Haymarket 1 Road Reconstruction Options Appraisal (6 October 2011)

6 October 2011

Introduction

Infraco is mobilised to commence full depth carriageway re-construction at Haymarket 1. The depth of construction currently proposed would require the re-location of significant numbers of services which were previously diverted under the MUDFA contracts.

In order to explore an alternative way forward for the project, a workshop was held at City Point offices on 6 October 2011. This workshop was attended by representatives for Turner & Townsend, City of Edinburgh Council, Transport Scotland and Hg Consulting.

This paper sets out the current contractual position, the risks to CEC in the event that construction continues as currently proposed, and summarises the discussions and recommendations made during the workshop including potential risk mitigation opportunities.

Background

Infraco commenced mobilisation of the On Street Works at Haymarket 1 on the 3rd of October 2011 and is planning to commence construction works on the 10th of October 2011. The first activity during these works will be the excavation of the existing road construction.

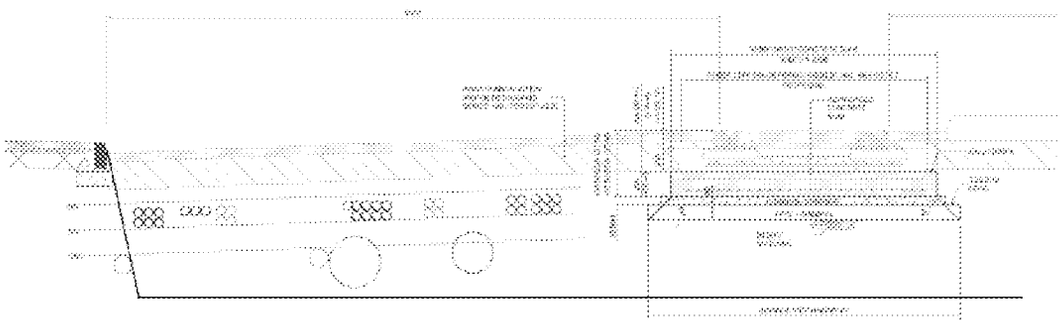
The basis of the contract is:

- a lump sum price
- a utility free site; and
- exclusive access to the site.

None of the above is achievable however the impact on Infraco's proposed construction methodology, and therefore cost and programme, is a function of the extent to which utilities need to be relocated during construction of the works.

Current Design

The design is based upon a full road reconstruction depth of 1.3m from kerb to kerb. This design satisfies the current project requirements of the loading conditions (in the form of CBR value) and provides a 20 year design life for the carriageway.



Utilities have been removed within the zone of the track slab (minimum Dynamic Kinematic Envelope) plus 2m either side. Utilities have been diverted between the track zone and the kerb to the standard depth that utility companies require, 0.6 to 0.9m deep. The proposed road reconstruction between this track zone and the kerb is 1.3m deep and therefore the utilities would need to be lowered or diverted to facilitate this.

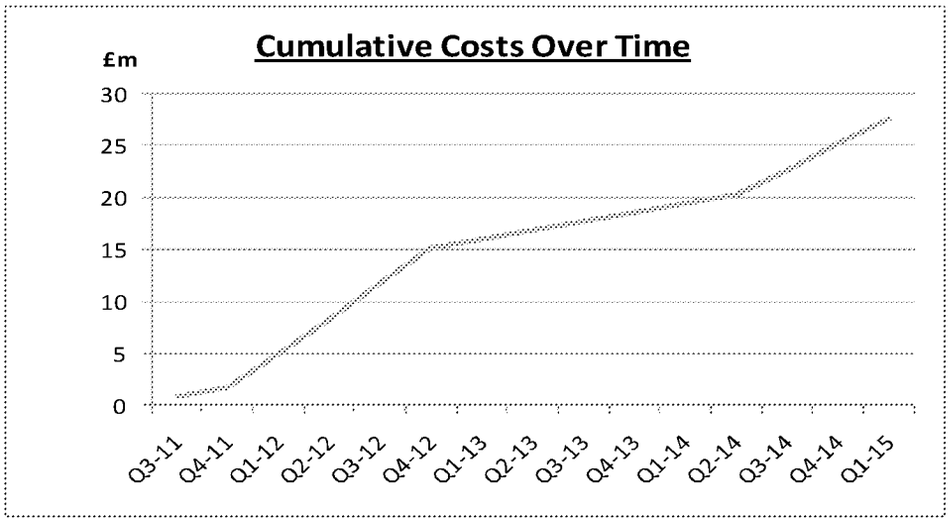
There is also a risk of abandoned utilities within the carriageway construction depth. A contractor has been engaged on a call off basis to remove these utilities to reduce the risk of disruption to Infraco resulting from abandonments.

