PREPARATION OF CENTRAL ASIA REGIONAL ECONOMIC COOPERATION CORRIDORS 5 AND 6 (SALANG CORRIDOR) PROJECT

BIDDING DOCUMENTS

FOR

TOPOGRAPHIC SURVEY

RFQ Ref No.: SMEC/MPW/SC-1/CS-08/RFQ

September - 2019

INSTRUCTIONS TO BIDDERS
FOR
TOPOGRAPHIC SURVEY

1. Invitation

Professional Topographic Survey organizations are invited to submit bids for the work described in the attached documents. These comprise:

- Instructions to Bidders
- Description of Services
- Financial Bid Submission Form
- Bill of Quantities
- Draft Sub-Contact Agreement

2. Bid Submission Requirements

The following are required to be submitted in one envelope to form a conforming bid for any package.

- Financial Bid Submission Form including priced Bill of Quantities
- Work Program and Methodology
- Proposed staffing including CV of entire survey team
- Schedule topographic survey equipment proposed to be used
- Outline of topographic survey methods
- Statement of relevant experience
- Sample reports of relevant survey completed in last five (05) years

Prices are to be submitted in United States Dollars (USD),

Bids that omit any of these items may be considered as non-conforming and be subject to rejection.

The original of the bid documents plus two copies, including any specified supporting documents, are required.

3. Lodgment of Bids

The Bid shall be submitted in a sealed envelope to:

Mr. Alexander Mackay
Team Leader
SMEC International
Karte Parwan
Parwan e du near Karimi Superstore
PD# 4 House #2
Kabul, Afghanistan
Mob - +93778002770
02:00 pm on **05 October 2019**.

The envelope shall be marked clearly with the name and reference number of the tender.

Also, please send / submit a soft copy of the complete Bid along with all attachments to the email addresses given below, after the bid opening:

Employer's Email: 1. John.thorpe@smec.com
2. *Hamed.Haqseta@smec.com*

Bids will be opened at 2:00 pm on the stated closing date and the apparent prices announced at the opening.

SMEC reserves the right to cancel the invitation for bids at any time without assigning any reason whatsoever before the award of the Contract.

4. Bid Validity

Bids shall remain valid for 45 days from the due date for submission of bids.

5. Bid Evaluation Criteria and Award

Bids will be evaluated by SMEC International on the basis of cost, value for money, technical experience and program.

As it is crucial that the work be completed within the stipulated time period, the bidder must demonstrate to SMEC's satisfaction the availability of resources sufficient to meet the required program. Given this the tender selection will be based on:

- The Company shall be legally registered with a core competency in topographic surveying;
- project experience of a similar scale and over similar terrain for the past 5 years;
- Experience as a main contractor leading topographic survey sub-contractors for at least one project of a similar nature and complexity equivalent to this Request for Quotation (RfQ) over the last five years. Evidence of this experience substantiated by a client's certificate of completion is required;
- The proposed team shall have relevant education certification including academic degrees from accredited universities;
- The team shall have at least seven (07) years' experience in conducting topo surveys;
- Working knowledge of donor / government interactions, donor's practices, procedures, and technical assistance protocols;
- Excellent written & spoken English; and
- Financial soundness of the firm and current financial statement.

The Employer will award the contract's bid based on the technical and financial responses to the RfQ. A proposal may not be considered, or may have reduced marks, if it deviates or provides reservations to the terms, conditions, and specifications in this RfQ. The Employer will evaluate and compare only the proposals determined to be substantially responsive.
The award of any contract may be subject to approval from the Ministry of Transport (MoT), Afghanistan.

6. Work Program

The bidder shall submit with its proposal his Work Program (the Program) in the form of a Gantt (bar) chart showing how the Works will be executed within the timeframe given in relevant Clause of these Terms of Reference. The following criteria needs to be considered:

- The maximum period for the works is two months. Please provide the plant and resource needed to achieve the works within this period.
- The works shall comprise an initial Stage 1 (Approach Road to the Tunnel), followed by the subsequent Stages 2 and 3 (North and South Highway alignments respectively), refer to Annex-1 for the Stage locations.

