JP CESTE FEDERACIJE BIH

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN FOR THE PROJECT OF THE RECONSTRUCTION OF CROSSROAD VITKOVIĆI, PAVEMENT AND AXIS CORRECTIONS ON MAJOR ROAD M-20

March, 2018

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LIST OF ABBREVIATIONS

BH - Bosnia and Herzegovina
CFD - Central Feedback Desk
CSOP - Construction Site Organization Plan
EIB - European Investment Bank
EIA - Environmental Impact Assessment
EMP - Environmental Monitoring Program
ESMF - Environmental Social Management Framework
ESMP - Environmental and Social Management Plan
EP - Environmental Permit
FBH - Federation of Bosnia and Herzegovina
FMoET - Federal Ministry of Environment and Tourism
IFI - International Financial Institutions
MP - Main project
MPCA -Management Plan in Case of Accidents

OP - Operational Policy of the World Bank

PAP - Project Affected Person

PPE - Personal Protective Equipment

PC Roads FBH - Public Company Roads of the Federation of Bosnia and Herzegovina

RAP - Resettlement Action Plan

RPF - Resettlement Policy Framework

TD - Tendering Documentation

TMP - Traffic Management Plan

WB - World Bank

WMP - Waste Management Plan

AEHS - Annual Environmental Health and Safety

EXECUTIVE SUMARY

INTRODUCTION AND OBJECTIVES OF THE ESMP

The project Road pavement and axis correction on road M-20, sections Ustikolina–Goražde 8 and Goražde 8 – Ustiprača, envisages 5 stretches all located in the vicinity of the city Goražde (the Project) for which this ESMP is developed, is one of the sub-projects under the FBH Road Sector Modernization Project co-financed by the WB and EIB. The project Road pavement and axis correction on road M-20, sections Ustikolina–Goražde 8 and Goražde 8 – Ustiprača, is screened as a category B project according to the Operational Policies (OP 4.01 on Environmental Assessment) of the WB as well as the screening procedure outlined in the project-specific ESMF. As such, this activity needs to have an ESMP developed, whereas pursuant to the local legislation this project does not require an environmental assessment or an environmental permit - whether federal or cantonal. PC Roads FBH will ensure all required local permits for this Project are obtained.

LOCATION AND TRAFFIC DESCRITPTION

The Project is situated on the Major road M-20, sections Ustikolina – Goražde 8 and Goražde 8 – Ustiprača, in the municipality Goražde. The first traffic counting device, on section Ustikolina-Goražde, located near the industrial zone Vitkovići, shows that the Average Annual Daily Traffic (AADT) on this section equals 4.664. The second one, however, although located nearer the central urban part of the city of Goražde shows the average number of vehicles per day (AADT) equals 3.312.

PROJECT DESCRIPTION

The project Road pavement and axis corection on road section Ustikolina–Goražde 8 envisages 5 streches all located in the vicinity of the city Goražde:

1. Reconstruction of the crossroad in Vitkovići:
   - construction of a roandabout
   - construction of an underpass

2. Reconstruction of the road section Goražde-Ustiprača and construcion of footways, chainage 0+500 – 2+880

3. Improvement of road section Ustikolina-Goražde (chainage 14+200-19+000) including the design of a resting area (10+500)

4. Reconstruction of the road section Ustikolina-Goražde and construcion of footways, chainage 19+995-21+030

5. Improvements of road section in Goražde city center including the construction of footways

BASELINE OF PARTICULAR INTEREST

The terrain of the Project is mostly with an altitude ranging from 300 to 400 meters above sea level. It can be said that the entire area is under the influence of the moderate continental climate or moderately warm and humid climate type (Cfb climate according to Köppen climate classification). Based on geographical features and the fact that there are no significant polluters, it considers that the air quality is good. Drina River is the closest surface water flow to the project site. According to the Analysis of pressures and impacts, risk assessment for the sub-basin of Drina, which was made by the Institute of Hydromechanics of the Faculty of Civil Engineering in Sarajevo in 2010, river Drina, in a number of parameters, meets the prescribed second class of water, while parameters such as indicators of organic pollution and nutrients are classified in the first class of the highest quality watercourses. In close proximity to the Project area, there are facilities for residential (houses), industry and business purposes (stores), and according to the Law on Noise Protection, they fall under the forth zone, where allowed noise levels are 60 dBA during day and 50 dBA at night. There are no sensitive receptors (hospitals, health resorts etc.) around the area that could be impacted by an increased noise level.

Discontinuous urban areas and industrial or commercial objects are *the* dominant *land* cover type covering *large areas in the* wider area of the Project according to the CORINE *methodology.* According to the available data, the real forest vegetation of the Bosnian – Podrinje Canton of Goražde is represented through oak phytocenoses, above the warmer positions, while on colder locations we can find beech forests. There are very rarely enclosed enclaves of beech forests and spruce fir. For higher zones are characteristic: phytocenosis of beech, beech and spruce forests, fir and spruce forests, as well as forests of subalpine spruce. The location of the Project is not located within a protected area according to Spatial plan of FBH and the Spatial plan Bosnian – Podrinje Canton of Goražde 2016. – 2036. There are also no recorded archeological findings in the observed area.

The Project road section lies in the far east of the Bosnian-Podrinje Canton and the Federation of Bosnia and Herzegovina. The project stretches are located on main road M-20 and follow the course of the River Drina from 10 kilometers south of the town Goražde to 2 kilometers north of it. According to the 2013 Population Census, the municipality has a population of 20.897 people on an area of 248,80 km². The population density is 84 ppl/km² making it an averagely populated area compared to the rest of the country.

IMPACTS DURING PRECONSTRUCTION

Socio economic impacts: The project roundabout is a part of the integrated Resettlement Action Plan (RAP) *for 9 sub-projects* which was publicly consulted and disclosed in March 2016. *As described in the integrated RAP, small parts of 4 private and 2 public land plots will*

be expropriated. The area affected on each of the a 4 private land plots is less than 10% of the total land area.

IMPACTS DURING CONSTRUCTION

The main impacts associated with the construction works include: emissions from the machinery used on site, dust generation from works, potential increases in noise and vibration levels, impact on soil and water from accidental leaks and spills, soil quality and land use, and trafic safety impacts. The contractor is bound by the provisions of this ESMP to conduct a baseline of the biological and natural resources specific to the site, and to adapt the measures of the ESMP and their work performance based on such findings.

Socio-economic impacts: At this time, it is not expected that it will be necessary to temporarily occupy any privately or publicly owned land plots for lodging machines and disposal of materials. Machines and materials will be disposed on land owned by the Investor.

- New business opportunities are expected to be created for local businesses such as transporters, suppliers and other service providers.
- Although the project area is uninhabited the following adverse impacts during construction are expected: Noise increase, Inappropriate disposal of construction waste, Local businesses can be affected in means of late delivery of goods and products.

MITTIGATION MEASURES

The mitigation measures focus on the major identified impacts during pre-construction and construction works, such as emissions from the machinery used on site, dust generation from works, potential increases in noise and vibration levels, impact on soil and water from accidental leaks and spills, soil quality and land use, trafic safety impacts, waste management, impacts on living conditions and impacts on local traffic.

ENVIRONMENTAL MONITORING PROGRAM

The monitoring measures focus on the major identified impacts during pre-construction and construction works, such as emissions from the machinery used on site, dust generation from works, potential increases in noise and vibration levels, impact on soil and water from accidental leaks and spills, soil quality and land use, trafic safety impacts, waste management, impacts on living conditions and impacts on local traffic.

IMPLEMENTATION AND REPORTING

PC Roads FBH is the implementer of the project and will be responsible for the implementation and compliance of the project in line with ESMP. The Contractor will be responsible for the implementation of the environmental mitigation measures during construction.

PUBLIC DISCUSION AND INFORMATION DISCLOSURE

Public consultation of the subject ESMP will be organized in Goražde after the WB and PC Roads FBH approve the draft of the ESMP. The record on public discussion, that is, grievances presented at the public discussion shall be recorded in the Grievance Register, and opinions and suggestions of the public shall be integrated into the final ESMP. The results of the public consultation will be incorporated into the final ESMP.

Grievance Mechanism

Besides the institutionally available ordinary and extraordinary legal remedy, and existing institutional channels, PC Roads FBH will ensure and form a special Grievance Redress Mechanism in collaboration and direct involvement of those municipalities under whose administrative authority the project is carried out, in this case with the Goražde municipality.

Requirements for start of works

The Contractor shall establish all required baseline data before the commencement of works. The Baseline – Monitoring data shall include air quality data, surface water quality data, soil quality data, survey and analysis of vegetation cover prior to the beginning and upon completion of works on construction site. The Contractor shall develop a Construction Site Organization Plan (CSOP) that is made up of Implementation Plan of this ESMP, a detailed Waste Management Plan (WMP), Study on Safety (includes Elaborate on Safety at Work and Elaborate on Protection From Fire and Explosions), Traffic Management Plan (TMP) must be developed, which will be created by the Contractor prior to the beginning of construction works.

1. INTRODUCTION

Based on the guidance *requirements* from the Environmental and Social Management Framework (ESMF has been disclosed and available to the public in local language on the website of PC Roads Federation of Bosnia and Herzegovina (FBH) in March 2016, http://jpcfbih.ba/bs/aktivnosti/modernizacija-magistralnih-cesta/38), this site-specific Environmental and Social Management Plan (ESMP) has been prepared.

The Public Company Roads of Federation of Bosnia and Herzegovina (further in the document PC Roads FBH) has initiated an overarching program for the project "Modernization of Major roads in the Territory of the Federation of Bosnia and Herzegovina" (The Program) to ensure appropriate road infrastructure by 2020. For this purpose, it has been requested from the Government of the FBH to ensure credit funds from international finance institutions (IFI).

In the framework of the abovementioned umbrella Program, the Public Company "Roads of FBH" (PC Roads FBiH), a limited liability company wholly owned by the Government of FBiH, has initiated the FBiH Road Sector Modernization Project. FBH filed an application for a credit/loan from the European Investment Bank (EIB) and from the World Bank (WB) in total amount of 103,38 million EUR for funding abovementioned Project.

FBH Road Sector Modernization Project comprises several small and mid-sized investment schemes including:

1. This component includes reconstruction of roads:

- Construction works for completion of the construction of major road M17.3 Neum–Stolac (in total 32,9 km);
- Construction of third lanes for slow vehicles (in total 40km on 8 sections of major roads);
- Reconstruction of roadway, correction of axes (in total 18 km on 5 sections of major roads, where a correction of axes is to be done on one section only in the length of 1 km),
- Reconstruction of 3 tunnels (with a total length of 1,86 km);
- Reconstruction of 7 bridges (with a total length of 0,55 km).

2. Interventions on improving road safety: The reconstruction of intersections, which are classified as "black spots" on major roads, in total 9;

3. Institutional reforms: Road Management in the FBH with a particular focus on sustainability of investments and road safety;

4. Project Implementation Support: Construction supervision and capacity building of the PC Roads FBH.

The project Road pavement and axis correction on road M-20, sections Ustikolina–Goražde 8 and Goražde 8 - Ustiprača envisages 5 stretches all located in the vicinity of the city Goražde (the Project) for which this ESMP is developed, is one of the sub-projects included in the group of sub-projects co-financed by the WB and EIB.

2. METHODOLOGY AND OBJECTIVES OF ESMP

The project Road pavement and axis correction on road M-20, sections Ustikolina–Goražde 8 and Goražde 8 - Ustiprača, is screened as a category B project according to the Operational Policies (OP 4.01 on Environmental Assessment) of the WB as well as the screening procedure outlined in the project-specific ESMF. As such, this activity needs to have an ESMP developed, whereas pursuant to the local legislation this project does not require an environmental assessment or an environmental permit - whether federal or cantonal[1]. PC Roads FBH will ensure all required local permits for this Project are obtained.

This ESMP aims at identifying all of the potential environmental and social impacts associated with this project activity. As such, the ESMP includes mitigation measures for all identified potential impacts that are to be undertaken throughout the different phases of the project including preparation, implementation and operation. The measures set forth in this ESMP are meant to avoid, neutralize or diminish adverse environmental and social impacts if not completely then to a satisfying level.

The ESMP identifies feasible and cost-effective measures which can reduce potentially negative impacts on the environment and society to an acceptable level. If mitigation measures are not possible, profitable or sufficient, compensation should be included as the last measure.

In order to ensure mitigation measures have been implemented, fully or partially, the ESMP sets forth a monitoring plan to be implemented during the specific stages of project preparation/designing and implementation. Monitoring during project preparation and implementation provides information on the key environmental and social aspects of the project, particularly on the environmental and social aspects of the project and efficiency of mitigation measures. Prior to commencement of works, in accordance with requirements of the ESMP, and a minimum of monitoring requirements, described in this ESMP, without

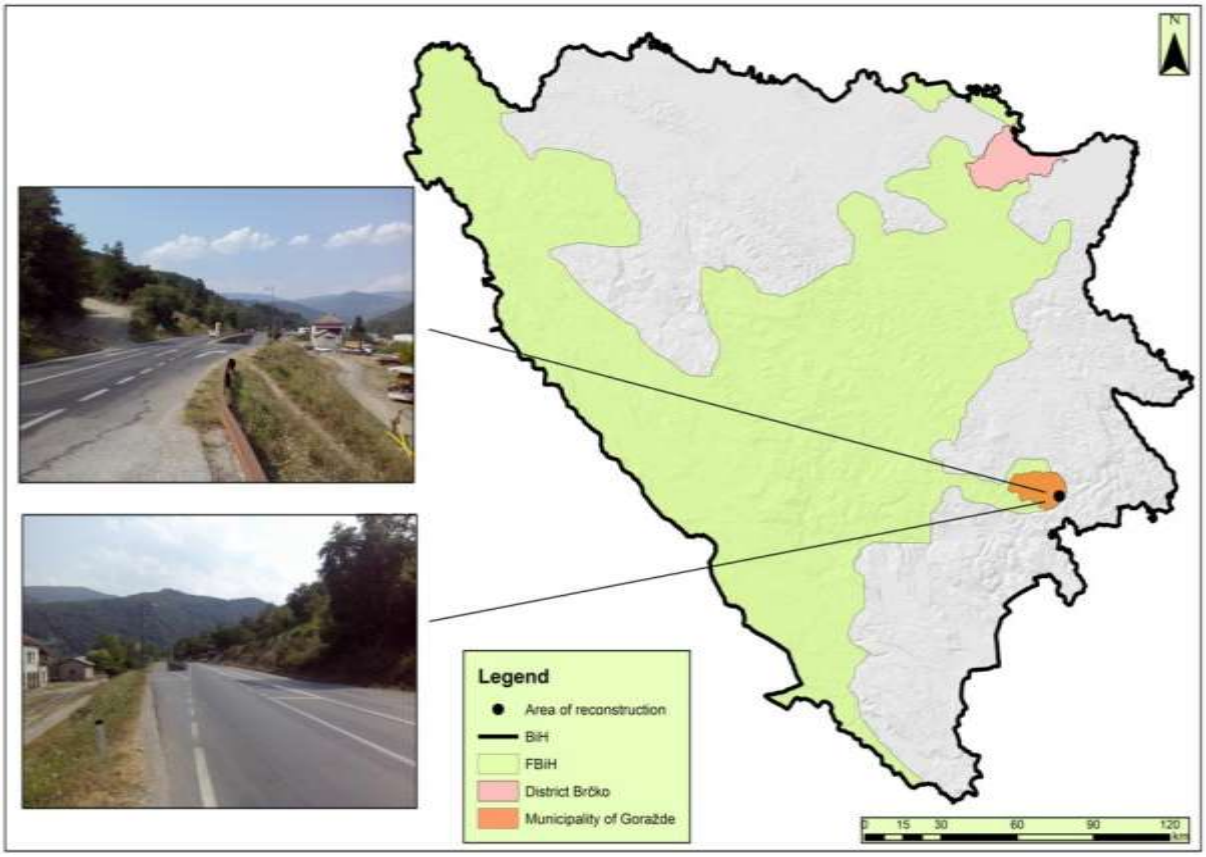
[1] *In FBH investments requiring EIA are identified by the Regulation on Plants and Facilities Subject to Obligatory Environmental Impact Assessment, and Facilities Which May be Constructed and Commissioned Only if Granted Environmental Permit (Official Gazette of FBH No. 19/04). Bosnian-Podrinje Canton Goražde investments requiring an EP are regulated by Regulation on Activities, Plants and Facilities Which May be Constructed only if Granted Environmental Permit (Official Gazette of Bosnian-Podrinje Canton Goražde, No. 1/05, 11/06 and 2/13).*

limitation to these requirements, the Contractor shall prepare detailed list of mitigation measures and parameters to be monitored.

