

Приложение 5:

Технические Заметки 1 (июнь 2018 г.)

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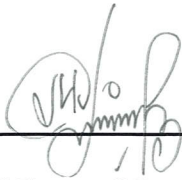


**TECHNICAL NOTES**  
**ON THE PREPARATORY SURVEY**  
**FOR THE PROJECT**  
**FOR REHABILITATION OF KIZILKALA – BOKHTAR SECTION**  
**OF DUSHANBE – BOKHTAR ROAD**  
**IN THE REPUBLIC OF TAJIKISTAN**

The Preparatory Survey Team commissioned to undertake the Outline Design (hereinafter referred to as “The Team”), under Japan International Cooperation Agency (JICA) conducted field surveys and review of existing documents and held several discussions with the implementing agency and other relevant agencies on the scope, basic policies and other technical aspect of “The Project for Rehabilitation of Kizilkala – Bokhtar Section of Dushanbe – Bokhtar Road in the Republic of Tajikistan”.

This note is signed between The Team and Ministry of Transport (hereinafter referred to as “MOT”) to share mutual understandings and agreement on the matters mentioned in Appendix-1.

Dushanbe, 9 June, 2018



**Mr. Mirzoev S.B.**  
First Deputy Minister  
Ministry of Transport  
Republic of Tajikistan



For

**Mr. Ryohei Watanabe**  
Chief Consultant  
Preparatory Survey Team  
Japan International Cooperation Agency (JICA)

## **1. General Items**

### **1.1 Inception Report**

The Team explained and MOT understood and agreed on the contents of the Inception Report submitted by The Team on April 12, 2018.

### **1.2 Consistency with Relevant Plans**

The design concept of this project will ensure, to the possible extent, consistency with the concepts of the on-going ABD Phase 2 project and the Master Plan of Bokhtar City.

### **1.3 Objective Section**

The start point of the project shall coincide with the end point of ADB's on-going Phase 2 plan. This was agreed upon after discussion between MOT, ADB, and the Team on May 10, 2018.

The coordinate system applied to this project is similar to that of the ADB section. Therefore, this project shares ADB's coordinates, and the coordinates of the start point are as given in the table below.

**Table-1 Details of Start Point**

<b>Points</b>	<b>Coordinate in accordance with ADB drawings</b>	<b>Station Number</b>
1 :Left end	X= - 4695.3214, Y=10842.8939	KM 730+50
2: Center line	X= - 4702.6324, Y=10838.5565	
3: Right end	X= - 4709.9435, Y=10834.2191	

### **1.4 Coordination with Relevant Authorities**

The existing irrigation canals, which is under the jurisdiction of the Land reclamation and Irrigation Agency under the Ministry of Melioration and Irrigation, runs parallel to the Project Road and crosses the at several locations. Also, there are various service lines and utilities, identified as of June 4<sup>th</sup> are water pipes, telecommunication cable, electric poles and transformers, along the roads belonging to different authorities, some of which are buried. Close coordination with these stakeholders is inevitable for relocation of the utilities that may require relocation for rehabilitation of the Project Section. MOT assured it will initiate coordination with these authorities appropriately.

## **2. Technical Items**

### **2.1 Road Classification**

The Team confirmed that the project section is an integral part of the Asian Highway (AH7) and its classification will be determined based on future traffic volume projected for twenty (20) years after completion of the rehabilitation.

### **2.2 Standard and Guidelines to be Applied**

Following standards/guidelines apply for planning/design of roads, structures and road ancillaries.

- (i) Highway Design: Asian Highway Standard (AH) or other equivalent  
(Items not covered in the Standard will be referred from past projects carried out under Japanese Grant Aid or standards applied in the Dushanbe – Qurganteppa Road

Improvement Project finance under ADB Projects.

- (ii) Pavement Design: AASHTO Guide for Design of Pavement Structure, 1993 or other equivalent
- (iii) Bridge Design: Specifications for Highway Bridges (Japan Road Association) or other equivalent
- (iv) Structural Design (Retaining Walls, Culverts): Japanese Standard, or other equivalent
- (v) Drainage Design: Japanese Standard or other equivalent
- (vi) Street Light Design: Japanese Standard or other equivalent

### 2.3 Target Year

The design target year is set to year 2041 (20 years after completion of the project).

### 2.4 Design Speed and Restricted Speeds

- Design speed of the Project road is set in accordance with the Asian Highway Standard shown in Table-2. As the objective section is flat, the standard design speed of 100km/h will be applied.

**Table-2 Proposed Design Speed**

Terrain	Design Speed in km/h for Class I Road
Level (L)	100
Rolling (R)	80
Mountain (M)	60
Steep (S)	60

*Source: Asian Highway Standard*

- Restricted speed of 60km/h will be applied at populated areas, school areas and other areas where number of pedestrians are high. These locations as indicated below:
  - (i) KM 786 ~ KM 820 (L=3.4km)
  - (ii) KM 782 ~ KM 784 (L=0.2km)
  - (iii) KM 759 ~ KM 781 (L=2.2km)
  - (iv) KM 741 ~ KM 752 (L=1.1km)

### 2.5 Geometric Condition

Parameters of geometric condition to be applied for design are shown in Table-3.

