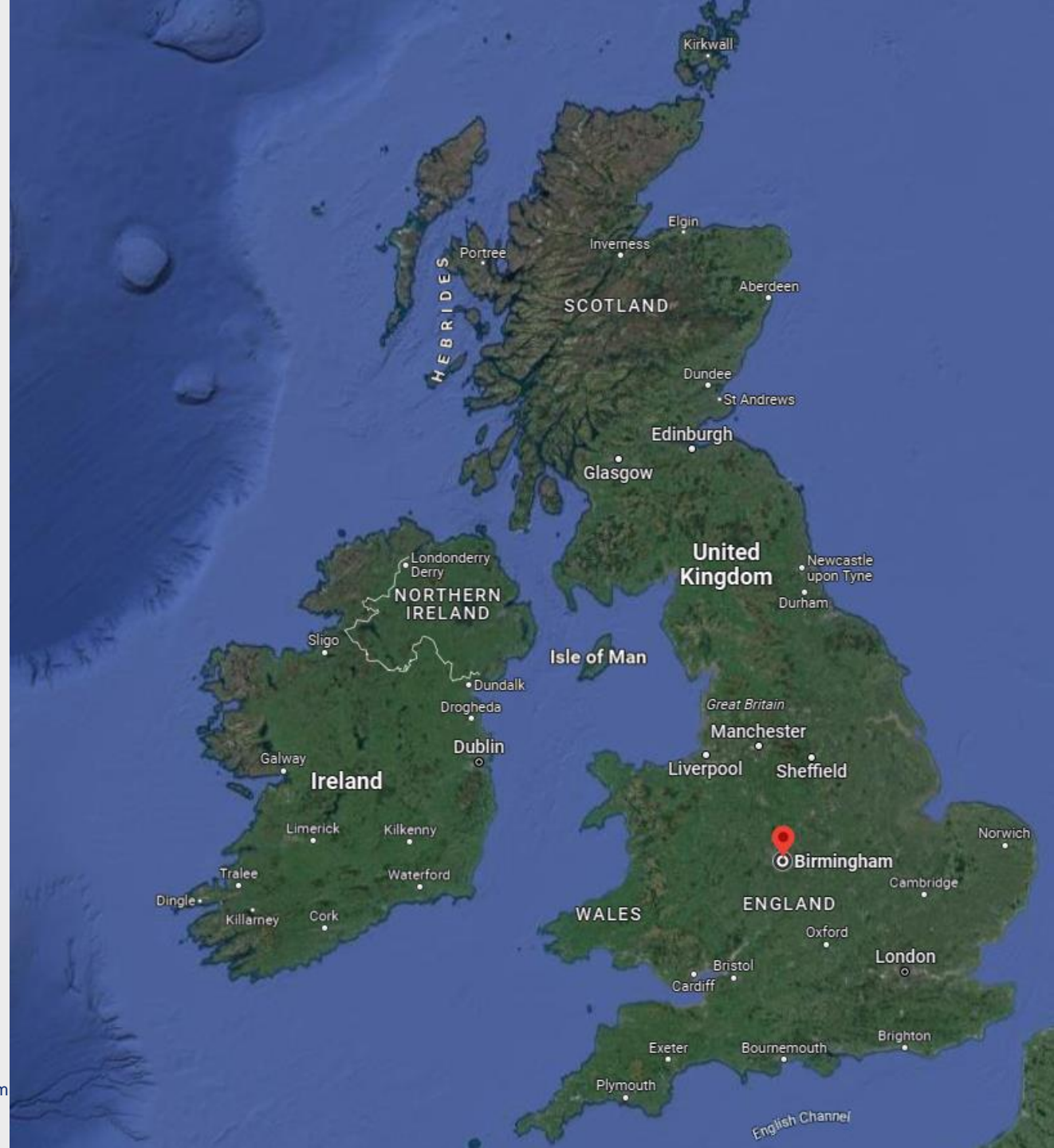
- M42 Junction 6 Improvements Scheme, United Kingdom

