



**Rob Leech**  
**Director of Project Delivery**

Turner & Townsend Project Management Limited  
Osborne House  
1 Osborne Terrace  
Edinburgh  
EH12 5HG

**t: +44 (0)13 [REDACTED]**  
**e: [rob.leech@turntown.co.uk](mailto:rob.leech@turntown.co.uk)**  
**w: [turnerandtownsend.com](http://turnerandtownsend.com)**

Edinburgh Tram Project  
Full Progress Report No. 20  
31<sup>st</sup> March to 27<sup>th</sup> April 2013  
**FINAL**

CONFIDENTIAL – LEGALLY PRIVILEGED AND FOI(S)A EXEMPT  
May 2013



CONTENTS

1	Executive Summary	3
2	Health, Safety & Environment and Quality	7
3	Programme	14
4	Risk	18
5	Commercial	23
6	On Street – Utility and Tram Infrastructure Works	33
7	Off Street Works	35
8	Trams	38
9	Assurance Monitoring	41

Milestone Table

Actual Progress of Master Schedule Plan & Variation of Section Finish Dates

Appendix 1 – Health, Safety & Environment and Consents Tracker

Appendix 2 – Cost Report

Appendix 3 – Change Log

Appendix 4 – Risk Register

Appendix 5 – On Street Schematic

Appendix 6 – Organisation Chart

Appendix 7 – Route Map

Appendix 8 – Acronyms

<b>Rev</b>	<b>Originator</b>	<b>Approved</b>	<b>Date</b>
0	Shirley-Anne Collin	Rob Leech	7 <sup>th</sup> May 2013
© Turner & Townsend. All rights reserved May 13. This document is expressly provided to and solely for the use of City of Edinburgh Council and must not be quoted from, referred to, used by or distributed to any other party without the prior consent of Turner & Townsend who accept no liability of whatsoever nature for any use by any other party.			
DOCUMENT5			

# 1 Executive Summary

## 1.1 Overview

This report covers progress made during the Period from the 31<sup>st</sup> of March to the 27<sup>th</sup> of April 2013.

During the last Period there were ten incidents reported on the Edinburgh Tram Project. One incident identified was classified as serious / significant relating to an injury to a member of the public as a result of a bus hitting and displacing the traffic management barriers, the incident is being treated as a road traffic accident by the Police and Turner & Townsend await the outcome of the Police investigation. Immediately following the incident Turner & Townsend met Infraco on site to inspect the Traffic Management which appeared to be in good order. There was also a RIDDOR reportable injury due to a site worker fracturing his hand. The other incidents comprised two environmental incidents and six near misses / unsafe conditions.

There has been a focus of attention on the standard of housekeeping on the on-street worksites.

Issues have been raised with Infraco regarding the use of Road Rail Vehicles on the tram infrastructure at Carrick Knowe Bridge where the track gradient was 1:15. A review of working practices by Infraco is underway.

There have been some changes to the Turner & Townsend team in the Period with Shirley Mushet and Ian Walker leaving the project and a revised organisation chart is included in this months Report. In conjunction with CEC Turner & Townsend are beginning to re-configure the team such that it is ready to effectively manage the transition from construction through to operations while providing support to Edinburgh Trams in ensuring the line is tested and commissioned in good time and to the correct standards.

Based upon progress up to the 30<sup>th</sup> of March 2013 the Contract milestones for Sections C and D remain forecast earlier than the contractual dates. The Section C & D Completion dates have not moved this period and remain forecast as the 15<sup>th</sup> of January 2014 and 15<sup>th</sup> of April 2014 respectively.

Regarding project risks two key risks were identified in the last Period. The first related to a potential clash between the underside of the tram and sections of infrastructure, and in particular the risk that CEC is held liable for tram interface design and construction issues. In response to this Turner & Townsend, CEC and the Independent Certifier met with Infraco and CAF to establish the likely cause of the problem and a report has now been commissioned by Infraco to establish the extent of the problem across the line. An update will be provided in the next Period Report.

The second risk related to the tram Operator Agreement not being signed in a timely manner and in response to this CEC asked Turner & Townsend to join the Operator Contract delivery team. Progress with Lothian Bus has remained very slow during the Period and it has now been agreed that an intensive session of meetings and workshops will be held throughout May in an attempt to reach agreement with Lothian Bus. If progress is not satisfactory it is likely CEC will need to consider alternative proposals for tram operations.

In the period Turner and Townsend and CEC have completed a review of the 67no. Third Party Agreements/Letters of Comfort and have identified the remaining obligations that require to be closed out. The key risks have been assessed and an action plan is being finalised. The risk allocation within the cost report has been reassessed to take account of the remaining obligations and the review has also identified the long term obligations which require consideration within the Operating Agreement negotiations. The key risks that have been identified relate to obligations on performance of the Tram system in relation to Noise, Vibration, Structural damage and stray current and the requirement for construction completion certification from NWR prior to the Tram operating. The action plans will provide detail of the specific mitigation measures and are being tracked on a weekly basis by the project team.

In the period Turner and Townsend have developed initiatives in conjunction with Siemens to maximise the recovery of costs for the surplus materials purchased through the Infraco contract. This work stream is being finalised and will require CEC to confirm the extent of the disposal required based on the available cost recovery. To date this initiative has identified cost savings of between £200k - £400k for this material. In conjunction with this review Turner and Townsend have also progressed with rationalisation of the remaining external storage areas and have consolidated the materials currently held in the NHS Leith Depot and Shenkar Leith storage yard into the Leith Bus Depot. This initiative will realise savings of £75k/annum for a modest outlay in capital cost and will be completed by the end of June 2013.

Despite Infraco reporting progress delays due to poor weather in the last Period Report the civil works completion date of June 2013 remains on target. CEC/Crummock demobilisation has been completed in the Period. Infraco have recently reported an issue relating to the completion of the track slab in the area of the buffer terminus. This issue is currently being investigated and any impact will be confirmed in the next Period Report.

St Andrew Square civil works were handed over to CEC on the 26<sup>th</sup> of April 2013. A section of North St Andrews St has been retained to complete sett laying. This is due to be completed by the 10<sup>th</sup> of May 2013.

Progress in Shandwick Place/Lothian works have been delayed due to the weather conditions at the beginning of the Period. The delays are non critical and street service works and road reinstatement works are due for completion by June 2013. Works between Haymarket and the Crescents have been impacted by the weather conditions at the start of the period however completion remains on target for June 2013. The 2<sup>nd</sup> stage track slab concrete at Palmerston is now substantially completed and will be prepared for road reinstatement in the next period.

Despite progress being made with Scottish Water senior management in relation to closing out legacy issues relating to the tram works, it is becoming clear that there is a disconnect between Scottish Water senior management and its advisors. An example of this would be Scottish Water returning to letter writing despite agreement being reached at a senior level that issues are to be dealt with in the main using the governance arrangements and project tracker currently in place. This change in approach seriously threatens the June date for close out of issues and thus increases the likelihood of additional costs being incurred by all parties in respect of ongoing management expense and increased capital expenditure.

**FINAL**

Turner and Townsend and CEC are finalising a Scottish Water close out strategy for the outstanding issues with a legal meeting currently scheduled for mid May and a principals meeting scheduled for end May 2013. It should be noted that unless significant progress is made at these discussions then the resolution of all issues with Scottish Water by the end June 2013 will be at significant risk.

In the Period Turner and Townsend have agreed the design specification for the Airport Terminus. Infraco will complete the design in the next Period and this will allow finalisation of the construction costs and contribution from Edinburgh Airport Limited. The design is based on the minimum option developed between CEC and EAL and will best placed to allow for any future expansion in this area.

There is one design issue that remains critical to completion of the Infraco works relating to the retaining measures adjacent to a Network Rail (NWR) lighting gantry at the ScotRail depot. The Form B was issued to NWR on the 26<sup>th</sup> of April 2013 and sign off is required by 3<sup>rd</sup> May 2013 to allow works to commence by the 6<sup>th</sup> of May 2013.

Turner and Townsend, CEC and Infraco have commenced a process of identifying the projects "Final Position" in relation to a number of outstanding matters with NWR. To date the issues being identified for escalation relate to the vehicle tram interface; design sign off to the gas governor, timber staircase and depot building; and potential additional works to the shuntline ballast walkway. These and any subsequent issues will be discussed at the next steering group/escalation meeting scheduled for the 14<sup>th</sup> of May 2013. Turner & Townsend will provide an update on progress in the next Period Report.

The commercial discussion on the outstanding Infraco issues relating to the additional retaining measures around the ScotRail depot have continued and Infraco have provided a briefing paper to which Turner and Townsend are finalising a response. This issue is expected to be resolved in the next Period however it should be noted works will continue to be progressed on site.

At Gateway the earthworks and drainage and track preparation works are nearing completion with track laying continuing in the Period. Works are progressing well ahead of the tamper commencing works in early July 2013.

The preparation for track installation between Murrayfield and Balgreen has been completed and track laying has commenced in the Period. Works are progressing well ahead of the tamper works commencing in early July 2013. Cabling works have commenced in the Period from the Bankhead substation towards Haymarket. Track laying is being prepared for installation at Edinburgh Park Bridge. Remedial works to flooding issues at Carrick Knowe golf course have also commenced.

Scottish Power are not currently progressing the wayleave agreement at the Haymarket substation as a result of the lack of an agreed access route with Network Rail. CEC, Turner & Townsend, NWR and Scottish Power have a meeting scheduled for w/c 29<sup>th</sup> April 2013 to progress this matter which is now critical.

CAF have now finished Routine Testing on 26 of the 27 trams, with the remaining tram (#251) scheduled to complete Type Testing when Section C becomes available for use.

CAF have confirmed that there will be no further discussion this Period on proposals to address the potential additional project costs CAF might incur following the change in the project completion date between the Rev 2 and Rev 5 project programmes. Turner & Townsend understands that additional discussions are scheduled to take place between CAF and CEC in the first weeks of the next Period.

Turner & Townsend and CAF continue to discuss the completion of the Sub-Contractor Direct Agreements which CAF have developed with their suppliers, as required by the Tram Supply Agreement. CAF have reported that any amendment to the current agreements may be difficult to agree with suppliers, as they have been in place for some time. CAF also state that there are some suppliers who will not sign-up to the agreement. Turner & Townsend have agreed to review the issues and discuss potential solutions with CAF.

CAF have confirmed to Turner & Townsend that it would be possible to extend the date of expiry of the Tram Supply Agreement (TSA) Performance Bond past the 15<sup>th</sup> of May 2013, which had been agreed as the expiry date during mediation discussions, however there would be a cost incurred for any extension. Turner & Townsend are currently reviewing the requirement for the bond, to determine whether any extension would provide any substantial benefit to CEC.

The Safety Verification team are now planning the audit schedule for 2013 with Technical Support Services (TSS), following the review of the schedule by all parties.

Following initial sampling of the Case for Safety evidence for Section B, a general concern has been raised that the evidence supplied does not adequately demonstrate successful integration and that snags and known exclusions have not always been captured. It has been agreed that this will be discussed at the next ICP Liaison meeting on 8<sup>th</sup> May 2013; with the SV team using the proposed SV audit "Demonstrate the sectional handover is assured" to investigate any integration matters arising.

Turner & Townsend will facilitate a 'Lessons Learned' workshop on the 8<sup>th</sup> of May 2013, to determine the most effective and efficient way to manage the submission and review of documentation required for Section C, as a repeat of the Section B submission process would most likely result in a delay to Section C Completion.

The overall forecast shows a minor £19k reduction in the period although there are a number of larger offsetting changes within the detailed sections of the cost report as scope is clarified and values of change are agreed. During the period, the risk allowance has reduced by £330k. This is principally a result of previously identified risks being realised and transferring into the body of the cost report. There was however, works to Scottish Water assets which had previously been excluded from the costs which were instructed in the period. These costs have been offset against savings identified elsewhere.

There remains some significant risks to the overall forecast, notably associated with the valuation of on street change, potential claims submitted by Infracore and Tramco for programme change and closeout of cost reimbursable elements of the project, particularly McNicholas and Scottish Water. The forecast includes a provision for these elements of work and the risks are being monitored on a period basis to allow mitigation action to take place if necessary.

**FINAL**

There are a number of other risks and exclusions associated with the forecast which are noted in the commercial section of this report.

### 1.2 CEC Actions & Decisions

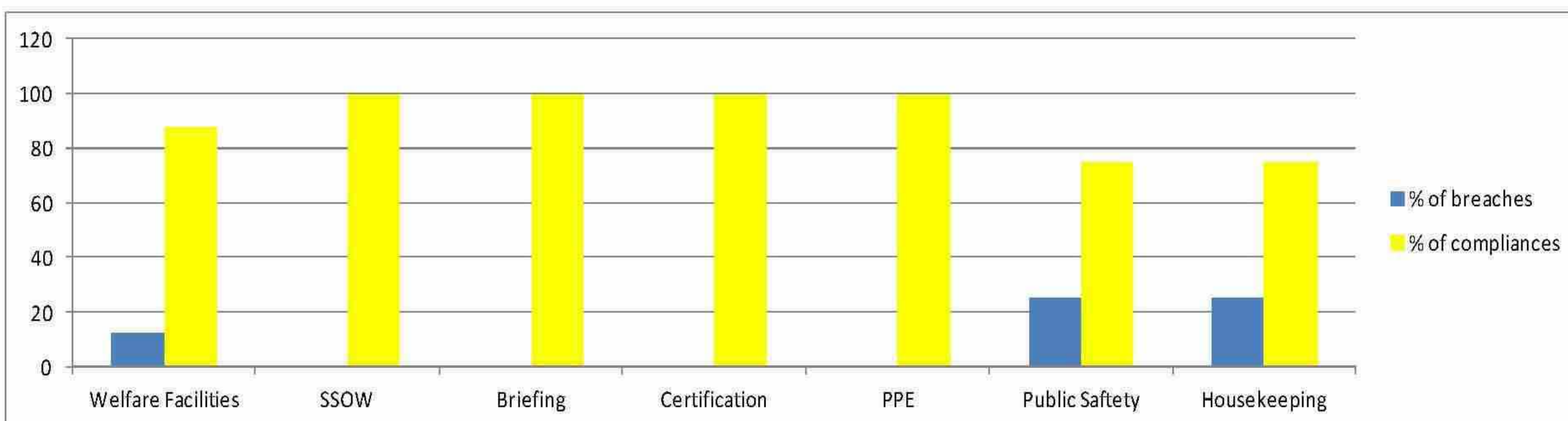
The following issues require CEC action and/or decision:

1. Scottish Power are not currently progressing the wayleave agreement at the Haymarket substation as a result of the lack of an agreed access route with Network Rail. CEC and Turner & Townsend are urgently meeting Network Rail and Scottish Power to progress this matter.
2. Formal confirmation is required on whether CAF have agreed to a proposal to address the potential additional project costs CAF might incur following the change in the project completion date between the Rev 2 and Rev 5 project programmes.
3. The water ingress into the depot building maintenance pits, Wheel Lathe and lifting platform pits remains to be resolved with discussions ongoing between CEC and Infracore.

