#### **REQUEST FOR EXPRESSIONS OF INTEREST**

#### **CONSULTING SERVICES – FIRMS SELECTION**

#### **Republic of Serbia**

#### The Serbia Railway Sector Modernization Project (SRSM)

#### Project ID No. P170868

#### **Assignment Title:**

#### Preparation of the Spatial Plan, Feasibility Study with Preliminary Design and Environmental Impact Assessment Study for reconstruction and modernization Pančevo Main – Vršac – Romanian border railway line

#### Reference No. SER-SRSM-QCBS-CS-21-21

The Republic of Serbia has received a Loan from the International Bank for Reconstruction and Development (IBRD) in the amount of EURO 51 million and from the Agence Francaise de Développement (AFD) in the amount of EURO 51 million, toward the cost of the Serbia Railway Sector Modernization Project, Phase 1 of the Multiphase Programmatic Approach (MPA) and intends to apply part of the proceeds to payments for consulting services for Preparation of the Spatial Plan, Feasibility Study with Preliminary Design and Environmental Impact Assessment Study for reconstruction and modernization Pančevo Main – Vršac – Romanian border railway line.

The consulting services ("the Services") include are divided into two activities:

- Activity 1: Inception report;
- Activity 2: Prior Studies Option analysis report
- Activity 3: Preparation of the Spatial Plan, Feasibility Study with Preliminary Design and Environmental Impact Assessment Study
- Activity 4: Support in preparation of procurement documents

<u>Activity 1:</u> The Inception Report shall be the specific output of the Inception Period and present an overall approach and detailed program work plan and completion schedule for the services. It should discuss constraints and challenges identified by the Consultant and ways to address them in order to timely and effectively deliver the assignment.

Activity 2: Prior Studies - Option analysis report is divided in the following sub-activities:

Sub-activity 2.1 - Preparation of Demand Study

Sub-activity 2.2 - Preparation of Railway Operation Plan

Sub-activity 2.3 - Options proposal

Sub-activity 2.4 - Selection of the Option

<u>Activity 3</u>: Preparation of the Spatial Plan, Feasibility Study with Preliminary Design and Environmental Impact Assessment Study is divided in the following sub-activities:

Sub-activity 3.1: Preparation of the Spatial plan for the special-purpose area for Infrastructure Corridor

Sub-activity 3.2: Preparation of the Preliminary Solution

Sub-activity 3.3: Preparation of the Feasibility Study with Preliminary Design

Sub-activity 3.4: Preparation of the Environmental Impact Assessment Study

<u>Activity 4:</u> Support in preparation of procurement documents: Within this Activity, the Consultant will prepare technical scope of Employers requirements and schedule of prices based on a template to be provided by the Client that will be part of the tender document

# Contract duration: 27 months starting from the commencement date, but no later than 31 December 2026, as Project completion date.

The detailed Terms of Reference for the above referenced consulting services is posted on the website of the Ministry of Construction, Transport and Infrastructure (MoCTI):

https://www.mgsi.gov.rs/cir/dokumenti/serbia-railway-sector-modernization-project-srsm-design-pancevomain-vrsac-romanian-border

The Central Fiduciary Unit (CFU) of the Ministry of Finance now invites eligible Consulting firms ("Consultants") to indicate their interest in providing the Services. Interested Consultants should provide information demonstrating that they have the required qualifications and relevant experience to perform the Services.

The Consultant firm will be selected in accordance with QCBS (Quality-and Cost-Based Selection) method set out in the World Bank's Procurement Regulations for IPF Borrowers (July 2016, revised November 2017, August 2018 and November 2020). The Client, intends to shortlist up to eight eligible firms to whom a subsequent Request for Proposals (RFP), both technical and financial, shall be sent. Consultants may associate with other firms to enhance their qualifications, but should indicate clearly whether the association is in the form of a joint venture and/or a sub-consultancy. In the case of a joint venture, all the partners in the joint venture shall be jointly and severally liable for the entire contract, if selected.

# To be shortlisted, a Firm or joint venture submitting the EoI must meet the following requirements:

As a precondition for being considered for shortlisting, a firm or joint venture submitting the EoI must be a legal entity. It must possess valid company licences issued by RoS, in accordance with the Serbian law (Law on Planning and Construction - Article 126), namely:

• For development of technical documentation: P141G2, P142G1, P141S1, P141E1, P141E4 and P131G2.

# As proof, a firm shall submit the Decision on the fulfilment of conditions for stated licences issued by the Ministry in charge.

Alternatively, proof of intent to obtain the company licenses shall be accepted, where the acceptable proof must be a declaration issued and signed by the company or joint venture stating that the named company licenses shall be obtained and available at the time of contract signing. The declaration must identify the engineering staff and all other resources and requirements by which the conditions for obtaining the licenses shall be fulfilled. The conditions for obtaining company licenses can be found on the website of the Ministry of construction, transport and infrastructure of the Republic of Serbia on the following URL:

https://www.mgsi.gov.rs/lat/dokumenti/pravilnik-o-nacinu-postupku-i-sadrzini-podataka-za-utvrdivanjeispunjenosti-uslova-za Firm or JV that doesn't submit the company licenses or stated proof of intent for obtaining the named licenses shall not be shortlisted.

The consulting firms/JV that will submit Eol shall possess the following experience and qualifications:

#### i) Experience in railway infrastructure designs

 Minimum two (2) successfully completed railway infrastructure design contracts in the last seven (7) years for Construction/Reconstruction/Modernisation, of public railway infrastructure in minimum of 20km length each.

Reference design contracts must be of a similar nature as the scope of this tender, covering minimum two (2) designs for construction or reconstruction of railway line and for all of the following components each:

- sub-structure and superstructure
- OCL (Overhead Contact Line) electrification
- electronic signalling, interlocking and telecommunications
  - Minimum one (1) successfully completed design contract in the last seven (7) years for construction/reconstruction of minimum 1 (one) railway bridge with span greater than 16m.

Reference design contract for railway bridge may be a separate individual design of a bridge, or part of a larger scope project.

The acceptable levels of technical documentation for design references are Preliminary and Design for a building permit (or equivalent), while concept/general designs or studies (or equivalent) design references shall not be considered as relevant experience. The design references shall be accepted if in the scope of a larger project (i.e. reconstruction of a railway section) as long as it includes all stated projects.

#### ii) Availability of qualified experts within the company/joint venture

As proof of availability of qualified experts within their firm/JV listed in 5.1. Term of references, the bidder shall prepare an organization chart and a list of experts conforming to requested conditions within the company who are relevant to the assignment. The contents of the list should be short-form table information for the available experts and their fulfilment of stated conditions (i.e. name and surname of the expert, years of experience, names of reference projects, owned licenses issued by RoS chamber of engineers).

As proof of experience in railway infrastructure designs, the bidder shall prepare reference forms, naming **ten (10) references maximum** for each stated requirement, clearly stating the following:

- Reference #
- Start date and completion date (mm/yy)
- Brief description of the design (10 sentence each maximum)
- Country of assignment with client name and address, and client reference contact
- Contract value
- Role on project

Submitted expressions of interest should be no larger than 30 pages of text, including reference forms and excluding licenses and other official government documents (if any).

Shortlisting of firms will be based on the following of points:

- i. Experience in railway infrastructure designs 70 points
- ii. Availability of qualified experts within the company/joint venture 30 points

#### Key Experts' CV are not required and will not be evaluated at the shortlisting stage.

The attention of interested Consultants is drawn to paragraphs 3.14, 3.16 and 3.17 of the World Bank's Procurement Regulations for IPF Borrowers – Procurement in Investment Project Financing Goods, Works, Non-Consulting and Consulting Services (July 2016, revised November 2017, August 2018 and November 2020) ("the Regulations") setting forth the World Bank's policy on conflict of interest.

Further information can be obtained at the address below during office hours 09:00 to 15:00 hours.

Expressions of interest in English language must be delivered in a written form to the email below, by June 26, 2023, 12:00 hours, noon, local time.

Contact:	E–mail:	Address:
То:	<u>zorica.petrovic@mfin.gov.rs</u> Ms. Zorica Petrovic Procurement Specialist	Ministry of Finance Central Fiduciary Unit 3-5 Sremska St
Cc:	ljiljana.dzuver@mfin.gov.rs larisa.puzovic@mgsi.gov.rs	11000 Belgrade, Serbia Tel/Fax: (+381 11) 765 2587

## **TERMS OF REFERENCE**

for preparation of the Spatial Plan, Feasibility Study with Preliminary Design and Environmental Impact Assessment Study

for reconstruction and modernization Pančevo Main – Vršac – Romanian border railway line

### Abbreviations

Abbreviation	Meaning
ADF	Agence Francaise de Développement
AGC	European Agreement on Main International Railway Lines
CBA	Cost-benefit analysis
ESIA	Environmental and Social Impact Assessment
TSI	Technical Specifications for Interoperability
FIDIC	International Federation of Consulting Engineers
FS	Feasibility study
OA	Option Analysis
IBRD	International Bank for Reconstruction and Development
IZS	Serbian Railways Infrastructure
MoCTI	Ministry of Construction, Transport, and Infrastructure
PIU	Project Implementation Unit
PD	Preliminary Design
PR	Performance Requirement
Project	Serbia Railway Sector Modernization (SRSM) Project
RAP	Resettlement Action Plan
ТА	Technical Assistance
TEN-T	Trans-European Networks - Transport
ToR	Terms of Reference
WB	World Bank

### **1** Background information

### 1.1 Beneficiary country: Republic of Serbia

Client: Ministry of Construction, Transport, and Infrastructure of Republic of Serbia (MoCTI).

Final Beneficiary: Infrastruktura železnica Srbije (Serbian Railway Infrastructure - IZS).