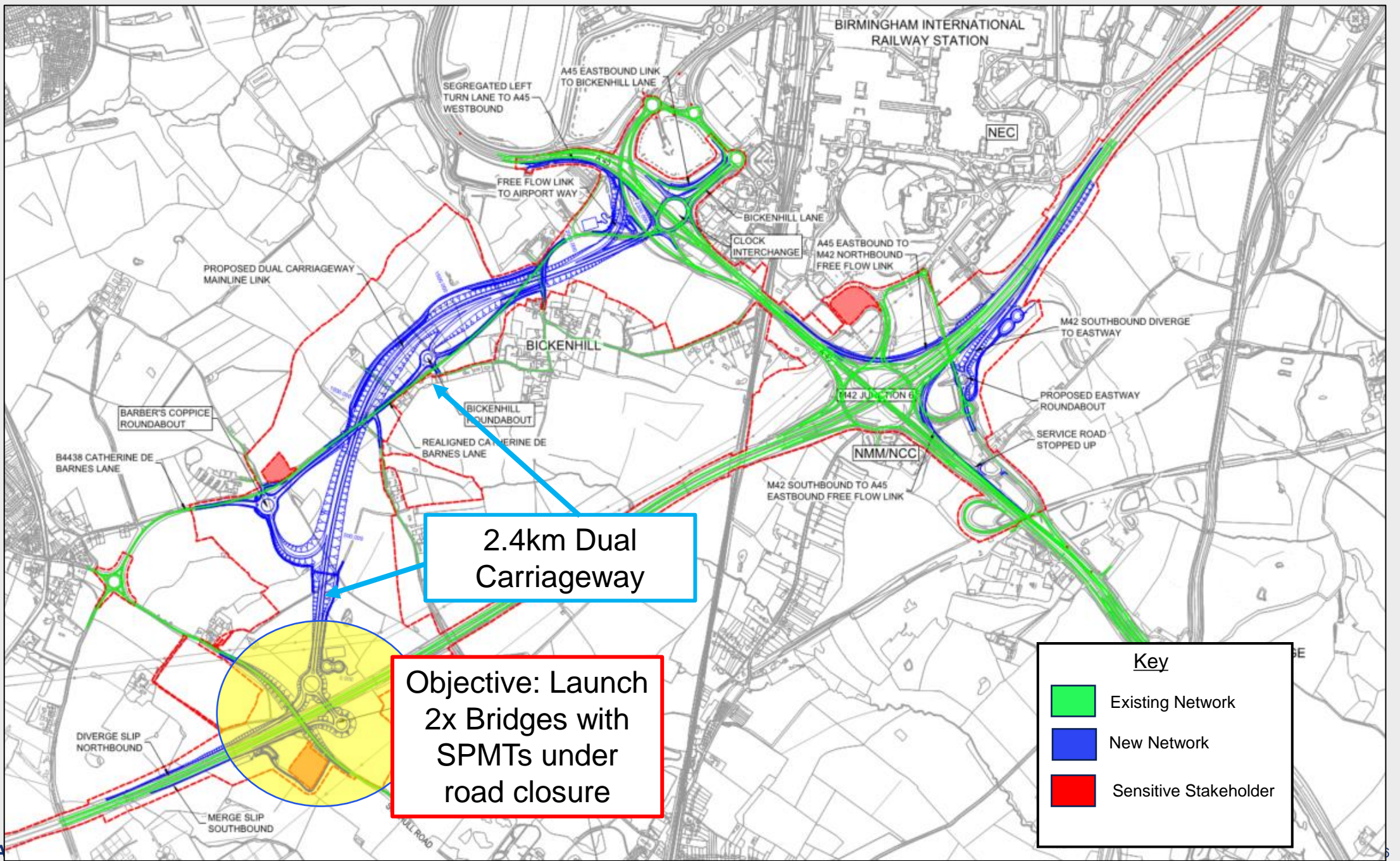


M42 Junction 6 Improvements Scheme, UK

Highways Scheme

- New Junction (Offslip & Onslip)
- 2.4km Dual Carriageway
- 6 new bridges
- £282m





2.4km Dual Carriageway

Objective: Launch 2x Bridges with SPMTs under road closure

Key

- Existing Network
- New Network
- Sensitive Stakeholder

What we did...



