NORTHUMBERLAND COUNTY COUNCIL

Ovingham Bridge Repairs

Report on Ovingham Bridge repairs Contract

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CONSTRUCTIVE EXPERTISE

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1.0 INTRODUCTION

1.1 Faithful+Gould have been instructed by Northumberland County Council (NCC) to prepare a joint report in conjunction with Fairhurst, on the Ovingham Bridge Repairs contract.

1.2 The Ovingham Bridge Repairs contract was commissioned by NCC and the contract has overrun in both time and cost and there have also been issues regarding workmanship.

1.3 The purpose of this report is to identify why the cost, time and workmanship issues have arisen and what lessons can be learnt to avoid similar issues on future contracts.

1.4 We have held meetings with the NCC Highways team, the NCC project manager for the contract and have been given access to a number of documents relating to the procurement of the contractor and management of the contract.

1.5 We have not discussed the project with the contractor and we therefore do not have the benefit of the contractor's opinions and our understanding of the project is therefore limited to the information provided by NCC.

2.0 BACKGROUND AND OBJECTIVES OF THE PROJECT

2.1 Ovingham Bridge is a single track bridge opened in 1883, with a total length of 154 metres the bridge provides a link between Ovingham and Prudhoe. It is understood that the bridge has had significant issues around both condition and capacity for several years.

2.2 The bridge comprises eight pairs of lattice trusses which needed repair due to corrosion and damage over their long service life. The original deck had been previously replaced with more lightweight aluminium elements which also needed to be upgraded, the aim of the repairs being to provide an effective remedial solution to extend the performance and use of the bridge for decades to come.

2.3 We understand that no formal Project Plan was prepared but a decision regarding procurement was made whereby NCC would provide the design and project management in-house with "open tender" contracts being procured for the site works comprising scaffolding, steelwork repairs, painting and waterproofing through the NEPO Framework. The steelwork repairs and painting were awarded to Graham who were the lowest tenderer for these works.

2.4 NCC took responsibility for providing the following:

- Structural assessment and design
- Production of drawings, specification and tender documents using NEC contract
- Employer and Project Manager
- Principal Contractor and Designer under CDM regulations
- Scaffolding and craneage elements of the site works which were separately procured, although the craneage was originally included in the site works tender awarded to Graham.

3.0 FEASIBILITY, OPTION STUDIES, SITE INVESTIGATIONS AND ADVANCE WORKS

3.1 We understand that no overarching feasibility study was carried out but the scope, design and options appraisal is understood to have been developed following a similar bridge repair project at Wark which, in the view of the officers we spoke to, was a success.

3.2 Prior to the main contract works commencing Site Investigations were carried out on an on-going basis through a programme of regular general and principal inspections and a structural inspection was carried out several years ago prior to the development of the repair contract.

3.3 We understand that no further site investigation was carried out on the structure to inform or validate the proposed works prior to tender documents being prepared and the reason for this were time constraints and the significant disruption to the use of the bridge which would be caused by intrusive investigations, particularly to the deck.

3.4 NCC designed the repairs and an independent Category 3 structural calculation check was carried out by an independent consulting engineer, Atkins. It is not known whether any independent review of the proposals was carried out in terms of option appraisals or contract strategy was carried out (i.e. content of tender documents, role and extent of work to be carried out by NCC, etc).

3.5 We understand that NCC did not carry out any advance works prior to the bridge closure but while the works were being carried out they maintained a presence on site and performed the functions of Principal Contractor under the CDM regulations and as the highways contractor. The supervisor role under the NEC contract was also carried out by several staff working part time on site. These staff had the benefit of being involved in the design and understood the technical requirements of the project.

4.0 CONCEPT, DESIGN DEVELOPMENT AND PROGRAMME

4.1 The concept design was developed based on the structural assessments and condition surveys carried out in previous years. The proposals being to dismantle the bridge by stripping away the existing deck, removing old paint, repairing corroded and damaged sections of the trusses, repainting and laying a new deck. Once these works were complete the bridge would be reopened and repairs carried out to the piers.

4.2 The development of the design was based on the experience of very similar works carried out by NCC on a bridge at Wark which we understand was successfully delivered and the similarities were such that no additional risk was perceived for the Ovingham Bridge.

4.3 The opportunity to carry out the repair work accelerated suddenly with the opportunity to obtain a funding contribution from the Department of Transport (DoT) and an application was made to the DoT Local Pinch Point Fund in February 2013. The application was successful and as the money had to be spent by a certain date the programme for tendering became very tight.