### **1.2 Project Information**

The International Bank for Reconstruction and Development (IBRD) launched the Multiphase Programmatic Approach (MPA) to support the Government of Serbia in continuation of institutional, physical and operational modernization of the railway sector in an integrated manner through providing financial support to Serbia Railway Sector Modernization Project as part of the Multiphase Programmatic Approach to be implemented in three overlapping phases over the ten-year period.

For the purpose of financing Serbia Railway Sector Modernization Project, Phase 1 of the MPA (the Project), IBRD and the Agence Francaise de Développement (AFD), jointly, granted to the Republic of Serbia EUR 102 million loan to support enhancing the efficiency and safety of existing railway assets and improving governance and institutional capacity of the railway sector. The Project includes the following Components:

- Component 1: Infrastructure Investments and Asset Management. This component focuses on improving the quality and safety of railway infrastructure and enhancing rail asset management practices. Sub-Component 1.2 Technical Documentation finances the Services object of these TOR.
- Component 2: Institutional Strengthening and Project Management. This component focuses on strengthening rail policies and institutions to deepen and sustain recent reforms.
- Component 3: Railway Modernization Enablers. This component will finance measures to protect the vulnerable and poor and strengthen sectoral enablers for sustainable business growth and job creation.

The Project is managed by the Ministry of Construction, Transport and Infrastructure (MoCTI) through the Project Implementation Unit (PIU) supplemented by the Project Implementation Teams (PITs) in Railway Directorate (RD) and in railway companies, respectively Serbian Railway Infrastructure (IZS), Serbia Voz (SV) and Serbia Cargo (SC). PITs will act as subordinate implementing agencies and provide technical support for specific Project subcomponents or activities of the MPA that pertain to their area of expertise. Primary responsibility for Project execution lies on PIU which will ensure that the Project development objectives are met.

### 1.3 General Railways Sector Information

The position of Serbia in the European railway network is such that it forms part of the shortest traffic line between West and South-East Europe and as such is often referred to as a gateway of Europe.

The length of the railway lines in the Republic of Serbia is 3.348,1 km, of which 3.059,4 km are single-track and 288.7 km of double-track railway lines, of which 1.273,7 km are

electrified. Railways within the Serbian railway network are categorized as main, regional, local and shunting lines.

Infrastructure modernization is essential to address various cross-cutting performance issues like safety, resilience, inclusion, and digitalization. Decades of low investments, outdated management structures and practices, and neglect of maintenance have led to serious deterioration of the Serbian rail network infrastructure, obsolescence of the rolling stock, and low rail service quality.

Within the Project, the preparation of spatial and technical documentation is planned for the reconstruction and modernization of the **railway section Pančevo main (incl.)** – **Vršac** – **State border in total length of approx. 80 km**. This section is part of railway line 107 Beograd Centar - Pančevo Main - Vršac – state border - (Stamora Moravita) which is by the European Agreement one of the most Important International Railways (AGC) coded as E66 line. This line is classified among the main connecting lines of class A and is of great importance because it connects the pan-European transport corridors X and VII with the pan-European corridor IV in the part that passes through Romania. The rail line is presented on Figure 1.





This rail line is also part of the indicative extension of TEN-T to the Western Balkans Core Network branded as Route 4 Romanian border/Vršac - Belgrade (Serbia) - Podgorica (Montenegro) - Bar (Montenegro). Having in mind that this railway line is part of the Core

Network and that it connects two main railway corridors, the modernization of this line is one of the main goals that should be achieved in the future in order to increase its capacity.

The railway line 107 Belgrade center - Pančevo Main - Vršac – state border - (Stamora Moravita) is a double-track line on section Belgrade Center - Pančevo Main (incl), while it is a single-track railway line on section Pančevo Main (excl.) - Vršac - state border. The rail line is of category D4 (permissible load: 225 kN per axle and 80 kN per meter) up to the station Pančevo Varoš, while from Pančevo Varoš station and onwards is categorized as D2 (permissible load: 200 kN per axle and 64 kN per meter).

On section Belgrade Center - Pančevo Varoš (incl.), the rail line is electrified by the 25kV 50Hz electric traction system. Section Pančevo Varoš (excl.) – Vršac – state border the rail line is non-electrified. On section Belgrade Center (incl.) - Pančevo Main (incl.), the rail line is equipped with automatic block signaling devices for mutual traffic with relay technology. Section Pančevo Main (excl.) - Vršac is not equipped with distant signals and it is not electrified.

The project for the construction of the second track on the section Pančevo Bridge - Pančevo Main (excl.) in the length of 14,9 km, was completed in 2017 through the loan provided by Russian Federation and with cofinancing from the budget of the Republic of Serbia. Works were executed in the amount of \$89.9 million. The works included constructing the second track, the right one from km 5 + 082.57 to km 15 + 882.72 and the left from km 15 + 309.59 to km 19 + 562.73, as it is marked in blue in Figure 2. below.



Figure 2: Route of the Pančevo Bridge - Pančevo Main section

As part of these works, new track and switch capacities in the stations Krnjača (3rd and 4th track) and Ovča (5th, 6<sup>th</sup>, and 7th track) were constructed, the existing Sebeš stop was renewed and a new stop Krnjača bridge was built, a new single-track railway bridge over the river Tamiš was built (upstream of the existing single-track railway bridge, 242 m long), 4 new bridges (span up to 8 m) and 5 culverts (span up to 2.2 m) were built and the existing catenary line was reconstructed within building parts of the new catenary line, telecommunication and signalling systems and devices were reconstructed.

The existing track from the former single-track line and the Pančevo main station was not in the scope of those works. Due o poor condition of the elements of the superstructure, especially wear of metal switch parts and switching devices, frequent disturbances on signalling and safety devices, low speed over switches (40 km/h for the passenger group of tracks and 20 km/h for the cargo group of tracks), it is necessary to repair the station tracks and upgrade the serviceability of this station.

### 1.4 Existing condition of Pančevo Main – Vršac – state border

The railway line 107 Belgrade center - Pančevo main - Vršac – state border - (Stamora Moravita) has been constructed for a long time. The first section was built in 1858 from the Romanian border to Vršac and over the years the railway was extended to Pančevo and later to Belgrade.

The railway section Pančevo Main – Vršac – state border is approximately 80 km long. It is a single track on its entire length and is not electrified (Table 1). Currently, the superstructure is constituted by rails anchored mainly on wooden sleepers and locked in the ballast. The line is constructed with a continuous welded rail with only short branches jointed.

The rail line was built mostly on the plain part, with an average longitudinal gradient of 4‰. Currently, the line has curves with radii ranging from a minimum of 300 m to a maximum of 10000 m. The line is of class D2 permitting an axle load of 22.5 tons and 6.4 tons/m. There are 4 culverts, 6 steel bridges, 1 concrete bridge, 1 pedestrian overpasses, and 2 road overpasses. There are also 63 level crossings on the line with or without signalisation and safety equipment, greatly influencing traffic safety.

The line has UIC B type of loading gauge. The line has been designed for a maximum speed of 80-120 km/h. Along the line, there are 10 service points, which are mainly unregulated and do not provide adequate comfort and safety to passengers (e.g. platforms, underpasses) or service to other uses (e.g. freight terminal equipment).

Opening for train operation	Distance in km	Chainage	Service point	Type of service point	Maximum permitted speed in km/h	Train Regulation
11.11.1935.	/	20,02/16,1	Pančevo Main	station	50	Station distance
11.10.1935.	2,1	18+2	Pančevo Varos	station		Station distance
20.08.1896.	15,8 34+0		Banatsko novo selo	station		Station distance
	11,9	45+9	Vladimirovac	station		Station distance
	7,6	53+5	Alibunar	bunar station 100		Station distance
08.12.1894.	5,5	59+0	Banatski Karlovac	station		Station distance
	4	63+0	Nikolinci	halt		Station distance
	7,3	70+3	Uljma	junction		Station distance

Table 1. Parameters of the rail line according to the Timetable for 2022

	5,0	75+3	Vlajkovac	halt		Station distance
	7,5	82,8	Vršac	station		
20.07.1858.	3,4	98,3/59,4	Border line	/	80	

The following table presents the current and restricted speeds on the Pančevo Main – Vršac – state border line and the reason for their introduction.

No.	Between service points	From km	to km	Speed km/h	Description
9	Pančevo Varos – Banatsko Novo Selo	18+743	22+700	60	curve
10	Pančevo Varos – Banatsko Novo Selo	29+170	30+300	80	curve
11	Banatsko Novo Selo – Vladimirovac	44+790	45+460	80	curve
12	Vladimirovac - Alibunar	48+650	48+750	20	Rail-level crossing
13	Vladimirovac – Banatski Karlovac	52+470	53+831	60	curve
14	Alibunar – Banatski Karlovac	54+000	55+200	40	weak terrain
15	Banatski Karlovac - Uljma	62+622	63+487	40	switch
16	Uljma - Vršac	81+700	82+374	30	curve
17	Vršac - state border (valid only for the direction state border - Vršac)	83+440	83+500	20	radio metering point activities
18	Vršac - state border	97+110	97+280	20	bridge

Table 2. Speed restrictions on Pančevo Main – Vršac – state border line

Rail line section Pančevo Main – Vršac – state border is open for mixed traffic, with three pairs of passenger trains currently in operation (Figure 2).

Figur	e 2. Rail	Timeta	ble for	2023
Train number	Departure	Arrival	Travels	Train type
2601	07:29	08:46	01:17	Re
2603	10:28	11:46	01:18	Re
2605	12:05	13:17	01:12	Re
2607	16:00	17:12	01:12	Re
2609	17:10	18:22	01:12	Re
2611	21:25	22:37	01:12	Re

Figure 2. Rail Timetable for 2023

Currently, there is no prepared spatial and technical documentation for the reconstruction and modernisation of the railway Pančevo Main - Vršac - state border.

