

understood to have been delayed by SDS such that it was not in place until **07/01/10**. This is either an SDS breach (which would excuse Infraco of the time) or if caused by a failure on the part of Infraco to manage SDS, it is a matter for which Infraco bears responsibility.

(ii) **Concurrent issues:** In our opinion the other events detailed above (i.e. the sub-contractor procurement timing and the WPP process) have less of a bearing on the late commencement of this area. Whilst in isolation these issues may have been critical to commencement their significance is considerably diminished by the occurrence of the events in G(i) above.

(iii) **Considerations of dominance:** availability of design and work areas are both equally important in terms of ability to commence. That said, if contemporaneously Infraco and SDS knew that the utilities diversions were significantly delayed, such that they did not have to progress the design in accordance with the original programme, then the works area availability will have more causative significance. In relative terms however Infraco will certainly argue that the late completion of MUDFA / utilities, and hence the late availability of the working area, will be more dominant (i.e. have more 'causative potency') than a delay in either the design issue or the INTC Estimate process which would / could have been overcome in accordance with the original programme had it been necessary.

Bearing in mind however that commencement of RW 1A & 1C were not dependent on completion of utility diversions, those works could have commenced on or around execution of the FP licence. That is, it appears they could have commenced on or around 01/02/10 (allowing for mobilisation). Delays up to that point relate to the late execution of the FP licence (a matter for which SDS is responsible; possibly Infraco if breach of its obligation to manage SDS can be established).

As such, from the information available it appears that the key issue to commencement of the RW was the execution of the FP licence. It would be wrong however at this stage to entirely dismiss the potential (earlier) impact of MUDFA/utility diversions on commencement of these structures. This point may require further investigation.

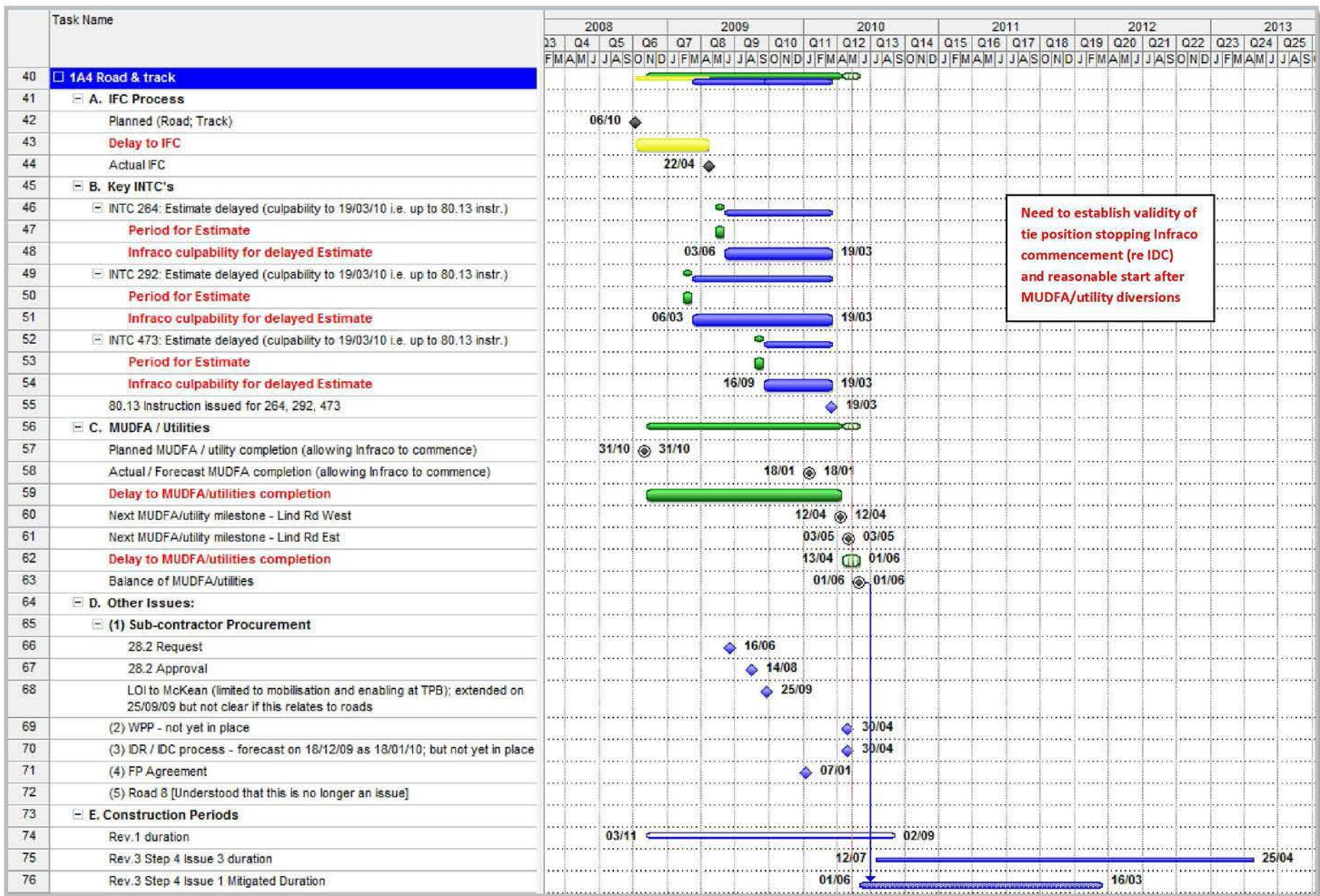
H. Current assessment of culpability

A. DELAY TO START: Current view on culpability [analysis of Lower and Upper Limits of culpability]															
Used Actual Start of 17/3/10	tie culpability					Cause	Infraco culpability				Cause	Poss. SDS culpability			
	From	to	Days	Weeks	From		to	Days	Weeks	From		to	Days	Weeks	
1. LOWER LIMIT															
MUDFA / Utility diversions	31/10/08	18/01/10	444	63.43	Late start	18/01/10	17/03/10	58	8.29	IFC	30/09/08	26/01/09	118	16.86	
			0	-				0	-				0	0.00	
				63.43					8.29					16.857	
2. UPPER LIMIT															
MUDFA / Utility diversions	31/10/08	17/03/10	502	71.71	Late start	18/01/10	17/03/10	58	8.29	FP TPB to 7/1	31/10/08	07/01/10	433	61.86	
			0	-				0	-				0	0.00	
				71.71					8.29					61.857	

B. DELAY TO FINISH: Current view on culpability [analysis of Lower and Upper Limits of culpability]									
IM Mitigated Period = +18 wks	IM Mitigated Period		Infraco Rev.3 Period		IM mitigated period +18wks: this is likely to be BDDI/IFC issues and TM revised phasing. Culpability not clear; range of possibilities - upper / lower limits recognise extremes of liability. Infraco Rev.3 period +54 wks: On the basis that Infraco can mitigate to 18 weeks per IM analysis then Infraco lower limit restricted to anything in excess of 18wks. tie liability remains at lower limit of 0 wks if Infraco responsible for all increased durations				
Infraco Rev.3 Period = +54 wks	tie	Infraco	tie	Infraco					
Lower Limit	0.00	0.00	0.00	36.00					
Upper Limit	18.00	18.00	18.00	54.00					

Draft discussion

1A4 Road & Track



A. **IFC Process:** The initial IFC was **198 days (or 28 weeks) late**; planned date was **06/10/08**; the actual was **22/04/09**. There is no information presently available to inform culpability for delay (see Preamble). Potential reasons include:-

- Late issue by SDS (at its simplest a CE under 65(t));
- A material breach by SDS (again at its simplest form a CE under 65(u));
- A failure of Infraco to provide the Infraco Design to SDS (clause 19.19 refers);
- A tie Change;
- A failure of Infraco in respect of its management of SDS or another breach by Infraco (e.g. failure to properly manage the CEC/NR interface);
- A requirement of CEC for which tie will bear responsibility.

Note: DS advised that "late submission of TAA package followed by length of time needed to incorporate CEC comments because so many needed to be made on design". Potentially a **delay by SDS, SDS /tie or Infraco?**

See also INTC 129 re CEC request for extension of time to Prior Approvals process.

Note: Further revision to IFC likely. DS advised "Full reasons not available but will have included incorporation of comments that weren't included in the first IFC - as discussed last week original IFC might have been a sensible mitigation but might have been deficient". MB advises that decisions re Ocean Terminal finishes and location also of concern in that redesign likely due to lack of funding for tie/CEC preferences at this location.

B. **Key INTC's:** From information provided it appears that Infraco issued 12 no. INTC's against this area. INTC's 093, 129, 166, 165, 257, 276, 287, 289, 292, 469, 473 & 264 refer. Of the aforementioned it appears likely that **INTC 264** (Lindsay Road Groundworks), **INTC 292** (Additional Ramp / Steps at Lindsay Road RTW) & **INTC 473** (Construction of 3no. sewer protection slabs & new chamber – Lindsay Road Schedule Part 2: - undefined prov. sum item 8) materially affected Infraco's ability to commence works in accordance with the Rev 01 programme. All of the foregoing were the subject of an **80.13 instruction on 19/03/10**. Details as follows:-

- (i) **INTC 264:** issued 07/05/09; Estimate due 02/06/09; No Estimate provided by Infraco. **Delay by Infraco.**
- (ii) **INTC 292:** issued 09/02/09; Estimate due 05/3/09; No Estimate provided by Infraco. **Delay by Infraco.**
- (iii) **INTC 473:** issued 20/08/09; Estimate due 15/09/09; No Estimate provided by Infraco. **Delay by Infraco.**

tie issued an 80.13 instruction on 19/03/10 covering all of the above.

See also INTC 129 re CEC request for extension of time to Prior Approvals process. Also note that more recent INTC re Ocean Terminal tramstop and finish may become an obstacle to progress.

C. **MUDFA / Utilities:** Planned completion **31/10/08**. MUDFA / utilities works in association with Lindsay Road RTW's were partially completed to allow commencement at chainage 0-230 as at **07 or 18/01/10**. MUDFA / Utilities completions beyond that date are forecast to complete as follows:-

- (i) Lindsay Road West (**12/04/10**) – access to chainage 0-500 on westbound lane works;
- (ii) Lindsay Road East (**03/05/10**);
- (iii) Balance of MUDFA / Utilities works (**01/06/10** – MB believes this may be **01/07/10**).

Delay by tie; tie culpability Note: **tie** restricting Infraco access to this area pending resolution of the Infraco IDC certification process (see below).

Also, MB believes chainage 0-230 roadworks are unnecessary. **Is this being formally pursued with Infraco?**

D. **Other Issues:**

- (i) **Sub-Contractor Procurement:** No formal sub-contract has been put in place for this section. It is also not clear whether any informal (LOI) is in place for road works in this section. LOI to McKean of 04/08/08 does not appear to cover 1A4 Road & track; extended LOI issued 25/09/09 but scope not clear [subject to future tie audit]. **Delay by Infraco. Infraco culpability.**
- (ii) **WPP Process:** Not yet submitted (as advised by MB). This could be an obstacle to commencement. **Delay by Infraco. Infraco culpability.**
- (iii) **IDR/IDC process:** IDC not yet in place. Infraco programme of 18/12/09 shows this as being forecast to be in place by 18/01/10. But not yet in place. Infraco delay. **tie** restricting Infraco access to this area pending resolution of the Infraco IDC certification process. See Preamble.
- (iv) **FPA Licence:** Not in place until 07/01/10. This would have been an obstacle to commencement. Advised that delay arose from failure of SDS (or failure of Infraco to manage SDS?) to provide 'Category 2' design calculations for ramp at TPB. SDS subsequently revised design to remove ramps as it could not satisfy FP as to suitability of design. This would have been an obstacle to commencement. **Delay by SDS (possible material breach – excusable under 65(u)); but possibly Infraco in failing to manage SDS (no evidence). SDS or Infraco culpability.**

E. Construction Periods:

1A4 Road & Track					
	Rev.1	Rev.3 Issue 3	Delay	IM Mitigated Rev.3	Delay
Start	03/11/2008	12/07/2010	88.00 wks	01/06/2010	82.14 wks
Finish	02/09/2010	25/04/2013	138.00 wks	16/03/2012	80.14 wks
Cal. Duration	95.57 wks	145.57 wks	50.00 wks	93.57 wks	-2.00 wks

Note: MB suggested mitigation exercise shows overall commencement and completion in Intermediate Section 1A4 as 01/03/10 to 05/07/11 respectively. That equates to a period of **70 weeks**.

- (i) **Delay to Start:** The table above refers to various programme dates. Forecast start dates differ between Issue 3, IM Issue 3, MB mitigated programme and MUDFA / Utility dates listed above.

Delay to start is therefore forecast to be a **range between 82 weeks (01/06/10) and 88 weeks (12/07/10)**. **MB mitigation exercise shows immediate commencement** [albeit that exercise is now outdated in terms of commencement dates].

Primary causes of delay to start as follows:-

- A. **IFC process:** The initial IFC **was 198 days (or 28 weeks) late**; planned date was **06/10/08**; the actual was **22/04/09**. There is no information presently available to inform culpability for delay. Unless there is proof of Infraco breach, **it may be a CE under either 65(t) or (u)** (but uncertain).
- B. **INTC's:** Delays by Infraco in the submission of Estimates. Delay up to 19/03/10 when tie issued clause 80.13 instruction.
- C. **MUDFA / Utilities:** Planned completion **31/10/08**. Partial completion at Lindsay Road RTW's as at **07 or 18/01/10**; further release of areas as at 12/04/10, 03/05/10 and 01/06/10. **Delay by tie; tie culpability.**

D. Other:

- **Sub-Contractor procurement:** No formal sub-contract has been put in place for this section. It is also not clear whether any informal (LOI) is in place for road works in this section. **Delay by Infraco. Infraco culpability.** Effect of this is not clear – it could be a hindrance to progress – but details not available to establish scope of work under McKean LOI;
- **WPP process:** Not yet submitted (as advised by MB). This could be an obstacle to commencement. **Delay by Infraco. Infraco culpability.** Unlikely to have significant impact;
- **IDR/IDC process:** IDC not yet in place. **tie** restricting Infraco access to this area pending resolution of the Infraco IDC certification process.
- **FPA Licence:** Not in place until 07/01/10. Delay arose from failure of SDS (Infraco?) to provide 'Category 2' design calculations. This would have been an obstacle to commencement. **Delay by SDS (possible material breach – excusable under 65(u)); but possibly Infraco in failing to manage SDS (no evidence). SDS or Infraco culpability.**

- (ii) **Delay to Finish:** Issue 3 programme shows an **increase of circa 50 weeks** over timescale in Rev.1 programme (majority of increase understood to be as a result of full-depth construction issue). IM mitigated view of Issue 1 however has slightly shorter duration than Rev.1 programme. MB mitigation proposal also has shorter duration than Issue 3 (70 weeks duration i.e. 10 weeks less than Issue 3). Presently, increase in duration not justified.

F. tie position on area availability:

- (i) Refer to section (C) above re MUDFA dates (available from January 2010 – but in limited area ch.0-230). Thereafter **12/04/10** is next availability date (for Lindsay Road West). See however IDR/IDC comments at D above. **tie** presently of the opinion that Infraco are not able to commence due to incomplete IDC process.

G. Conclusion:

- (i) **'Significant' issues/events:** In our opinion there were four main contributory factors, being (a) the IFC process; (b) the INTC process in respect of INTC's 264, 292 & 473; (c) late completion of MUDFA/utilities; and (d) the late execution of the FP licence. Taking those events in chronological order:-

The IFC was planned to be issued on **06/10/08**; it was actually issued on **22/04/09 (198 days late)**. **MUDFA/utilities diversions** were programmed to be completed on **31/10/08** (to facilitate a start on 1A4 Road & track 03/11/08). Those diversions however were not actually completed in phases during the period from **18/01/10 to 01/07/10** (current forecast). This is tie's culpability. Running concurrently with this was the **late provision by Infraco of the Estimates** for INTC's 264, 292 & 473. Those Estimates have yet to be provided. This is a matter for which Infraco is responsible. **Delay measured to 19/03/10** (when clause 80.13 instruction issued). Each of those events would have delayed commencement in this area. In addition, the execution of the **FP licence** is understood to have been delayed by SDS such that it was not in place until **07/01/10**. This is either an SDS breach (which would excuse Infraco of the time) or if caused by a failure on the part of Infraco to manage SDS, it is a matter for which Infraco bears responsibility.

The **IDR/IDC process** may also be a contributing factor affecting commencement from either **18/01/10 or 12/04/10** (but tie's ability to stop work from commencing on this basis is not clear).

- (ii) **Concurrent issues:** In our opinion the other events detailed above (i.e. the sub-contractor procurement timing and the WPP process) have less of a bearing on the late commencement of this area. Whilst in isolation these issues may have been critical to commencement their significance is considerably diminished by the occurrence of the events in G(i) above. They will however increase in significance as matters progress if they do pose an obstacle to work on the ground. **Discuss position being taken by tie.**
- (iii) **Considerations of dominance:** availability of design and work areas are both equally important in terms of ability to commence. That said, if contemporaneously Infraco and SDS knew that the utilities diversions were significantly delayed, such that they did not have to progress the design in accordance with the original programme, then the works area availability will have more causative significance. See previous comments re potential Infraco argument that the late completion MUDFA / utilities, and hence the late availability of the working area, will be more dominant (i.e. have more 'causative potency') than its delays which would / could have been overcome in accordance with the original programme had it been necessary.

As such, from the information available it appears that the two key issues to commencement of the road & trackworks in 1A4 are (i) the completion of the MUDFA / utility works; and (ii) the execution of the FP licence. There would appear to be equal causative potency of both issues up to January 2010; thereafter, the late completion of the utility diversions becomes the dominant issue.

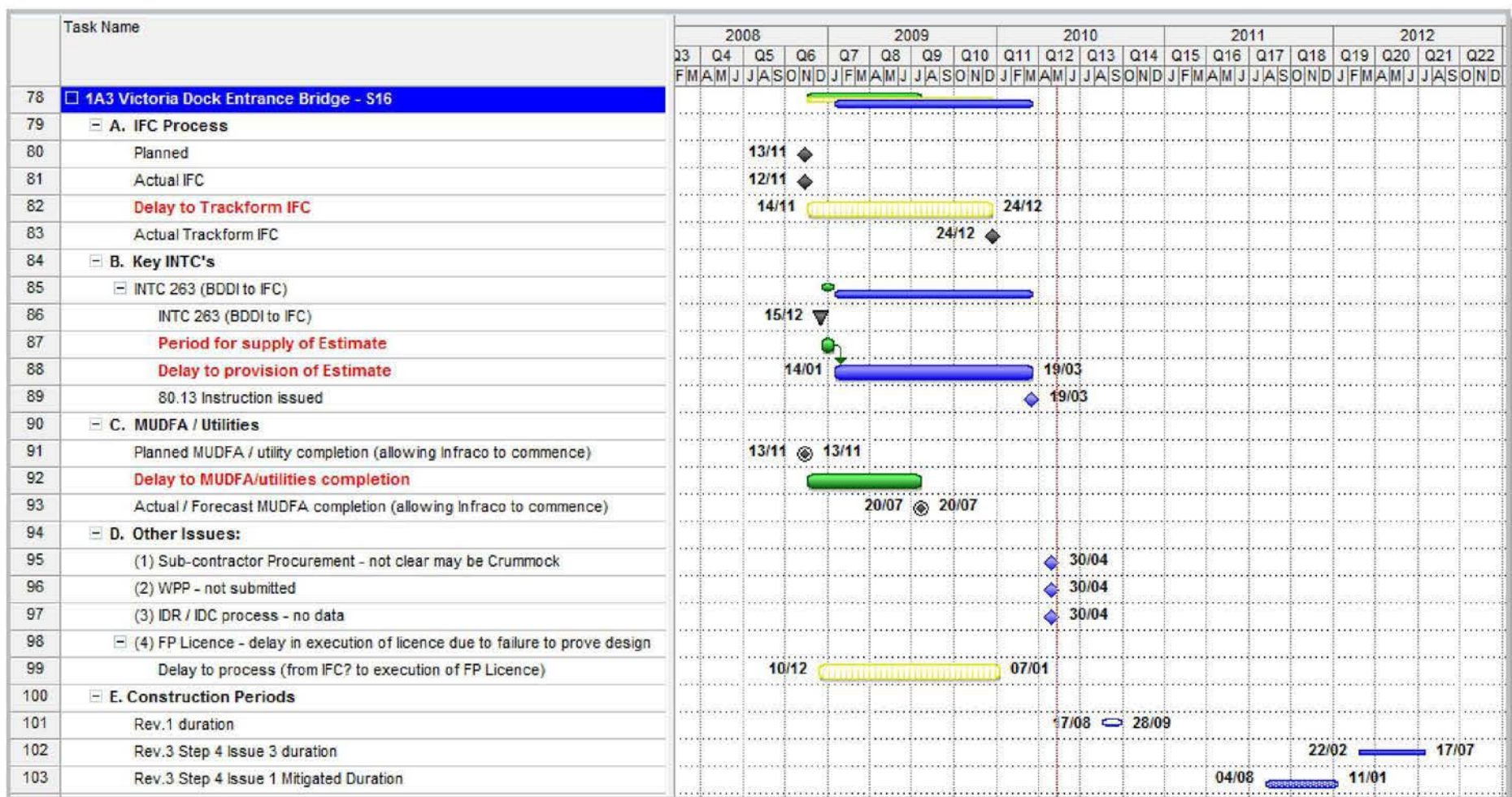
H. Current assessment of culpability

A. DELAY TO START: Current view on culpability [analysis of Lower and Upper Limits of culpability]														
	tie culpability				Cause	Infraco culpability				Cause	Poss. SDS culpability			
	From	to	Days	Weeks		From	to	Days	Weeks		From	to	Days	Weeks
1. LOWER LIMIT														
MUDFA / Utility diversions	03/11/08	12/04/10	525	75.00	Late start	01/06/10	12/07/10	41	5.86	Delay to IFC	06/10/08	22/04/09	198	28.29
			0	-				0	-				0	0.00
				75.00					5.86					28.286
2. UPPER LIMIT														
MUDFA / Utility diversions	03/11/08	01/06/10	575	82.14	INTC's	06/03/09	19/03/10	378	54.00	FP TPB to 7/1	03/11/08	07/01/10	430	61.43
			0	-				0	-				0	0.00
				82.14					54.00					61.429

B. DELAY TO FINISH: Current view on culpability [analysis of Lower and Upper Limits of culpability]					
IM Mitigated Period = -2 wks	IM Mitigated Period		Infraco Rev.3 Period		IM mitigated period -2wks: notwithstanding MUDFA / Utilities issues extant, this assessment is considered achievable on the basis of reasonable mitigation on the part of Infraco. Infraco Rev.3 period +50 wks: On the basis that Infraco can mitigate to -2 wks per IM analysis then Infraco lower limit restricted to anything in excess of -2 wks. tie liability remains at lower limit of -2 wks if Infraco responsible for all increased durations
Infraco Rev.3 Period = +50 wks	tie	Infraco	tie	Infraco	
Lower Limit	-2.00	-2.00	-2.00	50.00	
Upper Limit	0.00	0.00	0.00	52.00	

Draft for discussion

1A3 Victoria Dock Entrance Bridge



- A. **IFC Process:** Initial IFC issued on time (planned 13/11/08; actual 12/11/08). Subsequent IFC's issued as follows:-
 - (i) **Trackform 24/12/09.** There is no information presently available to inform culpability for delay (see Preamble). It is notable however, that the IFC issue date is still in advance of the works to this area. It of itself is unlikely to have been the direct cause of the delay in this area (or to the achievement of a Certificate of Sectional Completion for this Section). It should also be noted that this particular Trackform IFC would not have been an obstacle to Infracore's commencement or early progress of bridge works (this has been confirmed by MB). **Potential delay by SDS/tie; Infracore – but only to the area (not the Section)** [However, this should not have influenced delay to commencement of bridge or trackworks in this area]
- B. **Key INTC's:** From information provided it appears that the Infracore issued 1 no. INTC in relation to this structure; **INTC 263**. We are further advised that **INTC 263 (IFC Drawing Changes – Victoria Dock Entrance Bridge – Section 1A)** appears to have materially / critically affected Infracore's ability to commence works in accordance with the Rev 01 programme. Details are as follows:-
 - (i) **INTC 263:** issued by Infracore on 15/12/08 (33 days after IFC issue). Estimate should have been submitted on or around 13/01/09. Estimate has not yet been submitted by Infracore. As at 30/04/10 this is **472 days** later than permitted by the Contract. **Delay by Infracore. Infracore culpability for time taken to produce Estimate for INTC 230.**
However, an **80.13 Instruction was issued by tie on 19/03/10** instructing Infracore to proceed with the works covered by that INTC. **Delay by Infracore; Infracore culpability for the protracted time taken to produce an Estimate** (which in effect precipitated the need for tie to issue the 80.13 in an attempt to maintain progress – see Preamble).
- C. **MUDFA / Utilities:** Planned completion 13/11/08; actual 18/07/09, 247 days late. **Delay by tie; tie culpability.** Note: We are advised that service diversions are not yet fully complete. Nevertheless we understand that works are sufficiently complete to enable commencement. These issues are however subsumed with delays on and construction periods required for TPB.
- D. **Other Issues:**
 - (i) **Sub-Contractor Procurement:** No formal sub-contract has been put in place for this structure. It is also not clear whether any informal (LOI) is in place for road works in this section. **Delay by Infracore. Infracore culpability** (but due to start date for this structure it will not be critical at present) [Note: no details as to sub-contractor in place. Understood that Crummock may be appointed by Infracore for 1A3 – see Infracore Period Report No.3-1 report to 24/04/10].
 - (ii) **WPP Process:** Not yet submitted (as advised by MB) as no sub-contractor appointed. This could be an obstacle to commencement (but unlikely at present). **Delay by Infracore. Infracore culpability.**
 - (iii) **IDR/IDC process:** IDC not yet in place. Infracore programme of 18/12/09 does not contain details of the IDR / IDC process for this structure. **Infracore delay** (at present not affecting commencement because this is dependent on TPB). **tie** may restrict Infracore access to this area pending resolution of the Infracore IDC certification process.
 - (iv) **FPA Licence:** Not in place until 07/01/10. We are advised that this delay arose from a failure of SDS (possibly Infracore to manage SDS?) to provide 'Category 2' design calculations for ramp at TPB. SDS subsequently revised design to remove ramps as it could not satisfy FP as to the suitability of its original design. This would have been an obstacle to commencement. **Delay by SDS (possible material breach – excusable under 65(u)); but possibly Infracore in failing to manage SDS (no evidence). SDS or Infracore culpability.** Critical nature of this issue is seen in Tower Place Bridge.

