

Optimisation of the Stříbro – Planá near Mariánské Lázně Line NON-TECHNICAL SUMMARY

The “Optimisation of the Stříbro – Planá near Mariánské Lázně Line” construction is part of the modernisation of the 3rd Transit Railway Corridor of Cheb - Plzeň - Praha - Česká Třebová - Ostrava - Mosty near Jablunkov, to the execution of which the Czech Republic committed as part of international treaties. The goal of this optimisation, i.e. this construction, is to achieve higher speed parameters of the railway line to reduce the journey times of trains and also to modernize the existing railway structures and equipment in such a way that they comply with the currently required technical parameters and also to improve the rail traffic safety. The key benefit is to achieve clearance of rail vehicles of the D4 UIC line standard, UIC – GC loading gauge, modernisation of the current interlocking equipment, securing of the required. In the Planá near Mariánské Lázně - Cheb railway line section an increase in the maximum line speed to up to 140 km/h for vehicles with tilting technology and 110 km/h for conventional trains will take place.

The start of the construction is at km 381.547668 and the end of the construction is at km 413.578410, i.e. approximately 32 km. As part of this construction, a total of six railway stations (Stříbro, Milíkov, Svojšín, Ošelín, Pavlovice and Planá near Mariánské Lázně) will undergo reconstruction. The existing railway line is electrified with of 25 kV, 50 Hz AC traction and is single-track in its entire length. There is traffic in both directions on the line.

The purpose of the construction is putting the railway line and related structures and equipment into a technical condition which complies with European parameters and standards. These parameters are based on the international AGC and AGTC agreements, which the Czech Republic accepted.

As regards international passenger and freight services, the Prague – Pilsen – Cheb – Federal Republic of Germany state border track section represents an important connection with the Federal Republic of Germany and other countries in western and south-western Europe. In inland long-distance passenger service, the track provides connection with major centres of settlement in the Central Bohemian and Western Bohemian regions. In passenger service, this track fulfils an important function by connecting the capital Prague.

The subject of documentation under Act No. 100/2001 Coll., on Environmental Impact Assessment, is the reconstruction of the railway line for trains with electric traction.

In compliance with the classification of the plan under Act No. 100/2001 Coll., for purposes of the assessment the plan is characterised by basic information in the following scope:

- Technological changes – safety equipment (autoblock)
- Communication equipment (optical cables, information equipment at selected stations, as well as the public announcement system, if applicable)
- Electric traction – new lines, contact supply line, protection against errant current
- Reconstruction of the rail track substructure and superstructure
- The construction includes the reconstruction of bridge structures and culverts
- Ground constructions, modification of the public perimeter of the station, depending on the overall modernisation at selected stations, station underpasses for passengers, luggage tunnels
- The length of the treated railway line is 39.838 km

The construction will include the following activities, technologies, equipment and structures:

- Reconstruction of the line section with the goal of achieving line speed of up to 140 km/h
- Achieving spatial clearance for a UIC GC loading gauge and D4 UIC load category
- Technological changes – safety equipment (autoblock), line and station safety equipment
- Communication equipment (optical cables, information equipment at selected stations, as well as the public announcement system, if applicable, automatic telephone switch board, electronic fire alarm, electronic safety systems)

- Dispatcher control equipment (DCE)
- Electric traction – new lines, contact supply line, protection against errant current
- High voltage equipment – disconnecting station, mobile converter station, distribution stations, external grounding, distributor, transformer station, public lighting, modification of distributions and connections
- Grounding of conductive structures
- Reconstruction of the rail track substructure and superstructure
- Reconstruction of bridge structures and culverts
- Station platforms, roofs, underpasses for passengers
- Roads and reinforced surfaces, modification of roadways and railway crossings, landscaping
- Station platforms, roofs
- Ground structures – modifications of station buildings, technological buildings
- Fencing
- Map and direction system
- Demolition
- Anti-noise measures – anti-noise barriers, individual anti-noise measures at structures
- Piping – rainwater drainage, wastewater drainage, water main connections, sewage and gas lines
- Bridges and engineering structures – railway bridges, signal bridges, footbridges, breast walls and retaining walls

The construction site equipment areas are located according to the presumed requirements of the decisive building structures (rails, bridges and culverts). The draft was made with consideration for the configuration of the terrain, presumed needs of the supplier, ownership relations to surrounding land and their use. The construction site equipment areas are located primarily so that they are accessible from existing roads or the railway body and are at the same time as close as possible to the structure under construction.

The central construction site equipment areas are proposed at individual railway stations. Here existing reinforced surfaces within the perimeter of the station are used to a decisive extent. Other construction site equipment areas are proposed by individual bridges and culverts.

The recycling station of reclaimed material is proposed at the Svojšíň railway station in areas by the station. The placement of the recycling station is proposed with consideration for the stage of the construction.

Demolition is proposed for those structures which are in the way of the new track layout, structures, which are already obsolete due to their technical condition, structures, which do not have a technical reason – functional purpose - structures which are in a bad condition, and structures which are not suitable to new technology.

LAND USE DECISION

The construction is situated on the territory of Pilsen Region. This concerns the cadastral territories of Bor u Tachova, Brod nad Tichou, Damnov, Holostřevy, Holyně near Stříbro, Kladruby near Stříbro, Kočov, Lažany near Černošín, Lom near Stříbro, Lom u Tachova, Milíkov near Stříbro, Nynkov, Ošelín, Pavlovice nad Mží, Planá near Mariánské Lázně, Řebří, Skřivín, Stříbro, Svojšíň, Tachov, Ústí nad Mží, Vítkov u Tachova, Vížka, Vrbice near Stříbro, Vysoké Sedliště, Záhoří near Černošín.

The documentation for the land use decision was prepared in 09/2004. The land use decision for the construction was issued by the Stříbro Municipal Authority, Department of building, land using planning and regional development – Building office division – on 25 May 2006 under file number 517/OVÚP/06/208.

BUILDING PERMIT

The next stage is a building permit that is issued based on approved design documentation; this documentation was worked out in 06/2007. It clearly specifies both the technical solution and

compliance with the environmental protection requirements (monitoring, protective measures, etc.). The building permit was issued by the Rail Authority in Pilsen on 20.12.2007.