The reconstruction and modernisation of this railway line is foreseen to cover the following:

- reconstruction and modernization of the entire railway line from start of switch no. 1 in Pančevo main station in km 15+478,14 to the state border in km 98+314, including the improvement of elements of the alignment for the highest economically justifiable speed and permissible axle load on the railway line of 225 kN and permissible load per linear meter of 80 kN/m (category D4) and, depending on the conclusions of the Option analysis, eventual construction of the 2<sup>nd</sup> track;
- works on tracks and switches in Pančevo main station which were reconstructed within the Pančevo bridge – Pančevo main project shall be avoided as much as possible;
- reconstruction, rehabilitation and replacement of bridges and culverts, as needed;
- construction of fixed electric traction installations (electrification with the 25 kV/50 Hz system);
- fitting the open track and station tracks capacities with modern signalling and interlocking facilities in stations;
- increasing the level of protection at level crossings, reconstruction and eventual redesign of existing level crossings and/or potential delevelling of the most critical level crossings on the railway line;
- provision of clearance that corresponds to the loading gauge GC for electrified lines and enabling of the use of all intermodal transport technologies without restrictions;
- digitalization of telecommunications on the entire railway line;
- renovation of architectural buildings along the railway line, primarily the station buildings and ancillary buildings including the station ancillary areas (e.g. the access, parking areas, bus stops, etc., as applicable);
- improvement of accessibility of the rail system for persons with disabilities and persons with reduced mobility in the all-railway stations.

The Spatial plan for the special-purpose area of the railway Infrastructure Corridor Pančevo Main – Vršac – state border does not exist and needs to be developed to modernise the railway line.

### 2 Objective, purpose and expected results

### 2.1 Definitions

The "**Pančevo Main (incl.)** – **Vršac** – **state broder**" is the railway section to be reconstructed and modernised, described in Section 1.4.

The "**Contract**" refers to the contract for the preparation of the Spatial Plan, Feasibility Study, Environmental Impact Assessment, Preliminary Design, technical scope of Employers requirements and schedule of prices for Design&Build Tender Documents.

The "Client" refers to the MCTI.

The "**Consultant**" refers to the consulting firm/joint-venture to be selected through the present procurement process to undertake the Services.

The "Services" are described in Section 3.

### 2.2 Objective of the Services

For the reconstruction and modernization of the railway line Pančevo Main(incl.) – Vršac – state border, the Consultant shall prepare the following main documents:

- (i) Inception Report
- (ii) Prior Studies Options analysis Report;
- (iii) Spatial Plan of special purpose area for Infrastructure Corridor;
- (iv) Preliminary Solution;
- (v) Feasibility Study with Preliminary Design;
- (vi) Environmental and Impact Assessment (EIA) for the preferred option;
- (vii) Draft technical scope of Employers requirements for Contractor tendering

The studies shall cover the following elements:

- (i) definition of the category of the line (traffic code and performance parameters) in accordance with section 4.2.1 of the TSI Infrastructure;
- (ii) demand analysis, line capacity assessment, railway operational planning, identification of optimal line parameters;
- (iii) analysis and selection of the optimal track alignment solution;
- (iv) analysis and definition of new bridges and culverts, where needed;
- (v) identification of the existing level crossings and their level of protection;
- (vi) assessment of all level crossings and review of alternatives (underpasses, overpasses, rerouting, and, where other options are exhausted, protective barriers at level-crossings, all in the context of the intensity of traffic (road and railway), safety parameters, the Railway Law of Serbia and Railway Safety EU Directive;
- (vii) reconstruction of stations including buildings in the stations and measures to facilitate the intermodal connectivity;
- (viii) electrification of open track and station;
- (ix) control, command, signalling and interconnection system;
- (x) assessment of potential reduction of the number of stations and stops and their capacity;

The design will be developed in a format that allows local authorities to follow up on matters provided for by the local regulations, such as design validation by State Review Committee, approval of the procurement type, etc. Design documents shall be bi-lingual (Serbian and English).

### **3** Scope of the Services

#### **3.1** General activities

The Consultant shall carry out the specific tasks and activities as listed below and develop a well-functioning co-operation mechanism with MoCTI, the PIU and IZS/PIT on the basis of the following principles:

a) Consultation and consent - the responsibilities for the general implementation of the Project are delegated to the PIU. MoCTI is the Client for this Contract. The PIU/MoCTI and the IZS through its nominated Project Implementation team (PIT) shall be involved in the decision-making processes regarding the Contract implementation and shall be kept informed in all stages related to contract(s) monitoring and implementation. IZS is the final beneficiary of the contract and they should be agreed with all results and outputs. The cooperation with the final beneficiary will be sustained and managed by the PIU;

- b) The involvement of the IZS's PIT in the head office on the day-to-day activities together with the Consultant's staff is crucial;
- c) Efficiency the cooperation with the IZS's PIT and PIU/MoCTI shall be designed to avoid any delay or discontinuity in the decision making process or any dilution of the Consultant's responsibility.

The Consultant is required to provide professional inputs, advices and support during execution of his tasks.

It is noted that, in addition to these ToR, IZS will issue their specific technical requirements for preparation of the Preliminary Design to be respected during the performance of the services. Those technical requirements (Beneficiary's Requirements) will be considered consistent part of those ToR. The exact timing for their issuance will be clarified during the Inception phase.

### 3.2 Specific activities

All the activities to be executed by the Consultant will be as follows.

### **3.2.1** Activity 1: Inception report

Following the Kick-off Meeting to be held with the MoCTI/PIU representative(s) and IZS/PIT, the Consultant's first task shall be to meet with the relevant stakeholders and to gather the necessary data. Gathered information, data and collected documents shall be included in the **Inception Report**, with a detailed description and assessment of the current situation.

The outline of the Inception Report shall be proposed by the Consultant. The Inception Report shall be the specific output of the Inception Period and present an overall approach and detailed program work plan and completion schedule for the services. It should discuss constraints and challenges identified by the Consultant and ways to address them in order to timely and effectively deliver the assignment.

#### 3.2.2 Activity 2. Prior Studies - Option analysis report

#### Sub-activity 2.1 - Preparation of Demand Study

The Option analysis report shall include an engineering traffic analysis for expected passenger and freight traffic demand on the railway line as an integral part of the document.

A traffic study should be carried out in the wider project area, to understand the existing and potential demand for passenger and especially for freight transport and the functionality of the examined railway line.

The traffic forecasts should cover a 30 years period, providing estimates for selected time horizons for both passenger (passengers, pass-km, trains, train-km) and freight (tonnes, tonne-km, trains, train-km) traffic and identified strategic options:

- The opening years (3-5 years).
- The end of the stabilisation period (10-15 years).
- The economic long-term (30 years).

As a baseline for future traffic forecasts, key potential economic and fiscal developments in the wider area should be identified and applied.

Traffic study should provide a good understanding and forecast of the passenger and freight flows with an in-depth market analysis including structured surveys (e.g. at railway and bus stations, border-crossing, level crossings) and consultation (e.g. interviews) with the main users/stakeholders (including on the Romanian side of the corridor) from the industry selected (main importers/exporters, forwarding and logistic companies, main industries in the catchment area of the line, railway/transport operators, etc.).

#### Sub-activity 2.2 - Preparation of Railway Operation Plan

The Option analysis report shall include a Railway Operation Plan that will assess current condition of infrastructure subsystems in regards to railway operation along the rail line as well as the role and purpose of each service in terms of performing the transport service, schematic presentation of service points, accessibility to the station building and the plateau from the aspect of road traffic, passenger, cargo facilities and industrial tracks within service points.

The Railway Operation Plan shall include an analysis of current railway operation technology, exploitation and operation characteristics, analysis of current timetable in terms of passenger and freight trains, simulation of line capacity, and station track occupation.

The Railway Operation Plan shall include an analysis of future state railway technology, requirements, exploitation and operation characteristic, timetable and necessary station facilities in order to support forecasted demand for each of defined options.

#### Sub-activity 2.3 - Options proposal

Following the service planning, the Consultant shall prepare a detailed Option analysis report for reconstruction and modernization of railway line Pančevo Main (incl.) – Vršac – state border.

The purpose of the analysis is to consider tailor-made options by assessing key parameters that should be proposed by the Consultant and agreed upon with the Client. Options should be divided into two categories i.e. those of strategic importance and those which consist selection between technical solutions.

Strategic options refer to design speed, construction of second track, type of signalling and telecommunications systems and other potential aspects which affect traffic demand and capacity.

Technical solutions refer to small scale and/or local interventions or alternatives such as the number and layout of stations and stops, number of station tracks, other station facilities, number and solution at level crossings, etc.) which mainly affect the cost and construction method and duration.

The analysis should include comparative views and comments on, but not limited to:

- Single vs Double track,

- Design speed (on-line rehabilitation, 120 km/h and 160 km/h) Number of tracks in stations and fit-to-purpose layout according to demand, including station tracks that can accommodate 740m long trains on justified distance,
- Reconstruction and cancellation of level crossings to the most necessary number general options to include denivelation, pedestrian passages etc.
- Reconstruction and construction of bridges and other engineering structures on subject railway section general comments and options.
- Inclusion of Pančevo varos Pančevo Vojlovica railway line as an integral part of the project scope.

Within Option analysis as separate part should be analysed the economic viability of constructing the new intermodal terminal in Vršac station area. Under the current state, the railway yard in Vršac functions as a flat-shunted yard. The Consultant should analyze whether there is demand for rail-road container transshipment and, if there is, to suggest how the construction of an intermodal terminal can be executed and connected to the public railway network which is based on the orientation to retain the existing location and with a new layout station Vršac.