**Table-3 Geometric Condition**

Highway classification	Class I AH Standard (4 or more lanes)			
	L	R	M	S
Terrain classification				
Design speed (km/h)	100	80	60	
Min. horizontal curve (m)	350	210	80	
Pavement slope (%)	2			
Shoulder slope (%)	3 - 6			
Type of pavement	Asphalt			
Max. vertical grade (%)	4	5	6	7

*Source: Asian Highway Standard*

## 2.6 Alignment

Horizontal and vertical alignment will be planned in accordance with the geometric conditions to be applied. In planning of the alignment attention will be paid to avoid the grave yards and minimization of environmental and social adverse impact.

## 2.7 Basic Cross Section Elements

The basic cross section elements are as follows;

- Number of lanes : 4 (2 lanes on each direction),
- Exclusive lanes for U-turn and left turn will be provided at standard section. Exclusive lane for right and left turning vehicles at Bokhtar Intersection shall necessarily be provided.
- Carriageway width : 3.5m (including U-turn and left turn lanes)
- Shoulder width : 2.5m
- Median width : 2.0-3.0m
- Sidewalk width : 2.25m

\*Note

- (i) Typical cross sections will be designed in accordance with the basic elements mentioned above and will be shared with MOT.
- (ii) Cross section elements may vary depending on the embankment section, intersection, urban area or U-turn lane.
- (iii) For the section of 1.5km overlapped with Bokhtar City Master Plan area, total width including carriageway, shoulder and sidewalk will be 24.0m. Total width will remain same even if median (2.0m) is provided. Sidewalk will be non-mounted (flat) and its pavement structure will be the same as that of carriageway pavement, reflecting concept of the Bokhtar City Master Plan.

## 2.8 Design Vehicle

Vehicle to be considered for the design will be WB-19 as defined by AASHTO (Figure-1). This vehicle type covers the biggest vehicle size regulated in the Government Decree of the Republic of Tajikistan as of December 29 2006, No779 On Approving the Rules of Permit for the Vehicles with Loads and Dimensions exceeding Established Standards.

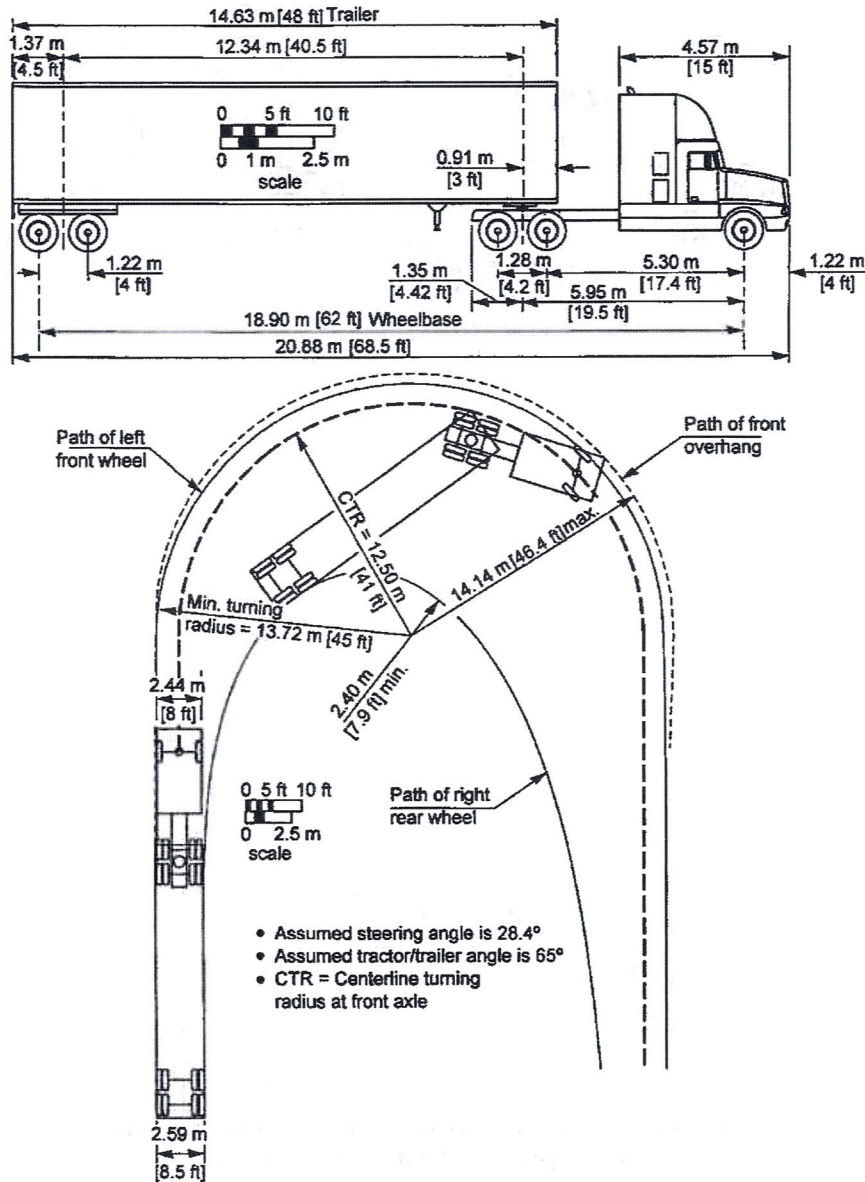


Figure-1 Design Vehicle (WB-19 defined by AASHTO)