SCOPE AND SUBJECT OF CONSTRUCTION

The optimisation of the rail line is a set of measures which enable reaching the D4 UIC line standard at speeds of up to 120 km/hour, introducing spatial clearance for the UIC GC loading gauge and modifications necessary for the highest line speed, including the option of using tilting technology rail cars. In other words, the construction includes operations from reconstructions of a small extent to reconstructions of whole structures or construction of new structures and process equipment. The goal of the prepared construction is the improvement of the parameters of the rail line, modernisation of the structures and equipment parts and increase in the speed and reliability of railway operation.

The "Optimisation of the Stříbro – Planá near Mariánské Lázně Line" construction treats the modifications of the existing railway line, and for this reason it is situated mainly on railway land of the Railway Infrastructure Administration, s.o. (state organisation) and Czech Railways a.s. (joint-stock company). The start of construction is at km 381.547668 before the railway station of Stříbro from the direction of Pilsen, and the end of the construction is at km 413.578410 (new station) after the railway station of Planá near Mariánské Lázně.

Construction Concept

CURRENT CONDITION

The existing railway line is a single-track line along the entire section. It is electrified using AC 25 kV, 50 Hz traction. Currently, the line is operated at speeds of 70 – 90 km/h with local restrictions to 60 km/h on the Pilsen gridiron at the railway stations of Svojšín and Planá near Mariánské Lázně.

DESIGNED STATE

The optimisation involves all professions connected to the rail line. In connection with the set of operations related to the reconstruction of the track alone, the parameters of other equipment with which railway traffic customers come into contact will also be improved. The scope, content and technical design of the construction is based on the previous documentation level for which the zoning and planning decision was issued.

The most important part of the project consists in the reconstruction of the railway superstructure, substructure, landscaping structures, traction conduits, communication and safety equipment and high voltage system. An important part of the construction includes building structures eliminating adverse effects of noise from the railway traffic on the surrounding area.

Construction capacity data

Capacity data	Project 2005
<u>Line speed</u> for classic assemblies for cars with car tilting technology	80 – 110 km/h 100 – 140 km/h
<u>Track building</u> New UIC 60 with base plate free fastening Used UIC 60 with base plate free fastening New S 49 with rigid fastening Used S 49 with rigid fastening	31,108 m 2,996 m 1,812 m 4,438 m
<u>Rail switches building</u> UIC 60 new on concrete sleepers S 49 new	22 units 20 units
<u>Modification of level railway crossings</u> Reconstruction / elimination	7 / 1 units

Capacity data	Project 2005
<u>Improvement of rail substructure</u> - total	32 km
<u>Station platforms – island type</u> Stříbro Svojšín Planá near Mariánské Lázně	1 x 300 m 1 x 140 m 1 x 300 m
<u>Station platform – exterior</u> Stříbro Milíkov Svojšín Ošelín Pavlovice Brod nad Tichou Planá near Mariánské Lázně	1 x 175 m 2 x 140 m 1 x 50 m 2 x 140 m 2 x 140 m 2 x 140 m 1 x 80 m
<u>Railway bridges, culverts and underpasses</u> Railway bridges - reconstruction Railway bridges - new Rebuilding of the railway bridge on a road underpass - new Road bridge - new Pedestrian bridge - demolition Pedestrian bridge - reconstruction Signal bridges Brest walls Retaining walls	44 units 1 unit 1 units 4 units 2 units 2 units 1 units 2 units 2 units 2 units 6 units
<u>Noise reducing measures</u> Anti-noise barriers	4,419 m
<u>Tunnels</u> Reconstruction	3 units
<u>Station safety equipment</u> Electronic signal box	7
<u>Railway line safety equipment</u> Electronic autoblock Automatic gate	in the entire length of the main line 2 connected lines
<u>Crossing safety equipment</u> Electronic Mechanical Svojšín – Bor line	4 2 2
<u>Construction of traction conduit</u> total assembly length	47 km
<u>Saving of labour</u>	23 employees
<u>Construction extent</u> New stationing Section length	381.547668 – 413.578410 32 km
<u>High voltage equipment</u> Reconstruction of a traction transformer and a converter station	1 facility

Description of the area of interest

The construction is located in the cadastral territories of Stříbro, Kladruby near Stříbro, Vrbice near Stříbro, Milíkov near Stříbro, Holině near Svojsín, Svojsín, Nynkov, Řebří, Damnov, Záhoří near Černošín, Vížka, Pavlovice nad Mží, Vysoké Sedliště, Ústí nad Mží, Kočov, Brod nad Tichou, Planá near Mariánské Lázně.

The construction is located to a large extent on the existing railway body. In some cases modifications of existing drainage equipment will also reach beyond the railway body.

GEOMORPHOLOGY

From the perspective of geomorphological classification the area of interest is located in two orographic systems. The path passes through the uplands of the Berounka River from Stříbro to Ústí, through the subsystem of Pilsen uplands and along the border of Stříbro and Holštýn upland systems. From Ústí to Planá the path turns towards the Bohemian Forest (Český les), which is a part of the orographic system of the South Bohemian Highlands. The above-mentioned line section passes here through the Tachov Basin.

The morphology of the wider surrounding terrain is relatively distinct. The sea level of the line varies from approximately 392 to 490 m above sea level and in general it has an ascending trend in the stationing direction.

PRE-QUATERNARY SUBSTRATUM

Pre-quaternary substratum is composed of the Proterozoic, Paleozoic and Tertiary eras. The area of interest, mostly towards the end of its path, is located along a significant geological boundary between the Tepelsko-Barrandian area, Bory granite massif and the basic complex of Mariánské Lázně. These geological formations are adjacent to each other along the Mariánské Lázně fault line running in the north-northwest – south-southeast direction, which is locally covered by younger tertiary sediments.

The Proterozoic minerals have the largest surface representation and are represented by the Blovice stratum complex of the Kralupy-Zbraslav (Barrandien) group. Phyllitic slate alternates here with phyllitic schists; the slate, however, is more dominant. They are grey to brown-grey minerals, in fissures limonitised, solid, with fine mica flakes, rich in quartz veins and intensely folded. These minerals dominate the area of interest and occur between Stříbro and Josefova Huť near Pavlovice. In the vicinity of Josefova Huť, also mica schist and schist gneiss of the Tepelsko crystallinum, reach into the path.