7. Information to be Submitted with Bid

The bidder shall submit with its bid:

- relevant information including completion certificates concerning previous experience in conducting topographic survey.
- curricula vitae (CVs) of key personnel (should be authenticated by the Contractor)
- the name and CV of the Coordinator to be assigned for the work
- outline of the methodology that will be followed
- work program
- details of the work experience in undertaking similar works within five (05) years, preferably in Afghanistan.
- five (05) years reports of relevant study completed in the past, preferably in Afghanistan.

8. Financial Bid Submission Form

8.1 Bidder's Proposed Rates

Bidders are required to submit their quotations in unit rates in the format given in the Bill of Quantities. All rates are to be in United States Dollars. The rates are to cover all work to be undertaken by the Sub-Contractor, and no separate payment will be made for work specified but not listed in the following schedule. Actual work may vary depending on the ground conditions.

No change in rate will be made on account of changes in quantities.

1 Terms of Reference for Topographical Survey

1.1 Scope of Work

To carry out the topographical (topo) survey using Total Station, DGPS and Auto Levels, preparation of layout map and digital terrain model for rehabilitation of the last stretch of Salang Corridor Road Project from Jabal-e-Seraj in the south to Khinjan in the north, a distance of about 90km (the project road). The terrain between these locations is mountainous with limited access along the existing route. The proposed highway alignment will follow, or be in close proximity, to the existing highway along the majority of the alignment. The survey will be carried out in stages, with the lower level alignment carried out initially and higher elevations carried out at a later stage. The subsequent stage of topographic survey will be completed within a month after commencement to allow time for completion of the site works.

Topo mapping shall be carried out for a minimum width of 60m from centerline on each side of the road (total width 120m) along 87 Km road, approximately area (200m x 200m) for each tunnel portal and the survey shall cover river section adjacent/ parallel to the road.

Also, the survey extent shall be increased based on consultant requirement.

If additional survey will require during the detailed design stage due to changes in alignment or any other purpose, the contractor shall perform the survey based on consultant requirement.

Coordinates of proposed alignment shall be provided to the survey team for all required areas.

The contactor shall fulfil any changes required in Topo Survey during the design stage.

The sections shall be taken every 10m spacing along the proposed alignment. The UTM coordinates system shall be followed for the survey work.

Due to the nature of the terrain and climatic conditions along the proposed alignment the site works will be carried out within the accessible summer season, with site works to be completed within two months.

1.2 Technical Specifications

Topographic survey is to be carried out using Total Station of two sec accuracies. Total station shall be checked periodically for horizontal and vertical collimation. Auto level of 1-mm accuracy shall be used for fixing benchmark levels and levels of station point of the Total Station.

Dual reference pillars shall be established once in every 1 km using differential GPS (DGPS) having valid calibration certificate. Reference pillars shall be in the form of concrete blocks of size 40 X 40 X 120cm and shall be embedded to a depth of 40cm in to the ground.

1.3 Benchmark Pillars Specifications

BM Pillars shall be established at 250m intervals in the form of precast concrete blocks of size 30 X 30 X 60cm and shall be embedded to a depth of 30cm in to the ground. The benchmark pillars shall be painted in yellow and details such as BM number and reduced level shall be clearly marked on it with red paint. All BM pillars shall be numbered sequentially as per the instruction

of the Engineer in charge of the site. Wherever the new benchmark pillars are laid, the level traverse shall be closed and the closing errors shall be in accordance with Section 4 of this ToR.

1.4 Methodology

The Contractor shall provide details of resource (professional surveyors and labour), specialist survey sub-contractors (if required) and plant (calibrated and sufficient to provide the specified accuracy along with the bid.

The Contractor will submit a program of the site survey teams, which are anticipated to be a minimum of 4No, such that the works can be completed within the limited time period available for site access. The program, including plant and survey teams will be submitted with the bid to provide assurance that the contractor is capable of completing these works within the limited access period.

The topographical survey shall consist of the following:

- Level traversing using Auto level
- Fixing of reference pillars using DGPS
- Transfer of co-ordinates from DGPS pillars to other BM pillars, and
- Feature survey.

Level Traversing shall be conducted using auto Auto level and digital having accuracy of 1mm in 1 km double run. Benchmark pillars shall be connected to nearest bench mark. Benchmark level also to be transferred on major permanent structures at least once in every 250m with sequential numbering and as per the instructions of the Engineer in charge of the site.