How we planned it digitally

21:45 30/09/22

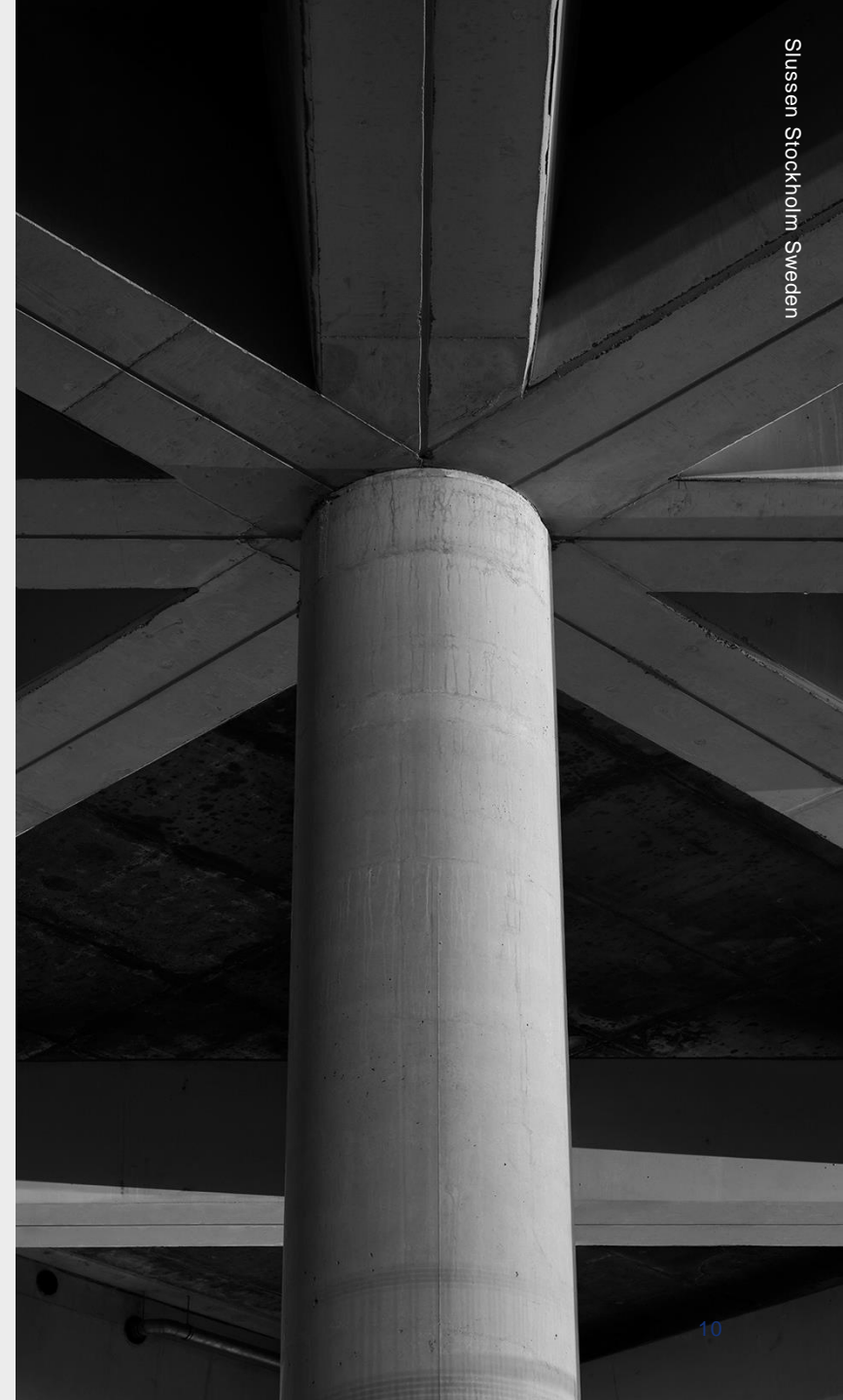


4D Digital Rehearsal Summary

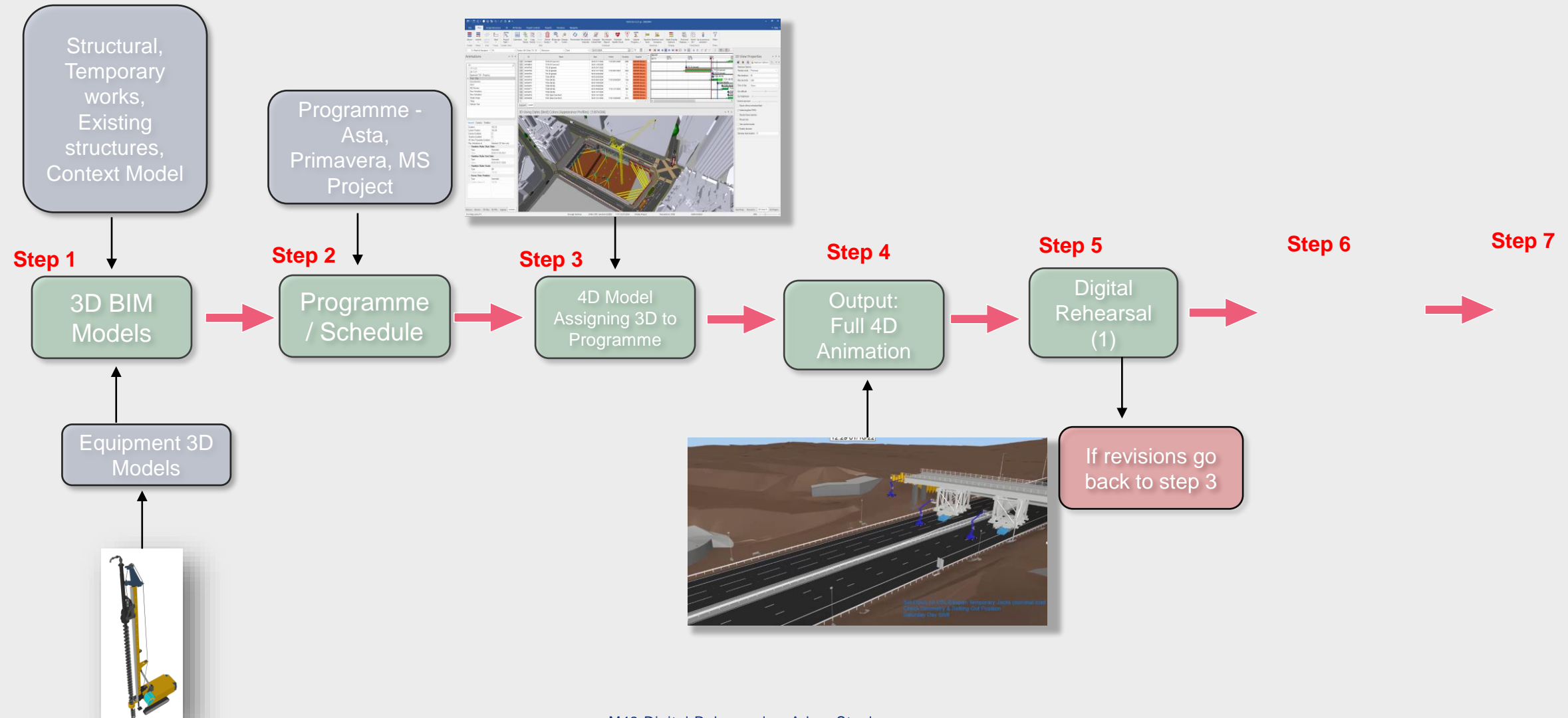
- Developed a 4D Model of Two SPMT Bridge Launches (M42 Weekend Closure)
- One source of truth and information reviewed
- Undertook virtual launches with suppliers, client and construction teams >8 weeks out
- Achieved Programme Betterment, Identified clashes and resolved them
- Model used for visualisation in RAMS, digital briefings on site and stakeholder engagement
- One source of truth (all programme and logistics information contained in model)



How **we virtually** rehearsed the launches



4D Planning Process



Stage 4 (4D Rehearsal)

1

Set Scene with animation



2

Step-by-step walkthrough



3

Live programme updates



Stage 4 (4D Rehearsal) - Outputs

Programme/Schedule Improvement

Changes to programme in session	
Description	Time Change
Reduce allowance for installation of TM	-2.5 hrs
Install stone at ERA transition area	-0.5 hrs
Install track mat at ERA & Carriageway	-2.0 hrs
BR01 - check geometry & setting out - amended to run in parallel with jack down	-1.0 hrs
BR02 - check geometry & setting out - amended to run in parallel with jack down	-1.0 hrs
Re-install of VRS	-2.0 hrs
Remove track mat at ERA	+2.0 hrs
BR02 - USL / Ekspan engage temporary restraints - DELETE	-3.0 hrs
Total	-10. hrs