Prior to implementation of any utility diversions, approval would be required from the Utility Companies. This is unlikely to be granted since the utilities have been moved once before and the utility depth required to move below carriageway construction would exceed normal standards.

Any works to utilities would delay Infraco and result in the following consequences:

- The project completion date would be delayed with an impact of £1.6M/month (this assumes that Infraco and all sub-contractors would be delayed and there was no opportunity to mitigate)
- The cost reimbursement provisions for the On Street Works would be triggered as the delay would exceed 21 days which could lead to additional costs in the order of 10% to 30% of the civils and track works costs
- Additional utility diversions would be required with no guarantee that approval could be secured. The cost impact of this element is therefore difficult to identify

An indication of the cost/risk profile for implementing the current design and construction proposal is indicated on the following graph:



Alternative Option

An alternative way forward is for the client team to introduce "hold points" during the carriageway excavation process. At each hold point an inspection of the exposed road surface would take place and an engineering judgement made as to whether excavation should continue or the carriageway be reconstructed from the exposed depth.

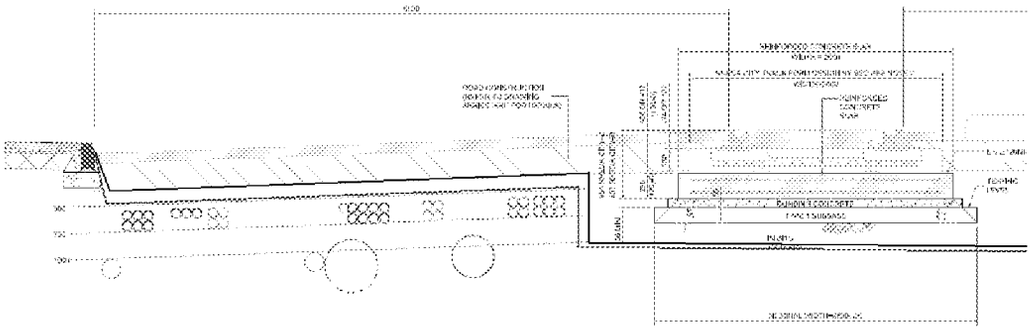
- Step 1: plane to the depth of a single pass of the planer (say 150mm deep) and then undertake a visual inspection to determine the integrity of the residual road construction. At this point a decision would be made either to re-construct the road from this depth, avoiding further excavation and re-construction, or to continue excavation.

- Step 2: if at Step 1 the road base is defective, excavation would continue to a depth of 290mm before CBR testing is undertaken. Again, a decision would be made at this depth as to whether further excavation is required prior to reconstruction.

- Step 3: If at Step 2 the carriageway is defective, excavation would continue to a maximum depth of 490mm (to the bottom of existing sub-base level) and CBR values determined. At this point desired CBR values may still not be met however reconstruction from this depth would provide the best possible carriageway reinstatement whilst minimising further disturbance to the re-located utilities.

  Some localised repairs to "soft spots" may be undertaken below 490mm, again, without disturbing utilities.

  CEC would accept that the Employer's Requirements and Design Standards would not be met and that no warrantee would be provided for the completed carriageway.