## 2 Health, Safety & Environment and Quality

### 2.1 Management of Health & Safety

Joint monitoring of the leading indicators has continued to be undertaken between Turner & Townsend and the Principal Contractors, the results are included using the graphic below. The leading indicators have identified that public safety and housekeeping are the areas with the highest non-compliance.



Issues regarding public safety are being addressed through increased joint monitoring with the principal contractor in areas which have a public interface and Turner & Townsend is seeking demonstrable compliance with the Code of Construction Practice in high risk areas of the project. The requirement to utilise dust suppression have been raised with the contractors at the project Occupational Health and Safety Meeting.

The standard of housekeeping on the on-street sections has been subject to a series of reviews due to the ongoing issues with construction waste and other waste materials which are within the site boundary fences. Some improvements have been noted but the issue will remain a focus of attention.

After observing Road Rail Vehicles (RRVs) in use by Siemens on severe gradients at Carrick Knowe Bridge, Turner and Townsend requested that these activities be stopped pending assurance that actions resulting from the RRV runaway incident in November 2012 have been satisfactorily closed out. These actions included completion of risk assessments, safe systems of work and competency.

Issues were also raised by Turner & Townsend regarding the use of a Road Rail Vehicle on a 1:15 slope to erect OLE columns at Carrick Knowe Bridge. Consequently Infraco took a decision to cancel the work activities planned under a Network rail possession pending the outcome of a review into the safe system of work. A meeting has been arranged by Infraco and Turner & Townsend for the 8<sup>th</sup> of May 2013 to close out actions regarding the use of the Road Rail Vehicles.

Infraco held their monthly Occupational Health & Safety Meeting on the 30<sup>th</sup> April 2013 which was attended by Turner & Townsend. Agenda items for the meeting focused on four key issues that and comprised:

- Eye protection – a presentation was given by bolle, a supplier of eye protection;
- Technical training – a presentation was given by a representative from Edinburgh College regarding the opportunities for construction related training.
- Dust suppression – issues regarding the requirements for controlling activities that generate dust.
- CoCP issues – highlighting issues relating to traffic management and members of the public.

## **2.2 Incident Management**

### **2.2.1 Incident Reporting**

During the last Period there were ten incidents reported on the Edinburgh Tram Project. One incident identified was classified as serious / significant relating to a member of the public who was involved in an accident outwith the work site when a bus hit and displaced a barrier that formed part of the traffic management system. There was also a RIDDOR reportable injury to a site worker due to a fractured hand caused by a rear door of a van being blown shut onto the hand in high winds. The other incidents comprised two environmental incidents due to noise and dust emanating from the construction works and six near miss / unsafe conditions.

There has been no contact from Lothian & Borders Police regarding the incident in the previous period which related to the road traffic accident and death of a member of the public who was a pedestrian.

### **2.2.2 Record of Incidents**



## Progress Report No. 20 – 31<sup>st</sup> March to 27<sup>th</sup> April 2013

**FINAL**

Incidents reported within this Period comprise:

Serious / significant incident

1

Non Tram Related

0

Date	Location	Detail	Contractor	Classification
04/04/13	South St Andrew St	Complaint from MOP to CEC regarding noise, dust/ debris and fumes associated with use of thermal lances.	BBS	Environmental
09/04/13	Constitution Street/Duke Street	Penetration of cellar room whilst undertaking SW Service Renewal Works. McNicholas to assess and repair any damage.	McNicholas	Near miss / unsafe condition
09/04/13	Princes Street	Penetration of cellar roof whilst undertaking Priority 2 works. McNicholas to assess and repair any damage.	McNicholas	Near miss / unsafe condition
09/04/13	Haymarket	2 no operatives were involved in cutting concrete during repair work but failed to have dust suppression in place. MOPs on adjacent footpath were exposed to dust. HSE Inspector on his way to work reported this issue to Infraco.	Lagan	MOP
14/04/13	Shandwick Place	CEC Care and Response Team to have reported that barriers (X2) have been blown over in high winds.	Lagan	Near miss / unsafe condition
14/04/13	York Place	CEC Care and Response Team to have reported that barriers have been blown over in high winds.	Crummock	Near miss / unsafe condition
16/04/13	Hanover Street/Mound	Cantilever breaking away from OHL mast due to weather conditions.	BBS	Near miss / unsafe condition
16/04/13	Gogarburn Tram stop	Roof of tramstop at Gogarburn damaged due to weather conditions	BBS	Near miss / unsafe condition
16/04/13	Shandwick Place/York Place	Injured party fractured his hand through crushing it between the two van doors caused by door slamming shut in high wind. RIDDOR reportable incident.	Marcon	Injury
20/04/13	Palmerston Place/West Maitland Street	Bus hit barrier and pushed barriers into a pedestrian. Bus did not stop. Pedestrian injured. Police called and attended site. Pedestrian taken to hospital – suspect broken leg. Police Investigating.	Class One	MOP

### 2.2.3 Incident Progress

With regard to the Road Rail Vehicle Incident (RRV) that occurred on the 23<sup>rd</sup> of November 2012 Turner & Townsend have had meetings with Infraco and have suggested additional actions relating to risk assessment, safe systems of work and competence. These have been accepted by Infraco. Evidence is still to be provided as to how a safe system of work will be implemented to undertake OLE erection on the further sections of the tramway.

### 2.3 CDM Regulations

A meeting was held with Scottish Water regarding the development of the Health and Safety File for the Scottish Water utility diversion works. A copy of the draft Health and Safety File information for the legacy MUDFA works was issued to Scottish Water. A response has been received from Scottish Water which is being responded to.

**FINAL**

The protocol for the arrangements for third parties to access the Tram Infrastructure to undertake works was issued to relevant third parties along Section B and utility companies. There is an outstanding action to develop protocol for working on or adjacent to the line when operational and CEC are in discussions with Edinburgh Trams as to how this can be expedited as early as possible. It has been agreed that CEC and Edinburgh Trams will aim to have the protocol in place by the end of May.

St Andrew Square / South St Andrew Street were released back to the public realm following completion of track work and completion of joint Infracore/T&T/CEC safety inspection and snagging work.

Turner & Townsend are undertaking CDM (Coordinator) duties for 2 additional CDM notifiable projects, namely the installation of tram ticketing equipment and the reinstatement of the Hearts war memorial at Haymarket.

**FINAL**

**2.4 Environmental**

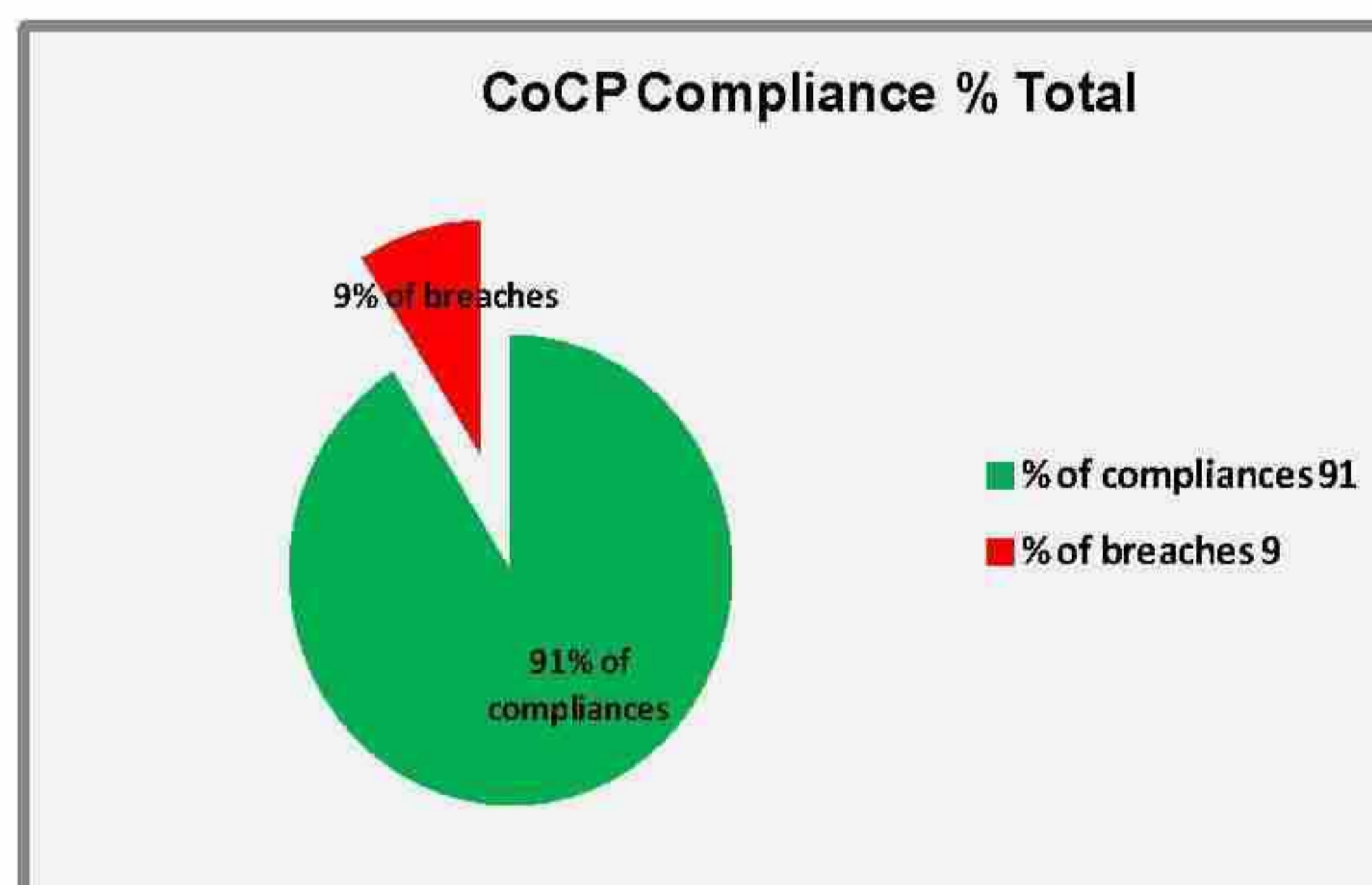
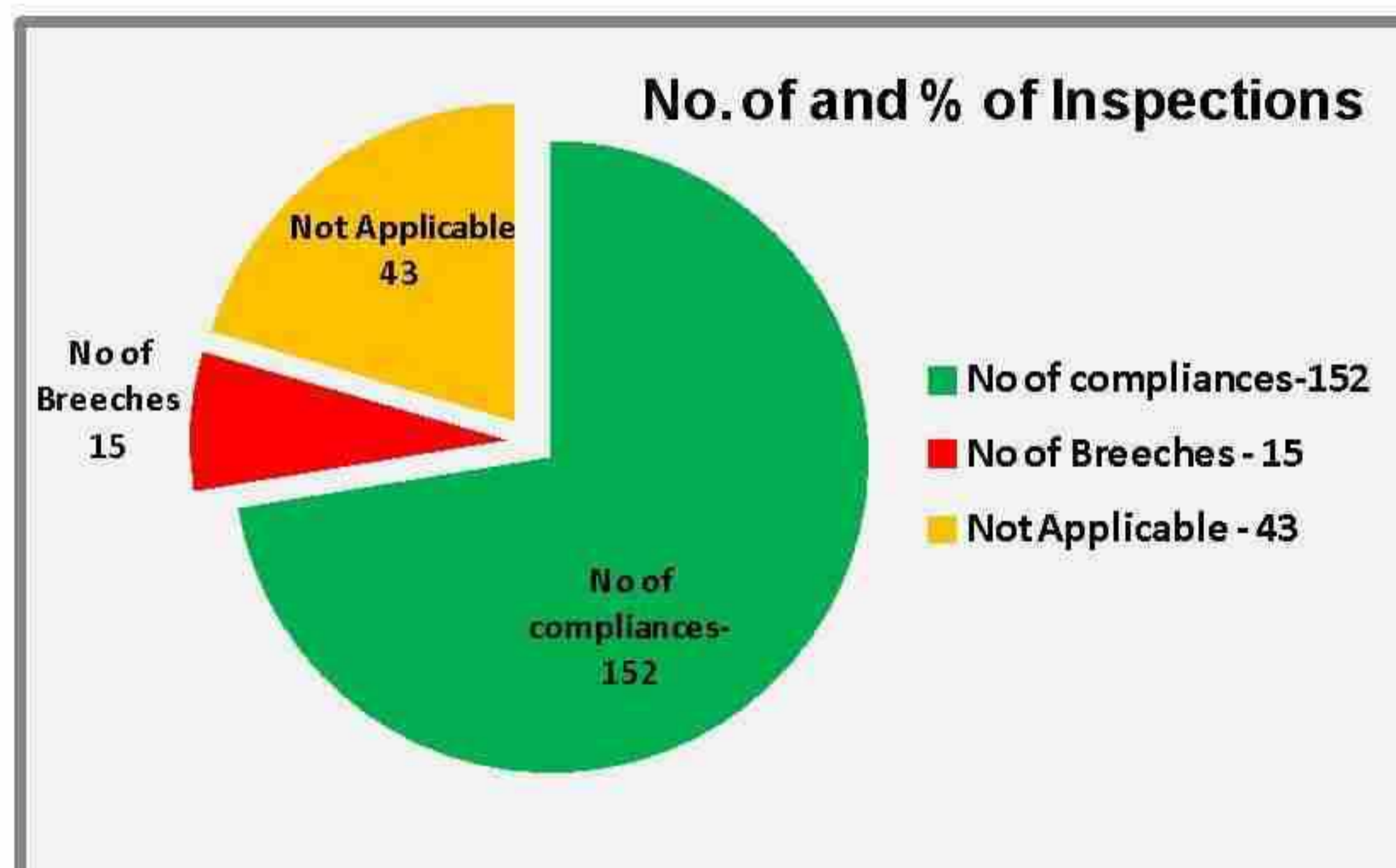
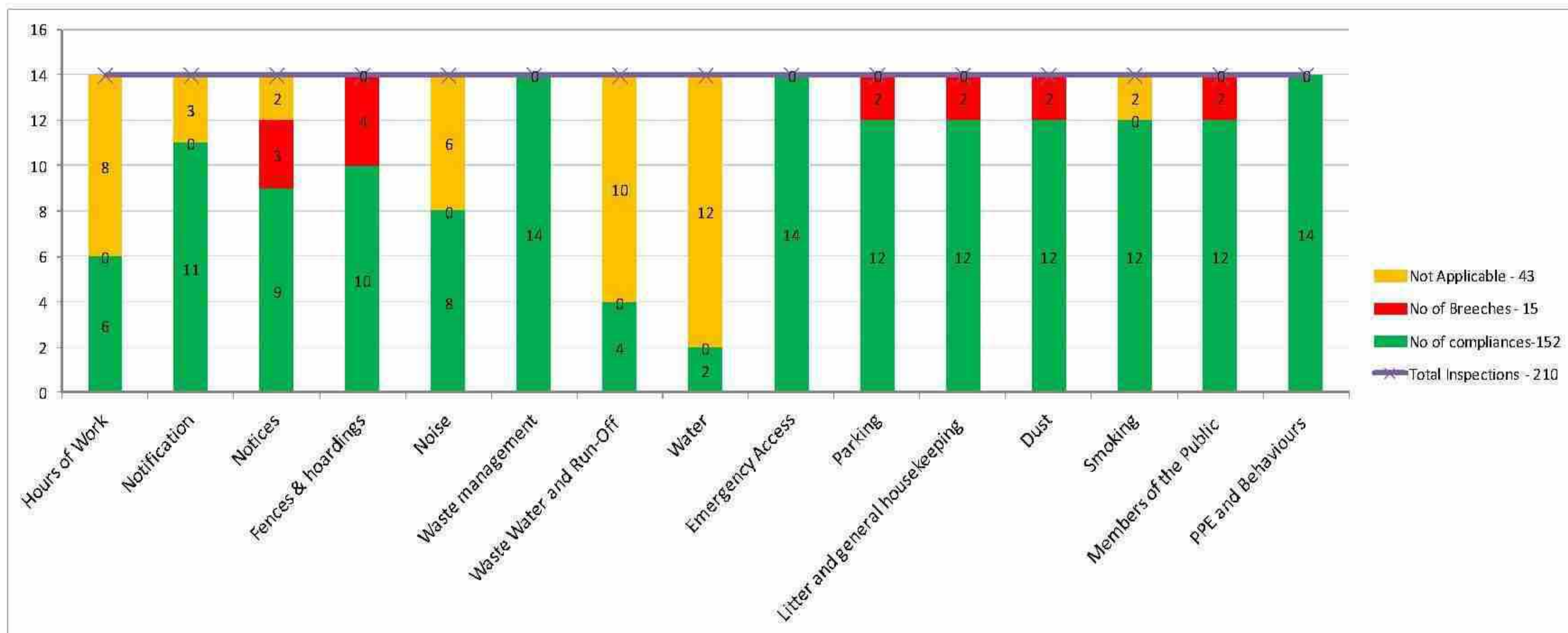
An environmental inspection was carried out with McNicholas on the 16<sup>th</sup> of April 2013. The inspection covered Haymarket, Coates Crescent and Shandwick place. No major issues were identified, however it is noted that issues were being encountered due to the adverse weather conditions, particularly with debris blowing about the sites. It was also noted that the gates at the site entrance at Coates Crescent were being left open which was causing confusion for motorists as it was not clear the road was closed. This was outwith the McNicholas scope of works but Infracore were notified.

