

Appendix 5

Cost Breakdown

Unit price breakdown of maintenance work

Unit cost breakdown		Hot Mix Asphalt Overlay																																																																																																																																												
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Unit cost breakdown **Cold Mix Asphalt Patching (labor force)**
AP produced asphalt

Cost estimation is considering following items:
1. Materials for Asphalt Pavement
2. Fuel for Plant Operation

Condition of calculation

7500m X 7m 52 500 m² Mixture 6 563 t
 where 5cm thickness
 2.5 ton/ m³

Material	Equipment	Condition			Quantity	Unit	Rate(Somoni)	Amount(Somoni)
Aggregate and sand quarrying		Free of charge					0	0
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Diesel	Machine to pave	46	day	150t/day 120L/day	0	L	5.0	0
Filler	Portland cement			4%of mixture	276	t	860.0	237 360
Tack coat	Cut back asphalt	0.4L/m ²			0	L	2.9	0
Diesel	Asphalt distributer	46	day	30L/day	0	L	5.0	0
Total								1 649 050

31.4
 Somoni/m²
 251
 somoni/ton

Unit cost breakdown **Cold Mix Asphalt Patching (labor force)**
Manual

Cost estimation is considering following items:
1. Materials for Asphalt Pavement
2. Fuel for Plant Operation

Condition of calculation

7500m X 7m 52 500 m² Mixture 6 563 t
 where 5cm thickness
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Material	Equipment	Condition			Quantity	Unit	Rate(Somoni)	Amount(Somoni)
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Tack coat	Cut back asphalt	0.4L/m ²			0	L	2.9	0
Diesel	Asphalt distributer	46	day	30L/day	0	L	5.0	0
Total								1 267 760

24.1
 Somoni/m²
 193
 somoni/ton

Unit price breakdown of Pavement Inspection

Required Cost Calculation for Gissar SETM in 2016

1. IRI Measurement Distance 633 km x 2=1266 km
2. Access distance 620 km x2=1240 km
3. Required cost
 Total: 2500 km x 1.1 =2506 somoni (per time)
 IRI 2 times in a year = **2506x 2= 5012 somoni**
 Visual Inspection 2 times in a year =**2506x 2=5012 somoni**
 Total: **10024 somoni**

Section 2 Unit Cost Calculation

Actual expenses on IRI survey in Gissar Zone (633km) per one time in 2015

#	SEHM	KM	Days	Fuel cost			Allowance cost				Other expenses	Grand Total (somoni)	
				Fuel (diesel)	Price per liter	Fuel Cost (somoni)	Members		Total				
Leader	allow	Assistant	allow										
1 Vakhdat	631	6	76	5		379	1	2			20	399	
2 Tursun-zoda	264	2	32	5		158	1	130	2	130	260	20	438
3 Rudaki	627	4	75	5		376	1	65	2	65	130	20	526
4 Shahrinav	500	4	60	5		300	1	130	2	130	260	20	580
5 Varzob	706	3	85	5		424	1	195	2	195	390	150	964
6 Faizobod	400	2	48	5		240	1	130	2	130	260	20	520
7 Hisor	578	2	69	5		347	1		2			20	367
8 Rogun	260	1	31	5		156	1	65	2	65	130	20	306
9 Norak	462	3	55	5		277	1	195	2	195	390	20	687
Total:	4 428	27	531			2 657		910		910	1 820	310	4 787
												Cost per KM in TJS	1.1

Required Cost Calculation for Kurgan-tube SETM in 2016

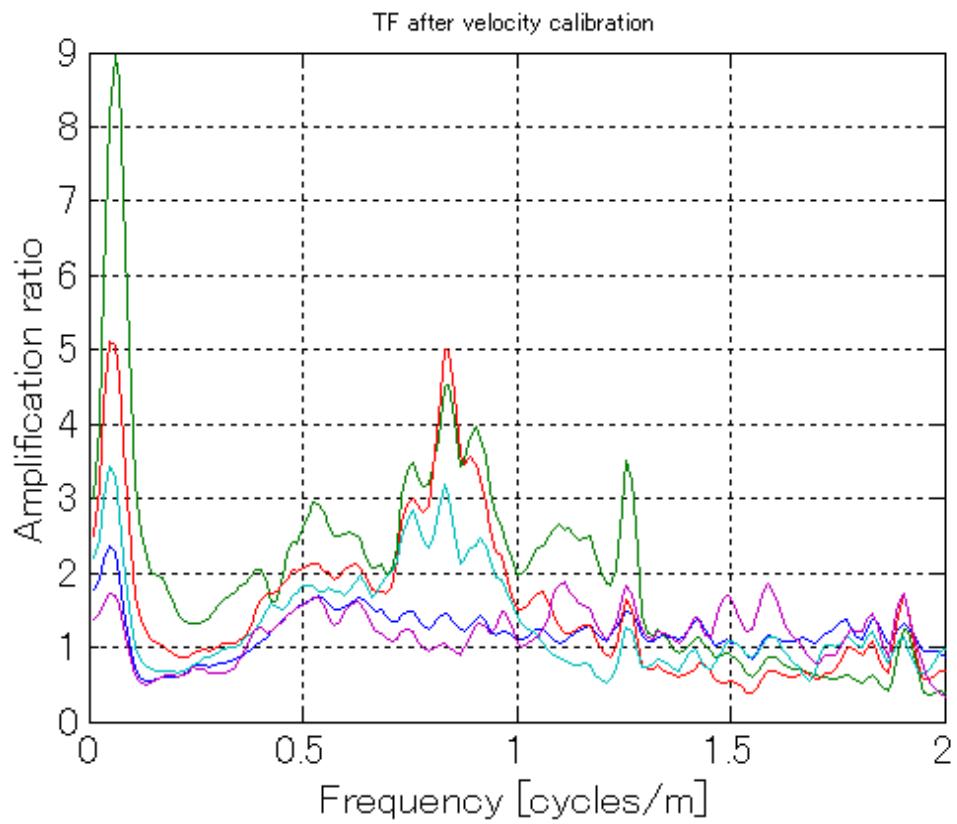
1. IRI Measurement Distance 750 km x 2=1500 km
2. Total distance 810 km x2=1620 km
3. Required cost
 Total: 3120 km x 1.3 =4056 somoni (per time)
 IRI 2 times in a year = **4056 x 2= 8112 somoni**
 Visual Inspection 2 times in a year =**4056 x 2=8112 somoni**
 Total: 16224 somoni

Section 2 Unit Cost Calculation

Actual expenses on IRI survey in Kurgan-tube Zone (750km) per one time in 2015

#	SEHM	KM	Days	Fuel cost			Allowance cost				Other expenses	Grand Total (somoni)	
				Fuel (diesel)	Price per liter	Fuel Cost (somoni)	Members		Total				
Leader	allow	Assistant	allow										
1 Vakhsh	252	2	30	5		151	1	2			20	171	
2 Bohtar	124	2	15	5		74	1	2		0	20	94	
3 Sarband	255	3	31	5		153	1		2		20	173	
4 Jilikul	269	3	32	5		161	1	136	2	136	272	20	453
5 Rumi	360	3	43	5		216	1	136	2	136	272	20	508
6 Jomi	320	3	38	5		192	1	136	2	136	272	20	484
7 Yovon	470	2	56	5		282	1	156	2	156	312	20	614
8 Khuroson	260	2	31	5		156	1	136	2	136	272	20	448
9 Kabadiyan	210	1	25	5		126	1	78	2	78	156	20	302
10 Shartuz	315	1	38	5		189	1	78	2	78	156	20	365
11 N. Khisrav	310	1	37	5		186	1	156	2	156	312	20	518
12 Pyanj	560	2	67	5		336	1	156	2	156	312	20	668
13 Kumsangir	340	2	41	5		204	1	156	2	156	312	20	536
Total:	4 045	27	485			2 427	13	1 324		1 324	2 648	260	5 335
												Cost per KM in TJS	1.3

DRIMS Operation Guideline



December 2014

JICA Expert Team

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CHAPTER 1 INTRODUCTION

1.1 Outline

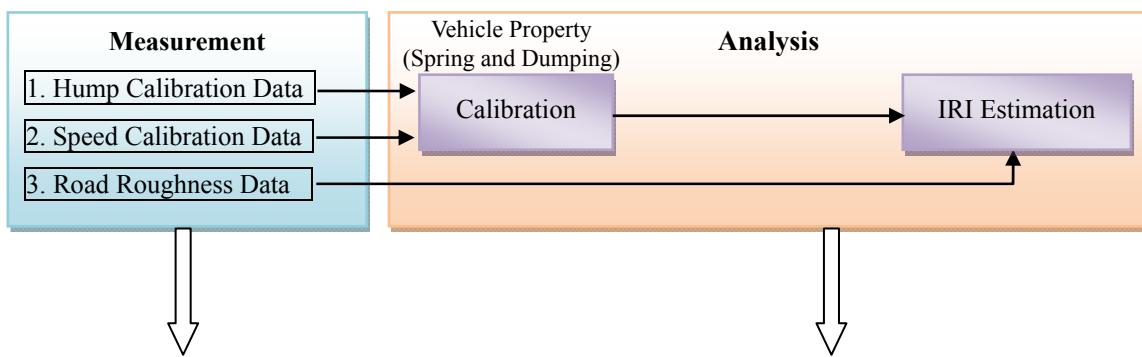
Dynamic Response Intelligent Monitoring System (hereinafter called DRIMS) that has been developed by Bridge and Structures Laboratory at University of Tokyo, Japan, is one of the systems to measure the road roughness and estimate International Roughness Index (hereinafter called IRI). DRIMS give us estimated IRI of the road as a result of measuring and calculating acceleration according to vehicle motion.

VIMS, which was former model, was developed to DRIMS in 2014. DRIMS consist of two kinds of software, which are measurement software and analysis software. DRIMS means the name of software including both measurement software and analysis software. However, name of measurement software is still “VIMS measurement” because this has not been developed yet. In this guideline, “VIMS” is sometimes used as measurement software.

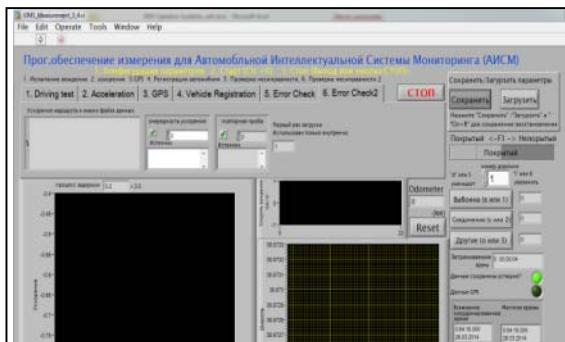
This guideline describes how to operate DRIMS so that DRIMS users, such as road administrator or those who engages road maintenance work, are able to properly measure and analyze the data collected on site, and to correctly evaluate its results.

IRI obtained by using DRIMS shall be not only the information of the road condition, but also the indicator when on maintenance planning and cost estimation for road maintenance.

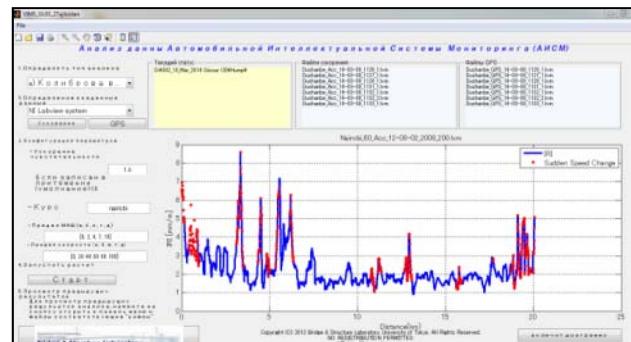
1.2 IRI Estimation Procedure of DRIMS



Прог. обеспечения по измерению



Анализ прог. обеспечения



1.3 Fundamental Rules

On operating DRIMS, follow below rules.

1. Do not start without Operation Check. This is required highly for preparation.
2. During measuring the data, check the data in folder periodically.
3. When you finished measuring data, create new folder and save into properly named folder.
Date and location should be included in folder name.

1.4 Technical Terms to be used in DRIMS

For operating DRIMS, there are some technical terms which are written in English in DRIMS. Cyrillic alphabet can not be used for DRIMS due to programming requirements in computer. User needs to master the below technical terms.

As well as this, the name of folders and files must be also English, which is automatically created in computer when you operate DRIMS software.

Table 1.4-1 Technical Terms to be Written in English

English	Russian
Driving test	Испытание вождения
Acceleration	Ускорение
GPS	GPS
Vehicle registration	Регистрация автомобиля
Error check	Проверка неисправности
Error check 2	Проверка неисправности 2
Hump	Выпуклости
Speed	Скорости
IRI	Миш
Hump calibration	Калибровка выпуклости
Speed calibration	Калибровка скорости
IRI estimation	Оценка МИШ
Data check	Проверка данных
Output	Результат
Google Earth	Google earth
Distance	Асстояние
Latitude	Широта
Longitude	Долгота

CHAPTER 2 PREPARATION

2.1 Hardware

(1) Devices and Tools

No.	Items	Photo	Description
1	Laptop Computer		<ul style="list-style-type: none"> ◆ For data measurement by specific software ◆ For data analysis by specific software
2	GPS		<ul style="list-style-type: none"> ◆ For recording location when on measurement
3	Accelerometer		<ul style="list-style-type: none"> ◆ For measuring acceleration of the vehicle
4	DAQ (Data Acquisition Module)		<ul style="list-style-type: none"> ◆ For transferring the data from accelerometer to computer
5	Humps		<ul style="list-style-type: none"> ◆ For speed calibration
6	Tape		<ul style="list-style-type: none"> ◆ For fixing Accelerometer

(2) Setup

Basic composition is shown in right Photo. The USB cable can be connected to any USB port. However, the connecting process should be taken as mentioned in **2.3 Operation Check**.



2.2 Software (Computer Program)

No.	Name	Icon	Description
1	VIMS Measurement		♦ For measuring GPS data and acceleration data
2	DRIMS Analysis		♦ For analyzing acceleration data and calculating IRI
3	Google Earth		♦ For visual checking of IRI on Google Earth Note : Available when in connection to internet

2.3 Operation Check

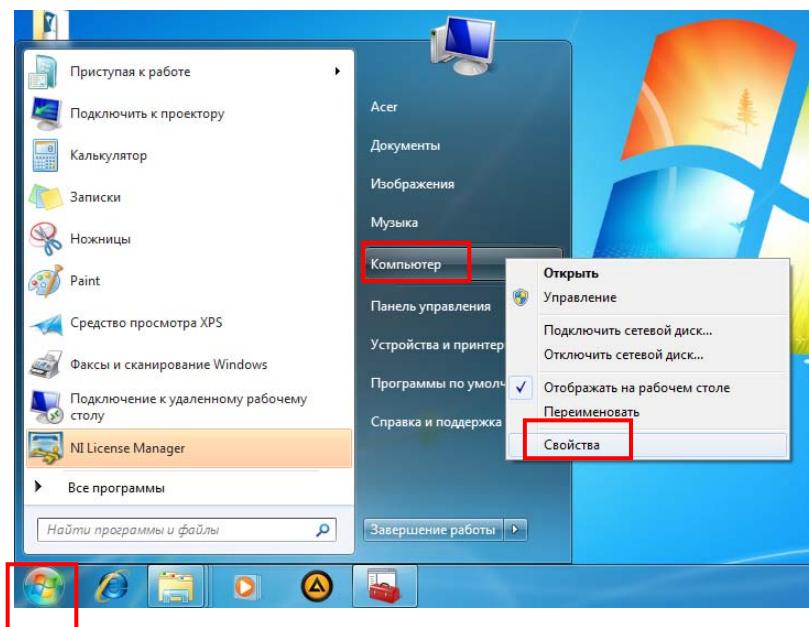
After setting up hardware and software, operation check should be done as following steps.

STEP1 : GPS Check

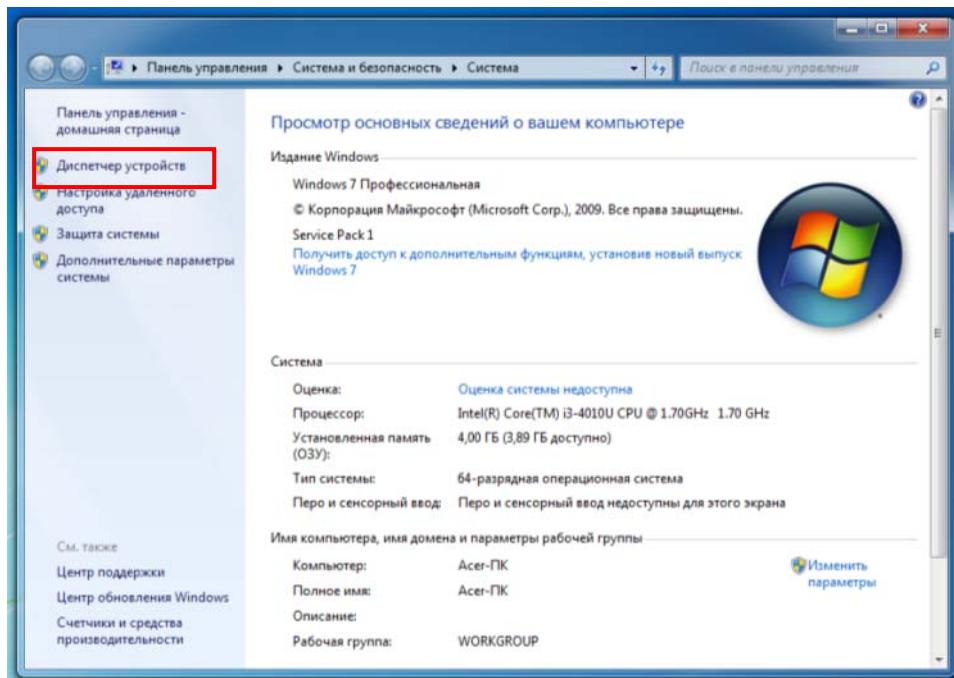
- 1) Turn on GPS.
- 2) Wait for about 30 second.
- 3) Confirm twice peep sound and blinking the center light.
(It means to be connecting to satellite.)
- 4) Connect USB cable to computer.

STEP2 :GPS Port Number (COM “X”) Check

- 1) Right click on “my computer” and select “Property”.