E. Construction Periods:

1A3 Victoria Dock Bridge - S16					
	Rev.1	Rev.3 Issue 3	Delay	IM Mitigated Rev.3	Delay
Start	17/08/2010	22/02/2012	79.14 wks	04/08/2011	50.29 wks
Finish	28/09/2010	17/07/2012	94.00 wks	11/01/2012	67.14 wks
Cal. Duration	6.14 wks	21.00 wks	14.86 wks	23.00 wks	16.86 wks

Note: MB suggested mitigation exercise shows overall commencement and completion in Intermediate Section 1A4 as 01/03/10 to 05/07/11 respectively. That equates to a period of **70 weeks**.

- (i) **Delay to Start:** The table above refers to various programme dates. Forecast start dates differ between Issue 3, IM Issue 3, MB mitigated programme and MUDFA / Utility dates listed above.

Delay to start is therefore forecast to be a **range between 50 weeks (to 04/08/11) and 79 weeks (to 22/02/12)**.

Primary causes of delay to start as follows:-

- A. **IFC process:** no material impact;
- B. **INTC's:** Delay by Infraco in the submission of Estimate - (delay of **430 days** up to 19/03/10 when tie issued clause 80.13 instruction). **Delay by Infraco; Infraco culpability.** No material impact on commencement;
- C. **MUDFA / Utilities:** Planned completion **13/11/08**; actual completion **18/07/09, 247 days late. Delay by tie; tie culpability.** no material impact – dependent on TPB;
- D. **Other:**
 - **Sub-Contractor procurement:** No formal sub-contract in place. Not clear whether any informal (LOI) is in place for works in this section. **Delay by Infraco. Infraco culpability** (but due to start date for this structure it will not be critical at present)
 - **WPP process:** Not yet submitted (as advised by MB). Could be an obstacle to commencement in future. **Delay by Infraco. Infraco culpability.** Unlikely to have significant impact;
 - **IDR/IDC process:** IDC not yet in place. This was clearly not an obstacle to commencement on Tower Place Bridge. **If not resolved prior to programmed commencement of VDEB, this may well prove an obstacle given current tie policy of restricting Infraco access area pending resolution of the Infraco IDC certification process site wide.**
 - **FPA Licence:** Not in place until 07/01/10. Delay arose from failure of SDS (Infraco?) to provide 'Category 2' design calculations. This would have been an obstacle to commencement. **Delay by SDS (possible material breach – excusable under 65(u)); but possibly Infraco in failing to manage SDS (no evidence). SDS or Infraco culpability.** No evidence available as to SDS/Infraco performance or management of process (subject to future audit).

- (ii) **Delay to Finish:** Issue 3 programme shows an increase of circa **15 weeks** over the timescale in Rev.1 programme. Current Infraco Rev.3 programme period (working period) considered reasonable by IM. The original Rev.1 programme duration was inserted in respect of a 'dummy' activity'.

F. **tie position on area availability:**

- (i) We are advised that the temporary diversion works required for VDEB were substantively complete on 18/07/09. It is notable however, that this work (although substantively complete) remains incomplete as at 30/04/10. (These incomplete works will not be critical until such times as the works to Tower Place Bridge are complete).

G. **Conclusion:**

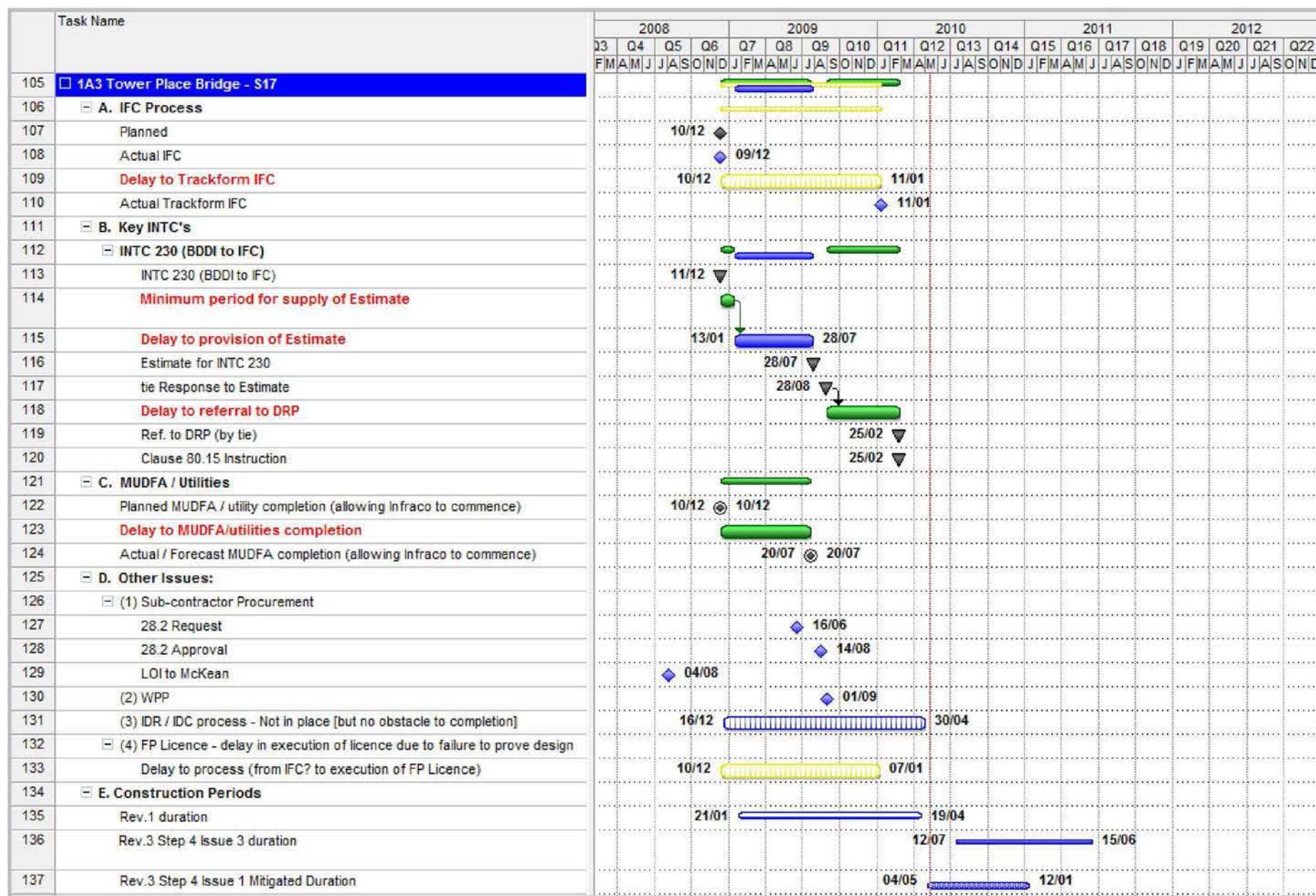
- (i) **'Significant' issues/events:** This structure is dependent on the commencement and completion of TPB. Delay to actual start is forecast to be between 50 and 79 weeks (see table above). In our opinion the main factor was and is the delays to TPB. Running concurrent with TPB delays are (a) the INTC process in respect of INTC 263; (b) late completion of MUDFA/utilities; and (c) the late execution of the FP licence. However due to the delay on TPB, those matters are not critical to commencement of this structure. Increase in duration of 15 weeks appears to be considered reasonable by both IM & MB mitigation exercises.
- (ii) **Other concurrent issues:** In our opinion the other events detailed above (i.e. the sub-contractor procurement timing; the WPP process & the IDR/IDC process) have less of a bearing on the late commencement of this structure. Whilst in isolation these issues may have been critical to commencement their significance is considerably diminished by the occurrence of the events in G(i) above.
- (iii) **Considerations of dominance:** It is the effect of the delays to TPB which materially affects the commencement of this structure. The other issues whilst running concurrently occur (at present) sufficiently in advance of the delayed start date such that they do not (presently) pose a obstacle to commencement.
- (iv) **Criticality:** Notwithstanding the above noted commentary on "Considerations of dominance", it does appear however, that issues attaching to VDEB are not of themselves critical to Section 1 completion. Clearly, the commencement of VDEB is dependent on the completion of works to Tower Place Bridge.

H. Current assessment of culpability

A. DELAY TO START: Current view on culpability [analysis of Lower and Upper Limits of culpability]														
	tie culpability				Cause	Infraco culpability				Cause	Poss. SDS culpability			
	From	to	Days	Weeks		From	to	Days	Weeks		From	to	Days	Weeks
1. LOWER LIMIT														
Delay; timescale from FP to 80.15 instruction for INTC 230 (TPB)	07/01/10	22/03/10	74	10.57	Delay; from 80.13 instruction to Rev 3 commencement date	19/03/10	17/08/10	151	21.57	IFC on time	10/12/08	10/12/08	0	0.00
			0	-				0	-				0	0.00
			0	-				0	-				0	0.00
				10.57					21.57					0
2. UPPER LIMIT														
MUDFA / Utilities (still not 100% complete on VDEB)	21/01/09	20/07/09	180	25.71	FP Licence	21/01/09	07/01/10	351	50.14	FP Licence	21/01/09	07/01/10	351	50.14
Delay; from INTC 230 estimate to 80.15 instruction (TPB)	20/07/09	25/02/10	220	31.43	Delay; from 80.13 instruction to Rev 3 commencement date	19/03/10	17/08/10	151	21.57				0	0.00
Infraco Mobilisation (TPB)	25/02/10	22/03/10	25	3.57				0	-				0	0.00
				60.71					71.71					50.143
B. DELAY TO FINISH: Current view on culpability [analysis of Lower and Upper Limits of culpability]														
IM Mitigated Period = +17 wks	IM Mitigated Period		Infraco Rev.3 Period				<p>IM mitigated period +17wks: this is likely to be BDDI/IFC issues , TM revised phasing or resequencing by Infraco. Culpability not clear; range of possibilities - upper / lower limits recognise extremes of liability. (Very much dependent on issues attaching to TPB which is the predecessor to commencement of VDEB).</p> <p>Infraco Rev.3 period +15 wks: On the basis that Infraco can mitigate to 15 weeks per it's analysis then Infraco lower limit restricted to anything in excess of 0 wks. tie liability remains at lower limit of 2 wks.If Infraco responsible for all increased durations</p>							
Infraco Rev.3 Period = +15 wks	tie	Infraco	tie	Infraco										
Lower Limit	2.00	0.00	0.00	0.00										
Upper Limit	17.00	15.00	15.00	15.00										

Draft for discussion

1A3 Tower Place Bridge – S17



- A. **IFC Process:** Initial IFC issued on time (planned 10/12/08; actual 09/12/08). Subsequent IFC's issued as follows:-
- (i) **Trackform 11/01/10.** There is no information presently available to inform culpability for delay (see Preamble). It is notable however, that as Trackform requires the further integration of Infraco design there is a responsibility on Infraco to provide information to SDS for incorporation on time. Notwithstanding, it is likely that the late issue of this IFC flows from one or more of the following reasons:-
 - a. Late issue by SDS (CE under 65(t));
 - b. A material breach by SDS (a CE under 65(u));
 - c. A failure of Infraco to timeously provide the Infraco Design to SDS (clause 19.19);
 - d. A failure of Infraco in respect of its management of SDS or another breach by Infraco.
 It should be noted however, that this particular Trackform IFC would not have been an obstacle to Infraco's commencement or early progress of bridge works (this has been confirmed by MB). An issue date of 11/01/10 although late would not appear to have affected the trackwork activities in this area, which were due to commence in the Rev.1 programme during June 2010 (this proceeds on the assumption that the Trackform IFC does not require amendments to the TPB IFC).

Potential delay by SDS/tie; Infraco – but only to the area (not the Section) [However, this should not have influenced delay to commencement of bridge or trackworks in this area]
- B. **Key INTC's:** From information provided it appears that the Infraco issued 3 no. INTC's in relation to this structure; INTC's 139, 230 & 405. We are advised that only **INTC 230 (Tower Bridge Structure IFC Drawings)** appears to have materially / critically affected Infraco's ability to commence works in accordance with the Rev 01 programme. Details are as follows:-
- (i) **INTC 230:** issued by Infraco on 11/12/08 (2 days after IFC issue). Estimate should have been submitted on or around 12/01/09. Estimate actually submitted by Infraco on 28/07/09 i.e. 197 days later than permitted by the Contract. **Delay by Infraco. Infraco culpability for time taken to produce Estimate for INTC 230.**
 - 80.15 Instruction issued by tie on 25/02/10.** 184 days following receipt of Estimate (less 28 days for review & discussion of same). **Delay by tie; tie culpability for time taken to issue 80.15 instruction following receipt of Estimate dated 28/07/09.**
- C. **MUDFA / Utilities:** Planned completion 10/12/08; actual completion 18/07/09, 220 days late. **Delay by tie; tie culpability.**
- D. **Other Issues:**
- (i) **Sub-Contractor Procurement: 28.2 approval process:** request submitted 16/06/09; approval granted 14/08/09. Note that this is much later than Rev.1 commencement date (21/1/09). However, first LOI (for mobilisation and enabling works) issued by Infraco on 04/08/08 (i.e. well in advance of Rev.1 commencement). **Delay by Infraco. Infraco culpability.** At best likely to be administrative delay by Infraco in terms of Rev.1 dates; however, it would be known post 04/08/08 that delay incurred to Bridge due to MUDFA works. Unlikely to have critical / dominant effect.
 - (ii) **WPP Process:** Submitted September 2009 in place for December 2009. This could have been an obstacle to commencement. **Delay by Infraco. Infraco culpability.**

- (iii) IDR/IDC process: IDC not yet in place. This was clearly not an obstacle to commencement as commencement took place on 22/03/10 in advance of IDC. See Preamble.
- (iv) FPA Licence: Not in place until 07/01/10. Advised that delay arose from failure of SDS (Infraco?) to provide 'Category 2' design calculations for ramp at TPB. SDS subsequently revised design to remove ramps as it could not satisfy FP as to suitability of design. This would have been an obstacle to commencement. **Delay by SDS (possible material breach – excusable under 65(u)); but possibly Infraco in failing to manage SDS (no evidence). SDS or Infraco culpability.**

E. **Construction Periods:**

1A3 Tower Place Bridge - S17					
	Rev.1	Rev.3 Issue 3	Delay	IM Mitigated Rev.3	Delay
Start	21/01/2009	12/07/2010	76.71 wks	04/05/2010	66.86 wks
Finish	19/04/2010	15/06/2011	60.29 wks	12/01/2011	38.29 wks
Cal. Duration	64.86 wks	48.43 wks	-16.43 wks	36.29 wks	-28.57 wks

- (i) Delay to [Actual] Start: The table above refers to various programme dates. Actual start however was **22/03/09**. This is **16 weeks** earlier than Infraco's Issue 3 programme; and **6 weeks** earlier than IM mitigated Issue 3 programme.

Delay to actual start is therefore 61 weeks (21/01/09 to 22/03/10).

Primary causes of delay to start as follows:-

- A. IFC process: no material impact;
- B. INTC 230: INTC issued on time; significant **Infraco delay to provision of Estimate (197 days late); tie delay (184 days) in dealing with Estimate through to 80.15 instruction on 25/2/10.** This is the last issue affecting commencement.

Note: as discussed there may be a hypothetical argument concerning the effect of 'removing' the delay in the provision of the Estimate (such that an earlier 80.15 instruction and hence start could have been achieved). However, this does not sit well with the actions of tie in relation to the actual date of issue of the 80.15 instruction. **To discuss further.**

- C. MUDFA / Utilities: Planned completion **10/12/08**; actual completion **18/07/09, 220 days late.** **Delay by tie; tie culpability.**

D. Other:

- **Sub-Contractor procurement:** First LOI issued in advance of IFC and planned start (although 28.2 process later). Appears to have limited impact;
- **WPP process:** Submitted September 2009 in place for December 2009. This could have been an obstacle to commencement. **Delay by Infraco. Infraco culpability.** Appears to have limited impact;
- **IDR/IDC process:** IDC not yet in place. This was clearly not an obstacle to commencement as commencement took place on 22/03/10 in advance of IDC.
- **FPA Licence:** Not in place until 07/01/10. Delay arose from failure of SDS (Infraco?) to provide 'Category 2' design calculations. This would have been an obstacle to commencement. **Delay by SDS (possible material breach – excusable under 65(u)); but possibly Infraco in failing to manage SDS (no evidence). SDS or Infraco culpability.**

- (ii) Delay to Finish: No further delay; in fact delay to finish is less than delay to start. That is, duration has been reduced which in turn reduces delay to completion of structure. Understood to be contributed to by a reduction in workscope.

Note: IM mitigated version of Rev.3 Issue 1 programme shows shorter duration than Infraco Issue 3 programme.

If earlier actual start of 22/03/09 is factored in, the delay to this structure and this area will be mitigated. The extent of that mitigation however will depend on the measures actually adopted by Infraco. The overall delay to Sectional Completion Date 'C' however remains as previously forecast (as delays to 1B & 1C maintain the critical delay to summer 2010 minimum).

F. **tie position on area availability:**

- (i) We are advised that the temporary diversion works required for Tower Place Bridge were completed on **18/07/09**. This was followed by the removal of fibre optic cables which we understand took a further 6 weeks (approx). This should have facilitated an early September 2009 commencement date for Infraco works.

G. **Conclusion:**

- (i) **'Significant' issues/events:** Delay to actual start was 61 weeks. In our opinion there were three main contributory factors, being (a) the INTC process in respect of INTC 230; (b) late completion of MUDFA/utilities; and (c) the late execution of the FP licence. Taking those events in chronological order

MUDFA/utilities diversions were supposed to be completed on **10/12/08** (to facilitate a start on TPB by 21/01/09). Those diversions however were not actually completed until circa **18/07/09**. This is tie's culpability. Running concurrently with this was the late provision by Infraco of the Estimate for INTC 230. That should have been provided by 12/01/09 (earliest) but was actually provided on **28/07/09**. This is a matter for which Infraco is responsible. Both events would have delayed commencement of the structure. Beyond 28/07/09 however, tie's review and inaction on the Estimate for INTC 230 ran until 25/02/10 (when the 80.15 instruction was issued). In light of the advice from DLA dated 24 March 2010, this is a period for which tie bears the responsibility. In addition, the execution of the FP licence is understood to have been delayed by SDS such that it was not in place until **07/01/10**. This is either an SDS breach (which would excuse Infraco of the time) or if caused by a failure on the part of Infraco to manage SDS, it is a matter for which Infraco bears responsibility.

- (ii) **Concurrent issues:** In our opinion the other events detailed above (i.e. the sub-contractor procurement timing; the WPP process & the IDR/IDC process) have less of a bearing on the late commencement of this structure. Whilst in isolation these issues may have been critical to commencement their significance is considerably diminished by the occurrence of the events in G(i) above.

- (iii) **Considerations of dominance:** Of the three significant events highlighted above, in our opinion neither can be said to be 'the' truly dominant delay affecting commencement for the entirety of the period. In relative terms however Infraco will certainly argue that the late completion

MUDFA / utilities, and hence the late availability of the working area, will be more dominant (i.e. have more 'causative potency') than its delay in the INTC Estimate process. They will also point to the tie delay in respect of INTC 230 – which runs beyond MUDFA / utilities completion. tie however may be able to reply by stating that 'but-for' the late submission of the Estimate, the 80.15 instruction could have been issued prior to the late completion of MUDFA (even allowing for their delay beyond receipt of the Estimate). That position would render more 'importance' to the late provision of the Estimate. That however is rather subjective as one cannot be certain that tie would have issued the 80.15 at an earlier date had Infraco issued its Estimate on time (or earlier than it did).

