Final Report

Verification of the viability of the project solutions within the design documents of the conceptual design (IZP) and the implementation plan (IZN) of the 'Upgrade of the Jesenice Railway Station' project

Customer:

Ministry of Infrastructure – Slovenian Infrastructure Agency

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History of Revision

Table 1: History of Revision

Rev.		Status	Date	Author	Changed Chapter	Reason of Change
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0.1		Release	13.09.2024	Supp/Hummitzsch	all	Minor formal corrections
0.2		Release	16.09.2024	Hummitzsch	all	Minor formal corrections

Release

Table 2: Release

	Autor:	Date:	Signature:
Creator:	Christoph Zettl Chapter 6.1 (6.1.1 – 6.1.8)	06.09.2024	
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1 Purpose

TÜV SÜD Rail GmbH (TSR) and IKK Group GmbH (IKK) have been commissioned to verify the viability of the project solutions within the design documents of the conceptual design (IZP) and the implementation plan (IZN) of the 'Upgrade of the Jesenice Railway Station' project.

The project area includes the Jesenice Railway Station at km 630+208.87 and the Jesenice-Hrušica connection. Jesenice station is located on the main railway line No. 20 Ljubljana-Jesenice.

As part of the project to modernise the main railway line no. 20 Ljubljana-Jesenice-d.m., the intermediate sections on the Kranj-Podnart, Podnart-Lesce Bled, Lesce Bled-Žirovnica (including Žirovnica station), Žirovnica-Slovenski Javornik and Slovenski Javornik-Jesenice lines have already been renovated in recent years.

The aim of the upgrade of the Jesenice Railway Station is to adapt the track and station capacities to the expected future demand /D117/. The modernisation is intended to optimise the quality of transport services as well as the technical processes and facilities, which are in line with the strategic visions of the Republic of Slovenia.

With the newly adopted TEN-T regulation, the railway line No. 20 Ljubjana-Jesenice-d.m falls under the Extended Core Network.

The contracting authority of the public contract is the Ministry of Infrastructure of the Republic of Slovenia (MIRS). The operator of the railway station Jesenice is SŽ-Infrastruktura.

According to the design, the estimated construction costs for the upgrade of the Jesenice Railway Station (construction value, excluding the modification of the internal signalling and safety installation) amounted to approximately 137.43 million euros incl. VAT (valorised and including 10% contingency).

Following the invitation to tender, three offers from construction companies were received with the following prices (incl. VAT):

- Offer 1: *175.676.598,74 €*
- Offer 2: *170.200.00,00 €*
- Offer 3: *178.932.520,01 €*

Discrepancies between the planner's estimate and the bids submitted by construction companies led to uncertainties for the contracting authority, raising concerns about the feasibility of the project.

1.1 Aim

Based on the submitted documents, TSR and IKK determine and review the basic requirements, considering the input data and boundary conditions for the upgrade of Jesenice Railway Station. It is assessed whether the planning is justified or appropriate and whether the planner's cost estimate is plausible.

1.2 Not scope of the work

TSR and IKK do not have to check whether the planning complies with the legal requirements or regulations or any law. The executive planner is responsible for this part. Furthermore, the evaluation of the document "Project-task" is not included.

2 Terms and Abbreviations

Table 3: Terms and Abbreviations

Term/ Abbreviation	Description
IKK	IKK Group GmbH
MIRS	Ministry of Infrastructure of the Republic of Slovenia
TSR	TÜV SÜD Rail GmbH

3 Referenced Standards and Specifications

Table 4: Standards and Specifications

Id.	Number	Title
/N1/	COMMISSION REGULATION (EU) No 1299/2014 of 18 November 2014 as amended	TSI - Infrastructure (INF)
/N2/	COMMISSION REGULATION (EU) No 1301/2014 of 18 November 2014 as amended	TSI - Energy (ENE)
/N3/	COMMISSION REGULATION (EU) No 1300/2014 of 18 November 2014 as amended	TSI - Persons with reduced mobility (PRM)
/N4/	COMMISSION IMPLEMENTING REGULATION (EU) 2016/919 as amended	TSI - Control-command and signalling (CCS)

4 Project Team, Project Activity and Project Approach

4.1 Project Team

For the verification of the viability of the project solutions within the design documents of the conceptual design (IZP) and the implementation plan (IZN) of the project “Modernisation of the Jesenice Railway Station”, the tasks were divided between the companies IKK Group GmbH and TÜV SÜD Rail GmbH.

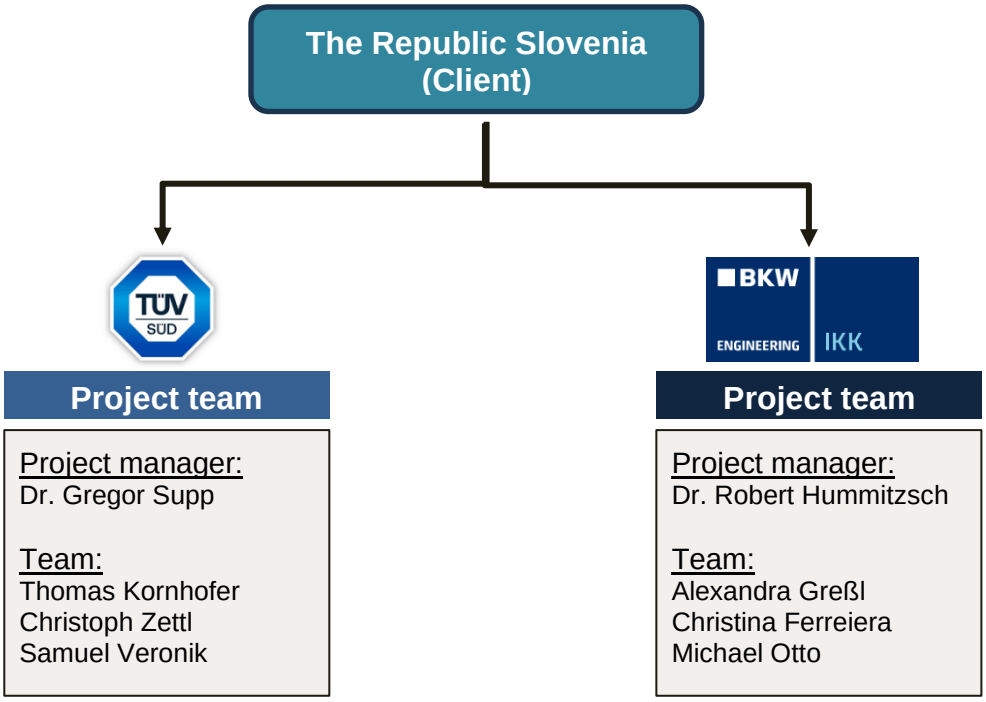
The tasks of the IKK includes checking the plausibility of the planner’s cost estimation of the full project and to assess whether the planning is justified or appropriate of the following topics:

- Dimension and construction of bridges
- Noise barriers
- Parking spaces
- Two additional stops.

The task of TSR includes the assessment whether the planning is justified or appropriate for the following topics:

- General technical feasibility
- Track layout
- Track components
- Overhead line lay-out (including delimitation point)
- CCS
- Refurbishment of station premises
- Platform layout (including access-point)

All topics above are assessed for the Jesenice Railway Station. The project team is organised as follows:



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4.2 Project Activities

The chapter provides a brief overview of the project activities.

- **On 9 July 2024, a meeting** was held in Maribor /D115/ with the following persons regarding to the project and the process:
  - DRSI: Mr. Megla, Mrs. Mikl Hočevar
  - IKK: Mr. Hummitzsch, Mrs. Ferreira
  - TÜV SÜD: Mr. Supp, Mr. Kornhofer
  - FFL Holding: Mrs. Lucker
  - DRI: Mrs. Pertinač, Mr. Čelan
  - SŽI: Mr. Račič, Mr. Bešić
  - SŽ-PP: Mr. Geč
  - Interpreter: Mr. Žerak

  At the meeting /D115/, the project participants introduced themselves and the project requirements and processes were defined. In the following step, the contractors travelled to Jesenice to get a comprehensive picture of the project area in person. This enabled a deeper understanding of the special features and challenges of the project.
  After reviewing the submitted documents, the contractors have raised questions that were sent to the client for clarification via email on July 19, 2024. The questions were answered and sent back to the contractors in the email dated July 24, 2024.

- **On August 7, 2024** a follow-up meeting was held via Microsoft Teams between the client and the contractors, during which additional outstanding issues were resolved. The contractor requested further documents that were necessary for the continued progress of the project.

- **On August 19, 2024** a meeting /D122/ took place in Maribor between the contractor and the client. During this meeting, the interim results of the project were presented, and outstanding questions were addressed and clarified. The discussions provided an opportunity for both parties to review the progress made so far and ensure that everyone was in agreement on the current status and the next steps.
- **On August 29, 2024** a final meeting took place via Zoom-call. The aim of the meeting was to make changes and adaptations to the content requested by the customer and, if necessary, to add further topics to the final version of the report.

4.3 Project Approach

The viability and the state-of-the-art of the project documents were assessed for the subsystems infrastructure, catenary and energy systems and signalling, telecommunication, and lighting by TSR. For each subsystem, experts from TSR spot checked the submitted documents in form of a plausibility control and stated a conclusion about the state-of-the-art of the project design.

Simultaneously the experts from IKK assessed the cost estimates and offers from the construction companies. This was done by three methods (Main construction elements, items with highest value, high deviation between estimate and offers). This enables a statement about the plausibility of the cost estimate of the planner and further analysis.

5 State of the railway station

5.1 Actual state of the railway station /D1/

The Jesenice Railway Station is the terminus of the electrified Ljubljana-Jesenice-d.m main line, and the start point of the non-electrified Jesenice-Sežana line. Serving as an important transit point, the station connects the Slovenian and Austrian railway network.

The main station also plays an important role as a loading and unloading, departure and arrival, transit, workshop and inspection station. Also, complete or partial conversion of both passenger trains and freight trains take place at the station.

The Jesenice Station is electrified on its A side with a 3 kV DC system. On the B side of the station, the overhead line is fed by a 15 kV AC current, as it is standard for the electrification of lines in the neighbouring Republic of Austria. The existing maximum speed limit for station speed is the same for conventional and light trains at 35 km/h. For trains with tilting technology, the speed limit is 40 km/h. The station is protected by an electrical relay signalling and safety device. The station is equipped with automatic train-stopping systems and the permissible axle load is 225 kN and 72 kN/m, i.e. category D3. The section Jesenice-Podrožca (Rosenbach) is protected by an electronic signalling and safety device.