Porphyric minerals are mostly of the Paleozoic age and belong to several massifs of various age. Biotic granodiorite to quartz diorite of the Lestkov massif is comprised of lightly pink porphyric minerals and occurs roughly from the Pavlovice tunnel to Ústí. In the vicinity of Ústí, biotic quartz diorite and gabbro reach into the path and from Ústí to Planá muscovite and biotic porphyric granite of the Bory massif are represented.

Tertiary sediments are represented strictly by clastic colourful sediments of varying lithological composition. They are mostly various types of sand and gravel, in places also clay with frequent lithological transitions. Their occurrence is irregular and is comprised of mutually separated island of denudatory remains found in the areas from Brod nad Tichou and Planá.

TECTONICS AND SEISMIC ACTIVITY

The most significant tectonic line of the area of interest is the Mariánské Lázně fault line zone running in the north-northwest – south-southeast direction, approximately parallel to the Ústí – Planá rail line section. Other less significant disturbance zones of parallel and perpendicular tectonics occur nearly along the entire path, for example in the vicinity of Milíkov, between Svojsín and Valečkův Mlýn, near Josefova Huť and Ústí. Tectonic break-up of the mineral massif is for the most part not very significant for the evaluated part of the rail line. The tectonic effect on the construction is nearly negligible, only locally some degradation of foundation conditions and possibly greater hydration can occur.

As described in Czechoslovak State Norm CSN 73 0036, the area of interest does not belong to a seismic area and therefore it is not necessary to take into consideration the possible effects of earthquakes.

QUATERNARY COVER

Quaternary cover is determined by the path of the rail line. Most prevalent are diluvial and diluvial-fluvial sediments, less prevalent are fluvial sediments and landfill. The most widespread quaternary cover are diluvial slopes and diluvial-fluvial sediments, mostly clay-sand to clay-gravel sediments, which can locally transition into fragment-free clay.

The occurrence of fluvial sediments is in the area of interest tied to the local stream and river system – mostly the Mže and Hamerský Creek valleys. They are clay to clay-stone deposits filling a relatively closed valley flood planes of the local streams.

Considering the varying morphological configuration of the area of interest, man-made landfill comprises only negligible soil type. In greater thickness it occurs mostly in areas of railway stations and rail line embankments (or other roadways) and also in areas where reinforcement foundations were covered and also in developed areas. The existing landfill has varying composition, in the embankments, down to the drilling probe depth, mostly landfill consisting of local mineral material or possibly of tailings and slag.

GROUND WATER

In the quaternary sediments the porous collector is developed in permeable layers of diluvial and fluvial sediments. The collector in the sloped areas is dependent on the amount of atmospheric precipitation. The collectors in the fluvial sediments are in a hydraulic connection with the water level in the local streams. However, the permeability fluctuates in connection with the facial changes in the granularity of the minerals.

CLIMATE

According to Quitt's description of the Pilsen bioregion, the central part of the basin is located in the warmest moderately warm MT 11 (Stříbro 7.4°C) climatic region, higher uplands and highlands that are naturally colder and in the south belong into the MT 10 (Klatovy 7.6°C) climatic region, in the north into the colder MT 7, MT 5 regions and the highest parts, around 600 above sea level into the MT 3 climatic region. Average temperatures here drop below 6.5°C.

According to Quitt, the northern part of the Tachov bioregion, which also includes the vicinity of Planá near Mariánské Lázně, is in the temperately warm MT 4 region.

The bioregion is located in the precipitation shadow – Stříbro 525 mm. In the valleys there are dispositions for the occurrence of inversions and exposition climate.

BIOTA

The bioregion is located in a mesophytic area, the vegetation levels, according to Skalický, are low-upland to sub-montaigne. Potential vegetation in higher elevation is comprised of acidophilus Luzula-Fagetum ash growths and on the acidophilus carbon sediments in the lower elevations there are significant acidophilus Genisto Germanicae – Quercion oak growths. Around the streams there are mostly associations of Stellario-Alnetum Glutinosae growths. Substitute vegetation is comprised of Calthion meadows and more rarely also Molinion, which then transition to peat moss Caricion Fuscae meadows. The flora is fairly varied, fauna of the Hercynian cultivated country type with a mosaic of fields, forests and meadows is rather poor. Most rivers belong to the grayling zone.

Environmental Impact During Construction

INPUT DATA

SOIL

Taking of land for the construction purposes will be conducted mostly from areas owned by Czech Railways and other land in the vicinity of the existing rail line and also from some forest land located

in the path of the rail line. Permanent takings of land which is not in the ownership of Czech Railways are mostly the result of the necessity of modification of the track substructure, more specifically drainage work. The construction will result in permanent taking of 0.3920 ha from the Agricultural Land Fund; there will be no temporary long-term land taking from the Agricultural Land Fund.

Arable land in the area of interest is mostly represented by brown to brown acidic soil. From the cultivation standpoint, approximately ½ of the acquisition is comprised of arable soil, approximately ½ of permanent grass land and a negligible part of gardens. The square footage of individual land acquisitions is quite small and consists of narrow strips of land along the existing rail line.

On all the land acquisitioned from the Agricultural Land Fund, removal of the cultivated horizon to the extent determined by the previous pedological exploration will be conducted. Arable soil removed from the Agricultural Land Fund areas affected by the permanent acquisition will be spread on the remaining parts of the lots out of the permanent acquisition areas. During the removal and handling of arable soil all conditions required by the relevant state administration bodies must be adhered to. The removed soil can also be used for some parts of the recultivated areas of the construction, namely the construction yards.

In the cadastre territory Kladruby near Stříbro and Pavlovice nad Mží, along the proposed optimised rail line, a total of 0.0418 ha of forest land will be permanently taken. Also 0.3475 ha of temporary takings of forest land (for the purposes of construction yards and access roads) have been recorded. The taking of forest land (PUPFL) reaches almost 0.4 ha (forest growths are mostly comprised of spruce, clearings and pine and only limited amount of mixed growth or oak).

PROTECTIVE ZONES

In the “Optimisation of the Stříbro – Planá near Mariánské Lázně Line” two water source protective zones – Milíkov and Svojšíň are located. Only the Milíkov water source protective zone is in direct contact with the rail line. In the construction yards located in the water source protective zones all construction machinery will be equipped with an ample quantity of absorption agent for the event of an oil spill. In cases when leakage of oil products or other hazardous substances occurs, the contaminated soil must be immediately removed and transported and stored at a site dedicated for this purpose. No handling of oil products or their storage is allowed in the water source protective zones. In the water source protective zones no machinery or equipment can be repaired and no vehicles can be parked. For parking and repairs of this equipment during construction work areas located outside of water source protective zones must be provided.