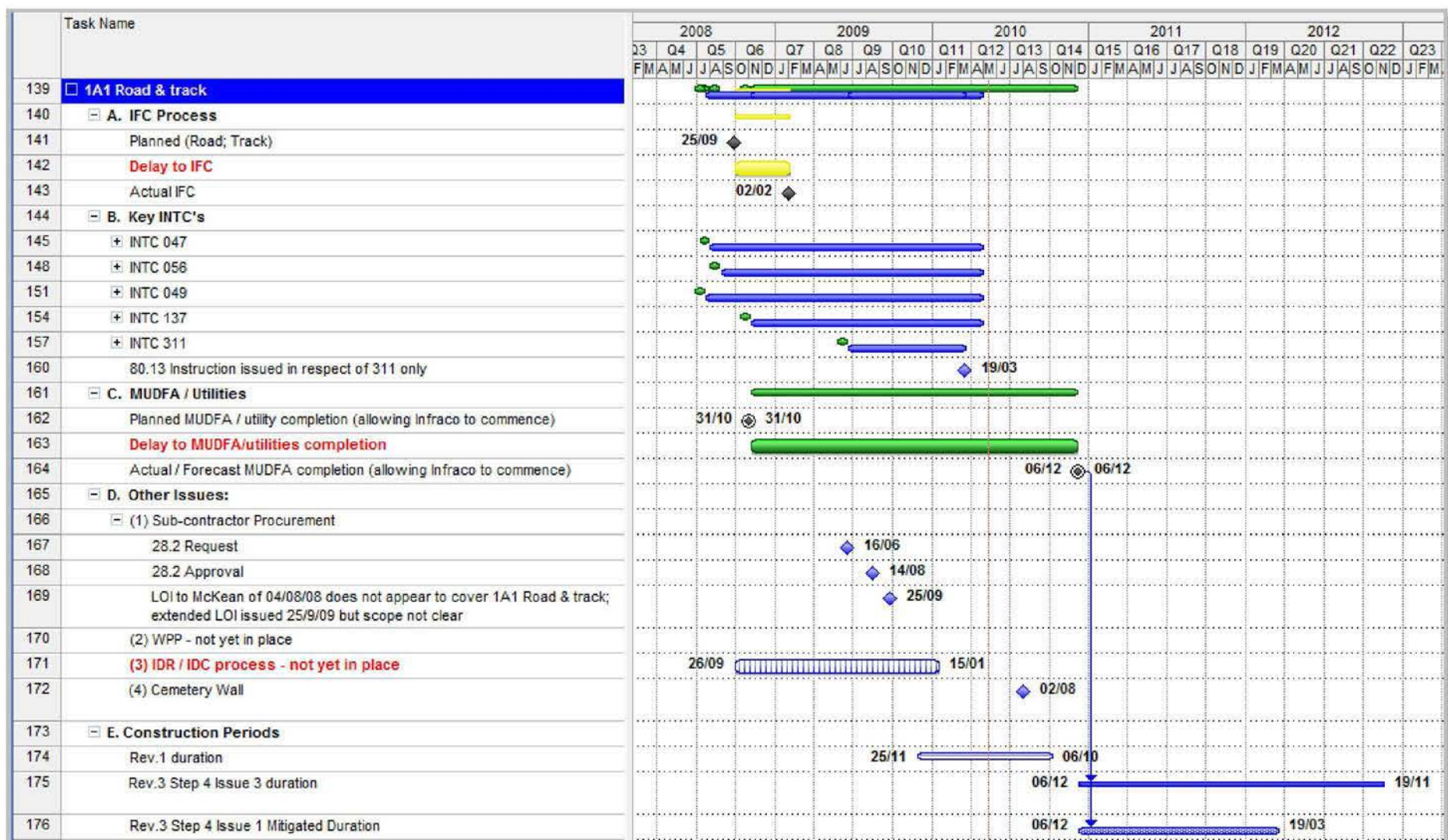
The FP licence event is considered to be concurrent up to January 2010. It does however subsequently become 'overtaken' by the period of the INTC 230 process (and in particular the late issue of the 80.15 instruction).

H. Current assessment of culpability

A. DELAY TO START: Current view on culpability [analysis of Lower and Upper Limits of culpability]														
	tie culpability				Cause	Infraco culpability				Cause	Poss. SDS culpability			
	From	to	Days	Weeks		From	to	Days	Weeks		From	to	Days	Weeks
1. LOWER LIMIT														
Delay; timescale from FP to 80.15 instruction for INTC 230	07/01/10	22/03/10	74	10.57	Delay to estimate for INTC 230 beyond MUDFA	20/07/09	28/07/09	8	1.14	IFC on time	10/12/08	10/12/08	0	0.00
			0	-				0	-				0	0.00
			0	-				0	-				0	0.00
			10.57					1.14					0	
2. UPPER LIMIT														
MUDFA / Utilities	21/01/09	20/07/09	180	25.71	FP Licence	21/01/09	07/01/10	351	50.14	FP Licence	21/01/09	07/01/10	351	50.14
Delay; from INTC 230 estimate to 80.15 instruction	20/07/09	25/02/10	220	31.43				0	-				0	0.00
Infraco Mobilisation	25/02/10	22/03/10	25	3.57				0	-				0	0.00
			60.71					50.14					50.143	
B. DELAY TO FINISH: Current view on culpability [analysis of Lower and Upper Limits of culpability]														
IM Mitigated Period = -29 wks	IM Mitigated Period				Infraco Rev.3 Period				IM mitigated period -29 wks: notwithstanding MUDFA / Utilities issues extant, this assessment is considered achievable on the basis of reasonable mitigation on the part of Infraco. Infraco Rev.3 period -16 wks: Infraco clearly accepts the possibility for mitigation. Though currently not to the same extent as noted above. On the basis however that Infraco can mitigate to -29 wks per IM analysis then Infraco lower limit restricted to anything in excess of 0wks. tie liability remains at lower limit of -29wks if Infraco responsible for all increased durations					
Infraco Rev.3 Period = -16 wks	tie	Infraco	tie	Infraco	tie	Infraco	tie	Infraco						
Lower Limit	-29.00	-29.00	-29.00	-16.00	-29.00	-16.00	-29.00	-16.00						
Upper Limit	0.00	0.00	-13.00	0.00	-29.00	-16.00	-29.00	-16.00						

Draft for discussion

1A1 Road & Track



A. **IFC Process:** The initial IFC was **130 days (or 19 weeks) late**; planned date was **25/09/08**; the actual was **02/02/09**. There is no information presently available to inform culpability for delay (see Preamble). Potential reasons include:-

- Late issue by SDS (at its simplest a CE under 65(t));
- A material breach by SDS (again at its simplest form a CE under 65(u));
- A failure of Infraco to provide the Infraco Design to SDS (clause 19.19 refers);
- A tie Change;
- A failure of Infraco in respect of its management of SDS or another breach by Infraco (e.g. failure to properly manage the CEC/NR interface);
- A requirement of CEC/NR for which tie will bear responsibility.

Note: DS advises "late submission of TAA package followed by length of time needed to incorporate CEC comments due to poor / incomplete design".
Delay by SDS, SDS /tie or Infraco?

B. **Key INTC's:** From the information provided it appears that Infraco issued 6 No. INTC's against this area. INTC's 047, 056, 049, 086, 137 & 311 refer **[Complete data on INTC's awaited]**. Details as follows:-

- INTC 047:** issued 04/07/08; Estimate due 30/07/08; No Estimate provided by Infraco. **Delay by Infraco.**
- INTC 056:** issued 29/07/08; Estimate due 22/08/08; No Estimate provided by Infraco. **Delay by Infraco.**
- INTC 049:** issued 24/06/08; Estimate due 18/07/08; An Estimate was provided by Infraco on 30/07/09 (**377 days late**). **Delay by Infraco.**
- INTC 137:** issued 08/10/08; Estimate due 03/11/08; No Estimate provided by Infraco. **Delay by Infraco.**
- INTC 311:** issued 22/05/09; Estimate due 17/06/09; No Estimate provided by Infraco. **Delay by Infraco.**

An 80.13 instruction was issued by tie on 19/03/10 in respect of INTC 311 only (as this appears to be a key INTC in terms of facilitating commencement).

C. **MUDFA / Utilities:** Planned completion **31/10/08**; Earliest forecast completion is **31/05/10** on Constitution Street ch 2600 – 2700. We are advised by tie PM staff that this is not sufficient however, to facilitate meaningful commencement on this section of the works. Meaningful commencement is dependent on MUDFA / Utilities completion to Victoria Bridge East Side to Baltic Street ch 1700 – 2300; that is forecast to complete on **06/12/10**.

Delay by tie; tie culpability.

D. **Other Issues:**

- Sub-Contractor Procurement:** No formal sub-contract has been put in place for this section. It is also not clear whether any informal (LOI) is in place for road works in this section. LOI to McKean of 04/08/08 does not appear to cover 1A1 Road & track; extended LOI issued 25/9/09 but scope not clear [subject to future tie audit]. **Delay by Infraco. Infraco culpability.**
- WPP Process:** Not yet submitted (as advised by MB). This *could* be an obstacle to commencement. **Delay by Infraco. Infraco culpability.**
- IDR/IDC process:** IDC not yet in place. Infraco programme of 18/12/09 shows this as being forecast to be in place by 15/01/10; but not yet in place. **Delay by Infraco. Infraco culpability.**
- Cemetery Wall:** Cemetery used to extend across Constitution Street. As a consequence, there are Archaeological and Historic Scotland issues governing the requirement to move skeletons displaced by the tram works. Given the intricacies attaching to these works the potential for further delays exist. We are advised that any works extending beyond August / September 2010 are likely to have a critical impact on works to 1B.

E. Construction Periods:

1A1 Road and Track					
	Rev.1	Rev.3 Issue 3	Delay	IM Mitigated Rev.3	Delay
Start	25/11/2009	06/12/2010	53.71 wks	06/12/2010	53.71 wks
Finish	06/10/2010	19/11/2012	110.71 wks	19/03/2012	75.71 wks
Cal. Duration	45.14 wks	102.14 wks	57.00 wks	67.14 wks	22.00 wks

Note: MB suggested mitigation exercise shows overall commencement and completion in Intermediate Section 1A as 01/03/10 to 05/03/12 respectively. That equates to an overall period of **105 weeks** (but is not comparable with the above 1A1 split).

- (i) Delay to Start: The table above refers to various programme dates. Forecast start dates differ between Issue 3, IM Issue 1, MB mitigated programme and MUDFA / Utility dates listed above.

Delay to start is therefore forecast to be **54 weeks (06/12/10)** in terms of both the Rev.3 and IM Rev.3 mitigation programmes. **MB mitigation exercise shows immediate commencement** [albeit now outdated].

Primary causes of delay to start as follows:-

- A. IFC process: The initial IFC was **198 days (or 28 weeks) late**; planned date was **25/09/08**; the actual was **02/02/09**. There is no information presently available to inform culpability for delay. **Unless there is proof of Infraco breach, it will be a CE under either 65(t) or (u).**
- B. INTC's: Lengthy delays by Infraco in the submission of Estimates. Delay at least up to 19/03/10 when tie issued clause 80.13 instruction.
- C. MUDFA / Utilities: Planned completion **31/10/08**. Partial completion at Constitution Street ch 2600 – 2700 as at **31/05/10**; further release of areas as at **06/12/10**. We understand this is the area required to make meaningful progress. **Delay by tie; tie culpability.**
- D. Other:
- **Sub-Contractor procurement:** No formal sub-contract has been put in place for this section. It is also not clear whether any informal (LOI) is in place for road works in this section. **Delay by Infraco. Infraco culpability.** Effect of this is not clear – it could be a hindrance to progress – but details not available to establish scope of work under McKean LOI. Without evidence to the contrary Infraco may be able to argue 'just-in time' procurement / authorisation.
 - **WPP process:** Not yet submitted (as advised by MB). This *could* be an obstacle to commencement. **Delay by Infraco. Infraco culpability.** Unlikely to have significant impact;
 - **IDR/IDC process:** IDC not yet in place. (tie's ability to stop work from commencing on this basis is not clear – see Preamble).
 - **Cemetery Wall:** Works yet to commence. This could be an obstacle to commencement on 1B Road & Track if incomplete as at September 2010. If incomplete as at the forecasted completion of MUDFA / Utilities works i.e. 06/12/10, this will impact on the meaningful commencement of works to 1A1 Road & Track. **Potential future delay by tie; tie culpability.**

- (ii) Delay to Finish: The Issue 3 programme shows an increase of circa **57 weeks** over timescale in Rev.1 programme (majority of increase understood to be as a result of full-depth construction issue). IM mitigated view of Issue 3 also shows an increased duration of 22 weeks over the Rev.1 programme period (albeit 35 weeks shorter than Infraco's proposed Issue 3 programme).

MB mitigation proposal also has shorter duration than Issue 3. **Discuss how this is to be pursued with / instructed to Infraco.**

F. tie position on area availability:

- (i) Refer to response (C) above re MUDFA dates (available from **06/12/10**).

G. Conclusion:

- (i) **'Significant' issues/events:** In our opinion there were three main contributory factors, being (a) the IFC process; (b) the INTC process in respect of INTC's 264, 292 & 473; and (c) late completion of MUDFA/utilities. Taking those events in chronological order:-

The IFC should have been issued on **25/09/08**; it was actually issued on **02/02/09 (130 days late)**. **MUDFA/utilities diversions** were planned to be completed on **31/10/08** (to facilitate a start on 1A1 Road & track on 25/11/09). Those diversions however are not forecast to complete until 06/12/10. This is tie's culpability. Running concurrently with this was the **late provision by Infraco of the Estimates** for INTC's 047, 056, 049, 137 & 311. Those Estimates have yet to be provided. This is a matter for which Infraco is responsible. **Delay measured to 19/03/10** for INTC 311 (when clause 80.13 instruction issued). Each of those events (i.e. IFC, MUDFA, INTC's) could have delayed commencement in this area.

The IDC process could also be a contributing factor if Infraco has failed / fails to adhere to a contractual process (but tie's ability to stop work from commencing on this basis is not clear – see Preamble).

- (ii) **Concurrent issues:** In our opinion the other events detailed above (i.e. the sub-contractor procurement timing and the WPP process) have less of a bearing on the late commencement of this area. Whilst in isolation these issues may have been critical to commencement their significance is considerably diminished by the occurrence of the events in G(i) above.

- (iii) **Considerations of dominance:** availability of design and work areas are both equally important in terms of ability to commence. That said, if contemporaneously Infraco and SDS knew that the utilities diversions were significantly delayed, such that they did not have to progress the design in accordance with the original programme, then the works area availability (due to MUDFA / utility delays) will have more causative significance. See previous comments re potential Infraco argument that the late completion MUDFA / utilities, and hence the late availability of the working area, will be more dominant (i.e. have more 'causative potency') than its delays which would / could have been overcome in accordance with the original programme had it been necessary.

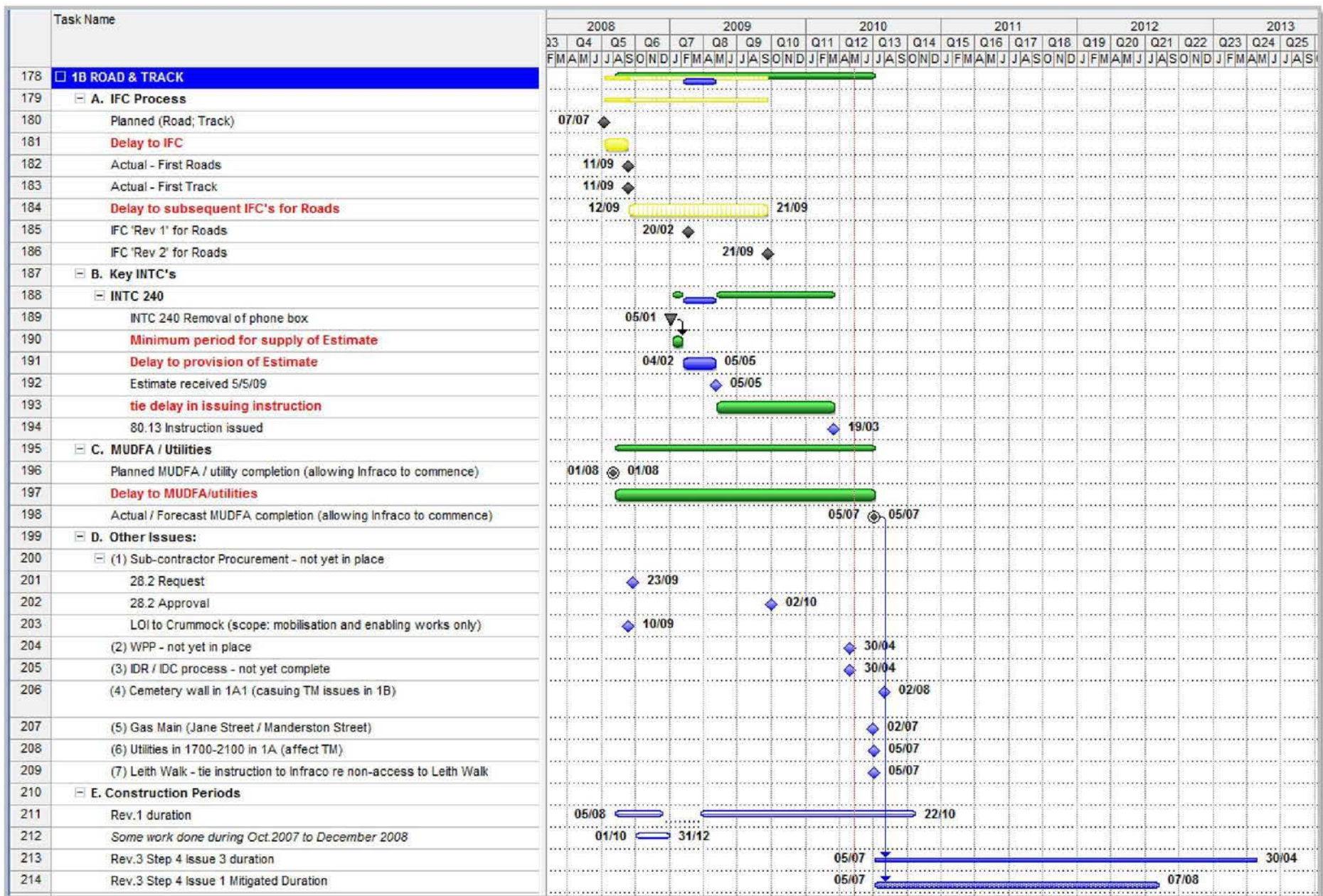
As such, in our opinion the delay to the MUDFA/utility works in 1A1 Road & Track is the dominant / critical factor affecting commencement and hence completion in this intermediate section.

H. Current assessment of culpability

A. DELAY TO START: Current view on culpability [analysis of Lower and Upper Limits of culpability]														
	tie culpability				Infraco culpability				Poss. SDS culpability					
	From	to	Days	Weeks	Cause	From	to	Days	Weeks	Cause	From	to	Days	Weeks
1. LOWER LIMIT														
MUDFA / Utilities	25/11/09	06/12/10	376	53.71				0	-	Delay to IFC	25/09/08	02/02/09	130	18.57
			0	-				0	-				0	0.00
			0	-				0	-				0	0.00
			53.71					-					18.571	
2. UPPER LIMIT														
MUDFA / Utilities	25/11/09	06/12/10	376	53.71										0.00
			0	-				0	-				0	0.00
			0	-				0	-				0	0.00
			53.71					-					0	
B. DELAY TO FINISH: Current view on culpability [analysis of Lower and Upper Limits of culpability]														
IM Mitigated Period = +22 wks	IM Mitigated Period		Infraco Rev.3 Period		<p>IM mitigated period +22wks: this is likely to be BDDI/IFC issues and TM revised phasing. Culpability not clear; range of possibilities - upper / lower limits recognise extremes of liability.</p> <p>Infraco Rev.3 period +57 wks: On the basis that Infraco can mitigate to 22 wks per IM analysis then Infraco lower limit restricted to anything in excess of 22 wks. tie liability remains at lower limit of 0 wks <u>if</u> Infraco responsible for all increased durations</p>									
Infraco Rev.3 Period = +57 wks	tie	Infraco	tie	Infraco										
Lower Limit	0.00	0.00	0.00	35.00										
Upper Limit	22.00	22.00	22.00	57.00										

Draft for discussion

1B Road & Track



- A. **IFC Process:** Initial IFC was 9.5 weeks late (planned 07/07/08; actual 11/09/08). This IFC was not issued as 1 no. IFC, it was divided into 2no. separate IFC's, addressing Roads and Track separately. Subsequent IFC's issued as follows:-
- (i) 'Rev 1' Roads (20/02/09) & Rev '2' Roads (21/09/09). There is no information presently available to inform culpability for delay to the foregoing (see Preamble). It is notable however, that as Trackform and Roads requires the further integration of Infraco design there is a responsibility on Infraco to provide information to SDS for incorporation on time. Potential reasons for the late issue of IFC's to this area include:-
 - Late issue by SDS (CE under 65(t));
 - A material breach by SDS (a CE under 65(u));
 - A failure of Infraco to timeously provide the Infraco Design to SDS (clause 19.19);
 - A failure of Infraco in respect of its management of SDS or another breach by Infraco.
 Infraco commenced some works on or around October 2008. This would indicate that this commencement was influenced by the late 'First Road & First Track' IFC's issues – but works appear to have been stopped because of the effect of the incomplete MUDFA / utility works. The later 'Rev 1 & Rev 2' Road's IFC's were clearly not an obstacle to Infraco's commencement or early progress on 1B Road & Track.

Potential delay by SDS/tie; Infraco
- B. **Key INTC's:** From the information provided it appears that Infraco issued around 48 no. INTC's against this area [Complete data on INTC's awaited]. There is insufficient information available at present to establish which INTC's are significant. The only INTC which was identified as having the potential to cause delay to commencement or progress was INTC 240. It is noted however that all of the foregoing were the subject of an 80.13 instruction issued to Infraco on 19/03/10. As such, notwithstanding Infraco delay in provision of Estimates, on the assumption that Infraco complies with that instruction, these INTC's should not provide an obstacle to commencement or progress.
- C. **MUDFA / Utilities:** Planned completion 01/08/08. MUDFA / utilities works are partially complete on Leith Walk: Southbound Carriageway (ch 900 – 150). However current advice is that commencement / subsequent progress on this section of the works is dependent on forecast MUDFA / utilities completions as follows:-
- (i) Leith walk : Foot of the Walk to Jane Street (30/04/10)
 - (ii) Leith Walk: Jane Street to McDonald Road on or around (05/07/10)
- Notwithstanding the above, tie PM advice is that meaningful material commencement cannot be made until 5 July 2010. Delay by tie; tie culpability.
- D. **Other Issues:**
- (i) Sub-Contractor Procurement: Understood that Crummock may be appointed by Infraco for 1B – see tie audit and Infraco Period Report No.3-1 report to 24/04/10. No sub-contract yet in place. Not clear if LOI issued covering this work or area. Subject to further tie audit. Delay by Infraco. Infraco culpability. The significance of this issue will increase as the 5 July 2010 nears.
 - (ii) WPP Process: Not yet submitted. This could be an obstacle to commencement. Delay by Infraco. Infraco culpability. Again, the significance of this issue will increase as the 5 July 2010 nears.