Inter visible Dual Bench mark pillars shall be established once in every 1 km using differential GPS (DGPS) having valid calibration certificate. The transfer time shall be such that the accuracy achieved shall be better than 1 in 20000.

The Total station traverse shall be closed with the nearest DGPS. Traversing shall be carried out using total station (having an accuracy of two sec.) to fix the co-ordinates on the benchmark pillars. Two rounds of angle measurements to be taken on both left and right face in both clockwise and anticlockwise direction. The angle spread between observed round shall not be more than 5 sec. Traverse shall be closed within an accuracy of 1 in 20000.

Feature survey is detailed in section 5. All computation shall comply with the following:

- Traverse adjustment by Bowditch method
- Least square adjustment by variation of coordinates

1.5 Detail Survey of Topographical Features

Based on the requirement of the consultants, the existing features shall be mapped for a minimum width of 60m from centerline on each side of the road along 87 Km road, approximately area (200m x 200m) for each tunnel portal and the river section adjacent/ parallel to the road.

Survey shall be carried out as per the code list provided by the consultant

- Electrical Poles, Telephone Poles, Lamp Poles and any other Private/Unauthorized utility Poles with their routing network.
- Water / Sewerage / Oil / Gas Pipe Lines with diameter and material of the pipe.
- All Utility lines, both overhead and underground.
- Manholes – with their actual size and shape (ex. rectangular or square or circular)
- Trees with girth more than or equal to 0.3m - while surveying the trees, care has to be taken to exactly classify the trees according to its girth.
- Building lines indicating the type of buildings (shops or houses), Right of Way boundary if available at site by presence of boundary stones.
- Sufficient road center points, edge points and shoulder points shall be taken to define the existing layout of the roadway. The cross section points shall be taken as detailed in sub-section “cross sections”.
- Approach road details of 60m width to be recorded on either side of the road. But on important junctions, length of road to be surveyed shall be as per the instruction of the Engineer in charge of the survey subjected to a minimum length of 300m.
- Location of traffic islands, median, channelizing islands, rotaries, police chowkis, (top and bottom levels are must for all these) with its locations, and dimensions.
- Location of bus bays / bus stops, lorry - parking areas: taper length, roadway width.
- Special emphasis shall be laid in identifying all religious places - its locations, boundary lines and clear dimensions of compound walls and entrances.
- Locations of roadside drain clearly identifying the type (Built-up / Earthen, Rectangular / Trapezoidal etc., and whether Open / Closed), width of drain (waterway width and wall width in case of built-up drain) including the beginning and end of drain. While surveying the existing drains, care has to be taken to take the top and bottom points of the drain to get the true contour and shape of the drain. All water features such as ponds, tanks, lakes, streams, canals and wells etc. shall be mapped.
- Roadside cultivation viz., agricultural, residential, commercial, shops and business established areas etc.
- Identification of all bridges and culverts along the project road - shall include location (chainage) and reference number, width of bridge / culvert (width of slab or diameter of pipe, no of pipes/spans), course of water path, skew of bridge / culvert, span arrangement.
- Any other Structure/Utility, (i.e., anything else which is not available in the code list) if found at site should also be recorded as per the instructions of the Engineer in site.

1.6 Cross - Sections

Based on the requirement of the consultants the cross-section shall be taken at every 10m in each directions for the full survey along 87 Km road and approximately area (200m x 200m) for each tunnel portal and the river section adjacent/ parallel to the road.

The cross-section shall be taken based on the requirement of the consultants as follows:

- For Existing carriageway at 10m interval:
  Top edge and bottom edges of central median.
  Center of pavement and edges of pavement (Paved Shoulder/ Earthen shoulder/ Footpath edges Side ditches/ other longitudinal structures).

- For the full 60m from the centerline to each side of the road at 10m interval, in addition to carriageway points:
  Intersection of embankment / cut with natural ground;
  Hill top / valley edge;
  Spot Levels beyond embankment / cut bottom at maximum 5m interval or as required to depict the ground variation up to the survey corridor.