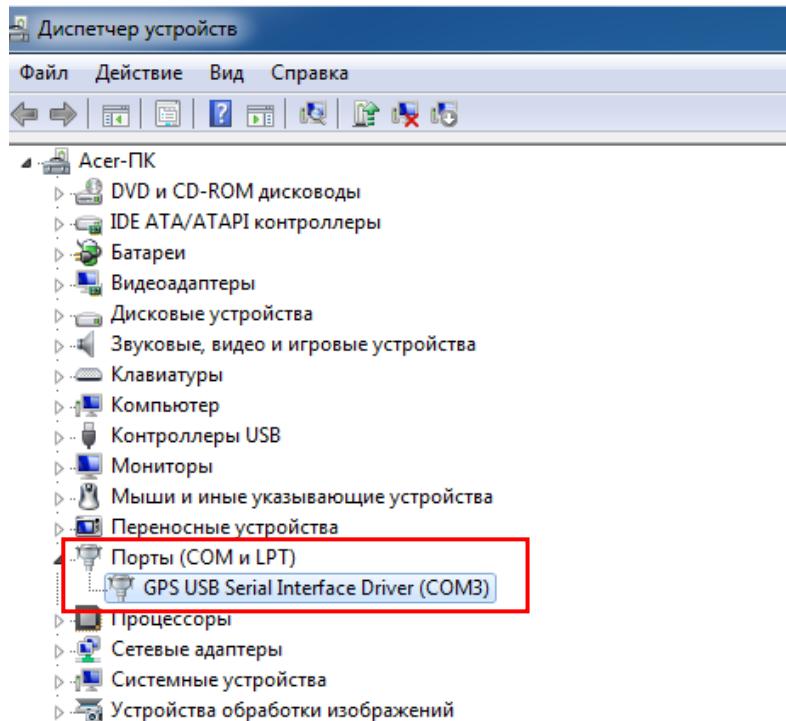


- 2) Click on the “Device Manager”.



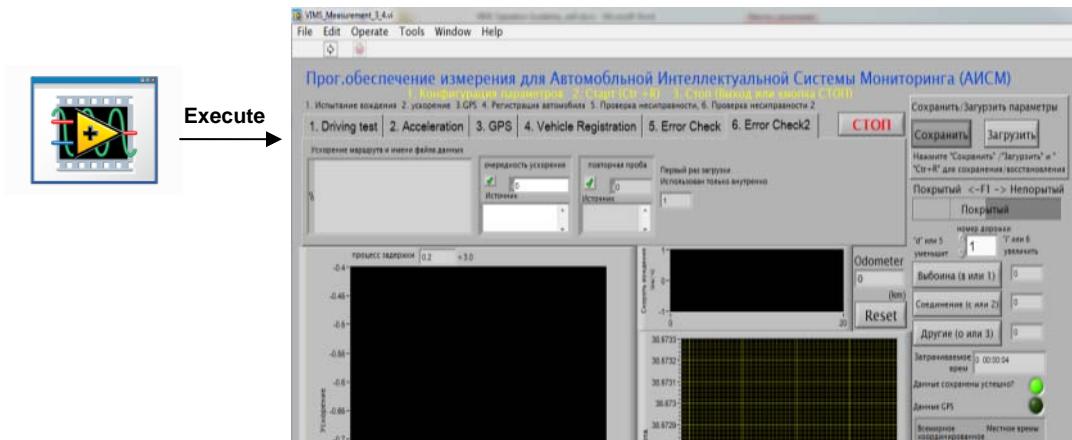
- 3) Click on Ports (COM & LPT) and confirm Ports number.

In this case, COM number is 6. It is changeable depending on USB ports.

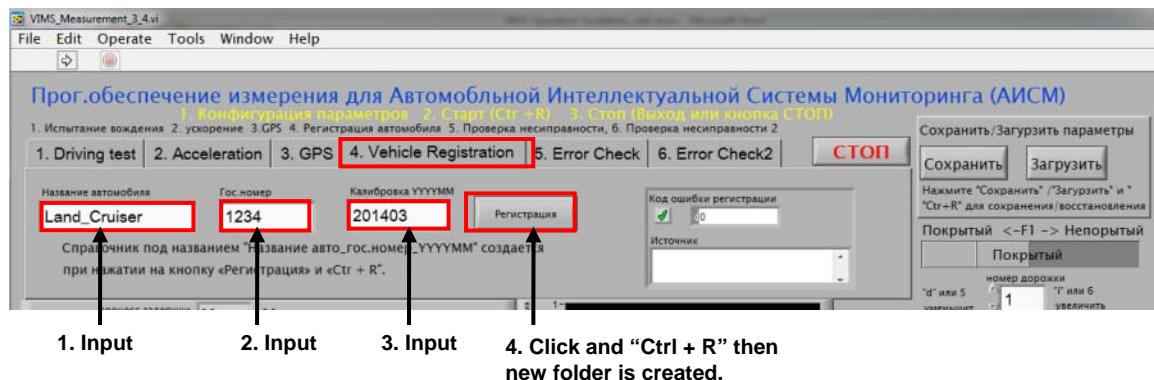


STEP3 : “VIMS Measurement” Check

- 1) Execute “VIMS Measurement.exe” by double-click on the icon or “enter” after selecting icon.



- 2) Select “Vehicle Registration” tab and follow below procedure.

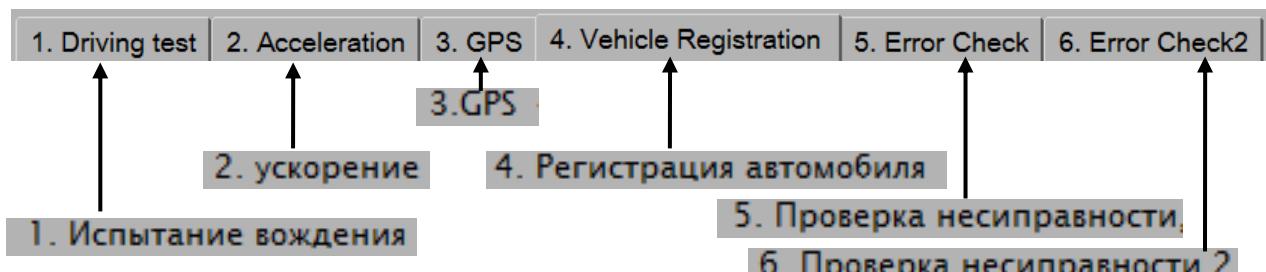


Note: After procedure “4”, a new folder which is named as input text is generated.

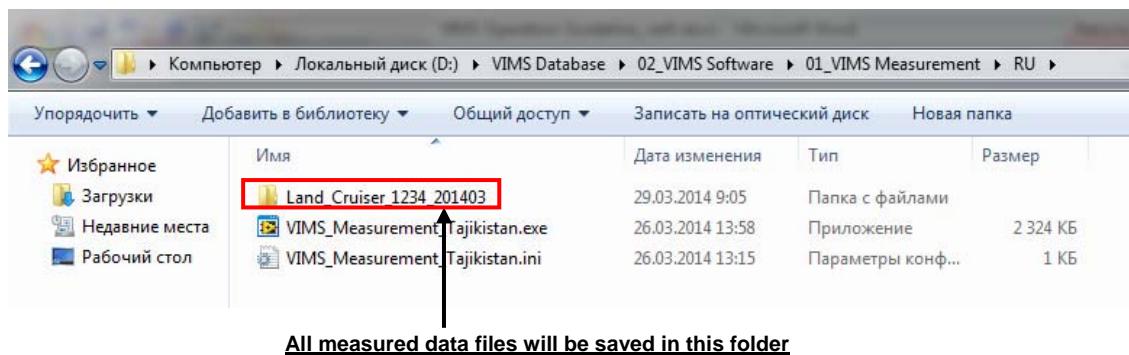
- 1: Road name ex) Kumsangir-02
- 2: Vehicle name ex) Toyota pick-up
- 3: Date ex) 08_12_2014

In this case, the new folder name is “Kumsangir-02_Toyota pick-up_08_12_2014”.

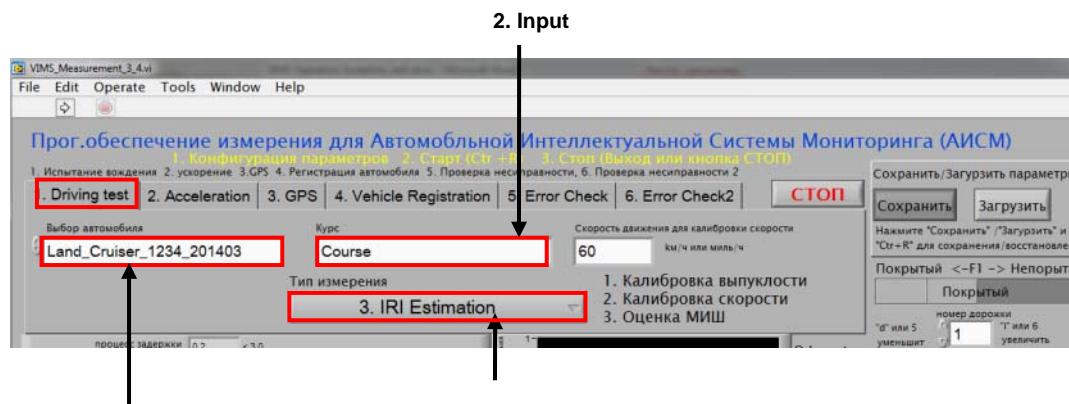
- English – Russian Terms



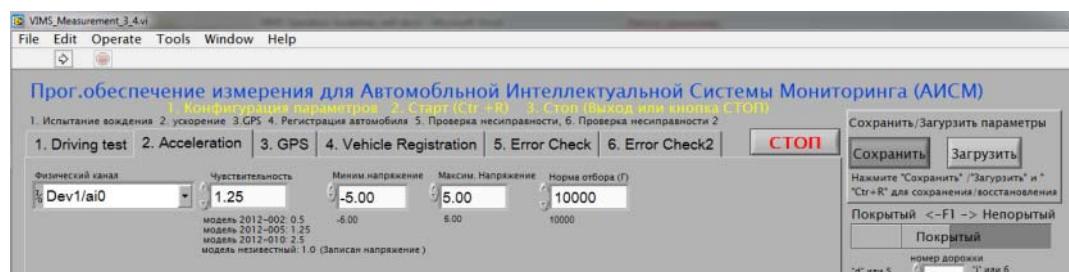
- 3) Open main folder ("VIMS Measurement.exe" is stored) in desktop, and check if the folder which you named at previous procedure was created.



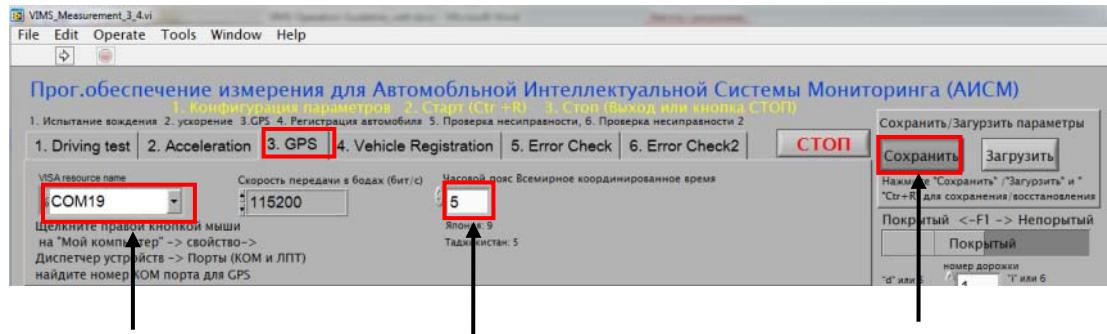
- 4) Go to "Driving test" tab and follow below procedure.



- 5) Go to "Acceleration" tab and check value in cells are the same as below.



6) Go to “GPS” tab and select COM number which was checked at **STEP 2**.

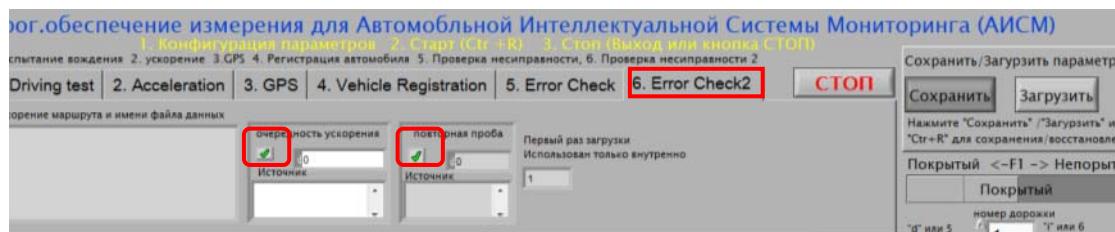
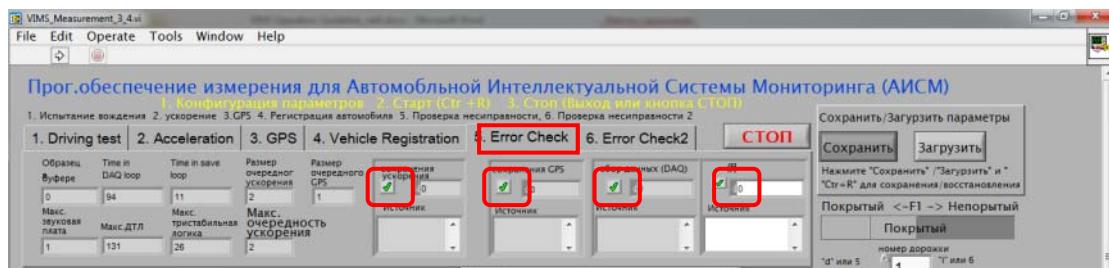


1. Click on ▼ and select your COM number.

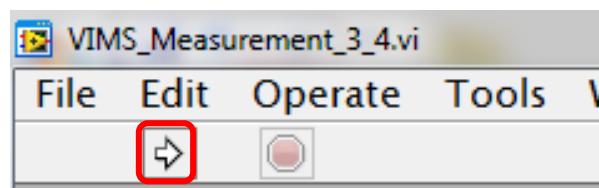
2. UTC time zone of Tajikisutan is 5.

3. Click and “Ctrl + R” to save input data

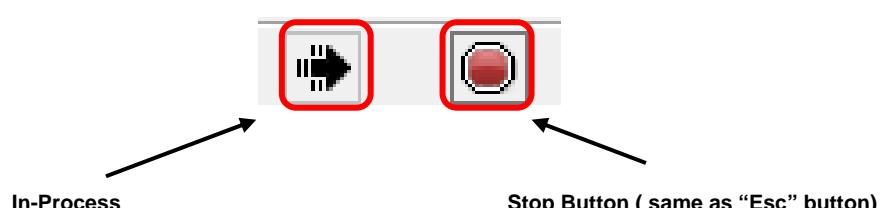
7) Go to “Error Check” and “Error Check2”, and check if green mark is shown.



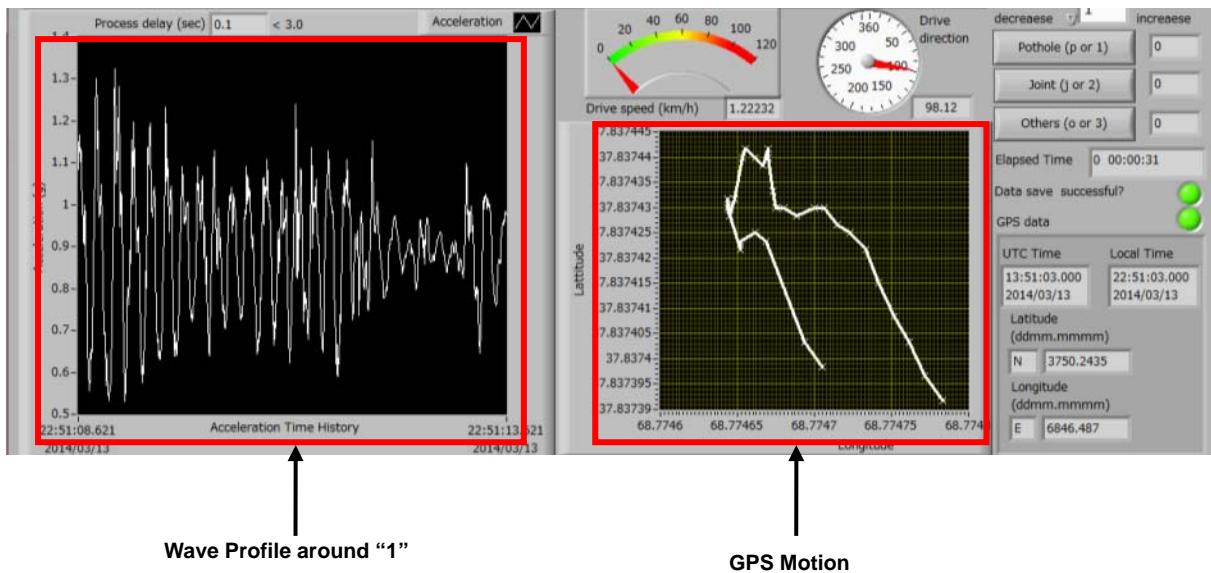
8) Run program by Click on “”, or “Ctrl + R”. **Mainly, use “Ctrl + R”.**



After starting, “” changes to “”.

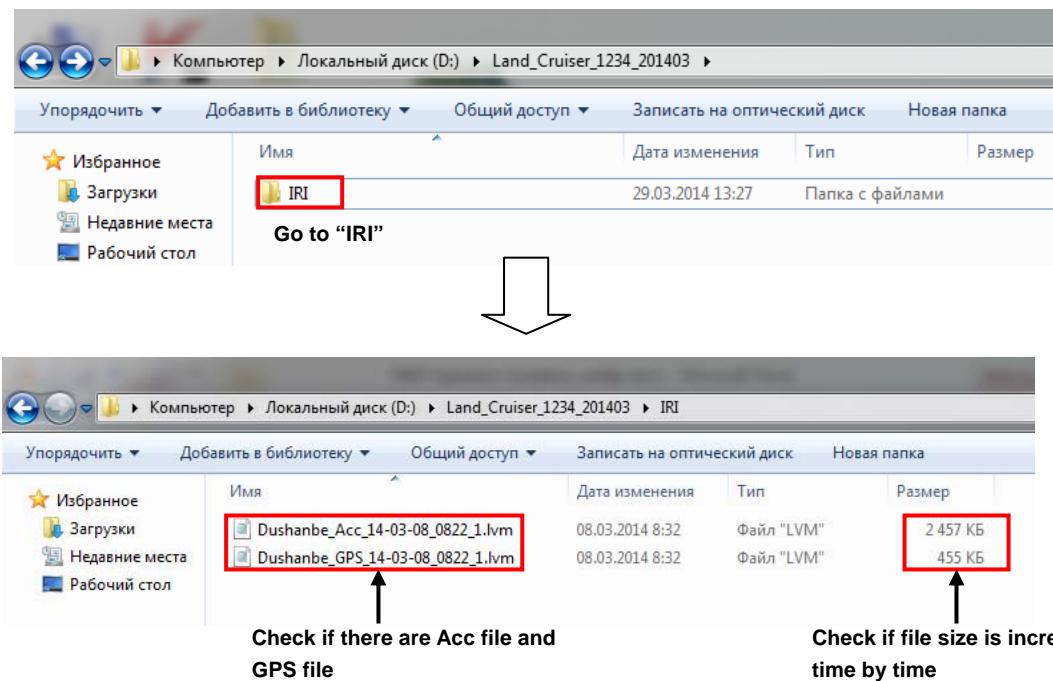


9) Check wave profile and GPS motion as shown below.