#### Sub-activity 2.4 - Selection of the Option

The selection of the preferred (strategic) Option will be made through a multi-criteria (MCA) methodology (if and as applicable for the main "distinguishing criteria") and/or "simplified CBA" (the results of which could be integrated into the MCA) in order to compare all strategic options. The selection procedure will take into account the estimation of the investment value of each option with cost breakdown, cost-benefit analysis that will assess the economic and financial results, expropriation needs technical difficulties and construction risks and Environmental and Social Assessment Report recommendations and requirements as per requirements of the ESS1 on Assessment and Management of Environmental and Social Risks and Impacts, Climate Change aspects, and other potential criteria to be identified by the Consultant. Depending on the process and differences between the options, full CBA will have to be prepared for the preferred option but may be needed also for the other options to be used for the CBA and the results of the demand analysis will have to be clarified with the Client.

All the above-mentioned is considered consistent part of the option analysis process and identification of the most feasible option.

Any changes caused by the selected option to the the design inputs given in Sub-activity 2.3 will be modified by IZS and MCTI with the support of the Consultant.

# **3.2.3** Activity **3**: Preparation of the Spatial Plan, Feasibility Study with Preliminary Design and Environmental Impact Assessment Study

Includes activities relevant to preparing the Spatial plan for the special-purpose area of Railway Infrastructure Corridor Pančevo Main – Vršac – state border, Preliminary Solution, Feasibility Study with Preliminary Design, and Environmental Impact Assessment Study.

The **documentation basis** for the preparation of technical documentation for the modernization of the railway line is:

- Spatial plan of Republic of Serbia 2021 to 2035 Draft
- Regional spatial plan for AP Vojvodina 2021 to 2035 Draft
- Options analysis and CBA documents
- Law on Railways ("Official Gazette of RS" No. 41/2018);
- Law on Safety in Railway Traffic ("Official Gazette of RS" No. 41/2018);
- Law on Interoperability of Railway System ("Official Gazette of RS" No. 41/2018);
- Law on Planning and Construction ("Official Gazette of RS", No. 72/221A9, 81/221A9 corrigendum, 64/2010 US decision, 24/2011, 121/2012, 42/2013 US decision, 50/2013 US decision, 98/2013 US decision, 132/2014, 145/2014, 83/2018, 31/2019, 37/2019 other law, 9/2020 and 52/2021);
- Law on Special Procedures for the Implementation of the Project of Construction and Reconstruction of Line Infrastructure Structures of Particular Importance to the Republic of Serbia ("Official Gazette of RS" No. 9/2020);
- Rulebook on the content, manner and procedure of preparation and manner of control of technical documentation according to the classes and purposes of the objects ("Official Gazette of RS", No. 73/2019);
- Rulebook on the content, manner and procedure of preparation of spatial and urban planning documents ("Official Gazette of RS", No. 32 of May 3, 2019);
- Network Statement for 2023;
- Rulebook on technical conditions and maintenance of railway superstructure ("Official Gazette of RS", no. 39/2016 and 74/2016);
- Rulebook on technical conditions and maintenance of railway substructure ("Official Gazette of RS", no. 39/2016 and 74/2016);
- Law on Environmental Impact Assessment ("Official Gazette of RS", No. 135/2004 and 36/2009);
- Law on Environmental Protection ("Official Gazette of RS", No. 135/2004 and 36/2009 36/2009 other law 72/2009 other law, 43/2011 decision US, 14/2016, 76/2018, 95/2018 other law and 95/2018 other law);
- Rulebook on the content of the Environmental Impact Assessment Study ("Official Gazette of RS", no 69/2005);
- Rulebook on Feasibility Study and Prefeasibility Study ("Official Gazette of the Republic of Serbia", no 87/2019).
- Rulebook on the content and scope of previous works, previous Feasibility study and feasibility studies ("Official Gazette of RS", No. 1/2012)
- Rulebook on the Content of Requirements on the Need for Impact Assessment and the Content of the Requirements for Determining the Scope and Content of the Environmental Impact Assessment Study ("Official Gazette of the Republic of Serbia", no 69/2005)
- Law on Expropriation ("Official Gazette of the Republic of Serbia", no 53/1995, "Official Gazette of Federal Republic of Yugoslavia" no 16/2001 decisions of the Federal Constitutional Court 23/2001 (SUS) μ ("Official Gazette of the Republic of Serbia", no 20/2009 μ 55/2013 – decision of the Constitutional Court 106/2016 DD– authentic interpretation)
- Existing documentation of "Infrastructure of Serbian Railways" JSC on the construction of the railway line, measures and works on maintenance and rehabilitation, the existing condition of the railway line, recorded problems, etc.;
- Data on underground installations of "Infrastructure of the Serbian Railways" JSC and other relevant infrastructure owners in scope of project;

- Existing documentation for capital repair and rehabilitation works;
- WB Environmental and Social Framework, including relevant E&S Standards, WB EHSG and GIIP.
- Project Environmental and Social Management Framework;
- All other applicable laws, by-laws, standards and regulations related to the subject of the project, fire protection, regulations related to safety and protection at work.

#### <u>Sub-activity 3.1: Preparation of the Spatial plan for the special-purpose area for</u> <u>Infrastructure Corridor</u>

Preparation of Spatial plan for the special purpose area for railway infrastructure corridor Pančevo main – Vršac – state border can be carried out by a Consultant with relevant licenses or through a sub consultant who will carry out this activity.

Planning, use, arrangement and protection of the railway corridor should be based on the principles of arrangement and use of space established by the Law on Planning and Construction ("Official Gazette of RS", No. 72/09, 81/09 - correction, 64/10 - US, 24 / 11, 121/12, 42/13 - US, 50/13 - US, 98/13 - US, 132/14, 145/14, 83/18 and 31/19 other law and 9/2020), as and the Law on Railways ("Official Gazette of RS", No. 41/18), the Law on Spatial Plan of the Republic of Serbia from 2020 to 2035<sup>1</sup>, the Law on Environmental Protection ("Official Gazette of RS", No. 135/04, 36/09, 36/09-other law, 72/09-other law, 43/11-decision US, 14/16, 78/18 and 95 / 18-other law), the Law on Strategic Environmental Assessment ("Official Gazette of RS", No. 135/04 and 88/10), the Rulebook on Elements of Railway Infrastructure ("Official Gazette of RS", No. 10/14 ), The Rulebook on the content, manner and procedure of drafting spatial and urban planning documents ("Official Gazette of RS", No. 32/19) and other laws and bylaws acts of the Republic of Serbia which define and determine the conditions, manner and content of preparation of planning and technical documentation.

An integral part of the Spatial Plan is the Report on the Strategic Environmental Assessment of the Spatial Plan.

The immediate subject of the Spatial Plan is the creation of conditions for raising the quality of the railway infrastructure on the railway section Pančevo Main (incl.) – Vršac – state border, which will increase the quality of accessibility of the Republic of Serbia.

The process of drafting the spatial plan is a combination of several activities in which the Department of Urbanism and Spatial Planning within the Ministry of Construction, Transport and Infrastructure also participates. In the following table, the most important activities in the process of drafting the spatial plan and the relevant institutions that implement these activities are identified.

No	Activity	Relevant Institutions	Expected Duration
1.	Adoption of the Decision on the development of the Spatial Plan by	Department of Urbanism and Spatial Planning	2 months

Table 3. Process of preparation of Spatial plan for the special-purpose area

<sup>1</sup>Preparation of Spatial Plan of the Republic of Serbia from 2021 to 2035 is currently under preparation.

	the Government of the Republic of Serbia and Decisions on the development of the Strategic Environmental Assessment of the Spatial Plan		
2.	Engagement of sub consultant (if needed)	Consultant	3 months
3.	Preparation of documents for early public insight	Consultant/ sub consultant	1 month
4.	Early public insight	Department of Urbanism and Spatial Planning/	15 days
5.	Obtaining conditions from the holder of public authorizations for the development of a spatial plan	Department of Urbanism and Spatial Planning	1 months
6.	Preparation of the Draft Spatial Plan	Consultant/ sub consultant	3 months
7.	Expert control of the Draft Spatial Plan	Department of Urbanism and Spatial Planning	5 days
8.	Amendments to the Draft Spatial Plan in accordance with the Expert Control Report	Consultant/ sub consultant	1 month
9.	Public insight	Department of Urbanism and Spatial Planning/ sub consultant	1 month
10.	Public session and preparation of Report on the performed public insight into the Draft Spatial Plan	Department of Urbanism and Spatial Planning	5 days
11.	Amendments to the Draft Spatial Plan in accordance with the Report on the performed public insight	Consultant/ sub consultant	1 month
12.	Procedure of adoption and publication of Spatial Plan	Department of Urbanism and Spatial Planning	2 months

#### Sub-activity 3.2: Preparation of the Preliminary Solution

The Preliminary Solution shall be prepared to define all technical and functional specifications per chosen variant option from the options analysis study. The technical and functional specifications include, but are not limited to: track centerline(s), general vertical alignment, normal profiles for the open track and stations, general bridge disposition(s) and planned work(s), power supply and overhead contact line details, signalization and safety details and cable infrastructure general position, general drainage solution(s) with planned recipients, level crossings layouts and details on raising the safety levels, general positions of eventual engineering structures (walls, substructure protections, etc), stations and station building reconstruction layouts and all other details necessary for definition and issuing of

location conditions and for further development of the design through the preliminary design.

The preliminary solution shall be designed per general and technical parameters defined in the options analysis and CBA documents, per option accepted and approved by IZS and MoCTI.

Preliminary Solution should be prepared according to the Rulebook on the content, manner and procedure of preparation and manner of control of technical documentation according to the classes and purposes of the objects ("Official Gazette of RS", No. 73/2019).

IZS shall be responsible for obtaining location conditions based on the Spatial plan for the special-purpose area of Railway Infrastructure Corridor Pančevo Main – Vršac – state border adopted by AP Vojvodina and the Preliminary Solution previously prepared by the Consultant and approved by the IZS and MoCTI.