A meeting was held with John Lawson CEC Archaeological Services to discuss the publication of the Post Excavation works. As a result a draft report is due to be submitted to CEC and Turner and Townsend detailing potential costs. This report will be finalised and formally issued during the next period.

Quotes have been received from a company called RSK with regards to monitoring required at the Gogarburn, in accordance with the requirements of the SEPA Controlled Activities Licence. Further quotes are awaited from WSP and Envirocentre.

**2.5 Code of Construction Practice (CoCP)**

CoCP compliance was recorded at 91% during the Period.



**FINAL**

Breaches marked in red in table below.

○ Q1. Hours of Work	○ Q9. Emergency Access
○ Q2. Notification	○ <b>Q10. Parking</b>
○ <b>Q3. Notices</b>	○ <b>Q11. Litter and general housekeeping</b>
○ <b>Q4. Fencing and Hoarding</b>	○ <b>Q12. Dust</b>
○ Q5. Noise	○ Q13. Smoking
○ Q6. Waste Management	○ <b>Q14. Members of the Public</b>
○ Q7. Waste Water and Run-Off	○ Q15. PPE and Behaviours
○ Q8. Water	

## **2.6 Quality**

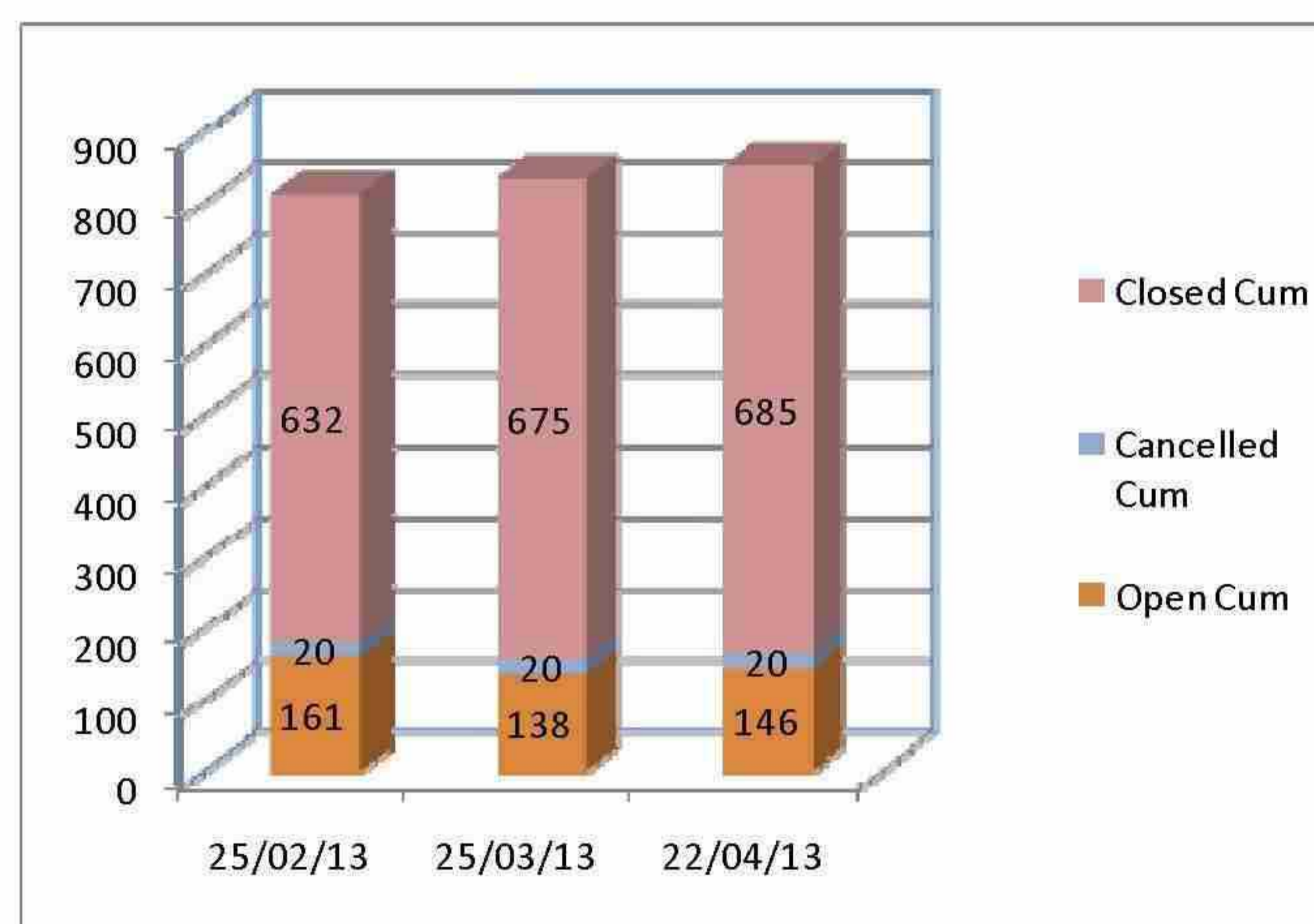
### **2.6.1 Key Issues**

### **2.6.2 Non-Conformance Reporting**

Monitoring by Turner & Townsend of the NCRs raised on the project continues. Details of the NCRs are included below:

The number of NCRs raised to date is 851. 18 NCRs were raised during the Period and 10 NCRs were closed out during the Period. 62 open NCRs are greater than 6 months old and 146 remain open.