Safety, Procurement, Design

Item	Action / Description	Owner
4	SPMT route path to be marked on road and shown in the model	Ian K to provide route path Survey team to mark route
10	VMS (2 No.) to be put in place	Jurin Compton / Oliver Hayer
12	Edge protection required on abutments and wall for BR02 - design to be provided	Max Lucker - design info Adam/BIM team - model
13	Stone stackpile in place in advance of work	
22	Programme Hold Paints	
23	Steel road plate to be procured and placed at the end of the track mat to transition back onto the carriageway	Max Lucker
26	Shift handover - time to be shown in programme for handover between shifts	
1	Tapa Fix in 4D model	
2	Temporary restraints to be modelled for BR01 and bearing plinth for BR02	
3	Tower light - design/location	Max
5	USL/Ekspan - 1na. MEWP on each side of BR01 placed on the platform to access restraints	
6	Add BR01 abutment into the layer to turn off - as these not gonna be done	
7	Viewing platform area to be shown in model	
8	Camera position 2 and scaffold arrangement to be shown in model	
9	Shift pattern - show shifts on the model	
11	Central reserve barrier - to be started on site just north of the work area within the central reserve - to be shown in the model at start location	
14	Support to clean carriageway part completion to be booked in and shown	Booking - Max Model - Adam
15	Time period for Highway Inspector to be confirmed - i.e., the inspection start/end of closure? To be confirmed what the hold paints are - i.e., what work can be done prior to completion of the inspection?	Jurin Compton / Oliver Hayer
16	Track mat order - to be installed on site in order to connect to existing (follow on from stone placement at ERA)	Adam
17	Existing sheet piling retaining Salihull road to be modelled as built - to show any potential clashes	Adam
18	Removal of Steel Road Plate	Adam
19	BR02 - Saron 1x MEWP on each carriageway to access jacking system	Adam
20	Saron - 1Na. MEWP on each carriageway following BR01 to remove packing from SPMTs	Adam
21	BR02 - Saron 1x Telehandler working between SPMTs to remove jacking blocks/restraints	Adam
24	Multiblock - 2/3 additional multiblocks to be delivered and installed on the shift as existing falls slightly to the right. 2 No. black gaps to be left until the end (exact point to be advised) for access back to same ground	Max - hold paint for last 2 blocks
25	Track mat installation - to be confirmed the time period for installation and the number of high footers involved.	Sam Linley
27	Access for hard staff to be determined by the TM team, ideally from J6 or within the ERA.	Jurin Compton / Oliver Hayer
28	Temporary restraint details to be reviewed by Saron to ensure buildability for landing	Max Lucker / Sam Linley
29	Skanska to arrange security to manage public access area (i.e., Shadubreak Lane)	Max
31	Saron to review survey information re CCTV height for BR02 clearance	Saron
32	Miscellaneous activities shown in programme (Pavement, Hand Back etc)	Adam
33	Terminal float to be shown in programme	Adam
34	NH inspections to be built in to programme	Adam

Stage 4 (4D Rehearsal) - Outputs

Safety, Procurement, Design

Clash Detection Programme/Schedule Improvement

The screenshot displays the SYNCHRO software interface. The top part shows a Gantt chart with tasks listed in a table. The bottom part shows a 3D model of a bridge structure with various components highlighted in different colors (green, yellow, orange, blue) corresponding to the appearance profiles.