- (iii) IDR/IDC process: Not yet in place. Infraco letter/programme of 18/12/09 identifies the requirement for 11 separate IDR/IDC's. Only 6 are shown in that programme. It is not clear whether Infraco will be permitted by tie to commence without this paperwork in place. This may merit further discussion. **Delay by Infraco. Infraco culpability.**
- (iv) Cemetery Wall: The original cemetery extended into Constitution Street. As a consequence there are Archaeological and Historic Scotland issues governing the requirement to move skeletons displaced by the tram works. Given the intricacies attaching to these works, the potential for further delays exist. Although this workscope is outwith intermediate section 1B, the impact of this work extending beyond August / September 2010 is likely to have a consequential impact on TM requirements on 1B Road & Track works. **No current delay (but potential to cause delay).**
- (v) Gas Main (Jane Street / Manderston Street): We have been advised that this is an issue which has not yet been discussed with Infraco. The current position is that if SDS design proposals do not meet SGN's requirements/aspirations, the potential exists for further substantive delays. At best this issue will rely on reasonable mitigation on the part of Infraco. This could therefore be an obstacle to future progress. **No current delay (but potential to cause delay)**
- (vi) Utilities in 1700–2100 Constitution Street: Similar to item (iv) above, work in this area is outwith the parameters of 1B Road & Track. The effects of same however have the potential to impact on TM requirements on 1B Road & Track. **No current delay (but potential to cause delay)**

E. Construction Periods:

1B Road and Track					
	Rev.1	Rev.3 Issue 3	Delay	IM Mitigated Rev.3	Delay
Start	05/08/2008	05/07/2010	99.86 wks	05/07/2010	99.86 wks
Finish	22/10/2010	30/04/2013	131.57 wks	07/08/2012	93.57 wks
Cal. Duration	115.57 wks	147.29 wks	31.71 wks	109.29 wks	-6.29 wks

- (i) Delay to Start: The table above refers to various programme dates. Both the Issue 3 and IM mitigated programme use the same projected start date of 05/07/10. This is the same date that the PM's consider meaningful progress can be made. That is to say, the delays to MUDFA / utility works are dictating the commencement date. The **delay to start** is therefore forecast to be circa **100 weeks**. Primary causes of delay to start as follows:-
- A. IFC process: The initial IFC was **9.5 weeks late**; planned date was **07/07/08**; the actual was **11/09/08**. Subsequent revisions to the 'Roads' IFC were issued on 20/02/09 & 21/09/09. It is unclear as to whether these revisions would have been material to commencement (certainly (re)commencement was actually delayed by utility works beyond those later IFC dates). There is no information presently available to inform culpability for delay to these subsequent IFC's. Unless there is proof of Infraco breach, **this could be a CE under either 65(t) or (u).**
- B. INTC's: see comments above. **[Complete data on INTC's awaited]**. Notwithstanding Infraco delay in provision of Estimates, on the assumption that Infraco complies with that instruction, these INTC's should not provide an obstacle to commencement or progress.
- C. MUDFA / Utilities: Planned completion **01/08/08**. Partial availability on Leith Walk: Southbound Carriageway (ch 900 – 150); further release of areas as at **30/04/10 & 05/07/10**. tie PM advice is that meaningful commencement cannot be made until **5 July 2010**. **Delay by tie; tie culpability.**
- D. Other:
- **Sub-Contractor procurement**: Understood that Crummock may be appointed by Infraco for 1B – see tie audit and Infraco Period Report No.3-1 report to 24/04/10. No sub-contract yet in place. Not clear if LOI issued covering this work or area. Subject to further tie audit. **Delay by Infraco. Infraco culpability.** The significance of this issue will increase as the 05/07/10 nears.
 - **WPP process**: Not yet in place. This could be an obstacle to commencement. **Delay by Infraco. Infraco culpability.** Unlikely to have significant impact if in place on time for commencement;
 - **IDR/IDC process**: yet in place. Infraco letter of 18/12/09 identifies the requirement for 11 separate IDR/IDC's. Only 6 are shown in that programme. It is not clear whether Infraco will be permitted by tie to commence without this paperwork in place (tie's ability to stop work from commencing on this basis is not clear – see Preamble) **Delay by Infraco; Infraco culpability.**
 - **Other potential obstacles to commencement / progress**: Cemetery wall; Gas main at Manderston Street & Jane Street; utility works to ch.1700 to 2100 (Section 1A1 Constitution Street) affecting TM.
- (ii) Delay to Finish: Issue 3 programme shows an **increase of circa 32 weeks** over the timescale in Rev.1 programme (majority of increase understood to be as a result of full-depth construction issue). IM mitigated view of Issue 3 shows a slight reduction in duration of **6 weeks** to the Rev.1 programme. There is presently no justification for the increased Rev.3 duration.

F. tie position on area availability:

- (i) Despite current availability on Leith Walk: Southbound Carriageway (ch 900 – 150), and imminent availability on Leith walk : Foot of the Walk to Jane Street we are currently advised that Infraco will not be able to make meaningful commencement on 1B Road & Track until all MUDFA / Utilities issues are completed. These works conclude on Leith Walk: Jane Street to McDonald Road on or around 05/07/10. **Delay by tie; tie culpability.**

G. Conclusion:

- (i) **'Significant' issues/events**: In our opinion there were three main contributory factors, being (a) the IFC process; (b) the INTC process; and (c) late completion of MUDFA/utilities. Taking those events in chronological order:-

The IFC was programmed to be issued on **07/07/08**; the first IFC was actually issued on **11/09/08 (9.5 weeks late)**. This appears to have facilitated commencement in this area. This is either a CE under 65(t) (or possibly a failure by Infraco to manage SDS). Subsequent revisions were issued on 20/02/09 & 21/09/09 – those revisions however were issued after Infraco had stopped work in this area (and did not of themselves facilitate a restart). **MUDFA/utilities diversions** were supposed to be completed on **01/08/08** (to facilitate a start on 1B on 05/08/08). Those diversions however are forecast to be sufficiently complete suffice to allow re-commencement on **05/07/10**. This is tie's culpability.

The IDR/IDC process may also be a contributing factor affecting commencement (but tie's ability to stop work from commencing on this basis is not clear).

- (ii) **Concurrent issues:** In our opinion the other events detailed above (i.e. the sub-contractor procurement timing and the WPP process) have less of a bearing on the late commencement of this area. This is evident from the actual (partial) commencement in October 2008. Whilst in isolation these issues may have been critical to commencement, their significance is considerably diminished by the occurrence of the events in G(i) above. They may however become more significant in the lead up to the area availability in July 2010.
- (iii) **Considerations of dominance:** availability of design and work areas are both equally important in terms of ability to commence. The late issue of the first IFC in this area does appear to have affected commencement. That said, if contemporaneously Infraco and SDS knew that the utilities diversions were significantly delayed, such that they did not have to progress the design in accordance with the original programme, then the works area availability will have more causative significance. We understand that an instruction was issued by tie (post Christmas 2008 embargo; INTC 250) such that Infraco was instructed not to work in 1B until further instructed by tie. As a minimum that would appear to restrict access up to partial availability on Leith Walk: Southbound Carriageway (ch 900 – 150). See also previous comments re potential Infraco argument that the late completion MUDFA / utilities, and hence the late availability of the working area, will be more dominant (i.e. have more 'causative potency') than its delays which would / could have been overcome in accordance with the original programme had it been necessary.

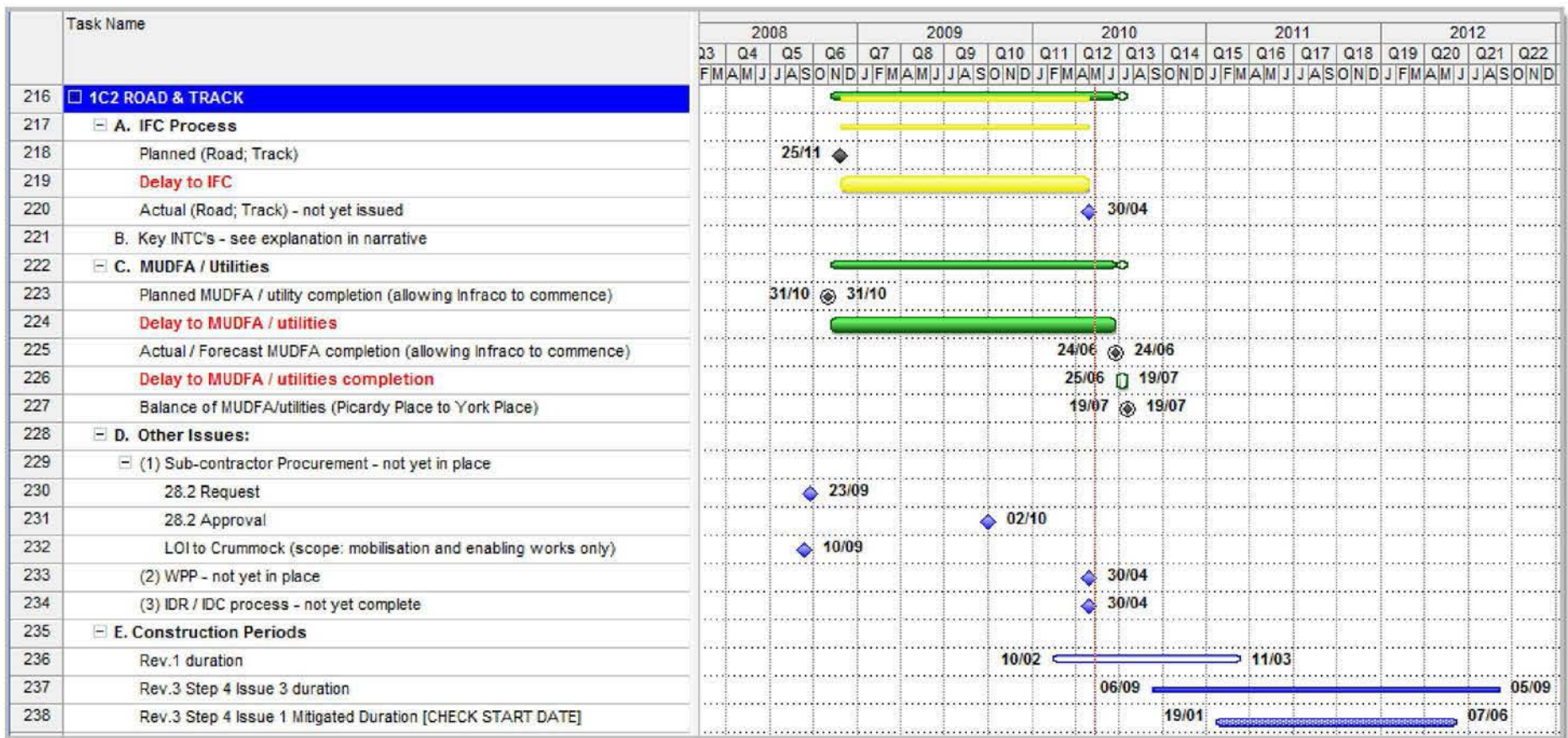
As such, in our opinion the delay to the MUDFA/utility works in 1B Road & Track is the dominant / critical factor affecting commencement and hence completion in this intermediate section.

H. Current assessment of culpability

A. DELAY TO START: Current view on culpability [analysis of Lower and Upper Limits of culpability]														
	tie culpability				Cause	Infraco culpability				Cause	Poss. SDS culpability			
	From	to	Days	Weeks		From	to	Days	Weeks		From	to	Days	Weeks
1. LOWER LIMIT														
MUDFA / Utilities	05/08/08	05/07/10	699	99.86				0	-	Delay to 1st IFC	07/07/08	11/09/08	66	9.43
			0	-				0	-				0	0.00
			0	-				0	-				0	0.00
				99.86					-					9.429
2. UPPER LIMIT														
MUDFA / Utilities	05/08/08	05/07/10	699	99.86						Delay to last IFC	07/07/08	21/09/09	441	63.00
			0	-				0	-				0	0.00
			0	-				0	-				0	0.00
				99.86					-					63
B. DELAY TO FINISH: Current view on culpability [analysis of Lower and Upper Limits of culpability]														
IM Mitigated Period = -6 wks	IM Mitigated Period		Infraco Rev.3 Period		IM mitigated period -6 wks: notwithstanding MUDFA / Utilities issues extant, this assessment is considered achievable on the basis of reasonable mitigation on the part of Infraco. Infraco Rev.3 period +32 wks: On the basis that Infraco can mitigate to -6 wks per IM analysis then Infraco lower limit restricted to anything in excess of -6 wks. tie liability remains at lower limit of -6 wks if Infraco responsible for all increased durations									
Infraco Rev.3 Period = +32 wk	tie	Infraco	tie	Infraco										
Lower Limit	-6.00	-6.00	-6.00	32.00										
Upper Limit	0.00	0.00	0.00	38.00										

Draft discussion

1C2 Road & Track



A. **IFC Process:** Initial IFC is currently **74 weeks late** (planned **25/11/08**; as at **30/04/10** the actual IFC is **yet to be issued**). DS advises that "... design not yet approved and still subject to change". DS also advised that the "... current design parameters were instructed by CEC and revised design parameters now being instructed – mainly to allow Picardy Place to function in traffic flow terms but also to take account of potential Henderson Global (St James Quarter)". From the above we understand that there are two concurrent issues. The first is that the SDS design is incomplete or not satisfactory to CEC. However the second issue (Henderson Global / St James Quarter) is outwith Infraco control. From discussion with DS, this appears to be the main issue delaying completion of the design in this area. It is therefore likely that the late issue of this IFC flows from one or more of the following possibilities:-

- Late issue by SDS (in its simplest form a CE under 65(t) – which may in turn permit the application of clause 65.12.2);
- A material breach by SDS (again in its simplest form a CE under 65(u) – which may in turn permit the application of clause 65.13);
- A failure of Infraco to provide the Infraco Design to SDS in accordance with the Consents Programme and Schedule. Part 14 (clause 19.19 refers);
- A tie Change;
- A failure of Infraco in respect of its management of SDS or another breach by Infraco (e.g. failure to properly manage the CEC interface);
- A requirement of CEC for which tie will bear responsibility;

Delay by SDS, SDS /tie or Infraco? As a minimum however, it is expected that Infraco will be excused the time for this delay due to CEC indecision concerning Henderson Global (St James Quarter) design requirements.

B. **Key INTC's:** From the information provided it appears that Infraco issued around **13 no. INTC's** against this area [Complete data on INTC's awaited]. Of those INTC's 2No. are known to have TCO issued against them (INTC's 91 & 169). Beyond that however, there is insufficient information available at present to establish which INTC's are significant. That said, it is noted that 7 No. of the foregoing were the subject of an **80.13 instruction issued to Infraco on 19/03/10**. As such, notwithstanding Infraco delay in provision of Estimates, on the assumption that Infraco complies with that instruction, these INTC's should not provide an obstacle to commencement or progress. In respect of the remainder, the obligation remains with Infraco to provide Estimates (which are overdue in terms of Clause 80 timescales).

C. **MUDFA / Utilities:** Planned completion was **31/10/08**. MUDFA / Utilities are forecast to complete at Broughton Street Junction on **24/06/10**. Meaningful commencement is dependent on MUDFA / Utilities completion on York Place / Elder Street to North St Andrews Square and Picardy Place to York Place on **18/07/10**. **[Note: IM's mitigated Rev.3 shows commencement on 19/01/11 – to be checked] Delay by tie; tie culpability**

D. **Other Issues:**

- (i) **Sub-Contractor Procurement:** Understood that Crummock are currently pricing this area – see tie audit and Infraco Period Report No.3-1 report to 24/04/10. No sub-contract yet in place. Not clear if LOI issued covering this work or area. Subject to further tie audit. **Delay by Infraco. Infraco culpability.** The significance of this issue will increase as the 06/09/10 nears (this is the earliest date of commencement in this area between Issue 3 and IM mitigated programme).
- (ii) **WPP Process:** Not yet submitted. This *could* be an obstacle to commencement. **Delay by Infraco. Infraco culpability.** Again, the significance of this issue will increase as the 06/09/10 nears.
- (iii) **IDR/IDC process:** Not yet in place. Infraco letter / programme of 18/12/09 identifies the requirement for 12 separate IDR/IDC's. Only 6 are shown in that programme. It is not clear whether Infraco will be permitted by tie to commence without this paperwork in place. **Delay by Infraco. Infraco culpability.**

E. Construction Periods:

1C2 Road and Track					
	Rev.1	Rev.3 Issue 3	Delay	IM Mitigated Rev.3	Delay
Start	10/02/2010	06/09/2010	29.71 wks	19/01/2011	49.00 wks
Finish	11/03/2011	05/09/2012	77.71 wks	07/06/2012	64.86 wks
Cal. Duration	56.43 wks	104.43 wks	48.00 wks	72.29 wks	15.86 wks

- (i) **Delay to Start:** The table above refers to various programme dates. Issue 3 programme shows a delay to start of **30 weeks**; the IM mitigated programme projects a later start (delayed by **49 weeks**) but an earlier completion. Primary causes of delay to start as follows:-
- A. **IFC process:** Still not issued in respect of Roads & Track. Initial IFC is currently **74 weeks late** (planned **25/11/08**; as at **30/04/10** the actual IFC is **yet to be issued**). There are two concurrent issues. The first is that the SDS design is incomplete or not satisfactory to CEC. However the second issue (Henderson Global / St James Quarter) is outwith Infraco control and appears to be the main issue delaying completion of the design in this area. As a minimum however, it is expected that Infraco will be excused the time for this delay due to CEC indecision. **Delay by CEC (tie); tie culpability**
- B. **INTC's:** see text above. Notwithstanding Infraco delay in provision of Estimates, on the assumption that Infraco complies with that instruction, these INTC's should not provide an obstacle to commencement or progress. In respect of the remainder, the obligation remains with Infraco to provide Estimates (which are overdue in terms of Clause 80 timescales).
- C. **MUDFA / Utilities:** Planned completion **31/10/08**. Estimated availability is **24/06/10 to 18/7/10**. **Delay by tie; tie culpability.**
- D. **Other:**
- **Sub-Contractor procurement:** Understood that Crummock may be appointed by Infraco for 1B – see tie audit and Infraco Period Report No.3-1 report to 24/04/10. No sub-contract yet in place. Not clear if LOI issued covering this work or area. Subject to further tie audit. **Delay by Infraco. Infraco culpability.** The significance of this issue will increase as the 06/09/10 nears.
 - **WPP process:** Not yet in place. This could be an obstacle to commencement. **Delay by Infraco. Infraco culpability.** Unlikely to have significant impact if in place on time for commencement;
 - **IDR/IDC process:** Not yet in place. Infraco letter / programme of 18/12/09 identifies the requirement for 12 separate IDR/IDC's. Only 6 are shown in that programme. It is not clear whether Infraco will be permitted by tie to commence without this paperwork in place. **Delay by Infraco. Infraco culpability.**
 - **Other:** we understand that there is some concern about accuracy of CUS as-built drawings which may therefore cause unforeseen conflicts with road and track works. This however is not something which features in the retrospective analysis (but may impact on future progress).
- (ii) **Delay to Finish:** Issue 3 programme shows an **increase of circa 48 weeks** over the timescale in Rev.1 programme (majority of increase understood to be as a result of full-depth construction issue). IM mitigated view of Issue 3 shows an increase in duration of **16 weeks** to the Rev.1 programme (it is understood that this increase relates to the introduction of additional TM phasing). There is presently no justification for Infraco's increased Rev.3 duration.

F. tie position on area availability:

- (i) First available date for the meaningful commencement of works to this area is governed by the completion of MUDFA / Utilities works to York Place / Elder Street to North St Andrews Square and Picardy Place to York Place. Predicted completion of said MUDFA / Utilities (24/06/10 & 18/07/10). Commencement of works in this area appears to be driven by works in other areas. **Delay by tie; tie culpability**

G. Conclusion:

- (i) **'Significant' issues/events:** In our opinion there were two main contributory factors, being (a) the IFC process; and (b) late completion of MUDFA/utilities. Taking those events in chronological order:-
- The IFC was programmed to be issued on **25/11/08**; the first IFC for Road and Track has still to be issued. The cause appears to be (i) a combination of potential inadequacies in SDS design SDS (either a CE under 65(t) or (u); or possibly a failure by Infraco to manage SDS); and (ii) a delay caused by CEC's indecision in respect of Picardy Place and Henderson Global (St James Quarter). We understand that latter point to be the main reason for delay. **MUDFA/utilities diversions** were supposed to be completed on **31/10/08** (to facilitate a start in 1C2 on 10/02/10). Those diversions however are forecast to be sufficiently complete suffice to allow commencement on **24/06/10 & 18/07/10**. This is tie's culpability.
- (ii) **Concurrent issues:** In our opinion the other events detailed above (i.e. the sub-contractor procurement timing and the WPP process) have less of a bearing on the late commencement of this area. Whilst in isolation these issues may have been critical to commencement their significance is considerably diminished by the occurrence of the events in G(i) above. They may however become more significant in the lead up to the area availability in June & July 2010.
- (iii) **Considerations of dominance:** availability of design and work areas are both equally important in terms of ability to commence. The significant delay to the issue of the first IFC in this area has clearly affected commencement. This appears to be an excusable delay for Infraco. The late completion of the MUDFA / utility works also restricted access to this area. See previous comments re potential Infraco argument that the late completion MUDFA / utilities, and hence the late availability of the working area, will be more dominant (i.e. have more 'causative potency') than its delays which would / could have been overcome in accordance with the original programme had it been necessary.

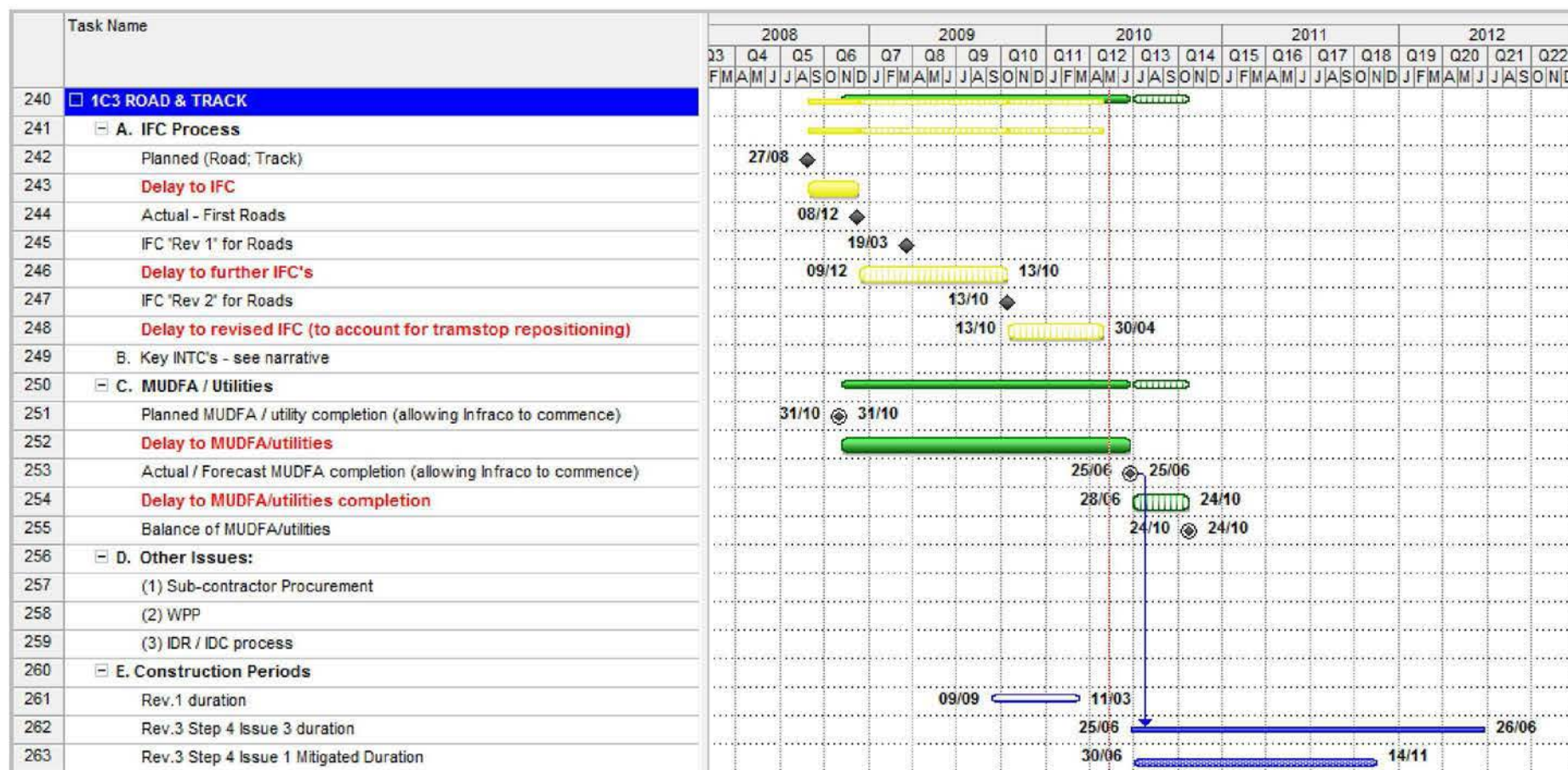
As such, in our opinion the delay to the MUDFA/utility works in 1C2 Road & Track is the dominant / critical factor affecting commencement and hence completion in this intermediate section.