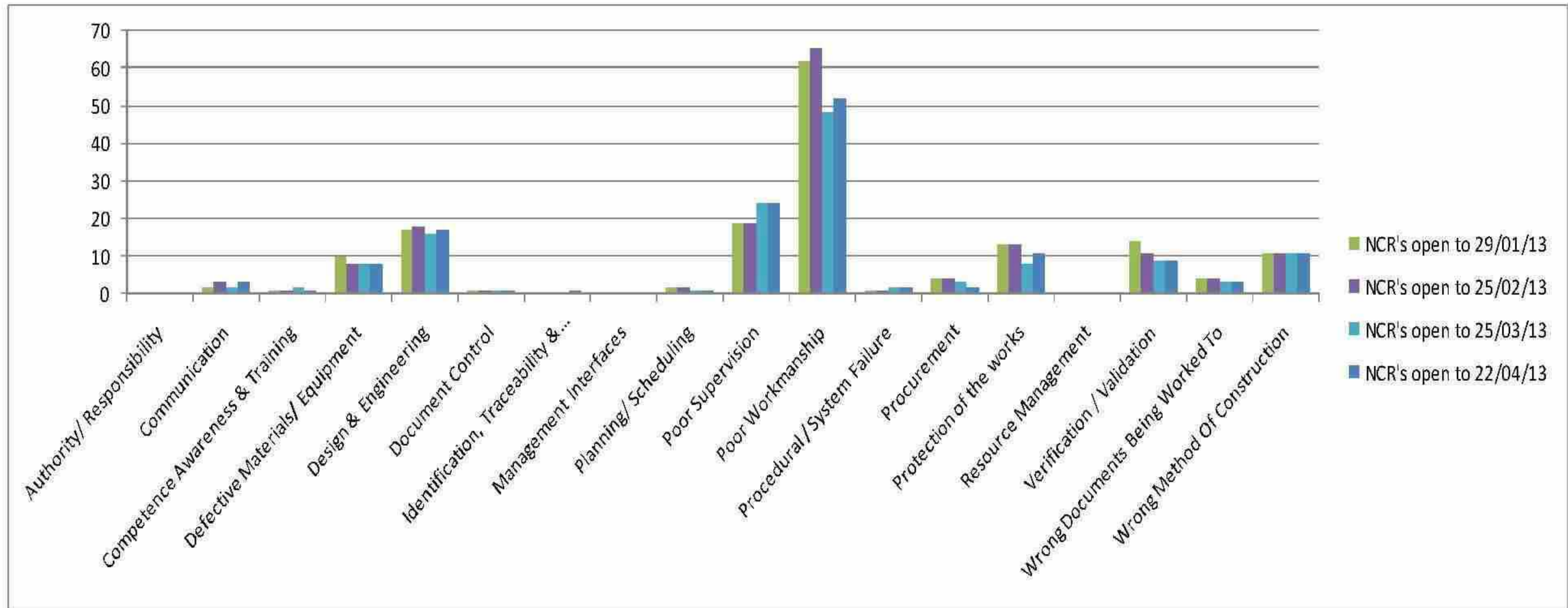
#### **Summary of non conformances**



**FINAL**

**Breakdown of non conformances**

Classification of open non conformances



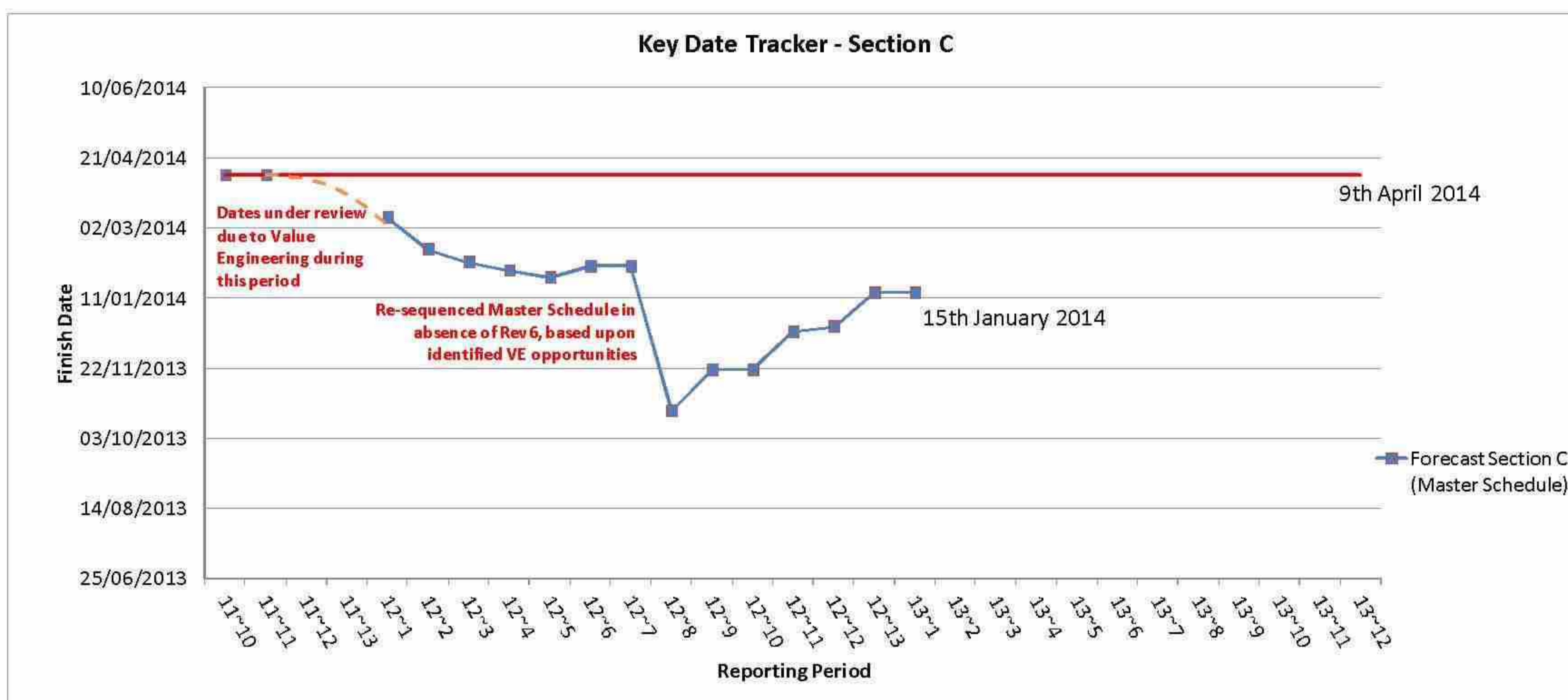
### 3 Programme

#### 3.1 Programme Overview

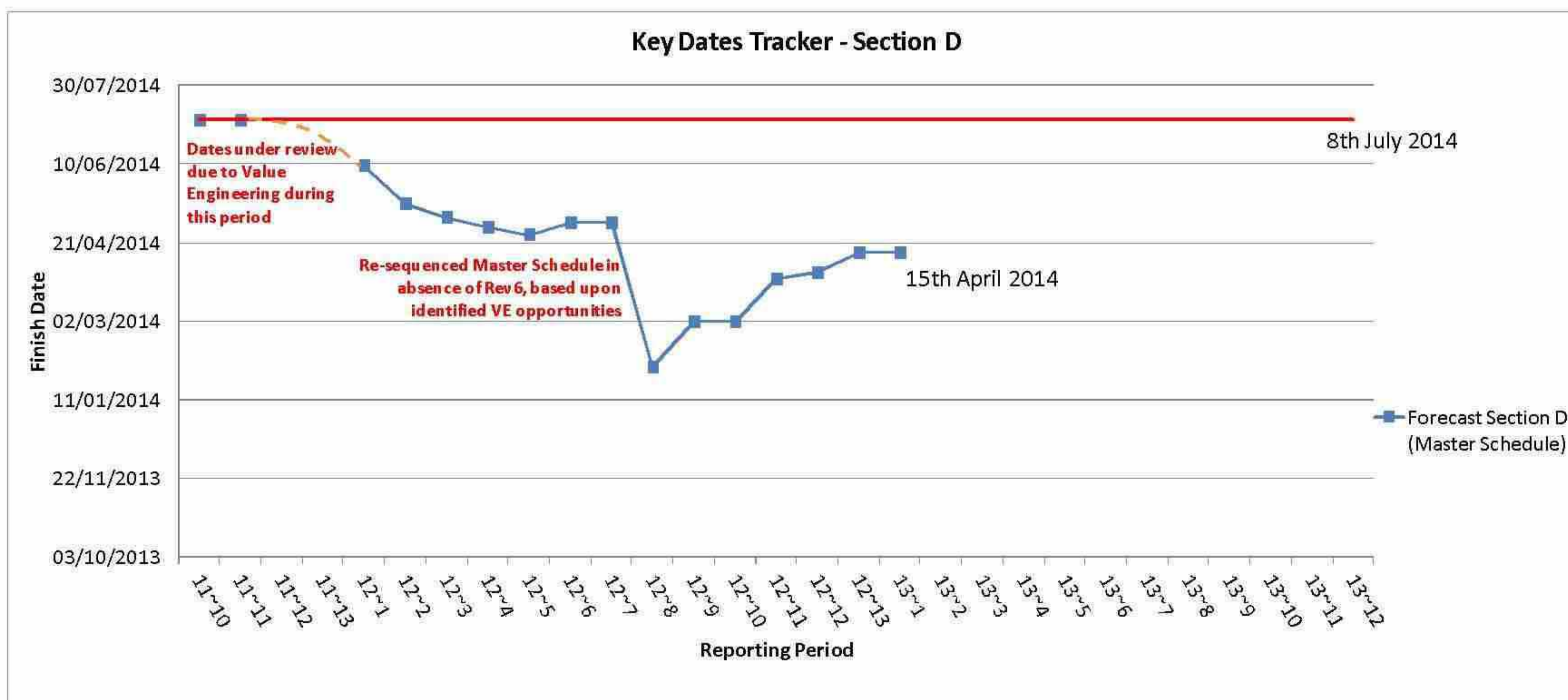
Based upon progress up to the 30<sup>th</sup> of March 2013 the Contract milestones for Sections C and D remain forecast earlier than the contractual dates. The Section C & D Completion dates have not moved this period and remain forecast as the 15<sup>th</sup> of January 2014 and 15<sup>th</sup> of April 2014 respectively.

The charts below track the forecast dates (from the Master Schedule) for the Sectional Completion milestones against the contractual dates and their movement throughout the project lifecycle to date. All information and analysis contained in this Programme Section of the report is based upon the Master Schedule, unless otherwise stated.

Section C; All Construction Complete (including T1 & T2 testing)



Section D; Open for Revenue



**FINAL**

The Section C and D dates continue to be driven by the earliest forecast energisation dates for the Cathedral Lane substation. This is based upon the Infraco letter, "HV & LV meter installation dates by EDF Energy", sent on the 15<sup>th</sup> of February. The letter states that Infraco's assessment is that the Cathedral HV meter will be required on the 3<sup>rd</sup> of September 2013. Further clarification continues to be sought from Siemens in relation to the intended sequencing of works for installation of OHLE/traction power and E&M fit-outs that will run concurrently with and subsequent to the tamper activity.

Infraco remain committed to the completion of all track laying between the Depot and Murrayfield Tram Stop, ahead of the tamper works. However, the use of resource levelling, in the progressed Rev5, is increasingly creating inaccurate forecasting of these works. Infraco acknowledge that they will have to work simultaneously along three, off-street, track laying fronts in order to meet the tamping dates of the 1<sup>st</sup> to 26<sup>th</sup> of July 2013.

### **3.2 Progress this Period**

There have been no section completions this period, therefore the project total number of sections complete remains at seven, with the remaining twenty-three in progress. Prolonged cold weather has had an adverse effect to progress of concrete and track sealant works. Overall progress across the sections remains steady and forecast ahead of the Original Rev5 schedule submitted by Infraco in June 2012.

Works along the tram line in York Place lost a further -16d in period. This was a result of limited progress of track civils at the east end of York Place and non-commencement of the York Place Tramstop this period.

Along the Murrayfield corridor; subsection 12, Roseburn Junction to Murrayfield tramstop (RbJn-MUS) track civils continue to progress slowly with a further -15d lost in period. The subsection now shows current available float of 20d. Infraco anticipate to only have track laid, from the Depot to MUS tramstop, in time for the tamping machine. This will mean all ballasted track is laid in accordance with the tamping dates. However, it will impact on the installation and commissioning of the Off-Street OHLE catenary lines, which is dependent on the completion of track laying from MUS through to Haymarket Yards.

Murrayfield corridor subsection 11, Murrayfield tramstop to Balgreen tramstop (MUS-BAL) has also slipped this period, by -19d, due to late commencement of track laying. Based upon the contract schedule, 150% efficiency will need to be achieved with the two off-street track gangs, in order to meet the fixed tamping dates of the 1<sup>st</sup> to 26<sup>th</sup> July 2013. Infraco have stated they recognise that off-street track laying will need to be progressed simultaneously on three fronts (Sections 5A, 5B and 5C). The resource levelling constraint, in the Master Schedule, has been adjusted to account for this. This section has 15d float.

At Edinburgh Gateway, as part of the efforts to meet the fixed tamping dates, track laying has commenced. Works on the rest of the retaining structure and embankment drainage continues to progress steadily. Despite this there has been -13d lost along this section. This has been primarily due to the cold weather, which as had an impact on the reinforced concrete slab works for the track.

**FINAL**

### **3.3 22 Week "Time Bank"**

The Rev5C Section D completion date continues to oscillate around early April 2014. This movement has been attributed to Infraco's own works and the 22 week drawdown remains at 14 weeks.

In January 2013, Turner and Townsend queried a number of delay events relating to York Place, in the Rev5C which came from Infraco's Section 1C tracker. It has subsequently transpired that within Infraco's tracker document, there are a number of additional delay events relating to St Andrew Square and Waverley Junction which were also not correctly recorded. Turner and Townsend are working with Infraco to establish the correct details for these delay events recorded by Infraco. It is likely that a review will also be required of previous Rev5C submissions, going as far back as May 2012. It is not anticipated that this review will result in any change to recorded 22 Week "Time Bank" draw down figures. With the exception of one reporting period the Rev5C critical path and therefore the 22 Week draw down has been determined by events in Section 1D (Shandwick Place) and not events in Section 1C.

It continues to be the view of both Infraco and Turner & Townsend that the likelihood of any future adverse delay events, attributable to client street works, remains significantly low.

### **3.4 Critical Path and Key Float Paths (Master Schedule)**

The Critical Path relates to the 'Longest Path' through the schedule, which would adversely affect the currently forecast end date if delayed. For the purposes of this project Turner and Townsend monitor the critical path and the next three longest paths, referred to as "Key Float Paths" through the schedule.

This period there has been no change in the Critical Path or Key Float Paths. The energisation of the Cathedral Substation continues to drive the Master Schedule, followed by the installation and commissioning of the E&M, in particular the OHLE. The adjustment of the resource levelling constraint to Off-Street track gangs has enabled the fixed tamper dates to remain non-critical. However, there is still some further clarification required, from Siemens, as to sequencing of the OHLE catenary line works and tamping of the track. These separate types of works are increasingly likely to be competing for work space along the track, between the Depot and Murrayfield Tram stop.