5.1.1 Overview of the actual situation of Jesenice Station /D1/

In the following the actual situation of the Jesenice Railway Station is shortly summarized:

- There is no operation for trains with a length of 740 m
- Insufficient number of tracks on which passenger trains can stop
- One centre platform
- Passenger trains from the line nr. 70 cross the tracks from other trains
- Double crossover points prevent higher speeds (< 35 km/h)
- The track capacities are greater than the actual requirements (closure and removal of unused tracks and switches)

- The Jesenice Railway Station is a border station where the Slovenian (3 kV) and Austrian (15 kV) overhead line voltage systems are exchanged
- When changing traction or locomotives, the traffic of other trains is disrupted (cutting off train paths)
- The condition of individual infrastructure subsystems (especially the super- and substructure and the overhead line network) is insufficient for future demands. The last renovations were carried out in 1987.
- Inadequate platform infrastructure with access (no grade-separated access to platforms, inadequate platform height and length)
- The station building is in a poor state – the platform roof is leaking along track 1
- The outdated station building is in need of renovation
- Unregulated parking facilities for users of public infrastructure services

5.2 Future project requirements

The aim of the upgrade is to adapt the track and station capacities to the expected future demand. The modernisation is intended to optimise the quality of transport services as well as the technical processes and facilities.

5.2.1 Desired goals /D1/ through the upgrade

In the following the main project goals are summarized.

- increasing speed through the station area, thus reducing journey times
- a maximum line speed of 100 km/h will be allowed on the main line when the project is finished
- more user-friendly infrastructure, with new access routes and external surroundings
- ensuring standards in line with TSI
- ensuring category D4 (225 kN/axle and 80.0 kN/m)
- provision of the GC clearance profile
- increasing the level of safety of transport and passengers, especially for people with disabilities
- increasing the security of the electricity supply by building a new electrical substation for transport (ENP)
- operation of longer freight trains with a length of 740 m
- reducing noise pollution in the built-up area by implementing noise abatement measures
- increasing the accessibility of rail transport to people in the wider area and improving inter-urban connectivity by upgrading the Jesenice–Hrušica railway connection and building two new suburban railway stops
- optimisation of the track layout with adjustments of track installations and platforms in accordance with the proposal of the new track layout for the expected needs of the station capacities by achieving the performance parameters for traffic codes P4 for passenger and F1 for freight traffic in accordance with the TSI at the Jesenice Station and achieving the performance parameters for traffic codes P5

for passenger and F1 for freight traffic in accordance with the TSI on the Jesenice–Hrušica line

- the design layout also takes into account the future double-tracking of line No 20 Ljubljana–Jesenice-state border as far as possible

5.2.2 Integration of the project into the European network

The Jesenice Railway Station is located on the single track electrified main railway line No. 20 Ljubljana-Jesenice. In the framework of the project upgrading of the main railway line No. 20, the inter-station sections on the railway line Kranj-Podnart, Podnart-Lesce Bled, Lesce Bled-Žirovnica (including the railway station Žirovnica), Žirovnica-Slovenski Javornik and Slovenski Javornik-Jesenice, have already been rehabilitated in the past years.

In view of the future double-tracking of line no. 20, it is necessary to take into account the provision of an adequate number of main transport tracks and ensuring the highest possible train speeds as a part of the extended TEN-Network.

With the upgrade of the Jesenice Railway Station, measures are being taken to create sufficient throughput and transport capacities in the railway infrastructure, which will also significantly strengthen the role of public passenger transport by rail.

The decision to modernise Jesenice station is based on the requirements of the MIRS with the strategies for the years 2030 and 2050, which are as follows:

5.2.2.1 Slovenia's development strategy 2030 /D117/

The Development Strategy of Slovenia 2030 is the general development framework adopted by the Government of the Republic of Slovenia on 7 December 2017. It is based on the directions of Slovenia's vision, the development starting point and Slovenia's international commitments, as well as trends and challenges at regional, national, European, and global level. To achieve the objectives of the strategy, its active implementation is required.

One of the priority goals of Slovenia's 2030 development strategy is to promote sustainable and economic development that will make it possible to reduce the gap with more

developed countries and improve the quality of life of all inhabitants. The planned investment in the modernisation of the Jesenice Railway Station relates to the development of public passenger transport and the optimisation of transit traffic and thus to influencing the amount of greenhouse gas emissions (redirecting traffic from road to rail).

5.2.2.2 Vision 2050+, development of the Slovenian railway network /D117/

Vision 2050+, the development of the Slovenian railway network, must be understood and used as a framework for further activities in long-term railway planning. The content provides possible but not conclusive proposals for measures. In the initial phase, the main focus is on the expansion of railway lines, provided that the permeability of the lines is guaranteed, and the TEN-T standards are met.

The investment is being made with the main and strategic objectives of ensuring throughput and TEN-T standards on the core network by 2030 and guaranteeing punctual transport on regional and main railway lines.

5.2.2.3 Directives /D117/

The project has to comply with the Directive (EU) 2016/797 of the European parliament of the council of 11 May 2016 on the interoperability of the rail system within the European Union and the TSI. The TSI compliance is provided for the following areas:

- **TSI - Control-command and signalling (CCS):** commission regulation (EU) 2016/919 of 27 May 2016 as amended, on the technical specification for interoperability relating to the ‘control-command and signalling’ subsystems of the rail system in the European Union.
- **TSI - Persons with reduced mobility (PRM):** commission regulation (EU) No 1300/2014 of 18 November 2014 as amended, on the technical specifications for interoperability relating to accessibility of the Union's rail system for persons with disabilities and persons with reduced mobility.
- **TSI – Energy (ENE):** commission regulation (EU) No 1301/2014 of 18 November 2014 as amended, on the technical specifications for interoperability relating to the ‘energy’ subsystem of the rail system in the Union.
- **TSI - infrastructure (INF):** commission regulation (EU) No 1299/2014 of 18 November 2014 as amended, on the technical specifications for interoperability relating to the ‘infrastructure’ subsystem of the rail system in the European Union.

The modernization of Jesenice Railway Station will implement Slovenia's development strategy for 2030. This project will further develop public transport and optimize international transit traffic. The expansion of the rail network in Slovenia will be adapted to the standard for the Trans-European transport network with this project. The adaptation of the core network is part of Vision 2050+, development of the Slovenian railway network and is covered by the planned project.

Compliance with the different TSIs (Inf, PRM, Energy, CCS) ensures that the compatibility of the project is fundamentally guaranteed both for the European network and for the 2030 & 2050 strategies.

6 Assessment whether the planning is justified or appropriate

This chapter considers the planned features of the project and compares them with the specific project requirements of the MIRS. The purpose of this analysis is to ensure that the objectives of the project are in line with the defined criteria.

Note: The evaluation is a plausibility check. Not all project-specific requirements are assessed in detail.

The chapter is subdivided into the following subchapters:

- Infrastructure
- Catenary System and Energy System
- Signalling, Telecommunication and Lighting

6.1 Infrastructure

6.1.1 Interoperability Components

The strategies 2030 and 2050 implemented by the MIRS aim to ensure that the requirements of the TSI for interoperability components such as

- rails (TSI INF 1299/2014, including amendments 2019 & 2023)
- sleepers (TSI INF 1299/2014, including amendments 2019 & 2023)
- fastenings (TSI INF 1299/2014, including amendments 2019 & 2023)
- displays (TSI PRM 1300/2014, including amendments 2019 & 2023)
- platform ramps (TSI PRM 1300/2014, including amendments 2019 & 2023)
- platform lifts (TSI PRM 1300/2014, including amendments 2019 & 2023)

are fully met. These requirements are critical for the seamless integration and functionality of the railway infrastructure within the European railway network.

The review of the submitted documents and given information /D119/ for rails, sleepers and fastenings have shown that it is planned that the components must fulfil all the necessary criteria of TSI – INF and we consider the solution to be appropriate and state-of-the-art.

6.1.1.1 Conclusion

Compliance with the TSI – INF ensures that the compatibility of the project is given with the European network and for the 2030 & 2050 strategies of Slovenia. The compliance of the TSI – INF must be ensured with further project progress by involving a notified body which must assess the project solutions with the TSI requirements. It must be ensured that valid conformity certificates are available for the interoperability components.

6.1.2 Structure gauge

According to the requirements of the MIRS, the GC structure gauge must be implemented. The requirement complies with the TSI – INF and was considered by the planner /D29/. We consider the solution to be appropriate and state-of-the-art. However, in general the appliable traffic code P5/F1 requires the structure gauge GA/GC and the applicable traffic code P4/F1 requires the structure gauge GB/GC. Hence, for both cases the structure gauge GC is decisive. By applying the GC structure gauge, also the requirements for the GA and GB structure gauge are fulfilled because the GC structure gauge is slightly bigger.

6.1.2.1 Conclusion

By applying the Structure Gauge GC on the main tracks TSI compliance is given. Hence, the planned project solution in terms of the structure gauge fulfils the requirements of the related TSI and ensures that the compatibility of the project is given with the European network and for the 2030 & 2050 strategies of Slovenia. The compliance of the TSI – INF must be ensured with further project progress by involving a notified body which must assess the project solutions with the TSI requirements.

6.1.3 Platforms

<u>Jesenice Railway Station:</u>

According to the document /D117/, it is assumed that for passenger transport, the number of trains from 2035 will operate in a higher frequency compared to now because of an expected increase of passengers (10% until 2035 and a further increase of 1% per every year after). At the moment, there are 2 platforms (1 side-platform and 1 centre-platform) available in the Jesenice Railway Station. Due to the higher amount of future

passengers and train frequency the currently available amount of platforms is consequently not sufficient to serve the future demand. Furthermore, the current platforms are not fulfilling the requirements of the European legislative. Thus, results in the necessity of an upgrade of the Jesenice Railway Station for passenger traffic and consequently of an increase of the number of available platforms to 3 (1 side-platform and 2-centre platforms).

In accordance with the requirements of the MIRS, a side platform with a length of approx. 250 m and two centre platforms with a length of approx. 400 m are planned for passenger trains. The lengths ensure compliance with the TSI – INF and correspond to traffic code P4.