#### Sub-activity 3.3: Preparation of the Feasibility Study with Preliminary Design

The Consultant shall prepare the feasibility study with the preliminary design, following all parameters and conditions defined by the location conditions issued by the relevant authority per submitted preliminary solution.

A. Preliminary Design to be prepared shall be designed as a detailed follow up to the preliminary solution, considering all specific conditions and restrictions, and shall include all documentation per Rulebook on the content, manner and procedure of preparation and manner of control of technical documentation according to the classes and purposes of the objects ("Official Gazette of RS", No. 73/2019) specifically relating to purpose and contents of the preliminary designs for linear infrastructure objects.

The Preliminary Design will provide the precise position, functional characteristics and technical and technological solutions for reconstruction and modernization of subject railway section, overhead line and electric power facilities, reconstruction and modernisation of telecommunications and the interlocking system and service points, as well as reconstruction and construction of new bridges and culverts, water protection and drainage, removal and reconstruction of road level crossings, in conformity with the requirements for the railway line infrastructural capacities and adopted international standards.

All specific parts of the Preliminary design must include:

- General documentation,
- Text documentation,
- Numerical documentation and
- Graphic documentation.

Contents of the textual and numeric documentation, graphic documentation scale and general level of detail prepared shall be done per laws, by-laws, standards and good engineering practices for preliminary designs of linear infrastructure objects.

For the development of the Preliminary Design, the Consultant shall carry out the following;

#### I. Survey works

Geodetic survey works shall include, but should not be limited to:

- establishing the geodetic base for surveying as an operational polygon, which will serve for initial and updated surveying, marking of temporary and permanent (fixed) points,
- surveying and digitally recording existing terrain data, positions of all existing railway and nearby infrastructure, buildings, structures, visible installations and all other relevant objects,
- transfer of surveyed data into detailed geodetic survey maps with all surveyed points represented on a digital cadaster-topographic base,
- survey point coordinates aligned with the national coordinate grid,
- preparation of geodesy marking project and operational polygon as an integral part of the preliminary design,
- cadaster-topographic bases with established an up-to-date borders of land owned by RoS managed by IZS (railway land area) in service points where the reconstruction is planned, as well as on the railway line where expropriation is required,
- performing of all other geodetic surveys for the purposes of preparing technical documentation,
- preparing geodetic elaborate analysis with the project for expropriation including field geodetic works for the purpose of implementing changes in the real estate cadaster in the process of expropriation.

**Geotechnical survey works** for obtaining detailed and reliable geotechnical data on conditions and parameters required for the design of the reconstruction and modernization of subject railway section, but should not be limited to:

- exploratory drilling and sample collection
- engineering geological mapping of exploration wells,
- excavation of exploration pits,
- geophysics geoelectric surveys where needed
- detailed geotechnical core mapping
- laboratory geomechanically research,
- preparation of geotechnical bases and documentation

The number and depth of excavation pits, collected samples and other geotechnical works shall be defined in The Program of geotechnical works per all laws, by-laws, standards and good engineering practices. The program of geotechnical works shall be subject to approval by IZS and PIU.

The program shall include the sufficient number of samples for all engineering objects, track substructure, buildings and borrow pits.

Geotechnical elaborates shall include, but not be limited to:

- Detailed collected sample profiles
- Longitudal geotechnical terrain crossections
- Relevant underground water levels presented in profiles and sections

- Laboratory results
- Conditions for structure foundations
- Hydro-geological conditions
- Conclusion with suggestions for substructure/soil replacement

Additional geotechnical surveys and/or laboratory research shall be done by the Consultant on request by IZS or MoCTI/PIU.

For these services, the consultant shall prepare OHS plan compliant to ESF, WB EHSG and national legislation before exploration/survey activity commences, subject to PIU and WB approval.

#### II. Preparation of Preliminary Design

The Consultant will adhere to the following general and specific design conditions when preparing this Preliminary Design.

#### 1) General design conditions:

- the maximum speed on the railway, number of tracks, station layouts and other general conditions for design will be determined through the approved options analysis documents,
- the design shall avoid impacts and works on tracks recently reconstructed through other projects in Pančevo main station, as much as possible;
- railway gauge shall be standard 1435mm;
- the railway shall meet the GC loading gauge;
- the railway category shall be D4 (225kN, 80 kN/m);
- the railway shall be electrified 25kV, 50Hz with remote management,
- the railway shall be equipped with conventional electronic signal-safety devices with visual signals and point-of-view devices for punctual train speed control and signalling, interlocking and telecommunications equipment of ERTMS level 2,
- all facilities envisaged by the project for construction should be planned on land owned by RoS managed by IZS (railway land area), exceptionally on other land for which expropriation is proposed, with a clear identification of the proposed expropriation.

All designs shall be developed considering the relevant national environmental, occupational and community health and safety regulations, labour management procedures and, WB EHSG where the stricter ones prevailing. Also, WB recommendations on Climate Change impact minimization need to be accounted for, as well as structures' stability and safety as well as resistance to natural disasters and impacts attributable to Climate Change. Resulting design must be in line with measures and recommendations documented in the national EIA and WB ESIA, which will be prepared in parallel with Preliminary Design.

#### 2) Specific design conditions:

#### Substructure and superstructure

- define the centreline, vertical alignment and all other track geometry parameters for the maximum allowed train speeds in accordance with approved options analysis documents;
- subgrade/foundation and substructure shall be designed per parameters defined in the geotechnical survey elaborates for loads of a D4 category railway track (225 kN, 80 kN/m);
- substructure formation shape shall be designed with typical cross-section dimensions for D4 category main railway line, including widening of formation in curves, cable gutters and other needed installations;
- subgrade/foundation and substructure formation materials shall be planned economically justifiable and from nearby borrow pits, quarries and other sources as to avoid unnecessary transportation costs. As much as possible, no new borrow pits, quarries and similar exploitations of mineral resources will be opened for the purposes of the project. Still, existing ones with valid licenses and concessions can be used;
- substructure and track bed drainage shall be designed to fully conform with standards and good engineering practices for soil and water level parameters presented in the geotechnical survey elaborates;
- detailed static calculations shall be done in accordance with the applicable regulations and standards for all engineering and substructure objects such as culverts, bridges, retaining walls and other similar structures to, first and foremost, ensure stability and safety of the infrastructure;
- inspection and examination of all bridges, retaining walls, culverts and all other engineering objects and structures that would be planned for reconstruction shall be done and results presented in the design;
- superstructure on the open track and the railway part of the station tracks should be designed with the appropriate type of rail pre-stressed concrete sleepers, and elastic fastenings in category 1 crushed stone ballast;
- tracks will be designed as CWR track on the full length of the subject railway section;
- switches shall be designed per relevant standards and rulebooks to enable the most suitable functioning of the stations, specifically using simple switches and switch track connections.
- switches shall be designed as welded in CWR track,
- RLC that remain in operation shall be designed to meet the minimum 60° angle parameter, constructed with modern rubber panel systems and in widths to accommodate common local cycling and pedestrian traffic, and with modern lighting installations,
- existing industrial track capacities in private sector ownership connected to stations in this project's scope shall be accounted for and their connection to the public railway designed and kept operational within the design unless specifically stated otherwise.

#### Electric traction system and facilities

The design for electrification of the overhead contact line (OCL) shall be in accordance with all Laws, bylaws and applicable standards for 25kV 50Hz electrified railways of maximum speed up to 160 km/h.

The electrification of the overhead line on the section of the Pančevo main - Vršac - State border railway shall include all objects, plants, structures and facilities of the catenary line in service points and on open railway tracks. The existing catenary line extension to Pančevo varoš station shall be included under works for reconstruction following all conditions of the final beneficiary.

The OCL on the Pančevo main – Vršac – state border railway line shall be designed as a simple compensated train line with Y rope. The OCL design shall follow all relevant all laws, bylaws and relevant standards, and technical requirements of the final beneficiary - IZS.

The design shall include the construction of a new facility for the accommodation of a heavy motor vehicle (HMV) - a garage with a concrete channel for inspection and repair of the HMV, warehouse space and a facility purposed as headquarters of the OCL maintenance section/crew within the Pančevo junction (proposal at the Pančevo Main station);

The design shall also include requirements for inspection and testing of the overhead line, the functional settings of traction system devices and equipment, and necessary testing and commissioning of OCL.

#### Traction substations and neutral section facilities

The design shall include the construction of stable electric traction facilities, reconstruction of existing power facilities and/or construction of new ones (transformer stations, lightning protection installations, platform lighting, internal electrical installations and lighting with the installation of new distribution cabinets).

The construction of the connection line (if necessary, the 110 kV transmission line and the 110 kV transmission line field) for powering electric traction facilities, shall be carried out based on the technical conditions of the "Elektromreže Srbije" (EMS) and the Distribution System Operator.

The design shall include the construction of minimum of two traction substations (TS) (i.e. Pančevo and Vršac, to be eventually coordinated with the Pančevo-Vinca-Beli Potok Railway Project). The design shall also include:

- new neutral section brake facilities between the supply area of TS Zemun-TS Pančevo,
- TS Pančevo-TS Vršac and TS Vršac-state border with the Republic of Romania (PSN Vatin),

The Design for substations and post-sectioning shall include, but not be limited to, the following for each deliverable:

- Details of connection to the 110kV public utility network;
- Location and disposition of the substation;
- Location of the post sectionings;
- 110 kV switch yard;
- Cross sections of 110 kV switch yard;
- Main circuit scheme (schematic);
- Layout and cross sections of SS 25 kV part;

- Switch gear 25 kV;
- Equipment distribution in 25 kV room;
- Details of current connections in the 25 kV part of SS;
- Insulated strings;
- 25 kV equipment supports;
- Earthing of equipment;
- Schematics of connection of remote control equipment in substations/post-sectioning facilities and in the Remote Control Centre;
- Situation plans of access roads.