ID	Name	Duration	Start	Finish
11	ST00... Set Down on USL/Ekspan Temporary Jacks (no...	2h	12:00 01/10/2022	14:00 01/10/2022
12	ST00... Check Geometry & Setting Out Position	1h	14:00 01/10/2022	15:00 01/10/2022
13	ST00... USL/Ekspan Engage Temporary Restraints	3h	15:00 01/10/2022	18:00 01/10/2022
14	ST00... Disengage SPMT units from bridge deck, releas...	2h	18:00 01/10/2022	20:00 01/10/2022
15	ST00... Drive BR02 from Site Assembly Compound to B...	2h, 30m	20:00 01/10/2022	22:30 01/10/2022
16	ST00... Jack Down Deck on SPMT's to 150mm above fin...	6h	22:30 01/10/2022	04:30 02/10/2022
17	ST00... Set Down on USL/Ekspan Temporary Jacks (no...	2h	04:30 02/10/2022	06:30 02/10/2022
18	ST00... Check Geometry & Setting Out Position	1h	06:30 02/10/2022	07:30 02/10/2022
19	ST00... USL/Ekspan Engage Temporary Restraints	3h	07:30 02/10/2022	10:30 02/10/2022
20	ST00... Disengage SPMT units from bridge deck, releas...	2h	10:30 02/10/2022	12:30 02/10/2022
21	ST00... Post Installation Works	0d	12:30 02/10/2022	22:30 02/10/2022 (97)
22	ST00... Remove track mat at ERA and stone	4h	12:30 02/10/2022	16:30 02/10/2022
24	ST00... Re-install multiblock	1h	16:30 02/10/2022	17:30 02/10/2022
23	ST00... Re-install VRS	6h	16:30 02/10/2022	22:30 02/10/2022

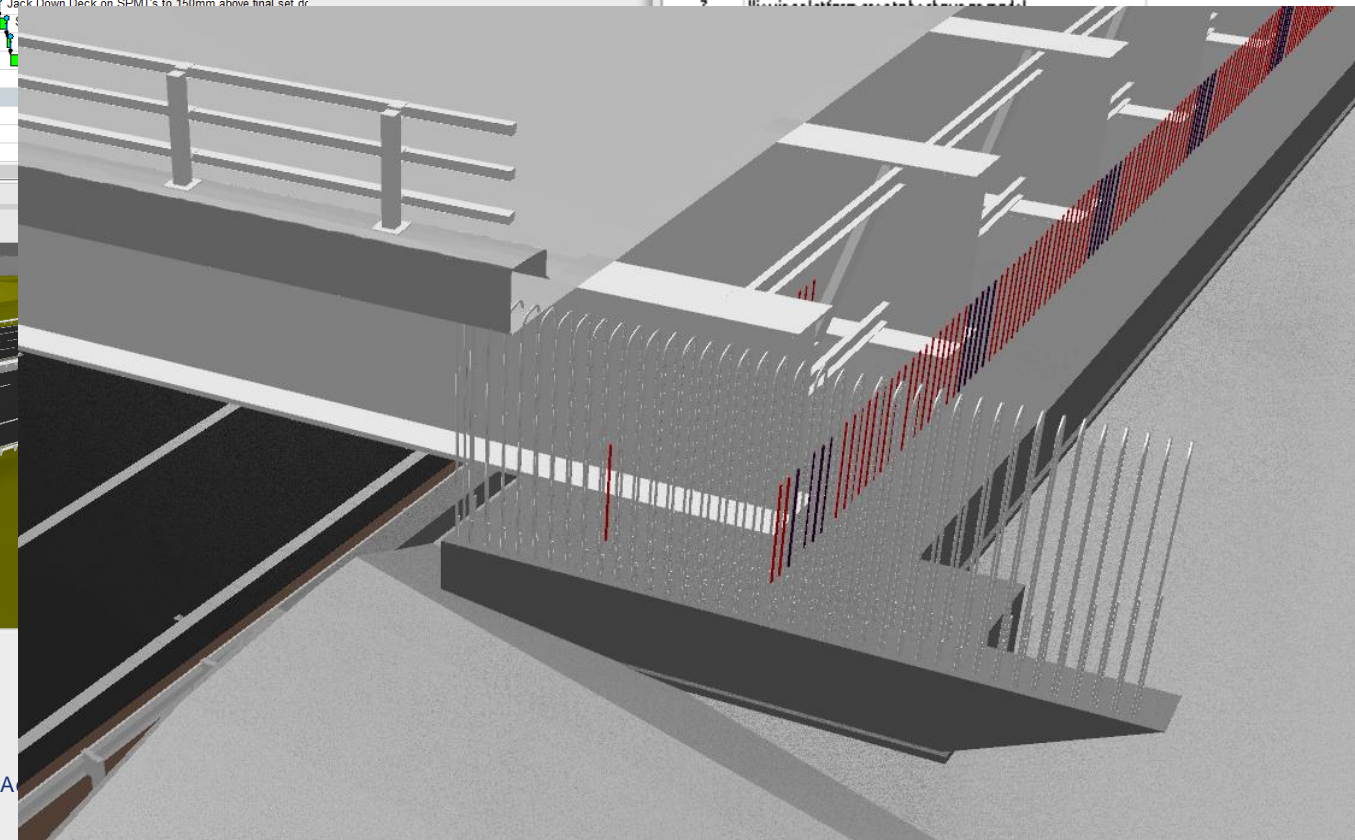
3D Using Dates [Best] Colors [Appearance Profiles] Filters [3D by Selection [Administrator]] [1498x420]