10) Check if the File size is increasing. There are 3 types of file, which are Acc, GPS, and Cmt file.

Focus on Acc and GPS file. Cmt file is not so important here because it is just the text information.

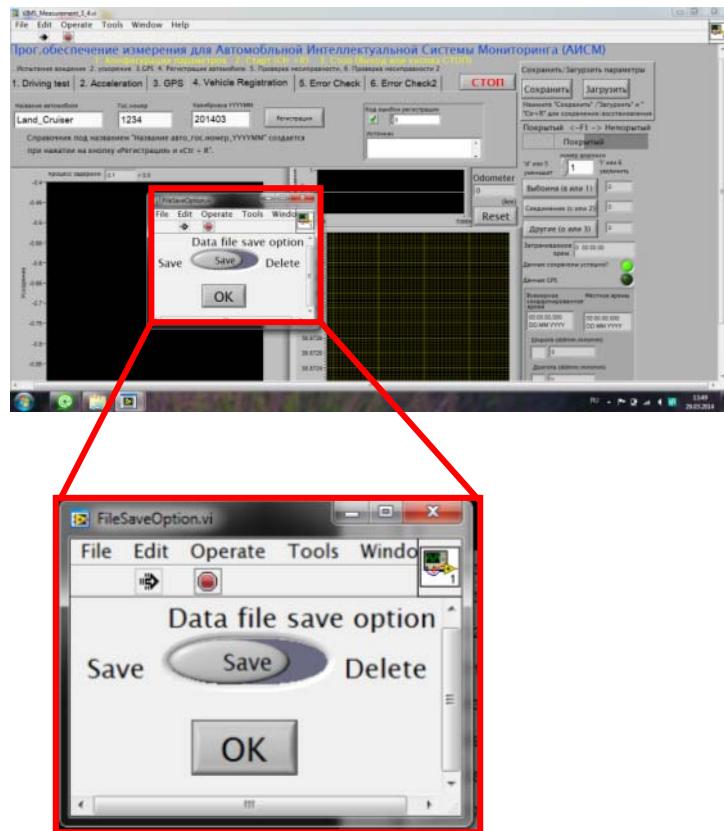


11) Stop software.

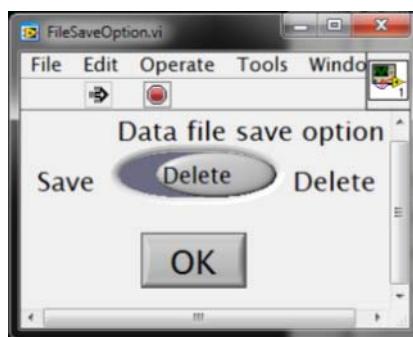
When you stop software, press “**Esc**”. Even if you press red button, sometimes the problem occurs.
Mainly use “**Esc**” to stop software.



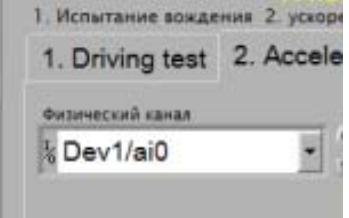
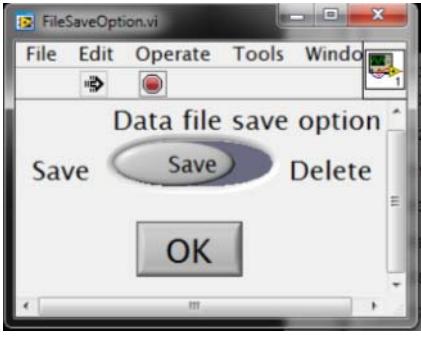
- 12) After checking above, go back to VIMS measurement software. Press “ESC”, then popping the below window.



Select “Delete” and press “OK” because this process is just for checking. In actual measurement, select ”Save”



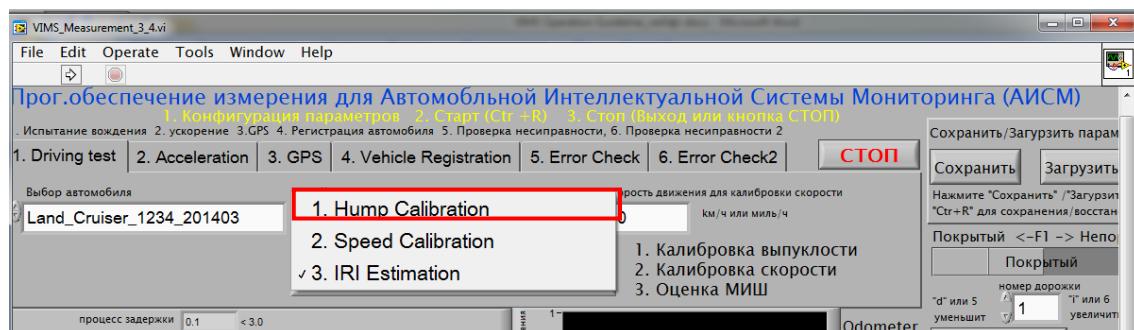
Trouble Shooting

Trouble	Measure
Acceleration is not shown.	Change the number from Dev1/ai0 to DevX/ai0 . (X = 2 or 3)
	
	Change the USB port for DAQ. Remove USB cable and restart software.
GPS is not shown.	Remove USB and close software. Restart GPS before connecting to PC, and make sure the sound first. After that, connect to PC and start software Change the USB port.
Below window is not appeared if stopping.	Remove all cables and close software. At first, take action from STEP1. When you stop software, press “Esc”, do not use red button. 

CHAPTER 3 HUMP CALIBRATION

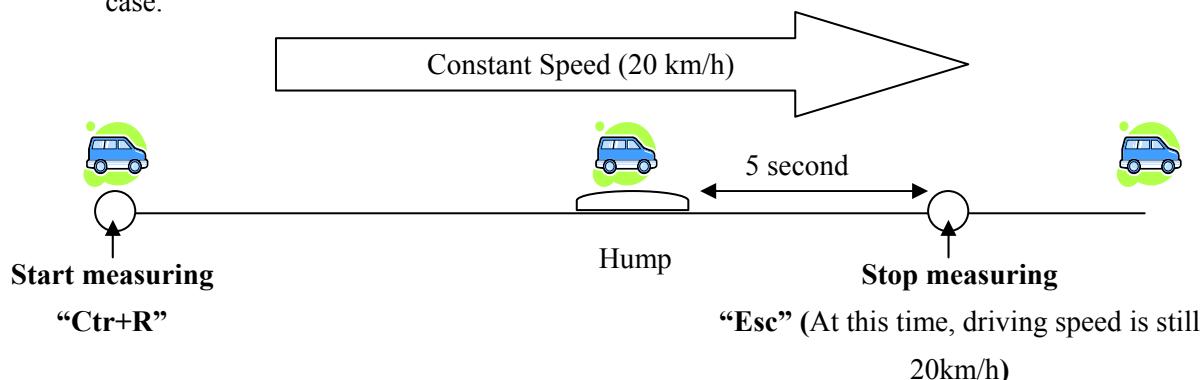
3.1 Starting-up of Measurement Software

Execute measuring software, and then select “1. Hump Calibration”.



3.2 Measuring

Stop at starting point, then press “Ctrl + R” to start to measure the data driving at 20 km/h constantly 5 times. Speed meter of a vehicle actually shows 90 % of real speed. Therefore, drive at 22 km/h. After passing over the hump, continue to drive at same speed for about 3 second. For the calculation, data for 5 times is required. However, you may occasionally obtain error files. It is better to measure the data for 10 times so that you can use correct data for 5 times even if under this case.



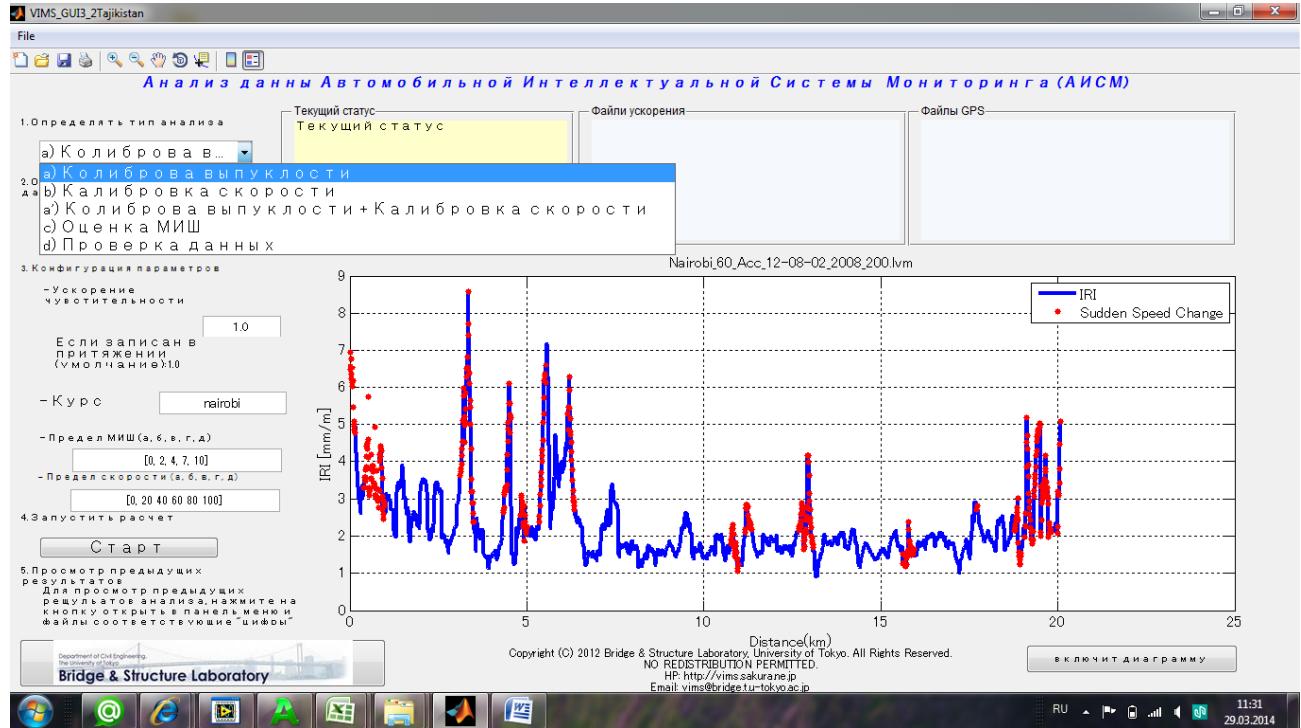
3.3 Checking the Measured Data

After finishing the measuring, go to the folder to check if the data was correctly saved. If there are acc file and GPS file, it is correct.

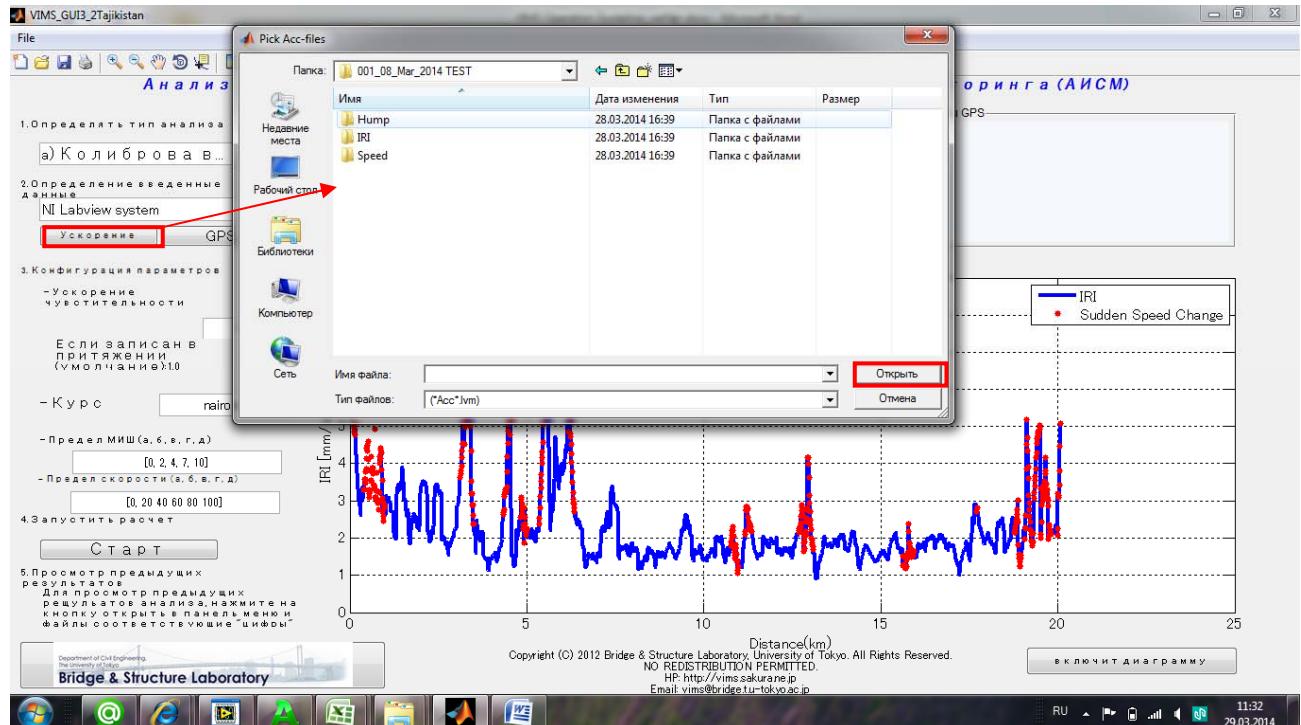
Компьютер > Локальный диск (D:) > VIMS Database > 02_VIMS Software > 01_VIMS Measurement > RU > Land_Cruiser_1				
Упорядочить	Добавить в библиотеку	Общий доступ	Записать на оптический диск	Новая папка
Избранное	Имя	Дата изменения	Тип	Размер
Загрузки	Hump	29.03.2014 10:07	Папка с файлами	
Недавние места	IRI	29.03.2014 10:07	Папка с файлами	
Рабочий стол	Speed	29.03.2014 10:07	Папка с файлами	

3.4 Analysis

Execute analysis software, and then select “a) Hump Calibration”.

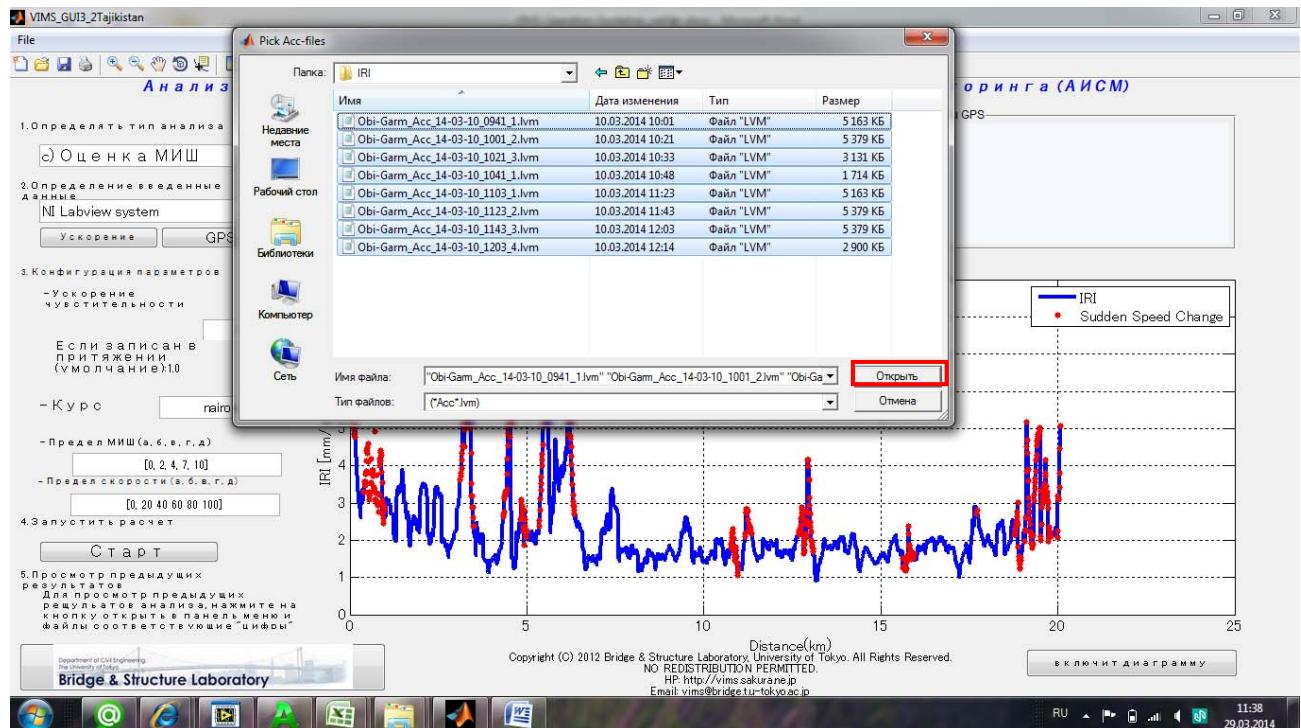


Select “Acceleration”, then new window pop-up. Go to “Hump” folder.