3. LOCAL DESCRIPTION

The Project is situated on the Major road M-20, sections Ustikolina – Goražde 8 and Goražde 8 – Ustiprača, in the municipality Goražde. The major road M-20 streches from Ivanica on the border with Republic of Croatia to Ustiprača in entity Republic of Srpska. M-20 is just over 37 kilometers long and in Ustiprača it is connected to the major road M-5.

Figure 1: The geographical location of the project

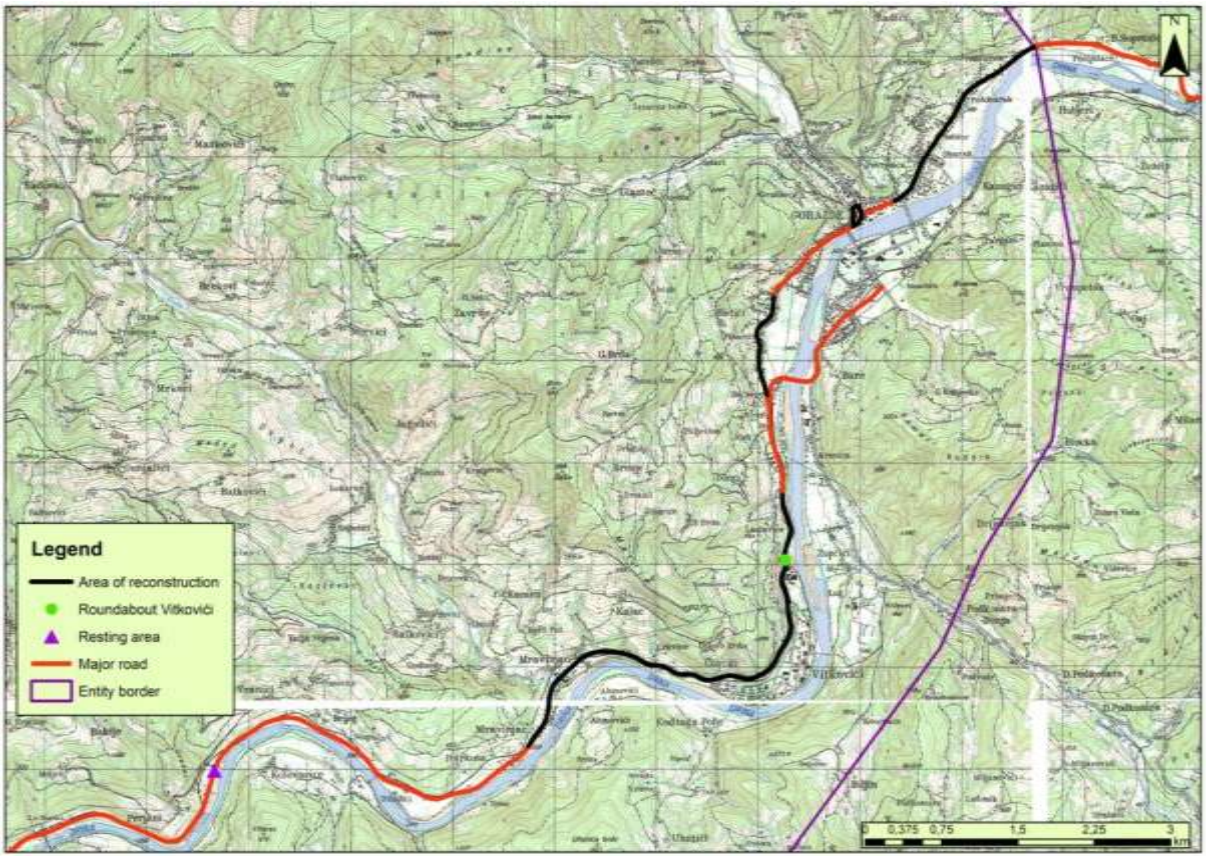


Source: PC Roads Federation of BH (Pictures: July 2017)

The subject of the project is the reconstruction of crossroad Vitkovići and reconstructions of the road sections Ustikolina – Goražde 8 and Goražde 8 – Ustiprača, and construcion of footways in the Municipality od Goražde. The areas of reconstruction is located outside of the urban area as well in the urban area of Goražde, and residential, public and commercial facilities are situated near the project.

Figure 2 shows the location of the project site in a wider surrounding area on a topographical map.

Figure 2: Lookup Map of Wider Area with the Project Location



Source: PC Roads Federation of BH

3.1. ROAD SAFETY AND TRAFFIC DATA

PC Roads FBH has installed automatic traffic counting along the major traffic network throughout FBH. Automatic traffic counting is being done since 2005 and last report[2] is published in 2016 with data for the previous year. Based on this information, two counting devices are relevant for the project area. The first traffic counting device, on section Ustikolina-Goražde, located near the industrial zone Vitkovići, shows that the Average Annual Daily Traffic (AADT) on this section equals 4664. The second one, however, although located nearer the central urban part of the city of Goražde shows the average number of vehicles per day (AADT) equals 3312 (Figure 3).

[2] *"Traffic count on major roads in Federation of BH in 2015", PC Roads Federation BH, Sarajevo 2016*

Figure 3: The average amount of vehicles per day in the year 2015

Source: PC Roads Federation of BH

By request of PC Roads FBH, traffic prognosis for the same network was made by IPSA Institute Sarajevo in 2014[3] for the period 2013 to 2040. Analysis of the traffic flow was made for every year applying "equilibrium" procedure. The project section has been analyzed within the relevant sections for the project: Ustikolina-Vitkovići, Vitkovići-Goražde8, Goražde -Goražde Junction, Goražde Junction-Ustiprača. The amount of predicted average daily number of vehicles is shown in Table 1 below.

Table 1: Traffic prognosis for sections of main road M20

Major road	Section name	AADT									
		2016	2018	2020	2022	2023	2025	2030	2035	2037	2040
M20	Ustikolina-Vitkovići	2761	2949	2898	3081	3184	3427	4220	533	5596	6054
M20	Vitkovići-Goražde	3903	4165	4192	4455	4600	4931	5946	7284	7632	8226
M20	Goražde-Goražde Junction	4575	4878	1148	1216	1252	1326	1520	3144	3451	3918
M20	Goražde Junction-Ustiprača	4027	4294	4532	4732	4884	5136	5869	6693	6991	7474

Source: PC Roads FBH, 2014

The number of vehicles that has been predicted in 2016 has been overcome already in 2015 according to "Traffic count on major roads in Federation of BH in 2015" (PC Roads Federation BH, Sarajevo 2016). Thus, an even greater increase in the number of vehicles can

[3] *„Justification study for modernization of major roads in FBH programme", IPSA Institute Sarajevo, 2014*

be predicted throughout the implementation period showing the major need of reconstruction of the project crossroad. Furthermore, table 1 depicts a significant decrease in the Number of Vehicles inside the city of Goražde. That is the case because of the planned built of the city's bypass.

4. PROJECT DESCRIPTION

The project Road pavement and axis correction on road section Ustikolina–Goražde 8 envisages 5 stretches all located in the vicinity of the city Goražde:

1. Reconstruction of the crossroad in Vitkovići:
   - construction of a roundabout
   - construction of an underpass

2. Reconstruction of the road section Goražde-Ustiprača and construction of footways, chainage 0+500 – 2+880

3. Improvement of road section Ustikolina-Goražde (chainage 14+200-19+000) including the design of a resting area (10+500)

4. Reconstruction of the road section Ustikolina-Goražde and construction of footways, chainage 19+995-21+030

5. Improvements of road section in Goražde city center including the construction of footways

Figure 4: Overview of project's streches

Source: PC Roads FBH, 2017

4.1. Reconstruction of the crossroad Vitkovići

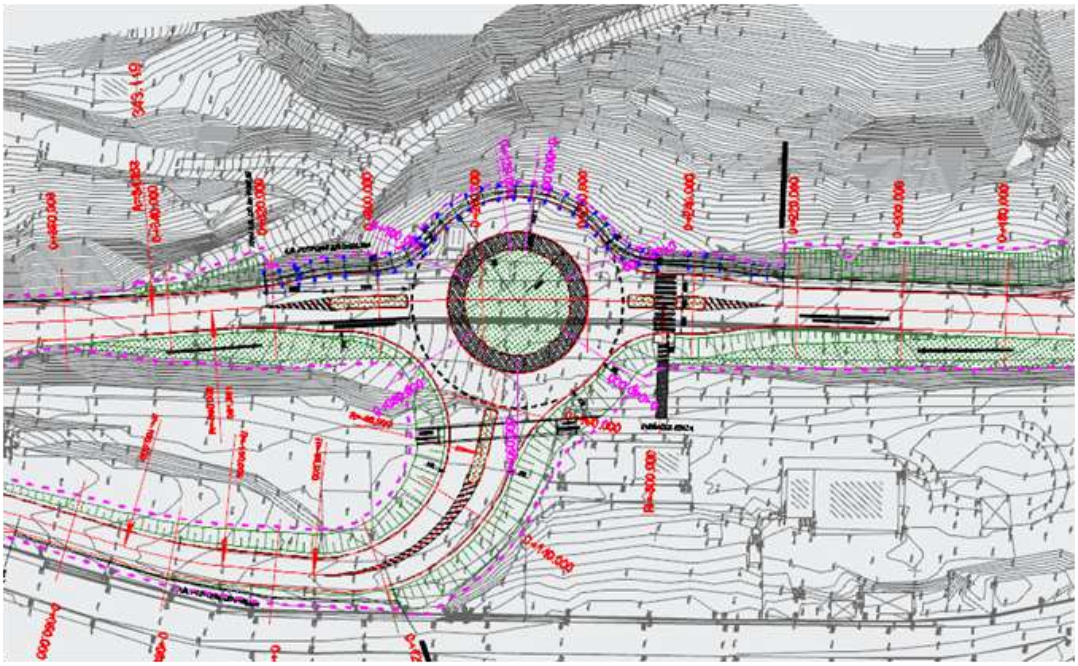
The project intersection is currently unstructured and represents a bottleneck, especially in the morning and afternoon spikes. The non-standard solution does not allow safe turning of heavy vehicles, which go towards the industrial zone. The intersection was made as a delevelled T-junction with ascending and descending ramps joining the main road. In addition to the transit problems, this intersection represents a high safety risk for entering vehicles and for vehicles that move along the main road, so it is necessary to reconstruct it with modified traffic conception.

After a preliminary analysis of the existing situation and initial ideas on the new concept of intersection, it was concluded that the optimal type of intersection at this location is a roundabout. A roundabout would provide optimal traffic flows and sufficient capacity, as well as increase the safety of traffic participants.

The adopted rondo type is designed as a one-lane roundabout with 3 entering lanes and an additional transit section for trucks. The adopted type of rondo has the external diameter R = 40m with internal radius R = 13.5m. After the analysis of the transit trajectory of the corresponding vehicle, the width of the traffic lane was adopted at 6,5m with an additional 3.5m for over-sized vehicles.

The minimum radius of the entrance is 12m and the exit is 15m, while on the access road these radiuses are increased according to the trajectories of the relevant cargo vehicles. The exit radius towards Vitkovići is 20m, while the radius on the entrance from Vitkovići is 30m. The width of the dividing islands at the entrances is 2.5m while the length equals 15m, with the extension of the lanes of 12.5m. The width of the entrance is 4m and width of the exit is 4.5m, while on the access road towards Vitkovići this width is higher due to the uninterrupted passage of heavy vehicles. The Rondo was designed with a cross-fall of 2.5%.

Figure 5: The designed Roaundabout in Vitkovići



Source: Main Design, Design QC, 2013

As the level of the designed roundabout is the same as the level of the main road, the project envisages the local road from the direction of Vitkovići to connect to the roundabout at the embankment. The raising of the road level of the local road and the construction of a high embankment prevents the residents to access the roundabout directly from the uncategorized access road (on the right in the direction of the chainage). To overcome this problem an underpass has been designed. The route of the new road and the underpass are determined with the regulatory plan.

The width of the road outside of the underpass is 6,0 m (2 x 3,0 m), while the width in the underpass is 4,0 m. The road is designed for two-ways motor traffic. The traffic in the underpass will be regulated with vertical signalization. The gutter width is 0,5 m, benching width 0,5 m and the flanks width equals 1,0 m.

The road narrowing before and after the underpass is conducted in the length of 10,0 m. The axis of the road is laid straight in the first 98,00 m and after that it goes towards the underpass using a left curve (R = 150 m) without transition curves. The underpass is laid on a straight line after which the axis connects to the new local road using a left curve (R=20,0 m). The rounding radiuses of the junctions to the local road are R = 8,0 m left, and R = 10,0 m right.

A continuous crossfall of 2,5% (from right to left) is projected on the entire length of the road (except the part of the junction with the local road). Due to the designed speed on the

new road being low (up to 30 – 40 km/h), the chosen steady crossfall will not have an impact on the characteristics of driving dynamics. The total length of the new road is L = 218,09 m.