1.6.1 Cross Sections at Horizontal Curves

At curves, the pavement cross-sections should be taken at closer intervals to get the arc to chord tolerance within an acceptable limit (say 0.1 m). In any case, it shall not be more than 5m.

1.6.2 Cross Drains at culverts/bridges & Rivers

The cross sections shall be taken as detailed below.

For small drains across CD works, at least three cross sections shall be taken, namely one at the selected site, one upstream and one downstream. For major bridge, drains and streams cross sections shall be taken as follows:

- The survey shall be carried out for bridges along 250m upstream and 200m downstream, at 25m interval on upstream and downstream sides, and the river bed level, river bank level, HFL (high flood level) and existing bridge elevations shall be taken. In case of bend in the river alignment additional cross section shall be taken to represent the bend.
- The survey shall be carried out for the culvert and causeway which have furnace run off and the bed and bank elevations of stream along 50m upstream and 50m downstream shall be taken.
- The survey shall be carried out for irrigation culverts and the bed, the bank elevation of channel, inlet and outlet elevations along 30m upstream and 30m downstream shall be taken.

For major drains/streams (catchment up to 3.0 sq.km), cross sections shall be taken for a distance of 100m on both upstream and downstream side. Survey work of the river / stream shall be fully complied with the abovementioned detail and data requirement for hydraulic analysis.

1.7 Survey record and report

The contractor shall submit the following

- Work program for the investigations duly approved by engineer in-charge at site.
- The report shall consist of topo survey drawings (soft), field book / level book, and all relevant details of the survey. Report shall be handed over to the Engineer in-charge at

site, approved and certified for work or to send the same to the Consultants office as advised by Engineer in-charge at site.

- Method used for survey and brief note on procedure followed.
- Input parameters, if any.
- Comments / discussion on results, including a note on accuracy achieved, standard deviation.
- Survey network diagram inclusive of control points (traverse points) and BM positions with their number and abbreviations.
- Final coordinate and elevation list
- Field observation if any

Report shall include the following:

- A coma separated ASCII file contains Easting, Northing, Level and Code.
- Three-dimension Auto Cad drawings of the survey. Scale of the drawing should be 1 in 1000. These drawings shall also contain additional details like names of villages, names of approach roads, road destinations & directions, names of junctions & interchanges, names of major buildings, structures, river, stream, water-bodies and other landmark points, in separate AutoCAD Layer.
- Details of reference pillars, benchmark pillars, and control points are to be submitted as a separate Excel file with their location landmarks and also as a 3d drawing file.

1.8 Safety Precautions

Contractor is responsible for the safety of his / her staffs and equipment's deployed at site during survey work. Adequate safety precautions shall be taken for working during night viz., providing lamps with red light reflectors, safety reflectors with red band / strips, torches and red jacket for crew.

1.9 Accuracy of the Survey

The contractor is fully responsible for the accuracy of the survey. The maximum permissible error in co-ordinate measurement shall be 1 in 20000 and error in levelling survey should not be more than 12 (k) 0.5.

FINANCIAL BID SUBMISSION FORM

[*Location, Date*]

To: Mr. Alexander Mackay
Team Leader
SMEC International
Preparation of Central Asia Regional Economic Cooperation Corridors 5 And 6 (Salang Corridor) Project
Karte Parwan
Parwan e du near Karimi Super store
PD# 4 House #2
Kabul, Afghanistan

Dear Sir:

We, the undersigned, offer to provide the Sub-Consultant services for [*Insert title of assignment including Package Identifier*] in accordance with your Invitation for Proposals dated [*Insert Date*]. Our attached Financial Proposal in the form of a priced Bill of Quantities is for the sum of [*Insert amount(s) in words and figures*[1]]. This amount is inclusive of the local taxes and VAT. Our Financial Proposal shall be binding upon us subject to any modifications resulting from contract negotiations, up to expiration of the validity period of the Proposal.

We also include all other information required to be submitted as noted in the Bid Submission Requirements of the Instructions to Bidders.

We understand you are not bound to accept any proposal you receive.

Yours sincerely,

Authorized Signature [*In full and initials*]: _____

Name and Title of Signatory: _____

_____

Name of Firm: _____

Address: _____

_____

_____

[1] In the event of any discrepancy, the amount in words shall prevail.