WATER

During construction work it will be necessary to provide drinking water for work crews; the construction yards will serve this purpose and approximately six litres of water per person and day will be delivered. After the end of construction work the operation will require no further delivery of drinking water. Individual stations are already being equipped with their own station drinking water connections, new stations or stops will be handled as needed and water for the use during operation will have to be brought into the newly built and reconstructed buildings on the line.

Water supply for construction sites and construction yards will be provided from existing public water supply network mains and hydrants.

To sites without existing water supply networks packaged water will be delivered as needed.

PROCESS WATER

The need for process water during the construction is related to the following activities in particular:

- Manufacture of concrete and other mixtures
- Treatment of concrete when it is stiffening and hardening
- Sprinkling of pavement and modification of the superstructure
- On high-dust days, sprinkling of paths by municipalities and the construction site as well
- Sprinkling of piles during transport of excavation materials
- Sprinkling of access routes and material storage yards

- Cleaning of equipment etc.

ELECTRICAL ENERGY:

Due to the fact that the line in the assessed section Stříbro - Planá near Mariánské Lázně is electrified, during operation it will have relatively significant demands on electrical energy consumption.

Electrical energy will be necessary for the following purposes in particular:

- Connection of the contact line
- Connection of the interlocking system
- Operation of the communication equipment
- Operation of technological equipment at stops and stations
- Electrical heating of switches
- Operation of station buildings at stops and stations (heating, light, distribution of electrical energy for other uses etc.)
- Etc.

BUILDING MATERIALS

Input Raw Materials

During the implementation of the construction, demands will arise for input raw materials, this involves primarily the one-off purchase of the following types of materials:

- Soil suitable for embankments
- Rocks and sand-gravel
- Cement and various additives for concretes
- Material for covering pavements
- Gravel and recycled gravel for the railway body
- Steel (reinforcement, safety fences, posts)
- Steel structures
- Prefabricates (drainage)
- Panels for access roads
- Material for anti-noise barriers

Fuels for automobiles and the operation of emergency power generators will be procured by construction suppliers from their regular distribution network for wholesale prices. During transport operation fuels will be procured from the transporters' resources.

DEMANDS ON TRANSPORT AND OTHER INFRASTRUCTURE

The Stříbro – Planá near Mariánské Lázně line section is located in a hard and inaccessible terrain. The line is conducted on high embankments and cliff cuttings. The Svojšíň – Ošelín – Pavlovice – Brod nad Tichou line section is located in a terrain which is practically without access routes. Therefore it is presumed that rail transport will be decisive for the distribution of materials to all bridge and engineering structures in this section. It is necessary to make sure that after removal of the track superstructure and during the reconstruction of structures access to certain bridges will be barred. During the reconstruction of railway stations and line sections, towards which access roads lead, most of the materials will be transported by automobile.

The main transport routes will be conducted along the existing I-st, II-nd and III-rd class roads and local roads. The access routes to the construction site from the main transport routes are designed on the basis of the requirements of the technical solution of individual building structures and on the basis of the local investigation of the documentation design authority. This involves the use of existing paved and unpaved field and forest roads. These roads will be returned to their original (drivable) condition after the completion of the construction.

INFORMATION ON OUTPUTS

AIR

Due to the fact that the assessed track section Stříbro - Planá near Mar. Lázně is electrified, it is not a source of emissions of pollutants during traffic.

The air quality along the railway line may only be affected by emissions of pollutants from operations during the track reconstruction which will include, among other things, reconstruction of the track superstructure and substructure, repairs of bridges, construction work on buildings, railway stations and crossings, new anti-noise barriers, relaying of cable routes, etc. During these operations, mainly building machinery with diesel engines will be used. At the same time, a certain amount of waste will be produced (excavated soil, gravel from the track, building and demolition waste, railway sleepers, iron scrap, trees and bushes from clearance, etc.) and it must be removed and, conversely, a lot of materials must be brought in. This transport will be provided, to a large extent, by the railway company alone and, to a smaller extent, it will be provided by trucks of the companies performing the reconstruction. A source of air pollution during the track reconstruction will be, apart from the recycling line, building machinery and trucks. Their diesel engines will emit, in particular, NO_x, CO and dust – particles with PM10.

A source of air pollution, particularly with dust particles, will be the operation of the recycling line of aggregate from railway bed, which will be located at the Svojšíň railway station. In accordance with the Act No. 86/2002 Coll., on air protection, and its implementing regulations, machines for the processing of aggregates are classified as medium sources of air pollution. For the above-mentioned machines, it is necessary to reduce or eliminate all places and operations where solid pollutants are emitted to the air directly at the source. Or, with consideration for technical possibilities, the source of pollution should be equipped with a water curtain, spraying, dust-collecting or misting equipment (the implementation of measures must be approved and regularly evaluated by inspection). At the border of the land where the ballast bed will be recycled by a machine for the processing of aggregates the dustfall deposition limit according to Government Decree No. 350/2002 Coll. must not be exceeded. However, the recycling line is located outside the residential area of the village and will tend to be started up only on occasion for the processing of material. Due to the above stated, the recycling line operation will only have a small or very limited impact on the residential area or the natural environment, because air pollution drops with the quadrate of distance from its source, i.e. the nearest settlements, spa or natural features of landscape will be affected from a large distance and in a limited manner.

The yards of dusty building materials at the construction site installations will be limited sources of air pollution by dust.

WASTEWATER

As part of the construction drainage of certain sections (primarily at the railway stations and stops) is proposed by a system of lengthwise pipe catch-drains. The majority of the drainage equipment is comprised of a system of lengthwise catch-drains between the rails or conducted outside of the rails by drainage piping into the sewer, the terrain or soaking equipment.

Drainage will be rebuilt in places:

- Where the modification of the track substructure creates new terrain ratios, here it will be necessary to renew the original drainage
- Where the modification of the railway body into its normalised form disrupts the existing drainage.

In the line, drainage by open gutters, drainage channel walls, catch drains and soaking screens is combined. Catch drains are used at crossings and in places where the use of an open gutter would cause increased costs due to the making of a cut. Soaking troughs are used in places with unfavourable terrain and slope.