## 2.9 Structures

### (1) Earthwork

- Road structures (embankment), at sections other than built-up areas and at intersections, will essentially be elevated (embankment) from the existing ground height to the height of the existing surface level in order to protect the road from washout.
- Embankment slope will be in accordance with SNIIP. In principal, following slopes will be applied;
  - (i) Embankment: 1:1.5 or gentler,
  - (ii) Cut: 1:1 or steeper

## (2) Bridges

Two (2) existing bridges located in KM 786+90 (Bridge No.15) and KM 805+50 (Bridge No.16) will be replaced by box culverts with allowable discharge capacity determined by runoff analysis. Design load for structural analysis shall be 100KN in accordance with SNiP.

Detailed description is as follows.

### 1) Bridge No.15

It will be installed near the current location considering the construction plan. Rehabilitation of the existing box culvert in the downstream of Br. No.15 is inevitable for securing sufficient cross section to allow flow of water downstream. Whether or not the rehabilitation of this culvert will be included in the project will be determined after discussion in Japan. In case that it is not capable of being carried out by Japan side, Tajikistan side shall replace or improve capacity of the box culvert to make it similar with the box culvert at the upstream side appropriately and before commencement of construction.

### 2) Bridge No.16

It will also be installed near the current location in consideration with the construction plan. Bokhtar City's Master Plan envisages provision of a symbolic roundabout at this location. MOT assured that there will be no impact on the replaced structure (Box culvert) of this bridge, during actual implementation of the said Master Plan.

## 2.10 Hydrological/Drainage Design Conditions

### (1) Return Period

Return periods for calculation of design discharge at bridges and road surface drainage will be as follows;

- (i) Design discharge for bridges: 10 years
- (ii) Road surface drainage: 3 years

### (2) Freeboard

Freeboard (minimum clearance between the bottom of the girders (in case of box culvert, the bottom of the top slab) and the design high water will be 1.0m.

#### **SNiP: 2.05.03-84 Bridges and Culverts**

The elevation of the bottom of the decks of buildings above the highest static level of water reservoirs at bridges, located in the non-navigational and unplanned zones of water reservoirs, should be not less than 0.75 Height of the calculated wind waves with an increase of 0.25 m.

### (3) Road Surface Drainage Design

Road drainage design will be carried out on the basis of runoff analysis result. Surface drainages will be transported and discharged at existing drainage facilities or rivers/canals. MOT shall



obtain permission for draining water from road, if necessary.

#### (4) Drainage System in Wetland Section

Drainage system in the direction from right side to left side will be planned in the wetland section from KM 75+80 to KM 772+60 so that the area will be dry in order to protect subgrade of the planned road from the underground water.

#### (5) Drainage at Toe of Embankment Slope

Sections where the embankment height is lower than thickness of designed pavement structure, drainage at toe of embankment will be installed.

#### (6) Irrigation Facility

Existing irrigation facilities crossing the road will be basically replaced by box culverts with the same cross sectional dimensions as the existing one. However, depending on the condition at the downstream, adjustment of the dimensions shall be made after a review.

### 2.11 Traffic Control System

#### (1) Traffic Signal

Necessity for provision of traffic signals at the intersections along the project section will be determined following results of traffic analysis and further studies.

#### (2) Provision for Road-crossing

At-grade pedestrian crossings (Zebra crossings) is proposed in combination of rumble strips, which will be provided necessarily ahead of the pedestrian crossing for securing traffic safety by alerting drivers of the existence of crossings ahead.

#### (3) U-Turn Lane

U- Turn lane (exclusive lane) will be provided at an approximate interval of 3.0 km in accordance with the result of discussion with the National Traffic Police.

Design condition for U-turn lane is shown in Table-4 Design Condition for U-Turn Lane.

**Table-4 Design Condition for U-Turn Lane**

Item	Proposed value	Remarks
Design Vehicle (Small Vehicle)	L=6m	By using full lane and widened shoulder, it is possible even for a heavy vehicle (L=20m) to pass through.
U-Turn Lane width (Median Opening)	W=12 to 15m	
Shoulder	W=4.0m	

#### (4) Street Lights

Planning policy subject to installation only along densely populated area will be determined after

discussion in Japan side. In addition, where street lights will not be provided, provision of road studs/reflectors will be considered.

## **2.12 Type of Pavement**

- Asphalt pavement will be applied.
- “Traffic Load” expressed by cumulative number of 18-kips (kilo-pound) equivalent single axle load application, which is similar to the value used in the on-going ADB project of the preceding section, will be applied.
- Other design input parameters referable from the pavement design conducted in the on-going ADB project of the preceding section, will be referred necessarily.
- Pavement design calculation will be carried out using AASHTO’s Pavement Design Guideline, 1993 or relevant SNiP (VSN).
- Performance period of pavement will be as follows;
  - (i) Surface course: 12 - 20 Years
  - (ii) Base course: 20 Years
  - (iii) Subbase course : 20 Years

## **2.13 Bus Bay**

Bus bays will be installed at/near the current location and with consultation with MOT. Design of bus bays will be in accordance with the standards of Tajikistan.