The current Critical Path is:

- 1. On-Street** Section 1C Cathedral Lane Substation / SAT and SITs

The Key Float Paths are:

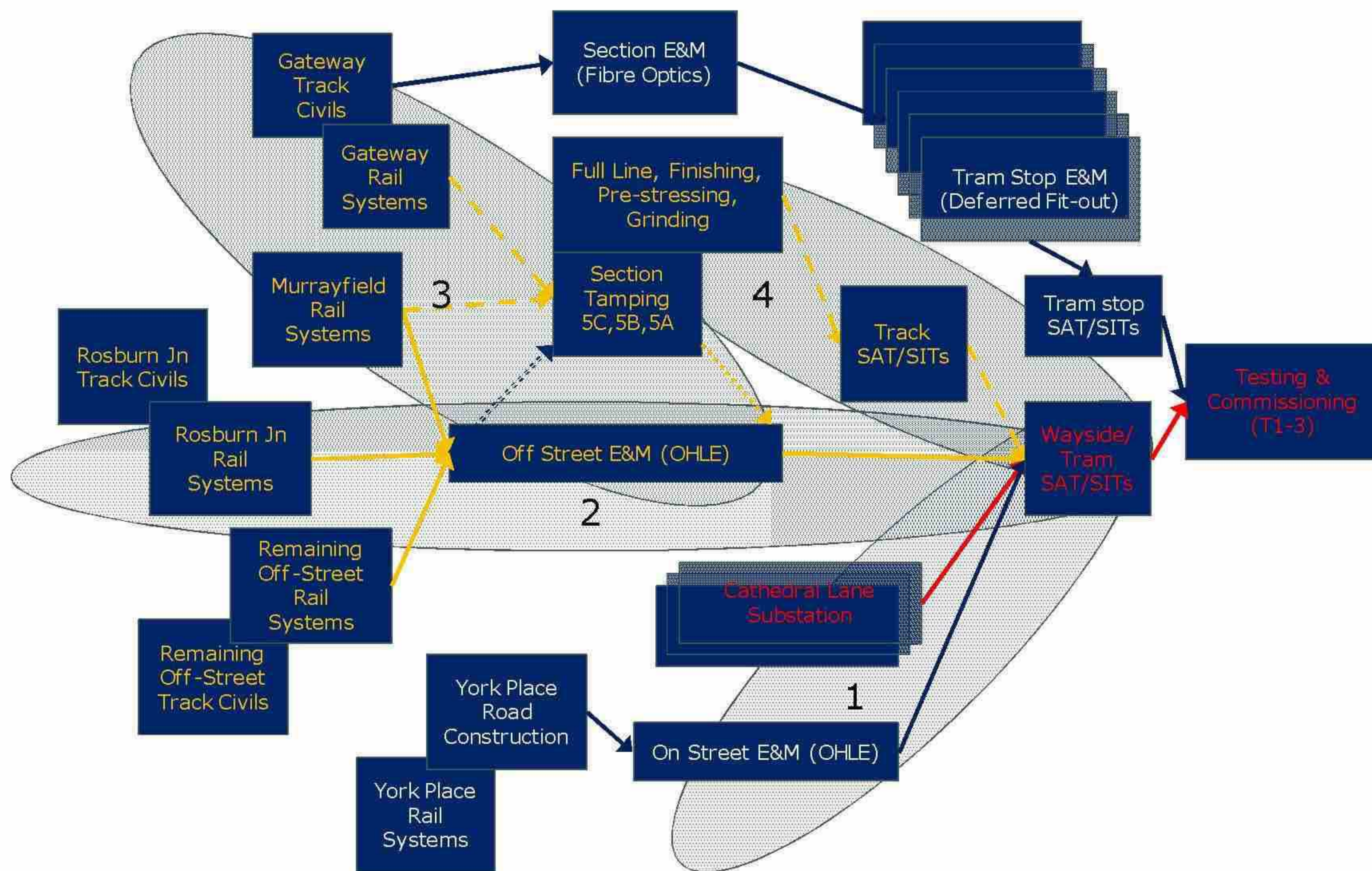
- 2. Off-Street** Section 5A and 5B / E&M (OHLE) / SAT and SITs
- 3. Off-Street** Section 5C Gateway / Tamper/ E&M (OHLE) / SAT and SITs
- 4. Off-Street** Full Line Finishes / SAT and SITs



**FINAL**

These float paths are continuously updated and reassessed. Below is a diagram which shows the interdependencies between these packages of work and the four float paths listed above.

Logic Diagram of the Master Schedule Critical and Key Float Paths



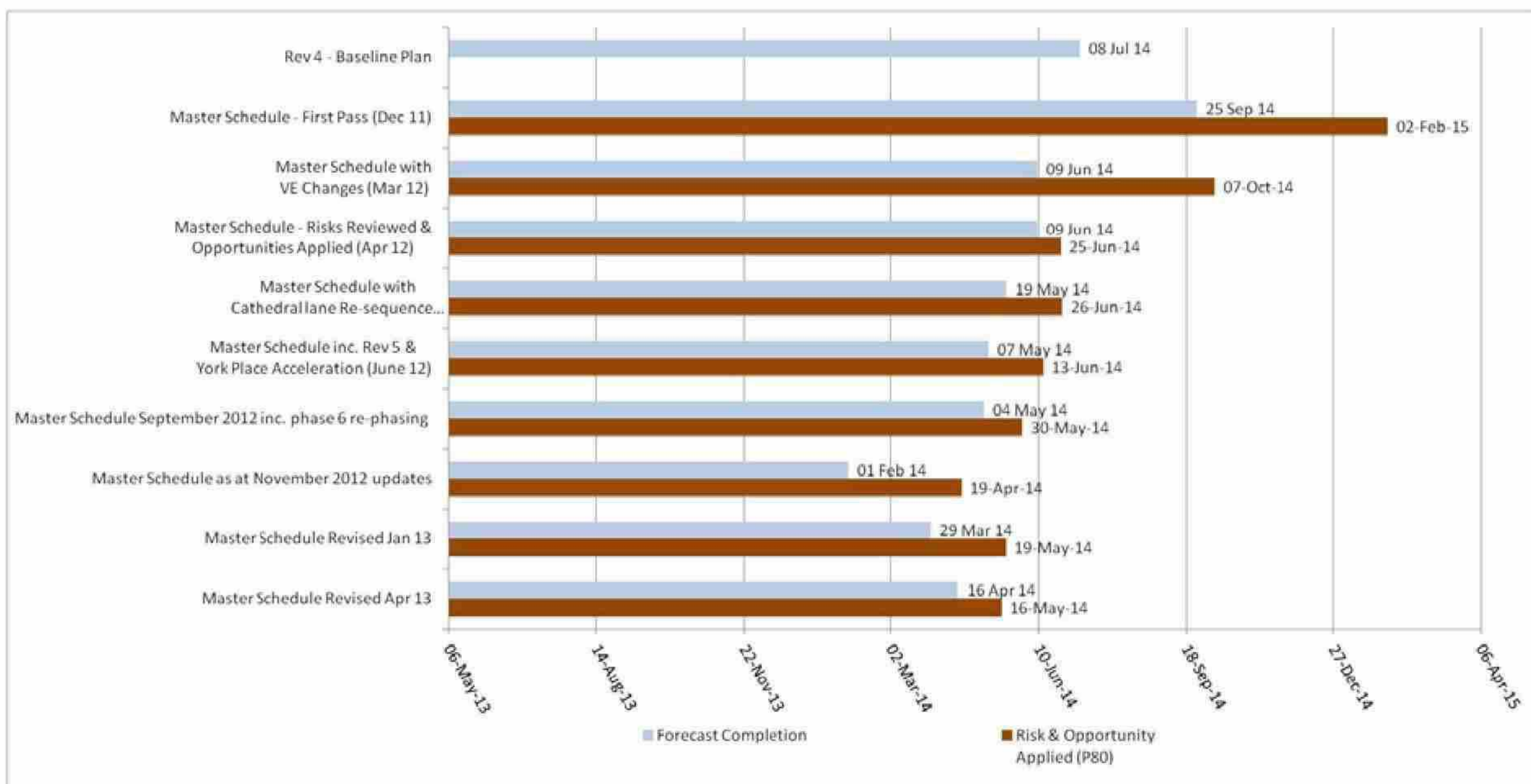
## 4 Risk

### 4.1 QSRA Tracker

The QSRA is run every quarter or when there are any new significant changes to programme or delivery strategy occurs. The risk profile used in the QSRA is made up of schedule related risks which form part of the attached Master risk register.

The chart below shows the forecast dates (before risks and opportunities are included) and the 'impacted' dates for all QSRA's:

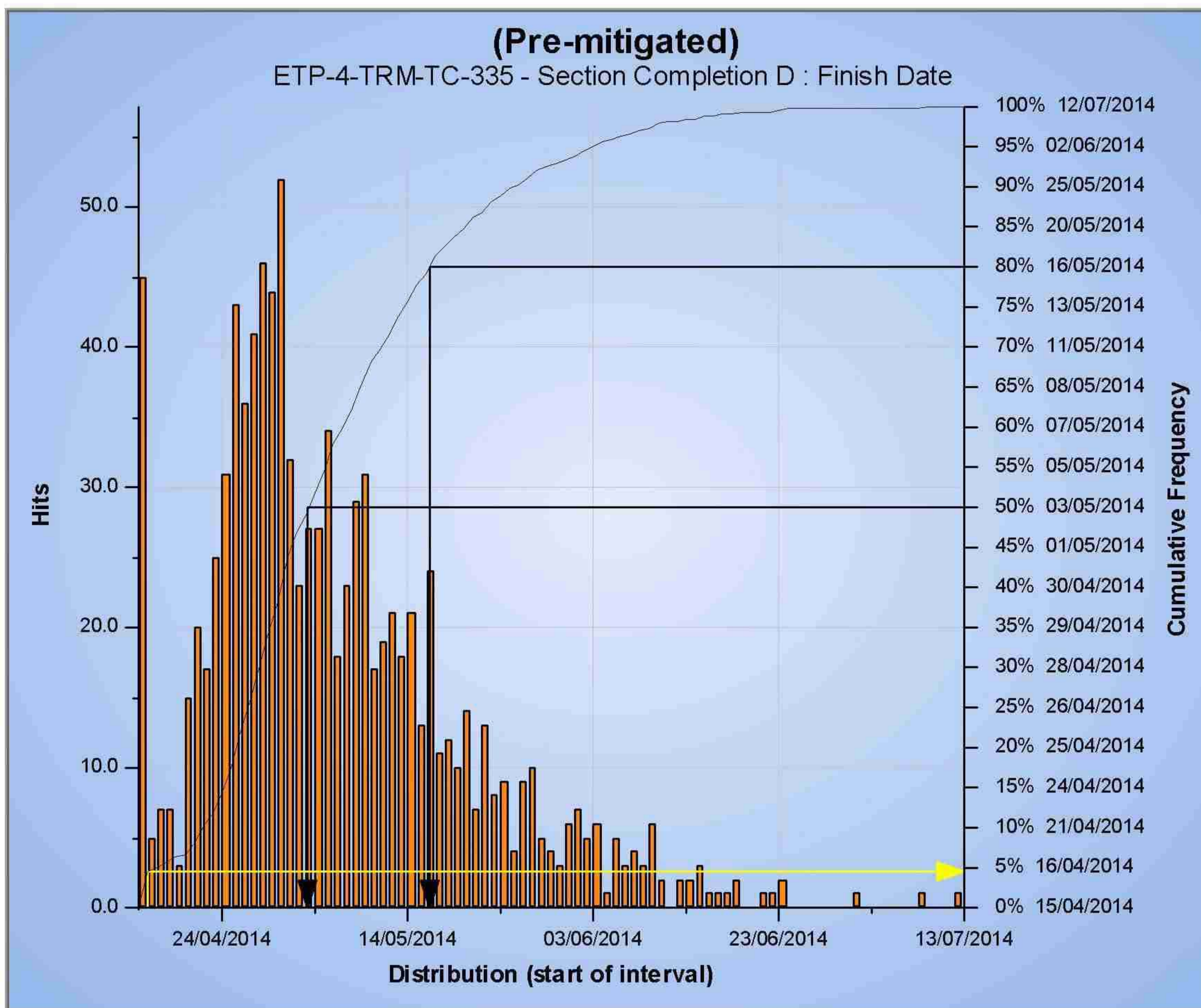
#### QSRA Trend Analysis



#### 4.1.1 Risk Likelihood (P80)

The latest QSRA was carried out on the most up to date schedule on the 21<sup>st</sup> of April 2013. This was analysed with the current Risk and Opportunity profile to calculate the milestone date as shown below. Based on the results of the QSRA carried out on the Master Schedule, the analysis predicts a **P80 Section D completion date of the 16<sup>th</sup> of May 2014** against the current risk and opportunity profile and there is approximately a 4% probability that the current schedule completion date of the 16<sup>th</sup> of April 2014 will be achieved as shown in the distribution graph below.

**FINAL**



P80 represents an 80% likelihood of completing the milestone on that date, based on the current schedule and risk profile. It is usual practice to utilise the P80 date as a standard on a project of this size, nature and public profile.

#### 4.1.2 Cost impact of delays in Haymarket to Depot

The Infraco and Turner & Townsend Progress Reports have identified that delays have occurred in Sections 2A/5A and Section 5. The delay has resulted principally from Infraco's delayed commencement of the retaining structures in Section 2A/5A, finalisation of Structures and Edinburgh Gateway in Section 5.

Through reference to the weekly prolongation costs included in the contract, the delay costs could amount to c. £1.8M. A Compensation Event Notice for prolongation costs has not been received.

The QSRA and QCRA does not contain any allowance for these potential delay costs since a Compensation Event Notice has not been received from Infraco and following discussions with CEC, Turner & Townsend also understand that Infraco has confirmed at the Joint Project Forum that no claims are currently being prepared.

#### 4.1.3 QSRA Iterations

These iterations of the Quantitative Schedule Risk Analysis have been carried out since September 2011, details and progress made are summarised below:

QRA Iteration	What is included
Master Schedule – First Pass	High Level schedule produced for QSRA analysis. Including utilities diversions.
Master Schedule with VE Changes	Post VE exercise. Revised On-Street phasing. Removal of summer embargoes. More mature Risk Register.
Master Schedule – Risks Reviewed & Opportunities Applied	Updated programme. Detailed Risk review. Identification of opportunities and application to the QSRA.
Master Schedule with Cathedral Lane Re-Sequence	Further updated programme. Early start of Cathedral Lane Sub-Station works. Impacted Scottish Water risks. Risk Review.
Master Schedule – including Rev5 and York Place ‘Radical Programme’ changes	Further updated programme. Rev 5 changes to Off-Street section. Early start of utility diversion works at York Place. Risk Review.
Master Schedule as at September 2012 including phase 6 re-phasing	As above plus: Progress to date and the re-phasing of section 6 to follow phase 2 instead of 5. This is assumed to be achievable.
Master Schedule as at November 2012 updates	As above plus: Works at York Place; Shandwick Place; Murrayfield Corridor; Gateway; as well as for the Depot to Haymarket track finishes, pre-stressing and grinding updated in line with Turner & Townsend’s estimate of the as-planned works. Risk & opportunity review in conjunction with the above changes.
Master Schedule as at January 2013	Programme incorporating progress up to the 5 <sup>th</sup> January 13.
Master Schedule as at March 2013	Programme incorporating progress up to the 30 <sup>th</sup> March. Energisation dates for Substations based upon Infraco’s requested HV meter dates to CEC (letter dated 14 <sup>th</sup> Feb 13).

**FINAL**

## 4.2 Project Risk update

This section discusses the changes to the Master Risk Register (MRR) which contains risks against the Master Schedule. It does not discuss changes to the Collaborative Risk Register (CRR), which is maintained by Turner and Townsend in collaboration with Infracore, detailing risks against the contract programme. Changes to the CRR are reported as part of the Programme & Risk meetings which are held every 4 weeks.