SEWAGE WATER

Production of sewage water can be expected in connection with the operation of sanitary installations of construction sites during the construction of roads and installations of construction site. The current stage of construction preparation does not specify its amount (the numbers of workers or their dwelling at construction sites are not known), nor the manner of disposal of this water (mobile chemical toilets and sanitary installations will be used in the places where building workers will change clothes – in station buildings on the line). The manner of disposal of this water must be designed in the next project documentation level in such a way that neither surface nor ground waters are contaminated.

Sewers and septic tanks (sumps) for toilets and sanitary installations will be built at those construction site installations where the sanitary base of the construction site will be located. In the areas of railway stations, the sanitary facilities of Czech Railways will be used. The construction and connection of site sanitary installations are part of the contractor's preparations. It is possible to connect to the current sewerage system in the current gully holes.

Chemical and mobile toilets will be used in places where it is not possible to connect to the current sewerage system and the building of septic tanks is unacceptable from the ecological or economical point of view.

PROCESS WASTE WATER

At the stage of implementation, the construction will only produce a minimum amount of process waste water, e.g. from spraying concrete, cleaning machine equipment, dust-removal at some operations. Neither the quantity nor the quality of this waste water can be specified now (the contractor has not been chosen) and the problems will be solved sufficiently in the next project documentation of construction.

In the operation stage, the construction will not produce any process waste water, unless we include spring washing and cleaning of the spaces of the railway station and stops and a possible winter application of de-icer during impaired weather conditions at railway stations, etc. Neither can be sufficiently estimated as the consumption of process water will only be known during operation.

WASTE

During construction work, a certain amount of waste of various types will be produced – both “other” and “hazardous” waste. The construction employer’s obligation is to provide all waste disposal in accordance with the relevant legislative regulations. These laws must be followed during waste disposal, i.e. the manner of its storage, transport, depositing and possible removal must be solved.

The construction projects includes a summary of the expected amount of materials gained by construction work. Their possible utilization within the construction or their further use in accordance with the applicable legislation is specified. Also, the options for the disposal of possible waste are proposed and there is an orientation list of companies engaged in waste disposal in the given region.

The character of construction shows that prevailing types of waste will be materials excavated during modification of the track superstructure and substructure. The level of its contamination was determined within the geo-technical survey. Taking the sources of contamination into consideration, the key excavated materials were divided into ballast bed, soil from sleeper subsoil under rails with a certain degree of contamination and soil without contamination, excavated outside the ground plain under the rails. Any excess soil removed will be taken to designated waste management lots. The ballast bed will be recycled according to the construction procedure at the recycling station in Svojsín. It is presumed that the ballast bed material will be transported to the recycling station by rail; the site is also accessible by road transport. Based on experience at other construction sites it is estimated that after recycling, approximately 80% of excavated volumes of ballast bed can be utilized as building materials.

Disassembled technical equipment for which there will be no utilization in railway traffic or for which there will be no possibility of or interest in retaining, will be scrapped.

In the project, the amount of potential waste is recorded overall for the entire construction by individual operating sets (PS) and building structures (SO) and the manner of its utilization or disposal is proposed. This includes, in particular, excavated soil, track superstructure ballast bed, waste after the recycling of track superstructure ballast, building and stone rubbish from demolitions, demolished concrete, disassembled metal structures, felled trees and cleared bushes from the construction site, remains of wooden structures, and others.

During the construction there will be a significant excess of excavated material. The smaller part of the excavated material will be used for embankments and fills. Recycling of construction waste is recommended to the maximum extent. New usable material falling under the ambit of Czech Railways categories according to the “Guidelines for managing material acquired from RIA property managed by Czech Railways” is not the subject of the waste management solution. This involves, for instance, rails, sleepers, switch parts and small rail fasteners. This material is not waste, as it will be reused in railway operation.

Technology for removal of the ballast bed with subsequent recycling is proposed, which will take place at the recycling station. It is proposed that the recycling station will be at the Svojšíň railway station. Here gravel will be classified for further use for the rail bed, for clean-up layers, embankments etc. As part of the construction project, research of contamination of the sleeper subsoil was carried out. During chemical analyses, the detected concentrations of analysed substances from samples taken at the track reconstruction place were compared to the limit concentrations of organic harmful substances in solid matter according to Decree of the Ministry of the Environment of the Czech Republic No. 383/2001 Coll., on waste disposal details, and to the limit values of extraction rate classes according to Annex 6 to the above-mentioned decree.

NOISE, VIBRATIONS

A noise study was prepared as part of the project for the construction. The noise study is concerned with an overview assessment of the future acoustic situation in the area adjacent to the line after the completion of the modernisation (i.e. operation on the new rail superstructure) and presents the possibilities for the solution of reducing the noise load on the neighbouring residential development and the spaces for use for living, recreation or sports according to the land use planning documentation. The study also includes a measurement of noise and vibrations from the existing railway transport by the closest residential development.

As part of optimisation of the railway line section, building mechanisms will be used which will be a source of noise.

- Which will move gradually along the line superstructure for the entire section of the line
- Which will be operated locally for a limited time in places where the reconstruction of separate structures is taking place
- Which will be operated for a lone time in designated spaces.

Table – Construction Activities Considered during Line Optimisation

Construction activity for DAY	Construction activity for NIGHT
<ul style="list-style-type: none"> ▪ Removal of the existing grid (sleepers and rails) ▪ Removal of the ballast bed ▪ Modification of the grade ▪ Reconstruction of bridge structures and culverts ▪ Laying and compacting of the new ballast bed ▪ Laying of the grid with rails 	<ul style="list-style-type: none"> ▪ Manual excavation work ▪ Installation of temporary interlocking systems ▪ Lime – cement stabilisation of the substructure ▪ Manual repairs of support walls ▪ Small-scale work - quiet (coatings) ▪ Laying cables

<ul style="list-style-type: none"> ▪ Tamping ▪ Grinding rails ▪ Excavation work (cables, walls, anti-noise barriers) 	<ul style="list-style-type: none"> ▪ Exchange or repair of trolley line ▪ Installation of new networks ▪ Installation of signalling and interlocking equipment ▪ Assembly of anti-noise barriers
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Noise load can also be expected from the transport of materials on access roads and from transport on by-pass routes. It is therefore necessary – according to the possibilities of the contractor – to relocate as much transport as possible to non-residential areas and to the railway line axis. The number of traffic routes must be reduced as much as possible by good organization of construction work. Construction sites where the permanent occurrence of noisy operations is possible, such as concrete plants, recycling stations, etc., are not designed near the residential area. Construction sites established in municipalities will minimise their noise levels by the designed measures (the construction manager is responsible). Where this is not possible, it is necessary to take suitable measures to reduce noise from construction work.