Appearance Profiles

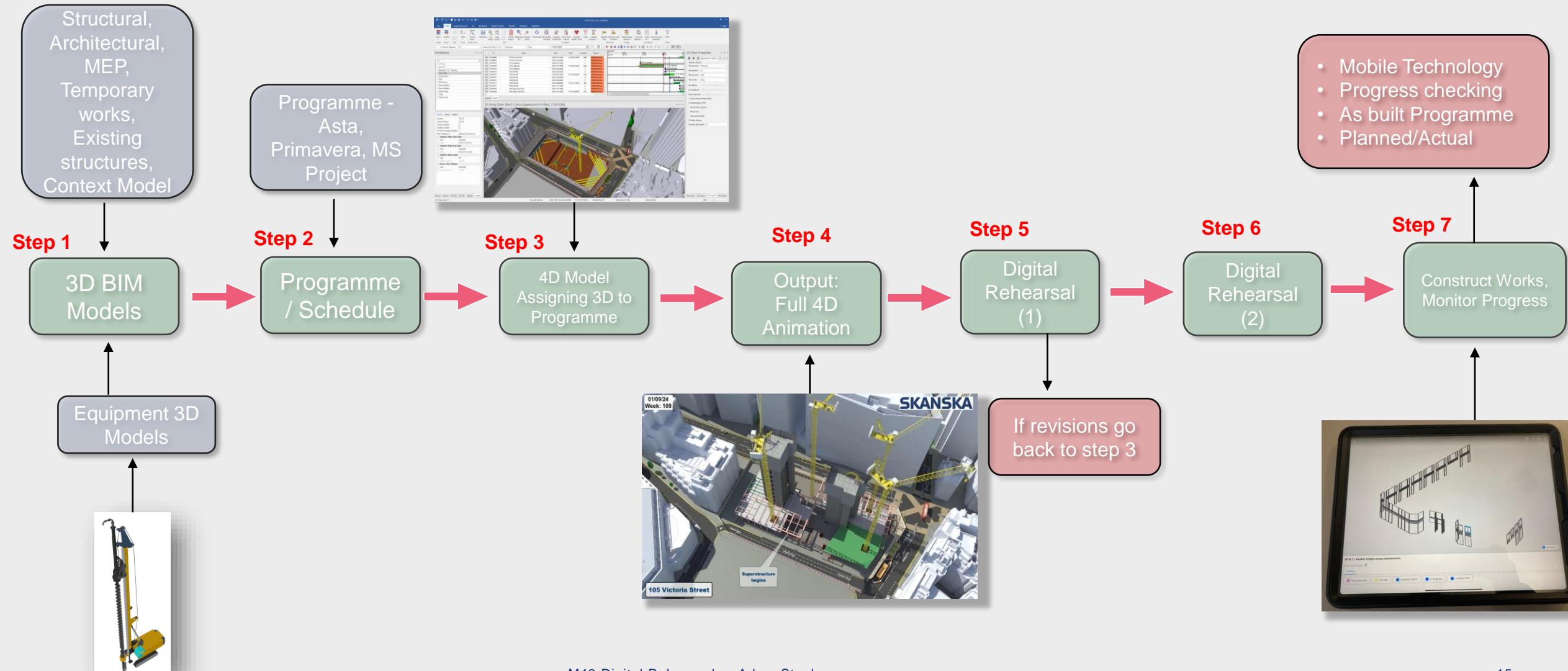
- Install
- Maintain
- Neutral
- No Change
- Remove
- Temporary