Each Period the MRR is reviewed and risks are assessed on an ongoing basis, with a general trend of reduction of risks as the team continues to mitigate against the potential impact. Following this Period’s regular review, there are three risk movements and five risk closures to be reported.

### 4.2.1 Risk Movements

Risk	Change
Scottish Water close-out lead to prolongation of resource beyond June 13.	Probability decreased as discussions with Scottish Water are progressing encouragingly <sup>1</sup> .
SPN requirement for additional cabling & insurance ducts to mitigate foamed concrete & set construction.	Probability decrease as one instance occurred, less likely to happen again on remaining route as they are seen as low risk in comparison.
Failure to recover costs for utilities off street from Infracore paid by CEC.	Probability Reduced as not been contacted with any further claims and with works progressing the probability of any future claims is diminishing.

### 4.2.2 Risk Closures

The following are no longer considered to be a risk to the remaining works associated with the project due to the progression of works and the close outs from this period’s PMC meeting.

Risk
Discovery of additional Track construction conflicts (Live).
Delay to achieving utility consents & supervision requirements for work increase.
OLE bases conflict with existing unknown and known utilities.
Discovery of old Tram tracks and equipment.
Reduced system envelope of TRW system (less than 1,200 mm).

---

<sup>1</sup> A decision to reduce the probability in relation to this risk was taken early in the period. Since taking this decision however Scottish Water appear to be reverting to past behaviours and this will need to be monitored, particularly in relation to additional cost

#### **4.2.3 Risk Review Gateways**

It had been agreed with CEC, that three risk gateway reviews will be carried out with regards to the timing of the closure of risks relative to the progress of the construction programme. These gateways were developed following a draft note created by Turner & Townsend following a request from CEC. The draft note could only be created based on the assumption that the Risk Profile remained at its current position, and that works progressed as per the master schedule, at the time of the draft.

The three gateways were listed to be at the end of the following months; April 2013, June 2013 and August 2013. The first gateway meeting has been held after the Period End and an update will be provided in the next period report.

#### **4.2.4 Key Risks**

Regarding project risks two key risks were identified in the last Period. The first related to a potential clash between the underside of the tram and sections of infrastructure, and in particular the risk that CEC is held liable for tram interface design and construction issues. In response to this Turner & Townsend, CEC and the Independent Certifier met with Infracore and CAF to establish the likely cause of the problem and a report has now been commissioned by Infracore to establish the extent of the problem across the line. An update will be provided in the next Period Report.

The second risk related to the tram Operator Agreement not being signed in a timely manner and in response to this CEC asked Turner & Townsend to join the Operator Contract delivery team. Progress with Lothian Bus has remained very slow during the Period and it has now been agreed that an intensive session of meetings and workshops will be held throughout May in an attempt to reach agreement with Lothian Bus. If progress is not satisfactory it is likely CEC will need to consider alternative proposals for tram operations.

**FINAL**

## 5 Commercial

### 5.1 Commercial Summary

#### 5.1.1 Cost summary

	£M	Comment
Contract Sum	479.66	
<b>Committed Costs</b>		
approved change	27.12	Includes £4.84m from £6.45m 22 week cost engineering change and £2.36m from £4.5m for Rev 3A to Rev 4 programme change (these figures relate to amounts claimed by B&S through the application process and instructed by CEC)
changes in progress	5.22	Includes balances of £1.61m for 22 week cost engineering change and £2.18m for Rev 3A to Rev 4 programme change (these figures are the outstanding agreed amounts included in the change issued)
anticipated changes	2.56	Changes required to complete, subject to approval
Contributions	-8.06	Third party contributions received and anticipated
<b>Total Committed</b>	<b>506.50</b>	<b>Budget £500.15m</b>
<b>Risk</b>		
risk estimate	1.67	QCRA: CEC/T&T risk meeting 28 April 2013. Note: payment of ex contract claims to Infraco is excluded as confirmed by CEC.
<b>Risk adjusted forecast</b>	<b>508.17</b>	<b>Budget £500.15m</b>
<b>Opportunities</b>		
utilities diversions	0.00	Ongoing monitoring of utility expenditure but no further opportunity identified at present.
rev 3A to rev4	0.00	Infraco have submitted a milestone schedule for full value of this change and are currently being paid against this schedule in accordance with instructions from CEC.
early programme completion	0.00	No agreement in place with Infraco to realise saving. This work covered by MoU (CEC/Infraco).
<b>Total Opportunities</b>	<b>0.00</b>	
<b>Total Forecast</b>	<b>508.17</b>	<b>Budget £500.15m</b>
<b>Excluded risks</b>		
Opportunities, rev 3A to Rev4	0.00	Refer comments in Opportunities section above
disruption	Excl	Ex contract disruption claims for On-Street Sub-Contractors and CAF programme changes have been excluded as we believe there is no clear basis for entitlement
<b>Total</b>	<b>0.00</b>	
<b>Forecast + Exclusions</b>	<b>508.17</b>	
	504.38	Adjustment if remaining milestones associated with Rev3A to Rev 4 programme change are not paid. CEC to confirm further instruction regarding certification.

The forecast committed costs exceed the budget by £6,350k, principally as a result of the instructions regarding the 22 week time buffer resulting from removal of traffic management constraints and programme embargoes and the scope of utilities diversions.

### **5.1.2 Movement from previous period**

The overall forecast has **decreased** by £19k in the period. The principal movements are identified below.

The Infraco contract forecast has **increased** by £14k from the previous forecast. Significant changes include:

- The value of the descope for St Andrew Square public realm works has been agreed and has **decreased** the forecast by £86k
- The requirement to maintain the depot workshop equipment to Dec 13 has **increased** the forecast by 15k
- Additional fencing requirements along the railway corridor has **increased** the forecast by £27k
- The requirement to provide sub-station switching at the depot until January 14 has **increased** the forecast by £49k
- Reinstatement works at the Airport has **increased** the forecast by £62k
- The requirement to carry out a study of the Dynamic Kinetic Envelope has **increased** the forecast by £20k

The forecast for utilities has **increased** by £297k from the previous forecast. Significant movements are described below:

- The requirement to carry out the water main crossing at Lochside Avenue has increased the forecast by £97k
- Carrying out remedial works to manhole 6210 has increased the forecast by £20k
- Remedials to the Water of Leith manhole has increased the forecast by £40k
- We have included an additional provision in the forecast for Scottish Water costs which has **increased** the forecast by £140k

The risk allowance has **decreased** by £330k. This is the result of the latest QCRA which models all cost and schedule risks to project completion. The two main reason for the reduction in the risk allowance are as follows:

- Items previously identified on the issues register, incorporated into the base costs reduce the forecast by £249k
- Mitigation and or avoidance of risks contained in the risk register have reduced the forecast by £62k



A summary of the movements is noted in the risk section of this report.

### **5.1.3 Commercial issues**

#### **Rev 3A to Rev 4**

A detailed description of the background to the cost impacts of the Rev3A to Rev 4 programme change was included in Progress Report 12. CEC confirmed the requirement to issue a change order for £4,541k and reference is made to the Certifier's opinion which requires that only costs incurred will be payable. £2,365k has been certified to date, as instructed by CEC, although Turner & Townsend have advised that Infracore have not provided sufficient information to demonstrate costs were incurred. Infracore have advised that they will not provide any further information to support this amount.

#### **Extension of time claims**

The Infracore and Turner & Townsend progress reports identify that delays have occurred in Sections 2A/5A and Section 5. These delays have resulted principally from Infracore's delayed commencement of the retaining structures in Section 2A/5A, finalisation of structures and Edinburgh Gateway in Section 5.

Through reference to the weekly prolongation costs included in the contract, the delay costs amount to c. £1.8M. However, as the delays are principally caused by Infracore, we would not anticipate a claim and, to date, no Compensation Event Notice for prolongation costs have been received.

The cost report and QSRA/QCRA does not contain any allowance for these delay costs since a Compensation Event Notice has not been received from Infracore and, following discussions with CEC, Turner & Townsend also understand that Infracore has confirmed at the Joint Project Forum that no claims are currently being prepared.

#### **Prelims / Overhead Mark ups on change**

Infracore have applied prelims and overhead and profit to OLE bases, section 1D drainage and Shandwick Place road reconstruction. This overlaps with the indirect costs/prelims included in the contract price. As the matter could not be resolved it was submitted to the escalation process and in this instance, CEC have confirmed that payment should be made. This was agreed *without prejudice* to future changes related to this issue, Turner & Townsend will seek to agree matters with Infracore and advise CEC accordingly.

Turner & Townsend have requested guidance from CEC on the same issue for Cathedral Lane substation. The estimate submitted by Infracore follows the same principles for calculating mark-up (i.e. prelim recovery is claimed on the full value of the work despite the contract already making some allowance for this scope). We have met Infracore to discuss this item and they have confirmed that they will not change their position. The Independent Certifier has confirmed that he will issue guidance in relation to this item.

#### **On Street Works Estimates**

The cost report includes provisions for a total of £4.6m additions to the contract sum submitted through the On Street Works Estimates in accordance with Schedule Part 45 of the contract. This captures all changes, delays and disruptions associated with on street work. As B&S do not provide any up front estimates for changes covered by this contract clause, there remains a significant level of uncertainty with the remaining provisions

**FINAL**

included in this section of the cost report due to the level of change encountered or instructed in the on street section. With the exception of the track alignment and tram stops, all other elements of the on street civils works have changed from the base design information.

**Claims**

Schedule 45 governs changes to the On-Street Works and no costs have been submitted for disruption associated with the execution of the On Street Works. The intent of the contract is for any legitimate costs to be submitted within the period applications rather than a retrospective claim for additional costs.

**Off Street Utilities**

Infraco have stated that their contract price does not contain any risk allowance for Off-Street Utilities. Turner & Townsend have advised that there is a lack of visibility regarding risk pricing by Infraco and therefore a negotiated settlement could be sought on items (specifically the SGN diversion at Ingliston) where liability is contested. The Independent Certifier has issued notes of the meeting and re-issued the Opinion paper. It is understood that Infraco do not agree with this paper. This matter requires clarification and resolution.

**Immunisation**

The Infraco contract includes an allowance of £3m for carrying out immunisation studies and associated work with a pain gain mechanism for costs above or below the target. £450k has been drawn down through milestones to date and we have been advised that a further £850k may be required to complete, providing a potential saving of £1.7m to be shared between 3 parties. However, there remains a risk that final testing will necessitate further works which would reduce or eliminate this saving. The current cost report includes an opportunity within the risk allowance for savings against this budget item. Meetings are ongoing with Network Rail to confirm approvals, mitigations and testing arrangements. The risk allowance will be updated as this opportunity is realised or expended.

**Network Rail**

Work is ongoing to mitigate commercial impact resulting from costs associated with work to Network Rail's boundary. We have summarised all of the issues relating to the railway corridor into a paper which will be used in negotiations with Network Rail over a potential contribution towards this work. We have included an assumed contribution of £250k in this period's report.

**Scottish Water**

Scottish Water have recently issued a forecast for their resources which is significantly higher than the reported forecast, both in cost of work done and final forecast. This is in part a result of Scottish Water maintaining their full team throughout the project. Our forecast is based on the following assumptions:

- A reduced resource profile from that proposed by Scottish Water with no resource requirement beyond June 2013 as discussed CEC/SW 30 January 2013.
- A Statutory Utility Company contribution, in accordance with the provisions of the New Roads and Street Works Act, will be payable by Scottish Water on costs incurred modifying its asset during the project. Scottish Water has been asked to confirm this is applicable.

**FINAL**

- A contribution will be payable for requested works by Scottish Water.

While we have not included anything in our forecast, we also intend to seek a contribution from Scottish Water for work carried out on Grosvenor Street sewer. While an independent report on the reason for the collapse of this sewer was inconclusive, it indicated that on the balance of probabilities, it was caused by an underlying fault in the asset and was not a result of tram activities. Scottish Water is likely to dispute this interpretation.

**Tramco**

Tramco have submitted a letter which identifies prolongation costs which would result from the difference between their contract programme and the Rev 5 programme. The periods involved and costs are significant however there is not a significant gap between the contract programme and the forecast dates in the master schedule. There is an anomaly in the contract which identifies a qualifying compensation event resulting from failure to meet and end September 2013 passenger service date. This contradicts the contract programme which shows final activities in December 2013. At present, we consider that the dates in the contract programme can still be achieved and as a consequence have made no provision for costs associated with this claim in the forecast. Tramco have intimated that there will be no claim if testing is completed by December 2013. They have been asked to confirm this in writing.

**Contributions**

The forecast includes allowances for a number of contributions from Third Parties. Some of these contributions are not yet secured and are being negotiated by CEC. Specific items which fall into this category are:

- Transport Scotland for Edinburgh Gateway (£4,361k) (£944k paid to date);
- Henderson Global for the Cathedral Lane substation (£470k in current forecast although additional recovery to be sought for design fees and the revised scope of work);
- CEC for public realm costs in St Andrew Square (£1,158k including Scoutmoor paving);
- Network Rail for Scottish Power cable diversion (£22k);
- Network Rail for work along the railway corridor (£250k);
- Transport Scotland for the Tram Integration Manager (£300k).

**5.2 Committed Costs**

**5.2.1 Approved Change**

Approved change is items that have been instructed and a commitment value agreed. The total value of approved change to date is £27,124k. This is a decrease from the previous period of £1,572k. The reason approved changes have decreased is because the descope value of St Andrew Square has been finalised and included within the approved figures during the period.