Also where temporarily exceeding the external noise level can be expected, the noise limits for internal space will be, in most probability, kept (the considered sound insulation of common windows is 25 dB, which is sufficient for keeping the daytime internal limit 40 dB even at the external noise of 65 dB. However, such situation will only occur sporadically. We also consider essential the psychological moment, when individual operations will be consulted with the local people in advance and all measures for eliminating the noise load will be communicated.

For the time of operation of the optimised Stříbro - Planá near Mariánské Lázně line a noise study was prepared as part of the project documentation. The noise study is concerned with an assessment of the future acoustic situation in the area adjacent to the line after the completion of the optimisation and presents possibilities for the solution of reducing the noise load on the neighbouring residential development. The study also includes a measurement of noise and vibrations from the existing railway transport and provides notice about noise from construction activity.

To determine the actual current noise load of the outdoor space in the neighbouring residential development, noise measurement was performed at selected points, the scope of which was discussed and agreed by representatives of the Pilsen Regional Institute of Hygiene, Tachov workstation.

The measurement was performed to check the noise load on residential buildings around the line for the condition before the line optimisation, i.e. before the increase in frequency of transport and increase in travel speeds of passenger train assemblies. For most of the structures in the railway protective zone in the field of direct impact of sound waves, values above the limit for night, and in most cases for the day as well, were recorded.

Anti-noise barriers were proposed on the basis of the noise study calculations in order to adhere to limit values for noise during operation of the optimised line. The efficacy of the noise reduction measures will be verified by control measuring.

Where anti-noise barriers would not be sufficiently effective or where they would protect only individual buildings, individual anti-noise measures are proposed - for 108 buildings in all.

Measurement of vibrations was carried out for verification of the load by vibrations from the railway before its modernisation, i.e. before the increase in frequency of transport and increase in travel speeds of passenger train assemblies and the concurrent improvement in the track superstructure. At all reference points, values clearly under the limits were found. Given this fact, it is not necessary to install special anti-vibration elements in the line substratum. A slight improvement in the current condition is anticipated by the improvement in the track superstructure.

EARTH WORK

The implementation of the Stříbro - Planá near M.L. line will not mean a significant intervention into the landscape, nor will it require extensive or significant earth work. Neither the route nor the vertical alignment of the line will be changed; in some locations merely a slight change in the directional and slope of the line will take place, to accommodate the parameters required for the necessary travel speed.

The reconstruction and repair of bridges and culverts will respect to the maximum extent possible the existing condition and character of these structures. At the same time any reconstruction or new construction of structures at the railway station will not call for any earth work of a large scale or intervention into the landscape.

ENVIRONMENTAL IMPACTS OF THE LINE OPTIMISATION PLAN

The following impacts may be regarded as direct impacts of the assessed track optimisation plan:

- Impact on air pollution
- Impact on the noise situation
- Impact on the rock environment and morphology of the landscape
- Impact on flora, fauna and the ecosystems on the line route
- Impacts on soil, certain impacts on the population.

Most of the expected impacts (particularly adverse ones) will be relatively low or of little significance and will only have a local character shown in the track location or its near surrounding. Conversely, it can be expected that positive effects on the population and other environmental components will be more significant and will have a favourable influence on the overall ecological load of the affected region.

However, in no case can it be considered that any impacts could occur that would go across the state borders of the Czech Republic. The possibility of an occurrence of across-border impacts on the environments of neighbouring countries can be clearly eliminated.

IMPACTS ON POPULATION

The population in the settlements along the line and its surroundings may be affected in the period of the optimised track traffic and in the period of its reconstruction during construction work. The expected impacts will be both favourable and adverse and it can be presumed that favourable impacts on both the population and environment will prevail. The main types and manner of impacts include, for example:

During operation:

- Impacts of noise from the operation of trains on the optimised track, noise load reduction;
- Impacts on the scenery, appearance and aesthetic values of the surrounding area due to the construction of designed anti-noise barriers or other structures;
- A temporary accentuated exposure of the track bed (including culverts and bridges) in the landscape after cutting down the existing greenery (especially outside forests) along the track;
- Improvement in the culture and comfort of travelling for the public;
- Improved safety during operation on the track;
- Improvement in conditions for people with impaired mobility.
- etc.

During construction work:

- Traffic restrictions during construction work (closings on the line);
- Possible substitute bus transport during closings in individual sections;
- Impairment of conditions for people with impaired mobility;
- Lower comfort of service for passengers;
- Adverse effects related to performing construction work (increased dust formation, noise, increased intensity of road haulage).

Individual adverse effects on the population will be eliminated to the maximum extent by the technical solution of construction and a suitable schedule of construction work (maximum shortening of the time of construction work, reduction of the construction site space, etc.). Possible adverse effects will be relatively small, they will be of an irregular character which is limited in time and it is not possible that they will affect the health condition of the population in the surrounding area.

Compared to the current condition, a significant favourable effect on the population in the surrounding of the track will be a lower noise load from railway operation by adhering to the set health limits, and so no adverse effects of the health condition of population can be expected.

The optimised track will have favourable effects in social and economic areas. Travelling comfort and handling of passengers will be improved, the increased frequency of trains on the line will improve the service for the villages along the line, an increase in the travelling speed will mean shortening the travelling time and time savings for passengers.

The track optimisation will have also an economic benefit, because local companies (building, transport and others) may participate in the construction work as subcontractors or cooperating organizations.

IMPACTS ON AIR AND CLIMATE

During operation the optimised electrified line will not be a source of emissions of pollutants into the air. The operation of the railway line in the assessed section will not impact the quality of the air in the surrounding territory in any way.

The quality of the air in the affected territory may be slightly affected only from sources during the construction of the surroundings. These are both the building mechanisms and means of transportation used, primarily with diesel motors, which produce exhaust gases with numerous pollutants and which are also a source of secondary dust during travel, as well as the recycling line for the recycling of the gravel from the rail bed, which will be located in the space of the Svojšíň railway station and which will primarily be a source of dust.