The planned height of the platforms (550 mm) also complies with the requirements of the TSI – INF. We consider the solution to be appropriate and state-of-the-art.

Jesenice – Hrušica line:

In accordance with the requirements of the MIRS two new stations

- Stop 1 – Plavž: km 631+332,452 (km 1+810,303)
- Stop 2 – Hrušica km 3+358,355

are planned on the Jesenice – Hrušica connection. Both platforms are planned with a length of approx. 150 metres and correspond to traffic code P5. We consider the solution to be appropriate and state-of-the-art.

6.1.3.1 Conclusion

Jesenice Railway Station:

With a length of approx. 250 m to 400 m for the platforms and the planned height of 550 mm TSI compliance is given. Hence, the planned project solution in terms of the platform length and height fulfils the requirements of the related TSI and ensures that the compatibility of the project is given with the European network and for the 2030 & 2050 strategies of Slovenia. The compliance of the TSI – INF must be ensured with further project progress by involving a notified body which must assess the project solutions with the TSI requirements.

Furthermore, due to the necessity of the upgrade of the Jesenice Railway Station for passenger traffic an increase of the number of available platforms is required consequently.

The current project solution is considered appropriate for the given requirements.

Jesenice – Hrušica line:

With a length of approx. 150 m for the platforms TSI compliance is given. Hence, the planned project solution in terms of the platform length fulfils the requirements of the related TSI and ensures that the compatibility of the project is given with the European network and for the 2030 & 2050 strategies of Slovenia. The compliance of the TSI – INF must be ensured with further project progress by involving a notified body which must assess the project solutions with the TSI requirements.

6.1.4 Railway tracks

The tracks 7 -11 and the main track 4 of the Jesenice Railway Station for freight traffic fulfil the requirements of TSI – INF and comply with traffic code F1. According to the document /D13/, five railway tracks with a length of 740 m are required for freight transport.

The tracks 3-6 are also used by freight trains, which are either kept to a minimum (only locomotive or driver changes) or only pass through the station.

Crossings at the stations Kranj, Podnart, Lesce and Bled etc. are problematic, because the sidings are of insufficient length to allow passenger trains to pass by. Freight trains coming from Austria often exceed the length of 600m and have to be shortened at the Jesenice Railway Station, which is the only station that allows shortening. With the upgrade, the crossings of trains with length up to 740m will be possible and therefore the entire line will function to its full capacity. Thus, the planned number of tracks as well as the track layout is considered appropriate for the present and future requirements.

6.1.4.1 Conclusion

With a track length of more than 740 m it is possible to operate freight traffic at the railway station according to the highest value of freight traffic, F1. Hence, the planned project solution in terms of the track length fulfils the requirements of the related TSI and ensures that the compatibility of the project is given with the European network and for the 2030 & 2050 strategies of Slovenia. The compliance of the TSI – INF must be ensured with further project progress by involving a notified body which must assess the project solutions with the TSI requirements.

The current project solution as well as the planned number of tracks and the track layout are considered appropriate for the present and future requirements.

6.1.5 Switches

In total 58 switches

- 39 switches using new material (new switches)
- 19 switches using used material (old switches)

will be used for the upgrade of the Jesenice Railway Station. The new switches will be installed on the main tracks for passenger and freight trains and the old switches on the shunting/stabling tracks. This is mandatory to efficiently handle the current and future volume of passenger and freight trains at the station.

It is suggested to perform a detailed check of the old switches in order to ensure full functionality and reliability. This should be done by an independent third party.

6.1.5.1 Conclusion

To meet requirements for the future, adaptions of the track layout are necessary. The track layout in the submitted plan seems appropriate to meet the present and future demands. It must be ensured that valid acceptance reports are available for the switches. The double-crossing points are replaced with single points, which enables a higher speed and less maintenance.

It is suggested to perform a detail check of the old switches in order to ensure full functionality and reliability.

The current project solution regarding the 39 new and 19 old switches is considered appropriate for the given requirements.

6.1.6 Speeds at the railway station

Compliance with the TSI – INF and the associated traffic codes P4/F1 ensures an increased maximum speed of 100 (110 km/h for trains with tilting technology) in the station area for the main tracks 4 and 5 (phase 2). Until phase 2 is in place, track 5 will run at 50 km/h. In phase 2, when double-tracking of the line No. 20 will be in place, track 5 will be operated at 100 (110) km/h. Phase 2 is not in the scope of this project. Furthermore, the replacement of the double-crossing points with single points ensures increased speed. We consider the solution to be appropriate and state-of-the-art.

6.1.6.1 Conclusion

Compliance with the TSI – INF ensures that the compatibility of the project is given with the European network and for the 2030 & 2050 strategies of Slovenia. The compliance of the TSI – INF must be ensured with further project progress by involving a notified body which must assess the project solutions with the TSI requirements.

6.1.7 Substructure

According to the project requirements /D29/ and the document “National implementation plan for the technical specification for the interoperability for the structural subsystem infrastructure” all elements of the substructure and superstructure must correspond to the D4 category of the line.

This makes the following measures /D95/ necessary for the upper construction:

- The minimum thickness of the track bed below the lower edge of the sleeper is prescribed as 30 cm
- A strain modulus value $E_{v2} \geq 80$ MPa must be achieved on the planum of the line
- The load capacity of the planum of the unbonded bearing layer shall be $E_{v2} \geq 100$ MPa

The requirements for the substructure can be guaranteed. However, the actual measures for the substructure depend on the position and differ in the project area. We consider the solution to be appropriate and state-of-the-art.

6.1.7.1 Conclusion

Compliance with the requirements of the given TSI classes P4/F1 for the earthworks ensures that the compatibility of the project is given with the European network and for the 2030 & 2050 strategies of Slovenia. The compliance of the TSI – INF must be ensured with further project progress by involving a notified body which must assess the project solutions with the TSI requirements.

The current project solution is considered appropriate for the given requirements.

6.1.8 Refurbishment of station premises

According to /D32/, the existing railway station building in Jesenice was built in 1956. As part of the restoration of the building, adjustments will be made mainly to the interior. No changes will be made to the main building structure. Due to the restoration of the station building, the inclusion of TSI-PRM is appropriate to provide access to the station and platforms for people with disabilities.

For platform access, elevators are planned. In that way, people with reduced mobility can access the platforms. Inside the station building no elevator is planned for connecting the ground floor with upper levels, as passengers only need to use the ground floor.

6.1.8.1 Conclusion

Compliance with the TSI – PRM ensures that the compatibility of the project is given with the European network and for the 2030 & 2050 strategies of Slovenia. The compliance of the TSI – PRM must be ensured with further project progress by involving a notified body which must assess the project solutions with the TSI requirements.

6.1.9 Noise Barriers

The study (Document number 11/13 - Noise pollution study and noise abatement measures) provided recommendations for the installation of noise barriers to mitigate sound pollution around the railway station Jesenice. The report outlines the dimensions and positioning of the noise barriers along with the estimated costs.

Northern Section – (PHO-J1):

- Proposed length of the noise barriers: 1011 meters
- Proposed height of the noise barriers: 3,0 meters

Southern Section – (PHO-J2a, PHO-J2b):

- Proposed length of the noise barriers 813 meters
- Proposed height of the noise barriers: 2,5 meters

The planned length and position of the noise barriers is nearly equivalent to the solution proposed in the expert opinion. However, in the PHO-J2b area, there is a difference in

the element heights. The noise barriers planned in the expert opinion with a height of 2,5 meters were planned with a height of 3,5 meters in the present planning of the Jesenice Railway Station.

According to a detailed statement of the designer this could be clarified: The total height of this section of the noise barrier was planned with 3,5 m. But this resulted in a height of 2.5 m above the level of the rail as required in the expert opinion. The design therefore complies with the requirements.

Table 5: Comparison Expert proposal vs. Planned execution

	Proposal in the report		Planned execution		Equal
Northern Section	*PHO-J1*	Height: 3,0m Length: 1011m	*PHO-J1*	Height: 3,0m Length: 1018m	Yes
Southern Section	*PHO-J2a*	Height: 2,5m Length: 437m	PHO-J2a_1	Height: 2,5m Length: 200m	Yes
			PHO-J2a_2	Height: 2,5m Length: 95m	Yes
			PHO-J2a_3	Height: 2,5m Length: 152m	Yes
	PHO-J2b	Height: 2,5m Length: 376m	*PHO-J2b_1*	Height: 2,5m Length: 268m	Yes
			PHO-J2b_2	Height: 3,5m Length: 126,5m	No, but necessary

6.1.9.1 Conclusion

The number and positioning of the noise barriers was implemented according to the expert report.

The height discrepancy in one section could be clarified. The expectable cost reduction by lowering the 126.5 m long noise barrier from 3.5 to 2.5 m is furthermore not expected to be significant.

6.1.10 Parking Spaces

There are no precise specifications regarding the number of parking spaces to be built at Jesenice station in the project task (2020-11-25_Potrjena projektna na-loga_Nad-gradnja ZP Jesenice).

According to the designer (Odgovori na vprašanja Recenzenta BKW_IKK_ Antworten auf Fragen des Recenzenten BKW_IKK), car parking spaces must be provided at Category II stations within the scope of the available space. However, at least five percent of the parking spaces must be designated for disabled users.

The designer also states that parking spaces at the new stops Hrušica and Plavž should only be planned if sufficient space is available.

With the provided document “Akcijski načrt ureditve parkirišč na žel območju_osnutek_čistopis_26oktober2022_” the action plan for arranging parking lots in the area of railway passenger stations and stops was submitted. According to this document for Jesenice are 118 parking spaces required, 6 of these must be with electric charging stations. 10% of the parking spaces must be designated for disabled and functionally impaired persons.

The following car park situations were planned:

Green Zone, Jesenice Train Station:

- 4 Disabled parking spaces (2,70 meters wide with a 0,90 meters buffer strip; length 5,40 meters)
- 36 Angled parking spaces (2,60 meters wide, 4,90 meters long)

Yellow Zone, Jesenice Train Station:

- 5 Disabled parking spaces
- 88 Standard parking spaces

Railway Signal Box:

- 12 Parking spaces for staff

Hrušica Station:

- 1 Disabled parking space (5.40 meters x 3.60 meters as per 2-1_Tir RP_Odsek Jesenice-Hrušica)
- 17 Parking spaces (5.00 meters x 2.60 meters as per 2-1_Tir RP_Odsek Jesenice-Hrušica)

6.1.10.1 Conclusion

In conclusion, it can be stated that the planned number of car parking spaces at the Jesenice Train Station (Green + Yellow Zone) with 133 parking spaces fulfils the required number. The number of parking spaces with an electric charging station were not identified in the submitted documentation. The number of disabled parking spaces in the Green Zone is sufficient, in the Yellow Zone the requirement of 10% is not reached.