Provision of bus shelters will be considered based on the data / information to be provided by MOT.

## **2.14 Longitudinal Gradient of Side Roads and Access Roads**

Maximum vertical gradient to be applied at side roads and access roads will be as follows;

- (i) Side roads: 7% (Asian Highway Standard)
- (ii) Access roads: 10% (Access from community, residents/shops, farm land etc.)

## **3. Environmental and Social Consideration**

MOT agreed to take initiative in managing environmental and social issues related to the project. MOT will take actions for obtaining necessary permissions timely. The Team takes consideration to minimize the extent of affected area and MOT shall sincerely take care of the issues of the land acquisition and resettlement.

## **4. Procurement and Construction Plan**

### **4.1 Dumping Soil**

The Team issued a letter on May 8, 2018, which is attached as Attachment-1, requesting to stop further dumping of soil at the depression area on the roadside as this space is likely to be used during

widening and the soil dumped is feared unsuitable as embankment material. MOT agreed on this matter.

In case dumping of soil continues further, it will have to be removed by Tajikistan side and on its own cost.

#### 4.2 Expected Disposal Site and Temporary Yard

##### (1) Disposal Site

The Team specified the depression area at the left side of the road from KM 732+10 to KM 740+80 as the disposal site for this project. MOT agreed on this matter.

##### (2) Temporary Yard

The Team specified an area at the left side of the road from KM 737+20 to 742+10 as the temporary yard for this project. MOT agreed on this matter.

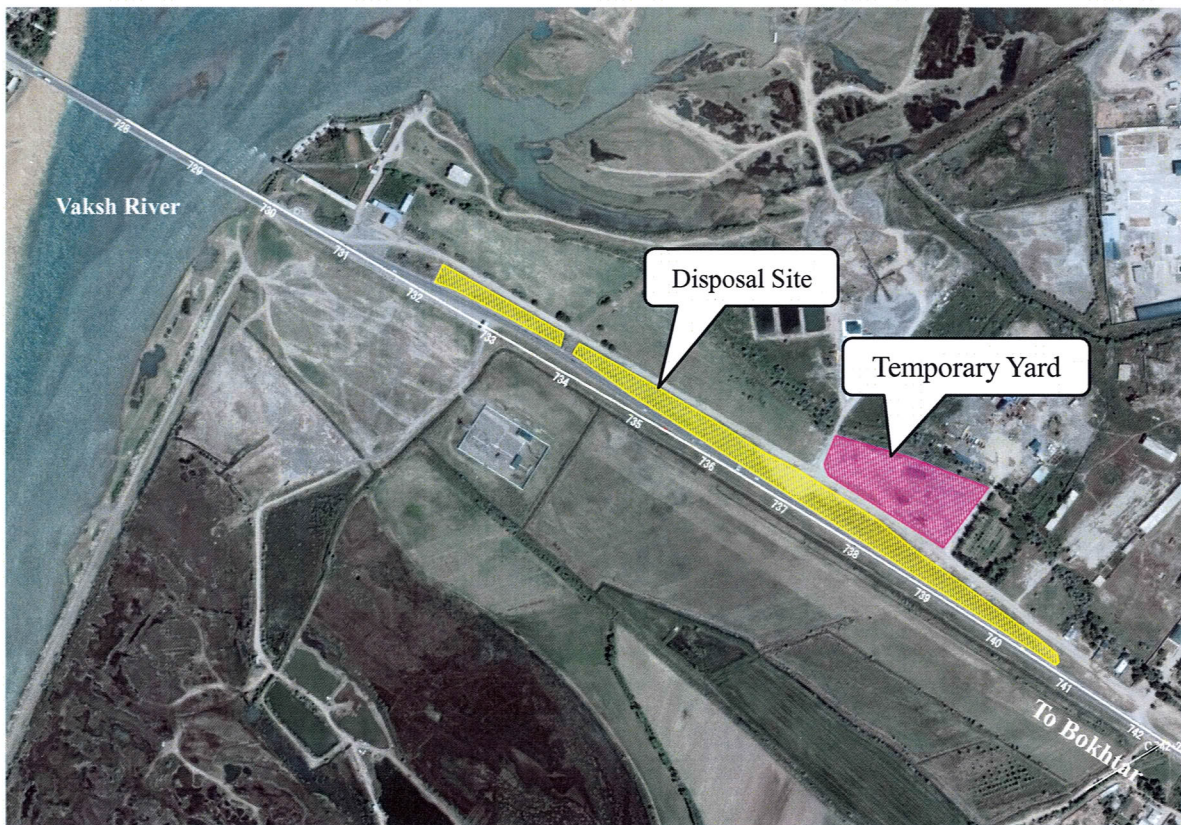


Figure-2 Location of Expected Disposal Site and Temporary Yard

#### 4.3 Road Management during Construction

During construction stage, there will in principle be no road closures and the existing traffic lanes will be secured at all time under the following conditions.

- (i) MOT will assist the Contractor during construction period for traffic safety assurance, in cooperation with traffic police.