IMPACTS ON THE NOISE SITUATION

The assessment of the anticipated noise load during the construction period was carried out for the three most noisy, or long-acting, activities involved in carrying out the optimisation of the line:

- Reconstruction of the track superstructure
- Reconstruction and construction of separate structures
- Recycling of the rail bed (construction waste).

The determination of noise emissions from the operating area of building machinery was based on Government Decree No. 9/2002 Coll., which sets technical requirements for products as regards noise. An analysis of the set of machines used for reconstruction work has shown that demolition work using demolition and pneumatic chippers falls into the category of the noisiest operations. When they are used, it can be expected that the limit value equivalent to sound pressure level A for the construction period $L_{Aeq} = 60$ dB (in the daytime between 7:00 a.m. and 9:00 p.m.) will only be achieved by noise reduction by distance already at the distance of approximately 50 to 60m from the place of operation. During the subsequent construction work, the loading of the outside space will be lower.-{ }-

For future operation on the optimised railway, noise limits would be exceeded – the highest permissible equivalent levels of acoustic pressure A - in particular through the impact of the increased number of trains, increased speed of trains and due to the fact that these limits are already being exceeded under the current condition.

For that reason, sufficiently effective anti-noise measures - anti-noise walls and individual anti-noise measures on structures - were proposed based on the results of the acoustic study, so that the stipulated noise limits are adhered to during future operation.

In total, 4,419 m of anti-noise barriers have been proposed.

Through the implementation of anti-noise barriers, a significant reduction in the noise load of residential buildings and a significant improvement in the acoustic climate will take place; in most locations limit values in the outdoor space in the protective zone of Czech Railways will be achieved.

For the closest structures, where even after the building of highly effective anti-noise barriers (reduction by 10 – 11 dB(A)), the limit level of outdoor noise will be exceeded, and where due to other technical means being used to protect the railway line it will not be possible to secure adherence to the limit values in the outdoor space of the protected territory in accordance with Government Order No. 502/2000 Coll., appropriate individual anti-noise measures in compliance with § 12 of the Government Order will be implemented.

For the line optimisation construction, all possibilities for the reduction of the noise load of the outdoor space (and the interior space of protected structures) were used around the railway line so that adherence to the stipulated noise limits under valid legislation was guaranteed and so that after line optimisation the negative impact of operation on the public health was excluded.

IMPACT OF VIBRATIONS

Due to the fact that at the present time the stipulated vibration limits are not being exceeded (as proved by measuring) by the railway operation and that vibrations will be reduced by 5 – 7 dB as a result of the implementation of technical measures during optimisation, it is likely that during the operation of the optimised line, the spreading of vibrations in excess of the limit into the surrounding development will not take place. The assessed plan of the optimisation of the Stříbro - Planá line will not have an impact on its surroundings by vibrations which might have an impact on surrounding residents from the health perspective.

WATER IMPACTS

From the perspective of surface water protection as a whole, the line optimisation construction does not represent a real threat to its quality. Apart from the reconstruction of bridge structures, the construction does not affect surface waters, nor does it handle them in any way. The current discharge conditions will not be changed by the construction. During reconstruction of bridges, no interference with streams or modifications of river beds are anticipated.

The above-mentioned reconstructions and constructions, with the exception of bridge structures and possible culverts, should not interfere with ground water circulation. A permanent change in the flow mode is not anticipated during construction work. The planned reconstructions of culverts should contribute to problem-free drainage of reconstructed structures and the easy discharge of rainwater and should secure the passage of watercourses by the railway embankment. Changes to the river beds are not designed.

The risk of oil leaks from building machines could pose a certain complication for the quality of water. Therefore, increased attention should be paid to the condition of vehicles in the construction sections in the protective zones of water sources and natural therapeutic sources, and daily inspections should be carried out.

During the track reconstruction, an increased risk of threat to the quality of waters and rock environment will not occur if the protective measures are taken. During the reconstruction of contaminated parts, these or excavated materials will not be used for ground work, but polluted soil will be decontaminated or removed from the area of interest for disposal according to valid regulations. This also concerns material from switches contaminated by oil substances.

SOIL IMPACTS

The impact of the line optimisation construction on the Agricultural Land Fund (ALF) will comprise the permanent taking of agricultural land; the construction does not call for temporary long-term takings of ALF. Temporary takings of ALF will be only short-term for the construction site, for a maximum period of 1 year including the time needed for restoring the land to its original condition.

As was already stated, the construction will be carried out primarily on land owned by the Railway Infrastructure Administration (RIA) or Czech Railways. Permanent takings of land not owned by

Czech Railways are primarily called for by the implementation of directional modifications of the line body and shifting of roads.

The entire permanent taking from the Agricultural Land Fund called for by the entire construction equals only 0.3920 ha; the construction does not require any temporary long-term taking. Individual takings are of a very small size and comprise only narrow strips along the existing line. For individual parcels ALF takings for the most part range on the order of tens to a few hundred m²; in certain cases this involves only individual m². Taken areas typically immediately join on Czech Railways land, on which the railway body is located. Spaces for taking are for the most part comprised of the edges of meadows and fields immediately neighbouring on the rail body; they are often neglected and used only marginally for agricultural purposes.

By implementing the line optimisation construction, no agricultural land will become inaccessible and no uncultivable land plots will be created.

Takings of forest land (PUPFL) will also be necessary for the line optimisation construction: This involves a total of 0.0418 hectares of permanent takings of forest land and also 0.3475 hectares of temporary taking of forest land (due to construction site installation and access roads).

After the completion of the construction, the areas for construction site installations during the track construction will be reclaimed and restored to their original condition.

IMPACT ON THE ROCK ENVIRONMENT AND NATURAL RESOURCES

Neither the construction nor the operation of the optimised Stříbro - Planá near Mariánské Lázně line will have significant or recognisable impacts on the rock environment or on natural resources in the area of interest.

The project involves only the reconstruction of the existing line, the vertical alignment of the line will be not changed. For the construction and reconstruction of connected structures, no significant excavation work or laying of foundations to a more extensive depth is expected, which could have an impact on the rock environment.