H. Current assessment of culpability

A. DELAY TO START: Current view on culpability [analysis of Lower and Upper Limits of culpability]														
	tie culpability				Cause	Infraco culpability				Cause	Poss. SDS culpability			
	From	to	Days	Weeks		From	to	Days	Weeks		From	to	Days	Weeks
1. LOWER LIMIT														
MUDFA / Utilities	10/02/10	06/09/10	208	29.71				0	-	No SDS Delay			0	0.00
			0	-				0	-				0	0.00
			0	-				0	-				0	0.00
				29.71					-					0
2. UPPER LIMIT														
MUDFA / Utilities	10/02/10	06/09/10	208	29.71									0	0.00
			0	-				0	-				0	0.00
			0	-				0	-				0	0.00
				29.71					-					0
B. DELAY TO FINISH: Current view on culpability [analysis of Lower and Upper Limits of culpability]														
IM Mitigated Period = +16 wks	IM Mitigated Period		Infraco Rev.3 Period		IM mitigated period +16wks: this is likely to be BDDI/IFC issues and TM revised phasing. Culpability not clear; range of possibilities - upper / lower limits recognise extremes of liability. Infraco Rev.3 period +48 wks: On the basis that Infraco can mitigate to 16 weeks per IM analysis then Infraco lower limit restricted to anything in excess of 16 wks. tie liability remains at lower limit of 0 wks if Infraco responsible for all increased durations									
Infraco Rev.3 Period = +48 wks	tie	Infraco	tie	Infraco										
Lower Limit	0.00	0.00	0.00	32.00										
Upper Limit	16.00	16.00	16.00	48.00										

Draft for discussion

1C3 Road & Track



A. **IFC Process:** Initial IFC was **15 weeks late** (planned **27/08/08**; actual **08/12/08**). DS advises that 'Roads and Track' IFC was partially updated on **19/03/09** to incorporate moving "...St Andrew Square tram stop 4.5m south". The subsequent IFC issued on **13/10/09** was a further 'Roads' update closing out CEC comments. DS further advises that the IFC process is **not yet complete** noting "Infraco still to close out all informatives in 1C3 from CEC as planning authority and roads authority – particularly significant in terms of scale is requirement to close out tram stop informatives. However, not yet causing delay to construction". There are however, two issues which appear to be the cause of delay to completion of the design in this area: (i) CEC planning and roads authorities informatives / requirements; and (ii) the time taken for Infraco / SDS to close out said issues. Responsibility for the above noted IFC delays is likely to flow from one or more of the following reasons:-

- Late issue by SDS (in its simplest form a CE under 65(t) – which may in turn permit the application of clause 65.12.2);
- A material breach by SDS (again in its simplest form a CE under 65(u) – which may in turn permit the application of clause 65.13);
- A failure of Infraco to provide the Infraco Design to SDS in accordance with the Consents Programme and Schedule. Part 14 (clause 19.19 refers);
- A tie Change;
- A failure of Infraco in respect of its management of SDS or another breach by Infraco (e.g. failure to properly manage the CEC interface);
- A requirement of CEC for which tie will bear responsibility;

Delay by SDS, SDS /tie or Infraco? As a minimum however, it is expected that Infraco will be excused the time for this delay due to CEC indecision.

B. **Key INTC's:** From the information provided it appears that Infraco issued around **12 no. INTC's** against this area [Complete data on INTC's awaited]. Of those INTC's 1No. is known to have a TCO issued against it (INTC's 91). Beyond that however, there is insufficient information available at present to establish which INTC's are significant. That said, it is noted that 8 No. of the foregoing were the subject of an **80.13 instruction issued to Infraco on 19/03/10**. As such, notwithstanding Infraco delay in provision of Estimates, on the assumption that Infraco complies with that instruction, these INTC's should not provide an obstacle to commencement or progress. In respect of the remainder, the obligation remains with Infraco to provide Estimates (which are overdue in terms of Clause 80 timescales). Only INTC 435 has an Estimate provided by Infraco (on 26/02/10). No instruction (80.13 or 80.15) has been issued for this INTC; neither has a TCO been issued. Whether there has been a delay by tie in instructing this INTC has yet to be established.

C. **MUDFA / Utilities:** Planned completion was **31/10/08**. MUDFA / Utilities are forecast to complete on South St. Andrew Street to Princes Street on **25/06/10** with the balance of MUDFA / Utilities completions forecast to complete on **24/10/10**. Meaningful commencement appears to depend on the completion of the South St. Andrew Street to Princes Street works as that appears to be the driver to Infraco's Rev 3 step 4 Issue 3 commencement date. **Delay by tie; tie culpability**

D. **Other Issues:**

- (i) **Sub-Contractor Procurement:** Understood that Infraco are currently concluding terms and conditions with **Mackenzie Construction Ltd** over section 1C3 (Castle Street – Waverley Bridge) – see tie audit and Infraco Period Report No.3-1 report to 24/04/10. No sub-contract yet in place. Not clear if LOI issued covering this work or area. Subject to further tie audit. **Delay by Infraco. Infraco culpability.** The significance of this issue will increase as the 25/06/10 nears (this is the earliest date of commencement in this area between Issue 3 and IM mitigated programme).
- (ii) **WPP Process:** Not yet submitted. This *could* be an obstacle to commencement. **Delay by Infraco. Infraco culpability.** Again, the significance of this issue will increase as the 25/06/10 nears.
- (iii) **IDR/IDC process:** Not yet in place. Infraco letter of 18/12/09 identifies the requirement for 7 separate IDR/IDC's. Only 2 are shown in that programme. It is not clear whether Infraco will be permitted by tie to commence without this paperwork in place. **Delay by Infraco. Infraco culpability.**

E. Construction Periods:

1C3 Road and Track					
	Rev.1	Rev.3 Issue 3	Delay	IM Mitigated Rev.3	Delay
Start	09/09/2009	25/06/2010	41.29 wks	30/06/2010	42.00 wks
Finish	11/03/2010	26/06/2012	119.71 wks	14/11/2011	87.57 wks
Cal. Duration	26.29 wks	104.71 wks	78.43 wks	71.86 wks	45.57 wks

- (i) **Delay to Start:** The table above refers to various programme dates. Issue 3 programme shows a delay to start of **41 weeks**; the IM mitigated programme projects a slightly later start (delayed by **42 weeks**) but an earlier completion. Primary causes of delay to start as follows:-
- A. **IFC process: Still incomplete.** This IFC is currently **87 weeks late** (planned **25/08/08**; as at **30/04/10** the actual IFC is **not yet complete**). The main issue flows from CE planning and roads authority informatives which Infraco has still to close out. There are therefore two issues which appear to be the cause of delay to completion of the design in this area: (i) CEC informatives / requirements; and (ii) the time taken for Infraco / SDS to close out said issues. It is expected that Infraco will be excused the time for this delay due to CEC indecision. **Delay by CEC (tie); tie culpability**
- B. **INTC's:** see text above. Notwithstanding Infraco delay in provision of Estimates, on the assumption that Infraco complies with the 80.13 instruction, these INTC's should not provide an obstacle to commencement or progress. In respect of the remaining INTC's, the obligation remains with Infraco to provide Estimates (which at this time are overdue in terms of Clause 80 timescales).
- C. **MUDFA / Utilities:** Planned completion **31/10/08**. Estimated availability is **25/06/10 to 24/10/10**. **Delay by tie; tie culpability.**
- D. **Other:**
- **Sub-Contractor procurement:** Understood that **Mackenzie Construction Ltd** may be appointed by Infraco for 1C3 – see tie audit and Infraco Period Report No.3-1 report to 24/04/10. Sub-contract not yet in place. Not clear if LOI issued covering this work or area. Subject to further tie audit. **Delay by Infraco. Infraco culpability.** The significance of this issue will increase as the 25/06/10 nears.
 - **WPP process:** Not yet in place. This could be an obstacle to commencement. **Delay by Infraco. Infraco culpability.** Unlikely to have significant impact if in place on time for commencement. The significance of this issue will however increase as the 25/06/10 nears;
 - **IDR/IDC process:** Not yet fully in place. Infraco letter of 18/12/09 identifies the requirement for 7 separate IDR/IDC's. Only 2 are shown in that programme. It is not clear whether Infraco will be permitted by tie to commence without this paperwork in place. **Delay by Infraco. Infraco culpability.**
 - **Other:** we understand that there is some concern about accuracy of CUS as-built drawings which may therefore cause unforeseen conflicts with road and track works. This however is not something which features in the retrospective analysis (but may impact of future progress).
- (ii) **Delay to Finish:** Issue 3 programme shows an **increase of circa 78 weeks** over the timescale in Rev.1 programme (majority of increase understood to be as a result of full-depth construction issue). IM mitigated view of Issue 3 shows an increase in duration of **46 weeks** to the Rev.1 programme. There is presently no justification for the increased Rev.3 duration.

F. tie position on area availability:

- (i) First available date for the meaningful commencement of works to this area is governed by the completion of MUDFA / Utilities works forecast to complete in South St. Andrew Street to Princes Street on **25/06/10**. The completion of this work appears to be the driver to Infraco's Rev 3 step 4 Issue 3 commencement date. **Delay by tie; tie culpability**

G. Conclusion:

- (i) **'Significant' issues/events:** In our opinion there were two main contributory factors, being (a) the IFC process; and (b) late completion of MUDFA/utilities. Taking those events in chronological order:-
- The IFC was programmed to be issued on **27/08/08**; the first IFC for Road and Track has still to be issued. The cause appears to be (i) a combination of potential inadequacies in SDS design SDS (either a CE under 65(t) or (u)); or possibly a failure by Infraco to manage SDS); and (ii) a delay caused by SDS / CEC interface with respect to tram stop informatives. **MUDFA/utilities diversions** were supposed to be completed on **31/10/08** (to facilitate a start in 1C3 on 09/09/09). Those diversions however are forecast to be sufficiently complete suffice to allow commencement on **25/06/10 & 24/10/10**. This is tie's culpability.
- (ii) **Concurrent issues:** In our opinion the other events detailed above (i.e. the sub-contractor procurement timing and the WPP process) have less of a bearing on the late commencement of this area. Whilst in isolation these issues may have been critical to commencement their significance is considerably diminished by the occurrence of the events in G(i) above. They may however become more significant in the lead up to the area availability in June 2010.
- (iii) **Considerations of dominance:** availability of design and work areas are both equally important in terms of ability to commence. The significant delay to the issue of the final IFC in this area may yet affect commencement. This however appears to be an excusable delay for Infraco (inasmuch as it relates at least in the main to revised CEC requirements re tramstop location). The late completion of the MUDFA / utility works has also restricted access to this area. See previous comments re potential Infraco argument that the late completion MUDFA / utilities, and hence the late availability of the working area, will be more dominant (i.e. have more 'causative potency') than the other less significant delays which would / could have been overcome in accordance with the original programme had it been necessary.

As such, in our opinion the delay to the MUDFA/utility works in 1C3 Road & Track is the dominant / critical factor affecting commencement and hence completion in this intermediate section.

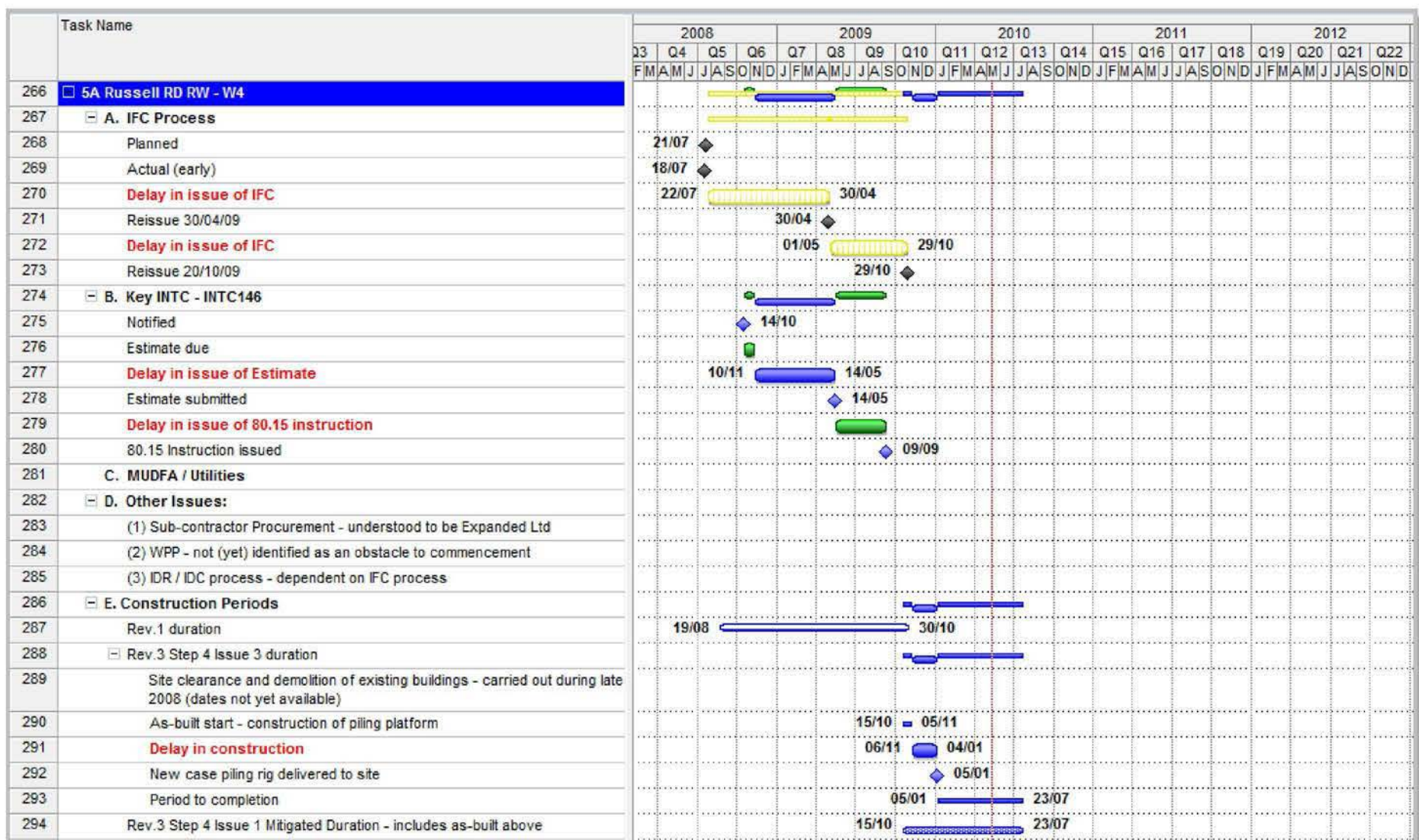
H. Current assessment of culpability

A. DELAY TO START: Current view on culpability [analysis of Lower and Upper Limits of culpability]														
	tie culpability				Infraco culpability					Poss. SDS culpability				
	From	to	Days	Weeks	Cause	From	to	Days	Weeks	Cause	From	to	Days	Weeks
1. LOWER LIMIT														
MUDFA / Utilities	09/09/09	25/06/10	289	41.29				0	-	No delay			0	0.00
			0	-				0	-				0	0.00
			0	-				0	-				0	0.00
			41.29					-					0	
2. UPPER LIMIT														
MUDFA / Utilities	09/09/09	25/06/10	289	41.29						Delay to 1st IFC	27/08/08	08/12/08	103	14.71
			0	-				0	-				0	0.00
			0	-				0	-				0	0.00
			41.29					-					14.714	

B. DELAY TO FINISH: Current view on culpability [analysis of Lower and Upper Limits of culpability]						
IM Mitigated Period = +46 wks	IM Mitigated Period		Infraco Rev.3 Period		IM mitigated period +46wks: this is likely to be BDDI/IFC issues and TM revised phasing. Culpability not clear; range of possibilities - upper / lower limits recognise extremes of liability. Infraco Rev.3 period +78 wks: On the basis that Infraco can mitigate to 46 wks per IM analysis then Infraco lower limit restricted to anything in excess of 46 wks. tie liability remains at lower limit of 0 wks if Infraco responsible for all increased durations	
Infraco Rev.3 Period = +78 wks	tie	Infraco	tie	Infraco		
Lower Limit	0.00	0.00	0.00	32.00		
Upper Limit	46.00	46.00	46.00	78.00		

Draft for discussion

5A Russell Road RW – W4



- A. **IFC Process:** Initial IFC issued on time (planned 21/07/08; actual 18/07/08). This original IFC addresses / satisfied 'Geotechnical TAA'. However, subsequent partial reissues of IFC's as at 30/04/09 & 29/10/09 suggest this initial IFC was incomplete. There is no information presently available to inform culpability for these delays. As a consequence, it is (likely) that the late issue of this IFC flows from one or more of the following reasons:-
 - Late issue by SDS (in its simplest form a CE under 65(t) – which may in turn permit the application of clause 65.12.2);
 - A material breach by SDS (again in its simplest form a CE under 65(u) – which may in turn permit the application of clause 65.13);
 - A failure of Infracore to provide the Infracore Design to SDS in accordance with the Consents Programme and Schedule. Part 14 (clause 19.19 refers);
 - A tie Change;
 - A failure of Infracore in respect of its management of SDS or another breach by Infracore (e.g. failure to properly manage the CEC interface);
 - A requirement of CEC for which tie will bear responsibility.

Delay by SDS, SDS /tie or Infracore?
- B. **Key INTC's:** From the information provided it appears that Infracore issued around 10 no. INTC's against this area [Complete data on INTC's awaited]. It is noted that 5 No. (INTC's 092, 117, 506 & 518) of the foregoing were the subject of an **80.13 instruction issued to Infracore on 19/03/10**. As such, notwithstanding Infracore delay in provision of Estimates, on the assumption that Infracore complies with that instruction, these INTC's should not provide an obstacle to commencement or progress. We are advised that the key INTC which prevented commencement was **INTC 146 (IFC Drawing Change Russell Road RTW's 1, 2, 3 & 4)**. That INTC was notified on 14/10/08; the Estimate was provided on 14/05/09 (27 weeks later than due). **Delay by Infracore**. This was the subject of an 80.15 instruction issued on 09/09/09; 17 weeks after submission of Estimate). **Delay by tie**.
- C. **MUDFA / Utilities:** There are a number of MUDFA / Utilities issues impacting on this structure. There is a Scottish Power 11kV cable diversion required at Haymarket Scotrail Depot. Misinformation received from Scotrail/SP suggested that there was an alternative power supply which could be utilised. We understand that this would have allowed the existing cable to be removed. This information proved to be wrong. Consequent to this, this cable remains an obstacle to completion of RW4 for most of unit 19 where the cable clashes with the proposed line of the retaining wall. tie issued Infracore with a TCO in this regard January 2010. There are further MUDFA / Utilities issues which need addressed on the access road. These issues were the subject of a MUDFA to Infracore transfer. **Delay by tie, Tie culpability** [dates still to be provided]. This was not an obstacle to commencement; but may yet prove to be an impediment to progress/completion.
- D. **Other Issues:**
 - (i) **Sub-Contractor Procurement:** Understood that Expanded Ltd have been issued with an extension to their current LOI to cover the mobilisation of a piling rig to complete the piling on Wall W4, units 11 to 18. – see tie audit and Infracore Period Report No.3-1 report to 24/04/10. No sub-contract yet in place. Subject to further tie audit. **Delay by Infracore. Infracore culpability**.
 - (ii) **WPP Process:** Assumed WPP in place given the fact that works have commenced. **No delay (to date)**.
 - (iii) **IDC/IDR process:** IDR was in place as at 29/10/09. **No delay**.
 - (iv) **Form 'C':** No information available on this issue. Assumed Form 'C' in place given the fact that works have commenced

E. Construction Periods:

5A Russell RD RW - W4 (piling & subsequent operations)					
	Rev.1	Rev.3 Issue 3	Delay	IM Mitigated Rev.3	Delay
Start	09/12/2008	15/10/2009	44.29 wks	15/10/2009	44.29 wks
Finish	30/10/2009	23/07/2010	38.00 wks	23/07/2010	38.00 wks
Cal. Duration	46.57 wks	40.29 wks	-6.29 wks	40.29 wks	-6.29 wks

Note: the above does not reconcile the actual site clearance and demolition activities. That as-built information is not (presently) available.

A re-commencement was made on 15/10/09 (on the construction of the piling platform) following resolution of the INTC 146 process. The delay up to this point centred on INTC146.

- (i) **Delay to Start:** The table above refers to various programme dates. Issue 3 programme shows a delay to piling start of **44 weeks**; the IM mitigated programme also shows a delay to start of piling of **44 weeks**. Primary causes of delay to start as follows:-
- A. **IFC process:** This original IFC addresses / satisfied 'Geotechnical TAA'. However, subsequent partial reissues of IFC's as at 30/04/09 & 29/10/09 suggest this initial IFC was incomplete. There is no information presently available to inform culpability for these delays. **Delay by SDS, SDS /tie or Infraco?**
- B. **INTC's:** Key INTC 146 – That INTC was notified on 14/10/08; the Estimate was provided on 14/05/09 (220 days later than due). **Delay by Infraco.** This was the subject of an 80.15 instruction issued on 09/09/09; 118 days after submission of Estimate). **Delay by tie.** Other delays by Infraco in the submission of other Estimates; those INTC's however clearly did not delay commencement (it appears to have been INTC 146). Future delays attaching to the INTC process are probable. Delays may yet flow from the late IFC completion in the form of BDDI – IFC changes (i.e. further INTC's yet to be submitted).
- C. **MUDFA / Utilities:** There are a number of MUDFA / Utilities issues impacting on this structure. There is a Scottish Power 11kV cable diversion required at Haymarket Scotrail Depot. There are further MUDFA / Utilities issues which need addressed on the access road. **Delay by tie. tie culpability.** It is notable that neither of these issues were obstacles to Infraco's commencement of the structure. As at 30/04/10 these works are yet to be completed and as such have the potential to prevent / compromise completion.
- D. **Other:**
- **Sub-Contractor procurement:** Understood that Expanded Ltd have been issued with an extension to their current LOI to cover the mobilisation of a piling rig to complete the piling on Wall W4, units 11 to 18. – see tie audit and Infraco Period Report No.3-1 report to 24/04/10. No sub-contract yet in place. Subject to further tie audit. **Delay by Infraco. Infraco culpability**
 - **WPP process:** Permit to commence work has been received. **No Delay.**
 - **IDR/IDC process:** Not yet in place. It is not clear whether Infraco will be permitted by tie to commence without this paperwork in place. This process is dependent upon the IFC completion – not yet in place.
 - **Form 'C' Approval:** not yet identified as being an obstacle to commencement (but this still has the potential to cause delay depending on documentation collation and submission).
- (ii) **Delay to Finish:** the Issue 3 programme shows a decrease in of **circa 38 weeks** over the timescale in Rev.1 programme. IM mitigated view of Issue 3 also shows a decrease in duration of **circa 38 weeks** to the Rev.1 programme. As noted above, Infraco re-commenced this structure on **15/10/09**. Thereafter a delay was incurred as a result of piling 'refusal' (tie contends that this was as are result of incorrect piling methodology adopted by Infraco – evidenced by subsequent change in piling). This could be either a **potential failure by Infraco**; or if caused by unforeseen ground conditions, **possibly a matter for which tie is responsible.**

F. tie position on area availability:

- (i) First available date for the meaningful commencement of works to this area is governed by two separate issues; (1) the demolition of the Viking & Simlock buildings (this work was completed during **December 2008** [dates not available for this operation]); and (2) the 80.15 instruction issued against INTC 146. The date of the 80.15 instruction issued against INTC 146 was 09/09/09; this in effect became the date at which meaningful (re-)commencement could take place.