The longitudinal course of the new road dictated the vertical position of the underpass (in line with the ToR) as did the point of conjunction with the local road. The maximum gradient is 2,50%/16,24 m and the minimum is 0,90%/100,22 m. Maximum value of the vertical rounding radius is Rconv = 1450,0 m and the minimum is Rconc = 600,0 m. The right side of the road is bordered with concrete curbs 18/24 while the left side border consists of gutters and curbs as is shown in the Main design.

4.2. Reconstruction of the road section Goražde-Ustiprača and construction of footways, chainage 0+500 – 2+880

This stretch envisages the reconstruction of roadway, surface drainage systems, pedestrian paths on the right side (from km 1+000 to km 2+150) as well as the construction of a pedestrian path on the left side (from km 0+520 to km 1 + 970). Furthermore, the project envisages the reconstruction of bus stops, upgrade of the pedestrian paths, as well as the arrangement of the connectors and the construction of collectors from the main road to the Drina River.

The concerned section was not subjected to any serious renovation in the past. All interventions on the roadway as well as on the drainage system were of a local character and short segments, which is reflected through the removal of rough and rutted roadway parts that characterize the whole section. A large portion of the stretch is characterized by a broken cross-fall. All stated resulted in retaining water on the roadway at certain points, as well as malfunction of the existing surface drainage system. The pedestrian path on the right side is a part of this project is in a very bad condition, reflected by worn-out curbs, as well as roughness and cracks.. Another feature of the subject section is the number of access roads and connectors. The above mentioned imposed a need for a new design of the concerned stretch in order to maintain its functionality in the following period.

The base of the route is maximally adapted to the existing geometric elements so that there are no major deviations from the preexisting axis. The width of the roadway slightly varies, at the beginning of the section (P10 to P40) where it moves from 6.0m to 6.30m, while on the other part it estimates 6.60 m, therefore the designer decided with the consent of the investor to unify the width of the roadway at 6.60m (the lanes of 2x3.0m and the lanes of 2x0.30m). The parts where the width of the roadway is lower than the designed width occurred, due to entering in the existing pedestrian path from the right (Max.30cm so that the width of the remaining part of the walking path is approx. 2.0m), and partly by extending to the left side where the construction of new pedestrian paths is envisaged. In

the section where the existing pedestrian walkway enters, the replacement of the gradual curbs is envisaged.

As stated in the ToR, the reconstruction of the pedestrian path on the right side of the road and the construction of the pedestrian trail on the left is planned. The width of the walking path on the right is 2.0m. It is recommended to remove the existing cobblestones and asphaltic layers and replace them with new ones. The asphalt thickness on the right pedestrian path is BB11sk d = 4cm while the thickness of the tampon is 10cm.

The estimated width of the newly designed pedestrian trail on the left is 1,60m, as opposed to the sections where due to realistic constraints (supporting walls) these measurements would not be possible to implement and would also necessitate a great sum of money for conducting the construction of the walking path in full width. These costs refer to the stretch from P8 to P10 + 9,50m and P70 +2,20m to P73-1,20m. The construction of the pedestrian path on the left side is BB11sk d = 4cm and the tampon d = 30cm. The crossfalls of the pedestrian paths equal 2% towards the road except on the access points. On access points it is necessary to install mountable curbs to ensure unobstructed access. The project also envisages the longitudinal carving of the roadway at a distance of 25cm from the existing curb and pavement for the construction or reconstruction of pedestrian paths.

4.3. Improvement of road section Ustikolina-Goražde (chainage 14+200-19+000) including the design of a resting area (10+500)

On the subject section of the main road M20, section 009: Ustikolina - Goražde 8, there were no interventions on the pavement, except on short stretches where the greatest damage occurred. On this stretch, the bitumen is emitted on the surface of the pavement, and ruts are created. This jeopardizes the safety of the participants in traffic. The visual recording and surveying of the entire stretch of the main road has been conducted. At the same time, surveying of the entire strech was . On each road profile, the width of the roadway was measured.

Visual records, show that this section has average traffic in the winter period, as opposed to the regarding beginning of the tourist season where there is an increase in traffic. The condition of the roadway on the larger part of the stretch is not satisfactory, which can be seen by visual inspection.

The section from km 14 + 200 up to the entry to the industrial zone Vitkovići is characterized by the shift of good and bad asphalt layers.

On this section, three bridges were noticed. The first and third bridge are characterized by bad asphalt layers as well as the need for replacement of curbs, while the fences are in poor

condition and the pedestrian paths, on which the replacement should be made, were recorded on all three bridges. With this bridge project, only asphalt pavements will be treated, while pedestrian paths and bridges are not the subject of this project.

On most of the asphalt pavement mesh and longitudinal cracks are visible. Considering that existing condition of the asphalt pavement the designer recommended replacement by asphalt, thickness 5 cm, made with silicate aggregate for middle traffic load according to the regulation U.E4.014.

The repavement includes:

TYPE I

Penetration of mesh cracks with asphalt AB16 d = 5cm and sealing of compounds with bitumen up to 2cm with prior cleaning and emulsifying. Punching holes AGNS22s d = 7cm and AB16 d = 5cm with pre-tamping of tampon layer and casting compounds with bitumen polymer up to 2cm with cleaning and emulsifying. The sealing of longitudinal cracks with polymer bitumen up to 2cm.

TYPE II

Cutting the asphalt pavement up to 5 cm thick and changing the pavement with asphalt (AB16 d = 5 cm) made on basis of silicate aggregate, with asphalt mixing parameters for medium traffic load, including with the prior TYPE I tamping, cleaning and emulsifying.

From these two types of renovations, four sections were excluded: P117-P125, P133-P142, P157-P166 and P175-P183, due to the congestion of the road and the insufficient width of the roadway, the reconstruction of the roadway and its extension as well as the reconstruction of the culvert are envisaged.

The access points and the BUS standpoint on the stretches of the main road that will be reconstructed, will be cut up to 5cm in length and 5-10m long (approaches 5-10m and the BUS standpoint over the entire surface) and thus the connection of the existing and new asphalt will be realized.

Although it is not on the project section, the construction of a resting place is included, according to the ToR. The rest area is located on the right side of the road at chainage km 10 + 500. six parking places (parking at 45°) with three types of equipment are envisaged by the design. The width of the alternative road at the rest area is 3.0m and the width of the dividing island is 1.20m. The dividing island is laceted is 0.50m from the edge of roadway. The entrance and exit of the resting place is designed in the form of a wedge witch length equals18.0m (R= 12.0m). The width of the entrance is 6,0m while the width of the exit equals 5,0m.

In close vicinity of the resting place a house is located. The existing state provides an access point to the house over the unregulated bus stop that is no more in function. The new design also provides an uninterrupted access to the facility.. On the right side of the rest area towards the river Drina, due to the insufficient width of the plateau, an "L" wall (length 16m)is predicted.

4.4. Reconstruction of the road section Ustikolina-Goražde and construction of footways, chainage 19+995-21+030

Although the area is inhabited, there is no pedestrian paths on the concerned strech of the M20 mainroad.. The existing pedestrian paths end in the village of Vinarići. According to the ToR the designed pedestrian paths should be connected to this mentioned end.

The technical solution of the pedestrian path was stated starting at km 19+995 and at the end of km 21+030 station. The total length of the design equals1035.0 m. The width of the existing roadway on the route is approximately 6.0m.

The width of the pedestrian path was set by the ToR and equals the width of two rows of pedestrians, min. 1.6 m. The width was respected in parts where it was possible. However, on access points to individual housing facilities directly connected to the main road under a large longitudinal slope the pedestrian trail was interrupted because otherwise it would cut off the access. The side obstacle requested in the ToR was not designed because it would significantly impact private land. A new pedestrian path is connected to the existing pedestrian path (towards Goražde) at the end of the section.

There is no pedestrian path on the existing BUS station. According to the existing lengths of the input, output, and the BUS part, the widths correspond to one bus. The designer has made the BUS station in line with design regulations. At the BUS station the designer envisaged a complete reconstruction of the roadway.

4.5. Improvements of road section in Goražde city center including the construction of footways

On the part of the main road M20 that passes through Goražde and includes the streets of Kulina Bana, a section of the street Sinan paša Sijerčić to the connective part with ul. Kulina Bana to the connective part with ul. Sead Sofovića Sofas and part of the Sead Sofovića Sofas street to the connective part with ul. Marshal Tito and connective part with ul. Kulina Bana deformations on the asphalt pavement curtain in the form of longitudinal, transverse and mesh cracks, and spot like wave denivelations were noticed on the roadway.

On the pavement, places that have been patched in the past have been noted.. The covers of the manholes and drains at the Kulina Bana and Sinan paše Sijerčić streets are delevelled in relation to the roadway. The pavements and asphalt pavement on the larger part of the concerned stretch are worn out, damaged and sloping.

The widths of the pavement are variable and range from approx. 5.0m to cca 7,0m. Pedestrian paths are variable with widths ranging from 1.0m to 3.0m and roads in between

of them are very damaged. The reason for theuneven widths of pavements and pedestrian paths is the surrounding construction along the road that runs through the old city center.

Surface drainage is not adequately solved and does not function as a whole, resulting in accumulation of water on the pavement.The project solution envisages the retention of existing road and pedestrian paths and the reconstruction of pavements and pedestrian paths with the replacement of the curbstones and the implementation of a new system of surface and deep drainage.

The axis is laid out in such a way that the existing edges of the roadway with insignificant deviations are retained to a large extent. Any major displacement of the axis would result in a reduction in the width of the existing pedestrian paths, and would decrease safety foer all traffic participants.

During the works, the existing one way (in two lanes) traffic flow will be retained

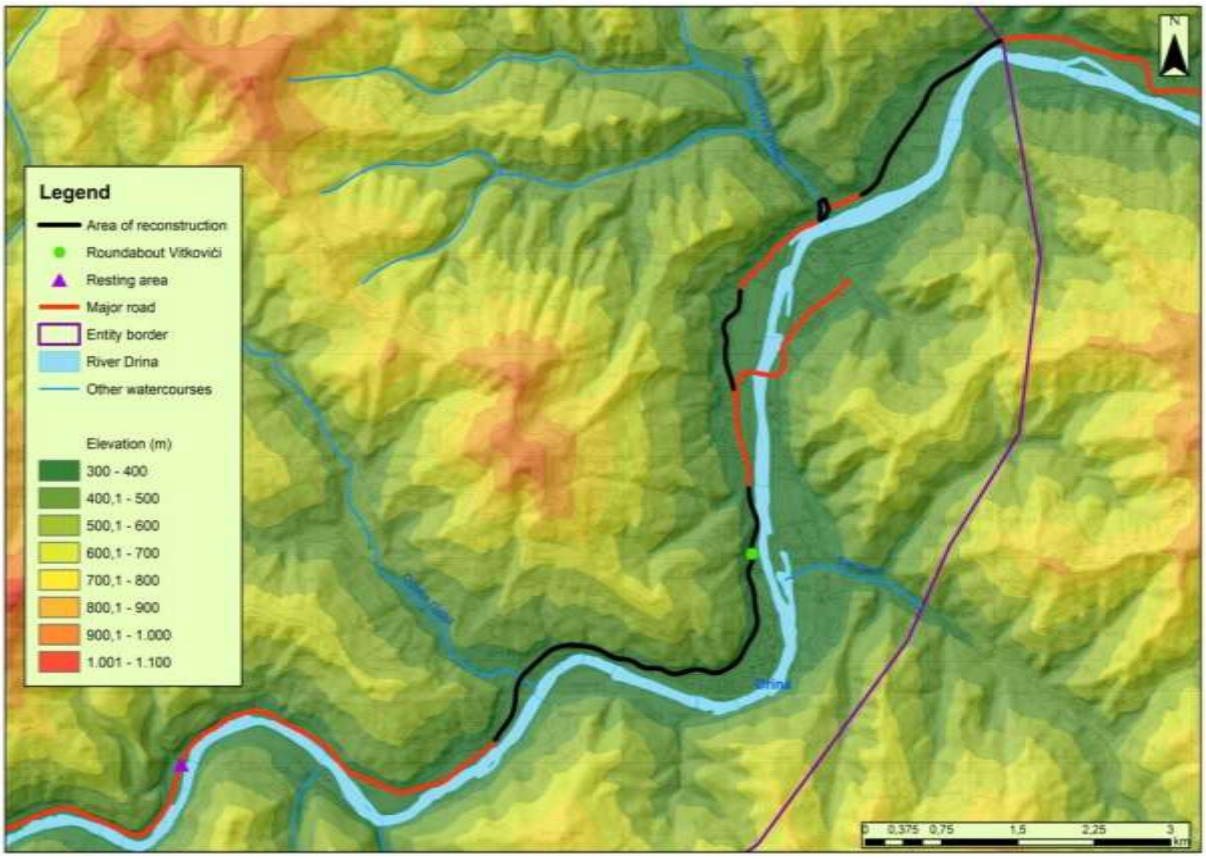
Reconstruction of pedestrian paths is planned in such a way that the existing asphalt pavement on pedestrian paths is replaced with concrete slabs. It is necessary to make excavation of asphalt and layers beneath it to the designed area, then rolling and squeezing the subsoil to the required values. After that, a layer of tampon, d = 20cm, (which is required to be rolled in order to obtain the required Ms = 60Mpa) is placed. On this prepared foundation a layer of sand is used as a basis for laying concrete slabs. The concrete slabs must satisfy the required resistance to frost, pressure, etc. Furthermore, the properties of teh concrete slabs must be in line with all regulations for the concered material as well as for the intended purpose. In the part of pedestrian paths, the area around the trees in a radius of 1,0 meters is to be casted with concrete blocks (8cm/ 8cm / 8cm)

5. BASELINE OF PARTICULAR INTEREST

5.1. GEOGRAPHIC CONDITIONS

The terrain of the Project is mostly with an altitude ranging from 300 to 400 meters above sea level, as indicated in the next Figure. From stratigraphic – petrographical point of view this area is composed from stable and well permeable rocks, and from structural geomorphological point of view this type of relief belongs to the fluvial-accumulative type of morphostructure. Hydrogeological complexes are mostly of intergranular porosity.

Figure 6: Geographical Map of Wider Area with the Project Location



Source: PC Roads Federation of BH

The geological structure of the wider area is characterized by quaternary rocks. Quaternary rocks are represented mostly trough gravel, sand and subordinate clay.

Figure 7: Geologic Map of the wider area of the Project

Source: Draft of Spatial plan of FBiH 2008.-2028.

5.2. CLIMATE FEATURES

Climatic features of subject area are determined by the thermal and pluviometric regime, and therefore it is necessary to define its basic parameters, using climatological monitoring and a detailed analysis of the same. It can be said that the entire area is under the influence of the moderate continental climate or moderately warm and humid climate type (Cfb climate according to Köppen climate classification) which can be concluded from the analysis of thermal and pluviometric regime.

Meteorological station in Goražde, closest to the site of reconstruction, reports following data: the average multi-annual temperature is 9.8 ° C, the warmest month is July, with an average perennial air temperature of 19 ° C and the coldest month is January when the average perennial temperature is -0.9 ° C.