(ii) Restricted speed shall be 40km/h or more.

## **5. Relevant Documents**

Letters and minutes of meetings conducted with relevant authorities are attached hereunder.

Attachment-1: Request Letter to Bokhtar SETM on Dumping Soil on the Roadside

Attachment-2: Minutes of Meeting with Bokhtar City Government

Attachment-3: Minutes of Meeting with National Traffic Police Department

Attachment-4: Russian translation of Technical Notes

Attachment-1: Request Letter to Bokhtar SETM on Dumping Soil on the Roadside



ハトロン州 STAM 所長 殿

2018年5月8日  
タジキスタン国 クルガンチュベールキジルカラ間道路改修計画準備調査  
JICA 調査団 チーフコンサルタント 渡邊 亮平

Subject : バクシュ川周辺の道路沿道への廃材・残土埋め立てについて

拝啓

現地調査でバクシュ川周辺の低地、STA.745+60 付近の低地（右側）及び STA.768+20 付近の低地（右側）（次頁写真参照）が廃材・残土で埋め戻しが実施されていることを確認しております。当該箇所は、道路拡幅が予定される場所であり、今後廃材・残土による埋め戻しは将来の道路建設に支障をきたします。

ついでに、埋め戻しを管轄するハトロン州交通局に対し、今後当該箇所への埋め戻し作業を中止していただくよう通知がございます。

なお、今後埋め戻しが継続された場合、撤去に係る費用はタジキスタン国側の負担となることとなります。

敬具

CC: MOT ソリム  
JICA タジキスタン事務所 田邊所長



Начальнику  
Управления автомобильного хозяйства по Хатлонской области  
САРДОРУ Файзуллозода Н.Ф.

8 мая 2018 года  
Подготовительное Исследование по  
Проекту реабилитации участка Кизилкала – Бохтар  
автодороги Душанбе - Бохтар  
Исследовательская Группа JICA  
Главный Консультант Ръёхей ВАТАНАБЕ

Относительно: Выброса отходов и остаточного грунта вдоль дороги вблизи р. Вахш

Уважаемый САРДОР Файзуллозода,

В ходе проведения полевых работ Исследовательская Группа выясняла, что в настоящее время идет засыпка кювета автодороги в начале проектного участка со стороны р. Вахш, а также на км 745+60 с павой стороны и км 768+20 с правой стороны. Для наглядности указанные участки отражены в Приложении на трех листах.

Поскольку указанный участок запланирован под расширение автодороги, дальнейшая засыпка кювета отходами и остаточным грунтом может создать помехи при строительстве дороги в будущем.

В связи с этим прошу Вас оповестить Отдел транспорта и другие соответствующие отделы Хукумата Хатлонской области, которые курируют данный вопрос, о необходимости приостановления процесса засыпки.

В случае, если процесс засыпки будет продолжен, расходы на расчистку участка будут покрываться за счет Таджикистанской стороны.

С уважением,

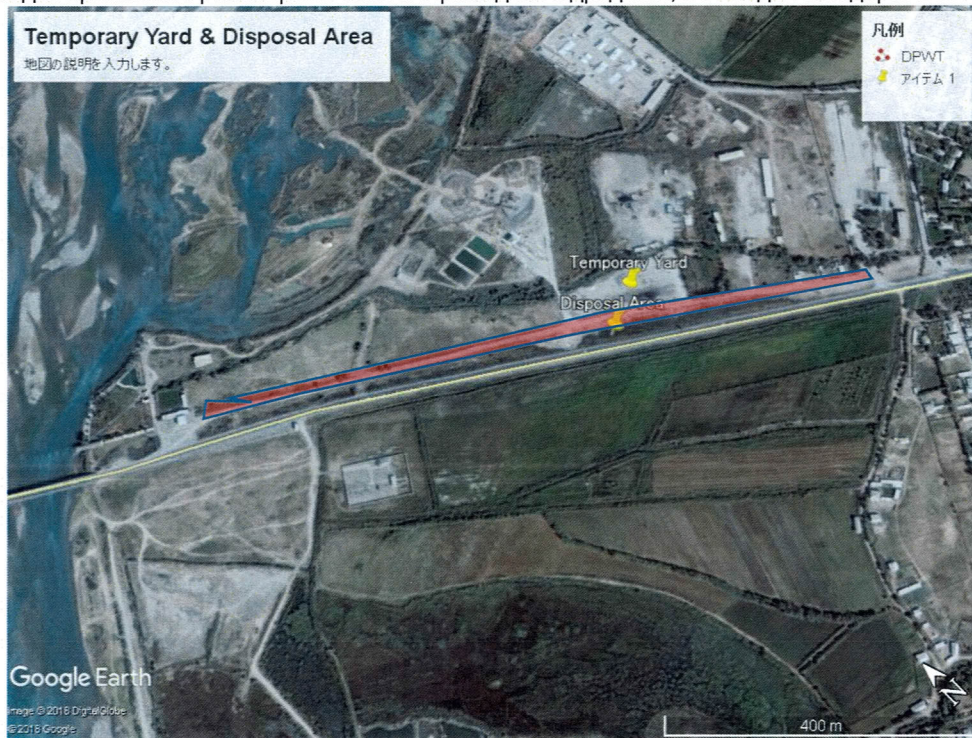
Ръёхей ВАТАНАБЕ

Копия: Олим Ятимов, Начальник Отдела по работе с иностранными инвестициями  
Г-н ТАНАБЕ, Глава Представительство JICA в Республике Таджикистан