G. Conclusion:

- (i) **'Significant' issues/events:** In our opinion there were two main contributory factors, being (a) the IFC process; and (b) the subsequent conclusion to INTC 146 (BDDI – IFC) IFC Drawing Change Russell Road RTWs 1,2,3 &4. Taking those events in chronological order: -
- In our opinion the delaying effect of the protracted IFC process is likely to have affected commencement. Although, first provided on time on **18/07/08**, this IFC was in effect incomplete. The IFC remained incomplete until **29/10/09**. Responsibility on this matter is currently uncertain (requires audit of design process). Running concurrently with this issue was the delay flowing from the INTC process (INTC 146) in particular. This appears to have prevented construction beyond the early demolition of the Viking & Simlock buildings from progressing any further. Infraco is culpable for delays in the late provision of the estimate from Infraco. Delays beyond that point with respect to the time taken for tie to issue the 80.15 is a matter for which tie is responsible.
- (ii) **Concurrent issues:** In our opinion the other event detailed above i.e. **MUDFA / Utilities** has less of a bearing on the late commencement of this area. Whilst in isolation completion on this issue may have been a hindrance to commencement, its significance is considerably diminished by the fact that Infraco did commence. Incomplete MUDFA / Utilities issues will be more significant to the successful completion of the works in this area.
- (iii) **Considerations of dominance:** The protracted delay attaching to the IFC on this structure has clearly affected commencement. However, delays to the INTC process (INTC 146) in particular appears to be the dominant delay to this structure. Although Infraco did commence demolition works in advance of this issue arising, it is clear that meaningful commencement (and subsequent recommencement of the works) was precluded by the absence of a resolution to this issue.

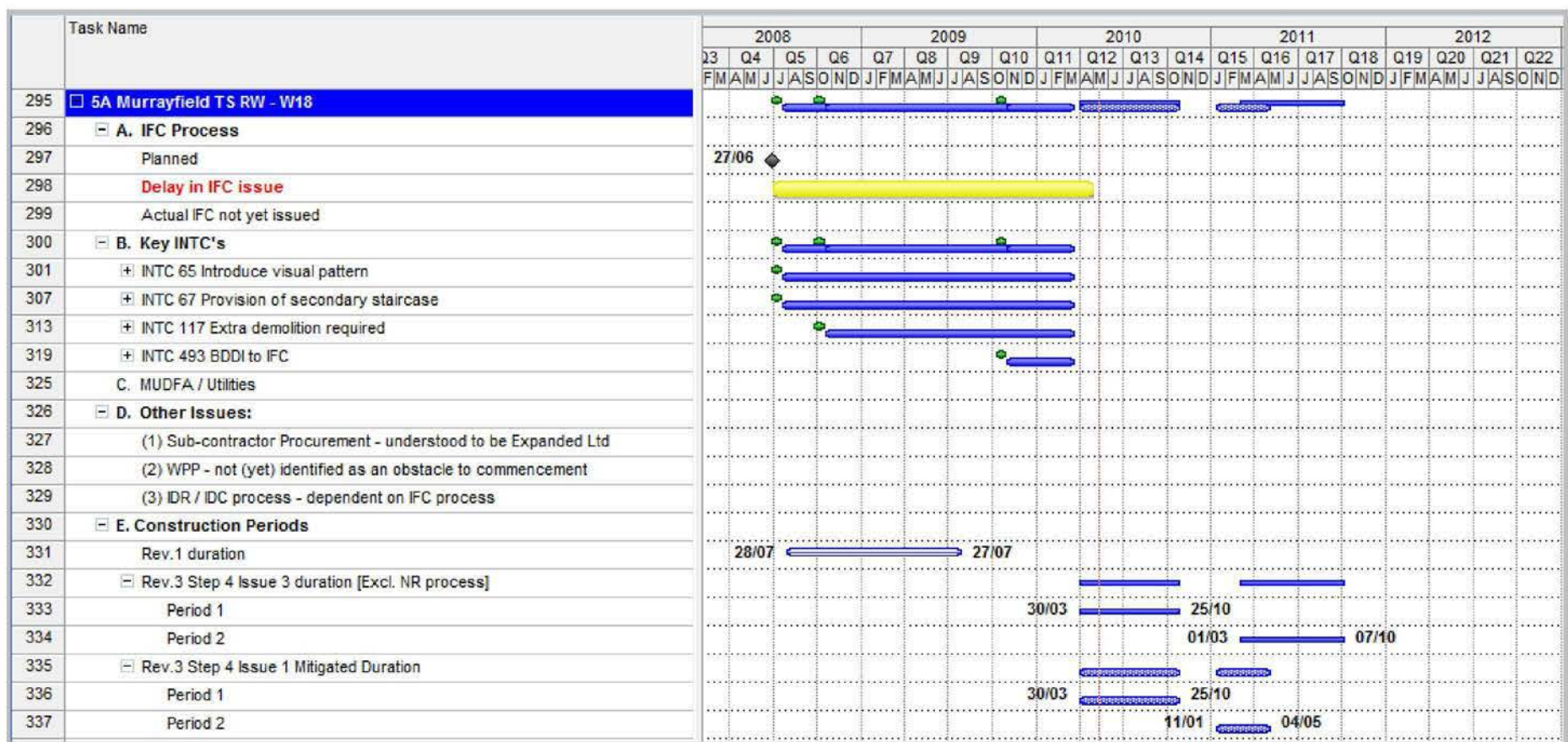
H Current assessment of culpability

A. DELAY TO START: Current view on culpability [analysis of Lower and Upper Limits of culpability]														
	tie culpability				Cause	Infraco culpability				Cause	Poss. SDS culpability			
	From	to	Days	Weeks		From	to	Days	Weeks		From	to	Days	Weeks
1. LOWER LIMIT														
Delay to 80.15 instruction	14/05/09	09/09/09	118	16.86	Actual start to delay in provision of INTC 146 estimate	09/12/08	14/05/09	156	22.29					
			0	-				0	-				0 0.00	
			0	-				0	-				0 0.00	
				16.86					22.29				0	
2. UPPER LIMIT														
Delay; from INTC 146 estimate to to 80.15 instruction	14/05/09	09/09/09	118	16.86	Actual start to delay in provision of INTC 146 estimate	09/12/08	14/05/09	156	22.29	Delay to IFC	22/07/08	29/10/09	464 66.29	
Period after 80.15	09/09/09	15/10/09	36	5.14	Period after 80.15	09/09/09	15/10/09	36	5.14				0 0.00	
			0	-				0	-				0 0.00	
				22.00					27.43				66.286	

B. DELAY TO FINISH: Current view on culpability [analysis of Lower and Upper Limits of culpability]					
	IM Mitigated Period		Infraco Rev.3 Period		
	tie	Infraco	tie	Infraco	
IM Mitigated Period = -6 wks					IM mitigated period -6 wks: notwithstanding INTC's issues and delays attaching to the progress of piling works extant, this assessment is considered achievable on the basis of reasonable mitigation on the part of Infraco. Infraco Rev.3 period -6 wks: Infraco clearly accepts the above noted mitigation achievable. On the basis that Infraco can mitigate to -6 wks then Infraco lower limit restricted to anything in excess of 2.5 wks (<i>this 2.5 wk period considers 8.5 wks Infraco culpability to ongoing works</i>). tie liability remains at lower limit of -6wks.
Infraco Rev.3 Period = -6 wks	-6.00	2.50	-6.00	2.50	
Lower Limit	0.00	0.00	0.00	0.00	
Upper Limit					
Observations on Actual Progress	tie	Infraco			
Analysis of ongoing progress, considered in 'Delay to Finish' periods detailed above.					-8.50
<i>*Infraco culpability attaching to downtime via piling issues. Period 6/11/09 to 4/1/10</i>					

Draft for discussion

5A Murrayfield Tram Stop Retaining Wall – W18



A. **IFC Process:** Initial IFC is currently **96 weeks late** (planned **27/06/08**; as at **30/04/10** the actual IFC is **yet to be issued**). Please see Preamble re availability of detailed information to inform culpability (and the SDS/Infraco design process being subject to further detailed tie audits). Information obtained to date as follows.

The delay in issuing this IFC appears to be a direct consequence of delays attaching to the Roseburn Viaduct VE exercise. DS advises that "... the reason for the delay in issuing this beyond the other retaining walls in this area has been BSC's decision not to issue the original design followed by the design as amended to accommodate the VE opportunity on Roseburn Viaduct. Instead BSC has opted to get SDS to only issue the design that incorporates VE and none of the VE package has yet been IFC".

Infraco period report dated 27 March 2010 noted anticipated commencement of Roseburn Viaduct as at 05/04/10. This commencement would clearly have depended on completion of the VE exercise. As at 30/04/10 the VE exercise remains incomplete. From information received on RV we understand that there are three contributory factors which have impacted on a resolution to this VE exercise they are as follows:

- (1) Infraco were slow to start the VE process, DS contends no progress initially noting that it was 18 periods (period reports?) after novation that design actually started.
- (2) Infraco has been slow to respond to CEC PA comments; and
- (3) delays in receipt of info from NR as it has been difficult to secure as-built information on utilities in the adjacent Haymarket Depot.

The above appear to be driven by two factors. The first factor (essentially covering items (1) & (2) above) is that the SDS design is incomplete or not satisfactory to CEC. However the second issue (NR) is outwith Infraco control and from discussion with DS appears to be the main issue delaying completion of the design in this area. Given the complexities attaching to the above, it is therefore likely, that the late issue of this IFC flows from one or more of the following reasons:-

- Late issue by SDS (in its simplest form a CE under 65(t) – which may in turn permit the application of clause 65.12.2);
- A material breach by SDS (again in its simplest form a CE under 65(u) – which may in turn permit the application of clause 65.13);
- A failure of Infraco to provide the Infraco Design to SDS in accordance with the Consents Programme and Schedule. Part 14 (clause 19.19 refers);
- A tie Change;
- A failure of Infraco in respect of its management of SDS or another breach by Infraco (e.g. failure to properly manage the CEC interface);
- A requirement of CEC for which tie will bear responsibility;

Delay by SDS, SDS /tie or Infraco? As a minimum however, it is expected that Infraco will be excused time for delays due to slow NR response.

B. **Key INTC's:** From information provided Infraco issued 4 no. key INTC's in relation to this structure; **INTC's 65, 67, 117 & 493**. We are advised that it is unlikely that any of the foregoing has materially / critically affected Infraco's ability to commence works in accordance with the Rev 01 programme. Details are as follows:-

- (i) **INTC 65:** issued by Infraco on **21/06/08** (prior to IFC issue). Estimate should have been submitted on or around 17/07/08. **Delay by Infraco.**
- (ii) **INTC 67:** issued by Infraco on **21/06/08** (prior to IFC issue). Estimate should have been submitted on or around 17/07/08. **Delay by Infraco.**
- (iii) **INTC 117:** issued by Infraco on **18/09/08** (prior to IFC issue). Estimate should have been submitted on or around 14/10/08. **Delay by Infraco.**
- (iv) **INTC 493:** issued by Infraco on **05/10/09** (prior to IFC issue). Estimate should have been submitted on or around 29/10/09. **Delay by Infraco.**

80.13 Instruction issued by tie on 19/03/10.

Given the fact that SDS has yet to issue an IFC in relation to this structure it appears likely that Infraco will issue a **further INTC** specifically addressing 'final' BDDI – IFC changes. This is clearly dependent on the completion of the Roseburn Viaduct VE exercise. There therefore remains the potential that issues attaching to this process may yet prevent / compromise commencement on Murrayfield TS RW's. See Roseburn Viaduct narrative for current view on culpability (it appears that there is split culpability for that structure). As such the delays in issue of Estimates by Infraco may, at least in part, be excused.

C. **MUDFA / Utilities:** There are no MUDFA / Utilities issues impacting on this structure. **No Delay**

D. **Other Issues:**

- (i) Sub-Contractor Procurement: Understood that Infraco intend to sublet this structure to Expanded Ltd – see tie audit and Infraco Period Report No.3-1 report to 24/04/10. No sub-contract yet in place. Not clear if LOI issued covering this work or area. Subject to further tie audit. **Delay by Infraco. Infraco culpability.**
- (ii) WPP Process: Permit issued **12/03/10** for site set-up only (since the IFC drawings are not in place as yet for a more expansive WPP application). **No Delay (to date).**
- (iii) IDR/IDC process: Not yet in place. Infraco letter of 18/12/09 predicted the IDC to be complete as 05/02/10. As at 30/04/10 the IDC is not yet in place. It is not clear whether Infraco will be permitted by tie to commence without this paperwork in place. This process is dependent upon the IFC completion – not yet in place.
- (iv) Form 'C': not yet identified as being an obstacle to commencement (but this still has the potential to cause delay depending on documentation collation and submission). As with other structures this process should be monitored.
- (v) Russell Road RW4 Interface: There is a sequencing interface between Murrayfield TS RW and Russell Road RW4. Piling works at rear of units 101 & 96 are required in conjunction with completion of the west end of RW4 to enable meaningful commencement of works on Murrayfield TS RW. **Delay by Infraco. Infraco culpability.**

E. **Construction Periods:**

5A Murrayfield TS RW - W18					
	Rev.1	Rev.3 Issue 3	Delay	IM Mitigated Rev.3	Delay
Start	28/07/2008	30/03/2010	87.14 wks	30/03/2010	87.14 wks
Finish	27/07/2009	07/10/2011	114.57 wks	04/05/2011	92.29 wks
Cal. Duration	52.14 wks	79.57 wks	27.43 wks	57.29 wks	5.14 wks

- (i) Delay to Start: The table above refers to various programme dates. Issue 3 programme shows a delay to start of **87 weeks**; the IM mitigated programme also shows a delay to start of **87 weeks**. Primary causes of delay to start as follows:-
 - A. IFC process: This IFC is currently **96 weeks late** (planned **27/06/08**; as at **30/04/10** the actual IFC is **yet to be issued**). The delay in issuing this IFC appears to be a direct consequence of delays attaching to the Roseburn Viaduct VE exercise. It is understood that completion of this exercise is needed to better inform the IFC completion for Murrayfield TS RW. **Delay by SDS, SDS /tie or Infraco? [Subject to tie audit]**
Matter to consider: Can the (Infraco) logic, linking Roseburn Viaduct & Murrayfield TS RW be broken, such that Infraco's reliance on the VE exercise to enable IFC completion on Murrayfield TS RW can be shown as unnecessary?
 - B. INTC's: Delays by Infraco in the submission of Estimates. Delay up to 19/03/10 when tie issued clause 80.13 instruction. [Complete data on INTC's awaited]. Future delays attaching to the INTC process are probable. Delays may yet / are likely to flow from the late IFC completion in the form of BDDI – IFC changes.
 - C. MUDFA / Utilities: **No impact** on this structure.
 - D. Other:
 - **Sub-Contractor procurement:** Understood that Infraco intend to sublet this structure to Expanded Ltd – see tie audit and Infraco Period Report No.3-1 report to 24/04/10. No sub-contract yet in place. Not clear if LOI issued covering this work or area. Subject to further tie audit. **Delay by Infraco. Infraco culpability.**
 - **WPP process:** Permit to commence work has been received. **No Delay.**
 - **IDR/IDC process:** Not yet in place. It is not clear whether Infraco will be permitted by tie to commence without this paperwork in place. This process is dependent upon the IFC completion – not yet in place.
 - **Form 'C' Approval:** not yet identified as being an obstacle to commencement (but this still has the potential to cause delay depending on documentation collation and submission).
 - **Russell Road RW4 Interface:** There is a sequencing interface between Murrayfield TS RW and Russell Road RW4. Piling works at rear of units 101 & 96 is required in conjunction with completion of the west end of RW4 to enable meaningful commencement of works on Murrayfield TS RW. **Delay by Infraco. Infraco culpability.**
- (ii) Delay to Finish: Issue 3 programme shows an **increase of circa 27 weeks** over the timescale in Rev.1 programme. IM mitigated view of Issue 3 shows a relatively minor increase in duration of **5 weeks** to the Rev.1 programme. There is presently no justification for the Infraco increased Rev.3 duration (noting in particular that the design is not yet complete).

F. **tie position on area availability:**

- (i) First available date for the meaningful commencement of works to this area is governed by two separate issues. The first being the IFC issue for Murrayfield TS RW. However, this is dependent on completion of the VE exercise on Roseburn Viaduct, which is currently predicted to complete **mid May 2010 (IFC by 09/06/10)**. The second issue is the completion of outstanding works to the west end of Russell Road RW4. This incomplete work is a matter for which Infraco is responsible.

G. **Conclusion:**

- (i) **'Significant' issues/events:** In our opinion there were two main contributory factors, being (a) the IFC process; and (b) outstanding works to Russell road RW4. Taking those events in chronological order: -

In our opinion the main delaying factor is the protracted IFC process. The IFC should have been provided by **27/06/08** as at **30/04/10** however, the IFC is **yet to be issued**. This is clearly dependent on the completion of the VE exercise at Roseburn Viaduct. Responsibility on this issue is uncertain. Running concurrent with this issue is Infraco's inaction on construction works to the west end of Russell Road RW4. These works are in effect, enabling works which are material to the meaningful commencement of works on Murrayfield TS RW. tie considers this to be as a result of dilatory progress on Infraco's part i.e. there is no known impediment to completion of this part of the works. This is a matter for which Infraco is responsible.

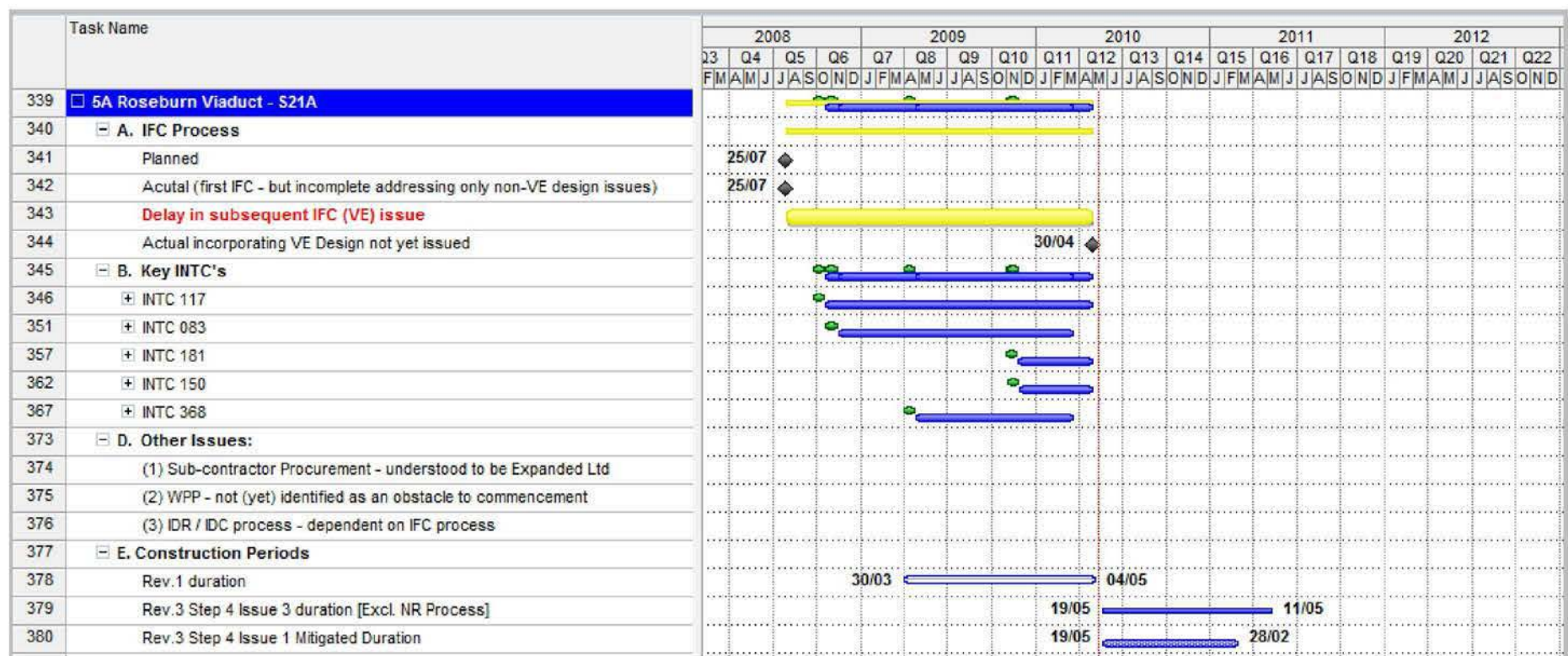
- (ii) **Concurrent issues:** In our opinion the other events detailed above (i.e. the sub-contractor procurement timing and the WPP process) have less of a bearing on the late commencement of this area. Whilst in isolation these issues may have been critical to commencement their significance is considerably diminished by the occurrence of the events in G(i) above. They may however become more significant in the lead up to the area availability in May/June 2010 (when the IFC is due to be issued). Running concurrently with this is the late provision by Infraco of Estimates for INTC's **65, 67, 117 & 493**. Estimates are outstanding for all of the aforementioned INTC's. Delay attaching to Infraco's response on the foregoing is however linked to the absence of an IFC. This in turn is dependent on completion of the above noted VE exercise. Therefore although there is Infraco responsibility for delays in the provision of Estimates, this may well be subsumed by delays attaching to the VE exercise on RV. Responsibility therefore, remains uncertain pending further investigation into the RV VE exercise. Delay in provision of Estimates measured to 19/03/10 (when clause 80.13 instruction issued); but this is unlikely to have been an obstacle to actual commencement (due to RV VE & IFC processes).
- (iii) **Considerations of dominance:** The protracted delay attaching to the IFC on this structure has clearly affected commencement. This appears to be a direct consequence of delays attaching to the Roseburn Viaduct VE exercise. The latter delay has in effect three constituent parts (1) slow / late Infraco commencement to the VE process; (2) slow Infraco response to PA comments; and (3) slow NR response to the provision of as-built information on utilities in the adjacent Haymarket Depot. Of equal 'causative potency' in terms of dominance is the incomplete works to the adjacent structure at Russell Road RW4. Delays attaching to the INTC process, sub-contractor procurement could yet prove significant but currently have less 'causative potency' than the above.