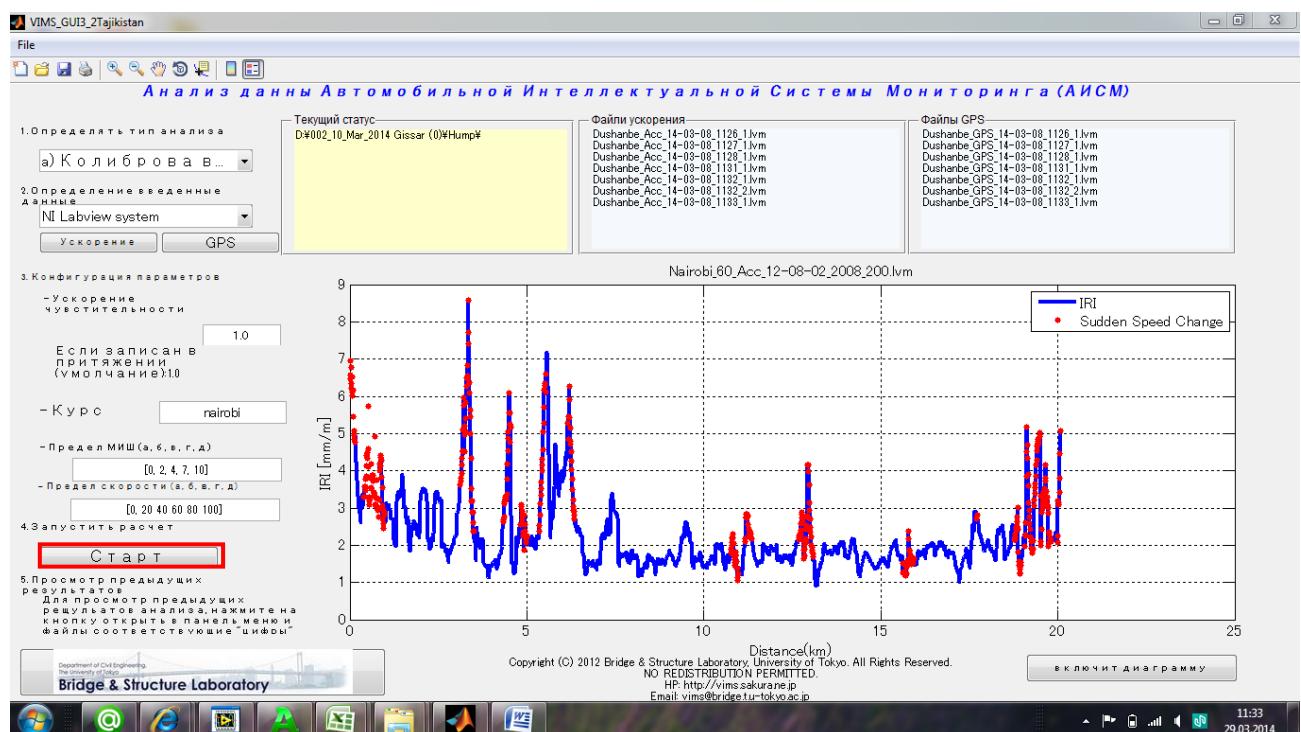


Go to “Hump” folder and Select all Acc file.

Select all Acc files, and then select “Open”.

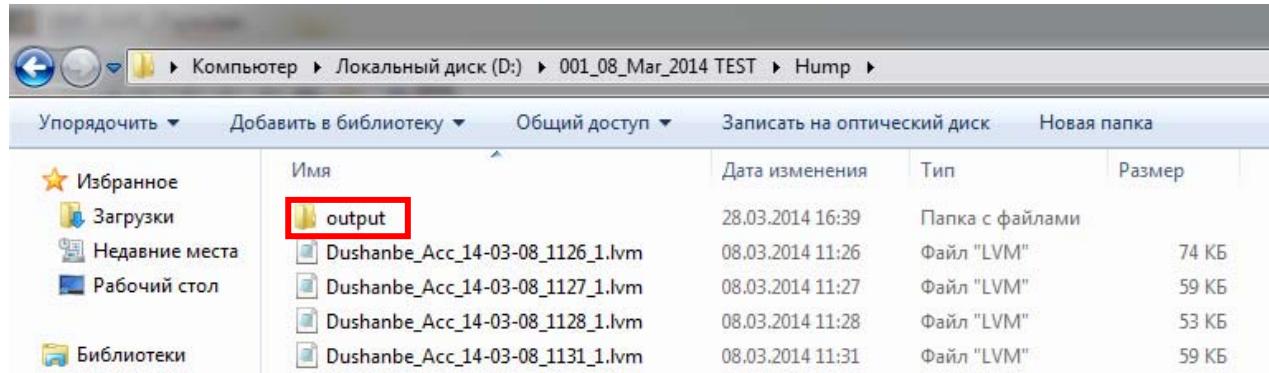


Select “Start”. Calculation will take about 10 minutes.



3.5 Checking Result

Open “Hump” folder. If hump calibration was correctly done, “output” folder is created. This data is needed when in IRI estimation.



Trouble Shooting

Trouble	Measure
Calculation stopped with blip sound.	<p>This is caused by error Acc file. If there are any error Acc file in selected 5 files, calculation is not started. At first, select one file and start analysis. If it was done, the file is correct. Using this method one by one, clarify which error files are. And delete error file.</p> <p>You should measure hump calibration data again.</p>

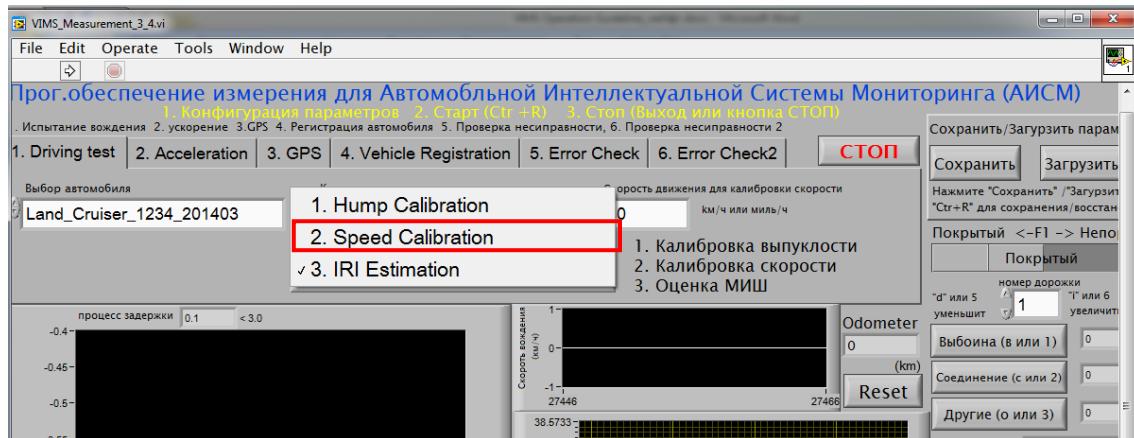
Follow the below order on Hump Calibration.

- (1) Stop the vehicle at starting point. (The distance from starting point to hump must be almost same. Set symbol for starting point, such as electric pole or tree, etc.)
- (2) Start measurement software
- (3) Make driving speed 20km/h as soon as possible
- (4) After passing over hump, continue to drive at 20 km/h constantly for 5 second.
- (5) Then stop measurement software. (At this time, driving speed is still 20km/h.)
- (6) After stopping software, stop driving.

CHAPTER 4 SPEED CALIBRATION

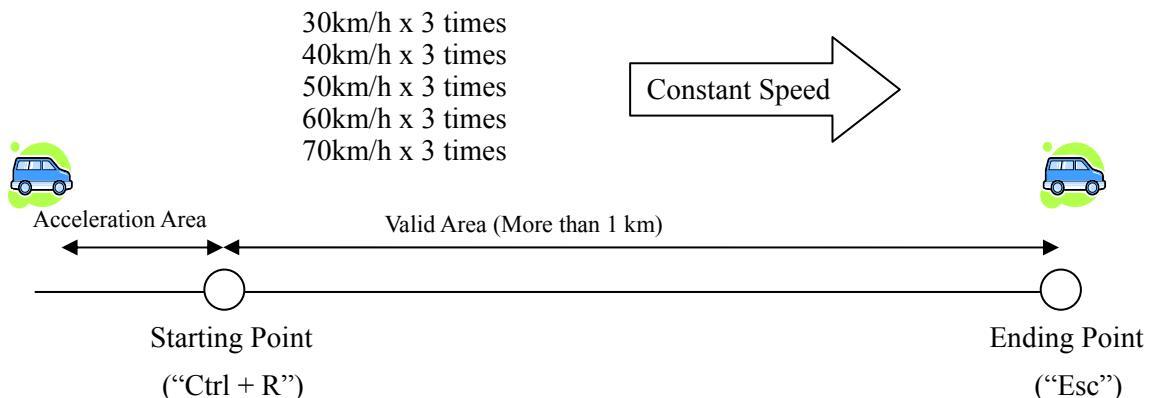
4.1 Starting-up of Analysis Software

Execute analysis software, and then select “2. Speed Calibration”.



4.2 Measuring

Stop at starting point, then press “Ctrl + R” to start to measure the data driving 3 times on the approximately same route for more than 1 km at below speed constantly. Speed meter of a vehicle actually shows 90 % of real speed. As shown in below table, drive at recommended speed on



Speed Meter	Real Speed (90% of Speed Meter)	Recommended Speed on Speed Meter
30km/h	27km/h	33 km/h
40km/h	36km/h	44 km/h
50km/h	45 km/h	56 km/h
60km/h	54 km/h	67 km/h
70km/h	63 km/h	78 km/h

4.3 Checking the Measured Data

After finishing the measuring, go to the folder to check if the data was correctly saved.

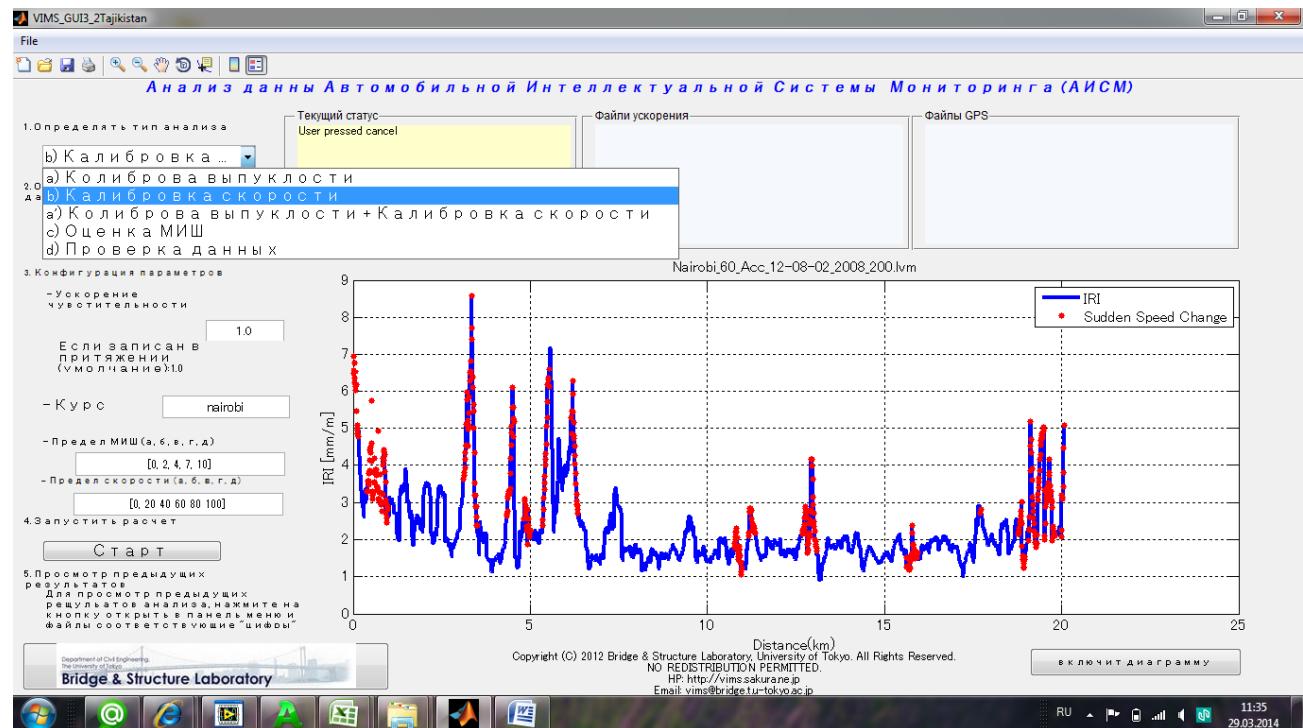
Компьютер > Локальный диск (D:) > VIMS Database > 02_VIMS Software > 01_VIMS Measurement > RU > Land_Cruiser_1				
Упорядочить	Добавить в библиотеку	Общий доступ	Записать на оптический диск	Новая папка
★ Избранное	Имя	Дата изменения	Тип	Размер
Загрузки	Hump	29.03.2014 10:07	Папка с файлами	
Недавние места	IRI	29.03.2014 10:07	Папка с файлами	
Рабочий стол	Speed	29.03.2014 10:07	Папка с файлами	

If there are acc file and GPS file, it is correct. Repeat to drive at same speed as well.

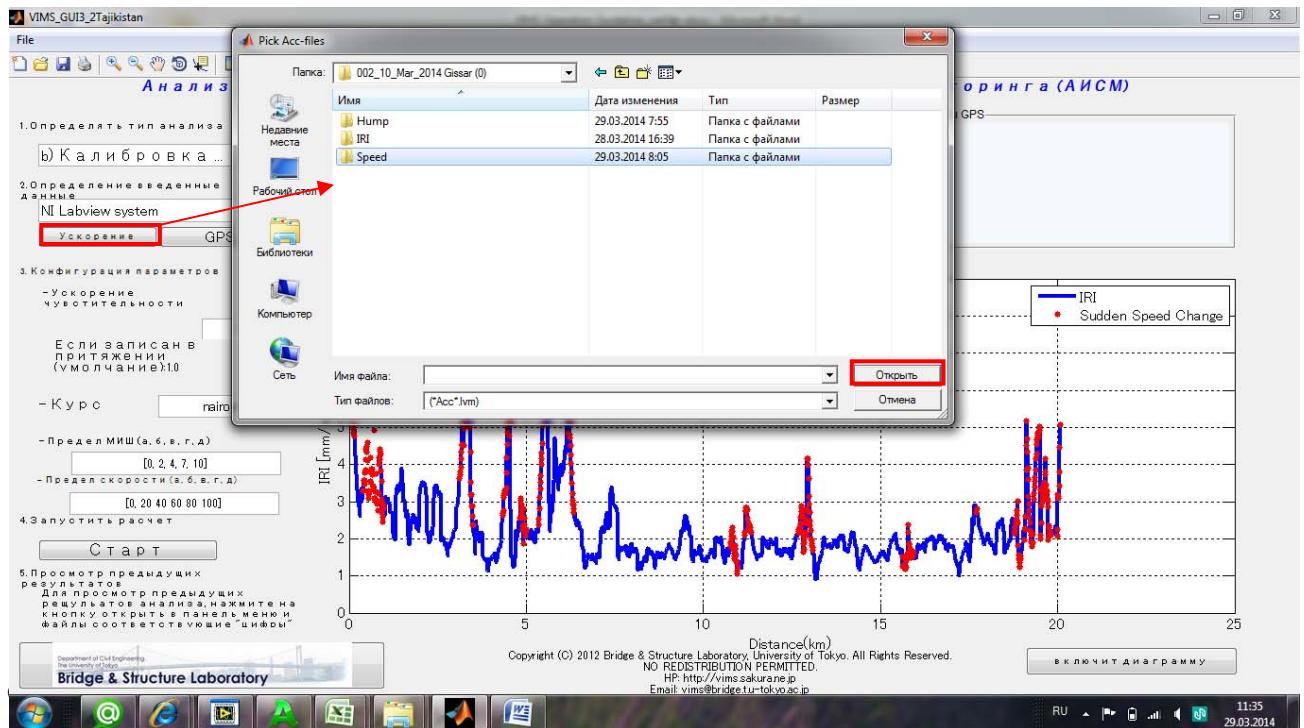
On speed calibration, there will be totally 30 files (15 Acc files and 15 GPS files).

4.4 Analysis

Execute analysis software, and then select “b) Speed Calibration”.