- Table 2. Average temperature and precipitation for the multi-year period (1961.-1990.)

Month	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Avrg./Summ
Temperature (°C)	-0,9	1,5	5,6	9,9	14,3	17,5	19	18,8	15,3	10,3	5,3	1,1	9,8
Precipitation (mm)	55,3	55	46,5	64,3	70,8	73,1	64,5	63,6	68,7	70,4	80,4	73,3	785,8

Source: Federal Hydrometeorological Institute BiH, Sarajevo

The average rainfall measured at the same meteorological station, during multi-year period is 785,8 mm per year. The rainiest month is November, when the average precipitation is 80,4 mm. The least precipitation occurs in March, only 46,5 mm on average.

In this area, the appearance of frosts and fogs are significant, so in this region it occurs on an average of 93 to 99 days with frost.

The dominant winds come from the northeast, and the presence of the southeast, southwest and northwest wind is very often. The highest average wind speed of 1.8 m/s occurs at the southern wind.

5.3. AIR QUALITY

No particular monitoring of air quality for this location was performed, neither for the area of Goražde. Judging by the location of the Project, it can be concluded that the highest air pollution refers to the traffic of the major road. There are no other major air polluters such as industrial facilities near the site.

Based on geographical features and the fact that there are no significant polluters, it considers that the air quality is good. The Contractor shall conduct a baseline measurement for air quality monitoring prior to the start of works.

5.4. WATER AND WATER QUALITY

Drina River is the closest surface water flow to the project site (location indicated in the next figure). Drina is a river in eastern part of Bosnia and Herzegovina. The Drina River is formed by the merging of the Montenegrin Rivers Tara and Pliva in Šćepan Polje.

The larger tributaries on the left are Sutjeska, Bistrica, Prača, Drinjača and Janja, and from the right Ćehotina, Lim, Rzav, Ljubovija and Jadar. Only a small part of the sub-basin of the Drina River is located in the territory of the Federation of FBiH. In the length of about 25 km, the Drina River flows through the Federation of FBiH, including the area of Goražde.

The drainage area of the Drina River in the Federation of BiH is 974 km^2. The characteristic values of the flow of the Drina River at the Goražde water – measuring station are given in the following table.

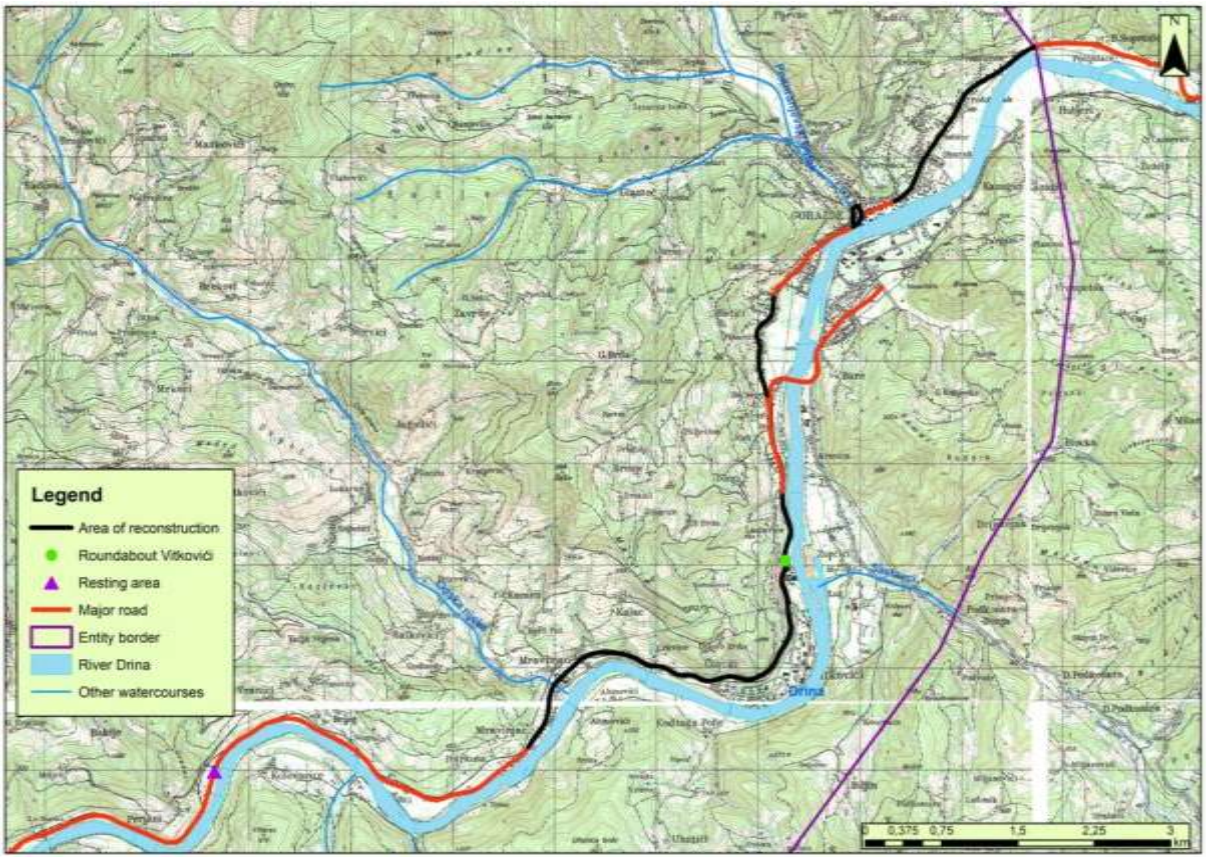
- Table 3. The Drina River – characteristic flows

Water – measuring station	Watercourse	$Q_{avrg.\ year}$ (m^3/s)	$_{avrg.}Q_{min}$ (m^3/s)
Goražde	Drina	226	43,9

Source: Water management strategy of the Federation of Bosnia and Herzegovina, Institute for water management d.d. Sarajevo and Institute for water management d.o.o. Mostar, 2009.

According to the Analysis of pressures and impacts, risk assessment for the sub-basin of Drina, which was made by the Institute of Hydrotechnics of the Faculty of Civil Engineering in Sarajevo in 2010, river Drina, in a number of parameters, meets the prescribed second class of water, while parameters such as indicators of organic pollution and nutrients are classified in the first class of the highest quality watercourses. The worrying amount of heavy metals, especially Pb, Cd, Cu, is recorded in significant concentrations downstream from Goražde. It is possible to assume that the increased concentrations of heavy metals are the result of the discharge of wastewater from the industry in Goražde (Unis Ginex, Pobjeda Rudet etc).

Figure 8: Hydrographic Map of the wider area of the Project



Source: PC Roads Federation of BH

5.5. NOISE LEVELS

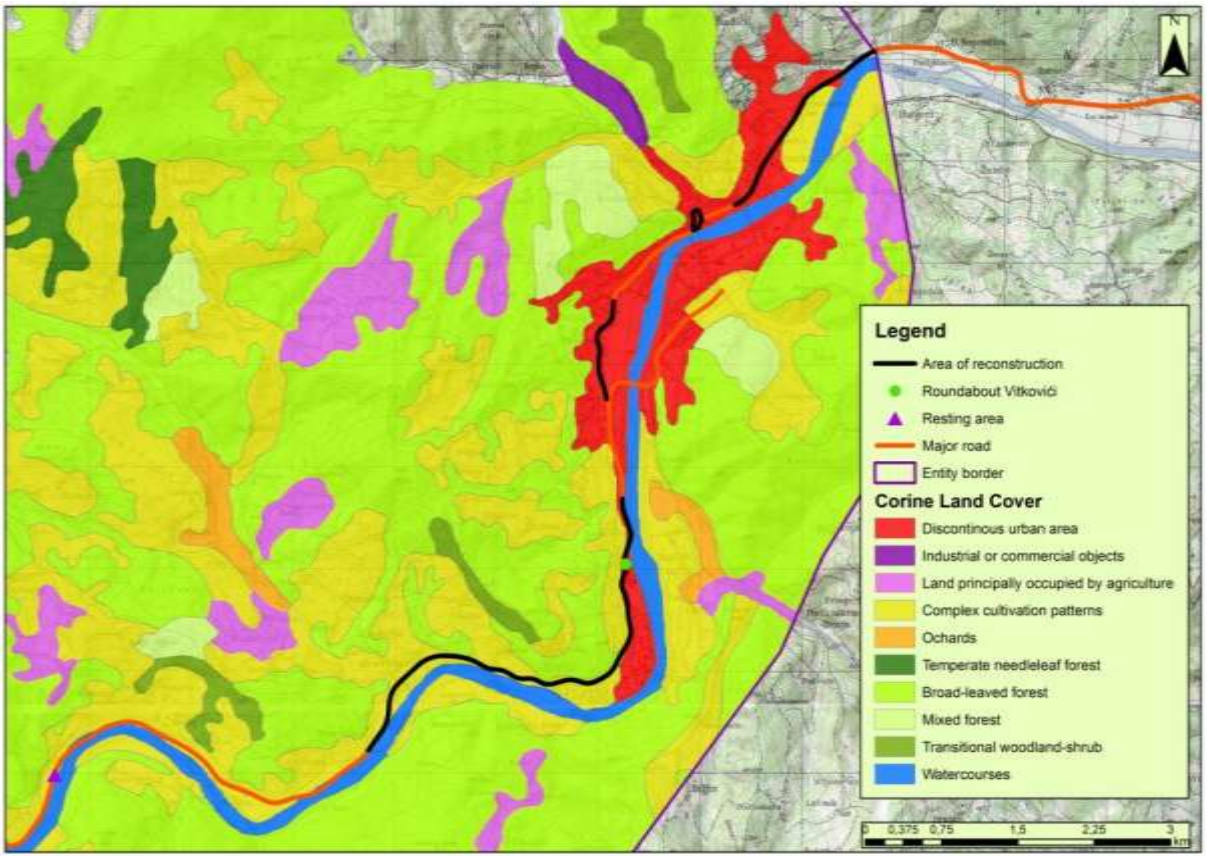
There was no monitoring of noise levels near the Project area; therefore there is no available baseline data of the impact of the noise on the environment. The largest source of noise, in general, is traffic.

In close proximity to the Project area, there are facilities for residential (houses), industry and business purposes (stores), and according to the Law on Noise Protection, they fall under the forth zone, where allowed noise levels are 60 dBA during day and 50 dBA at night. There are no sensitive receptors (hospitals, health resorts etc.) around the area that could be impacted by an increased noise level.

5.6. LAND AND LAND USE

Discontinuous urban areas and industrial or commercial objects are *the* dominant *land cover type covering* large areas in the wider area of the Project according to the CORINE methodology[4].

Figure 9: Land use in the wider area of the project according to CORINE model



Source: *Coordination of information of the Environment - European Environment Agency*

5.7. FLORA AND FAUNA

According to the available data, the real forest vegetation of the Bosnian – Podrinje Canton of Goražde is represented thorugh oak phytocenoses – Quercetum frainetto-cerris in lower zones, above which are Quercetum petraeae montanum and Quercetum petraeaemontanum, above the warmer positions, while on colder locations we can find beech forests. There are very rarely enclosed enclaves of beech forests and spruce fir (Piceo-

[4] *Coordination of information of the Environment - European Environment Agency*

Abieti-Fagetum). For higher zones are characteristic: phytocenosis of beech (Fagetum montanum il lyricumet Luzulo-Fagetum), beech and spruce forests (Piceo-Abieti -Fagetum), fir and spruce forests (Abieti-Piceetum), as well as forests of subalpine spruce (Piceetum subalpinum).

Based on the fact that this is an existing road, and that almost all activities will be carried out within the existing footprint, the risk to the flora and fauna is minimal. However the Contractor shall hire a biologist to conduct a review of the site for the baseline that needs to be prepared for monitoring prior to the start of works.

5.8. PROTECTED AREAS

The location of the Project is not located within a protected area according to Spatial plan of FBH and the Spatial plan of Bosnian – Podrinje Canton of Goražde 2016. – 2036. There are also no recorded archeological findings in the observed area.

5.9. POPULATION AND SETTLEMENTS

The Project road section lies in the far east of the Bosnian-Podrinje Canton and the Federation of Bosnia and Herzegovina. The project stretches are located on main road M20 and follow the course of the River Drina from 10 kilometers south of the town Goražde to 2 kilometers north of it. According to the 2013 Population Census, the municipality has a population of 20.897 people on an area of 248,80 km². The population density is 84 ppl/km² making it an averagely populated area compared to the rest of the country.

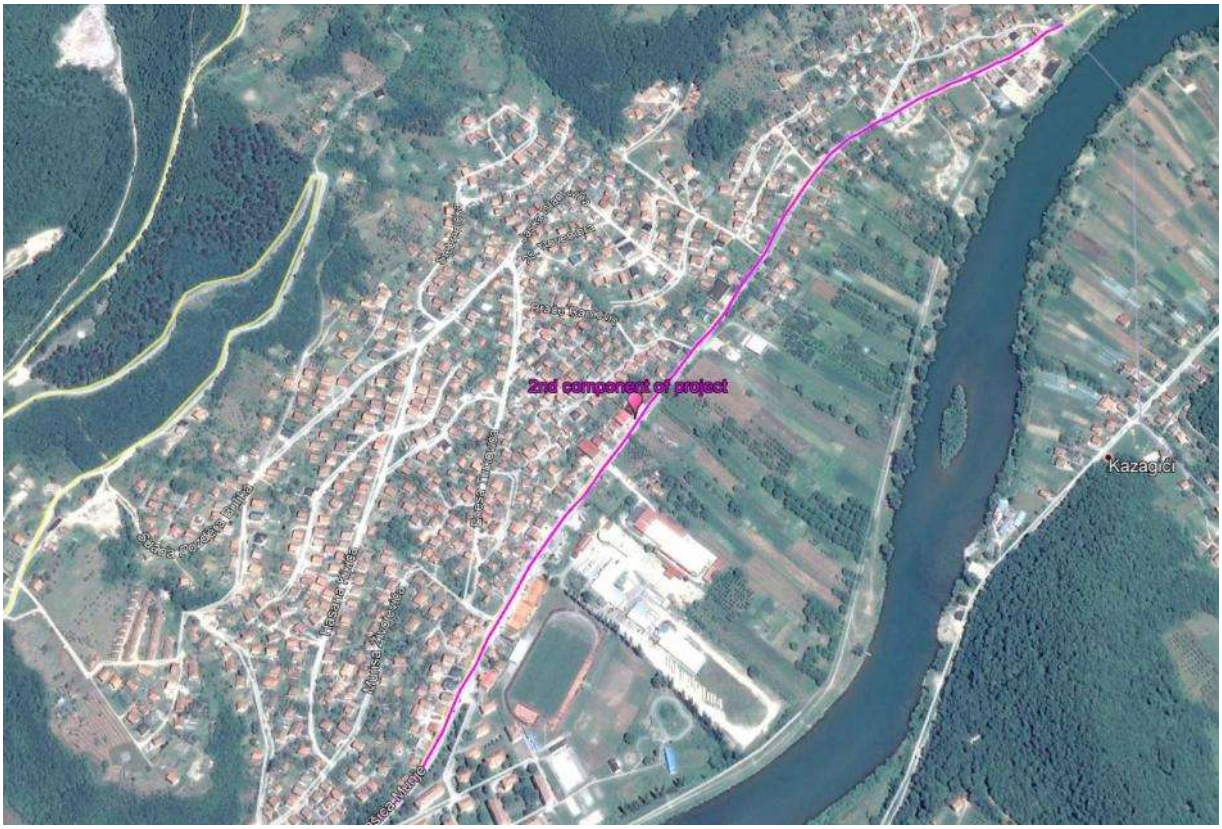
The first project strech, the roandabout Vitkovići lies in the industrial zone Vitkovići. In close vicinity of the designed roundabout there are two factoriwes a gas station and one small groundfloor house.