The preparation of the Design of electrification (catenary, substations and post sectioning) shall include preparation of the corresponding drawings, calculations, technical reports and technical specifications for equipment and works, corresponding bills of quantities and cost estimate.

During the preparation of the Design, it is necessary to establish a close collaboration between this and the other two activities (signalling-interlocking and telecommunications teams) to enable prompt updates of all designs according to the actually produced layouts.

#### Signalling safety and interlocking

The design must include the following:

- ETCS-Level 2 for facilities and the railway line, and conventional electronic signalsafety devices with visual signals and point-of-view devices for punctual train speed control, enabling train speeds equipped with the locomotive onboard system (I-60 system) up to 160 km/h;
- Newly built devices must be connected to the adjacent stations by an appropriate interface.

All devices must meet the following basic requirements:

- SIL 4 security integrity level according to SRPS EN 50126-1, SRPS EN 50128 and SRPS EN 50129;
- Security principle (computer architecture) of at least 2 of 3 or 2x2 of 2;
- Complete electronic control of all external elements;
- Interface for ETCS L2.

A workstation for the operator must be foreseen, equipped with computers and peripheral devices (monitor, keyboard, mouse). The workstation must include an active, spare workplace, and service post for authorised maintenance workers. The workstation must have enough monitors with clear indications and a large screen to show the complete condition of security elements. The presentation on the monitors shall be according to the approved graphic of Serbian Railways Infrastructure and the latest enclosed symbol catalogue.

In addition, the following shall be foreseen:

- New light signals equipped with LED technology lamps and new signal cabinets;
- In all service points, provide the installation of devices for electric heating of switches with power supply from the catenary line. The heating system should be under a SCADA system with a central dispatch terminal, station terminals and control cabinets per station;

- Occupancy control in all stations and inter-station sections via axle counter;
- Polyethylene (PE) insulated cables to connect exterior security elements in stations and at inter-station distances;
- Special cable networks and special signal dividers, for switchgear, axle counters for auto-stop devices, and switch heating monitoring and control;
- Transmission of information, commands and controls for inter-station dependencies via optic cable;
- Adaptation of existing facilities for signalling-safety equipment where possible in accordance with relevant technical conditions and standards on accommodation and installation such equipment;
- All level crossings must be provided with electronic technology in a configuration of at least two of two;
- Replacement of existing level crossing devices with modern electronic devices, and complete replacement of the existing cable network connecting external road crossing elements to the internal device;
- Level crossing devices with an interface for ETCS-Level 2;
- Construction, adaptation or replacement of existing crossing points in accordance with relevant technical conditions and standards on accommodation and installation of such equipment;
- Reflector lighting and video surveillance at all level crossings with a minimum of three cameras per crossing and remote access to the video surveillance device;
- Power supply devices at facilities and system for continuous power supply of the equipment installed;
- Necessary voltages from static converters and rectifiers with a redundant 1 of 2 design and static switch;
- Public power distribution network 3x400V, 50 Hz as primary power source;
- 25kV, 50Hz contact network as a backup power source;
- Stationary rechargeable battery for static converters for 3 hours as an auxiliary power source;
- Powering of red bulbs on the main signals and the shaft counter system for an additional 8 hours after switching off other sources;
- Connection for a 3x380V, 50Hz mobile diesel engine.
- Any other requirements stated by the final beneficiary.

#### Telecommunication, information and communication plant

General conditions for the accommodation of telecommunication, information and communication equipment:

- Accommodation arrangements must satisfy the climatic-mechanical characteristics of the equipment;
- Provide all necessary technical solutions for power supply and grounding of telecommunication system devices, in accordance with the applicable regulations in this field;

General requirements for cable infrastructure:

- For concrete bridges in need of rehabilitation, provide for the replacement of concrete ducts housing cables;

- Provide for the replacement of ducts housing cables (tin, concrete, etc) on all bridges if covers or ducts are damaged;
- Provide for installation and replacement of ducts and covers in stations;

The designs should consider the following infrastructure:

- Cable infrastructure for laying optical tubes;
- Cables should be removed and/or protected to be completely safe from construction works on the substructure, superstructure and objects;
- Placement of rail optic cables along the entire length of the reconstructed line, on either side of the underground line, alternatively one per contact network. Plan for rail optic cable in all stations according to the needs and purpose of that optical fibre;
- In stations, dismantling of existing dispatching telephone devices and phones at input and output signals. Dismantling of all telephones on the open line. Dismantling of rendering and dispatching devices to align them with the technology of the construction works and establish necessary temporary connections for communications;
- Installation of new integrated station digital telephone dispatching devices (central devices with TK desk and anti-vandal phones) in all stations. On the open track, installation of phones in anti-vandal enclosures with a selective transmitter for block signalling (version at APB box or near separate signal and phones at road crossings. Replacement of phones and selective transmitters in electric traction units. The devices must be interoperable with the dispatching devices on the Belgrade Vršac state border railway line;
- The radio dispatching system remains operational and must be adapted to the new track line, track situation, newly constructed infrastructure facilities, technology and traffic management centres for speeds up to 160 km/h. The number and location of additional radio stations must be estimated in relation to the current situation for their inclusion in the investment costs. The exact number and location of radio stations based on EM field measurements must be determined.
- Activities and related costs for measuring the EM field and modifying and supplementing the EM Tracking Measurement Report for the field of the existing radio-dispatching system and other necessary technical documentation required by the regulatory bodies for this type of device;
- Replacement of existing analogue radio stations and RD switchboards with modern technology devices, in accordance with the recommendation UIC 751-3, while ensuring interoperability with the devices on the Belgrade – Vršac – state border railway line;
- Design of the GSM-R system as an information transfer platform for ETCS Level 2 (primary) and a platform for voice communication and other services for the railway staff. The system must be interoperable with the European rail traffic management system;
- Design of the GSM-R system to provide the optimum configuration for the required level of redundancy for ETCS level 2, in accordance with EIRENE/MORANE technical specifications, ERTMS, EU directives and relevant national and railway standards;
- The GSM-R system must be easily expandable and support upgrades to the FRMCS (5G) technology systems;
- Measurements of the electromagnetic field along the track, as verification of selected locations determined by radio wave propagation prediction models;

- Activities and related costs for measuring the EM field and developing the EM field track measurement report and other necessary technical documentation required by the regulatory bodies for this type of device;
- The GSM-R central equipment and the monitoring and control equipment for the Pančevo main – Vršac – state border railway line must be located in two georedundant centres unless it is developed in a different project;
- The technical solution for the power supply of the GSM-R system must be redundant and have backup power autonomy, as required for ETCS Level 2 and provided for in the energy design. It must consider the consumption of all telecommunication and supporting devices on the open track;
- All the stations will be equipped with telecommunication systems. Station telecommunication systems must be incorporated in the ISR Intranet network, in accordance with the General Design of Integrated Systems;
- Telephone and computers installation must follow the principle of structural cabling within a common communication network. This means that all computer and telephone sockets are type RJ-45 minimum cat. 6. The layout of RJ-45 slot locations must be adjusted to needs;
- Centralised VoIP telephony system for railway staff communication must be installed for the entire railway line. The central device of VoIP telephony must be integrated into the central device at the Belgrade Centre ŽAT. Redundant connection to the central VoIP telephony device must be provided for in adequate stations and local VoIP telephony devices at ŽAT central station. The system must be connected with the existing ŽAT network through the ŽAT power plant in Belgrade Nemanjina Street. The existing numbering used in the ŽAT network must be maintained. Each station must have interface devices with adequate capacity for connecting analogue phones to the VoIP system. A monitoring system for the control of the proper functioning of the VoIP system and all its elements must be considered;
- A state-of-the-art digital sound system operating locally and centrally must be installed. The local mode must enable train dispatchers to notify passengers via a microphone console. The central regime involves the integrating the system into the central information system at the Belgrade Centre. The announcement system should be connected to the AVIS system. All premises and rooms where passengers are allowed to are equipped with speakers. The sound system and all its elements must be provided with a monitoring system;
- A visual information system for passengers based on IP technology must be installed. IP dashboards must be provided for in all the facilities equipped with this system. The Passenger Visual Information System should be connected to AVIS. The information board system and all its elements must have a monitoring/control system for its sound operation;
- A clock system based on IP technology and equipment should be installed, including secondary IP clocks in all its locations and a monitoring system. The central equipment of the clock system is the main clock and GPS receiver at the Belgrade Centre;
- AVIS system for the harmonised publication of predefined messages via a notification system and dashboard systems should be provided for. It must be integrated into the AVIS system at the Belgrade Centre and be connected to the central railway database for monitoring train operation;
- Within the business information system, provide for three adequate centres to accommodate the server structure. IT premises must be directly connected with the

centres at Nemanjina 6 and Prokop station via L3VPN or a separate VRF server structure. All workstations in the local computer network must be members of the information system (domain structure of the LMS). The business information system must be part of the Intranet of SRI.

The railway line must be equipped with systems consisting of:

- SDH high reliability and availability system for transmission of critical telecommunication and signalling systems services for ETCS Level 2 and remote control of fixed electro-traction facilities, with traffic protection for very fast response (faster than 50 ms) in the event of network element failure or interruption of the fibre-optic cable;
- DWDM systems for the transfer of non-critical services based on IP/MPLS solutions in accordance with the General Design of Integrated Telecommunication Systems;
- The system of non-critical systems must be integrated into the Intranet HMS. The active equipment of non-critical systems (L2, L3, MPLS) must be housed on existing IT premises in stations;
- Synchronization networks (with primary and secondary sources of synchronization);
- The management and control system (NMS) of the transportation systems, i.e. all network elements of this system, unless included in another project, must be georedundant and unique for the entire Pančevo main Vršac state border railway line. The system must support E2E configuration, management and monitoring, and be expandable to allow management and monitoring of other network elements, such as: microwave, xDSL, routers, switches, etc. The NMS must have a graphical interface for displaying the topology and structure of the network and enable its viewing and management in real-time. This system, unless it is part of another project, must allow the expansion or addition of new network elements in line with the development of the transportation system of the Serbian Infrastructure Railways;
- The management and control system must be capable of defining access authority, configuration and monitoring at the user account level, in accordance with the users' authority and responsibility for maintaining the system;
- The power supply technical solution for the equipment of the transmission system must be redundant and have appropriate autonomy under backup power supply, as required for ETCS Level 2 for the critical service transmission network.