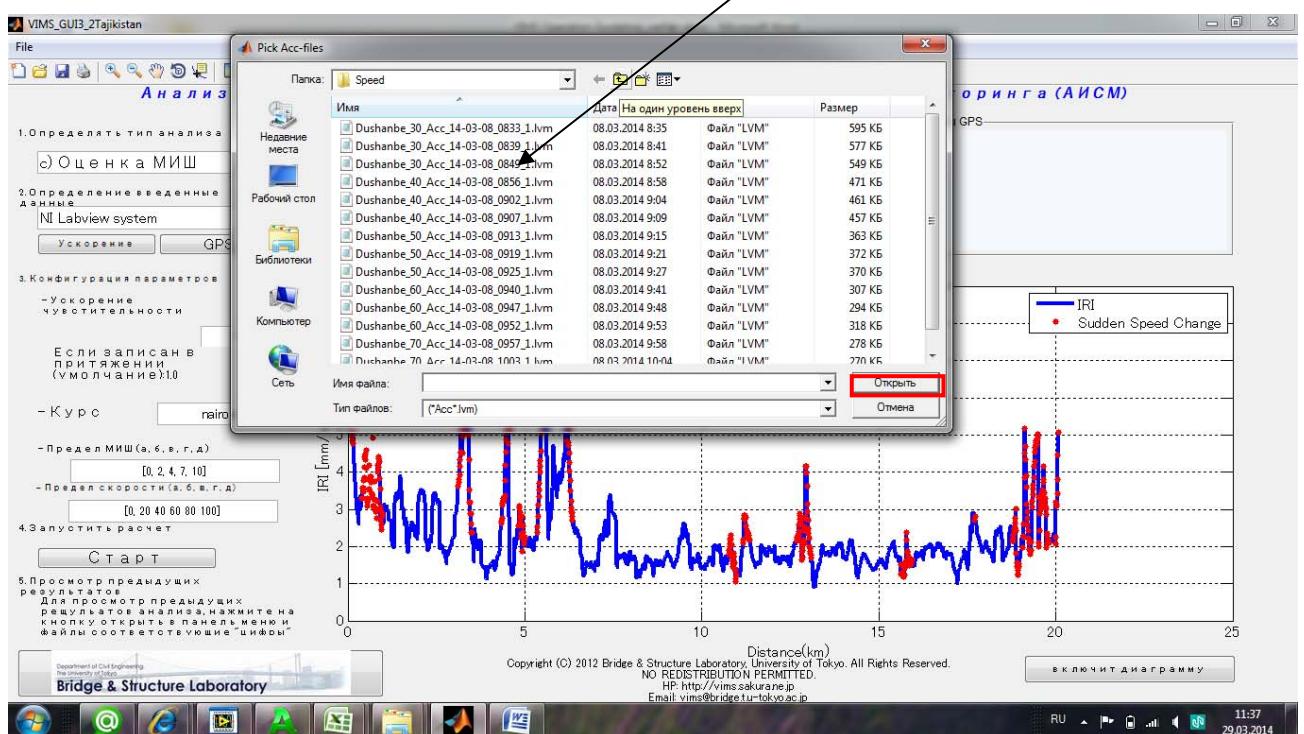


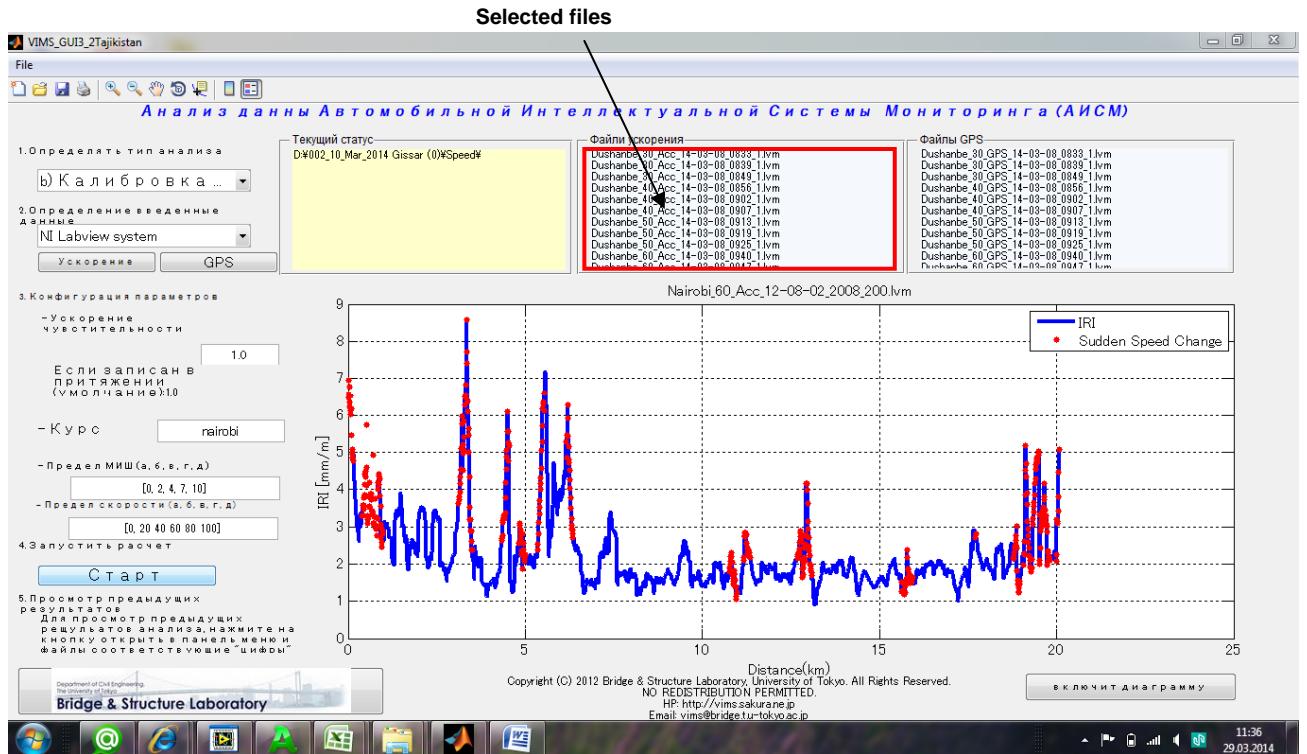
Select “Acceleration”, then new window pop-up. Go to “Speed” folder.



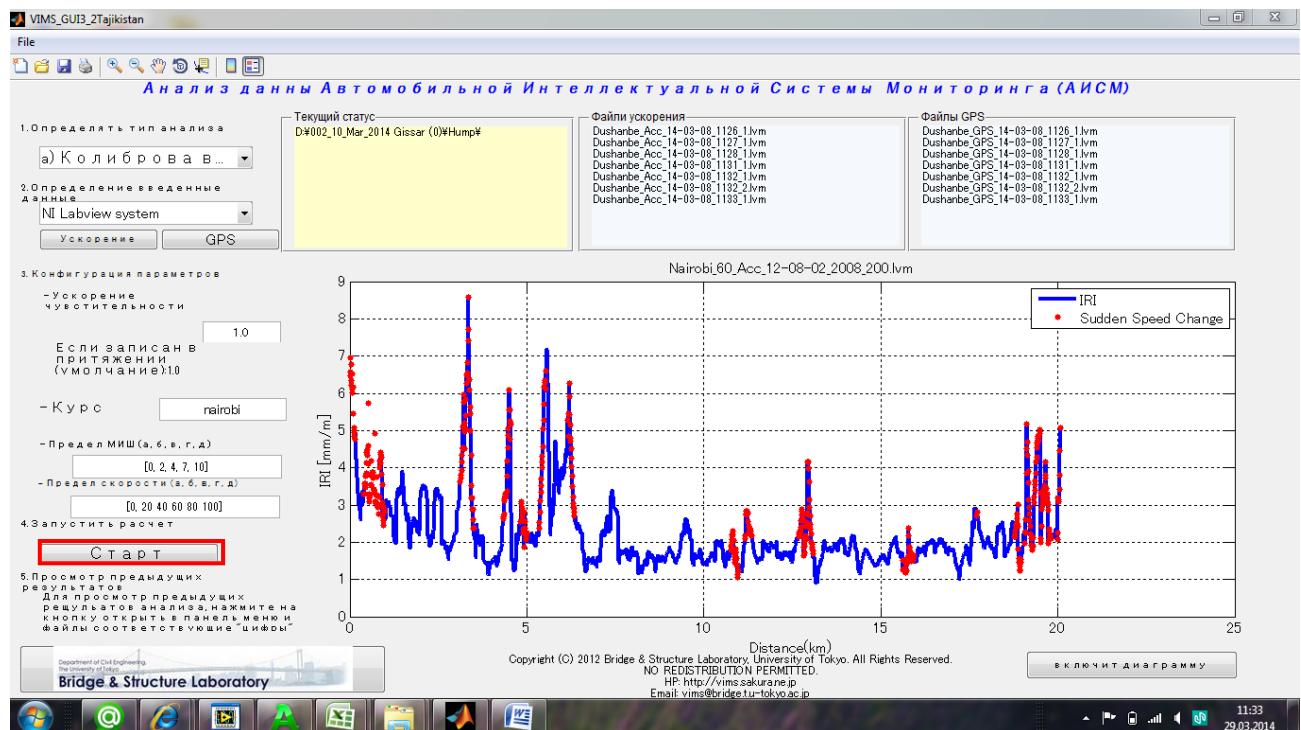
Select all Acc files as well as Hump Calibration, and then select “Open”.

Select any file, and press “Ctrl+A”. You can select all file at the same time.

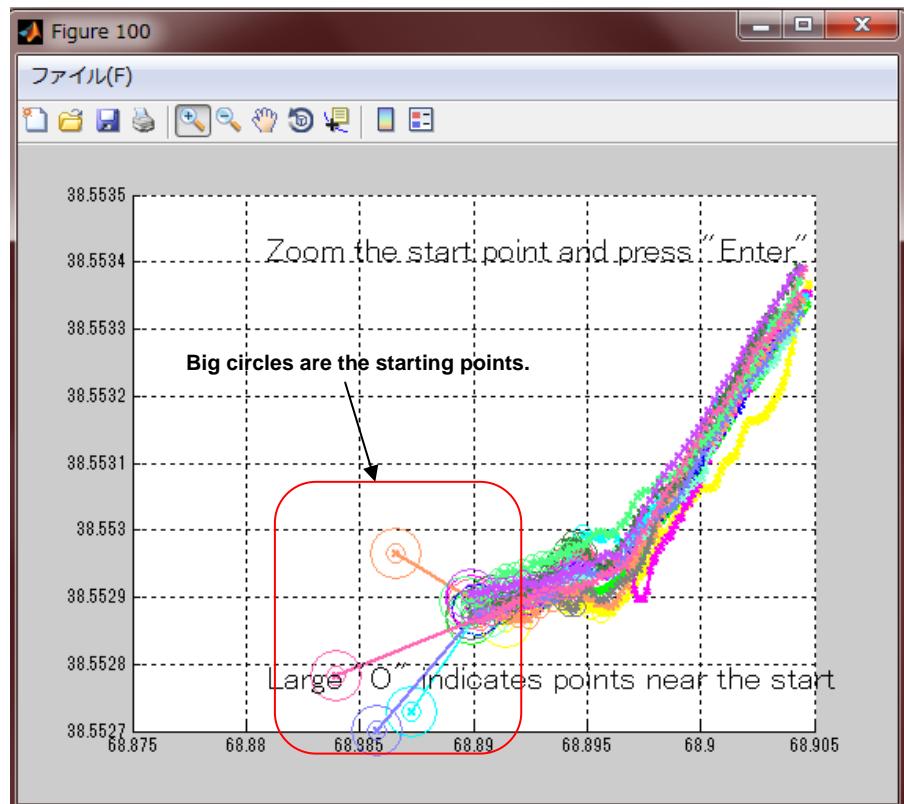




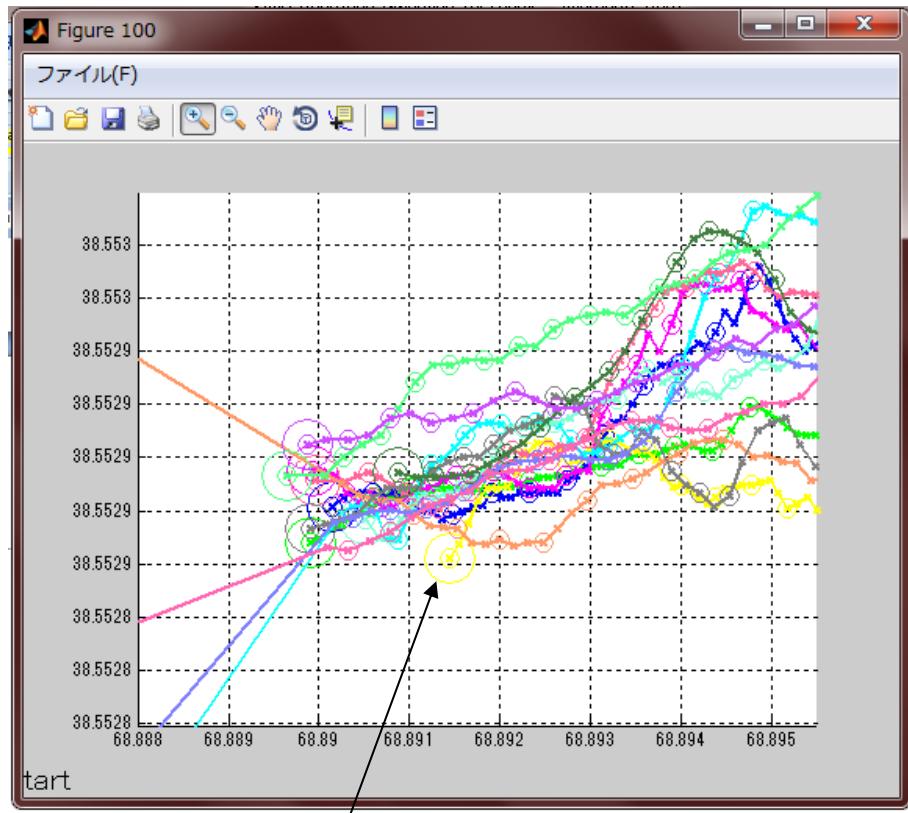
Press “Start”.



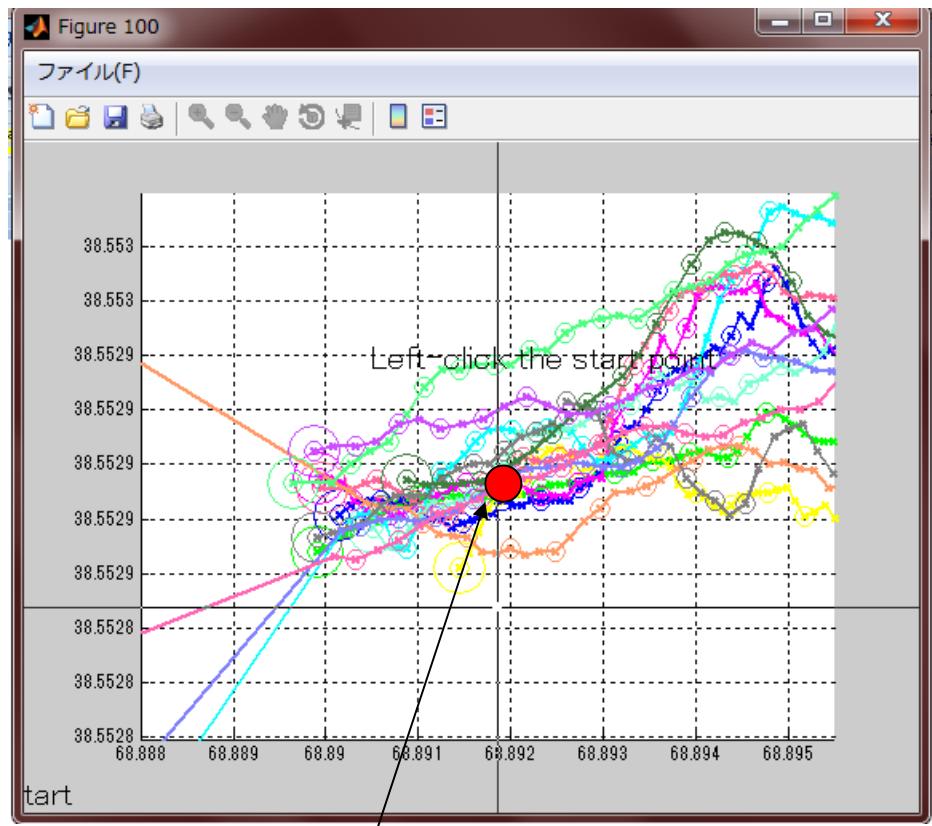
New window appears soon like below. These show the all routes which we measured.



This process is to abstract common area to be measured. Firstly, decide the starting point. Come closer by left click to the place where big circles are.



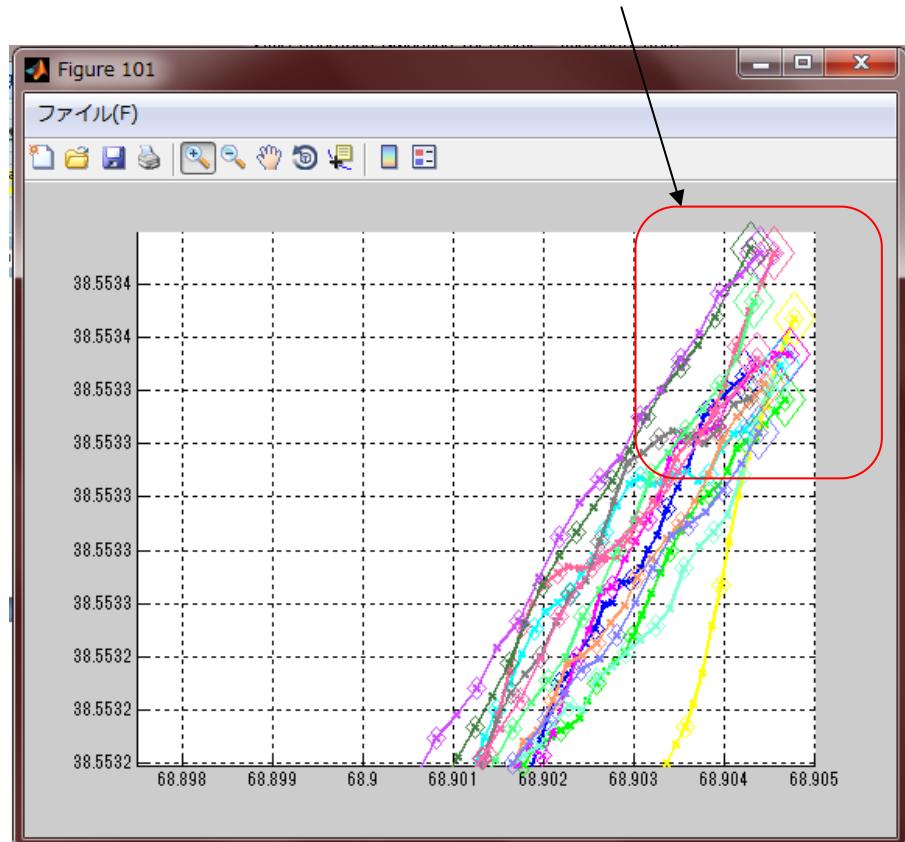
After finding innermost circle, press “Enter”. And turn mouse around.



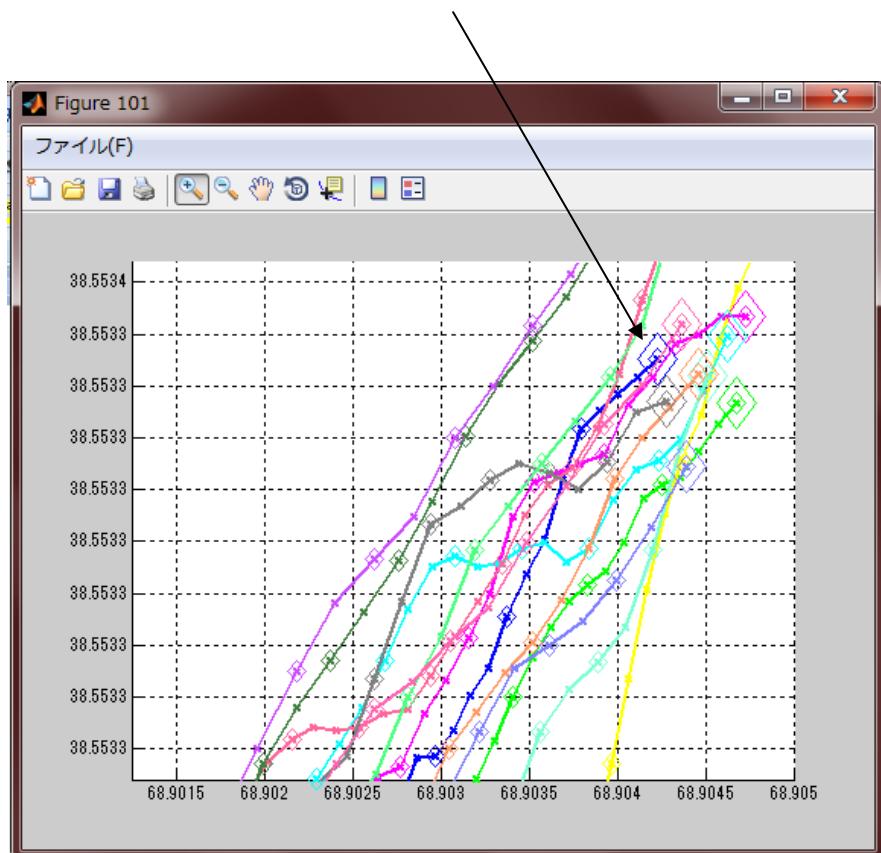
Move “Cross Line” to the right side of innermost circle, and left click on around red point.