PREAMBLE

Measurement and Payment

The final Service Fee will be determined by actual quantities of work approved by The Consultant and the unit prices included in the Contract. The priced BOQ is to be used to determine the total fee for the project. Where no specific pay items are included for a particular item of work, the costs associated with that item of work are deemed to be included in the rates and prices generally for the Work under the Contract.

Tax and VAT will be deducted from each payment including the mobilisation advance as per rules of the Government of Afghanistan.

With the exception of the mobilisation advance payment, 25% will be deducted from all progress payments to recoup the mobilisation advance.

No change in rate will be made on account of changes in quantities.

Contingency Sum expenditure shall only occur after written direction from the Consultant's authorised representative to proceed with such expenditure.

Pay Item P1 – Mobilization

The Unit of Measurement is Item.

The schedule rate includes all supply and mobilisation to site of all personnel, materials, equipment, instruments, site inspection, testing and calibration and ancillary work for topographic survey and on-site measurements. This includes obtaining local agreements as to the positioning of monitoring equipment and the starting physical works.

Payment of the Pay Item P1 will be made as follows:

> After signing of contract and supply of required Mobilisation Advance Security / Bank Guarantee in a form acceptable to The Consultant – 100% of Pay Item P1.

Pay Item P2 – Control Point and Bench Marks installation

The Unit of Measurement is Item

The schedule rate must include the submission of method as agreed by the Consultant including all consultations, discussions, review of proposals provided. Payment will be 100% following the amendment of the draft report to address satisfactorily the Consultant's comments.

Pay Item P3 – Primary and Secondary Survey Controls

The Unit of Measurement is Item

The schedule rate must include the submission of method as agreed by the Consultant including all consultations, discussions, review of proposals provided. Payment will be 100% following the amendment of the draft report to address satisfactorily the Consultant's comments.

Pay Item P4 – Details topographic survey

The Unit of Measurement is Item

The schedule rate must include the submission of method as agreed by the Consultant including all consultations, discussions, review of proposals provided. Payment will be 100% following the amendment of the draft report to address satisfactorily the Consultant's comments. Payment will be made as follows

Stage 1 - Report 30% of the Pay Item.

Stage 2 and 3 – Report 70% of the Pay Item.

Refer to Annex 1 for the locations of the Stages 1 to 3 surveys.

Pay Item P5 – Data Analyze and Preliminary Survey Drawings

The Unit of Measurement is Item

The schedule rate must include all consultations, discussions, obtaining of documents, review of proposed works drawings provided by the contractor, analysis, report preparation and production.

Payment will be made as follows

Stage 1 - Report 30% of the Pay Item.

Stage 2 and 3 – Report 70% of the Pay Item.

The schedule rate must include the amendment of the draft report to address satisfactorily The Consultant's comments, printing, binding and delivery to the Consultant of the specified number of copies of the final report in the required formats.