#### Technical protection system

Modern security-safety systems must be provided for, in accordance with the relevant laws, regulations and standards.

Video surveillance shall include the following:

- IP system of video surveillance for the protection of critical locations (level crossings, SPEV, relay rooms, station space, passenger movement and other);
- Surveillance in real time, recording in continuity and on parameters, surveillance and reviewing of the recorded material. Recordings from cameras should be stored for 30 days;
- Monitoring system for the video surveillance system and all its elements.

#### **Operation and organization of traffic**

Based on the determined traffic flows, and in accordance with the verified Preliminary Solution and options analysis, the design shall provide details on the necessary capacities of the subject railway section, station capacities for train traffic regulation, passenger service and handling of goods.

The design shall develop the new Technology of railway operation of stations, service points and railways as a whole, in the conditions of planned electrification and modernization of safety inter-locking equipment and telecommunications.

Technological, Functional requirements and technical-technological solutions of service points shall de defined in detail.

Functional requirements for equipping the railway line and service points with electrotechnical infrastructure shall be defined and included in designed technology of operation (signaling-interlocking, telecommunication facilities and electric power plants and devices).

General technology and organization of traffic during works shall be designed as a basis for detailed designs in subsequent design phase(s).

The design shall include the position of the railway 107 Belgrade Center - Pančevo main - Vršac - State border on the railway network of RoS and the geographical position of the railway shown in an overview situation in a suitable scale.

All graphic documentation shall be in suitable scale, and must include the layout/situation plan of the subject railway line, the schematics of stations and service points, the designed road route plans and all other relevant drawings.

#### Station buildings and facilities

- Station buildings with railway commercial facilities for market rental, which complement the functions of the railway in passenger and freight transport (such as freight forwarding, agencies, shops, etc.) shall be reconstructed and new facilities constructed to accommodate the new railway parameters and modern services,
- For exploitation services the design shall check and update the existing office premises in stations to meet the new requirements of the railway,
- Passenger platforms shall be designed as 550 mm height with canopies in adequate lengths,
- Passenger platforms shall be connected to station buildings via pedestrian underground passages,
- For exploitation services the design shall check and update the existing office premises in stations to meet the new requirements of the railway.

#### Cost estimates

Cost estimates prepared based on Preliminary design and BoQ (to be a deliverable separated from the Preliminary design).

**B.** Feasibility Study shall be made on the basis of the Preliminary Design, previously approved by the IZS and MoCTI, and in accordance with the Rulebook on the content and scope of previous works, previous Feasibility study and feasibility studies ("Official Gazette of RS", No. 1/2012) and shall determine, in particular, the spatial,

environmental, social, financial, market and economic justification of the investment for the selected solution, developed by the Preliminary design.

**Feasibility study** with **Preliminary design** is subject to audit (expert control) of the State Revision Committee and other competent and state bodies. Thus, the Consultant shall be obliged to, in a timely manner and at own costs, eliminate all deficiencies in the Preliminary Design with Feasibility Study, according to the findings of the State Revision Committee and other competent and state bodies, and the authorized representative of the IZS and MoCTI/PIU in order to obtain required approvals.

The Preliminary Design with Feasibility Study shall be prepared in four (4) printed copies and six (6) copies on a CD and submitted to IZS and MoCTI/PIU on Serbian and English language. The documentation on the CD must be identical to the printed copies in terms of presentation, content and order of data. All drawings, textual and graphic attachments submitted on the CD must be submitted in \* .pdf format and in open files (\* .doc, \* .xls, \* .dwg, \* .mpp, ...) where at all situation models in the DWG format must be in the National (Spatial) Reference System.

#### Sub-activity 3.4: Preparation of the Environmental Impact Assessment Study

The Consultant is obliged to prepare the Environmental Impact Assessment study according to the Serbian regulation which will outline the main procedures and responsibilities to manage environmental and social risks associated with the implementation of the Project activities.

This shall include:

- Preparing the Request for screening, in accordance with the Rulebook on the content of the request on the need for impact assessment and the content of the request for determination of the scope and content of the Environmental Impact Assessment Study ("Official Gazette of RS", No. 69/05) and Law on Environmental Impact Assessment ("Official Gazette of RS", No. 135/04 and 36/09);
- Preparing the Request for determination of the scope and content, if the competent authority decide that EIA is needed, in accordance with the Rulebook on the content of the request on the need for impact assessment and the content of the request for determination of the scope and content of the Environmental Impact Assessment Study ("Official Gazette of RS", No. 69/05) and Law on Environmental Impact Assessment ("Official Gazette of RS", No. 135/04 and 36/09);
- Preparation of Environmental Impact Assessment Study;
- Participation in the procedure of adoption of the Environmental Impact Assessment Study, in accordance with the Law on Environmental Impact Assessment ("Official Gazette of RS", No. 135/04 and 36/09), Rulebook on the content of the Environmental Impact Assessment Study ("Official Gazette of RS", No. 69/05) and the Decision on determining the scope and content of the Environmental Impact Assessment Study issued by the competent body for Environmental protection.

The Consultant is obliged to, timely and at its own expense, to eliminate all deficiencies in the Study on Environmental Impact Assessment, according to the findings of the competent authority that issues the consent to the subject study.

The Environmental Impact Assessment will comply with both the Serbian legislation and the World Bank Environmental and Social instruments<sup>2</sup> prepared for this Project. The WB ESIA document will be prepared by other consultancy firm externally contracted by MoCTI. The Consultant will be available for meetings and exchange of all necessary information during the preparation of the WB ESIA:

### 3.2.3 Activity 4: Support in preparation of procurement documents

Within this Activity, the Consultant will prepare:

- technical scope of Employers requirements and schedule of prices based on a template to be provided by the Client that will be part of the tender document;

### 4 Location and timing

### 4.1.1 Location

During the project timeline, the Consultant is obliged to establish an operational base on his own premises.

Regular meetings between PIU/MoCTI , IZS and the Consultants representatives shall be held on agreed locations.

### 4.1.2 Commencement date and period of implementation

The intended commencement date is September 2023, but the actual commencement date will be defined with the signature of the Contract. The period of implementation of the Contract will be **27 months** starting from the commencement date, but no later than 31 December 2026, as Project completion date.

	_			_		_		_		_		_		_				_			_			_		_	_
Deliverables/months	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Inception report																											
Options analysis report																											
Spatial plan																											
Preliminary solution																											
Location conditions																											
Preliminary design & FS																											
EIA																										$\square$	
State review committee																											
Employers requirements																											

The Consultant will carry out the Services in line with a detailed time schedule to be submitted as part of his proposal.

### 5 Consultant requirements

The Consultant firm will be selected in accordance with QCBS (Quality and Cost-Based Selection) method set out in the World Bank's Procurement Regulations for IPF Borrowers (July 2016, revised November 2017, August 2018 and November 2020).

The assignment will require a qualified consulting company or consortium that can demonstrate extensive experience in technical assistance service for the contract.

<sup>&</sup>lt;sup>2</sup> <u>https://www.worldbank.org/en/projects-operations/environmental-and-social-framework</u>

### 5.1 Personnel

The Consultant shall establish his Team in accordance with the needs and requirements of these ToR. The Team shall consist of a core team made of key experts with the qualifications and skills defined in the Table 3, below and non-key experts, as needed.

The Consultant is obliged to ensure adequate staff in terms of expertise and time allocation, as well as needed equipment in order to complete the activities required under the scope of work and to achieve the objectives of this Contract in terms of time, costs, and quality. The Consultant is expected to be flexible in terms of travelling.

All experts shall be independent and free from any conflicts of interest in the responsibilities. Note that staff of the public administration of the beneficiary country (Republic of Serbia) cannot be proposed as experts.

The Project language is English. All the team members assigned by the Consultant must be able to communicate effectively in English. A sufficient number of the Consultant's team should be fluent in Serbian language.

The Consultant shall provide adequate administrative staff (secretary, translators, drivers accountant) needed to support the expert team.