Я.О

Я.О

Участок для временного размещения базы и офиса для Подрядчика, и зона для складирования отходов



Участок под базу и временный офис (около 9,000м<sup>2</sup>)



Планируемый участок для складирования отвалов (вблизи р.Вахш)





Км 745+60 (с правой стороны)



Км 768+20 (с правой стороны)



Attachment-2: Minutes of Meeting with Bokhtar City Government

«Approved»

Chief Consultant  
JICA Survey Team

\_\_\_\_\_ Ryohei WATANABE  
«\_\_\_» May 2018

«Approved»

The Executive of local authority of Bokhtar city  
The mayor of Bokhtar city

\_\_\_\_\_ A. ISMOILZODA  
«\_\_\_» May 2018

MINUTES OF MEETING

Of JICA Survey Team

For the Project for Rehabilitation of Kizilkala – Bokhtar Section of Dushanbe –Bokhtar Road  
with Executive of local authority of Bokhtar city on discussion of Bokhtar city's Master Plan

**Date:** 3 May 2018

**Time:** 10:00

**Participants**

**From local authority of Bokhtar city:**

1. Mekhmondustzoda Zh. Head, Secretaty office of the Mayor
2. Yatimzoda B. Chief Architect
3. Manonov L. Chief Engineer, Road Maintenance Unit
4. Madaliev Kh. Chief specialist, Architecture division

**From the Ministry of Transport:**

1. Kholikov M. Chief Engineer, Bokhtar SETM

**From JICA Survey Team:**

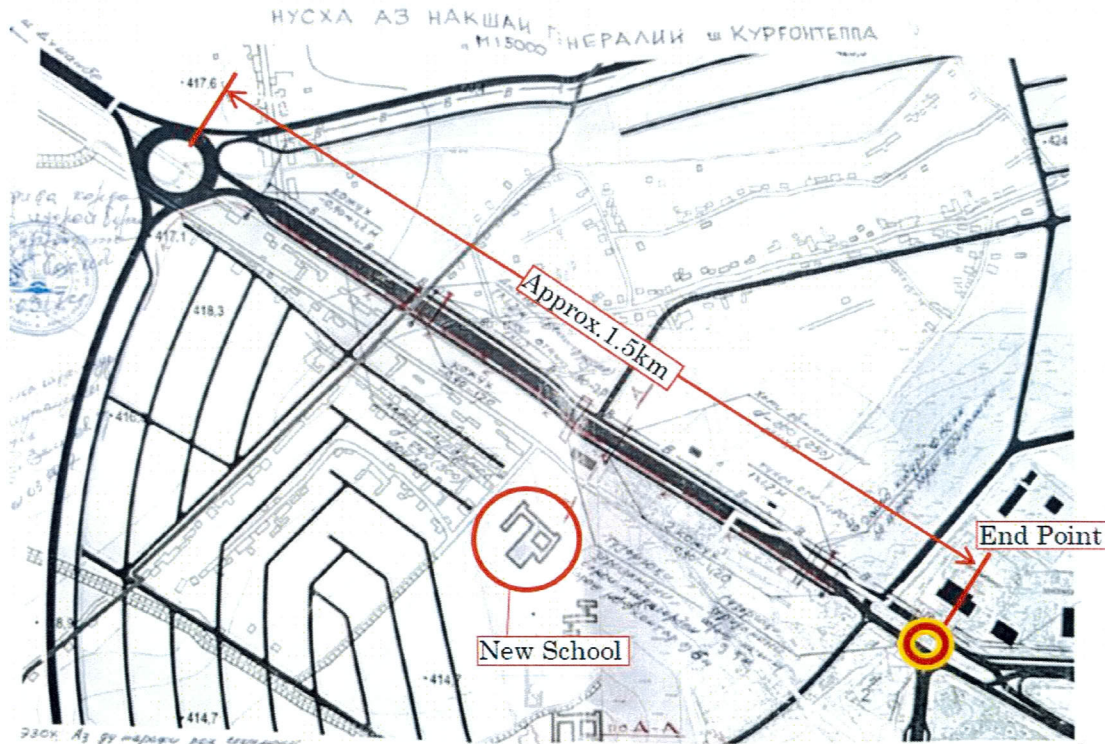
1. Ryohei WATANABE Chief Engineer
2. Takahiro MIYAZAKI Road Structure and Ancillary Design
3. Zhanybek Satkynaliev Interpreter

At the meeting the local authority of Bokhtar city has informed that the Master Plan of Bokhtar city had been developed and approved by the Government Decree of the Republic of Tajikistan as of 30 December 2011, #660 «On Approval of Master Plan on Kurgantyube city of Khatlon region», and that according to this plan, a part of the Project section, approx.1.5 km length, towards of which the Preparatory Survey for Rehabilitation of Kizilkala – Bokhtar section of Dushanbe – Bokhtar Road is being conducted, overlaps with Master Plan (See Figure-1).