Figure 10: 1st strech of project, Roundabout Vitkovići

Source: PC Roads of FBH

The second project strech, the reconstruction of the road section Goražde-Ustiprača and construction of footways on chainage 0+500 – 2+880, goes through a highly populated suburban area on the north entrance to the city of Goražde. Most of the local population works in the city of Goražde and gravitates to it.

Figure 11: 2nd strech of project, *reconstruction of the road section Goražde-Ustiprača and construcion of footways on chainage 0+500 – 2+880*



Source: PC Roads of FBH

The third project strech, the improvement of road section Ustikolina-Goražde (chainage 14+200-19+000) crosses a sparsely populated area on the south exit of the Municipality of Goražde. The area gravitates to the city of Goražde concerning healthcare education and employment.

Figure 12: 3rd strech of project, *improvement of road section Ustikolina-Goražde*

Source: PC Roads of FBH

Figure 13: 4th strech of project, *reconstruction of the road section Ustikolina-Goražde and construcion of footways*

Source: PC Roads of FBH

The forth project strech, the reconstruction of the road section Ustikolina-Goražde and construction of footways crosses a highly populated area on the south entrance to the Municipality of Goražde. The area gravitates to the city of Goražde concerning healthcare education and employment and most of local population works in the City.

The fifth project strech, envisages improvements of road section in Goražde city center including the construction of footways.

Figure 14: 5th strech of project, *improvements of road section in Goražde city center including the construction of footways*

Source: PC Roads of FBH

6. DESCRIPTION OF POSSIBLE IMPACTS DURING CONSTRUCTION, OPERATION AND MAINTENANCE

6.1. PRE-CONSTRUCTION IMPACTS

Socio-economic Impacts

Pre-construction land acquisition: The project roundabout is a part of the integrated Resettlement Action Plan (RAP) for 9 sub-projects which was publicly consulted and disclosed in March 2016. As described in the integrated RAP, small parts of 4 private and 2 public land plots will be expropriated. The area affected on each of the a 4 private land plots is less than 10% of the total land area.

Table 4: Excerpt from the RAP Census (inventory of impacted private parcels)

No.	Location (section)	Land plot no.	Type of impact	Category	Total area of plot (m2)	% affected
1	Gorazde (Ustikolina-Gorazde 8)	3900/47	Part of access road	Business	6470,00	1%
2		3900/27	Part of access road	Business	4882,00	0,50%
3		3909	Part of land	Land plot	1740,00	5-10%
4		3908	Part of d land	Land plot	1147,00	5%

One of the affected public land plots (plot number 4090) is being usurped. A small summer house of approximately 10 m² is erected on it. The summer house, depicted on figure 17 will be moved in order to assure safety during the construction and implementation period.

Figure 15: Small summer house on public land plot number 4090

Source: PC Roads of FBH

6.2. IMPACTS DURING CONSTRUCTION

Impact on Air Quality

Exhaust gases - The machinery that is used during the construction and delays, i.e. traffic standstills on the road due to works on reconstruction of road will lead to an increased emission of such gasses as SO2, CO2, CO, NOX and Pb.

Dust generation - where the most important polluters are solid particles (PM10 and PM2,5). Possible sources of dust generation include: site preparation activities, handling of building materials such as gravel, sand, asphalt, cement and the construction itself. The spreading of this pollution will depend on the weather conditions (wind strength and precipitation). The impact of dust emissions is not significant, it is temporary and of local character.

Impact on Noise Level and Vibrations

Noise emission is likely to appear during site preparation. Possible sources of noise are: ground preparation activities, use of tools and equipment, assembly of building materials on site; offloading of building materials such as gravel, sand, asphalt etc. and the work of construction machines in general.

Impact on Surface Water Quality

Possible contamination of water – may occur due to general construction activities and malpractice including inappropriate extraction of resource material, handling of hazardous substances (i.e. asphalt, chemicals and paint), inadequate waste handling, liquid and solid, equipment damage which may lead to leakage of lubricants and fuel (increased blurring, input of fats and oils) etc. These impacts can be avoided by working carefully, so the construction will not have a significant negative impact on the water.

Impact on Soil Quality

- Soil compaction due to heavy machinery (vehicles and equipment for construction) moving around the location;
- Uncontrolled (storing, handling and depositing) and untreated waste is one of the major sources of pollution that can disrupt soil quality.

Impact on Biological and Natural Resources

- Pollution of the Drina River and soil with hazardous substances (fuel and oils in case of spills) can harm biodiversity of the river and its surrounding area.

Impact on Protected areas

The observed project is not situated in any of the existing or planned protected areas.

Impact on Landscape Values

Partial alternation of landscape and visual aspects can be expected with organization of construction sites, presence of personnel and machinery on site. These impacts are temporary and negligible.

Impact on Traffic Safety and Traffic Flow

Traffic congestion and obstructions on road section - increased traffic flow, leading to congestion and obstruction is likely to be experienced on major road M20during the construction.

No complete traffic stoppage is planned due to construction activities of the project roundabout.

Trenches are likely to be made during implementation of construction activities, including earthworks and temporary storage of construction material.

Population Safety Impact

According to local practice, no working camps will be set up for the purpose of accommodation of workers. All workers will commute daily to the construction site. Thus the impact of worker's presence on local community is minor.

The vicinity of the construction site: safety issues regarding local population that can occur due to the vicinity of the construction site includes:

- Inadequate noise levels that can impact the health of the local population
- Ilicit entrance to the construction sites by local population (children)
- Reconstruction also may lead to interruption of land use by inadequate waste management in terms of uncontrolled and untreated waste (e.g. accidental spills from construction machinery, solid waste generated by workers on the construction site) that might be harmful to local communities.

Socio-Economic Impacts

Temporary land use and damage to private property: At this moment it is not expected that it will be necessary to temporarily occupy any privately owned land plots for lodging machines and disposal of materials. Machines and Materials will be disposed on land owned by the Investor alongside the project road. However, if temporary occupation of private land is needed during construction, this will be agreed upon with respective owners and the compensation will be paid in accordance with provisions determined in the RPF and Integrated RAP before the land is accessed.

Access restrictions: No access restriction to nearby residential or any other facilities is expected during construction works.

New workplaces and impacts on local businesses (positive): New business opportunities are expected to be created for local businesses such as transporters, suppliers and other service providers. The project is expected to have positive impact on the local employment opportunities with opening new workplaces during road construction. This impact is considered to be short term and small due to small scope of civil works.

Impact on living conditions of local communities

Following adverse impacts during construction are expected:

- Traffic disruptions,
- Noise increase,
- Inappropriate disposal of construction waste,

- Disruptions to water and electricity supply, telephone and Internet connections, waste collection, regular public transport, delivery of mail,
- Potential hazards form the proximity of construction activities.
- Local businesses can be affected in means of late delivery of goods and products. The impact is short termed and minor due to the expected short duration of civil works.

6.3. IMPACTS DURING OPERATION AND MAINTENANCE

Neither new negative impacts, nor deterioration of existing negative impacts, during operation and maintenance are expected.

6.4. POSITIVE IMPACTS

Project implementation will have positive impacts on the quality of life of the local community. There are several environmental and social opportunities that were detected in the project:

- Improved safety for drivers due to the correction of unsafe elements of the road section
- Improved pedestrian safety due to construction of pedestrian lanes along populated stretches.
- More efficient and safer traffic system: by decreasing the time of travelling, lower number of traffic accidents, lower costs of maintenance and management;
- Improvement of transport system and accessibility;
- Developed road structure with improved access to and out of the project area;
- Benefits to vehicle users and users of public transportation due to improved traffic connections and capacity;
- Lowering traffic congestions by increasing traffic flow;
- Increased travel speed and travel quality;
- Reduced pollution of river Drina and its environment due to drainage water treatment (installation of grease and oil separator).

6.5. ENHANCEMENT MEASURES

- Table 5: Enhancement Measures

Impact	Improvements to be achieved	Cost Assessment (US$)		Institutional Responsibility	
		Operative	Implementation	Operative	Implementation
▪ Traffic	▪ Better traffic flow; ▪ Reduction in time travel and cost by enhancing road surface and building a roundabout; ▪ Improved road and travel safety; Increased pedestrian safety by designing footpaths.	-	-	Contractor	PC Roads FBH
▪ Socio-economic	▪ New job and business opportunities for local construction workers and firms (temporary); ▪ Improvement of connections of local population to the municipality center Goražde	-	-	Contractor	PC Roads FBH
▪ Water	▪ Improvement of the protection of the Drina river with implementing a treatment of drainage water (installation of grease and oil separator) and regular maintenance of it;	Included in construction works	Included in supervision	Contractor	PC Roads FBH
▪ Visual aesthetic and landscape	▪ Improving visual aspects of the road and surrounding area.	Included in construction works	Included in supervision	Contractor	PC Roads FBH

7. MITIGATION MEASURES

The purpose of this ESMP is to set forth mitigation measures associated with the environmental impacts identified for this given project activity. The mitigation measures are included in this section and summarized in Table 6. This chapter includes also the general provisions and mitigation measures that the contractor hired for reconstruction will need to obey and/or perform. The requirements that the Contractor needs to follow, beyond the provisions of the ESMP, will be outlined in a number of planning documents (plans) that will be developed by the contractor prior to any start of works. The development of such documents will allow for adjustments of the ESMP measures based on the potential new findings on the site, as a result of the public consultations or developing the project specific baseline.

As a part of Tendering Documents (TD) for the Contractor, PC Roads FBH will require that the Contractor submit a Construction Site Organization Plan (CSOP), which will highlight certain requirements both for completion of works and implementation of mitigation measures.

CSOP consists of following components[5]:

(i) Description of the preparation works and description of location organization during and after the construction (design of access roads, internal roads, manipulative and parking spaces, layout of installations, design and organization of temporary construction site facilities, terrain rehabilitation upon completion of works). This part of CSOP needs to contain technical description, calculation and graphical appendices, and BoQ.

(ii) Technological scheme (location and operation of the storage and disposal sites of the materials, location of the mechanization maintenance, disposal sites for special types of waste, storage of dangerous and harmful substances). This part of CSOP needs to contain technical description, calculation and graphical appendices, and BoQ.

(iii) Elaborate on safety (Elaborate on safety on work and Elaborate on protection from fires and explosions), which shall include according to provision of this ESMP a Management Plan in Case of Accidents (MPCA); and

(iv) Practical plan of the implementation of this ESMP and among other a detailed Waste Management Plan (WMP)].

Additional request for the Contractor, as stipulated by ESMF and this ESMP, is to design and submit a detailed Traffic Management Plan (TMP) 30 days prior to commencement of

[5] *Ordinance on Construction Site Organization, Mandatory Documents on Site and Participants in Construction (Official Gazette of the FBH No.48/09)*

works (in accordance with Appendix 4. Road Safety Management of the ESMF). The TMP shall also include management of traffic according to the season, notably trying to minimize impacts during the summer months.

Within the framework of the project, PC Roads FBH prepared a Resettlement Policy Framework (RPF) which clarifies land acquisition/resettlement and compensation principles, organizational arrangements and procedures for planning land acquisition/resettlement. The RPF also serves as a guide for preparation of site-specific Resettlement Action Plans (RAPs). This sub-project is included in the Integrated RAP, disclosed and consulted in March 2016.

7.1. MITIGATION MEASURES IN PRE-CONSTRUCTION PHASE

7.1.1. Contractor Management

PC Roads FBH will ensure that the construction intervention is carried out without risk to the health and safety of all workers and local community trough contract clauses. Therefore, the Contractor will plan, coordinate, control and monitor the undertaken activities to effectively minimize the risks presented during their work.

The ESMP is forming part of the tendering documents and the Contract for Execution of Works. It is the Contractor's obligation to include the implementation of environmental and social mitigation measures into the overall cost.

The Contractor will be required to provide a short statement that confirms that:

- The ESMP conditions have been estimated and included into the bid price,

- The Contractor for Execution of Works has a qualified and experienced person on the Contractor‘s team who will be responsible for the environmental and social compliance requirements of the ESMP.

- The Contractor will comply with applicable BH and FBH laws, EU standards and WB requirements, including the relevant Operational Policies, this ESMP, framework ESMF and the Environment, Health and Safety guidelines, where applicable.

The following contractual conditions shall apply to the Contractors for Execution of Works employed by PC Roads FBH:

- The Contractor will be required to prepare site-specific CSOP in accordance with the requirements of this ESMP. All submitted CSOPs should be formally reviewed by PC Roads FBH prior to agreement and signing.

- The Contractor will provide formal written reports to PC Roads FBH in accordance with requirements set-out in the ESMP which is part of this document;

- PC Roads FBH is responsible to introduce all contractors and sub-contractors and personnel working on the Project on the contents and provisions of this ESMP and any penalties arising from non –compliance therewith;

- The Contractor is responsible for notifying PC Roads FBH immediately upon receiving any complaints or grievances, as well as immediately upon identifying and implementing any of any corrective actions. The Contractor shall inform the complainant of the Grievance redress mechanism. All grievances will be registered with the Central Feedback Desk (CFD) and logged in the Central Grievance Log. Contractor will fill out the grievance registration template provided in Appendix 2 of this ESMP on aregular basis and will make it a part of the monthly reports to the Contractor.

- The Contractor shall provide monthly reports on its management and monitoring of the working conditions of direct and indirect employees on the work site and ensure that systems are in place to monitor compliance with labor and health and safety standards.
The contractor shall:

- Ensure that all workers are required to comply with all national/federal legislation on labor and health and safety, as well as any other relevant standards, including the World Bank Group EHS guidelines; and be held responsible if compliance is not met;

- Be responsible for all activities undertaken by his subcontractors;

- Maintain regular effective two-way communication with all workers, sharing information and assisting in dealing with any unforeseen problems promptly.