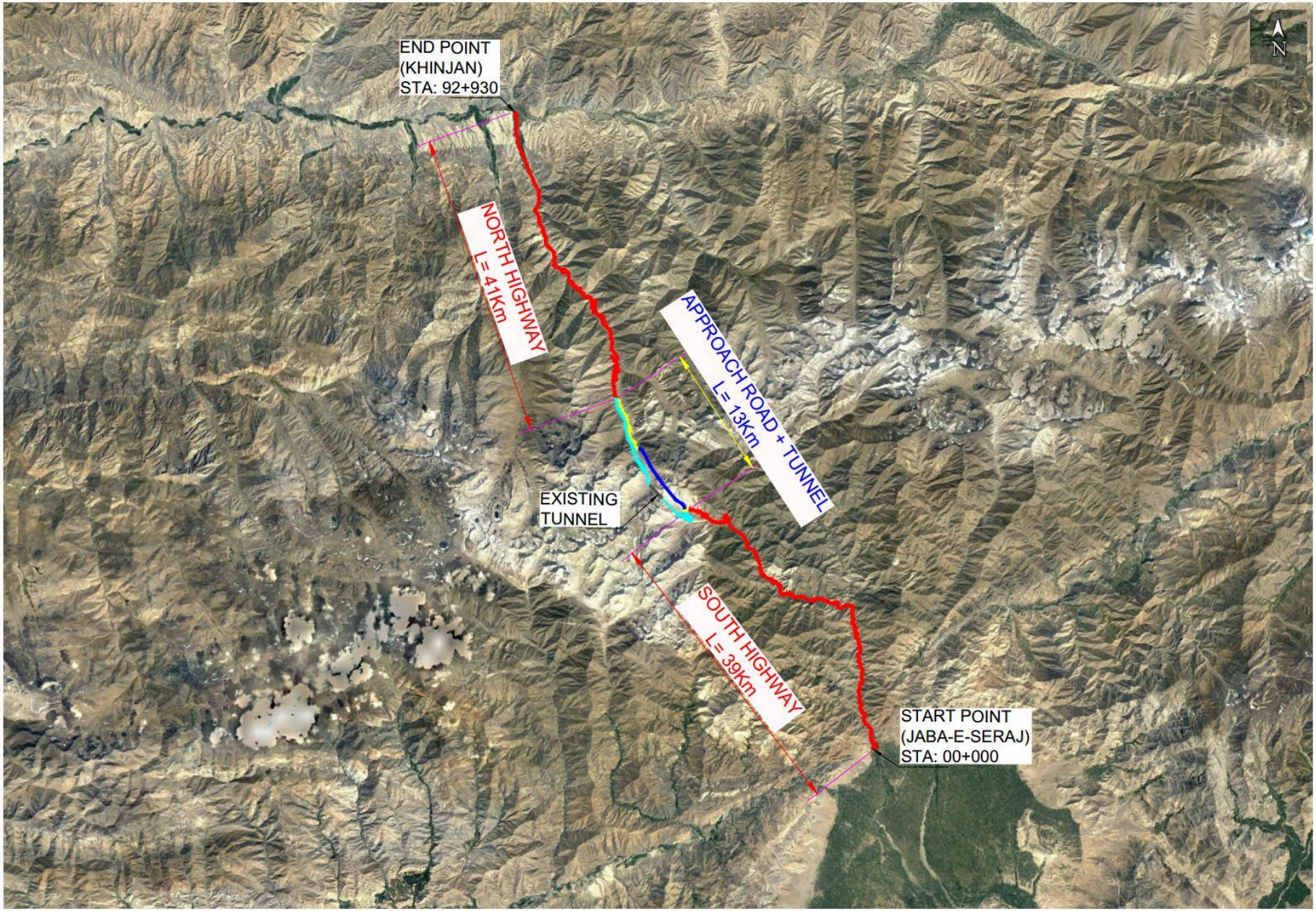
Refer to Annex 1 for the locations of the Stages 1 to 3 surveys.

BILL OF QUANTITIES

#	Description	Unit	Qty.	Rate (USD)	Amount (USD)	TOTAL (USD)
P1	Mobilization	-	LS			
P2	Pillar/ Control Point installation with steel galvanize cover for pillar details marking , in each km or as per project site	KM	87.5			
	Bench marks installation with steel galvanize cover for pillar details marking , in each 250 m or as per project site	KM	87.5			
P3	Primary survey control with static method use GNSS adjustment and GNSS salutation software.	KM	87.5			
	Secondary survey control with RTK fixed and AutoCAD Civil 3D 2018 & Software	KM	87.5			
	Horizontal and Vertical Controls	KM	87.5			
P4	Details topographic survey	KM	87.5			
P5	Data analyse and preliminary survey drawing provide A3 Size	KM	87.5			
					Total	
					Add Tax and VAT:	
					Total:	
					In words:	
					Contingency:	**USD 5,000**
					Grand Total:	

Notes:

1. **No. = number**
2. **Use of contingency expenditure will require SMEC's prior approval and SMEC may also need to obtain Ministry of Transport approval to such expenditure.**

Signature:	*[insert signature of authorised representative of the Bidder]*
Name:	*[insert full name of signatory with National ID]*
In the capacity of:	*[insert designation of signatory]*
Name of Company	*[insert company name with full address]*
Duly authorised to sign the Bid for and on behalf of the Bidder	

ANNEX-1 STAGE LOCATIONS MAP