6.1.11 Two additional Stops - Hrušica and Plavž

There are no specific requirements for the additional stops resulting from the project task (2020-11-25_Potrjena projektna na-loga_Nadgradnja ZP Jesenice). No car parking spaces are to be provided, but they can be built if there is sufficient space. However, according to the DRSI, railway stops that are designed as side platforms should be at least 150 meters long and have a minimum width of 2,50 meters.

The train stations Plavž and Hrušica are technically equipped as follows:

- **Plavž**

Parking Spaces:

- No parking spaces planned

Platform:

- Width: 2,50 meters
- Length: 153 meters
- Distance from Track Axis to Platform Edge: 1,66 meters
- Danger Zone: 2,20 meters
- Waiting Booth available
- Equipped with tactile guidance system
- Access via staircase construction

- **Hrušica**

Parking Spaces:

- 1x Disabled Parking Space: 5.40 m x 3.60 m (according to 2-1_Tir RP_Odsek Jesenice-Hrušica)
- 17x Parking Spaces: 5.00 m x 2.60 m (according to 2-1_Tir RP_Odsek Jesenice-Hrušica)
- 10 Bicycle Parking Spaces

Platform:

- Width: 2,50 meters
- Length: 153 meters
- Distance from Track Axis to Platform Edge: 1,66 meters
- Danger Zone: 2,20 meters
- Waiting Booth available
- Equipped with tactile guidance system
- Access via 2,5 m wide staircase at the end of the platform
- Barrier-free access in the middle: Slope 4.3%, Width 1,40 m

6.1.11.1 Conclusion

The additional stops at Hrušica and Plavž were planned according to the requirements. We consider the solution to be appropriate and state-of-the-art.

6.1.12 Dimension and construction of bridges

The project task was to extend the railway bridge on lines 1 and 2 at km 631+634. According to the project task (2020-11-25_Potrjena projektna na-loga_Nadgradnja ZP Jesenice), the client has no specifications for the culvert in the Hrušica stop area.

- **New half-frame bridge at km 631+154.796**

The 110-year-old riveted steel structure on which both tracks are located is to be demolished and a new single-track pre-stressed half-frame bridge is to be built.

- **Refurbishment plan for the existing steel bridge at km 631+154.796**

The existing steel bridge, which is located next to the new half-frame bridge, is to be lifted and renovated. The bridge structure is designed as a free-standing beam with a length of 20,8 m. The bridge width is 5m.

- **Culvert (Station Hrušica)**

The culvert is designed as a closed frame structure with a clear span of 4,0 meters. The length of the culvert is 7,3 meters and the height between the floor and the lintel is 2,17 meters.

6.1.12.1 Conclusion

The bridge constructions listed above were planned according to the requirements. We consider the solution to be appropriate and state-of-the-art.

6.1.13 Final Conclusion Infrastructure

The upgrade of the Jesenice Railway Station is not contrary to the applicable regulations and guidelines regarding the spotchecks carried out by TSR. This reflects a high standard of compliance with the European 2030 and 2050 strategies as well as interoperability within the Trans-European Railway Network. The adherence to regulatory guidelines ensures that the station provides a secure environment for passenger and freight trains while facilitating smooth operations. Continued vigilance in maintaining the referenced standards and regulations is strongly recommended as the project progresses, including involvement of a notified body.

Furthermore, due to the necessity of the upgrade of the Jesenice Railway Station for passenger traffic an increase of the number of available platforms is required consequently. With a track length of more than 740 m it is possible to operate freight traffic at the railway station according to the highest value of freight traffic, F1. The current project solution as well as the planned number of tracks and the track layout are considered appropriate for the present and future requirements.

Finally, it must be stated that the current project solution appears to be appropriate under the given requirements specified by the MIRS.

6.2 Catenary System and Energy System

6.2.1 Requirements

The power system is 3kV direct current (DC), standard for Slovenia, as well as 15kV alternating current (AC), standard for Austria. To ensure continuous operation between the two systems, there must be a neutral zone to separate the two systems from each other. The catenary system must apply to all common standards and local regulations. The Power Supply must comply to “TSI Energy”. The catenary system must ensure operation between different types of pantographs (1900mm,1600mm, 1450mm). Switches should have electrical motors and are remote controlled. The 3kV system is operated by the Slovenian Control Centre. The 15kV system is operated by the Austrian Railway Centre.

All definitions are described in the document “project requirements”.

6.2.2 Design, Description and Evaluation

As part of the concept, a system for switching between voltages was considered, of which the following conclusion emerged; “In the future, it can be expected that the proportion of multi-system locomotives will correspond to that of single locomotives, and the proportion of trains requiring a locomotive change at the station will decrease. Therefore, the separation system of continuous network systems without a switch is more suitable for these cases. Based on the insights described above, we can conclude from the perspective of railway transportation technology that the ability to switch the voltage in the overhead line does not provide any advantage”.

It is planned to create a grounded zone of approximately 8 meters between the 3 kV DC and 15 kV AC traction systems, which is also in accordance with SIST EN 50367 as well as TSI ENE. This grounded area largely ensures that there is no interconnection between the two traction systems.

6.2.3 Final Conclusion Catenary System and Energy System

All metallic parts of the AC 15 kV system and the DC 3 kV system are intended to be directly connected to the earthing connection. These connections should be adequately sized to reduce unwanted stray currents. Special attention should be paid to the connection of metallic components (poles, signals, etc.) to the ground. These components should be periodically inspected during operation. A comparison between Hodoš and Jesenice stations shows that Jesenice station cannot be designed like Hodoš station for operational reasons.

If a train comes to a stop in the area of the other (AC or DC) traction system, a suitable locomotive (train vehicle) must be reliably available to perform the necessary movements. The same applies if an electrical train stops in the neutral zone.

According to the insights presented in the concept phase, as well as the planning documents, the area of the overhead line system and power supply meets stated Project Requirements. Regarding the received documents, it is stated that all applicable standards, regulations, and the TSI Energy will be met in project design and realisation. While the number of neutral zones appears to be generally well dimensioned.

Further, it is described that a 170mm^2 contact wire is used throughout the entire area, while in Austria a 120mm^2 contact wire is common for 15kV. Therefore, a 120mm^2 contact wire can be used, for mechanically separated systems. In the framework of the project “Technical and safety upgrade of the Karavanke Railway tunnel”, implemented in 2021, a 170mm² and 190mm² contact wires were built in the area from the B side of the Jesenice railway station to the southern portal of the Karavanke railway tunnel. In the tunnel itself a 120mm² contact wire was built.

6.3 Signalling, Telecommunication and Lighting

6.3.1 Requirements

As part of the project requirements, the safety technology of Jesenice Railway Station is thought to be modernized and adapted. Additionally, new cable routes and pipes are to be installed. A shared cable route is planned in the platform area.

For signalling only systems with SIL Class 4 approval are permitted. During the renovation, the signalling system must be temporarily secured. Signal visibility must be always maintained and coordinated with the overhead line area.

Information systems are also planned throughout the entire station. According to the project requirements, a 20% capacity reserve is planned and expected to allow for future adaptations. All lighting fixtures, both interior and exterior, are to be renewed during the construction process.

An emergency power supply automatically switching to the safety power supply, in case of a grid failure, is to be established. This also applies to parts of the lighting in public areas, for example. Detailed requirements regarding light intensity, light point height, and lamp replacement are described as project requirements for the lighting. The type of light source has not been explicitly specified.

6.3.2 Design Description and Evaluation

According to the submitted documents, the facility will be equipped with axle counters and new signal systems. It is described that the facilities must meet all project-specific requirements, as well as standards and regulations, and have a safety integrity level SIL4. Calculations and light cone representations were included in relation to the lighting. Most of the design documents are mentioned in the documents /D14/, /D29/ /D55/ as well as /D64/ to /D70/.

6.3.3 Final Conclusion Signalling, Telecommunication and Lighting

The signalling part is heavily standardized, leaving little room for design flexibility. Therefore, there are no suggestions for simplification in this regard. Equipping with axle counters is a common safety solution. The areas of passenger information and low-voltage range were not further considered due to their small share in the overall project. The following points can be noted as remarks:

- As part of the project requirements, lighting poles ranging from 11m to 5m in height, need a climbing aid or rappelling, however, for easier maintenance in the future, the use of tiltable poles could be considered. The lighting could possibly also be integrated into the catenary system.

- According to the project requirements, “ground cables” instead of cabletrays could be used. This option is much cheaper than constructing cable trays. Therefore, especially for a small number of cables, this should be considered more frequently.

7 Costs

7.1 Overall costs

7.1.1 Table of offers and cost estimate

The following bids and cost estimate (net) were submitted for review and verification of the viability.

Bids		Offer amount (net)
1.	KUFNER GRUPA	143.997.212,08 €*
2.	RIKO	139.508.196,72 €*
3.	VOC	146.666.000,01 €*
Cost Estimate		**Amount**
	Cost estimate	112.645.468,96 €

*The given values already include a surcharge of 10% for unforeseen work. So that a comparison to the cost estimate is proper.

7.1.2 Deviations from the cost calculation

When comparing the individual offers with the cost estimate, the cost estimate is significantly lower than the sums offered. It should be noted that a valorization of 7.01% for 2023, unforeseen work with a surcharge of 10% and an inflation impact for the years 2024 to 2026 were already included in the cost estimate.

The plausibility of this deviation is examined below.

7.2 Audit of Cost

7.2.1 Method of the audit

For the audit of the deviation above, three assessment methodologies have been used:

- **Main construction elements:** The main construction elements such as tracks including switches, platforms including equipment and roofs, overhead catenary, noise barriers, small stations and bridges were audited. These elements represent the main work within the project. The prices of the cost estimate and offers are

compared with prices from comparable projects in Austria and thus checked for plausibility.