4.4 Due to time constraints the design and tender documents had to be developed quickly and designs were produced to provide sufficient detail to obtain realistic tenders, final details being developed later, the full extent of the works would not in any event be known until the various components of the work were opened up and exposed for examination.

5.0 PROCUREMENT PROCESS

5.1 As the design was not fully developed there was a risk of significant variations and NCC decided to use Option C, (Target Cost option) of the NEC contract. The intention of this decision was to select a non-adversarial contract with an incentive to keep costs under control. This was a sensible strategy but some of the risk was retained by NCC as they provided some of the support facilities i.e. scaffolding and cranes which meant NCC rather than the contractor suffered the additional cost of these items when the contractor failed to perform and the contract suffered delays.

5.2 Tenders were invited via the NEPO procurement portal using a single stage tender process with no pre-qualification requirement. The tender requirements were business and environment questionnaires and priced activity schedule.

5.3 The contractor for the successfully delivered Wark bridge contract, Carillion, did not submit a tender but the sub-contractor on that project, Site and Field Services (SSF), submitted a tender as main contractor.

5.4 Four tenders were received, the tenderers were of varying size and technical ability, some being specialist repair companies who were capable of carrying out their own steel fabrication and painting and others would need to sub-contract one or both of these activities.

5.5 The selected tenderer, Graham, were the only large contractor and they sub-contracted all the work, their role being to manage and co-ordinate the majority of the works. Due to the way the project was procured NCC had no control over who could tender for the works.

6.0 TENDER DOCUMENTS AND ADEQUACY OF DESIGN INFORMATION

6.1 The tender documents comprised comprehensive drawings, which provides most of the detail for the works, specifications, a brief Works Information document and an Activity Schedule which is the document tenderer priced. No separate Site Information document was issued and this information was again provided on the drawings.

6.2 More comprehensive Works Information, Activity Schedule and Site information documents would have provided an opportunity to expand on the contract requirements and draw attention to important and specific issues, particularly those which may be overlooked by the tenderers estimators who are frequently working under pressure to meet tender deadlines.

6.3 A comprehensive Activity Schedule including general items as well as permanent and temporary works provides a checklist to ensure all requirements are priced. In addition the exercise of abstracting information from the drawings and specification provides an opportunity to audit the design information and iron out any ambiguity or conflicts

between the various documents and reduce the potential for disputes after the contract has been awarded.

6.4 Time constraints together with the experiences from the Wark contract appear to have influenced the brevity of the documents but the production of more detailed documents would have identified and eliminated some of the issues which led to some of the problems post contract.

6.5 Another document which may have helped to identify potential issues would have been a simple Risk Register which has the advantage of making the design and procurement team think about specific issues and how the risk can be managed.

6.6 One example of where risk could probably have been managed better is where some of the items required to deliver the project were provided by NCC such as scaffolding, site compound areas and provision of cranes. Whilst it is understood that the provision of these should have helped to reduce mobilisation times the additional risk which this approach posed could have been identified on a risk register and if the risk had been correctly identified an alternative strategy could have been implemented.

6.7 The specification includes an inspection plan and it may have helped avoid some of the supervision and defects problems which occurred if a specific item had been included in the pricing document to draw the tenderer's attention to the Quality Management requirements.

7.0 TENDERS RECEIVED, QUALIFICATIONS AND CONCERNS AT TENDER STAGE

7.1 We understand that tender amendments were issued during the tender period and one of them corrected an error on the drawings which doubled the quantity of painting to the main trusses. We are unaware of exactly how the inclusion of tender amendments by the tenderers was monitored and checked as we have not seen a comprehensive tender report but we have been provided with a schedule which compared the prices allowed by each tender for the items identified on the Activity Schedule.

7.2 A total of four tenders were received, all passed the "pass/fail" sections of the tender assessment. Graham, scored the highest on quality and was the lowest price after adjustments made in the tender checking process to enable a comparison to be made on an equal basis with the other tenderers, Graham were therefore appointed.

7.3 We understand from the officers we spoke to that Graham's appointment was made despite their concerns regarding their proposed sub-contractors. They also had concerns regarding the CVs submitted by Graham as they were for senior management rather than for technical site staff who would be responsible for managing and delivering the project.