H Current assessment of culpability

A. DELAY TO START: Current view on culpability [analysis of Lower and Upper Limits of culpability]														
	tie culpability				Cause	Infraco culpability				Cause	Poss. SDS culpability			
	From	to	Days	Weeks		From	to	Days	Weeks		From	to	Days	Weeks
1. LOWER LIMIT														
			0	-				0	-				0	0.00
			0	-				0	-				0	0.00
			0	-				0	-				0	0.00
			-					-					0	
2. UPPER LIMIT														
Roseburn Viaduct VE exercise	28/07/08	30/03/10	610	87.14	Roseburn Viaduct VE exercise	28/07/08	30/03/10	610	87.14	Roseburn Viaduct VE exercise	28/07/08	30/03/10	610	87.14
			0	-				0	-				0	0.00
			0	-				0	-				0	0.00
			87.14					87.14					87.143	
B. DELAY TO FINISH: Current view on culpability [analysis of Lower and Upper Limits of culpability]														
IM Mitigated Period = +5 wks	IM Mitigated Period		Infraco Rev.3 Period				IM mitigated period +5wks: this is likely to be issues flowing from the RV VE exercise. Culpability not clear (audit recommended). Upper / lower limits recognise extremes of liability. Infraco Rev.3 period +27 wks: On the basis that Infraco can mitigate to 5 wks per IM analysis then Infraco lower limit restricted to anything in excess of 5 wks. tie liability remains at lower limit of 0 wks if Infraco responsible for all increased durations							
Infraco Rev.3 Period = +27 wks	tie	Infraco	tie	Infraco										
Lower Limit	0.00	0.00	0.00	22.00										
Upper Limit	5.00	5.00	5.00	27.00										

Draft
discussion

5A Roseburn Viaduct – S21A



A. IFC Process: Initial IFC issued on time (planned 25/07/08; actual 25/07/08).

It is important to note that this initial IFC although on time recognised only non VE design relating to this structure. Subsequent IFC's were forecast by SDS/Infraco to complete as follows:-

- S21A RC Portal Bridge – Roseburn Street Viaduct VE Design (forecast 23/03/10);
- S21A Steel Composite Bridge - Roseburn Street Viaduct VE Design (forecast 23/03/10); and
- S21A New Reinforced Earth Structure - Roseburn Street Viaduct VE Design (forecast 07/04/10).

The above issue dates were not achieved. As at 30/04/10 there have been **no further IFC's issued**.

DS advises that the revised IFC issue for the RV VE design is **forecast to be issued on 09/06/10** (in SDS v56). Should this transpire the overall delay attaching to this issue will be around **98 weeks late**.

The delay in issuing this IFC appears to be a direct consequence of delays attaching to the Roseburn Viaduct VE exercise. DS advises that "... the reason for the delay in issuing this beyond the other retaining walls in this area has been BSC's decision not to issue the original design followed by the design as amended to accommodate the VE opportunity on Roseburn Viaduct. Instead BSC has opted to get SDS to only issue the design that incorporates VE and none of the VE package has yet been IFC".

Infraco period report dated 27 March 2010 noted anticipated commencement of Roseburn Viaduct as at 05/04/10 (i.e. one week after issue of the said report). This commencement would clearly have depended on completion of the VE exercise. As at 30/04/10 the VE exercise remains incomplete.

From information received on RV we understand that there are three contributory factors which have impacted on a resolution to this VE exercise, as follows:-

- (1) Infraco were slow to start the VE process, DS contends no progress initially noting that it was 18 periods after novation that design actually started.
- (2) Infraco has been slow to respond to PA comments; and
- (3) delays in receipt of info from NR as it has been difficult to secure as-built information on utilities in the adjacent Haymarket Depot.

The above appear to be driven by two factors. The first factor (essentially covering items (1) & (2) above) is that the SDS design is incomplete or not satisfactory to CEC. However the second issue (NR) is outwith Infraco control and from discussion with DS appears to be the main issue delaying completion of the design in this area. Given the complexities attaching to the above, it is therefore likely, that the late issue of this IFC flows from one or more of the following reasons:-

- Late issue by SDS (in its simplest form a CE under 65(t) – which may in turn permit the application of clause 65.12.2);
- A material breach by SDS (again in its simplest form a CE under 65(u) – which may in turn permit the application of clause 65.13);
- A failure of Infraco to provide the Infraco Design to SDS in accordance with the Consents Programme and Schedule. Part 14 (clause 19.19 refers);
- A tie Change;
- A failure of Infraco in respect of its management of SDS or another breach by Infraco (e.g. failure to properly manage the CEC interface);
- A requirement of CEC for which tie will bear responsibility;

Delay by SDS, SDS /tie or Infraco? As a minimum however, it is expected that Infraco will be excused time for delays due to slow NR response.

B. Key INTC's: From information provided Infraco issued 5 no. INTC's in relation to this structure; **INTC 117, 083, 181, 150, & 368**. It is unlikely that any of the foregoing has materially / critically affected Infraco's ability to commence works in accordance with the Rev 01 programme. Details are as follows:-

- INTC 117:** issued by Infraco on **18/09/08** (prior to IFC issue). Estimate should have been submitted on or around 14/10/08. **Delay by Infraco.**
- INTC 083:** issued by Infraco on **15/10/08** (prior to IFC issue). Estimate should have been submitted on or around 10/11/08. **Delay by Infraco.**
- INTC 181:** issued by Infraco on **28/10/09** (prior to IFC issue). Estimate should have been submitted on or around 23/11/09. **Delay by Infraco**
- INTC 150:** issued by Infraco on **31/10/09** (prior to IFC issue). Estimate should have been submitted on or around 25/11/09. **Delay by Infraco**
- INTC 368:** issued by Infraco on **27/03/09** (prior to IFC issue). Estimate should have been submitted on or around 22/04/09. **Delay by Infraco**

INTC's 083 & 368 were the subject of an 80.13 Instruction issued by tie on 19/03/10.

Given the fact that SDS has yet to issue an IFC in relation to this structure it appears likely that Infraco will issue a further INTC specifically addressing 'final' BDDI – IFC changes. This is clearly dependent on the completion of the VE exercise. There therefore remains the potential that issues attaching to this process may yet prevent / compromise commencement. It appears that there is split culpability for that structure. As such the delays in issue of Estimates by Infraco may, at least in part, be excused.

C. **MUDFA / Utilities:** There are no MUDFA / Utilities issues impacting on this structure. **No Delay.**

D. **Other Issues:**

- (i) **Sub-Contractor Procurement:** Understood that Infraco intend to sublet this structure to Expanded Ltd – see tie audit and Infraco Period Report No.3-1 report to 24/04/10. No sub-contract yet in place. Not clear if LOI issued covering this work or area. Subject to further tie audit. **Delay by Infraco. Infraco culpability.**
- (ii) **WPP Process:** Not in place as yet but dependent on IFC process.
- (iii) **IDR/IDC process:** Not yet in place. Infraco letter of 18/12/09 predicted the IDC to be complete as 05/02/10. As at 30/04/10 the IDC is not yet in place. It is not clear whether Infraco will be permitted by tie to commence without this paperwork in place. This process is dependent upon the IFC completion – not yet in place.
- (iv) **Form 'C':** not yet identified as being an obstacle to commencement (but this still has the potential to cause delay depending on documentation collation and submission). As with other structures this process should be monitored.
- (v) **VE Exercise:** See 'A' (IFC Process) above.

E. **Construction Periods:**

5A Roseburn Viaduct - S21A					
	Rev.1	Rev.3 Issue 3	Delay	IM Mitigated Rev.3	Delay
Start	30/03/2009	19/05/2010	59.29 wks	19/05/2010	59.29 wks
Finish	04/05/2010	11/05/2011	53.14 wks	28/02/2011	42.86 wks
Cal. Duration	57.29 wks	51.14 wks	-6.14 wks	40.86 wks	-16.43 wks

- (i) **Delay to Start:** The table above refers to various programme dates. The Issue 3 programme shows a delay to start of **59 weeks**; the IM mitigated programme also shows a delay to start of **59 weeks**. Actual start will be later than shown due to VE/IFC exercise. Primary causes of delay to start as follows:-
 - A. **IFC process: Still incomplete.** This IFC is currently **92 weeks late** (planned **25/07/08**; as at **30/04/10** the actual IFC is **yet to be issued**). The delay in issuing this IFC appears to be a direct consequence of delays attaching to the Roseburn Viaduct VE exercise. **Delay by SDS, SDS /tie or Infraco?**
 - B. **INTC's:** Delays by Infraco in the submission of Estimates. Delay up to 19/03/10 when tie issued clause 80.13 instruction [Complete data on INTC's awaited]. Future delays attaching to the INTC process are probable. Delays may yet / are likely to flow from the late IFC completion in the form of BDDI – IFC changes.
 - C. **MUDFA / Utilities: No impact** on this structure.
 - D. **Other:**
 - **Sub-Contractor procurement:** Understood that Infraco intend to sublet this structure to Expanded Ltd – see tie audit and Infraco Period Report No.3-1 report to 24/04/10. No sub-contract yet in place. Not clear if LOI issued covering this work or area. Subject to further tie audit. **Delay by Infraco. Infraco culpability.** But commencement / progress dependent on IFC process.
 - **WPP process:** Not in place as yet but dependent on IFC process.
 - **IDR/IDC process:** Not yet in place. It is not clear whether Infraco will be permitted by tie to commence without this paperwork in place. Dependent on IFC process.
 - **Form 'C' Approval:** not yet identified as being an obstacle to commencement (but this still has the potential to cause delay depending on documentation collation and submission).
 - **VE Exercise:** See A (IFC Process) above.
- (ii) **Delay to Finish:** Issue 3 programme shows a reduction in duration of **circa 6 weeks** over the timescale in Rev.1 programme. IM mitigated view of Issue 3 shows a reduction of **-16 weeks** to the Rev.1 programme. There is presently no justification for the increased Rev.3 duration – but noted that final Estimates of durations will be dependent upon final design.

F. **tie position on area availability:**

- (i) First available date for the meaningful commencement of works to this area relies on the IFC issue for Roseburn Viaduct. This is dependent on completion of the VE exercise, which is currently predicted to complete mid May 2010 (IFC by 09/06/10).

G. **Conclusion:**

- (i) **'Significant' issues/events:** In our opinion the main obstacle to commencement on this structure is the delay to the revised IFC. The IFC should have been provided by **25/07/08** as at **30/04/10** however, the IFC is **still incomplete**. This is clearly dependent on the completion of the VE exercise. Responsibility on this issue is complex and presently uncertain due to absence of detailed evidence. This needs to be established by tie audit (see G(iii) below).
- (ii) **Concurrent issues:** In our opinion the other events detailed above (i.e. the sub-contractor procurement timing, the WPP process & the IDC / IDR process) have less of a bearing on the late commencement of this area. Whilst in isolation these issues may have been critical to commencement their significance is considerably diminished by the occurrence of the events in G (i) above. They may however become more significant in the lead up to the area availability in June 2010. Running concurrently with this is the late provision by Infraco of Estimates for INTC's **117, 083, 181, 150, & 368**. Estimates are still outstanding for all of the aforementioned INTC's. Delays attaching to Infraco's response on the foregoing are due to the absence of an IFC. This in turn is dependent on completion of the above noted VE exercise. Therefore although there is Infraco responsibility for delays in the provision of Estimates, this may well be subsumed by delays attaching to the VE exercise on RV. Responsibility therefore, remains uncertain. Delay measured to 19/03/10 (when clause 80.13 instruction issued; but unlikely to have been an obstacle to actual commencement).

(iv) **Considerations of dominance:** The protracted delay attaching to the IFC on this structure has clearly affected commencement. This appears to be a direct consequence of delays attaching to the Roseburn Viaduct VE exercise. The latter delay has in effect three constituent parts (1) slow / late Infraco commencement to the VE process; (2) slow Infraco response to PA comments; and (3) slow NR response to the provision of as-built information on utilities in the adjacent Haymarket Depot. Responsibility on this issue is complex and presently uncertain due to absence of detailed evidence. This needs to be established by tie audit. Delays attaching to the INTC process, sub-contractor procurement could yet prove significant but currently have less 'causative potency' than the above.

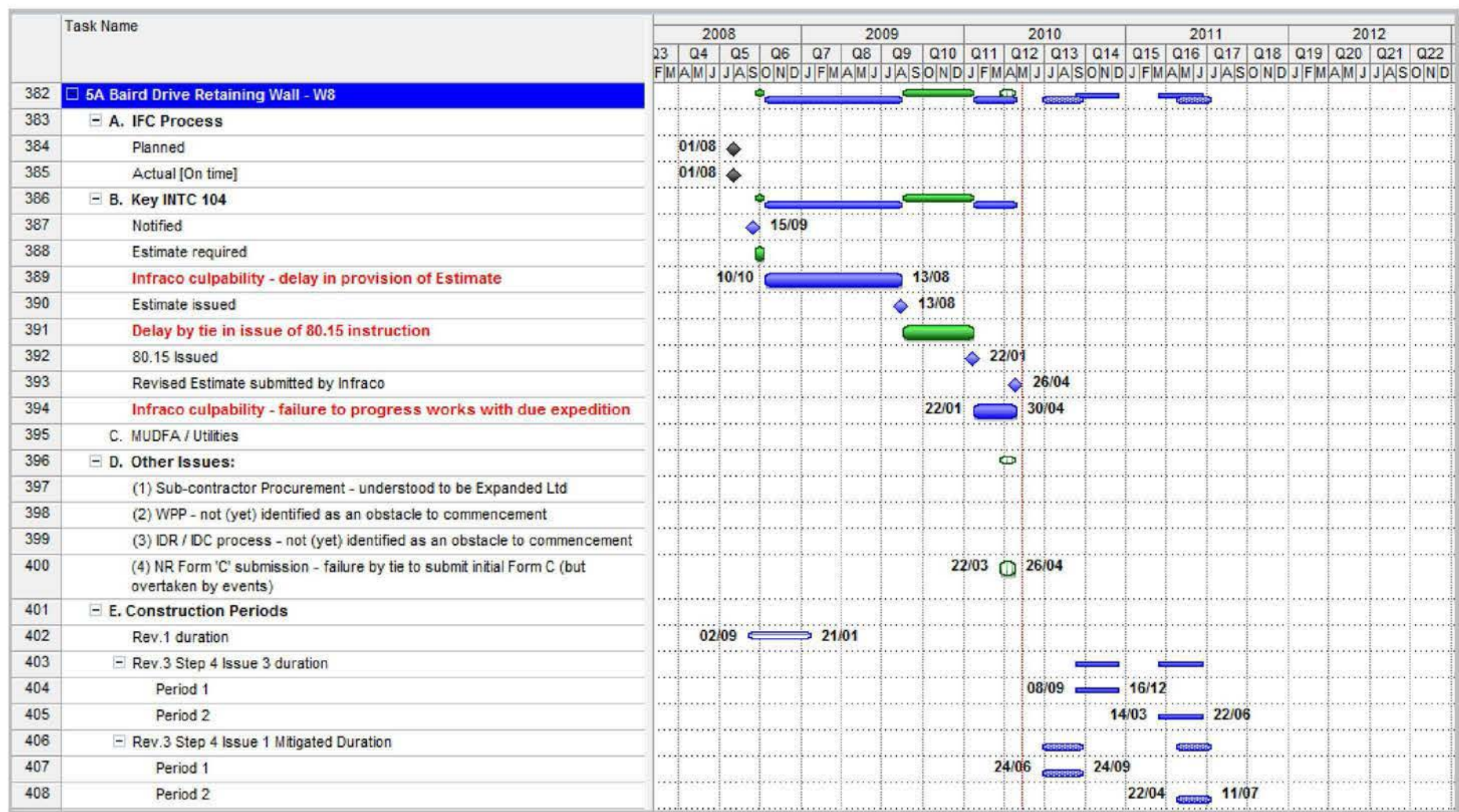
As such, in our opinion the delay to the issue of the IFC (and associated VE exercise) for this structure is the dominant / critical factor affecting commencement and hence completion for same. This should be the subject of a detailed tie audit. This issue has a knock-on delaying effect on Murrayfield Tramstop Retaining Wall – W18 and Murrayfield Tramstop.

H Current assessment of culpability

A. DELAY TO START: Current view on culpability [analysis of Lower and Upper Limits of culpability]														
	tie culpability				Cause	Infraco culpability				Cause	Poss. SDS culpability			
	From	to	Days	Weeks		From	to	Days	Weeks		From	to	Days	Weeks
1. LOWER LIMIT														
			0	-				0	-				0	0.00
			0	-				0	-				0	0.00
			0	-				0	-				0	0.00
			-					-					0	
2. UPPER LIMIT														
Delay from rev 1 - Rev 3 date (Affected by RV VE)	30/03/09	19/05/10	415	59.29	Delay from rev 1 - Rev 3 date (Affected by RV VE)	30/03/09	19/05/10	415	59.29	Delay from rev 1 - Rev 3 date (Affected by RV VE)	30/03/09	19/05/10	415	59.29
			0	-				0	-				0	0.00
			0	-				0	-				0	0.00
			59.29					59.29					59.286	
B. DELAY TO FINISH: Current view on culpability [analysis of Lower and Upper Limits of culpability]														
IM Mitigated Period = -16 wks	IM Mitigated Period		Infraco Rev.3 Period		IM mitigated period -16 wks: .Notwithstanding delays attaching to the RV VE exercise this assessment is considered achievable on the basis of reasonable mitigation on the part of Infraco. Infraco Rev.3 period -6 wks: Infraco clearly accepts the possibility for mitigation. Though currently not to the same extent as noted above. On the basis however, that Infraco can mitigate to -16 wks per IM analysis then Infraco lower limit restricted to anything in excess of -16 wks tie liability remains at lower limit of -16 wks if Infraco responsible for all increased durations									
Infraco Rev.3 Period = -6 wks	tie	Infraco	tie	Infraco										
Lower Limit	-16.00	-16.00	-16.00	-6.00										
Upper Limit	0.00	0.00	-10.00	0.00										

Draft for discussion

5A Baird Drive Retaining Wall – W8



- A. **IFC Process:** Initial IFC issued on time (planned 01/08/08; actual 01/08/08). No subsequent IFC's have been issued as at 30/04/10. **No Delay**

- B. **Key INTC's:** From information provided it appears that the Infraco issued 2 no. INTC in relation to this structure; **INTC's 104 & 105**. We are further advised that **INTC 104 (BDDI - IFC Drawing Changes – Baird Drive RW – Section 5A)** in particular, appears to have materially / critically affected Infraco's ability to commence works in accordance with the Rev 01 programme. Details are as follows:-
 - (i) **INTC 104:** issued by Infraco on **15/09/08** (45 days after IFC issue). Estimate should have been submitted on or around 13/10/08. Estimate was received on **13/08/09**; **43 weeks** later than required. **Delay by Infraco; Infraco culpability** for time taken to produce Estimate for INTC 104. On 15/01/10 subsequent to review & discussion of **INTC 104**, tie gave notice that the Estimate in relation to W8 Baird Drive RW was being referred to DRP for determination. **80.15 Instruction issued by tie on 22/01/10**; **23 weeks** following receipt of Estimate. **Delay by tie; tie culpability** for time taken to issue 80.15 instruction following receipt of Estimate dated 13/08/09.
Note: we understand that Infraco submitted revised Estimate for this structure w/c 26/04/10. It is not known whether this has delayed commencement of progress.

- C. **MUDFA / Utilities:** There are no MUDFA / Utilities issues impacting on this structure. **No Delay**

- D. **Other Issues:**
 - (i) **Sub-Contractor Procurement:** Understood that Infraco intend to sublet this structure to Expanded Ltd – see tie audit and Infraco Period Report No.3-1 report to 24/04/10. No sub-contract yet in place. Not clear if LOI issued covering this work or area. Subject to further tie audit. **Delay by Infraco; Infraco culpability.**
 - (ii) **WPP Process:** Permit to commence work has been received. **No Delay.**
 - (iii) **IDR/IDC process:** Not yet in place. Infraco letter of 18/12/09 does not identify what the IDR / IDC requirement is for Baird Drive RW. It is not clear whether Infraco will be permitted by tie to commence without this paperwork in place. **Delay by Infraco; Infraco culpability.**
 - (iv) **Form 'C':** Infraco submitted Form 'C' certificate on 22/03/10. **tie has not yet processed this Form 'C' application.** (TC advises that tie are concerned that by signing-off on the Form 'C' submission, tie's position in respect of Infraco's argument on removal and replacement of the potentially soft underlying strata may in some way be diluted). In our opinion this will be viewed as a **Delay by tie (i.e. tie culpability)** for the time taken to sign off Form 'C'. **Currently 39 days in delay.** Please however see item immediately below.
 - (v) **Dynamic Probe Testing:** DPT carried out along Baird Drive as at w/c 22/02/10. Infraco state this was necessary because SI carried out July / August 2008 was insufficient to confirm the depth of excavation for the RW. These results have been sent to SDS by TQ. Infraco has stated that it is awaiting SDS conclusions regarding design assumptions with regard to the removal and replacement of the potentially soft underlying strata. It further states that upon receipt of SDS response Infraco will formalise a work scope and programme. This appears to be a **Delay by Infraco; Infraco culpability.** Note however that a **revised Estimate was submitted by Infraco during w/c 26/04/10.** This appears to confirm that additional reduced-level excavations are no longer required. Elaborate Temp. Works in association with this has now been replaced with a proposal for piling works in isolation. This therefore appears to be a **Delay by Infraco & Infraco culpability.** This particular issue has been resolved sufficiently in advance of (26/04/10) the earliest date of commencement in this area between Issue 3 and IM mitigated programme to have no material delaying effect.

E. Construction Periods:

5A Baird Drive Retaining Wall - W8					
	Rev.1	Rev.3 Issue 3	Delay	IM Mitigated Rev.3	Delay
Start	02/09/2008	08/09/2010	105.14 wks	24/06/2010	94.29 wks
Finish	21/01/2009	22/06/2011	126.00 wks	11/07/2011	128.71 wks
Cal. Duration	20.29 wks	41.14 wks	20.86 wks	54.71 wks	34.43 wks

- (i) **Delay to Start:** The table above refers to various programme dates. Issue 3 programme shows a delay to start of **105 weeks**; the IM mitigated programme projects an earlier start (delayed by **94 weeks**) but a later completion. Primary causes of delay to start as follows:-
- IFC process:** Initial IFC **issued on time** (planned & actual: **01/08/08**). No subsequent IFC's have been issued as at 30/04/10. **No Delay**
 - INTC's:** INTC 104 issued 45 days after IFC; significant **Infraco delay to provision of Estimate (304 days late); tie delay (162 days) in dealing with Estimate through to 80.15 instruction on 22/01/10.**
 - MUDFA / Utilities:** **No impact** on this structure.
 - Other:**
 - **Sub-Contractor procurement:** Understood that Expanded Ltd may be appointed by Infraco for Baird Drive RW – see tie audit and Infraco Period Report No.3-1 report to 24/04/10. No sub-contract yet in place. Not clear if LOI issued covering this work or area. Subject to further tie audit. **Delay by Infraco. Infraco culpability.** The significance of this issue will increase as the 24/06/10 nears.
 - **WPP process:** Permit to commence work has been received. **No Delay.**
 - **IDR/IDC process:** Not yet in place. Infraco letter of 18/12/09 does not identify what the IDR / IDC requirement is for Baird Drive RW. In contrast to Section 1 works in particular, the absence of a completed IDR / IDC does not appear to be an obstacle to commencement for this structure. **Delay by Infraco; Infraco culpability** (but little / no effect).
 - **Form 'C' Approval:** Infraco submitted Form 'C' certificate to tie on 22/03/10. tie has not yet processed this Form 'C' application. (TC advises that tie was concerned that by signing the Form 'C' signs off, tie's position in respect of Infraco's argument on removal and replacement of the potentially soft underlying strata would in some way be diluted). In our opinion this will be viewed as a **Delay by tie (i.e. tie culpability** for the time taken to sign off Form 'C').
Note however that receipt of Infraco's revised Estimate w/c 26/04/10 is likely to allay tie concerns with regard to the above. This should see the Form 'C' certificate signed off imminently. [Not known if Form C has to be revised]. This issue has been resolved sufficiently in advance of 26/04/10 the earliest date of commencement in this area between Issue 3 and IM mitigated programme to have no material delaying effect.
 - **Dynamic Probe Testing:** DPT carried out along Baird Drive as at w/c 22/02/10. **Delay by Infraco; Infraco culpability.** (Revised Estimate submitted w/c 26/04/10 appears to confirm that additional reduced level excavations are no longer required. Elaborate Temp. Works in association with same has now been replaced with a proposal for piling works in isolation). **Delay by Infraco; Infraco culpability.** This issue has been resolved sufficiently in advance of (26/04/10) the earliest date of commencement in this area between Issue 3 and IM mitigated programme to have no material delaying effect.
- (ii) **Delay to Finish:** Issue 3 programme shows an **increase of circa 21 weeks** over the timescale in Rev.1 programme. IM mitigated view of Issue 3 shows an increase in duration of **34 weeks** to the Rev.1 programme. There is presently no justification for Infraco's increased Rev.3 duration. In respect of IM's increase in overall duration, this is due to the relationship between this structure, Water of Leith Bridge (S21E) and Balgreen Road Bridges (S22A & S22B) – see gap in chart above. Potential for reduction of this gap has been identified.