**FINAL**

**Infraco**

The total value of approved changes in the Infraco contract is £9,730k. This is a decrease of £1,572k from the previous period. Significant changes are as follows:

Description	Change Amount (£k)	
tNC 539 - System Wide - Delay in signing - impact on commencement and completion - costs incurred at front end of programme	£242	*
tNC 553 - SDS to provide the services of Matt Fell until August 2012	£-11	*
tNC 560 - St. Andrew Square - Omit work North South & West St Andrew Square and St David Street	£-2156	
tNC 571 - Hope Street Junction Design	£-8	*
tNC 605 - Depot - Sub-Station Switching	£49	*
tNC 701 - Reinstatement works at the Airport	£62	*
tNC 717 - Cost Engineering in respect of the Programme (22 week saving)	£269	*
tNC 762 - Omit junctions 22 and 26 from scope (Siemens cost only)	£-199	
tNC 763 - SPRUCE traffic control system	£199	
On street works estimate 19	-19	

\* Increases from previously approved value

**Utilities**

The total value of approved changes in the Utilities budget section is £16,049k. This is unchanged from the previous report.

**Tramco**

The total value of approved changes in the Tramco budget section is £5k. This is unchanged from the previous period.

**5.2.2 Changes in Progress**

Changes in progress are known changes that have not yet been incorporated into the contract sum, either because we are awaiting a price from Infraco or the value has not yet been agreed. The total value of change in progress is £5,218k, an increase of £1,683k from last period. The main reason for the increase is the transfer of the descope value for St Andrew Square from this section into the approved section.

**Infraco**

Change in progress associated with the Infraco contract is £5,183k. This is an increase of £1,683k from last period. Significant changes include:

**FINAL**

▪ Clause 80 tNCs transferred to Approved section (note that value is positive as this included the St Andrew Square descope):	£2,067k
▪ tNC 765 - Additional fencing along the railway corridor:	£27k
▪ tNC 766 - Change to lantern specification for wall mounted floodlights.:	£20k
▪ tNC 539 - System Wide - Delay in signing - impact on commencement and completion - prolongation costs at end of programme:	£-242k
▪ tNC 717 - Cost Engineering in respect of the Programme (22 week saving):	£-269k
▪ Changes to On Street works tNCs	£79k

Refer to the cost report for a complete list of change in progress.

**5.2.3 Anticipated Change**

Anticipated change are variations to the contract that are known about but no change has been raised at this time, either because the scope has not yet properly been defined or the change has not taken place yet. Anticipated change amounts to £2,559k, an increase of £197k during the period. The following describes the main items of change during the period.

**Infraco**

Anticipated change has reduced by £100k which includes:

▪ Change in specification of wall mounted lights (moved to change in progress section)	£-20k
▪ Dynamic Kinetic Envelope Study (survey by Infraco to identify any interface issues between trams and permanent works)	£20k
▪ Surplus materials recovery (assumed recovery from unused York Place to Newhaven materials)	£-100k

**Utilities**

Anticipated change has increased by £297k which includes:

▪ Water main crossing at Lochside Avenue	£97k
▪ Remedial works to manhole 6210	£20k
▪ Remedials to the Water of Leith manhole	£40k

**FINAL**

Note that the above items were previously excluded works as instructed by CEC which have now been agreed as part of the closeout discussions with Scottish Water

- Scottish Water resource cost forecast (based on the realisation of previously identified risks associated with Scottish Water resource levels and durations) £140k

**Tramco**

Anticipated changes are unchanged during the period.

**5.2.4 Contributions**

The forecast amount of contributions is £8,057k which is a reduction of £3k during the period.

**5.3 Risk and Contingency**

**Quantified Cost Risk Analysis (QCRA)**

Following the most recent risk review, the risk allowance included in the forecast amounts to £1,670k, a decrease of £330k from the previous period. This is based on the outputs of the QRA which follows a review of all project risks. The main reasons for the reduction in risk allowance are noted below:

- Uncertainty: The allowance for uncertain work scope (as identified on the issues register) has reduced by £249k. This is as a result of previously identified risks being realised and transferring into the cost report or mitigated and removed from the issues register.
- ED132: Phased handover/ lack of integrated programmes has been reduced as the risk associated with delay due to tamper start date is **reduced**.
- ED027o: Opportunity associated with immunisation has been **increased** to cover additional fencing required to the railway corridor
- R067: Suspension of works by Network Rail has been **removed**
- ED030: Additional traffic management and enabling works required to meet Stakeholder constraints has been **removed**
- R037: Third Party Consents not obtained has been **removed**
- ED080: Unknown or abandoned chambers', cellars, voids etc. has been **removed**
- ED047: Hydrocarbon contamination of the ground, groundwater and watercourses (McNicholas) has been **removed**
- ED003: Tram (CAF) / Infrastructure (Infracore) integration risk. Risk that Infrastructure and Tram meet the employers requirements but are incompatible such that system is inoperable has been **increased**

**FINAL**

- It should be noted that the risk allowance does not make provision for any ex-contract claims which may be issued and or accepted by CEC such as loss of productivity.

The risk includes £213k associated with Legacy Scottish Water settlement in addition to the budget of £750k. This is as agreed with CEC.

#### **5.4 Opportunities**

The total value of opportunities in the current forecast is £14,077k. Most of these opportunities are secured. However, there remains a risk to certain items included within this total, identified below:

- Item 03 – St Andrew Square Public Realm: This opportunity is for a non tram budget in CEC to contribute towards the cost of setts and Scoutmoor paving in St Andrew Square. We are still in negotiation with Bilfinger Berger over the rate for the revised specification of setts which may affect the total value for this item although it is assumed that any additional / reduced cost will be part of the contribution and therefore have no overall effect on the tram forecast
- Item 14 – Road Reconstruction depth: The impact of utilities diversions have reduced the area of road which can be preserved however this is compensated by savings in pavements and footways. During the period we have reconciled savings associated with this item, St Andrew Square descope and Track box excavation resulting in a net increase in the overall saving although a reduction associated with this item.

A meeting was held on 30 January 2013 to consider further opportunities for savings. These opportunities are currently being managed to mitigate additional cost where possible.

#### **Programme Opportunities**

Progress report Nr 13 provided details on relationship between the Rev 3A Rev 4 cost movements (also refer above) and prelims costs associated with the difference between an estimated completion dates (based upon relaxation of resource constraints and extrapolation of current progress) with the Rev 4 completion date.

Infraco's position is that they are entitled to contract prelims, plus the £4.5m to Rev3A to Rev 4 movement. Subject to performance and actual completion in advance of Rev 4 dates there may be an opportunity to save part of the £2.2m for the programme movement at the end of the project. This is also dependent upon Infraco changing their commercial position. It should be noted that Infraco have submitted a milestone schedule for these amounts which indicate that the full amount should be paid by December 2013. This issue is not resolved at this time.

#### **5.5 Exclusions**

The following items are excluded from the Cost Report

- Repairs to pavements and footways

**FINAL**

- Further design changes beyond those included in the cost report (Note that design costs are beyond the norm since SDS Management Fee at 25.65% and Infraco mark up at 34.9% is applied).
- Claims for disruption from the sub-contractors on the On-Street section as entitlement exists for PAVs.
- Scottish Water manholes at Jenners.
- Leith Walk Utilities Diversion – The budget for this work has been reduced to £470k. All items of scope over and above those presently included in the McNicholas contract are, therefore, excluded from the overall costs.
- Any provisions for carrying out manual switching at the depot substation beyond Jan 2014.
- Scottish Water supervision costs beyond June 2013. Further supervision will be dependent on agreement with CEC and on the source of funding.
- Landscaping costs at Shandwick Place

**5.6 Payments and Cashflow**

A summary of the certified amounts are provided below.

	<b>Certified £k</b>	<b>Planned £k</b>	<b>Comment</b>
Infraco	381,190	383,000	Planned – based upon current forecast
Utilities	17,190	17,050	McNicholas plus SUC costs
Trams	62,176	62,176	Payments generally in accordance with milestone schedule. Incomplete milestones are not included in certified amounts.



**FINAL**

## 6 On Street – Utility and Tram Infrastructure Works

### 6.1 Progress in Period

#### 6.1.1 York Place

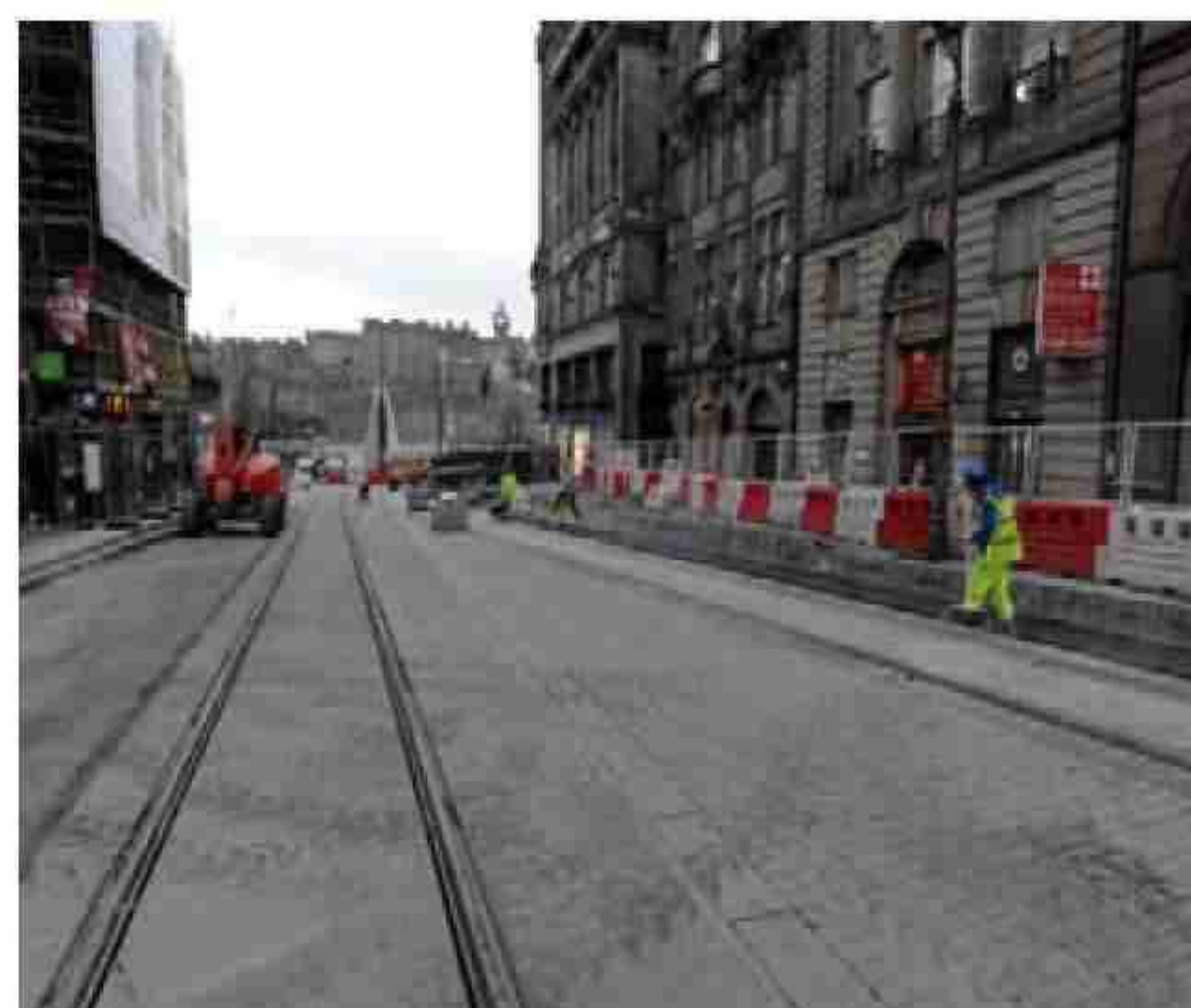
Despite Infraco reporting progress delays due to poor weather in the last Period Report the civil works completion date of June 2013 remains on target. CEC/Crummock demobilisation has been completed in the Period. Infraco have recently reported an issue relating to the completion of the track slab in the area of the buffer terminus. This issue is currently being investigated and any impact will be confirmed in the next Period Report.

#### 6.1.2 Cathedral Lane Substation

Infraco have revised their programme sequence at the substation to reflect the recently revised energisation dates. This results in a revised completion date for the civil element of the substation by end May 2013 with Siemens installation works to commence in June 2013. The building progress is currently on target to meet these dates with completion expected 27th May 2013. In the period Turner and Townsend have identified a defect with the recently installed ducts for the Scottish Power cables. To resolve this issue discussion will be required with Infraco to revise the Traffic Management for the Siemens work scope which commences in June 2013. The detailed planning will be completed in the next period with the works scheduled to be completed in parallel with the Siemens substation fit out works in June 2013.

#### 6.1.3 St Andrews Square

St Andrew Square civil works were handed over to CEC on 26th of April 2013. A section of North St Andrews St has been retained to complete sett laying. This is due to be completed by 10th May 2013.



#### 6.1.4 Princes Street

An integrated programme detailing the defect rectification works and finalisation of Infraco permanent works has been compiled. This has identified that defect rectification works will commence on 6th May 2013.

#### 6.1.5 Shandwick Place

Progress in Shandwick Place/Lothian works have been delayed due to the weather conditions at the being of the Period. The delays are non critical and street service works and road reinstatement works are due for completion by June 2013.

**FINAL**

### **6.1.6 Haymarket**

Works between Haymarket and the Crescents have been impacted by the weather conditions at the start of the period however completion remains on target for June 2013. The 2<sup>nd</sup> stage track slab concrete at Palmerston is now substantially completed and will be prepared for road reinstatement in the next period.

### **6.2 Key Issues**

Despite progress being made with Scottish Water senior management in relation to closing out legacy issues relating to the tram works, it is becoming clear that there is a disconnect between Scottish Water senior management and its advisors. An example of this would be a return to letter writing by Scottish Waters advisors despite agreement being reached at a senior level that issues are to be dealt with in the main using the governance arrangements and project tracker currently in place. This change in approach seriously threatens the June date for close out of issues and thus increases the likelihood of additional costs being incurred by all parties in respect of ongoing management expense and increased capital expenditure.