7.4 There does appear to be some weaknesses in this stage of the procurement process in that the requested content of the tenders was not sufficiently detailed to enable a comprehensive tender check to be carried out and the level of interrogation of the submissions i.e. CVs, sub-contractors and contractor interviews could have also been more thorough.

7.5 We are also aware that there are procurement regulations to follow, the procurement department carries a lot of authority and can very much influence and dictate the procurement process which in our view can lead to the quality of a tender submission being marked rather than the real objective of employing a competent contractor who

will safely deliver a project on time, to the required quality and within budget. Perhaps closer cooperation between the NCC staff who have to deliver the project and the procurement department to better understand the objectives will help.

7.6 Despite concerns, the appointment of Graham was on the face of it a reasonable decision as they are a reputable established main contractor who made a good submission and their tender was not excessively lower than the others and, whilst there were some actions which could have been taken, we do recognise that it is difficult to correctly assess whether the preferred contractor is really capable of successfully delivering the project particularly when a tenderer has "said" all the right things in their submission and is the lowest price.

7.7 At some stage after the lowest tender was accepted it became apparent that they had not included the tender amendment for the increase in the quantity of painting. We are not clear why the failure of the tenderer to include this amendment was not identified when the tenders were checked but to avoid this happening in future a procedure needs to be implemented whereby all tenders are checked to ensure they have included all amendments issued during the tender period.

7.8 One final procurement issue is the lowest tender was still higher than the estimate and this may have also influenced the decision to appoint the lowest tenderer i.e. going for the second lowest tenderer would have created a bigger budget problem at this stage.

8.0 COMPENSATION EVENTS, PROGRAMME AND OTHER ISSUES

8.1 Problems became apparent soon after the contract was awarded. There were concerns regarding the technical experience of the site agent and engineer neither of whom demonstrated any experience of bridges or repairs to historic structures and the contractor also changed the paint sub-contractor without asking for the approval of the Project Manager.

8.2 The tender pricing document did not include any contingencies, instead a provision for contingencies was apparently made by overstating the required work in the tender document.

8.3 The tender allowances for additional work apparently covered the actual amount of additional repairs but costs increased due to the contract overrunning the programme. Actions were taken to mitigate the increases by omitting some work but there was insufficient scope to control costs within the original tender and the cost of the other contracts such as scaffolding and craneage also increased due to delays caused by Graham's contract exceeding the programme.

8.4 One of the measures taken to control costs was to remove the crane provision from the contractor and for payment to be made direct by NCC as NCC could hire the crane for less than Graham charged. Unfortunately this action also transferred to NCC the risk of additional crane costs due to delays which added to the cost problem.

8.5 The valuing of Compensation Events (variations) has also given rise to disputes as it would appear that Graham are taking a very commercial approach and are exploiting the provisions of the NEC for valuing Compensation Events based on Actual Cost regardless of their allowance in the contract. Although the NEC contract is now widely used and recognised as a good contract this method of valuing variations can be abused by contractors and consideration should be given to amending the clause to

something more like the ICE Contract whereby variations are valued at tendered rates or used as a basis where work is of a similar nature.

8.6 Regarding progress Graham did not update their programme which they are required to do under the contract. They produced a pdf programme in February 2015 but did not provide any further programmes despite requests for an updated programme by the Project Manager. The project did not complete until well beyond the original contract date, the original completion date being May 2015 but Practical Completion was not achieved until 3rd December 2015.

8.7 The effect of Compensation Events on the programme has been a significant cause of disputes between the Project Manager and Graham who apparently blame all delays on Compensation Events denying they are due to their slow progress and time taken to correct defects.

8.8 Graham's site supervision appears to be very poor and it is NCC's supervisors who have picked up defects such as poor painting and steelwork which is bowed or not the correct lengths. These defects are further detailed in the next section but are mentioned here as they are a further example of poor site management by Graham.

8.9 One further point to note is that the NEC contract is designed to encourage a culture of trust and co-operation and the procedures are designed to encourage better management and control of the project. Unfortunately it appears that Graham have not embraced this culture or complied with the contract procedures which is surprising for a reasonably large national contractor.

9.0 QUALITY OF WORKMANSHIP AND CORRECTIVE ACTIONS

9.1 The quality of the workmanship by sub-contractors has been poor in places and the Project Manager's opinion is that this has been due to failure of the contractor to properly supervise and manage the sub-contractors from the outset and this has resulted in significant remedial work and subsequent delays.

9.2 Graham have left the detection of defects to the NCC team and the subsequent re-working and other corrective actions have compounded the delays.