FLORA, FAUNA AND ECOSYSTEM IMPACTS

The impacts on flora are mainly the cutting and clearing of trees, stripping and landscaping work in places of permanent land taking and the setting up of construction sites for individual constructions. The total scope of felling of greenery is described in the dendrological research, which is part of another level of project documentation for the building permit (accompanying growth along the line are not of great value, and for the most part this involves secondary volunteer trees (black elder, black locust, plum trees, pear trees, blackthorn, briar rose, hawthorn, as well as spruce and pine trees). The applicable city authority gives consent to the felling and clearing of trees and shrubs, as the authority responsible for nature protection, and this authority should also stipulate sufficient compensatory measures composed mainly of substitute plantings after the completion of the construction in selected areas (or other measures), in particular at places of recultivation around removed rails and on suitable railway land.

The value of the growths around the railway line varies greatly and matches the level of maintenance of growth in an abandoned landscape, at present no protected plants were found, the growths match the description of the bioregion. In terms of fauna, in the route of the proposed railway line protected animal species amounting to approximately 4 species were found; indeed these were species, birds and mammals, which appear mainly around the line and visit the line itself when crossing it or looking for food.

As a practical matter, the elimination of these species or their biotopes through the impact of the construction is not threatened and therefore it is possible to compensate for building activity by making preliminary research at the construction site and performing any necessary protective transfers, connected with the selection of a suitable time for the construction (June-July). It is fundamental to carry out construction work in the summer period, when the majority of animals will already be outside of the area and it will be possible to transfer any rare individuals. The best time in particular

for the removal and recultivation of removed sections of the railway line appears to be September – October.

In the territory where the reconstruction of the railway line in Stříbro – Planá near M.L. is proposed, no sites in the European system for the protection of nature and the landscape, Natura 2000, are recorded, neither are any protected territories, only significant landscape elements and ÚSES (Territorial System of Ecological Stability). Thus, no fundamental impacts on natural ecosystems in the construction surroundings are tentatively anticipated.

LANDSCAPE IMPACTS

The optimisation of the line will not impact the appearance of the landscape in any significant way. No change will take place in the direction of the current railway alignment, only the reconstruction of the track substructure and superstructure. During the modification of existing bridges and culverts the utmost attempts were made to preserve their original appearance. The technical solution of individual structures is adapted to this requirement.

IMPACTS ON CULTURAL AND ARCHAEOLOGICAL LANDMARKS:

It is necessary to consider the territory where the railway line optimisation construction is being performed a territory with archaeological findings in the meaning of §22 (2) of Act No. 20/1987 Coll., on state preservation of monuments. The construction is not routed close to any historically protected structure, nor does it pass through a historically protected territory. During construction work archaeological findings may occur and therefore it is necessary to secure archaeological supervision of the construction. The investor has the obligation to meet the requirements which §22 and §23 of Act No. 20/1987 Coll. impose, specifically:

- To notify the Archaeological Institute of the Academy of Sciences of the Czech Republic, the Western Bohemian Museum in Pilsen, as the applicable archaeological workstation, of the plan to perform earthwork from the time of construction preparation
- To announce any archaeological findings
- To enable rescue archaeological research
- Compensation for protective archaeological research is governed by the provisions of §22(2) of the above mentioned act

If the mentioned obligations on the part of the investor and suppliers of the construction are adhered to, the construction will not have an unfavourable impact on archaeological monuments.

No structure entered in the Central List of Cultural Monuments (cultural monument in accordance with Act No. 20/1987 Coll.) will be directly affected by the planned construction, and neither will any territory with comprehensive historical protection (preserve with monuments, monument zone, their protective zone).

MITIGATING MEASURES

The mitigating measures are proposed primarily for the line optimisation construction period, since the construction activity and the activities connected with it (construction transport, recycling of materials, waste removal etc.) will have significantly larger and more significant negative impacts on the lives of the population, or on the public health, than the following period of traffic on the optimised line. Measures for the prevention and exclusion of negative impacts and for the best possible course of the construction without conflict with the environment are specified for the construction preparation period, the construction implementation period and the operating period on the optimised line and are focused in particular on the components of the environment, for which negative impacts can be presumed.

PROPOSAL OF MEASURES:

- During construction work, the movement of machinery and heavy-duty equipment near residential areas will be minimized, noisy stationary equipment will be shielded by mobile anti-noise barriers;

- The contractor shall ensure that noise limits will be kept during construction work in accordance with Government Decree No. 502/2000 Coll.,
- The roads used will be cleaned regularly;
- Vehicles will be cleaned regularly before accessing the road;
- Loose and powder materials will be loaded and secured on trucks in such a way that they do not fall onto the road;
- Catch containers (of sheet metal, with a pad of suitable absorbent) against leaks will be installed under standing building machines;
- Refuelling in the construction site installation area is inadmissible;
- A mobile oil emergency kit, with a capacity of at least 90l containing a sorbent mat, barriers, pillows, emergency sealant, a warning tape and protective gloves will be available on the railway construction site;
- No fuels may be stored on the construction site installation surfaces;
- No loose or floating materials may be stored on the construction site installation areas near watercourses;
- Chemical toilets for the respective number of workers will be installed at the construction site;
- Felled trees will be removed by chipping, or composting; burning is not allowed;
- Enable rescue archaeological research in accordance with § 22 of Act No. 20/1987 Coll. during the performance of earthmoving and excavation work. Archaeological surveys according to §22 of Act No. 20/1987 Coll. are to be paid for by the investor and a contract regarding these must be concluded in advance;
- Announcement of any chance archaeological findings during the construction to the Archaeological Institute of the Academy of Sciences of the Czech Republic;
- Existing trees shall be protected in accordance with Czechoslovak State Norm CSN DIN 18 920 – Landscape gardening and landscape architecture – Protection of trees, stands and areas for vegetation during construction activities
- Felling of greenery outside of forests shall be carried out outside of the growing season (October – March)
- After the completion of construction, the terrain shall be landscaped in grassy areas in accordance with Czechoslovak State Norm CSN DIN 18 917 – Landscape gardening and landscape architecture – Starting lawns
- The selected contractor, who will recycle the gravel from the rail bed, shall submit to the investor the statements and permits from the appropriate air protection authority, which are required on the basis of § 17(2)(b) and (c) of Act No. 86/2002 Coll., on air protection

CONCLUSION

During the assessment of the impacts of the “Optimisation of the Stříbro - Planá near M.L. Line” project, no significant adverse environmental impacts were found. The project will not adversely affect, in a significant way, the current overall ecological load of the given region and, conversely, it will reduce the current load in some aspects. The project can therefore be considered acceptable in the given locality and its realization can be recommended if the measures and conditions for the protection of individual components of the environment and population are observed.