Secondary, come closer by left click to the place where diamond shape are and decide the ending point.

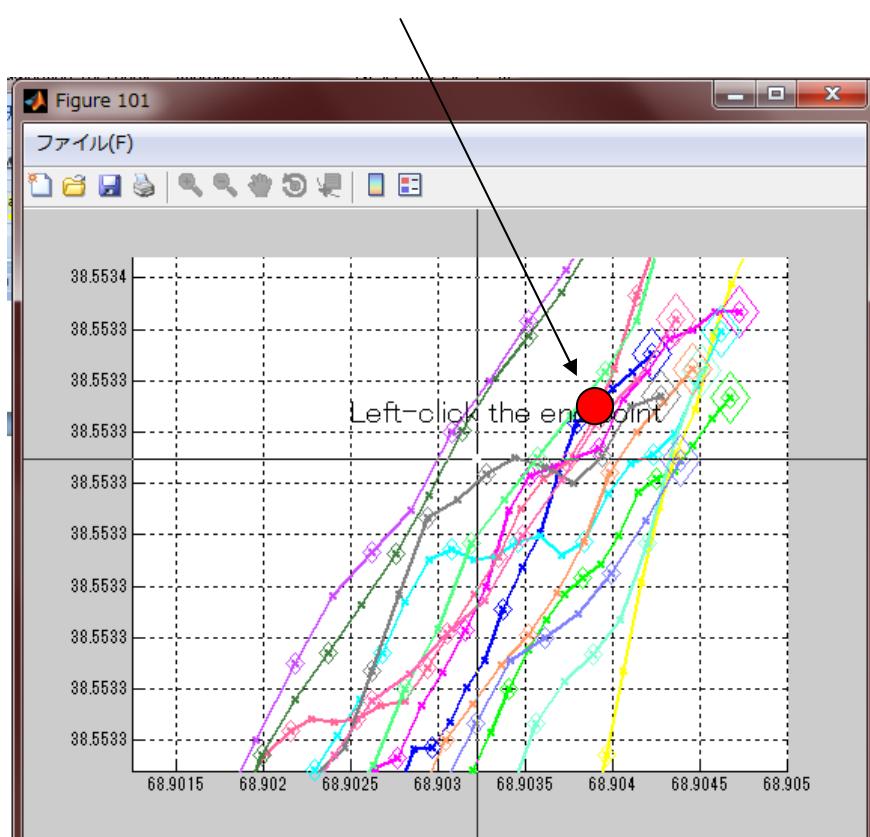
Diamond shapes are the ending points.



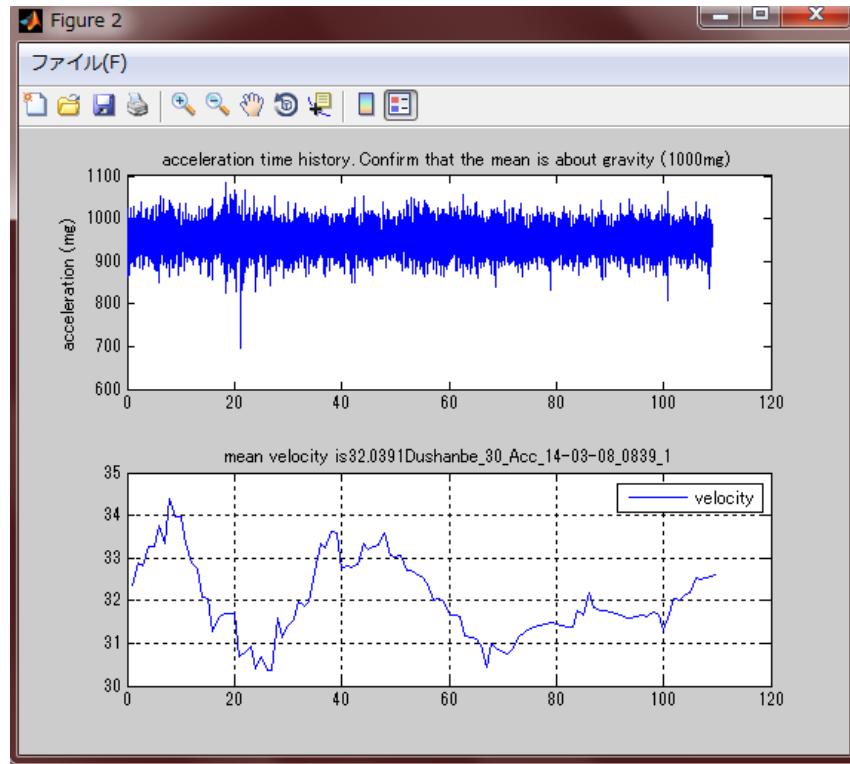
After finding innermost diamond, press “Enter”. And turn mouse around.



Move “Cross Line” to the right side of innermost circle, and left click on around red point.



Then, calculation starts automatically. During calculation, below windows will be appearing.

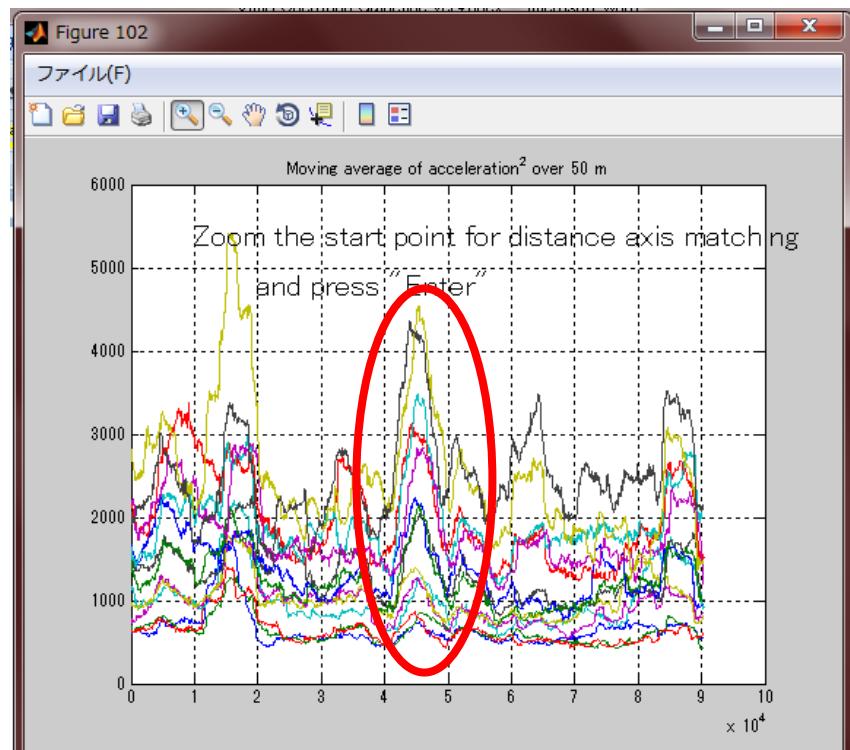


A few minutes later, below window appear. This process is to adjust the difference between the routes where we drove. The routes do not completely correspond even though same route.

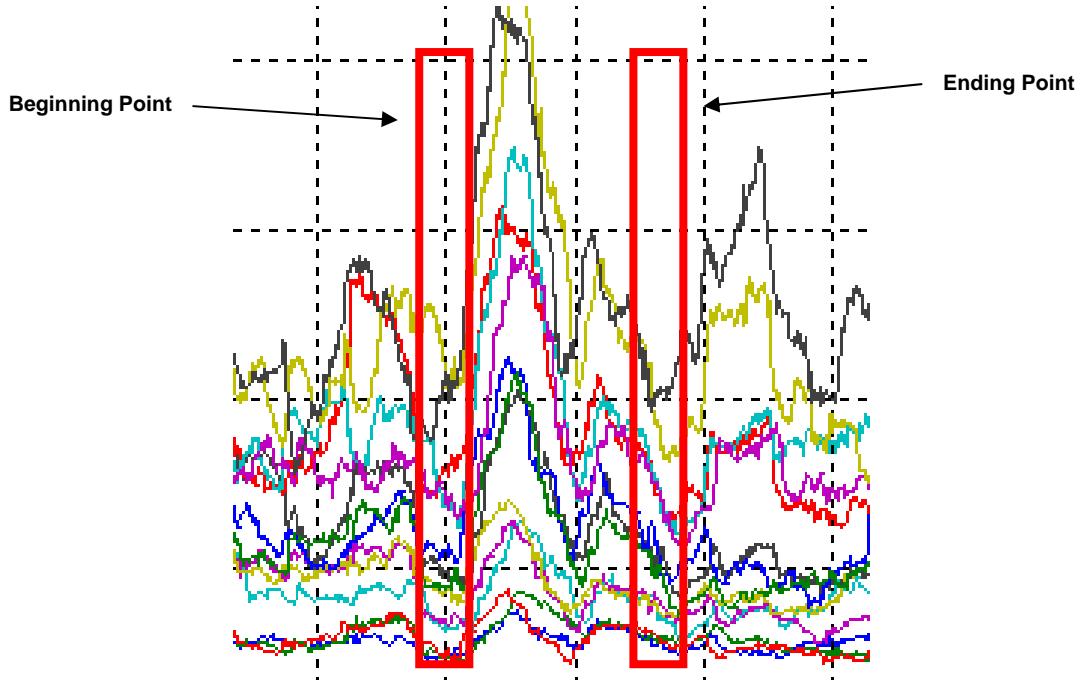
Therefore, it is necessary to adjust the differences here.

At first, look for the clearest mountain at the same distance in this figure.

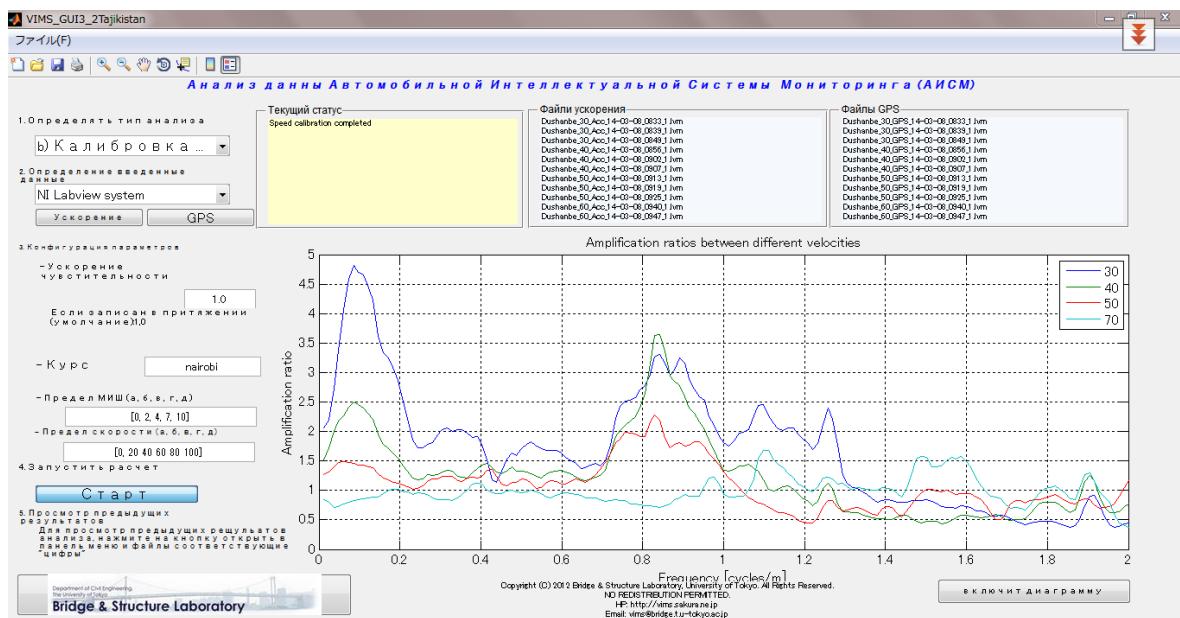
In this case, the mountain indicated by red circle should be focused on.



Come closer by left click to mountain, and press “Enter”. After that, you can see cross line as well. Press left click at the beginning and ending of mountain. In this case, inside of the area surrounded by red line should be selected. It has nothing to do with selected position in vertical direction.



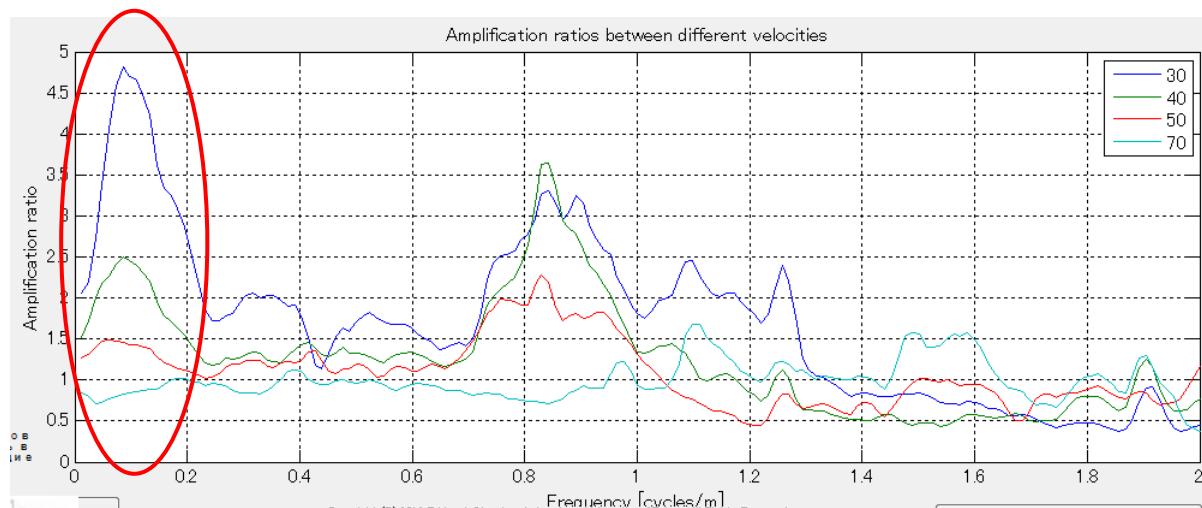
Finally, the graph shows in the main screen in the software.



4.5 Checking Result

(1) Graph

After obtaining speed calibration result, check if the lines at each driving speed are ranked in descending order from top at low frequency area where less than 0.2 cycle/m as shown in the figure is.



If not, measuring data for speed calibration should be done again.

(2) Appearance of "output" folder

Open "Speed" folder. If speed calibration was correctly done, "output" folder is created. This data is needed when in IRI estimation.

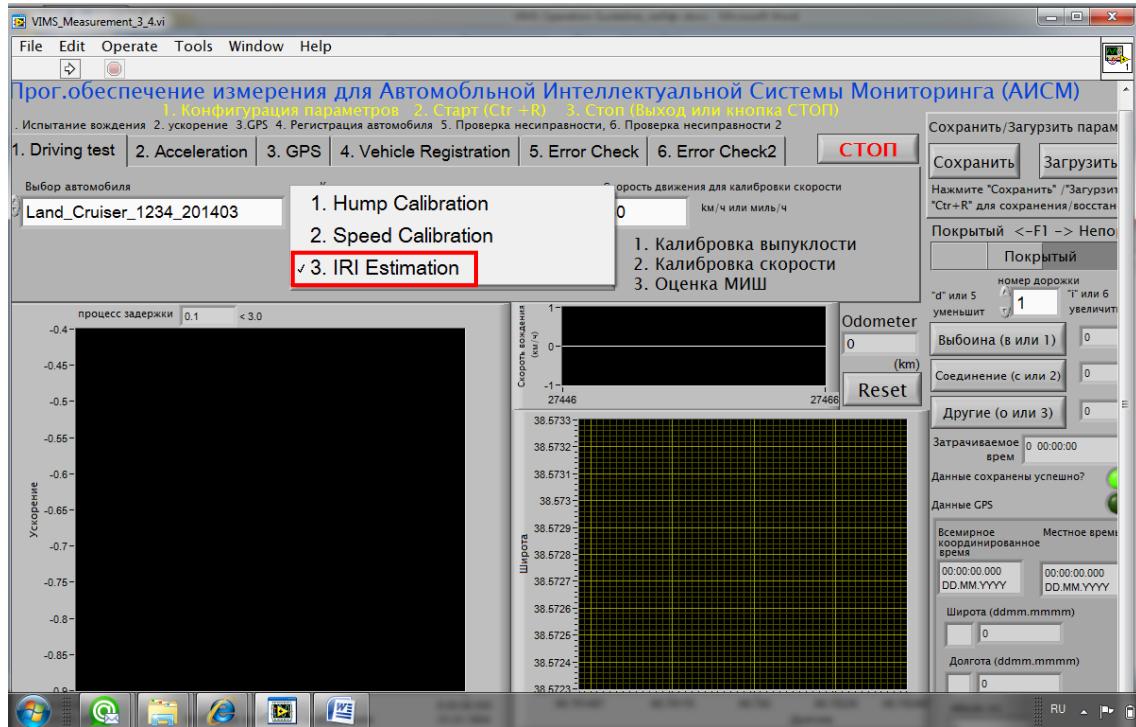
The screenshot shows a Windows file explorer window with the path: Компьютер > Локальный диск (D:) > 001_08_Mar_2014 TEST > Speed. The 'output' folder is highlighted with a red box. The table lists files in the 'output' folder:

	Имя	Дата изменения	Тип	Размер
★ Избранное				
♫ Загрузки	output	28.03.2014 16:39	Папка с файлами	
🕒 Недавние места	Dushanbe_30_Acc_14-03-08_0833_1.lvm	08.03.2014 8:35	Файл "LVM"	595 КБ
💻 Рабочий стол	Dushanbe_30_Acc_14-03-08_0839_1.lvm	08.03.2014 8:41	Файл "LVM"	577 КБ
📁 Библиотеки	Dushanbe_30_Acc_14-03-08_0849_1.lvm	08.03.2014 8:52	Файл "LVM"	549 КБ
🎥 Видео	Dushanbe_30_GPS_14-03-08_0833_1.lvm	08.03.2014 8:35	Файл "LVM"	113 КБ
📄 Документы	Dushanbe_30_GPS_14-03-08_0839_1.lvm	08.03.2014 8:41	Файл "LVM"	110 КБ
🖼️ Изображения	Dushanbe_30_GPS_14-03-08_0849_1.lvm	08.03.2014 8:52	Файл "LVM"	105 КБ
🎵 Музыка	Dushanbe_40_Acc_14-03-08_0856_1.lvm	08.03.2014 8:58	Файл "LVM"	471 КБ
	Dushanbe_40_Acc_14-03-08_0902_1.lvm	08.03.2014 9:04	Файл "LVM"	461 КБ

CHAPTER 5 IRI ESTIMATION

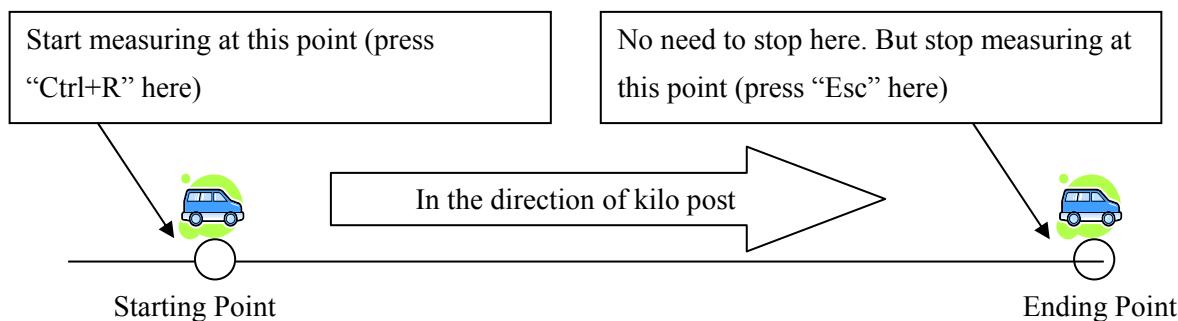
5.1 Starting-up of Analysis Software

Execute analysis software, and then select “2. Speed Calibration”.