9.3 In addition the defects have incurred additional cost for NCC due to the design team and Atkins, who are the independent design checker spending more time checking the works on site and undertaking urgent re-analysis to verify that the trusses and cross girders were not compromised by damage to the steelwork during erection and supervising the repainting.

9.4 We have queried whether there should be any concerns regarding the remedial work and the answer we were given was that there are no structural issues to cause concern but future maintenance costs may be affected due to a possible requirement to repaint and carry out checking earlier than would have been the case if there had been no remedial work.

10.0 CONCLUSION AND RECOMMENDATIONS

10.1 Our main findings are:

.1 The scheme was developed and tendered in haste to take advantage of a funding stream which suddenly became available

.2 The tender documents were lacking in some areas.

.3 The tender returns could have been more closely scrutinised.

.4 The procurement process did not achieve the key objective of appointing a competent contractor who would safely deliver the works to the required quality, on time and within budget.

.5 The successful contractor under-priced the work (this could have been a genuine mistake or a commercial decision to win the contract)

.6 There were some warning signs at tender stage but these were not followed up.

.7 The contractor has not performed and despite his shortcomings being brought to his attention has shown little willingness to improve.

.8 NCC provided design and project management services for the works using their own resources, the site works were split up into separate packages, the scaffolding and craneage being let as separate contracts with the permanent works being let as one contract. This arrangement left NCC with risks which were not under their control i.e. additional cost of scaffolding and cranes due to the contractor being in delay.

10.2 Our recommendations are:

.1 Even when tender documents have to be prepared quickly sufficient time must be spent to get them right and the improvements we recommend are:

Greater care and checking of the initial estimate.

More comprehensive pricing document preferably prepared by a commercial person who has experience of dealing with contractor's quantity surveyors, this exercise will also act as an audit on the design information to remove ambiguities before tenders are invited.

Production of a comprehensive Works Information document to help all participants to fully understand the project and assist tenderers who often only have a short time to tender and need to quickly understand the project.

Production of a risk register from the concept stage to make the design team focus specifically on risk and clearly identify ownership of each risk. The risk register should be kept up to date and be independently reviewed at key stages.

Set out the onsite quality control procedures and requirements in the tender documents emphasising that they will be rigorously enforced.

Have all documents checked and reviewed by appropriately experienced staff before issue.

.2 Have a more rigorous procedure to check and interrogate the preferred tenderer including making sure all tender clarifications issued during the tender period have been included, low prices are thoroughly interrogated, interviewing the proposed site staff and key sub-contract staff with, if necessary, a visit to their workshops to check their quality control, obtain references from previous clients, particularly if NCC do not have experience of the main contractor or their proposed sub-contractors and make sure all references are properly followed up.

.3 Engage with the procurement department so they fully understand the key requirement to appoint a competent contractor, encourage them to be more pro-active and responsible for delivering this key requirement.

.4 Consider whether another procurement route rather than NEPO should be used for projects of this nature. We understand that NCC Highways previously had a framework arrangement with a contractor (Carillion) which worked well.

.5 Consider whether NCC have the in-house capability to manage the whole project and employ the sub-contractors direct which should reduce cost, avoid the need for a main contractor from outside NCC (contract site agent and engineers could be used) and will give NCC greater direct control over the project.

.6 If a project has to be split into works carried out by NCC and works by others consider the allocation of risk and make sure the decisions are not to the detriment of NCC if the project is delayed by others.

.7 Consider holding a workshop or team building day with the contractors and the key sub-contractors site staff prior to starting to encourage a non-adversarial team culture.

.8 Consider commercial support to the Project Manager to free up their time to concentrate on design and contract administration matters. The commercial support should be an experienced person to counter the contractor's commercial representatives who may attempt to aggressively pursue perceived contractual weaknesses to their commercial advantage.

.9 Consider amendments to NEC contract clauses that can be exploited by contractors particularly the Actual Cost clause for valuing Compensation Events i.e. by using something similar to the ICE Contract which uses tender rates to value variations rather than Actual Cost.

.10 Take prompt action as soon as it becomes clear a contractor is not performing and quickly escalate to a senior level if the contractor does not take corrective action quickly.

.11 Hold a lessons learnt workshop at the end of every project, record the findings and feed back into future projects.

10.3 Whilst the above recommendations will never guarantee successful delivery of a project they will help to avoid a similar situation happening in the future.

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