Besides during the meeting there had been stated that in March 2017, the local authority of Bokhtar

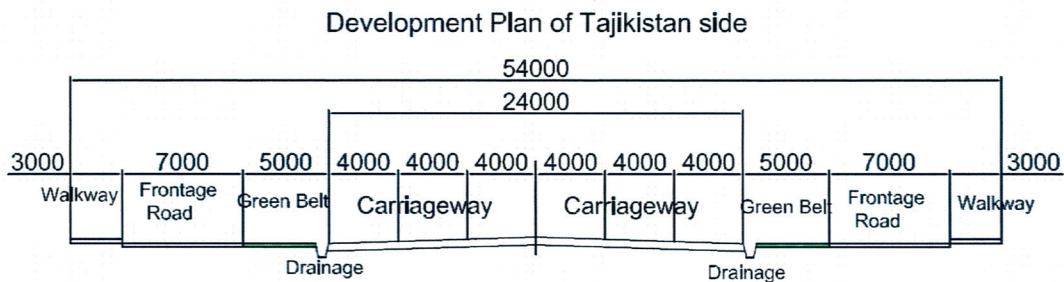
city issued a letter towards the PIU (Project Rehabilitation Unit) with request to take into account the requirements of Master Plan in planning and construction of roads.

At the meeting it has also been noted that implementation of Master Plan is planned up to 2035, and that financing of the plan had not been decided so far.



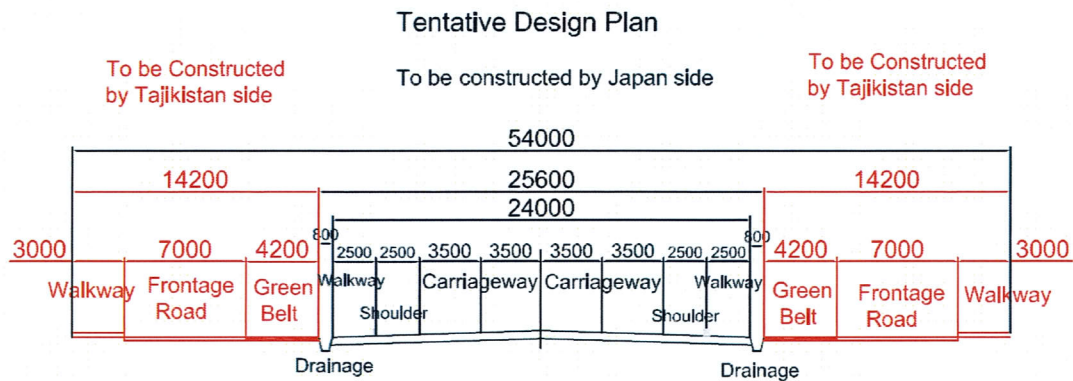
**Figure-1 Master Plan of Bokhtar city and overlap section with Japan project**

The participants from local authority of Bokhtar city mentioned that the section shown on Figure-1 with 1.5km length, according to the Master Plan of Bokhtar city, must have three (3) lanes on each direction with total width of carriageway 24 m (see Figure-2).



**Figure-2 Cross section of road specified in the Master Plan**

JICA Survey Team (hereinafter Team) has informed the participants of the meeting that it had conducted a meeting with ADB (Asian Development Bank) and explained the objective of the project which is improvement of road traffic by widening of existing Dushanbe – Bokhtar Road from two to four lanes.



**Figure-3 Proposal of JICA Survey Team**

Further, the Team explained that construction of six-lane road on overlap section under the Japanese Grant is impossible due to extremely low viability and necessity, moreover taking into account the fact that the Master Plan of Bokhtar city, the implementation of which is planned up to 2035, does not have exact schedule in terms of financing.

On response to that explanation, representatives from local authority of Bokhtar city noted that on the overlap section, the road should have six lanes, and that four-lane road on this section is not considered, in principle.

The Team requested the representatives of local authority of Bokhtar city to confirm their position towards the following issues:

- In the framework of the Japan project there will be provided the road which will meet requirements of six-lane road, i.e. for the case when the Master Plan will be implemented;
- At the same time, in the Japan project the road will be put into service as four-lane road. On the remaining part of the road, necessary for providing two more lanes, there will be provided a shoulder (slow-vehicle lane) and a walkway. Further, in Japan project there will be provided drainage facilities on both sides of the road;
- In future, when the Master Plan will be implemented, provided in this plan the elements of the road, as green belt, frontage road, walkway, will be constructed by Tajik side;
- The abovementioned proposal is shown in Figure-3.

**The results of the meeting have been summarized as follow:**

- In case of the proposal provided by JICA Survey Team the road and ancillaries to be constructed by funds of Japan project will be integrated into Master Plan as it is (without any modification) when the Plan will be implemented, and such can further remain in service. This proposal needs to be discussed with JICA.
- Regarding the lighting and associated elements, provision of such will be decided after discussions with JICA.

- Local authority of Bokhtar city has accepted the proposal.
- Local authority of Bokhtar city has agreed to promptly prepare the necessary information on the Master Plan after receiving a list of questions from the JICA Survey Team.