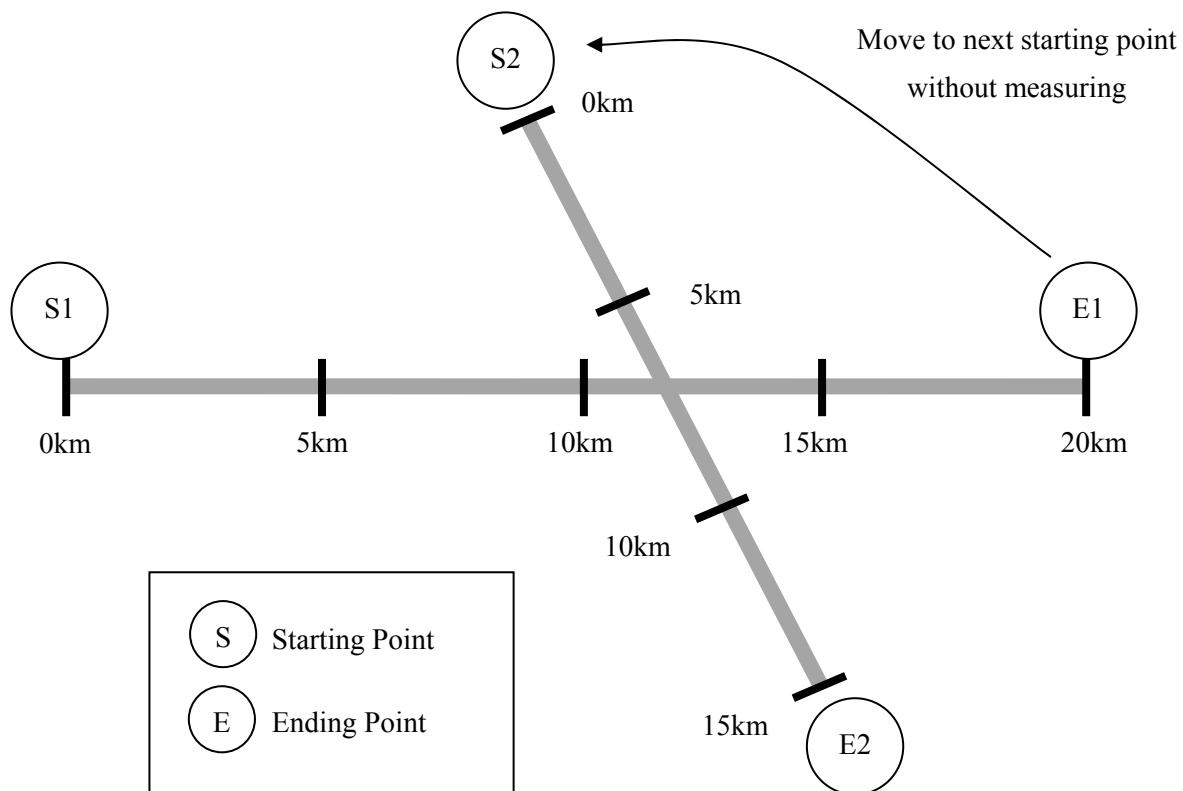
5.2 Measuring

All you need is driving for obtaining IRI estimation data with measuring software. However, there is need to start measuring from the starting point of the target road. It is not necessary to stop at the starting point. See below figure.



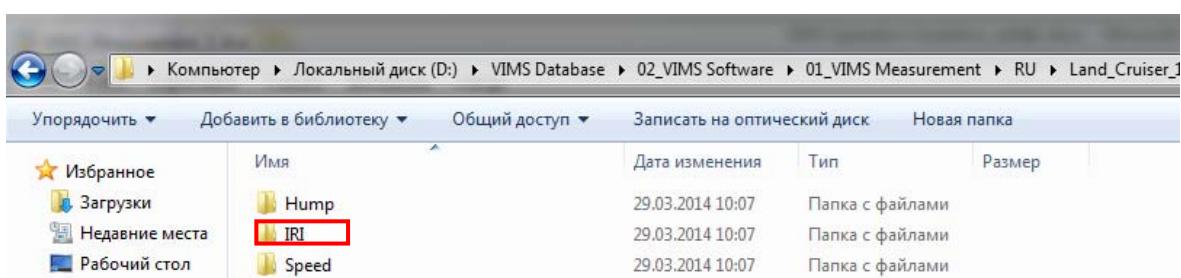
The reason to do above is to correctly manage the data file. In the process from “Start (Ctrl+R)” to “Stop (Esc)”, one file is created. Therefore, target road for measuring data should be decided in advance.

For example, in the case where there are two target roads, measuring data shall be done from S1 to E1, and from S2 to E2.



5.3 Checking the Measured Data

After finishing the measuring, go to the folder to check if the data was correctly saved.

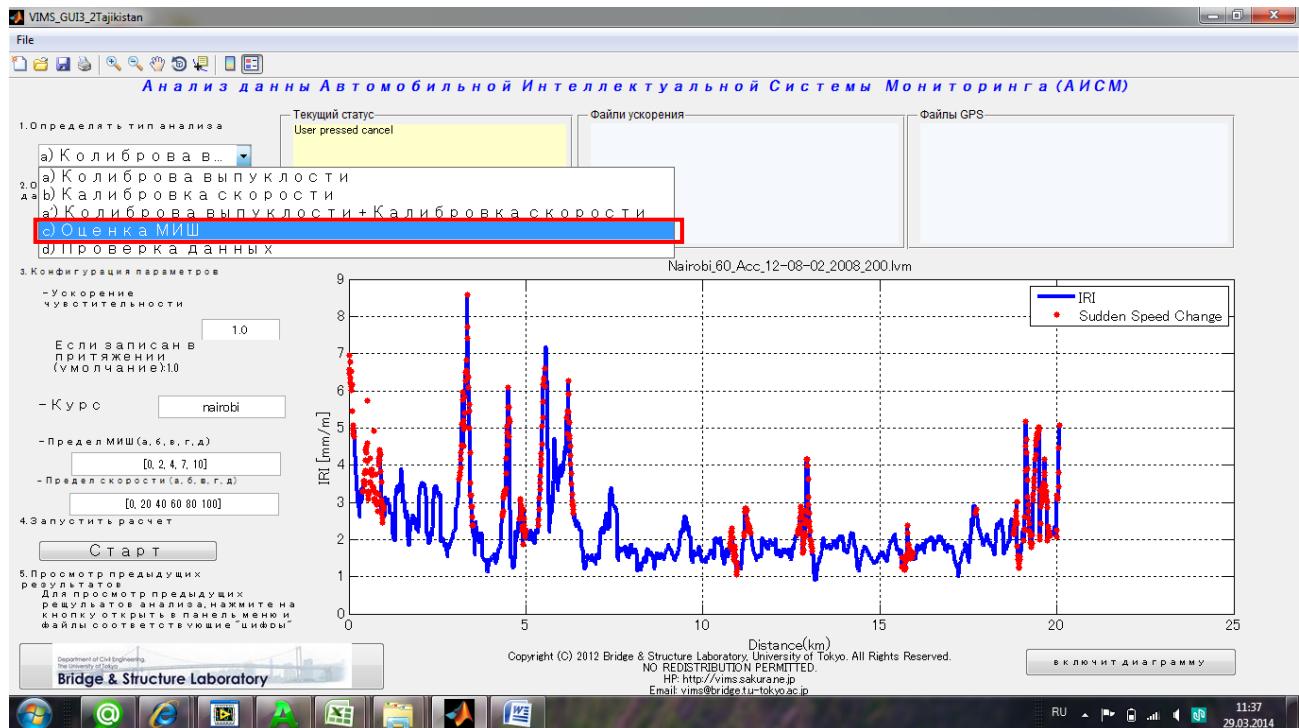


If there are acc file and GPS file, it is correct. In IRI measurement, a new file will be automatically created at 20 minutes interval, or when you take the process that is to start measuring “Ctrl+R” and to stop measuring “Esc”.

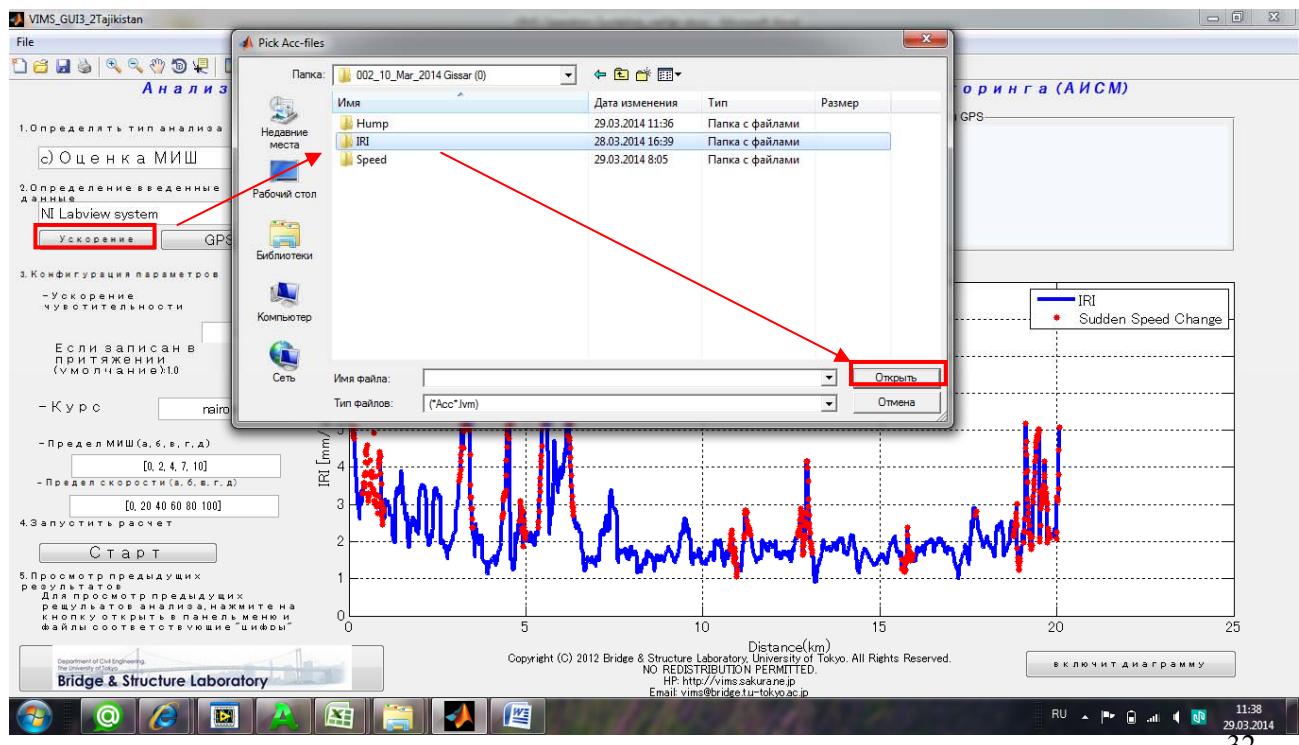
Note: “Hump” and “Speed” folder which has “output” folder must be here.

5.4 IRI Analysis

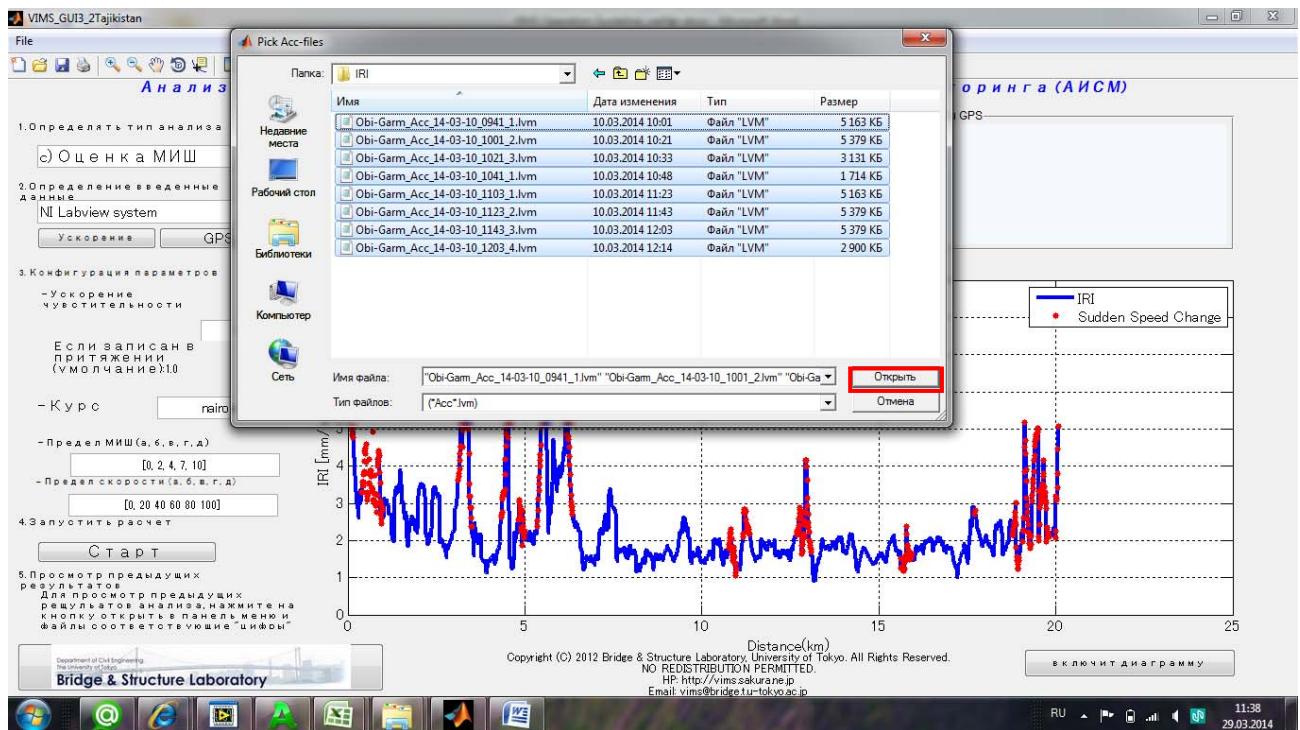
Execute analysis software, and then select “c) IRI Estimation”.



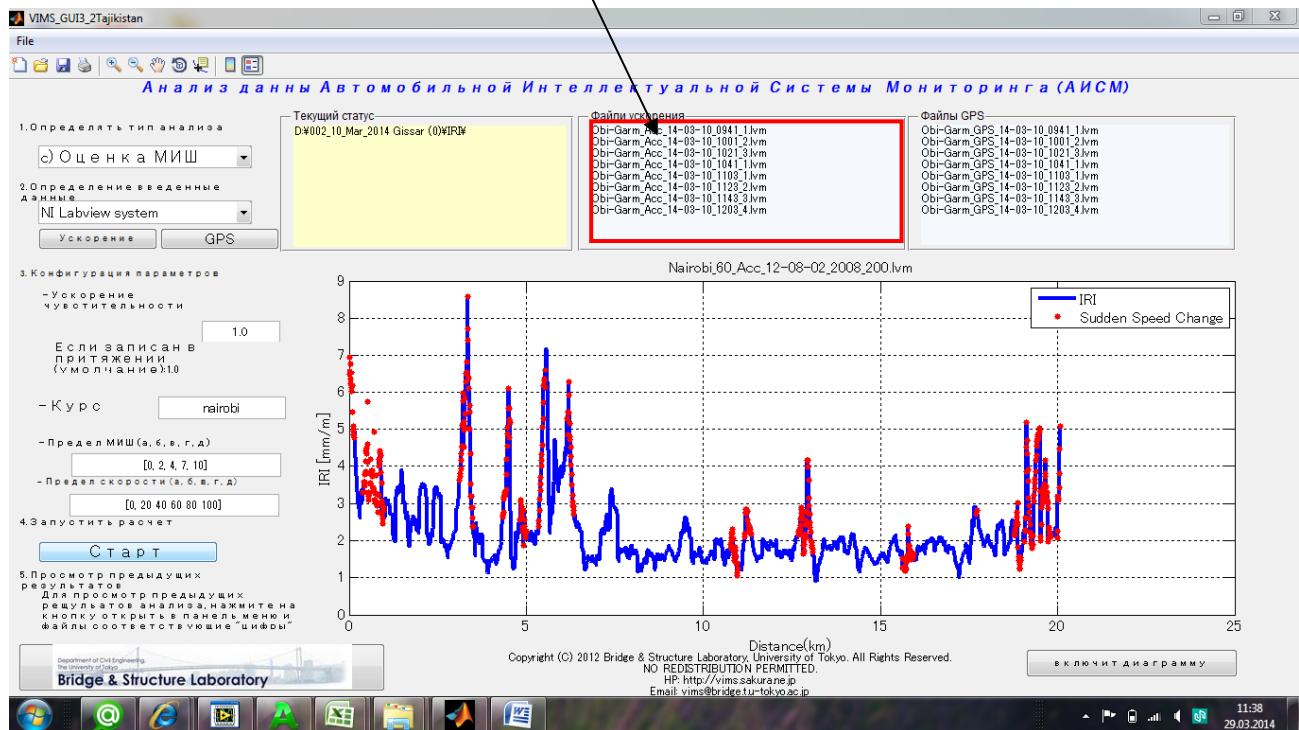
Select “Acceleration”, then new window pop-up. Go to “IRI” folder.