This option provides the following benefits:

- A saving in the direct works (through reduced excavation depths)

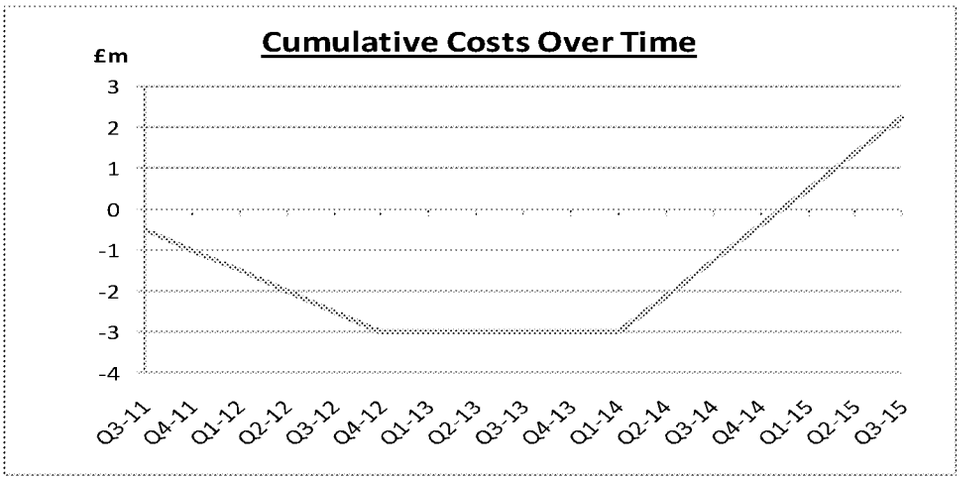
- Reduction in programme risk and potential for a financial saving

- Reduced risk of the On Street reimbursement provisions being triggered.

The risks of this option include:

- Loss of the protection of a contractor's warrantee on the completed works
- Risk of future carriageway remedial works transfers to CEC;
- Risk to reputation or tram revenue in the event that repairs are required in the short to medium term (while trams are in service)
- Risk of Third party claims resulting from the disruption.

The cost / risk profile is indicated below



Conclusions

The workshop concluded that, in the interests of minimising the risk of delay to the programme and increased costs, the alternative option should be instructed for Haymarket 1. A draft Instruction to Infraco has been produced and is included at the end of this paper.

Consideration should be given to extending this instruction to other on street areas. The Haymarket 1 site should therefore be used as a trial for the alternative option.

Draft Instruction for Infraco.

Addendum to Appendix 7/1 in relation to permitted Pavement Options for Haymarket 1.

Introduction:

Within the existing pavement construction at Haymarket 1 there are known utilities at a depth of circa 600mm. The purpose of this instruction is to avoid conflict resulting from executing the works in accordance with Appendix 7/1 and the need to undertake further utility works.

Infraco shall proceed as follows:

1. After first planning (circa 150mm in depth) Infraco shall allow the client team to undertake a visual inspection of the exposed pavement. The client team will then instruct:
    a) No further excavation required, Infraco to reinstate as per M4, or
    b) Infraco to continue to 290mm

2. After reaching an excavation depth of 290mm, Infraco shall carry out testing in accordance with Appendix 7/1. Testing shall be witnessed by the client team.
   In the event of a test compliant with Appendix 7/1, Infraco shall proceed to reinstate as per Appendix 7/1.

   In the event of a non compliance with Appendix 7/1, the client team shall instruct one of the following:
    a) No further excavation required, Infraco to reinstate as per D5 of Appendix 7/1, and/or
    b) Localised repairs, or
    c) Proceed to excavate to a depth of 490mm

3. After reaching an excavation depth of 490mm, Infraco shall carry out testing in accordance with Appendix 7/1. Testing shall be witnessed by the client team.

   In the event of a test compliant with Appendix 7/1, Infraco shall reinstate as per Appendix 7/1.
   In the event of a non compliance with Appendix 7/1, the client team shall then instruct:
    a) No further excavation required, Infraco shall reinstate as per D12 of Appendix 7/1, and/or
    b) Localised repairs