The minutes of meeting has been prepared by  
Mr. Takahiro MIYAZAKI  
Road Structure and Ancillary Design  
JICA Survey Team

«Утверждаю»

Главный Консультант  
Исследовательской Группы ЛСА

Рьёхей БАТАНАБЕ

«14» мая 2018 года

«Утверждаю»

Председатель Исполнительного органа  
местной государственной власти г. Бохтар



Исраилов А.

«03» мая 2018 года

### ПРОТОКОЛ

Встречи Группы Подготовительного Исследования Японского Агентства  
международного сотрудничества «ЛСА» по Проекту Реабилитации участка Кизилкала –  
Бохтар автодороги Душанбе – Бохтар с Исполнительным органом местной государственной  
власти города Бохтар по обсуждению Генерального плана города Бохтар

**Дата:** 3 мая 2018 года

**Время:** 10:00

#### Участники

##### Со стороны Исполнительного органа местной государственной власти г. Бохтар:

- |                       |  |
|-----------------------|--|
| 1. Мехмондустзода Дж. | Руководитель местного аппарата мэра города |
| 2. Ятимзода В.        | Главный архитектор                         |
| 3. Манонов Л.С.       | Главный инженер ДЭУ                        |
| 4. Мадалиев Х.        | Главный специалист архитектуры             |

##### Со стороны Министерства транспорта:

- |               |   |
|---------------|---|
| 1. Холиков М. | Главный инженер, ГУ «УАХ Бохтарского региона» |
|---------------|---|

##### Со стороны Группы:

- |                        |                                       |
|------------------------|---------------------------------------|
| 1. Рьёхей БАТАНАБЕ     | Главный Консультант                   |
| 2. Такахиро МИЯЗАКИ    | Проектирование придорожных сооружений |
| 3. Жанибек Саткиналиев | Переводчик                            |

На встрече со стороны Исполнительного органа местной государственной власти города Бохтар была озвучена информация о том, что Генеральный план города Бохтар был составлен и утвержден постановлением Правительства Республики Таджикистан от 30 декабря 2011 года, №660 "Об утверждении Генерального плана города Кургантюбе Хатлонской области", и что согласно указанному плану, часть участка, протяженностью около 1,5 км, по которому

Р.В

проводится Подготовительное исследование для реабилитации участка Кизилкала – Бохтар автодороги Душанбе – Бохтар, подпадает под Генеральный план (см. Схему-1).

Также в ходе встречи было озвучено, что в марте 2017 года, от Исполнительного органа местной государственной власти города Бохтар в адрес ЦРП РД (Центр Реализации Проектов реабилитации дорог) было направлено письмо с просьбой учитывать требования Генерального плана в планировании и строительстве дорог.

Далее на встрече было отмечено, что реализация Генерального плана рассчитана до 2035 года, и что вопросы финансирования реализации плана на сегодняшний день остаются открытыми.

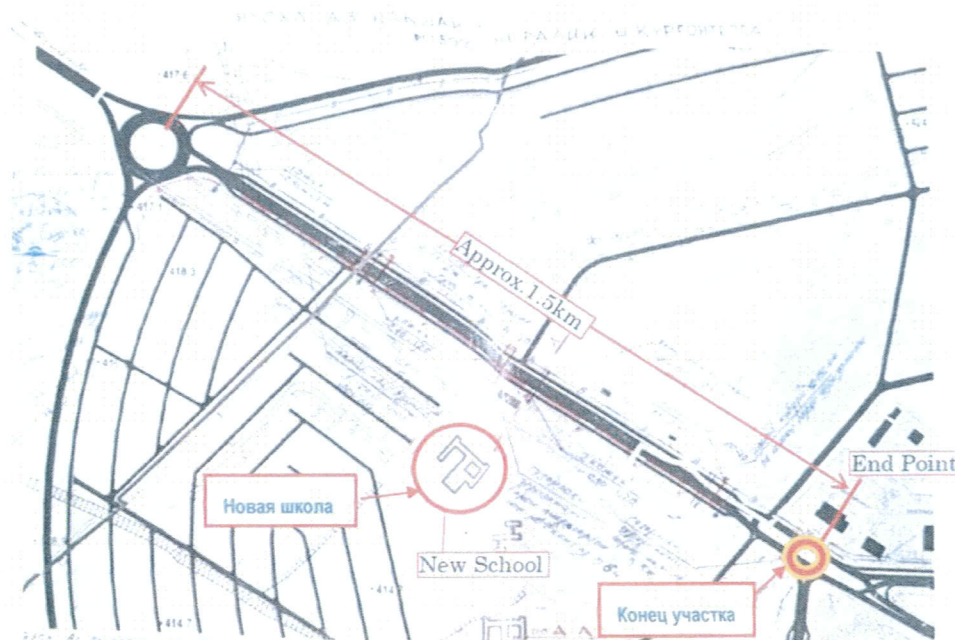


Схема-1 Выдержка из Генплана г. Бохтар и совместный участок

Участники встречи со стороны Исполнительного органа местной государственной власти города Бохтар отметили, что указанный на Схеме-1 участок протяженностью 1,5 км, согласно Генеральному плану города Бохтар, должен иметь 3 полосы для движения в одном направлении с общей шириной проезжей части 24 метра (см. Схему-2).

R.W

J.O