- **Highest cost drivers:** Single items with a price of 500.000,00 € or more were audited. These items have a significant influence on the total volume of the project and are therefore most important. The prices of the cost estimate are compared with the prices of the best bidder´s offer (RIKO). Furthermore, these prices are compared with prices from comparable projects and thus checked for plausibility. The comparable projects were planned or built in Austria and Germany. It should be noted that the item descriptions are not completely identical and therefore the market prices may differ. Regional differences must also be taken into account.
- **Largest percentage deviation:** Items where the prices of the best bidder's offer (RIKO) differ significantly from the cost estimate are examined more closely and checked for excessive bid prices or an underestimated cost estimate with the help of the other offers. This determines the plausibility of the individual prices. Items for which the percentage deviation is higher than 500% have been assessed in this step.

Note 1: Basis of comparable prices: The prices used in this audit to compare with the prices of the designers cost estimate and the offered prices are on a price basis of 2023 (This means, that all older prices are valorised properly). The applied prices are average prices according to the inhouse price database at IKK Group GmbH. The prices are taken both from offered prices in recent railway projects in Austria (e.g. Koralmbahn, Flughafenast, Ostbahn, Bahnhof Oberndorf, Bahnhof Gleisdorf) and Germany (Zulaufstrecke Fehmarnbelt) as well as actual cost estimates currently agreed with different railway infrastructure companies in Austria (e.g. ÖBB; GKB, StLB, Salzburg AG).

Note 2: Not for all items or objects sufficiently reliable reference prices could be determined. This is either due to the fact, that the item itself varies to much from the usually used items in Austria or due to the fact, that the available prices are not reliable enough due to widely differing masses or due to different construction methods.

Estimation of reasonable total project cost: The submitted documentation and the scope of the assessment project do not allow to estimate a concrete figure for a reasonable total project cost. Therefore, based on these three audit-methods a rough estimation of a range where a detailed cost estimation would most likely lead to, will be given.

7.2.2 Main Construction Elements

7.2.2.1 Tracks and Switches

The work for dismantling and laying the switches and tracks was taken into account and consists mainly of item 0.2.C(ZGORNJI USTROJ - Superstructure). The substructure was not considered. The cost estimate for the tracks and points differs significantly from the offers submitted.

Table 6

	Element	*Cost Estimate*	*Kufner Grupa*	*RIKO*	*VOC*
Costs	*Dismantling*	*2.944.462,00€*	*3.893.190,80€*	*3.817.807,78€*	*4.339.672,17€*
	New tracks	*11.506.971,20€*	*17.959.752,96€*	*17.171.551,45€*	*11.956.090,00€*
	New switches	*6.277.340,00€*	*9.087.873,48€*	*9.943.790,88€*	*9.246.467,99€*
	Total	*20.728.773,20€*	*30.940.817,24€*	*36.933.150,11€*	*25.542.230,16€*

The cost estimate of € 20,728,773.20 is significantly lower than the bids submitted by the three bidders. However, the difference between the cost estimate and the individual bidders varies widely. The differences between the individual bidders also vary widely. The difference between RIKO, the most expensive bidder for these items, and VOC, the cheapest, is around €11.5 million.

Compared with projects from Austria and Germany, IKK would estimate the partial costs as follows:

- Dismantling: 4.322.914,00 €
- New tracks: 13.368.067,00 €
- New switches: 10.615.250,00 €
- Total: 28.306.231,00 €

In total, the prices from Austria/Germany also exceed the cost estimate, are in between the offers from VOC and Kufna, but are not as high as the prices from RIKO.

Note: Comparing the cost position “I.1) TIRNE NAPRAVE S PERONI” (track installations with platforms) the cost estimate is 33.855.989,63€ (without considering valorization, unforeseen work and inflation impact). The best bidder´s offer (RIKO) is 49.228.426,76€ and therefore 45% higher than the cost estimate. This difference is also seen in the above compared positions and fit therefore into the described picture.

7.2.2.2 Platforms incl. equipment

Table 7

	Element	*Cost Estimate*	*Kufner Grupa*	*RIKO*	*VOC*
Costs	*Platform incl. equipment*	*999.630,39€*	*1.527.313,79€*	*1.437.892,88*	*1.471.777,18€*
	Roof	*3.321.838,10€*	*4.193.939,58€*	*4.653.266,17€*	*4.879.408,55€*
	Total	*4.321.468,49€*	*5.721.253,37€*	*6.091.159,05€*	*6.351.185,73€*

The cost estimate differs widely from the three offers and is significantly lower. The individual offers are roughly in the same proportion to each other.

The cost of the platform based on Austrian prices is 1.448.528,50€ and is therefore in the range of the submitted offers prices.

No comparable Austrian prices can be used to calculate the costs of the platform roof, as the standard is based on a calculation based on square meters and not on weight. Therefore, the square meters of the roof were calculated and the cost calculation was carried out using a comparable price from Austria.

The costs used amount to 1.600 €/m². This results in a cost estimate of 7.556.096€. The cost estimate based on Austrian prices is therefore much higher than the offers from the three bidders. Due to the conversion of the positions from weight to area, it is not possible to make a precise comparison, so the result may not be meaningful.

7.2.2.3 Overhead lines

Table 8

	Cost Estimate	*Kufner Grupa*	*RIKO*	*VOC*
Costs	*9.263.645,00€*	*14.748.327,58€*	*13.552.604,49€*	*13.593.262€*

The cost estimate is significantly lower than the three offers. The difference is up to 5.5 million €.

To calculate the costs based on Austrian prices, the total length was offset against the Austrian costs. The cost of an overhead line per linear meter is around €640. This results in a total of 12.720.832,00€.

The calculated costs are significantly higher than the cost estimate, but still below the offers of the three bidders. However, the costs are significantly closer to those of the three bidders.

It should also be noted that no cost calculation was carried out on an item basis, but on a quantity basis.

7.2.2.4 Noise Barriers

The cost estimate for the noise barrier installation varies significantly from the offers.

Table 9: Cost comparison – Noise Barriers

	Cost Estimate	*Expert Assessment*	*Kufner Grupa*	*RIKO*	*VOC*
Costs	*1 801 736,60€*	*2 411 300,00€*	*2 830 558,20€*	*2 577 680,16€*	*2 672 861,56€*

The designer's estimate of 1.801.736,60€ is significantly lower than the offered prices of all 3 bidders. In contrast, the estimates from Kufner Grupa, RIKO and VOC are relatively close to the expert assessment. They all range between approximately €2.4 million and €2.8 million.

A comparable project in Austria shows that the price per square meter of noise barrier can be estimated at 330€. If this value is multiplied by the area of 6.890 square meters the resulting costs are 2.273.700,00€. In comparison, the planner's cost estimate therefore appears to be relatively low.

7.2.2.5 Two additional Stops - Hrušica and Plavž

Table 10: Cost comparison – Additional stops

	Position	Cost Estimate	Kufner Grupa	RIKO	VOC
Costs	*I.8) TIRNE NAPRAVE S PERONI NA PROGI JESENICE-HRUŠICA (Track expansion with platforms on the Jesenice-Hrušica line)*	*2 827 493,71 €*	*4 858 159,82 €*	*4 556 006,18 €*	*4 265 060,50 €*
	STRANSKI PERON POSTAJALIŠČA PLAVŽ (Side platform of the Plavž station)	*160 160,33 €*	*316 232,77 €*	*246 548,31 €*	*235 784,21 €*
	STRANSKI PERON POSTAJALIŠČA HRUŠICA (Side platform of the Hrušica station)	*155 006,93 €*	*264 841,41 €*	*254 016,46 €*	339 129,53 €

The costs estimated by the designer for position “I.8) Track expansion with platforms on the Jesenice-Hrušica line” amount to approximately €2,8 million. However, this estimate is significantly lower than the submitted offer prices, which range from €4,2 million to €4,8 million. Even with a detailed examination of subpositions such as "STRANSKI PERON POSTAJALIŠČA PLAVŽ" (side platform of the Plavž station) or "STRANSKI PERON POSTAJALIŠČA HRUŠICA" (side platform of the Hrušica station), there are considerable price differences.

The costs estimated by the designer for the side platform of the Plavž station amount to 160.160,33€. The closest offer comes from the company VOC at 235.784,21€. The highest offer is from the company Kufner Grupa at 316.232,77€.

Similarly, the designer's cost estimate for the platform at the Hrušica station is 155.006,93€. In this case, VOC is the most expensive bidder at 339.129,53€, while the lowest offer comes from Riko at 254.016,46€, closely followed by Kufner Grupa with a bid of 264.841,41€.

Also, the lowest offers for the Plavž platform (75.600€ price difference) and the Hrušica platform (99.000€ price difference) differ significantly from the cost estimate.

Comparable projects in Austria show that the price per square meter of railway platform is around 850 € (including equipment). Higher than the offered prices and thus a lot higher than the cost estimation form the designer.

7.2.2.6 **Bridges**

Table 11: Cost comparison - Bridges

	Cost Estimate	*Kufner Grupa*	*RIKO*	*VOC*
New half-frame bridge at km 631+154.796	452 034,20€	948 678,75€	738 199,90€	667 567,37€
Refurbishment plan for the existing steel bridge at km 631+154.796	153 683,10€	328 265,52€	335 942,19€	230 343 ,91€
Culvert (Hrušica)	57 413,50 €	159 056,83 €	127 334,64 €	86 735,34 €

The designer's cost estimate for the new half-frame bridge is 452.034,20€, which is around 216.000€ cheaper than the lowest cost estimate received from VOC at 667.567,37€. The other two offers from RIKO (738.199,90€) and Kufner Grupa (948.678,75€) are even higher.

A comparable project in Austria shows that the price per square meter of half-frame reinforced concrete bridge can be estimated at 6000€. If this value is multiplied by the area of 163,8 m² (23,4m x 7m) the resulting costs are 982.800,00€. In comparison, the planner's cost estimate therefore appears to be too low.

The designer's cost estimate for the refurbishment of the existing steel bridge is 153.683,10€, which is around 77.000€ cheaper than the lowest offer received from VOC at 230.343,91€. The other two offers from RIKO (335.942,19€) and Kufner Grupa (328.265,52€) are significantly higher.

The cost estimates for the culvert vary significantly. The cost estimate was 57 413,50€, but the offers range from 86.735,34€ (VOC) to 159.056,83€ (Kufner Grupa).

7.2.3 Highest cost drivers

During the review, a total of 29 items were identified with an item price of €500,000.00 or more.