- Exchange information and request any plans from sub-contractors, which deals with significant health and safety hazards and risks created by or associated with their work activities.

The recommendations and proposed mitigation measures will be attached to the tendering documentation and subsequently the contract with the Contractor. The ESMP is a part of the work program and as such, it needs to be addressed to the Contractor and carried out as required.

During the construction phase, Contractors will be required to allocate the responsibility of overseeing day-to-day compliance with the SS ESMP to a senior member of staff. Contractors will be responsible for the implementation of all measures included in the SS ESMP for all activities undertaken in terms of the construction contract (including work undertaken by subcontractors). Compliance of Contractors with these measures will be

assessed by the Construction Supervisor appointed by the JP Ceste FBIH, in line with the Decree on Construction Site Organisation, Mandatory Documentation on Construction Site and Construction Work Participants.

7.1.2. Land acquisition and Involuntary Resettlement

The project roundabout is a part of the integrated Resettlement Action Plan (RAP) *for 9 sub*-projects which was publicly consulted and disclosed in March 2016. As described in the integrated RAP, small parts of 4 private and 2 public land plots will be expropriated.

All land acquisition and expropriation will be conducted in compliance with the applicable legislation in FBiH (in particular, the Law on Expropriation of FBiH), the requirements set by WB OP 4.12 on Involuntary Resettlement and the integrated RAP.

All owners, occupants and users of affected properties at the time of the cut-off date, whether with or without fully recognized ownership rights, are eligible for certain type of compensation or assistance as outlined in the Entitlements Matrix in the Integrated RAP.

Compensation will always be effected prior to land entry or taking of possession over property by the expropriation beneficiary. The land cannot be taken physically (i.e. any civil works or construction cannot start) before compensation has been paid to the affected persons.

All affected persons will be informed, meaningfully consulted and encouraged to participate throughout the land acquisition process, in accordance with the information disclosure and consultation requirements set out in the integrated RAP.

In addition, an effective grievance mechanism is in place for receiving and addressing in a timely fashion specific concerns about compensation and relocation raised by displaced persons, in the manner described in more detail in Chapter 10.2.1 of this ESMP (Grievance Mechanism).

7.2. MITIGATION MEASURES DURING CONSTRUCTION PHASE

7.2.1. Environmental Management

During the construction phase, the Contractor shall award the responsibility of supervising everyday compliance with ESMP to a senior engineer.

The Contractor will be responsible for the implementation of all measures included in the ESMP for all activities undertaken in terms of the construction contract (including work undertaken by sub-contractors).

Compliance of Contractorwith provision of ESMP will be assessed by the Construction Supervisor appointed by PC Roads FBH, in accordance with the Ordinance on Construction Site Development, Obligatory Documents on Construction Site and Participants in Construction Work (Official Gazette of the FBH, No. 48/09, 75/09 and 93/12).

Compliance reviews will be submitted by Contractor to PC Roads FBH on a monthly basis. Non-conformances, incidents and deviations from the ESMP will be communicated to PC Roads FBH, or the Supervisor, as soon as possible, within 24 hours form the time of occurrence, where PC Roads FBH shall react to the occurrence a.s.a.p. and impose corrective measures with a deadline for undertaking them.

All mitigation measures are specified in the Table 6. Environmental and Social Impacts Management Plan.

7.2.2. Health and Safety

Works on the reconstruction may pose health and safety risks for construction workers and visitors to the construction site. Population near the construction site and construction workers, as well as road users will be exposed to the risk of: biophysical health risk factors, (e.g. noise, dust, chemicals, construction material, solid waste, waste water, vector transmitted diseases etc.), and (ii) road accidents from construction traffic.

Therefore, the Contractor is obliged to:

- Ensure that only properly trained/licensed people operate heavy machinery;
- Implement suitable safety standards for all workers and site visitors, which should not be less than those laid down in the international standards in addition to complying with the national standards of the FBH[6],
- Make sure basic safety features for visitors are in place, such as construction warning signs for protecting unsafe areas from being accessed or the obligation for every visitor to wear a helmet before entering the construction site
- Provide the workers with a safe and healthy work environment, taking into account inherent risks in its particular road rehabilitation activity and specific classes of hazards in the work areas,

[6]*- Occupational Safety and Health Convention, 1981 (No. 155)*

- Promotional Framework for Occupational Safety and Health Convention, 2006 (No. 187)

- The Safety and Health at Work Directive 89/391/EEC

-World Bank Occupational Health and Safety Guidelines (April 30, 2007.)

- and other Recommendations and EU directives

- Provide personal protective equipment (PPE) for workers, such as safety boots, helmets, masks, gloves, protective clothing, goggles, full-face eye shields, and ear protection. Maintain the PPE properly by cleaning dirty equipment and by replacing damaged equipment with new one.
- Safety procedures include provision of information, training and protective clothing to workers involved in hazardous operations and proper performance of their job.
- Appoint an environment, health and safety manager to look after the health and safety of the workers.

7.2.2.1. Safety Engagements

The Contract should ensure that all possible risks in the course of work are eliminated or reduced to a minimum. In order to prevent the possibility of higher-scale accidents it is necessary to plan and develop the measures to help reduce the adverse impacts. The Contractor's duty is to create a Management Plan in Case of Accidents (MPCA).

The MPCA should include organizational structure, responsibilities, procedures, communication, training, resources and other measures needed to provide appropriate reaction of the Contractor in case of accidents which might occur during the project. The most important items of the MPCA are as follows:

- Identify potential hazards and large-scale accidents,
- General procedures for all emergencies and accidents that might occur during the project due to natural disasters, defects on equipment of human errors,
- Description of preventive measures against accidents,
- Workers training for their roles and responsibilities when accident occurs,
- Determining responsible person at the spot,
- Urgent communication procedures,
- Information and contacts of important local authorities and emergency services,
- Internal and external alarming,
- Response plans for specific types of hazards, for example medical assistance, fire etc.

The MPCA should include:

- Spill Response Plan,
- Emergency Preparedness,
- Response Plan to Accidents.

The contractor is also obliged to:

- The contractor should provide portable toilets at the construction sites, if about 25 people are working the whole day for a month. Location of portable facilities should be at least 6 m away from storm drain system and surface waters. These portable toilets should be cleaned once a day and all the sewerage should be pumped from the collection tank once a day and should be brought to the common septic tank for further treatment.
- Contractor should provide bottled drinking water facilities to the construction workers at all the construction sites.

The Contractor is obliged to secure the construction site in accordance with the Regulations on Occupational Safety and to provide adequate equipment

In case compliance is not met the contractor will be held responsible in accordance with Labor Protection Law.

7.2.2.2. First Aid

The Contractor shall:

- Ensure that facilities that provide health care and first aid are easily accessible. Appropriately equipped first aid stations are to be easily accessible in the whole work area;
- Documenting and reporting accidents, diseases and incidents on workplace;
- Prevent accidents, injuries and diseases originating from, in connection with or arising in the course of work, reducing as much as possible the possible cause of danger in the way which is in accordance with good international practice of;
- Identify potential dangers for works, particularly those that might pose threat to life, and provide the necessary preventive and protective measures;
- Ensure that construction site drivers strictly comply with the rules of driving;
- Ensure appropriate lighting in city urban area and alongside roads.

7.2.3. Traffic and Road safety

The Contractor shall ensure traffic and road safety during performance of works.

The Contractor shall develop the CSOP which includes preparation and organization of construction site during and after construction, including roads on the construction site i.e. Traffic Management Plan (TMP).

Traffic on construction site is to be regulated the same way as public traffic roads.

The Contractor is obliged to:

- Prepare and deliver TMP to PC Roads FBH for its approval, no later than 30 days upon the beginning of works on any component of the project included in traffic redirection and management.
- For the purpose of uninterrupted traffic movement during the reconstruction of the crossroad, include in TMP the following parts: detailed drawings of traffic solutions by showing all bypasses, temporary roads, temporary turns, necessary barricades, signalization/lighting, traffic signs etc.
- Ensure signs in strategic parts of traffic roads.
- Install and maintain a sign on each important crossroad, on roads which will be used during reconstruction works, which will clearly indicate the following data in a local language:
    - Location: station label and settlement name
    - Duration of construction
    - Period of the proposed bypass/alternative road
    - Name and contact address/telephone number of responsible personnel
    - Name and contact address/telephone number of contractor
    - Sincere apology for the caused inconvenience

According to the Law on Roads FBH, article 77. For every construction on public road, for works on regular maintenance or any other works under traffic, appropriate temporary signage has to be set up. Respectively traffic has to be regulated in a way that will guarantee safety of traffic and contractor with minimum traffic flow disruptions.

The appropriate signage will be determined based on the Regulations on Traffic Signs (Regulations on Traffic Signs and Signage on Roads, Ways of Marking Works and Obstacles on Roads and Signs that an Authorized Person Can Give to Participants in Traffic ("Official Gazette of BiH", No. 16/07)) and in line with the Guidelines for Design, Construction, Maintenance and Control on Roads (Sarajevo/Banja Luka 2005).

TMP should include details about the following:

- Construction plan by phases,
- Beginning and duration of works,
- Overview of the existing conditions near the construction site,
- Identification of affected areas,

- Mitigation measures,
- Plan of public transport, for example, timetable, change of timetable, disturbance and the like;
- Circulation plans, including zones of entry and exit, routes for towing of material, turnaround points, parking areas, zones of interlocking with other traffic roads etc.,
- Routes for pedestrians and vehicles,
- Traffic controls for each expected intervention, including illustrations of barriers, paths, signalization plan, warning signs etc.,
- Requirements for special vehicles, for example, those of large dimensions,
- Construction works paths (access, ramps, loading, unloading),
- Connection roads for supply vehicles and storage of material,
- Expected interaction of pedestrians and vehicles,
- Roles and responsibilities of persons on construction site regarding traffic management,
- Instructions on the procedures regarding traffic control, including urgent situations.

TMP should also include appropriate communication with affected population about traffic and timely information of traffic changes/road blockage.

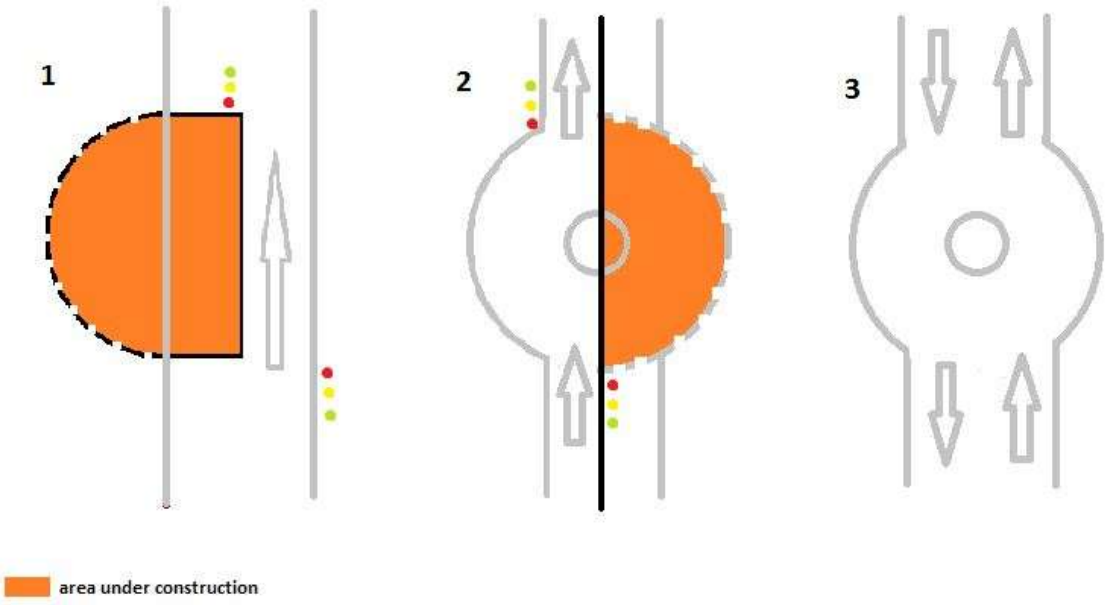
TMP should be monitored on a regular basis (responsibility of the supervision engineer) and audited to ensure effective implementation and to take into consideration any changes on construction site. All workers on construction site should be acquainted with the TMP.

Road safety measures envisaged during construction include vertical and horizontal signage based on Regulations on Traffic Signs (Regulations on Traffic Signs and Signage on Roads, Ways of Marking Works and Obstacles on Roads and Signs that an Authorized Person Can Give to Participants in Traffic ("Official Gazette of BiH", No. 16/07)) as shown in figure 8.

Organization of traffic flow during the constructionof the roundabout will have three phases as depicted in figure 20:

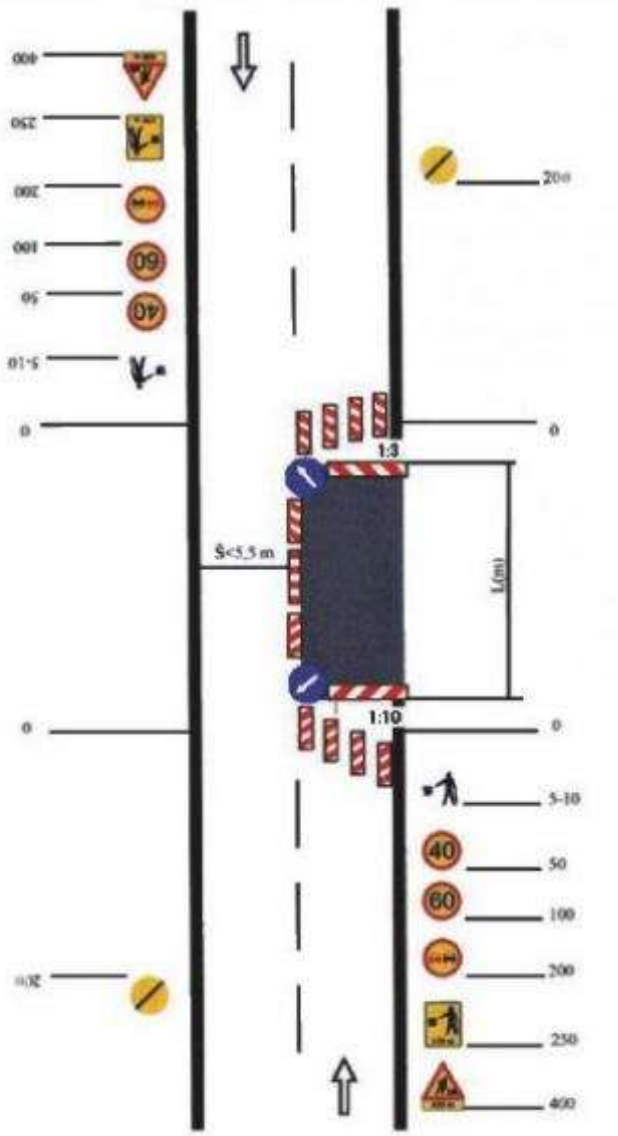
1. While the first part of the roundabout is being constructed traffic will flow on the other half in a one way regime
2. While the second half of the roundabout is being constructed, traffic will flow on the constructed half in a one way regime
3. Once the roundabout is formed traffic will flow regularly

Figure 16: Scheme of traffic flow during construction



Source: PC Roads

Figure 17: Scheme of traffic signage that will be used during construction period



Source: PC Roads

7.2.4. Construction Site Safety

The Contractor shall secure the construction site. The construction site should be accompanied with a board with information on works and participants in construction (investor's name, contractor's name, project designer's name, name and type of construction being built, beginning and end of works). These measures are necessary so the Contractor could ensure safety of construction site and prohibit entry ensure of unauthorized persons.

