



Tunnel Lining Improvement Works – award of contract

Committee Strategy & Programmes

Date of meeting 28 August 2020

Date of report 10 August 2020

Report by Director of Subway

1. Object of report

To recommend for approval the award of a contract for tunnel lining improvement works to Freyssinet Limited.

2. Background

2.1 Requirement summary

Effective management of the Subway's 125 year old 10.5km twin tunnel infrastructure is vital to safe and reliable operation. Through an extensive programme of works to the tunnel lining between 2015 and early 2018, SPT was able to deliver improvements to tunnel lining integrity and condition. Successes of the programme included proving practicability and effectiveness of a suite of repair designs and methodologies to achieve improvements in a safe and assured manner, within the bounds of standard track access times. The works, as approved at Partnership in December 2014, were centred on 5 (of the total 15) sections of the Subway system, which were selected based on overall risk profile at the time.

To provide assurance of the on-going fitness for purpose of the tunnels, SPT engages suitably qualified engineers to undertake detailed visual survey of the tunnels on a 5 yearly basis. The latest such survey and assessment was undertaken in early 2018, coinciding with the end of the programme of improvement works. It identified defects, categorised them in terms of criticality, and assigned recommended timeframes for rectification. The Subway tunnels were constructed to an engineering specification consistent with 19th century civil engineering methodology and the degradation of these has and will continue to require significant engineering input to maintain the integrity of the tunnels. The last survey identified a range of works required to maintain the tunnel structure, the most critical as outlined in this Paper.

2.2 Aims and objectives

The overall aims and objectives of the tunnel lining improvement works contract are to:

- Address a prioritised bank of known tunnel lining defects in order to improve structural integrity and reduce risks associated with local failure of the surrounding ground;
- Reduce, and improve management of, water ingress through the tunnel lining in order to minimise movement of fines, reduce risks to in-tunnel infrastructure and services, and reduce associated on-going maintenance costs;

- Secure resource with requisite expertise and experience, supported by robust control and assurance systems, to deliver all works in a safe and quality manner with risks minimised throughout;
- Build on the successes and lessons learnt from the 2015-2018 improvement works, using established designs and seeking out innovations in methodologies to increase efficiencies and quality;
- Co-ordinate and deliver the works in a manner that minimises risks to the programme of the Rolling Stock and Controls System Project and other on-going Subway work streams; and
- Provide capability and flexibility to respond to and address, as necessary, tunnel lining defects arising over the term of the contract.

3. Outline of proposals

3.1 Scope of services

Members will recall (Strategy & Programmes, 10 May 2019) that a consultant was appointed to develop a detailed specification and bill of quantities for the tunnel lining improvement works along with reference designs for each repair type. SPT used these to invite contractors to tender for a works contract that includes:

- Joint validation survey with the designer and investigative activities, including cores and probe holes, drip sheet removal and crack mapping facilitation, in order to inform repair extents, methodologies and prioritised programme;
- Addressing tunnel lining defects through fabric repairs including concrete repairs, repair of deteriorated brickwork, crack repairs and re-caulking of cast iron joints;
- Chemical resin injection of brickwork/concrete lining to minimise water ingress and installation of weep pipes to manage ingress of water where resin injection is not sufficient/appropriate;
- Infilling voids behind the tunnel lining with OPC grout in a limited section between Partick and Hillhead;
- Robustly controlling and assuring the quality of all materials and activities pertaining to the works, and providing SPT with comprehensive records in support of on-going and future asset management; and
- Fulfilling the role of Principal Contractor for the tunnel lining works in accordance with Construction, Design and Management (CDM) Regulations 2015.

3.2 Tender assessment process

The procurement route to market was a restricted (two stage) procedure conducted under the Utilities Contracts (Scotland) Regulations 2016. At stage one the European Single Procurement Document (ESPD) was issued in January 2020. Nine responses were received from which, following evaluation; five organisations were invited to stage two - Invitation to Tender (ITT). The ITT was issued in March 2020, with proposals from all invited organisations received in May 2020. One bid was subsequently withdrawn, with four proceeding to tender evaluation.

The ITT was issued as NEC Engineering and Construction Contract Option B – priced contract with bill of quantities. A bill of quantities was developed to reflect the prioritised bank of known tunnel lining defects. The re-measurable form of contract reflects the nature of the works to be undertaken which cannot be accurately priced as a fixed lump sum, but rather will be informed by detailed site investigations to be undertaken by the contractor prior to works commencing. The award is to be based on the most economically advantageous tender against a 70:30 quality:cost split.