F. tie position on area availability:

- (i) First available date for the meaningful commencement of works to this area is governed by the 80.15 Instruction issued by tie on 22/01/10. Allowing for 20 working days mobilisation beyond this date, works should have commenced on or around 18/02/10. Commencement of works in this area is not driven by works in other areas. Initial **delay by Infraco;** subsequent delay by tie in respect of timing of the 80.15 instruction and the NR Form C submission delay. Infraco Period Report No 3-1, to 24 April 2010 predicts commencement on 17 May 2010.

G. Conclusion:

- (i) **'Significant' issues/events:** In our opinion there were two main contributory factors, being (a) the INTC process; and (b) failure to sign off Form 'C' approval. Taking those events in chronological order:-
In our opinion the main delaying factor was the protracted INTC process attaching to **INTC 104 (BDDI - IFC Drawing Changes – Baird Drive RW – Section 5A)**. INTC 104 was issued by Infraco on **15/09/08** (45 days after IFC issue). That should have been provided by 13/10/08 (earliest) but was actually provided w/c 13/08/09. This is a matter for which Infraco is responsible. Beyond 13/08/09 however, tie's review and inaction on the Estimate for INTC 104 ran until **22/01/10** (when the 80.15 instruction was issued). In light of the advice from DLA dated 24 March 2010, this is a period for which tie bears the responsibility. Following the issue of the 80.15 instruction Infraco is obliged to commence the works. Commencement however, was compromised by the absence of Form 'C' approval. tie is currently withholding this approval pending negotiations over ground conditions. This is a matter for which tie is responsible. However, given the fact that the latest revised Estimate received from Infraco does not now reflect its previous intentions in regard to work scope this is likely to require the submission of a revised Form 'C' certificate. That may well absolve tie of the delay in submission of the initial Form C.
- (ii) **Concurrent issues:** In our opinion the other event detailed above (i.e. the sub-contractor procurement timing) has much less of a bearing on the late commencement of this area. Whilst in isolation this issue may have been critical to commencement its significance is considerably diminished by the fact that there is a WPP package in place. (This suggests that the procurement process is close to resolution). This may however (if unresolved) become more significant if unresolved beyond the completion of the Form 'C' approval process.
- (iii) **Considerations of dominance:** The significant delays attaching to the issue of the first INTC on this structure has clearly affected commencement. The delay has in effect three constituent parts (1) Infraco's delay in issuing an INTC from the IFC issue date (2) the protracted

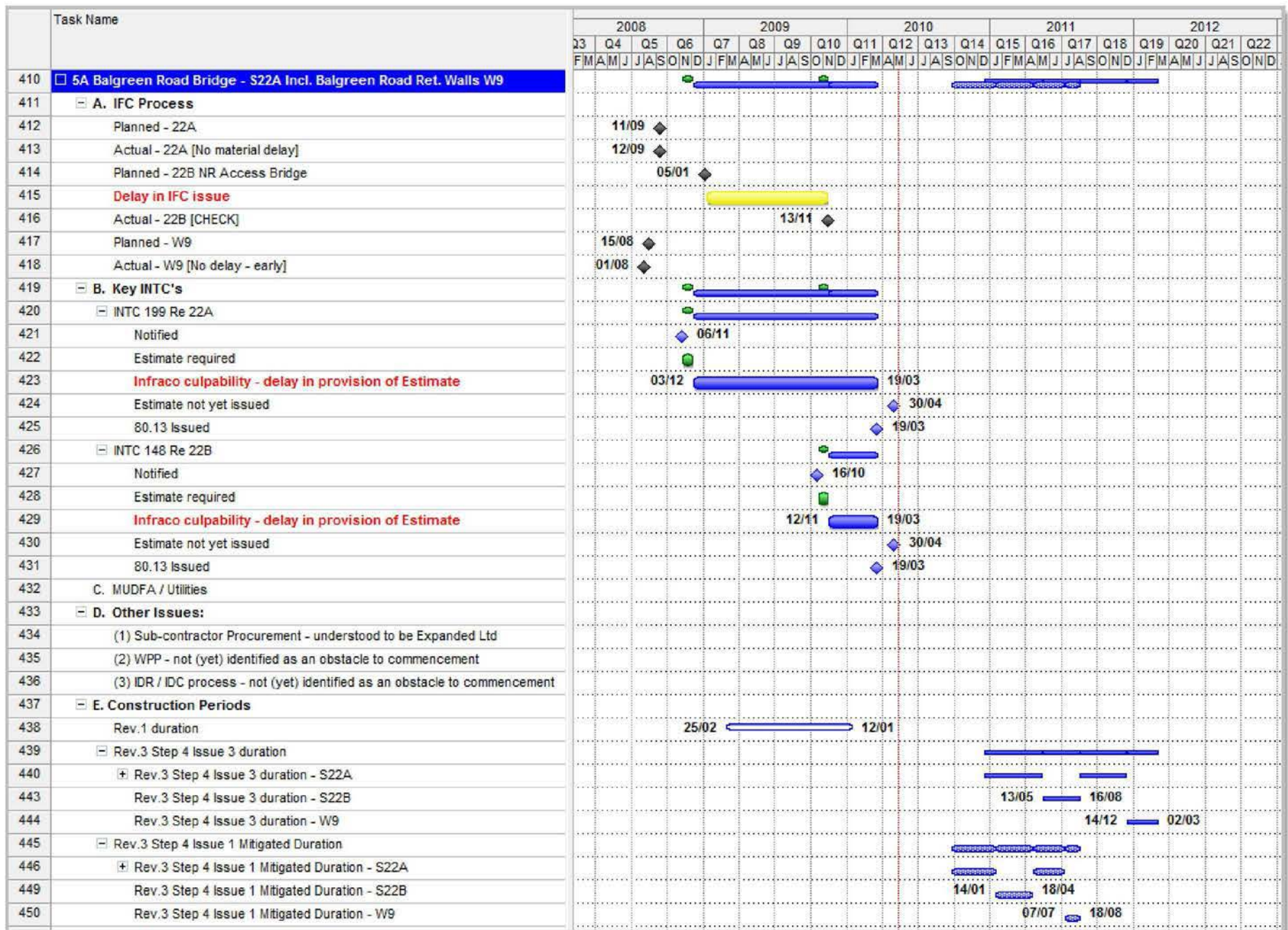
timeframe taken by Infraco to provide a compliant Estimate following the issue of the INTC, and (3) tie's delay in issuing an 80.15 instruction on receipt of the Estimate. The late approval of the Form 'C' may also have restricted access to this area. Following the issue of the 80.15 instruction Infraco is obliged to commence the works. Commencement however, was compromised by the absence of Form 'C' approval. tie is currently withholding this approval pending negotiations over ground conditions. This is a matter for which tie is responsible. However, given the fact that the latest revised Estimate received from Infraco does not now reflect its previous intentions in regard to work scope this is likely to require the submission of a revised Form 'C' certificate. That may well absolve tie of the delay in submission of the initial Form C.

H. Current assessment of culpability

A. DELAY TO START: Current view on culpability [analysis of Lower and Upper Limits of culpability]																																			
	tie culpability				Cause	Infraco culpability				Cause	Poss. SDS culpability																								
	From	to	Days	Weeks		From	to	Days	Weeks		From	to	Days	Weeks																					
1. LOWER LIMIT																																			
Recognises upper limit less 2 weeks prolonged INTC notice			0	27.00	Delay to estimate INTC 104	10/10/08	13/08/09	307	43.86	No IFC delay	01/08/08	01/08/08	0	0.00																					
			0	-	Delay; From 80.15 instruction to revised Infraco estimate	22/01/10	30/04/10	98	14.00				0	0.00																					
			0	-	Delay; From 80.15 instruction to Rev 3 start date	30/04/10	08/09/10	131	18.71				0	0.00																					
				27.00					76.57					0																					
2. UPPER LIMIT																																			
Delay; Rev 1 start to INTC 104 notification	02/09/08	15/09/08	13	1.86	Delay to estimate INTC 104	10/10/08	13/08/09	307	43.86				0	0.00																					
INTC 104 estimate period	15/09/08	10/10/08	25	3.57	Delay; From 80.15 instruction to revised Infraco estimate	22/01/10	30/04/10	98	14.00				0	0.00																					
Delay: From INTC 104 estimate to 80.15 instruction	13/08/09	22/01/10	162	23.14	Delay; From 80.15 instruction to Rev 3 start date	30/04/10	08/09/10	131	18.71				0	0.00																					
			0	-				0	-				0	0.00																					
				28.57					76.57					0																					
B. DELAY TO FINISH: Current view on culpability [analysis of Lower and Upper Limits of culpability]																																			
<table border="1"> <thead> <tr> <th rowspan="2"></th> <th colspan="2">IM Mitigated Period</th> <th colspan="2">Infraco Rev.3 Period</th> <th rowspan="2"></th> </tr> <tr> <th>tie</th> <th>Infraco</th> <th>tie</th> <th>Infraco</th> </tr> </thead> <tbody> <tr> <td>Lower Limit</td> <td>13.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td rowspan="2"> IM mitigated period +34 wks: this is likely to be delays flowing from BDDI/IFC issues and TM revised phasing. Culpability not clear; although likely to rest with Infraco. Upper / lower limits recognise extremes of liability. Infraco Rev.3 period +21 wks: On the basis that Infraco can mitigate to 21 wks per IM analysis then Infraco lower limit restricted to anything in excess of 0 wks. tie liability remains at lower limit of 0 wks if Infraco responsible for all increased durations </td> </tr> <tr> <td>Upper Limit</td> <td>34.00</td> <td>21.00</td> <td>21.00</td> <td>21.00</td> </tr> </tbody> </table>																IM Mitigated Period		Infraco Rev.3 Period			tie	Infraco	tie	Infraco	Lower Limit	13.00	0.00	0.00	0.00	IM mitigated period +34 wks: this is likely to be delays flowing from BDDI/IFC issues and TM revised phasing. Culpability not clear; although likely to rest with Infraco. Upper / lower limits recognise extremes of liability. Infraco Rev.3 period +21 wks: On the basis that Infraco can mitigate to 21 wks per IM analysis then Infraco lower limit restricted to anything in excess of 0 wks. tie liability remains at lower limit of 0 wks if Infraco responsible for all increased durations	Upper Limit	34.00	21.00	21.00	21.00
	IM Mitigated Period		Infraco Rev.3 Period																																
	tie	Infraco	tie	Infraco																															
Lower Limit	13.00	0.00	0.00	0.00	IM mitigated period +34 wks: this is likely to be delays flowing from BDDI/IFC issues and TM revised phasing. Culpability not clear; although likely to rest with Infraco. Upper / lower limits recognise extremes of liability. Infraco Rev.3 period +21 wks: On the basis that Infraco can mitigate to 21 wks per IM analysis then Infraco lower limit restricted to anything in excess of 0 wks. tie liability remains at lower limit of 0 wks if Infraco responsible for all increased durations																														
Upper Limit	34.00	21.00	21.00	21.00																															

Draft for discussion

5A Balgreen Road Bridge – S22A (Incl. Balgreen Road RW9); & Bridge 22B



A. **IFC Process:** Initial IFC for 5A Balgreen Road Bridge – S22A was issued (effectively) on time (planned 11/09/08; actual 12/09/08). No material delay. Initial IFC for Balgreen Road RW9 was issued 2 weeks early (planned 15/08/08; actual 01/08/08). Initial IFC for 5A Balgreen Road (NR) Bridge – S22B however, was issued 45 weeks late (planned 05/01/09; actual 13/11/09). We are advised by DS that the salient factors contributing to this delay are as follows:-

- (i) Throughout the Prior Approval process there was some debate over the appropriate shape and form of the bridge. In particular, the way in which voids below the bridge would / should be treated. This however, appears to have been resolved to allow on-time granting of PA.
- (ii) Issues arose over protection measures to secure departure from recognised standards to allow a lower than 5.30m clearance. SDS was 24 weeks late in submitting the bridge for technical approval. It appears that this delay can be attributed to the late provision of access to NR land to undertake ground investigations. That said, it is our understanding that the delay noted arose from SDS's failure to request access timeously. This is a matter for which SDS is responsible.
- (iii) Following submission of the bridge for TAA, approvals were delayed by the requirement for Cat 3 checks and agreement on protection measures against bridge strikes by NR. This resulted in disagreements between NR & CEC over bridge heights. DS further advises that SDS failed to prepare a briefing note to NR & CEC with a view to meeting at the end of May 2009. Consequent to this, delays continued until the IFC was issued on 13/11/09. **Note:** this 6 month period appears odd, however it is presently the only information available.

Having regard to the foregoing, DS advises culpability for the delays noted rests mainly with SDS in failing to manage the Technical Approvals process / interface with both NR & CEC. Whether this extends to a failure of Infraco in respect of its management of SDS is currently uncertain (further details required from audits to be carried out). It therefore appears that the late issue of this IFC flows from one or more of the following reasons:-

- Late issue by SDS (in its simplest form a CE under 65(t) – which may in turn permit the application of clause 65.12.2);
- A material breach by SDS (again in its simplest form a CE under 65(u) – which may in turn permit the application of clause 65.13);
- A failure of Infraco to provide the Infraco Design to SDS in accordance with the Consents Programme and Schedule. Part 14 (clause 19.19 refers);
- A tie Change (depending on BDDI to IFC issues)?;
- A failure of Infraco in respect of its management of SDS or another breach by Infraco (e.g. failure to properly manage the CEC interface);
- A requirement of CEC for which tie will bear responsibility.

Delay by SDS, SDS /tie or Infraco?

B. **Key INTC's:** From information provided Infraco issued 3 no. INTC's in relation to this structure; INTC's 097, 148 & 199. We are advised that INTC 148 (IFC Drawings for Balgreen Road Tram Bridge) and INTC 199 (IFC Drawings for Balgreen Bridge S22A) have materially / critically affected Infraco's ability to commence works in accordance with the Rev 01 programme. Details are as follows:-

- (i) **INTC 148:** issued by Infraco on 16/10/09. Estimate should have been submitted on or around 11/11/09. **Delay by Infraco.**
- (ii) **INTC 199:** issued by Infraco on 06/11/08. Estimate should have been submitted on or around 02/12/08. **Delay by Infraco**

All of the above INTC's were the subject of an 80.13 Instruction issued by tie on 19/03/10.

C. **MUDFA / Utilities:** There are no MUDFA / Utilities issues impacting on this structure. **No Delay**

D. **Other Issues:**

- (i) **Sub-Contractor Procurement:** Understood that Infraco intend to sublet this structure to Expanded Ltd – see tie audit and Infraco Period Report No.3-1 report to 24/04/10. No sub-contract yet in place. Not clear if LOI issued covering this work or area. Subject to further tie audit. **Delay by Infraco; Infraco culpability.**
- (ii) **WPP Process:** Not in place as yet. **Delay by Infraco; Infraco culpability.**
- (iii) **IDR/IDC process:** Not yet in place. It is not clear whether Infraco will be permitted by tie to commence without this paperwork in place. **Delay by Infraco; Infraco culpability.**
- (iv) **Form 'C':** Not yet in place. Infraco Period Report No.3-1 report to 24/04/10 notes 'Form C/WPP has continued'.

E. **Construction Periods:**

5A Balgreen Road Bridge - S22A Incl. Balgreen Road Ret.Walls W9 & Bridge S22B					
	Rev.1	Rev.3 Issue 3	Delay	IM Mitigated Rev.3	Delay
Start	25/02/2009	16/12/2010	94.14 wks	24/09/2010	82.29 wks
Finish	12/01/2010	02/03/2012	111.43 wks	18/08/2011	83.29 wks
Cal. Duration	46.00 wks	63.29 wks	17.29 wks	47.00 wks	1.00 wks

- (i) **Delay to Start:** The table above refers to various programme dates. Issue 3 programme shows a delay to start of **94 weeks**; the IM mitigated programme projects an earlier delay to start of **83 weeks**. Primary causes of delay to start as follows:-
 - A. **IFC process:** Initial IFC for **5A Balgreen Road (NR) Bridge – S22B** was issued **45 weeks late** (planned **05/01/09**; actual **13/11/09**). Culpability for the delay appears to rest with SDS in failing to manage the Technical Approvals process / interface with both NR & CEC. Whether this extends to a failure of Infraco in respect of its management of SDS is currently uncertain **Delay by Infraco, SDS /tie or tie?**
 - B. **INTC's:** **INTC 199 (IFC Drawings for Balgreen Bridge S22A)** issued by Infraco on **06/11/08** (55 days after IFC issue). As at 30/04/10 Estimate is currently outstanding i.e. 540 days later than permitted by the Contract. **INTC 148 (IFC Drawings for Balgreen Road Tram Bridge S22B)** issued by Infraco on **16/10/09** (in advance of IFC issue issued 13/11/09). As at 30/04/10 Estimate is currently outstanding i.e. 196 days later than permitted by the Contract. **Significant Delay by Infraco. Infraco culpability**
Delay taken up to 19/03/10 when tie issued clause 80.13 instruction.
 - C. **MUDFA / Utilities:** **No impact** on this structure.
 - D. **Other:**
 - **Sub-Contractor procurement:** Understood that Infraco intend to sublet this structure to Expanded Ltd – see tie audit and Infraco Period Report No.3-1 report to 24/04/10. No sub-contract yet in place. Not clear if LOI issued covering this work or area. Subject to further tie audit. **Delay by Infraco; Infraco culpability.**
 - **WPP process:** Not in place as yet. **Delay by Infraco; Infraco culpability**
 - **IDR/IDC process:** Not yet in place. It is not clear whether Infraco will be permitted by tie to commence without this paperwork in place. **Delay by Infraco; Infraco culpability.**
 - **Form 'C' Approval:** Not yet in place. Infraco Period Report No.3-1 report to 24/04/10 notes 'Form C/WPP has continued'. **Delay by Infraco; Infraco culpability**
- (ii) **Delay to Finish:** Issue 3 programme shows an increase in duration of **circa 17 weeks** over the timescale in Rev.1 programme. IM mitigated view of Issue 3 shows a minor increase of **1 week** to the Rev.1 programme. There is presently no justification for the Infraco increased Rev.3 duration.

F. **tie position on area availability:**

- (i) First available date for the meaningful commencement of works to this area **relies on a proportion of reinforced earthworks on Baird Drive** to enable its commencement. Protracted delays on Baird Drive (for the most part the INTC process) have significantly delayed its commencement. Infraco Period Report No.3-1 report to 24/04/10 forecasts commencement on Baird Drive on 17 May 2010.

G. **Conclusion:**

- (i) **'Significant' issues/events:** In our opinion there are three main contributory factors, being (a) completion of a proportion of reinforced earthworks on Baird Drive RW; (b) the IFC process; and (c) the INTC process. Taking those events in chronological order:-
In our opinion the main delaying factor is completion of a proportion of reinforced earthworks on Baird Drive RW. Protracted delays on Baird Drive have significantly delayed commencement on Balgreen Road Bridge 22A. For responsibility refer Summary chart / narrative for Baird Drive RW above (in summary a delay caused by the INTC process re INTC 104. Split culpability – majority rests with Infraco)
Running concurrently with the 'Baird Drive' delays are delays attaching to both the IFC and INTC processes. The IFC for **5A Balgreen Road (NR) Bridge – S22B** was issued **45 weeks late** (planned **05/01/09**; actual **13/11/09**). Responsibility on this issue is uncertain (see above – this should be subject to tie audit).
Thereafter, delays attaching to the provision of Estimates for INTC's 148 & 199 are matters for which Infraco is responsible.
- (ii) **Concurrent issues:** In our opinion the other events detailed above (i.e. the sub-contractor procurement timing, the WPP process and the NR Form C process) have less of a bearing on the late commencement of this area. Whilst in isolation these issues may have been / may yet be critical to commencement their significance is considerably diminished by the occurrence of the events in G (i) above. They may however become more significant in the lead up to the area availability in September 2010. Infraco's failure to submit Form 'C' for approval is a matter for which it is responsible.
- (iii) **Considerations of dominance:** The protracted delay attaching to the IFC for 5A Balgreen Road (NR) Bridge – S22B and subsequent delays attaching to INTC process for both bridges have clearly been obstacles to commencement on this element of the works. However, Balgreen Road Bridges rely on a proportion of reinforced earthworks on Baird Drive to enable its commencement. The above noted IFC & INTC delays are

in effect subsumed by the delays attaching to Baird Drive RW reinforced earthworks which are clearly the determinant / predecessor to commencement of the Balgreen Road Bridges; and as such this has greater 'causative potency' than the other issues above.

H. Current assessment of culpability

A. DELAY TO START: Current view on culpability [analysis of Lower and Upper Limits of culpability]														
	tie culpability				Cause	Infraco culpability				Cause	Poss. SDS culpability			
	From	to	Days	Weeks		From	to	Days	Weeks		From	to	Days	Weeks
1. LOWER LIMIT														
No Tie culpability dependent on BDRW			0		Delay to estimate INTC 199	25/02/09	19/03/10	387	55.29	Delay to last IFC	05/01/09	13/11/09	312	44.57
			0	-	Delay; From 80.13 instruction to Rev3 start date	19/03/10	16/12/10	272	38.86				0	0.00
			0	-				0	-				0	0.00
				-										
									94.14					44.571
2. UPPER LIMIT														
			0	-	Delay to estimate INTC 199	25/02/09	19/03/10	387	55.29	Delay to last IFC	05/01/09	13/11/09	312	44.57
			0	-	Delay; From 80.13 instruction to Rev3 start date	19/03/10	16/12/10	272	38.86				0	0.00
			0	-				0	-				0	0.00
			0	-				0	-				0	0.00
				-										
									94.14					44.571
B. DELAY TO FINISH: Current view on culpability [analysis of Lower and Upper Limits of culpability]														
IM Mitigated Period = +1 wks	IM Mitigated Period		Infraco Rev.3 Period				IM mitigated period 0 wks: Currently no mitigation considered possible Rev 1 construction duration still considered more or less achievable. Affected by the consequential 'knock on' effect of delays attaching to Baird Drive RW's. Infraco Rev.3 period +17 wks: Infraco clearly considers slippage likely, On the basis however, that Infraco can (more or less) maintain the original Rev 1 programmed duration as per IM analysis then Infraco lower limit restricted to anything in excess of 0 wks. tie liability remains at lower							
Infraco Rev.3 Period = +17 wks	tie	Infraco	tie	Infraco										
Lower Limit	0.00	0.00	0.00	16.00										
Upper Limit	1.00	1.00	1.00	17.00										

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