21:47 01/10/22

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12 Edge protection required on abutments and wall for BR02 - design to be provided	Max Locker - design info Adam/BIM team - model
13 Stone stackpile in place in advance of work	
22 Programme Held Points	
23 Steel road plater to be procured and placed at the end of the track mat to transition back onto the carriageway	Max Locker
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6 Add BR01 abutments into the layer to turn off - as these not gonna be done	
7	



4D Planning Process



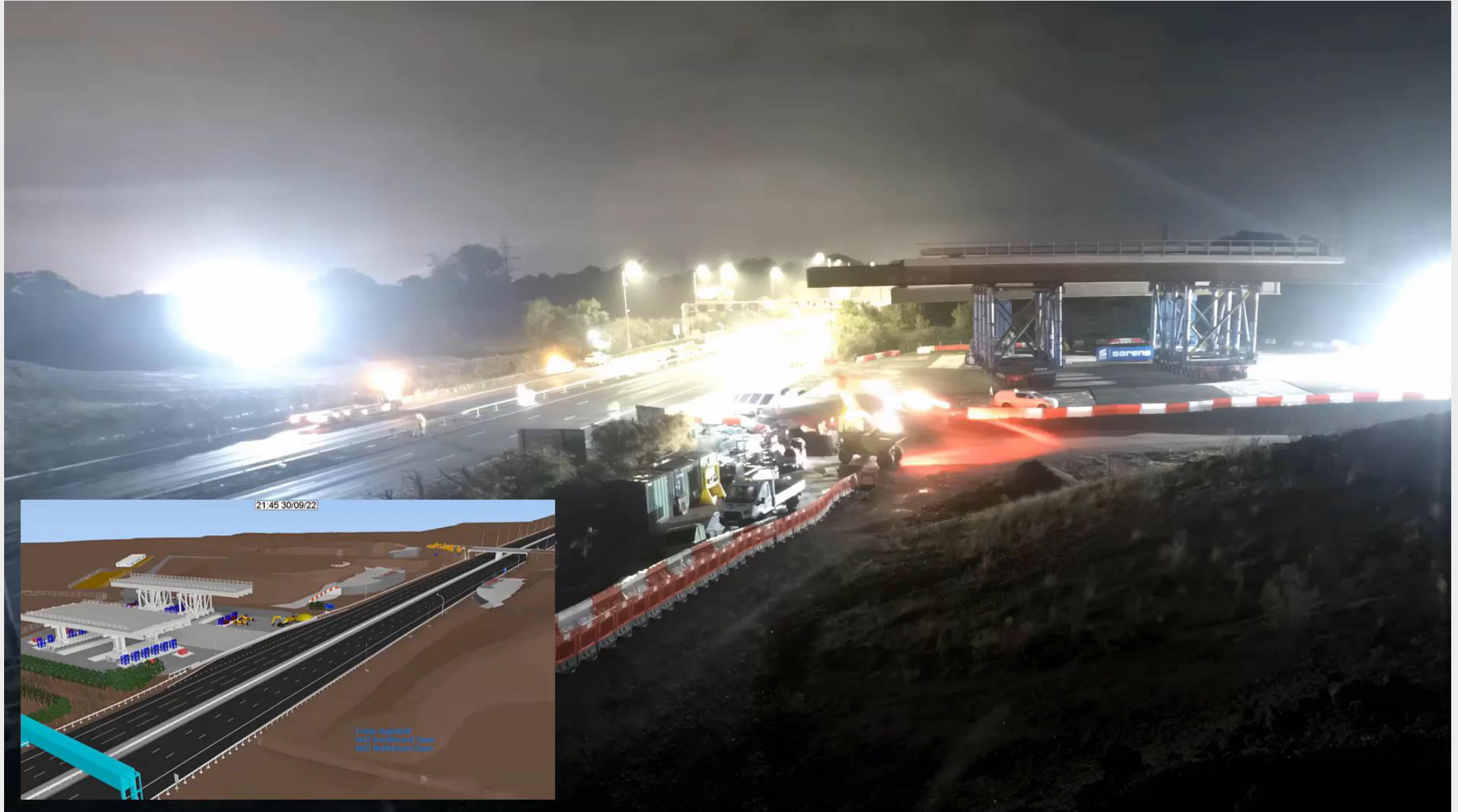
Stage 7: Construct & Use Model



Planned Vs Actual



Planned Vs Actual



Thank you

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