### 5.1.1 Key experts

The team should include key experts with the qualifications and experience listed below, as well as non-key experts, if necessary, and as a minimum, the Consultant shall provide the following experts:

Title	Qualifications/Experience	Skills
Team Leader	Education: Have as a minimum MSc Degree in civil engineering or another relevant field; <u>Relevant professional experience:</u> At least 15 years of general experience; at least 7 years of relevant experience in preparation technical documentation for the railway sector; Experience as a team leader/project manager /in successfully implemented at least 2 railway projects related to the designing of for (re) construction / rehabilitation of railway track.	Excellent command of the English language. Computer literacy. Knowledge of Serbian language will be an advantage

Table 3 Key experts for the assignment

Railway Civil	Education:					
Engineer	Have as a minimum MSc Degree in civil engineering.					
	Relevant Professional Experience:	Communication skills, fluency in				
	Experience: at least 10 years of general experience; at least 7 years of relevant experience in preparation of technical documentation for the railway sector. Participation in at least 2 projects in the last 7 years for railway infrastructure design for (re)construction / rehabilitation of public railway infrastructure.					
	Valid license: 315 (or new licence number equivalent)					
Railway electrical	Education:					
expert	Have as a minimum MSc Degree in electrotechnical engineering;					
	Relevant Professional Experience:	Communication				
	Experience: at least 10 years of general experience; at least 7 years of relevant experience in preparation of technical documentation for the railway sector. Participation in at least 2 projects in the last 7 years for railway infrastructure design for overhead contact line construction/reconstruction	Skills, fluency in English. Knowledge of Serbian language will be an advantage				
	Valid license: 350 or 351 (or new licence number equivalent)					
Railway electrical	Education:					
Signalling and interlocking /	Have as a minimum MSc Degree in electrotechnical engineering;					
expert	Relevant Professional Experience:	Communication				
	Experience: at least 10 years of general experience; at least 7 years of relevant experience in preparation of technical documentation for the railway sector. Participation in at least 2 projects in the last 7 years for railway infrastructure design for signalling, interlocking or telecommunication system installation or modernisation.					
	Valid license:352 or 353 (or new licence number equivalent)					

Railway operation expert	Education:Have as a minimum MSc Degree in traffic and transport;Relevant Professional Experience:Experience: at least 10 years of general experience; at least 7 years of relevant experience in preparation of technical documentation for the railway sector. 	Communication skills, fluency in English. Knowledge of Serbian language will be an advantage
Environmental Expert	Education:Have as a MSc Degree in an environmental discipline or equivalent;Relevant Professional Experience:Minimum 7 years of professional experience in the environmental protection sector. Previous experience in the preparation of ESIA/EIA for transport infrastructure projects. Participation in the preparation of at least 1 ESIA/EIA studies for transport infrastructure-related projects. Knowledge of World Bank Safeguard practices will be considered as advantage	Communication skills, fluency in English. Knowledge of Serbian language will be an advantage

### 5.1.2 Non - Key experts

Non-key experts for both Activity- Optional analysis and Design in the following areas of expertise are foreseen: Transport planner/Transport economist, Financial and Economic Expert, Structural and Civil engineers, Architectural engineer, Geological engineer; Geodetic engineer; Electrical engineers, Environmental specialists, Occupational Health and Safety Expert, Fire-protection Expert, Social Development and Safeguards Specialist, pool of Experts for The Spatial plan for the special-purpose area.

The Consultant must indicate clearly which profile they have so it is clear which fee rate in the budget breakdown will apply. All experts must be independent and free from conflicts of interest in the responsibilities they take on.

The pool of non-key experts is expected to support/complement all the activities of the key experts. Possession of relevant Serbian design license (personal license) would be required, as applicable.

The Consultant is expected to include other positions they consider necessary for the assignment in their proposals.

### 5.2 Office accommodation

Office accommodation for each expert working on the Contract is to be provided by the Consultant. The Consultant shall ensure that all key and non key experts are adequately supported and equipped. In particular, the Consultant shall ensure that there is sufficient administrative, secretarial and interpreting provision to enable experts to concentrate on their primary responsibilities.

No equipment is to be purchased on behalf of the neither Client (MoCTI), PIU nor Beneficiary (IZS) as part of this service contract or transferred to the Client or beneficiaries at the end of this Contract.

### 6 Outputs

### 6.1 Outputs requirements

The Consultant shall prepare, as a minimum, the below listed documents during the period of execution of the Contract.

Deliverables	Description	Due date	Format	Payments
Inception Report	Describe the initial findings, progress in collecting data, any difficulties encountered or expected, the proposed approach, taking into consideration the situation at the starting date of the assignment. It will also set out a detailed work plan for completion of activities. If there are any proposed modifications to the original ToR due to changed circumstances through information gathering activities, these are to be discussed and agreed in principle with the Client and IZS before the submission of the Report (up to 20 pages) Subject to approval by the MoCTI	No later than 1 month after the commencement date	Digital and 4 hard copies in English and Serbian language	10%
Options analysis Report	The analysis will identify main technical and financial parameters to be reviewed and accepted by the Client, to serve as base parameters for subsequent design phase(s). The document will provide clear technical and technological options for the modernization of the railway at an appropriate technical level with accompanied Traffic Study and Selection Methodology. Subject to pre-approval by IZS and approval of the MoCTI.	No later than 4 months after the inception report	Digital and 4 hard copies in English and Serbian language	15%
Early public insight of Spatial plan	Elaborate for early public insight of The Spatial plan for the special-purpose area of Infrastructure Corridor Pančevo Main – Vršac – state border should be prepared in accordance with the Rulebook on the content, manner and procedure of preparation of spatial and urban planning documents ("Official Gazette of RS", No. 32 of May 3, 2019),	No later than 2 months from the date of the Decision on the preparation of the Spatial plan for the special- purpose area issued by AP	Digital and 4 hard copies in Serbian language	10%

	in appropriate scale.	Vojvodina			
	Subject to pre-approval by AP Vojvodina and approval by the MoCTI				
Spatial plan for the special- purpose area	The Spatial plan for the special-purpose area of Infrastructure Corridor Pančevo Main – Vršac – state border should be prepared in accordance with the Rulebook on the content, manner and procedure of preparation of spatial and urban planning documents ("Official Gazette of RS", No. 32 of May 3, 2019), in appropriate scale. Subject to pre-approval by AP Vojvodina and approval by the MoCTI	No later than 12 months from the date of the Decision on the preparation of the Spatial plan for the special- purpose area issued by AP Vojvodina	Digital and 4 hard copies in Serbian language	10%	
Preliminary Solution	Preliminary Solution in terms of scope and content should be done in accordance with applicable laws, regulations, codes, instructions and standards that for subject of design. Subject to pre-approval by IZS and approval of the MoCTI.	No later than 2 months from the selection of the option	4 printed copies and 4 digital copies on a CD on Serbian	10%	
Preliminary Design with Feasibility Study	Preliminary Design with Feasibility Study in terms of scope and content should be done in accordance with applicable laws, regulations, codes, instructions and standards that are the subject of designing. Subject to pre-approval IZS and MoCTI and approval of Republic audit Commission for experts control of technical documentation	No later than 3 months from the date of submission of the Location Conditions to the Consultant.	4 printed copies and 4 digital copies on a CD on Serbian	30%	
Environmental Impact Assessment Study	Environmental Impact Assessment Study should be done in accordance with Decision on determining the scope and content of the Environmental Impact Assessment Study issued by the competent body for Environmental protection and in accordance with applicable laws and regulations. Subject to pre-approval of the Ministry for Environment Protection and approval of the MoCTI	No later than 3 months from the date of submission of the Location Conditions to the Consultant.	3 printed copies and 3 digital copies on a CD on Serbian and English	10%	
Employers Requirements for bidding documents	Preparation of Employers Requirements that will be part of the design and build biding documents. Subject to pre-approval by IZS and approval of the MoCTI.	No later than 1 months from the date of the approval of the Preliminary Design by Republic Audit Commission	Digital, Serbian and English	5%	
Regular status reports					
Monthly Reports	Description of the level of completed documentation, possible problems and proposals for their solution, review of adopted design options by variations and	Not later than 1 week after the end of month	Digital, Serbian and En	glish	

	explained proposal for change. Monthly reports must also contain an overview of all receivables submitted by the Contractor since the beginning of the Contract. This overview should be made in a convenient form that allows consideration of requests, previous activities and key deadlines for resolving requests. (up to 20 pages).		
Final design report	<ul> <li>On completion of design and procurement documentation, the Consultant shall submit the final design report to the IZS and PIU/MoCTI. The final report contains: <ul> <li>An overview/timeline of the actual progress of the contract/design detailing reasons for design delays and/or extensions of time</li> <li>All relevant conditions, approvals and permits presented in the design timeline</li> <li>Details of design/technical difficulties encountered and how these were overcome.</li> <li>Details of administrative difficulties encountered and how these were overcome</li> </ul> </li> <li>An appraisal of the strengths and weaknesses in the contract documents (including but not limited to the, technical specifications, schedules, deadlines and design details) with recommendations on how improvements could be made for future contracts.</li> </ul>	No later than 30 days after approval of drafted procurement documents.	Digital and 4 hard copies in Serbian and 2 hard copies in English language

### 6.2 Requirements for drawings and reports

The detailed content of engineering documents, which shall be prepared by the Consultant and submitted for approval to the Client, shall be fit for purpose. The Client will reject all documents and designs in cases where he considers them to be unsatisfactory, not in compliance with these requirements or not sufficiently detailed.

The documents and drawings to be submitted by the Consultant shall take their final form after approval by the Client.

Design Documents and drawings shall be numbered systematically and the Consultant shall maintain an electronic register of all reports, documents and drawings to be used under the Contract.

Amendment and revision to any document shall be recorded and only the latest approved version shall be considered valid.

### 6.3 Submission and approval of outputs

All reports and other outputs shall be written in English and translated into Serbian language. The draft version of the reports (electronic copy, fully editable) shall be submitted to PIU for distribution to the MoCTI and IZS. The commenting period for the outputs is 3 weeks. In case of no-reaction to the submitted outputs such status will be interpreted as "no objection" and shall be deemed as approved.

During Phase 2 - the Review period of the relevant authorities, such as the Republic audit Commission for Expert Control of technical documentation and other competent and state bodies, shall not be part of the consultant time. Such approvals are estimated to be as follow:

- Creation and adoption of the Spatial plan for the special-purpose area: 14 months,
- Issuance of location conditions: 2 months,
- Receiving a positive report of the State Review Committee: 2 months,
- Approval for the national Environmental Impact Assessment Study: 2 months.

All deliverables will be sent as electronic copies to PIU.

Hard copies will be send to the following addresses:

- "Serbian Railways Infrastructure" JSC, 6, Nemanjina Street, 11000 Belgrade, Republic of Serbia
- PIU/MoCTI, Uzun Mirkova 3, 11000 Beograd, Republic of Serbia.

### 7 Terms of Payment

The Consultant should note that the proposed contract for this assignment will be as Lump Sum payments with milestones against submission of deliverables per Section 5, item 5.1.

### 8 Conflict of Interest

The engaged Consultant firm must not be involved in any other related activity to this Project.