Turner and Townsend and CEC are finalising a Scottish Water close out strategy for the outstanding issues with a legal meeting currently schedule for mid May and a principals meeting scheduled for end May 2013. It should be noted that unless significant progress is made at these discussions then the resolution of all issues with Scottish Water by the end June 2013 will be at significant risk.

Infraco have confirmed that platform alignment remedial measures are required at the Princes Street Stop. These will be dealt with by Infraco during the next phase of Siemens works with the works due to commence in the next period.

CEC/T&T are reviewing potential DKE clashes between the tram and track alignment on the On Street section in particular the alignment between North St Andrews and York Place. An instruction has been issued to Infraco to complete an alignment check with the output expected towards the end of the next period.

**FINAL**

## 7 Off Street Works

### 7.1 Progress in Period: Critical Areas

#### 7.1.1 Section B Completion

Section B was handed over by Infraco on the 8<sup>th</sup> of March 2013 and a Lesson's learned workshop has been arranged with Infraco to ensure the timely receipt and review of documentation ahead of Section C completion.

In the period Turner and Townsend have agreed the design specification for the Airport Terminus. Infraco will complete the design in the next period and this will allow finalisation of the construction costs and contribution from Edinburgh Airport Limited. The design is based on the minimum option developed between CEC and EAL and will best placed to allow for any future expansion in this area.

#### 7.1.2 Network Rail Interface

There is one design issue that remains critical to completion of the Infraco works relating to the retaining measures adjacent to a Network Rail (NWR) lighting gantry at the ScotRail depot. The Form B was issued to NWR on 26<sup>th</sup> April 2013 and sign off is required by 3<sup>rd</sup> May 2013 to allow works to commence by 6<sup>th</sup> May 2013.

Turner and Townsend, CEC and Infraco have commenced a process of identifying the projects "Final Position" in relation to a number of outstanding matters with NWR. To date 6 of the 20 issues have been resolved however some key issues will require to be progressed through the projects escalation process. To date the issues being identified for escalation are:

**Vehicle Tram Interface(ScotRail Access):** NWR have identified concerns at this road/tram junction and Turner and Townsend/CEC will respond in the next period. It is unlikely agreement will be reached until this area is successfully tested and commissioned.

**Gas Governor:** NWR are refusing to sign off the Form B without further detail on the Infraco designers qualifications.

**Timber Staircase:** NWR continue to seek betterment in this area and will currently not sign off the Form B.

**NWR Depot Building Loading:** NWR are continuing to request further design calculations despite design assurance given by Infraco.

**Shuntline Ballast Walkway:** NWR are disputing the photographic evidence presented by Infraco and requesting additional works.

These and any subsequent issues will be discussed at the next steering group/escalation meeting scheduled for 14<sup>th</sup> May 2013. Turner & Townsend will provide an update on progress in the next Period Report.

The commercial discussion on the outstanding Infraco issues relating to the additional retaining measures around the ScotRail depot have continued and Infraco have provided a

**FINAL**

briefing paper to which Turner and Townsend are finalising a response. This issue is expected to be resolved in the next Period however it should be noted works will continue to be progressed on site.

### **7.1.3 Edinburgh Gateway**

The earthworks and drainage and track preparation works are nearing completion with track laying continuing in the Period. Works are progressing well ahead of the tamper commencing works in early July 2013.



## **7.2 Progress Update: General**

### **7.2.1 Haymarket to Balgreen**

Haymarket Tramstop street lighting has now been resolved. Murrayfield Tramstop works have progressed well with completion due around the 10<sup>th</sup> of May 2013. A 14m section of tram track on the inbound track adjacent to NWR platform 0 at Haymarket is being replaced due to an alignment issue. This is expected to be completed in the next period. The preparation for track installation between Murrayfield and Balgreen has been completed and track laying has commenced in the period. Works are progressing well ahead of the tamper works commencing in early July 2013.

### **7.2.2 Balgreen to Edinburgh Park**

Cabling works have commenced in the Period from the Bankhead substation towards Haymarket. Track laying is being prepared for installation at Edinburgh Park Bridge. Remedial works to flooding issues at Carrick Knowe golf course have also commenced.

## **7.3 Other Key Issues**

Scottish Power are not currently progressing the wayleave agreement at the Haymarket substation as a result of the lack of an agreed access route with Network Rail. CEC, Turner & Townsend, NWR and Scottish Power have a meeting scheduled for w/c 29<sup>th</sup> April 2013 to progress.

Edinburgh Airport Limited (EAL) have raised concerns with the erosion of the Gogarburn and a monitoring programme is being established by CEC to review causation ahead of further discussions with EAL and Infraco.

The Scottish Water connection into MH 6201 at Bankhead Drive is yet to be resolved as the latest Technical Query submitted to Scottish Water was rejected. This will be progressed early in the next Period.

The clash between the underside of the tram and the Strail road crossing at Eastfield Avenue is being investigated by Infraco and CAF and as discussed in the risk section of this

**Progress Report No. 20 – 31<sup>st</sup> March to 27<sup>th</sup> April 2013**

**FINAL**

report a wider study has been commissioned to review the rest of the line to establish if there are any other areas of conflict. An update will be provided in the next Period report.

**FINAL**

## 8 Trams

### 8.1 Trams Progress in Period

CAF have now finished Routine Testing on 26 of the 27 trams, with the remaining tram (#251) scheduled to complete Type Testing when Section C becomes available for use.



There were additional integration tests carried out during the period, to ensure that the trams could provide flange lubrication at curved sections of track. Tests of the track-side equipment proved successful; however there were issues with the tram-borne equipment. CAF have committed to rectifying these issues before the 29<sup>th</sup> of April 2013, to allow re-testing of the system to take place.

CAF's Testing and Commissioning Engineer, Unai Olaciregui, has now left Edinburgh following the completion of the above Routine Tests. CAF have been asked to confirm who will cover the role of Test & Commissioning Engineer, to ensure CAF are able to continue to support Integration and Acceptance Testing.

The investigation into the cab alignment issues found on 'cab E' of tram #272 during the Dynamic Gauging and Contact Tests is ongoing, with CAF now seeking additional support from the technical office in Spain. It is anticipated that the re-work will be completed in the coming period.

As part of their driver training and familiarisation programme, Edinburgh Trams are now running a 'pseudo-service' between Gogar Depot and the Airport. Drivers are now running to a specific timetable; stopping at tram Stops and opening / closing doors as would be done in passenger service. This is providing excellent practice for drivers and as has been mentioned previously, an opportunity to understand the operation and performance of the trams earlier than would normally be possible.

This new way of working will also provide Edinburgh Trams and CAF with an opportunity to further develop and verify their operating procedures, allowing them to iron out issues long before Shadow Running commences.

One issue identified was that Edinburgh Trams were not being supplied with sufficient trams to fulfil their operating and training needs. The issue was raised during the weekly Technical Meeting attended by CAF, Edinburgh Trams and Turner & Townsend, with a solution identified and implemented. The ongoing availability of trams will now be recorded daily and discussed weekly at this meeting.

The following technical issues were also discussed during the period:

- Battery Charger failures (reported on 7 trams)  
CAF report that they have now received an amended report into the cause and a proposed solution to address the above issue from SEPSA. This is now being reviewed, following comments raised by their own technical team.

Turner & Townsend have raised this as a concern to CAF, as we are still awaiting the issue of a report more than four months after the initial failure was reported.

- CCTV system performance and visibility (reported on numerous trams)  
Edinburgh Trams and CAF have completed a campaign to adjust the external cameras to improve the driver's visibility from the cabs.

The ICP has raised a further issue whereby visibility of passengers alighting or departing a tram via the centre doors is limited. The issue has been raised with CAF and possible solutions are being considered.

Turner & Townsend are working with CAF and Edinburgh Trams to develop a 'Tram Reliability' KPI, which will indicate the performance and reliability of the various systems on the tram. The KPI will be published in the monthly progress Report as soon as it has been accepted by all parties.

## **8.2 Vesting of Trams with CEC**

Following discussion between CEC and CAF, Turner & Townsend have written to CAF acknowledging that the risk and title for 26 of the 27 trams shall pass from CAF to CEC at 09:00 on 1st June 2013, or on a different date if mutually acceptable to both CAF and CEC and not on the issue of a Certificate of Tram Commissioning, as required by the Tram Supply Agreement (TSA).

Despite previously accepting that the Tram Inspector was unable to issue any Certificate of Tram Commissioning prior to the completion of Type Testing on tram #251, CAF have now requested that certificates for the 26 trams which have completed Routine Testing be issued. Turner & Townsend have agreed to discuss the issue with both the Tram Inspector and the Independent Certifier, to determine whether there is a mutually acceptable solution possible.

## **8.3 Fare Collection System**

The Fare Collection project continues to be reported by Parkeon as progressing well, with the first five Ticket Vending Machines having been built at their factory in France. These units will shortly be shipped to Parkeon's facility in Poole, where they will be used for final development and testing of the Edinburgh Tram system operating software.

Development of technical and user interface documentation continues to progress ahead of schedule, with Turner & Townsend being supported by Lothian Buses and Edinburgh Trams as the primary reviewers of these documents.



A Client Change Order for the purchase of an additional 20 Hand Held Devices for Lothian Buses was raised and approved during the last period, with the units to be made available for the start of passenger service.

#### **8.4 Key Issues**

CAF have confirmed that there will be no further discussion this Period on proposals to address the potential additional project costs CAF might incur following the change in the project completion date between the Rev 2 and Rev 5 project programmes. Turner & Townsend understands that additional discussions are scheduled to take place between CAF and CEC in the first weeks of the next Period.

The water ingress into the depot building maintenance pits, Wheel Lathe and lifting platform pits remains to be resolved. Turner & Townsend have confirmed with Edinburgh Trams that actions to mitigate this 'residual risk' are included in their risk register, however rectification action is still immediately required as CAF have raised this as a safety concern and confirmed that it is affecting the efficiency of their operation. This action lies with CEC.

Turner & Townsend and CAF continue to discuss the completion of the Sub-Contractor Direct Agreements which CAF have developed with their suppliers, as required by the Tram Supply Agreement. CAF have reported that any amendment to the current agreements may be difficult to agree with suppliers, as they have been in place for some time. CAF also state that there are some suppliers who will not sign-up to the agreement. Turner & Townsend have agreed to review the issues and discuss potential solutions with CAF.

CAF have confirmed to Turner & Townsend that it would be possible to extend the date of expiry of the Tram Supply Agreement (TSA) Performance Bond past the 15<sup>th</sup> of May 2013, which had been agreed as the expiry date during mediation discussions, however there would be a cost incurred for any extension. Turner & Townsend are currently reviewing the requirement for the bond, to determine whether any extension would provide any substantial benefit to CEC.

#### **8.5 Look Ahead**

The following items will also be progressed during the coming Period(s):

- 1 Trams:**
  - Re-test of operation of the flange lubrication system
  - Realignment of E-cab on tram 252 to be completed
  - Tram Reliability KPI to be developed and agreed with CAF and Edinburgh Trams
  - CAF to provide availability of trams as agreed with Edinburgh Trams
- 2 Vesting of Trams with CEC**
  - Turner & Townsend to discuss the possibility of issuing Certificates of Tram Commissioning prior to the completion of Type Testing with the Tram Inspector
- 3 Fare Collection:**
  - First 5 Ticket Vending Machines to be delivered to Parkeon at Poole
  - First Platform Validator to be built and delivered to Poole
  - Parkeon to continue the development of Edinburgh Tram operating software
- 4 Key Issues:**
  - Sub-Contractor Direct Agreement issues to be addressed
  - Requirement for TSA Performance Bond to be confirmed



## 9 Assurance Monitoring

### 9.1 General

Turner & Townsend continue to provide an Assurance Monitoring role on the project, through the identification and reporting of any issues found during site visits or during attendance at the various operational and control meetings.

The Safety Verification and Assurance functions continue to report through the 'Deliver a Safe Tram' (DaST) section in the Edinburgh Tram progress report; with Turner & Townsend providing an update on any issues that Edinburgh Trams highlight as significant in the DaST.

A copy of the DaST has been included as an attachment to this report.

### 9.2 Safety Verification (SV)

The Safety Verification team are now planning the audit schedule for 2013 with Technical Support Services (TSS), following the review of the schedule by all parties.

Following initial sampling of the Case for Safety evidence for Section B, a general concern has been raised that the evidence supplied does not adequately demonstrate successful integration and that snags and known exclusions have not always been captured. It has been agreed that this will be discussed at the next ICP Liaison meeting on 8th May 2013; with the SV team using the proposed SV audit "Demonstrate the sectional handover is assured" to investigate any integration matters arising.

Turner & Townsend will facilitate a 'Lessons Learned' workshop on 8<sup>th</sup> May 2013, to determine the most effective and efficient way to manage the submission and review of documentation required for Section C, as a repeat of the Section B submission process would most likely result in a delay to Section C Completion.

There were no issues were noted in this period with respect to the change in SV administration.

### 9.3 Independent Competent Person (ICP) issues

The ICP liaison meeting 13 took place on the 17<sup>th</sup> of April 2013. The following areas of concern were discussed:

- 1 Rail lubrication: The curves on Section B are currently being hand lubricated, until CAF investigate why the tram flange lubrication system is not operating correctly. The ICP was satisfied this matter is being dealt with.
- 2 Eastfield Avenue junction control: Although the signals are installed as designed, Edinburgh Trams have concerns regarding their operation. The ICP is preparing an opinion on the current arrangement.
- 3 Airport points: The detection has been reset and is functioning correctly, however further discussions are required to determine if the Employer's Requirements can be fully satisfied.