Quality was given a higher rating as experience and confidence in relevant engineering skills and site management were seen as key requirements, particularly given the anticipated demands of delivering these works concurrently with the Subway Modernisation Programme.

The ITT required contractors to submit prices for the full work bank of known defects, with a breakdown showing costs for highest priority repairs and separately costs for the remainder of the repair works. Evaluation of tender price submissions was undertaken on the basis of price for the highest priority repairs plus a proportion of the remaining work bank. This reflects the anticipated volume of works to be delivered under the contract.

The evaluation results are as follows:

Contractor Name	Quality Score	Price Score	Total Price + Quality
Freyssinet Limited	69.55	30.00	100
Amalgamated Construction Limited	70.00	27.47	97
Story Contracting Limited	67.74	25.72	93
Terra Solutions Limited	64.13	18.29	82

When assessed against the tender award criteria, the Freyssinet Limited tender was deemed to be the most economically advantageous submission.

Within their tender submission, Freyssinet Limited was able to demonstrate experience and expertise in successfully delivering tunnel lining works projects that addressed defects and associated challenges similar to those anticipated on this project. Indeed the submission provided a robust summary of identified hazards and measures to be implemented in order to mitigate associated risks. Consideration was given to a wide range of factors, from occupational health and safety to technical success of repairs and response to unexpected tunnel or ground conditions.

The Freyssinet Limited submission shows their understanding of the criticality of planning and managing site access with a view to minimising the risk of disruption to Subway operations and other Subway activities, such as the on-going Subway Modernisation Programme. The submission outlines a range of measures to be implemented in order to maximise predictability of the works and an intention to combine this with proactive programme management to ensure defects are addressed in a timely and efficient manner.

A commitment to continually seek improvement in both quality and efficiency throughout the term of the contract is well evidenced in the Freyssinet Limited submission. Recognising the importance of personnel in achieving these aims, the submission outlines a suite of measures Freyssinet Limited intends to implement in order to secure retention of a competent and experienced workforce. In addition to training and development initiatives, on-going staff engagement activities and personnel support structures, Freyssinet Limited will seek to deliver community benefits through apprenticeship schemes.

4. Conclusion

The submission by Freyssinet Limited was assessed to be the most economically advantageous tender taking account of both quality and price as outlined in the tendering criteria.

5. Further information

SPT's consultant will continue to provide technical support throughout the term of the works contract, including fulfilling the role of Principal Designer.

The works contract is re-measurable. The contractor has provided a schedule of rates for the range of anticipated repair types and associated activities, as well as a schedule of fixed preliminary costs. Prior to works commencing in a tunnel section a joint survey will be undertaken by the contractor, SPT and SPT's designer to confirm locations and extents of the highest priority repairs and to highlight any opportunities to optimise value and works efficiency by concurrently effecting desirable repairs. Based on this survey, supplemented by necessary intrusive surveys, the contractor will propose for SPT agreement, a costed work schedule for the section, defined using the established schedule of rates. Effective contract management will be in place, supported by SPT's technical advisor, to ensure control of programme and costs, with continual optimisation of value.

6. Committee action

It is recommended that the Committee approves the award of a contract to Freyssinet Limited for a five year term contract for tunnel lining works with a contract budget of up to £13,000,000 (excl. VAT).

7. Consequences

Policy consequences	<i>None identified.</i>
Legal consequences	<i>Contract will be awarded subject to the conditions of contract contained within SPT's ITT together with agreed and permitted variations. Award of the contract is subject to satisfaction of the requirements of the mandatory standstill period for EU advertised public sector contracts.</i>
Financial consequences	<i>The call-off contract costs will be accommodated within the capital budget, under project 10375 "Tunnel & Infrastructure Works". This project is funded from the Subway Infrastructure Fund (General Fund – Earmarked Reserve).</i>
Personnel consequences	<i>None identified.</i>
Equalities consequences	<i>None identified.</i>
Risk consequences	<i>Requirement for works to be delivered in order to ensure effective on-going management of risks to tunnel integrity.</i>

Name Antony Smith
Title Director of Subway

Name Gordon MacLennan
Title Chief Executive

For further information, please contact *Graeme Cameron, Infrastructure Asset Engineer* on 0141 333 3624.