The individual items are compared with similar items as described above. A detailed comparison is written below the table. To avoid repetition of individual items, equal items with similar prices were summarised.

The following items were identified:

Item		UNIT PRICE (CE)	ITEM PRICE (CE)	UNIT PRICE (IKK)	ITEM PRICE (IKK)	ITEM PRICE (RIKO)
0_2		-	-	-	-	-
0.2.C7	Track removal	83,00 €	1.177.106,00 €	147,00 €	2.084.754,00 €	1.650.501,16€
0.2.C19	Machine excavation and removal of the track bed	18,00 €	837.450,00 €	18,00 €	837.450,00 €	1.039.368,50€
0.2.C21	Supply and complete installation of a new switch 60E1 (R500)	182.000,00 €	1.092.000,00 €	350.000,00 €	2.100.000,00 €	1.787.165,22€
0.2.C22	Supply and complete installation of a new switch 60E1 (R300)	140.700,00 €	1.688.400,00 €	204.000,00 €	2.448.000,00 €	2.457.426,24€
0.2.C24	Supply and complete installation of a new switch 60E1 (R200)	115.800,0 €	1.158.000,00 €	204.000,00 €	2.040.00,00 €	1.800.517,80€
0.2.C25	Supply and complete installation of a new switch 60E1 (R200)	112.700,00 €	563.500,00 €	204.000,00 €	1.020.000,00 €	900.265,45 €
0.2.C26	Supply and complete installation of a new double-crossing switch 60E1 (R215)	198.000,00 €	594.000,00 €			1.283.427,39€
0.2.C33	Supply and complete laying of new 60E1 track and switch ties	672,00 €	2.774.352,0€	955,00 €	3.942.717,50€	4.159.876,60€
0.2.C34	Supply and complete laying of new 60E1 track and switch ties	668,00 €	2.525.708,00 €	940,00 €	3.554.140,00 €	3.749.504,27€

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0.2.C38	Complete installation and laying of track made of previously built 49E1 rails on wooden sleepers	320,00 €	1.630.912,00 €	340,00 €	1.732.844,00 €	2.507.425,27€
0.2.C58	Backfilling with water permeable material	42,00 €	691.866,00 €	45,00 €	741.285,00 €	1.510.409,37€
0.2.D3	Excavation and removal of material	18,00 €	1.110.960,00€	25,00 €	1.543.000,00 €	1.297.971,60€
0.2.D7	Construction of frost-resistant layer	25,00 €	1.405.350,00 €	30,00 €	1.686.420,00 €	2.546.494,20€
0.2.D8	Construction of an unbound bearing course	28,00 €	1.171.296,00 €	65,00 €	2.719.080,00 €	2.009.190,96€
0.2.E5	Supply and installation of plastic drainage and sewerage pipes	56,00€	637.392,00 €	60,00 €	682.920,00 €	398.028,54 €
1_1		-	-	-	-	-
1.1.H4	Alu dropped ceiling - composite facade panels	200,00 €	720.000,00 €			961.632,00 €
2_1		-	-	-	-	-
2.1.C11	Supply and complete laying of new 49E1 track	615,00 €	862.230,00 €	605,00 €	848.210,00 €	1.392.915,04€
2_3		-	-	-	-	-
2.3.2.E2	Rehabilitation of degraded concrete and reinforcement	230,00 €	529.000,00 €			303.048,00 €
3_1		-	-	-	-	-
3.1.B1.2	Supply and installation of poles (M110vp)	2.800,00 €	501.200,00 €			713.844,84 €
3.1.B1.6	Supply and installation of poles (M160P/10- II double support mast)	12.950,00 €	854.700,00 €			1.168.143,24€
3.1.B1.16	Supply and installation of poles (Gantry beam for 25-27m span (P3_20_TT))	29.560,00 €	504.640,00 €			704.846,80 €
3.1.B2.1	Carrier of one overhead contact line	1.520,00 €	738.720,00 €	3.500,00 €	1.701.000,00 €	886.235,58 €

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3.1.B5.1	Supply and installation of overhead conductor	50.400,00 €	957.600,00 €			1.285.481,67€
3_12		-	-	-	-	-
2.6	Protection of existing main HVDC cables with PE cut pipes	280,00 €	700.000,00 €	30,00 €	75.000,00 €	59.500,00 €
3_13		-	-	-	-	-
D.1.62	Supply and installation of a hydraulic switch	16.320,00 €	1.011.840,00 €			1.152.105,70€
D.1.81	Light displacement signal, two-pole, supply and installation	9.000,00 €	702.000,00 €			844.877,28 €
11_20		-	-	-	-	-
1	Preparation and organisation of the construction site	6.500.000,00 €	6.500.000,00 €			8.102.585,01€
2	Design and geotechnical supervision	65,00 €	520.000,00 €	95,00 €	760.000,00 €	656.000,00 €
4	Preparation of the project documentation for the detailed design	800.000,00 €	800.00,00 €			750.000,00 €

0_2

- 0.2.C7: The cost estimate for the complete removal of tracks is lower than similar projects. The difference of the price is around 60 € per meter but because of the high amount of around 14.182 m of this item the discrepancy in price amounts to a total of around 900.000,00 €. The offered price of the best bidder RIKO is closer to the price estimate of the IKK than to the estimate of the designer.
- 0.2.C19: The estimate for the machine excavation of the track bed is similar to other projects. The price offered by the best bidder RIKO differs equally from the two identical estimated prices.
- 0.2.C21, C22, C24, C25, C26: These items consist of the supply and installation of various types of switches. The cost estimate does have generally a lower unit price than comparable projects of around 100.000 € or more per switch. Because

of this discrepancy of the unit price the overall difference of item prices amounts to around 3.500.000,00 €. The price offered by the best bidder RIKO is closer to the estimated price of IKK in items C21, C22, C23, C24 and C25. There is no IKK estimate for item C26 and therefore no comparison possible.

- 0.2.C33, C34: These items describe the supply and laying of new tracks in two different types. Comparable projects in Germany have a slightly lower item price than the offered prices from all bidders. All 4 prices are far higher, than the cost estimate.

  The Slovenian and German item both include the fixing material, the welding of the rails, the track clearance and machine regulation. The supply and installation of new track ballast is not included in the price.

  Note: Comparable Projects in Austria on the other hand show lower prices than offered, in about the range of the cost estimate. We could not completely clarify where this difference is coming from.
- 0.2.C38: The installation and laying of used track components has a lower price than the supply and construction with new materials. The cost estimate is slightly lower than comparable prices in Austrian projects. The price offered by the best bidder RIKO is a lot higher than the designer's estimate.
- 0.2.C58: The cost estimate of the backfilling of inter-tracks with water-permeable material is slightly lower than comparable prices. The offer of the best bidder RIKO is a lot higher than the designer's cost estimate and the estimated price of the IKK.
- 0.2.D3: The excavation of material is a similar item used in the comparable projects. The unit price is slightly higher than the cost estimate. The offer of the best bidder RIKO is closer to the designer's cost estimate than to the estimated price of the IKK.
- 0.2.D7: The construction of a frost-resistant layer is also a common item in other projects. The unit price is slightly higher than the cost estimate but not significantly. The offer of the best bidder RIKO is closer to the estimated price of the IKK than to the designer's cost estimate.

- 0.2.D8: This item describes the construction of unbound bearing course of gravel. The unit posted is m³. In the other projects the unit used is usually m². Due to this difference in unit the adapted price is a lot higher than the cost estimate. The offer of the best bidder RIKO is closer to the estimated price of the IKK than to the designer's cost estimate.
- 0.2.E5: The cost estimate and the comparable unit prices for the supply and installation of pipes is almost similar and differentiate just slightly. The offer of the best bidder RIKO is closer to the designer's cost estimate than to the estimated price of the IKK.

1_1

- 1.1.H4: The construction of a dropped ceiling isn't used in the other projects. A comparison of the prices isn't possible.

2_1

- 2.1.C11: This item is comparable to the items 02.C33 and C34. The offer of the best bidder RIKO is closer to the designer's cost estimate than to the estimated price of the IKK.

2_3

- 2.3.2.E2: The rehabilitation of degraded concrete with construction of reinforcement does not have a comparable item in other projects. A comparison of prices isn't possible.

3_1

- 3.1.B1.2, B1.6, B1.16: These items consist of the construction of poles. The described types of poles do not have a counterpart in other projects. A comparison of prices isn't possible.
- 3.1.B2.1: The cost estimate for the construction of a carrier for an overhead contact line is around the half of the unit price from other projects. This means, the difference of the item price is around 1.000.000,00 €. The offer of the best bidder

RIKO is closer to the designer's cost estimate than to the estimated price of the IKK.

- 3.1.B5.1: The supply and installation of an overhead conductor doesn't have a counterpart in other projects. A comparison of prices isn't possible.

3_12

- 2.6: The protection of cables is a similar item compared to other projects. The unit price for the other projects is around one tenth of the cost estimate. The offer of the best bidder RIKO is closer to the estimated price of the IKK than to the designer's cost estimate.

3_13

- D.1.62: The supply and installation of a hydraulic switch doesn't have a comparable item in other projects. A comparison of prices isn't possible.
- D.1.81: The sully and installation of a light displacement signal doesn't have a comparable item in other used projects. A comparison of prices isn't possible.

11_20

- 1: This item describes the entire preparation and organization of the construction site. This item depends on the individual project and can't be compared.
- 2: This item describes the design and geotechnical supervision. The billing is calculated by the hour. The hourly cost for a supervision in Austria is around 95€. The Austrian price is higher than the cost estimate and the best offer by RIKO. It is to be noted that wages depend on regional differences and can't be easily compared.
- 4: This item describes the preparation of the project documentation. This item depends on the individual project and can't be compared.

7.2.4 Largest percentage deviation

During the audit, a total of 28 item prices of the most favourable bidder were identified, which, depending on the cost estimate, are over 500% more expensive.

The individual items are compared with the prices offered by the other bidders and listed as follows. A detailed comparison of the items is written below the table. To avoid repetition of individual items, equal items with similar prices were summarised.