The Elaborate on safety on work and Elaborate on protection from fires and explosions should include detailed measures of safety on construction site in order to ensure safety of location and remove possible risks and adverse impacts on employees and unauthorized persons.

7.2.5. Land Acquisition, Involuntary Resettlement and Economic Displacement

At this moment, it is not expected that any private land will have to be occupied during construction for lodging machines and disposal of materials. However, if temporary occupation of private land is needed during construction, this will be agreed upon with respective owners and the compensation will be paid in accordance with provisions determined in the RPF before the land is accessed. The contractor is responsible for keeping the works within the right of way.

7.3. MITIGATION MEASURES IN OPERATIONAL PHASE

It is required to undertake the instructions given in the Table 6. Environmental and Social Impacts Management Plan in operational phase.

7.4. SUMMARY OF MITIGATION MEASURES

- Table 6: Environmental and Social Impacts Management Plan

Impact/Problem	Mitigation Measures	Cost Assessment (US$)		Institutional Responsibility		Comments
		Operative	Implementation	Operative	Implementation	
PRE-CONSTRUCTION PHASE						
▪ Restricted access.	▪ Development of the TMP.	Included in the bid	Internal resources	Contractor	PC Roads FBH	
▪ Impacts on living conditions.	▪ Informing the local communities on the extent of works and duration prior to the commencement of construction works via local newspapers, the municipality's notice board and website and via PC Roads' website as soon as the contract is signed. ▪ informing road users via the construction site information board, and an information leaflet at the construction site	Internal resources	Internal resources	PC Roads FBH	PC Roads FBH	Road users are orderly informed about construction works on roads via radio news and auto-moto club's press releases
▪ Expropriation, involuntary resettlement and economic displacement	-All land acquisition and expropriation will be conducted in compliance with the applicable legislation in FBiH and the Integrated RAP - Compensation will always be paid out prior to land entry or taking of possession over property by the expropriation beneficiary. -. Cash compensation will be provided at replacement cost according to the entitlement	Internal resources	Internal resources	PC Roads FBH + Municipality of Goražde		

Impact/Problem	Mitigation Measures	Cost Assessment (US$)		Institutional Responsibility		Comments
		Operative	Implementation	Operative	Implementation	
	matrix in the integrated RAP -All affected persons will be informed, meaningfully consulted and encouraged to participate throughout the land acquisition process, in accordance with the information disclosure and consultation requirements set out in the integrated RAP. ▪ Assuring an effective grievance mechanism for receiving and addressing in a timely fashion specific concerns about compensation and relocation raised by displaced persons, in the manner described in more detail in Chapter 10.2.1 of this ESMP (Grievance Mechanism).					
▪ Compliance with national legislation.	-Obtaining all necessary permits for Project implementation.	Internal resources	Internal resources	PC Roads FBH + Project designer	Competent body for issuing the permit	Prevention of negative impacts
▪ Restrictions on land use and damages on private property and businesses.	▪ Avoid private properties where possible; ▪ The Contractor will organization the construction site in collaboration and agreement with the municipality of Goražde; -In case occasional land occupation cannot be avoided, compensation will be provided to affected owners/users (application of RPF and RAP), as well as compensation for loss of the possibility to	Internal resources	Internal resources	Contractor + PC Roads FBH	PC Roads FBH	If occasional land use cannot be avoided, it will be agreed upon with respective owner and compensation will be paid before the land is

Impact/Problem	Mitigation Measures	Cost Assessment (US$)		Institutional Responsibility		Comments
		Operative	Implementation	Operative	Implementation	
	continue to use land and businesses as intended.					accessed
▪ Job creation and impacts on local business.	▪ Informing the public in advance about the construction works, in order to enable businesses and workforce in the area to prepare for the demand on the market via local newspapers, the municipality's notice board and website and via PC Roads' website as soon as the contract is signed. ▪ Informing business owners in advance about the construction works, in order to be able to plan the necessary road use accordingly (via local newspapers, the municipality's notice board and website and via PC Roads' website as soon as the contract is signed)	Internal resources	Internal resources	PC Roads FBH	Contractor + PC Roads FBH	.
CONSTRUCTION PHASE						
▪ Impacts on living conditions of local community;	▪ Providing timely information to the citizens on any type of disruption and inconvenience via local newspapers, the municipality's notice board and website and via PC Roads' website as soon as the contract is signed.; ▪ Implementation of TMP; ▪ Implementation of CSOP; ▪ Implementation of ESMP provisions.	Included in construction works	Included in supervision	PC Roads FBH (providing informations to the citizens)+ Contractor (implementation of the TMOP, CSOP,	Supervisory body*	

Impact/Problem	Mitigation Measures	Cost Assessment (US$)		Institutional Responsibility		Comments
		Operative	Implementation	Operative	Implementation	
				ESMP)		
▪ Impacts on local traffic: ▪ increase of local traffic, including heavy machinery and trucks; ▪ closing one of the traffic lanes for construction purposes causing traffic delays and limited access.	▪ Implementation of TMP; ▪ Introduction of appropriate signalization and warning signs; ▪ Adjustment of working hours to local traffic patterns, e.g. avoiding major transport activities during rush hours; ▪ Traffic management system and staff training, especially for site access and near-site heavy traffic; ▪ Provision of safe passages and crossings for pedestrians where traffic interferes.	Included in construction works	Included in supervision	Contractor	Supervisory body*	In collaboration with the local Ministry of the Interior
▪ Temporary occupation of privately or publicly owned land plots in case of unforeseen events	▪ Avoidance of temporary occupation of privately owned plots; ▪ In case avoidance is not possible, minimize size of the area used and impacts on the vegetation and implementation of RPF and RAP provisions on temporary occupation.	Internal resources	Contractor	PC Roads FBH	PC Roads FBH	
▪ Air emissions: - exhaust gasses; - dust generation.	▪ High quality fossil fuels (with low percentage of sulphur and lead) need to be used for construction machinery and equipment; ▪ All machines and vehicles to be used in	Included in construction works	Included in supervision	Contractor	Supervisory body*	

Impact/Problem	Mitigation Measures	Cost Assessment (US$)		Institutional Responsibility		Comments
		Operative	Implementation	Operative	Implementation	
	construction/ reconstruction/ rehabilitation activities must have use permit; ▪ Vehicles need to be regularly maintained ; ▪ Equipment with installed filters to reduce soot emission needs to be used; ▪ When not in use the equipment and machinery need to be shut down; ▪ Maximum speed of the vehicle on unpaved roads should be restricted to 20 km/h; ▪ Moistening/ wetting the site to prevent dust occurrence (in areas with dry soils or where activities generate dust); ▪ Sand and gravel materials need to be transported in covered trucks.					
▪ Increased level of noise and vibration: - noise emission and noise disturbance; - vibration.	▪ In the case of noise complaints by local residents, simultaneous use of machines that generate noise over 70 dB needs to be limited; ▪ In the case of noise complaints by local residents, number of trucks per day visiting the site needs to be reduced; ▪ All machines and vehicles to be used in construction/ reconstruction/ rehabilitation activities must have use permit;	Included in construction works	Included in supervision	Contractor	Supervisory body*	

* *Supervisor shall be a Consultant appointed by PC Roads FBH according to Federal legislative*

Impact/Problem	Mitigation Measures	Cost Assessment (US$)		Institutional Responsibility		Comments
		Operative	Implementation	Operative	Implementation	
	▪ When not in use the equipment and machinery need to be shut down; ▪ Maximum speed of the vehicle on unpaved roads should be restricted to 20 km/h.					
▪ Emissions into water: - possible contamination of surface water.	▪ Ensure there is an emergency plan to contain all leaks and spills that result from an accident. ▪ Prevent any repairs, handling of machinery, fuels or lubricants in areas that are not designated for such use. ▪ Proper waste disposal and separation of hazardous waste is required, as well as the engagement of authorized companies for final waste disposal; ▪ Oil and fuel collection systems to be fitted to prevent leakage; ▪ Vehicles and machines need to be regularly maintained to prevent leakage.	Included in construction works	Included in supervision	Contractor	Supervisory body*	
▪ Soil degradation and emissions to soil: - soil contamination by oils, fuels and other hazardous substances.	▪ Proper waste disposal; separation of hazardous waste; engagement of authorized companies for final waste disposal; track of the final disposal sites especially for removed asphalt; note/record of the waste amounts; ▪ Oil and fuel collection systems to be fitted to prevent leakage	Included in construction works	Included in supervision	Contractor	Supervisory body*	
▪ Decrease in the aesthetic value of the landscape due to	▪ The land determined for use by the Project can only be used for the construction activities and no	Included in construction	Included in	Contractor	Supervisory	

Impact/Problem	Mitigation Measures	Cost Assessment (US$)		Institutional Responsibility		Comments
		Operative	Implementation	Operative	Implementation	
construction site organization.	other land is available for i.e. storage of building material, parking of the heavy machinery etc. in terms of soil disruption;	works	supervision		body*	
▪ Inadequate traffic management during construction: - traffic congestion and obstructions on road sections;	▪ Implementation of EMP which includes the: - Design and implementation of the TMP, - Placement of adequate traffic signalization.	Included in construction works	Included in supervision	Contractor	Supervisory body*	
▪ Inadequate waste and soil handling.	▪ Implementation of WMP that shall ensure environmentally sound collection of waste, its storage, transport and final disposal, and primarily reuse / recycling. ▪ No clandestine waste disposal will be allowed on site, including open burning of wastes. ▪ The waste should be stored for a short period of time and should be removed as soon as possible. ▪ The waste should be primarily recycled or reused where possible and then finally disposed ▪ No open burning of wastes is allowed on site ▪ All waste that cannot be reused should be handed over to a licensed company or agent (amounts are to be recorded as well as types of handling	Included in construction works	Included in supervision	Contractor	Supervisory body*	

* *Supervisory body shall be a Consultant appointed by PC Roads FBH according to Federal legislative*

Impact/Problem	Mitigation Measures	Cost Assessment (US$)		Institutional Responsibility		Comments
		Operative	Implementation	Operative	Implementation	
	actions). ▪ Disposal sites of construction material will be determined by the municipality and should be handled in the most appropriate environmental manner. ▪ All excavated soil need to be stored or used for a different purpose, in line with permits provided by the municipality.					
▪ Inadequate organization of construction site.	▪ Implementation of CSOP	Included in construction works	Included in supervision	Contractor	Supervisory body*	
▪ Inadequate workers safety.	▪ Implementation of work safety measures: - Provide workers with a safe and healthy work environment, - Provide personal protective equipment, - Respect safety procedures, - Provide portable toilets, - Provide drinking water	Included in construction works	Included in supervision	Contractor	Supervisory body*	
▪ Accidental situations i.e. spills, leakage of oils, fats, fuels and similar hazardous materials.	▪ Implementation of MPCA which includes: - Spill Response Plan, - Emergency Preparedness and Response Plan.	Included in construction works	Included in supervision	Contractor	Supervisory body*	

* *Supervisory body shall be a Consultant appointed by PC Roads FBH according to Federal legislative*

Impact/Problem	Mitigation Measures	Cost Assessment (US$)		Institutional Responsibility		Comments
		Operative	Implementation	Operative	Implementation	
	▪ Implementation of Elaborate on protection from fires and explosions ▪ Implementation of Labor Protection Law					
▪ Materials supply and transport.	▪ Implementation of CSOP to ensure materials are transported in covered vehicles to reduce impacts on environment and Management Plan on Safety at Work to ensure materials are used in accordance with Bill of Quantities	Included in construction works	Included in supervision	Contractor	Supervisory body*	
CHANCE-FIND PROCEDURES DURING CONSTRUCTION PHASE						
▪ Impacts on cultural heritage.	▪ If archeological findings or other chance finds appear on or near construction site immediate work suspension and local authorities notification is required;	Included in construction works	Included in supervision	Contractor	Supervisory body*	In case of finding cultural heritage, supervision is implemented by the competent institution
OPERATION PHASE						

* *Supervisory body shall be a Consultant appointed by PC Roads FBH according to Federal legislative*

Impact/Problem	Mitigation Measures	Cost Assessment (US$)		Institutional Responsibility		Comments
		Operative	Implementation	Operative	Implementation	
▪ Regular occurrences during road operation	▪ Regular road maintenance	Incl. in maintenance works	Internal resources	Contractor for maintenance works	PC Roads FBH	
▪ Contamination of river Drina	▪ Installation of oil separators in accordance with EN ISO 858-1 and 858-2 ▪ Regular maintenance of the water treatment system in accordance with Maintenance Department of PC Roads FBH	Included in maintenance works	Internal resources	Contractor for maintenance works	PC Roads FBH	
▪ Decrease in road safety due to the increase of traffic	▪ Regular maintenance of road safety equipment and signage	Incl. in maintenance works	Internal resources	Contractor for maintenance works	PC Roads FBH	

8. ENVIRONMENTAL MONITORING PROGRAM

The table below presents monitoring plan necessary for construction site – developed in connection with mitigation measures to avoid or reduce negative impact.

Prior to commencement of works, in accordance with requirements of the ESMP, and a minimum of monitoring requirements, described in table below, without limitation to these requirements, the Contractor shall prepare detailed list of mitigation measures and parameters to be monitored and prepare the site-specific baseline data as foreseen in the monitoring plan below.

The monitoring plan on construction site will be used by Supervision Engineers of PC Roads FBH. These signed lists will be forwarded to PC Roads FBH, who will be responsible for monitoring and reporting about the compliance.

PC Roads FBH will maintain a registry of grievances, which will contain all information on grievances or complaints received by the community or other interested parties. That will include: type of grievance, time and actions for their resolution and outcome.