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ITEM NUMBER	ITEM PRICE (CE)	ITEM PRICE (KUFNER)	ITEM PRICE (RIKO)	ITEM PRICE (VOC)
0_2	-	-	-	-
0.2.A12	400,00 €	40,70 €	56.465,70€	607,49 €
0.2.C30.1	23.940,00 €	42.528,75 €	218.180,52 €	36.017,73 €
1_1	-	-	-	-
1.1.C4	2.700,00 €	7.317,00 €	38.700,00 €	4.086,00€
1.1.H6	16.800,00 €	26.303,30 €	86.685,20 €	24.920,00 €
1.2.2.H26	4.500,00 €	32.020,41 €	35.873,49 €	6.631,17 €
1_5	-	-	-	-
1.5.1.A3	1.500,00 €	2.500,33 €	34.2466,58 €	2.210,39 €
1.1.1.D2	5.100,00 €	37.788,00 €	38.517,00 €	7.641,00 €
1.1.1.P6	3.000,00 €	40.089,46 €	40.712,00 €	4.406,14 €
1.1.1.R2	4.750,00 €	36.790,00 €	37.327,50 €	7.027,50 €
1.1.1.R3	8.250,00 €	54.107,50 €	54.897,50 €	12.150,00 €
1.1.1.R5	17.250,00 €	87.437,50 €	88.710,00 €	25.325,00 €
2_1	-	-	-	-
2.1.D1	725,00 €	30.348,79 €	39.999,99 €	1.095,33 €
2_2	-	-	-	-
2.2.1.A2	1.050,00 €	28.333,33 €	30.000,00 €	1.610,22 €
2	-	-	-	-
2.10.C6	1.600,00 €	36.781,61 €	37.647,06 €	2.342,14 €

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3_1	-	-	-	-
3.1.A1.2	4.500,00 €	29.069,77 €	44.712,64 €	6.640,45 €
3.1.A6.2	6.300,00 €	54.942,30 €	127.921,50 €	10.759,35 €
3.1.E1.3	4.500,00 €	4.351,19 €	47.529,41 €	6.587,26 €
3_4	-	-	-	-
3.4.3.A2	7.500,00 €	41.666,67 €	38.470,59 €	11.125,15 €
3_6	-	-	-	-
3.1.1.A12	1.584,00 €	29.232,72 €	28.271,92 €	2.330,40 €
3_11	-	-	-	-
3.11.1.B40	6.000,00 €	30.560,71 €	30.201,18 €	8.783,01 €
3_12	-	-	-	-
2.87	2.500,00 €	6.857,14 €	38.176,47 €	3.659,59 €
2.104	14.375,00 €	91.080,00 €	82.507,90 €	21.042,70 €
3_13	-	-	-	-
D.2.3	5.000,00 €	41.785,71 €	29.823,53 €	7.465,56 €
3_14	-	-	-	-
3.14.B29	3.500,00 €	38.150,00 €	37.702,00 €	5.124,00 €
3_18	-	-	-	-
3.18.P21	4.400,00 €	18,04 €	29.364,00 €	6.440,88 €
3_24	-	-	-	-
3.24.B1.14	200,00 €	21.428,00 €	29.364,00 €	292,00 €
3_26	-	-	-	-
3.26.A1.1	620,00 €	26.040,00 €	36.468,40 €	905,20 €

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3_4	-	-	-	-
91	5.265,00 €	15.343,38 €	27.624,87 €	7.878,78 €

0_2

- 0.2.A12: This item describes the complete construction of an access path with a length of 80 m. The best offer (RIKO) has an extremely high price compared to the cost estimate and the other two offers. RIKO offers this item for an increase price of approximately 56.000 € more than other prices.
- 0.2.C30.1: The replacement of worn-out switch sleepers of older switches is offered by the other bidders and the cost estimate by a lower price than the best bidders offer. The best bidder has a price increase of around 150.000€

1_1

- 1.1.C4: This item consists of the loading and removal process of excess material is around 30.000 € more expensive than the cost estimate and the other offers.
- 1.1.H6: The ceiling filler is around 3 times more expensive than the other offers and the cost estimate.
- 1.2.2.H26: The offer for the supply and installation of the steel doors is around 8 times more expensive than the cost estimate. But another offer made by KUFNER has a similar price as the best offer by RIKO does. The third offer is still way lower and comes close to the cost estimate.

1_5

- 1.5.1.A3: This item describes surveying the work for the construction of the building. The best offer by RIKO is more than 10x more expensive than other offers and the cost estimate. There is a possibility that the bidder couldn't assess the actual work of this item and therefore put in a high offer, since the item isn't described much.

- 1.1.1.D2: The inspection of a storm sewer described in meters has a high offer by the best bidder comparing to the cost estimate and one bid. Comparing to the bid by KUFNER it has a very similar price.
- 1.1.1.P6: This item describes the supply and installation of glass walls. It is described in a very detailed way. The best bidder offered the highest price of all bidders but is on par with the offer of KUFNER.
- 1.1.1.R2; R3; R5: These items describe different types of work with an existing facade. RIKO does have the highest offer on these items but is still in the same range as KUFNER.

2_1

- 2.1.D1: The highest offer for the installation and securing of transvers profiles was made by RIKO. They offered a similar amount as KUFNER but is still around 10.000 € more expensive than KUFNER.

2_2

- 2.2.1A: The determination and verification of position, heights and orientations for the construction is posted one piece. RIKO has the highest offer but comparing to KUFNER is in the same range as them.

2

- 2.10.C6: This item consists of raising a steel bridge structure and is posted as one piece but is described in a detailed way. Like many other items the offer by RIKO and KUFNER are very similar and a lot higher than the cost estimate and the third offer.

3_1

- 3.1.A1.2: The grading with securing, installation of cross-sections and other surveying work is offered by RIKO for a lot more than the cost estimate estimated.
- 3.1.A6.2: This item consists of the protection of the track bed during excavation. It is also noted as “estimate” which could lead to speculation during the

calculations by the bidders. The offer by RIKO is again a lot higher than the rest of the offers. Especially around double the amount as the second highest offer.

- 3.1.E1.3: The offers for the creating of temporary switching schemes are usually around the same range as the cost estimate. RIKO is around 10 times higher than the rest.

3_4

- 3.4.3.A2: The offer by RIKO for the supply and installation of a control cabinet according to the plan is around the same range as KUFNER but still higher than the other offer and the cost estimate.

3_6

- 3.1.1.A21: The construction of the shaft type is described in a thorough way with dimensions and the type. The cost estimate and the offer by VOC are similar.

3_11

- 3.11.1.B40: This item describes the supply and installation of a control cabinet like the item above. The offers are different in value but similar to the price range of the other item.

3_12

- 2.87: The allowance for the cable shaft construction is posted as flat rate. Flat rates are usually difficult to calculate because it depends on different items by the individual bidders. RIKO has the highest offer, but it could be because of the flat rate.
- 2.104: This item consists of the laying of a pipe and other types of work that comes with it like excavations, filling, etc. RIKO does not have the highest offer in this item but is still a lot higher than the cost estimate. KUFNER has a higher offer than RIKO but is still in the same range.

3_13

- D.2.3: The dismantling of unused external installations and visible cables is posted a flat rate which makes make the calculation dependent on the induvial bidder. The cost estimate is a lot lower than the best bidders offer RIKO. But the highest offer was made by KUFNER. It could be a result of the flat rate without a thorough description of the work.

3_14

- 3.14.B29: This item describes the introduction, closing and termination of EE cable. RIKO and KUFNER have similar offers and are around 10 times higher than the cost estimate.

3_18

- 3.18.P21: The offers for the supply and installation of cable sealing modules are not consistent compared to the rest of the offers. KUFNER offered an extremely low price even compared to the cost estimate. RIKO has a very high offer. This difference is unusual and could result by the explanation of the item or bill of quantities.

3_24

- 3.24.B.14: The necessary labour for this item is not described in a thorough way. It is listed as the type of construction part in meter. This rather short item description could lead to potential speculation on the offer.

3_26

- 3.26.A1: This item consists of the construction of earthing rings around the PENP. It is also described with a construction plan. Due to the present construction plan the calculation should be precise. The offer by RIKO is still a lot higher than the rest of the offers. KUFNER has a similar price as RIKO but is around 10.000 € lower. Both offers are way higher than the cost estimate.

3_4

- 91: The construction of fire-resistant penetrations at the pipe penetrations is described with a reference to NSR 408. RIKO as the best bidder has the highest offer. It is around 6 times higher than the cost estimate.

7.3 Estimation of reasonable total project cost

As already described above IKK Group and TÜV SÜD Rail could not perform a complete cost estimation for the entire project due to several reasons. Therefore, based on the above-described results of the audit-methods, a subjective range is given, where a cost estimate would most likely result:

It can be clearly said that the designers estimate seems to be far too low. On the other hand, the offered prices are considered as slightly above the expectable market prices.

A cost estimate for the entire project would therefore most likely lead to a total price slightly below or within the offers at a range of 130 to 150 Mio €. This estimate also includes the surcharge of 10% for unforeseen work.

7.4 Final Conclusions Costs

Considering the three cost comparison methods that were conducted above, it can be seen, that the most prices of the cost estimate are significantly lower than the compared prices of Austrian and German projects. This applies both on element-costs and on individual item-costs.

Note: All prices are compared on a price basis of 2023. The prices are based on a prices data base of IKK Group GmbH comprising data from several, but not all railway projects in Austria and Germany in the last years.

Several prices of the designers cost estimate are significantly below the compared market values, which is why it is possible that significantly lower prices were chosen, or outdated prices were used in the cost estimate.

(As already described, regional differences in terms of wages, costs, etc. must be considered here. Likewise, the item descriptions are not always identical to the comparison projects, which is why a direct comparison of prices is not always possible.)

Considering the comparison between the cost estimate and the individual bidders, the suspicion that the cost estimate was too low is reinforced.

When comparing the individual bidders, no clear tendency could be seen: The bidders KUFNER and RIKO, offered similar prices in some of the monitored cost positions, but in other cases, the prices differ widely. Also the prices of the third bidder, VOC, vary strongly, meeting in some items the low prices of the cost estimate but for the items examined, but still ending up being the most expensive bidder. In several cases, the three bidders differ greatly from one another.

8 Summary and Final Conclusion

TSR and IKK reviewed whether the planning of the Jesenice Railway Station is justified or appropriate and whether the planner's cost estimate is plausible.

In detail, the following parts of the planning were reviewed:

- Infrastructure
- Catenary System and Energy System
- Signalling, Telecommunication and Lighting.

Furthermore, the price estimate of the planner is compared with prices given from three different companies for the construction of the Jesenice Railway Station in order to determine any price discrepancies.