- Table 7: Environmental and Social Monitoring Program

Potential impact	Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed?	When will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Implementation	Operative	Implementation	Operative
PRE-CONSTRUCTION PHASE								
▪ Job creation and impacts on local businesses.	▪ Number of employed persons from local communities; ▪ Timely informing the local communities about the forthcoming works.	Wider area of construction	Inspection	Prior to construction	Included in performance	Included in performance	Contractor	Contractor
▪ Expropriation, involuntary resettlement and economic displacement	▪ Implementation of RAP provisions	PC Roads of FBH	Monthly and quarterly internal reports	Prior to construction	/	50000	PC Roads of FBH+ Supervisory body	PC Roads of FBH+ Supervisory body
▪ Temporary occupation of privately owned land plots for the purpose of construction of access roads and placement of staff, machines and material.	▪ Implementation of RPF provisions	Construction site	Visual inspection and inspection	Prior to construction and during construction when necessary	Included in supervision	Included in supervision	Supervisory body + PC Roads FBH	Supervisory body + PC Roads FBH
CONSTRUCTION PHASE								
▪ Access restrictions.	▪ TMP in place, ▪ Implementation of RPF provisions on compensation procedures for businesses	Construction site	Visual inspection	Random checks at least once a week during the	Included in supervision	Included in supervision	Supervisory body + PC Roads	Supervisory body + PC Roads

Potential impact	Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed?	When will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Implementation	Operative	Implementation	Operative
	affected by access restrictions and livelihood restoration.			construction			FBH	FBH
▪ Restrictions on land use and damage to the private property (agricultural plots, horizontal infrastructure, fences and railings) due to disposal of construction waste, work camps and parks of heavy machinery	▪ CSOP in place; ▪ Implementation of RPF provisions on compensation procedures in case occasional land use cannot be avoided, compensation will be provided to affected owners/users ▪ grievances	Construction site	Visual inspection + Central Grievance Log	Prior to construction and random checks at least once a week during the construction	Included in supervision	Included in supervision	Supervisory body + PC Roads FBH	Supervisory body + PC Roads FBH
▪ Impacts on local traffic (increase of local traffic, including heavy machinery and trucks, operation of roads with only one lane causing traffic delays and limited access)	▪ TMP in place; ▪ Traffic patterns; ▪ Timely information to the citizens.	On construction site and nearby	Visual inspection and inspection	Random checks during the week	Included in supervision	Included in supervision	Supervisory body	Supervisory body
▪ Air emissions: - exhaust gasses; - dust generation	▪ Level of dust (amount of particles of sediment and floating particles); ▪ Emissions of exhaust gases from vehicles and	Construction site	Measuring devices	As a baseline and during construction when needed and upon	-	500 USD/measuring	Contractor	Authorized laboratory

Potential impact	Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed?	When will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Implementation	Operative	Implementation	Operative
	equipment; ▪ (SO_2, NO_2, dim and PM_{10}).			complaints by the citizens				
▪ Increased level of noise and vibration: - noise levels, - vibration.	▪ Level of noise.	In populated places near the construction site	Measuring devices	Upon order by supervisory organ or upon complaints by the citizens	-	500 USD /measuring	Contractor + Supervision	Authorized laboratory
▪ Emissions into water: ▪ possible contamination of surface water	▪ Analysis of parameters of surface water quality: - Chemical analysis (PH, turbidity, conductivity, temperature, suspended particles, COD, BOD, ingredients with nitrogen) - Standard bacteriological analyses	In watercourse near construction site downstream	Standard laboratory equipment and methods of water quality monitoring	As a baseline and upon order by supervisory organ or upon complaints by the citizens	-	1000 USD /measuring	Contractor + Supervision	Authorized laboratory
▪ Pollution of surface watercourses.	▪ Presence of oil film in surface watercourses.	In watercourse near construction site downstream	Visual inspection + Standard laboratory equipment and methods of water quality monitoring	Upon order by supervisory organ or upon complaints by the citizens	-	500 USD /measuring	Contractor + Supervision	Authorized laboratory

Potential impact	Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed?	When will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Implementation	Operative	Implementation	Operative
▪ Soil pollution	▪ Soil quality, including, PH, heavy metals, phosphorus, nitrogen, Na, Ca, salts, PAHs hydrocarbons	On representative plots of land near construction sites	Taking samples and standard laboratory analyses	As a baseline and upon order by supervisory organ or upon complaints by the citizens	-	500 USD /measuring	Contractor + Supervision	Authorized laboratory
▪ Emissions into water and soil due to improper waste handling.	▪ CSOP in place, ▪ Waste generation and management.	Construction site	Visual inspection, disposal records or receipts from landfills	Daily	Included in performance	Included in performance	Contractor + Supervision	Contractor
▪ Degradation of biological and ecological resources	▪ Survey of the site for any endemic or endangered species	In the zone of corridors of direct and indirect impacts	Field recordings and incorporation of the findings in the ESMP	As a baseline	-	-	Contractor	Authorized institution
▪ Waste and soil management.	▪ Implementation of CSOP and WMP. ▪ Soil management in line with permits provided by the municipality.	Construction site	Visual inspection, disposal records or receipts from landfills	Regularly during construction. Amount and disposal records	Included in performance	Included in performance	Contractor + Supervision	Contractor

Potential impact	Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed?	When will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Implementation	Operative	Implementation	Operative
				internal reports will be made daily and monthly				
▪ Accidental situations i.e. spills, leakage.	- Implementation of MPCA which includes: - Spill Response Plan, - Emergency Preparedness and - Response Plan.	Construction site	Visual inspection	Daily	Included in performance	Included in performance	Contractor + Supervision	Contractor
▪ Materials supply.	▪ Implementation of CSOP (the origin of material, material approvals etc.).	Construction site	Reports	Daily	Included in performance	Included in performance	Contractor + Supervision	Contractor
▪ Material transport.	▪ Implementation of CSOP (the origin of material, licenses etc.).	Construction site	Visual inspection	Daily	Included in performance	Included in performance	Contractor + Supervision	Contractor
▪ Workers safety.	▪ Implementation of work safety measures (protection equipment, toilets, drinkable water etc.).	Construction site	Visual inspection	Daily	Included in performance	Included in performance	Contractor + Supervision	Contractor
OPERATION PHASE								

Potential impact	Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed?	When will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Implementation	Operative	Implementation	Operative
▪ Water emissions	▪ Analysis of the water quality parameters: ▪ Chemical analysis (PH, turbidity, conductivity, temperature, suspended particles, COD, BOD, ingredients with nitrogen, total fats and oils, mineral oils);	At the treated water outlet	Sampling	Once a year	Internal resources	1000 USD/sample	PC Roads FBH	Licensed laboratory

9. IMPLEMENTATION AND REPORTING

9.1. PROJECT IMPLEMENTATION

PC Roads FBH is the implementer of the Project and shall be responsible for the implementation and compliance of the Project in line with the ESMP.

The public has the right to participate directly or indirectly, with a possibility to state their interests and opinion in decision-making process during all project activities.

The application of all identified environmental and social mitigation measures and the environmental monitoring program will be ensured. The Contractor will be responsible for the implementation of the environmental mitigation measures during construction and will employ environmental experts to supervise the implementation of Contractor's responsibilities and will be in communication with the investor and with the FMoET. PC Roads FBH will constitute a Grievances Committee which will receive all grievances during Project implementation in accordance with grievance mechanisms as prescribed in the ESMF. During project implementation, PC Roads FBH will supervise compliance of the Contractor with provisions and ESMP.

Upon project completion, PC Roads FBH will be in charge of structures' management and maintenance. Regular and timely payment will be carried out in accordance with monitoring plan.

9.2. REPORTING PROCESS

9.2.1. Contractor to PC Roads FBH

The Contractor shall prepare a Report on compliance with ESMP in form of a monthly progress report and submit it to PC Roads FBH in a local language (C/S/B and in English, in analogue and digital form).

In case of any accidental situations or jeopardizing the environment and society the reporting must be immediate. The Contractor is obliged to inform the PC Roads FBH and local community immediately after any accidental situations that happened over the phone +387 33 250 370 or via email form at the PC Roads FBH website: http://jpcfbih.ba/index.php/bs/kontakt.

The Contractor's reports to PC Roads FBH are to include a list and description of the performed activities, as well as recommendations and planned future activities and protection measures.

9.2.2. Supervision Engineer to PC Roads FBH

The Supervision Engineer shall prepare a Report on compliance with ESMP in form of a monthly progress report and submit it to PC Roads FBH in a local language (C/S/B and in English, in analogue and digital form).

9.2.3. PC Roads FBH to WB

PC Roads FBH shall prepare Annual Environmental Health and Safety Reports (AEHS), including monitoring indicators and reports on the implementation of their requirements set in ESPM and submit them to the World Bank for review.

In case of higher-scale accidents or deaths on construction site, PC Roads FBH shall promptly notify the World Bank thereof.

10.PUBLIC DISCUSSION AND INFORMATION DISCLOSURE

10.1. PUBLIC CONSULTATION

Public consultation of the subject ESMP will be organized in Goražde after the WB and PC Roads FBH approve the draft of the ESMP.

The public consultations will be announced in the local newspaper, on the web page of the municipality, on the notice board of the municipality and on the web page of PC Roads FBH minimum 15 days prior to the set date.

The record on public discussion, that is, grievances presented at the public discussion shall be recorded in the Grievance Register, and opinions and suggestions of the public shall be integrated into the final ESMP.

After public discussion the documents shall be disclosed again.

10.2. INFORMATION DISCLOSURE

ESMP draft will be available on the website of PC Roads of the (www.jpcfbih.ba) in a local language and on the website of the WB in English. During the process of public consultation the interested public will obtain all information regarding the project, including anticipated

social and environmental impacts. The findings of the assessment will be presented in a simple way.

During construction period, the Contractors will submit monthly information to PC Roads FBH regarding process of work, which will be published on the websites of PC Roads FBH and BHAMK (Car Association of BH) regarding temporary traffic regulation.

Schedule of works and potential changes to the schedule will also be announced two weeks prior to the beginning of works on the website of PC Roads FBH and in local newspapers, radio and television stations for disclosure. The schedules will provide information on the beginning and end of works, which can impact the affected groups (such as changes to traffic/water/regime of electric energy supply and access, noise and dust due to construction works).

10.2.1. Grievance Mechanisms

Besides the institutionally available ordinary and extraordinary legal remedy, and existing institutional channels, PC roads FBH will ensure and form a special Grievance Redress Mechanism in collaboration and direct involvement of those municipalities under whose administrative authority the project is carried out, in this case with the Goražde municipality.

Grievance redress mechanism designed for this project is the **Central Feedback Desk (CFD)** at the level of the implementing agency PC Roads FBH which shall serve as both project level information center and grievance mechanism, available to those affected by implementation of all project sub-components. The CFD shall serve the persons affected directly or indirectly by construction works.

The Grievance Registration Sheet (Appendix 1) as print out shall be available at municipal administration, at the construction site and in the offices of PC Roads FBH and shall be available for download on the website of PC Roads of FBH (WWW.JPCFBIH.BA) and the municipality's website.

The grievance can be logged in writing with the Contractor, at the construction site as well as in the contractor's offices. The contractor is obliged to hand out the Grievance Registration Sheet, explain the grievance mechanism to the concerned citizen and forward the filled in Grievance Form to the central Feedback Desk in PC Roads FBH. The grievance can also be filled in within PC Roads FBH, by phone, by fax, and by e-mailing it to the designated e-mail address zalbena@jpcfbih.ba, or by mail to the address Terezija 54, 71000 Sarajevo.

An information leaflet concerning the grievance mechanism be available at the construction site at all times, weather the construction site is closed or open. The information leaflet will be plasticized and hung on the construction site information board to be available to road users at all times.

All grievances will be archived in the register and assigned a number, and acknowledged within 3 working days.

The CFD will make all reasonable efforts to address the complaint upon the acknowledgement of grievance. If the CFD is not able to address the issues raised by immediate corrective action, a long-term corrective action will be identified. The complainant will be informed about the proposed corrective action and follow-up of corrective action within 14 working days upon the acknowledgement of grievance.

If the particular issue raised through the Grievance Mechanism cannot be addressed or if action is not required, a detailed explanation/ justification will be provided to the complainant on why the issue was not addressed. The response will also contain an explanation on how the person/ organization that raised the complaint can proceed with the grievance in case the outcome is not satisfactory.

At all times, complainants may seek other legal remedies in accordance with the legal framework of FBH.

11.Requirements for start of works

The Contractor shall establish all required baseline data before the commencement of works. The Baseline – Monitoring data shall include air quality data, surface water quality data, soil quality data, survey of the site for any endangered and endemic species and other environmental issues in zone of corridors of direct and indirect impacts. The Contractor is also obliged to ensure these measurements during and after completion of the construction works. The Contractor will ensure that the measurements are conducted by authorized agencies and that they are based on the findings and recommendations of a qualified expert.

The Contractor shall develop a Construction Site Organization Plan (CSOP) that is made up of:

a. Implementation Plan of this ESMP,
b. a detailed Waste Management Plan (WMP)]
c. Study on Safety (includes Elaborate on Safety at Work and Elaborate on Protection From Fire and Explosions),
d. Traffic Management Plan (TMP) must be developed, which will be created by the Contractor prior to the beginning of construction works.

These studies are to be developed in accordance with federal acts[7], before starting the execution of works, while the Contractor's legal obligations defined in the Bidding Documents and Contract shall be based on the a provisions of this ESMP. The Contractor shall submit these studies to the PC Roads FBH supervisory engineer, Environmental and Social Specialists, before beginning of works, and the company has to accept and approve them prior to start of works. Due to the time constraints related to the issuance of the bidding documents, the public consultations are to be held prior to the start of works but once the bidding documents have been issued; therefore the ESMP included in the bidding documents may need to be subsequently updated after the consultations. The contractor will be obliged to follow the updated ESMP.

11.1. Social aspects

- Implementation of the integrated RAP
- Payment of the compensation in accordance wirth RAP provisions before the land is accesed

[7] *Provision on arrangements of construction site, mandatory documentation at the construction site and participants in construction, Official Gazette of FBH 48/09, 75/09 and 63/12*

APPENDICES

APPENDIX 1. GRIEVANCE FORM

	REFERENCE NUMBER (Filled by the office)		
CATEGORY OF COMPLAINTS	A) Affected by expropriation		
	b) All others		
PARTICIPANT INFORMATION OF GRIEVANCE			
FULL NAME			
YEAR OF BIRTH			
GENDER	M	F	
ADDRESS			
TELEPHONE/MOBILE NUMBER			
E-MAIL			
Description of Incident for Grievance (What happened? Where did it happen? Whom did it happen to? What is the result of the problem?)			
Date of the Incident?			
• One-time incident/grievance – Date: _____ • Happened more than once (How many times?) _____ • On-going (currently experiencing problem)			
What would you like to see happen?			
DATE:	SIGNATURE:		
RETURN THIS FORM TO: CENTRAL FEEDBACK DESK PC ROADS OF THE FBH Terezija 54, 71000 Sarajevo Note: All copies are returned to PIU			

APPENDIX 2. GRIEVANCE REGISTRATION TEMPLATE TABLE

No.	Date of receipt	Type of grievance	Description of grievance	Complainant		Date of acknowlgement of receipt	Description of actions undertaken	Date of solvation of grievance
				Status	Sex			

APPENDIX 3. REPORT ON PUBLIC DISCUSSION