All performed review activities have been based on spotchecks in form of a plausibility control of the submitted documents.

Especially the visions 2030 & 2050 of the Slovenian Republic which considers the implementation of the Jesenice Railway Station into the European TEN-Network and also the increase of frequency for passengers and freight transport have been considered.

Thus, leading to the following expert opinions:

- **Due to the necessity of the upgrade of the Jesenice Railway Station for passenger traffic an increase of the number of available platforms is required consequently.**
- **The track layout as well as the number of tracks, presented in the submitted plans, seems appropriate to meet the present and future demands for freight and passenger transport.**
- **With a track length of more than 740 m it is possible to operate freight traffic at the railway station according to the highest value of freight traffic F1, which is necessary according to the European legislative.**
- **Based on the conducted samples, it can be assumed that a cost estimate of IKK would be higher than the designer´s cost estimate, but within the range**

of or lower than the offers received. Therefore, the three offers received are considered justified.

- **Finally, the current project solution is considered appropriate for the given requirements.**

8.1 Suggested further steps:

The above results do not give an indication that it is regarded as necessary to stop the current procurement process and to reinitiate it. Anyhow a repetition of the procurement process may be adventurous due to the following factors, if they are performed precisely:

- Circumstances (as e.g. track closure periods) could be properly redefined due to the already expectable delay
- Items with a very wide variety of cost among the different bidders could be further clarified and detailed, so that a more precise calculation is possible
- Items with a very big difference between the cost estimation (both the original designers and IKK Group / TÜV SÜD Rails estimation) and the offered prices could be further clarified and detailed, in order to avoid miss-understanding of specific tasks
- Items with a relatively wide range of activities could be separated so that a better comparability of prices is possible

It cannot be stated, that it is expected that the new offers will therefore be lower, but will most likely be more reliable and will give less chance for cost increases during the period of construction.

Referenced Documents

Table 12: Referenced Documents

Id.	Title	Submitted on
/D1/	2024-05-08_Projektna_naloga_preveritev_ZP_Jesenice_EN	15.05.2024
/D2/	2024-05-08_Vabilo_k_oddaji_ponudbe_EN	15.05.2024
/D3/	2024-05-08_Vzorec pogodbe (preveritev ZP Jesenice)_EN	15.05.2024
/D4/	3735_0_2_Gradbena situacija	01.07.2024
/D5/	3735_0_2_Pregledna situacija_obstojece stanje_postaja Jesenice in Jesenice-Hrusica	01.07.2024
/D6/	3735_0_2_Pregledna situacija_predvideno stanje_postaja Jesenice in Jesenice-Hrusica	01.07.2024
/D7/	3735_0_2_Situacija tirne sheme_postaja Jesenice	01.07.2024
/D8/	3735_3_1_ Gradbena situacija_vozna mreza_Jesenicev	01.07.2024
/D9/	3735_3_1_ Stikalna shema_postaja Jesenice	01.07.2024
/D10/	3735_3_2_Gradbena situacija_vozna mreza_Jesenice - Hrusica	01.07.2024
/D11/	3735_11_2_Tehnologija gradnje_obstojeca in predvidena SV shema	01.07.2024
/D12/	3735_11_2_Tehnologija gradnje_predvidena ureditev postaje	01.07.2024
/D13/	2022-06-13_SZI_Potrditev idejne zasnove IZP (varianta 3)	01.07.2024
/D14/	3735_Jesenice_IZP_Var3_Digitalni projekt_1 del	01.07.2024
/D15/	3735_Jesenice_IZP_Var3_Digitalni projekt_2 del	01.07.2024
/D16/	Poročilo o pregledu IZP_133-PP1-248	01.07.2024
/D17/	2023-12-19-+IP+Jesenice+podpisan	01.07.2024
/D18/	2024_02_13_Ocenjena vrednost (ZP Jesenice - novo) (UB)	01.07.2024
/D19/	3735_Jesenice_IZP_Var3_Digitalni projekt_2 del	01.07.2024
/D20/	Ponudbeni predracun (ZP Jesenice) (UB v6 - s cenami)	01.07.2024
/D21/	POTR_sklep_o_potrditvi_I_P	01.07.2024
/D22/	Railway Station Jesenice_ documentation	01.07.2024
/D23/	PPR-1.del-Jesenice-20240318	08.07.2024
/D24/	PPR-II-2023-2024-Jesenice	08.07.2024
/D25/	TPD-2023-2024-Jesenice	08.07.2024

Id.	Title	Submitted on
/D26/	Ponudbeni predracun KUFNER GRUPA	18.07.2024
/D27/	Ponudbeni predracun RIKO	18.07.2024
/D28/	Ponudbeni predracun VOC	18.07.2024
/D29/	0-2 Tirne naprave	01.07.2024
/D30/	1-1_Pnadst_jesenice	01.07.2024
/D31/	1-2_CP_Jesenice	01.07.2024
/D32/	1-3_PP_Jesenice	01.07.2024
/D33/	1-4_Zavetisca_Plavz_Hrusica	01.07.2024
/D34/	1-5_Nadst_Kurilniska	01.07.2024
/D35/	1-6_PP avla in fasada	01.07.2024
/D36/	2-1_Tir RP_Odesk Jesenic-Hrusica	01.07.2024
/D37/	2-2_Podhod v km 629+689,615	01.07.2024
/D38/	2-3_Podvoz_Podmezakla	01.07.2024
/D39/	2-4_Podhod_Kurilniska	01.07.2024
/D40/	2-5_Most_Jesenica	01.07.2024
/D41/	2-6_Sanacija obstojecih prepustov	01.07.2024
/D42/	2-7_Prepust Hrusiski potok	01.07.2024
/D43/	2-8_Jeklene konstrukcije nadstresnic	01.07.2024
/D44/	2-9_Jeklena konstrukcija_kurilniska	01.07.2024
/D45/	2-10_Sanacija jeklenega mostu	01.07.2024
/D46/	2-11_Načrt konstrukcij PHO	01.07.2024
/D47/	2-12_VGU Jesenica	01.07.2024
/D48/	2-13_VGU Hrusiski potok	01.07.2024
/D49/	2-14_PENP Jesenice podstavek	01.07.2024
/D50/	2-15_Gradbene konstrukcije PP	01.07.2024
/D51/	2-16_Gradbene konstrukcije CP	01.07.2024
/D52/	2-17_Mostna konstrukcija signalov	01.07.2024
/D53/	3-1 VM JESENICE	01.07.2024

Id.	Title	Submitted on
/D54/	3-2 VM JESENICE - HRUSICA	01.07.2024
/D55/	3-3_Zunanja razsvetljava na postaji Jesenice	01.07.2024
/D56/	3-4_Električno gretje kretnic	01.07.2024
/D57/	3-5_Elektricne instalacije v poslopju CP	01.07.2024
/D58/	3-6_Elektricne instalacije v postajnem poslopju, podhodu in nadstreskih	01.07.2024
/D59/	3-7_Elektircne instalacije TP CP	01.07.2024
/D60/	3-8_Elektircne instalacije TP Kompresorji	01.07.2024
/D61/	3-9_Elektircne instalacije TP Kolodvor	01.07.2024
/D62/	3-10_Elektricne instalacije za podhod Kurilniska	01.07.2024
/D63/	3-11 Daljinsko vodenje stikal VM	01.07.2024
/D64/	3-12_Prestavitev in zaščita SVTK	01.07.2024
/D65/	3-13_Načrt SV naprav	01.07.2024
/D66/	3-14_Načrt TK naprav	01.07.2024
/D67/	3-15_Načrt SV NPr 2.2	01.07.2024
/D68/	3-16_Načrt SV NPr 2.6	01.07.2024
/D69/	3-18_Načrt TK postajališč Plavž in Hrušica	01.07.2024
/D70/	3-19_Načrt SVTK na progi Jes-Hrušica	01.07.2024
/D71/	3-20_Video nadzor_Plavž_Hrušica	01.07.2024
/D72/	3-21_Elektricne instalacije za postajalisce Jesenice-Plavz	01.07.2024
/D73/	3-22_Elektricne instalacije za postajalisce Jesenice-Hrusica	01.07.2024
/D74/	3-23_SN in NN povezave, kabelska kanalizacija	01.07.2024
/D75/	3-24 Nacrt primarnih naprav PENP s povezavami	01.07.2024
/D76/	3-25_Daljinsko vodenje PENP	01.07.2024
/D77/	3-26 Nacrt NN instalacij v PENP	01.07.2024
/D78/	3-27_Nacrt napajanja PENP in 20kV omrezje	01.07.2024
/D79/	3-28_Nacrt tehnicnega varovanja PENP	01.07.2024
/D80/	3-29 TK v PENP	01.07.2024
/D81/	3-30_Video nadzor_Jesenice	01.07.2024

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/D82/	4-1_Strojne instalacije PP	01.07.2024
/D83/	4-2_Dviglala podhoda	01.07.2024
/D84/	4-3_Strojne instalacije CP	01.07.2024
/D85/	4-4_Dvizne ploscadi CP	01.07.2024
/D86/	4-5_Strojne instalacije avle	01.07.2024
/D87/	6-1_Nacrt pozarne varnosti CP	01.07.2024
/D88/	6-2_Nacrt pozarne varnosti PP	01.07.2024
/D89/	6-3_Nacrt pozarne varnosti PENP	01.07.2024
/D90/	6-4_Nacrt pozarne varnosti avle	01.07.2024
/D91/	8-1_Geodetski nacrt	01.07.2024
/D92/	8-2_Geodezija postajnega poslopja	01.07.2024
/D93/	11-1_Tehnologija prometa	01.07.2024
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/D108/	11-16_Elaborat emisij delcev	01.07.2024
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/D110/	11-18_Elaborat oblikovanja PHZ	01.07.2024
/D111/	11-19_Nacrt rusitev objektov	01.07.2024
/D112/	11-20_Varnostni nacrt	01.07.2024
/D113/	11-21_Elaborat izvedbe del	01.07.2024
/D114/	11-22_Hidrogeolosko porocilo	01.07.2024
/D115/	TÜV Rail_IKK Notiz_Jensenice_2024	17.07.2024
/D116/	1_Potrditev IZP	07.08.2024
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/D121/	6_Zahteve glede kretnic, tirnic	07.08.2024
/D122/	2024_08_22-Zapisnik 2. Koordinacije_Protokoll der 2. Besprechung_DE	26.08.2024

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