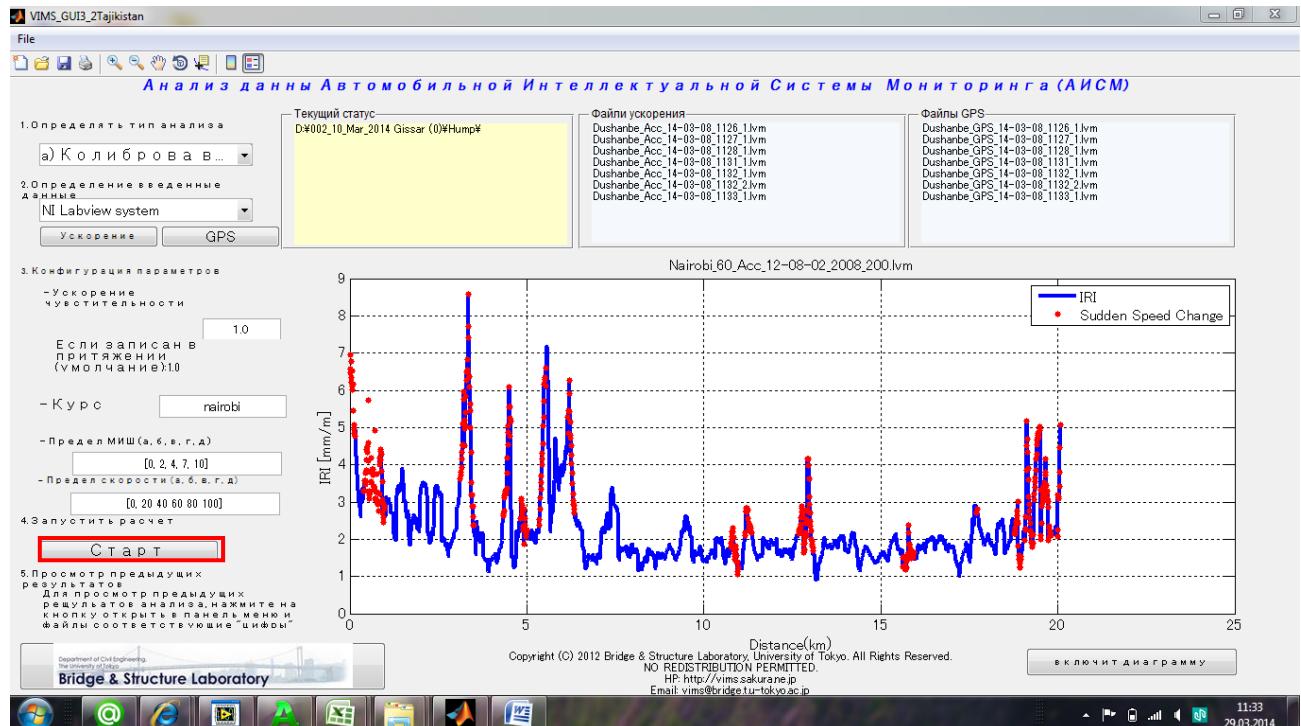
Select all Acc files as well as Hump Calibration, and then select “Open”.



Selected files

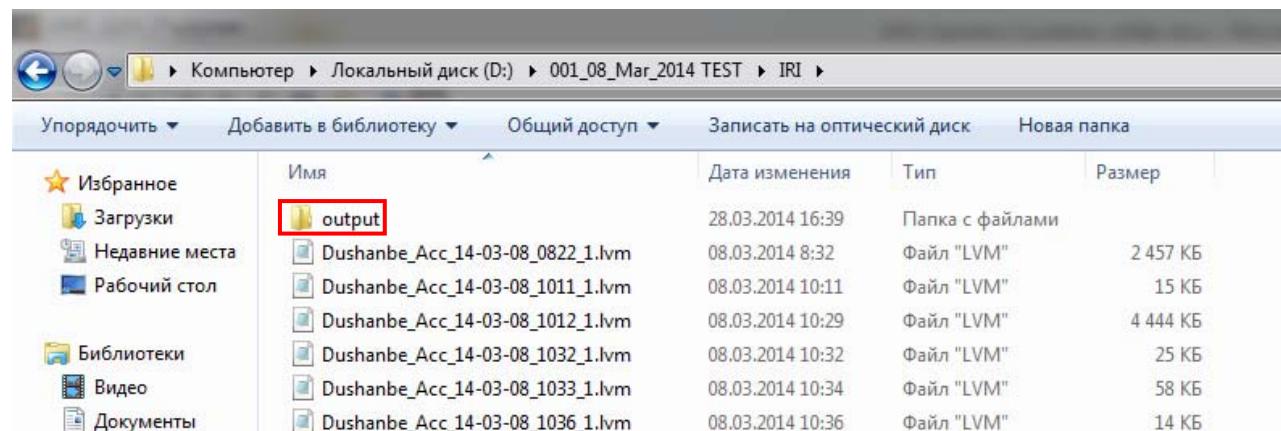


Press “Start”. It will take time according to number of files.

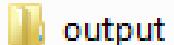


5.5 Checking Result

Open “IRI” folder. If IRI Estimation was correctly done, “output” folder is created.



Trouble Shooting

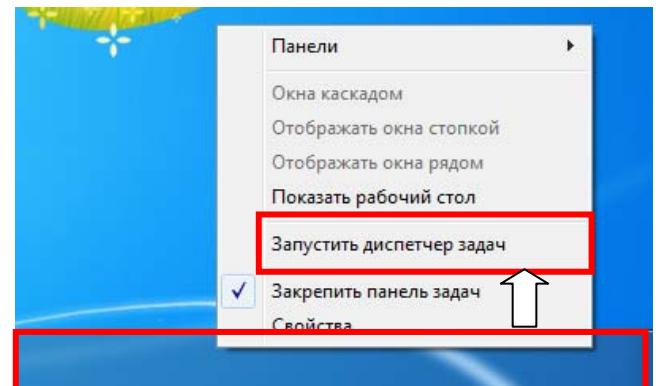
Trouble	Measure																
Calculation stopped with blip sound.	<p>This is caused by error Acc file. If there are any error Acc file in selected 5 files, calculation is not started. At first, select one file and start analysis. If it was done, the file is correct. Using this method one by one, clarify which error files are.</p> <p>Generally, error files are the one which size is so smaller than others as shown below. In this case, do not select these files when you do IRI estimation.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">  <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Dushanbe_Acc_14-03-08_0822_1.lvm</td> <td>08.03.2014 8:32</td> <td>Файл "LVM"</td> <td>2 457 КБ</td> </tr> <tr> <td>Dushanbe_Acc_14-03-08_1011_1.lvm</td> <td>08.03.2014 10:11</td> <td>Файл "LVM"</td> <td>15 КБ</td> </tr> <tr> <td>Dushanbe_Acc_14-03-08_1012_1.lvm</td> <td>08.03.2014 10:29</td> <td>Файл "LVM"</td> <td>4 444 КБ</td> </tr> <tr> <td>Dushanbe_Acc_14-03-08_1032_1.lvm</td> <td>08.03.2014 10:32</td> <td>Файл "LVM"</td> <td>25 КБ</td> </tr> </table> </div>	Dushanbe_Acc_14-03-08_0822_1.lvm	08.03.2014 8:32	Файл "LVM"	2 457 КБ	Dushanbe_Acc_14-03-08_1011_1.lvm	08.03.2014 10:11	Файл "LVM"	15 КБ	Dushanbe_Acc_14-03-08_1012_1.lvm	08.03.2014 10:29	Файл "LVM"	4 444 КБ	Dushanbe_Acc_14-03-08_1032_1.lvm	08.03.2014 10:32	Файл "LVM"	25 КБ
Dushanbe_Acc_14-03-08_0822_1.lvm	08.03.2014 8:32	Файл "LVM"	2 457 КБ														
Dushanbe_Acc_14-03-08_1011_1.lvm	08.03.2014 10:11	Файл "LVM"	15 КБ														
Dushanbe_Acc_14-03-08_1012_1.lvm	08.03.2014 10:29	Файл "LVM"	4 444 КБ														
Dushanbe_Acc_14-03-08_1032_1.lvm	08.03.2014 10:32	Файл "LVM"	25 КБ														
Calculation does not start.	<p>Below is the condition to calculate IRI.</p> <p>1. “Hump”, “IRI” and “Speed” folders must exist in a folder. If some of folders is missing, calculation does not start.</p> <div style="border: 1px solid black; padding: 10px; margin-left: 20px;">  </div> <p>2. “output” folder must exist in “Hump” and “Speed” folder.</p> <div style="border: 1px solid black; padding: 10px; margin-left: 20px;">  </div> <p>3. “output” folder must be the folder which was correctly calculated at the stage of Hump calibration and Speed calibration.</p> <p>When you face with this problem, check above condition. Even if you have only “IRI” folder, you can calculate IRI by coping “Hump” and “Speed” folder from anywhere and pasting them to the folder which “IRI” folder is being stored.</p>																

How to Check Status of Computer

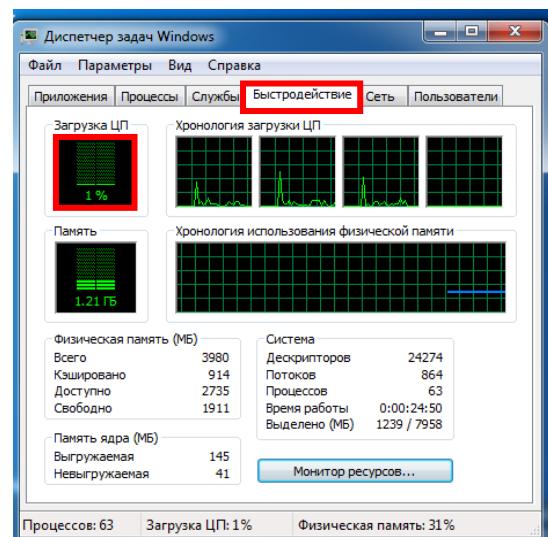
Computer is sometimes unresponsive. In this case, check the status of computer as following.

Right-click on free space of below bar. Select “Task Manager”

Select “Performance”, and then check “Status of CPU”. When in high score, calculation is been doing.



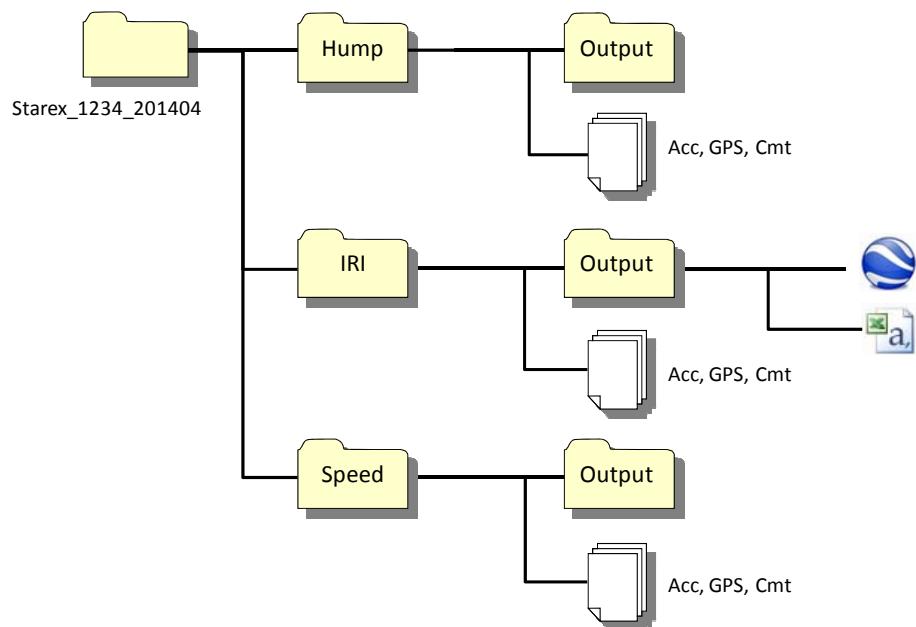
When in low score, calculation finished or stopped.



CHAPTER 6 DATA MANAGEMENT

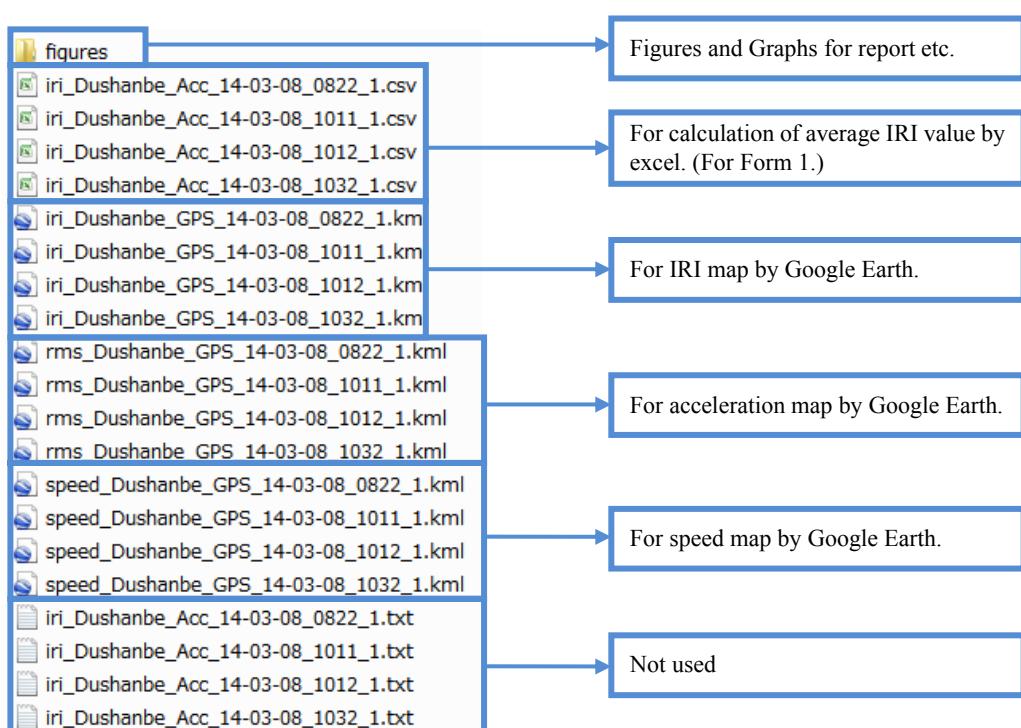
6.1 Folder Structure

The relation of software and data is illustrated as below. When you would like to move the data which was created by using VIMS, the 1st folder (here, Starex_1234_201404) including all shall be moved.



6.2 File Type

Normally, there is no need to use the files in “Hump” and “Speed” folder. These files are used for IRI analysis. Here, file type in “output” folder of “IRI” folder is explained.

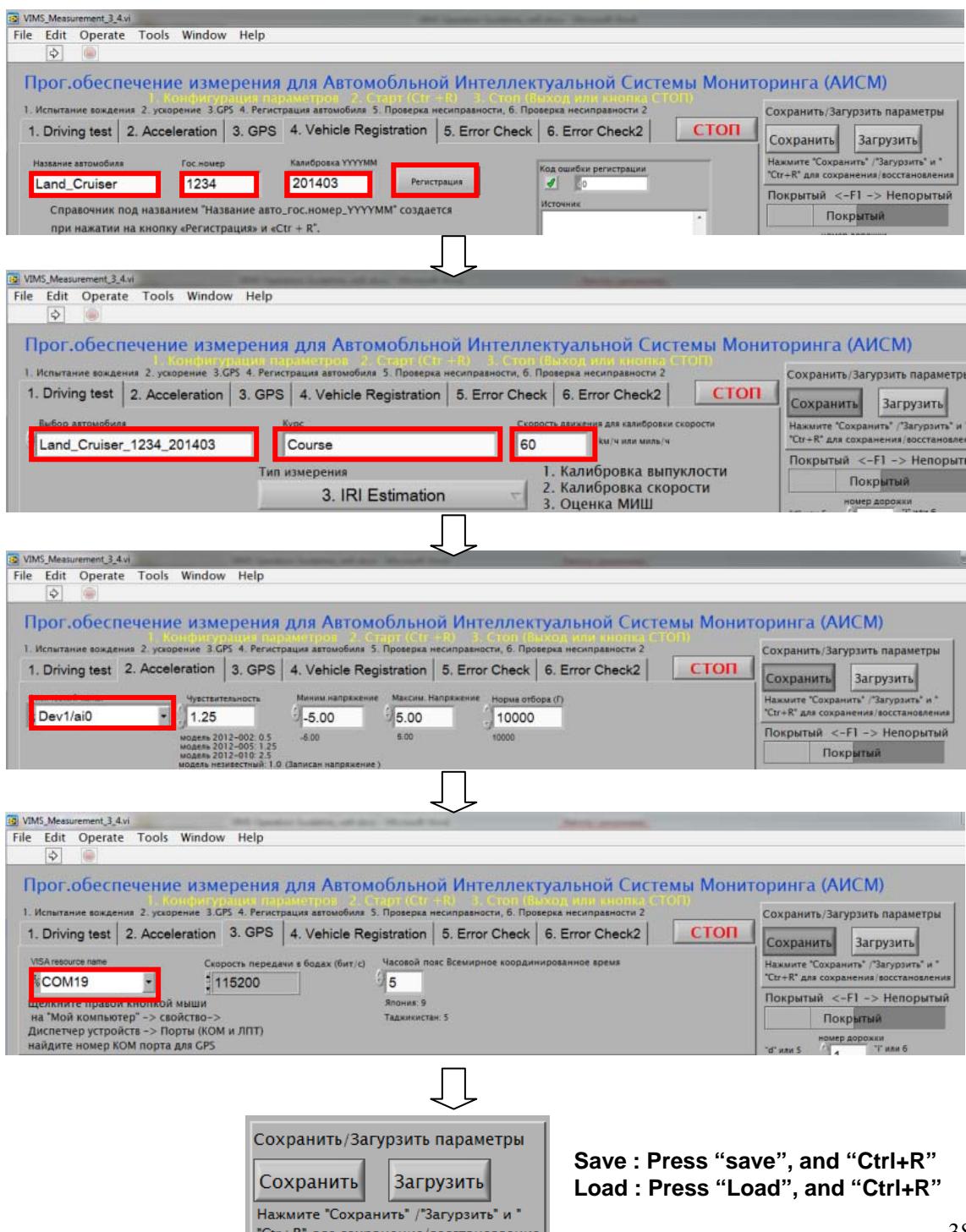


CHAPTER 7 OTHER FUNCTIONS OF DRIMS

7.1 Measurement Software

(1) Save and Load

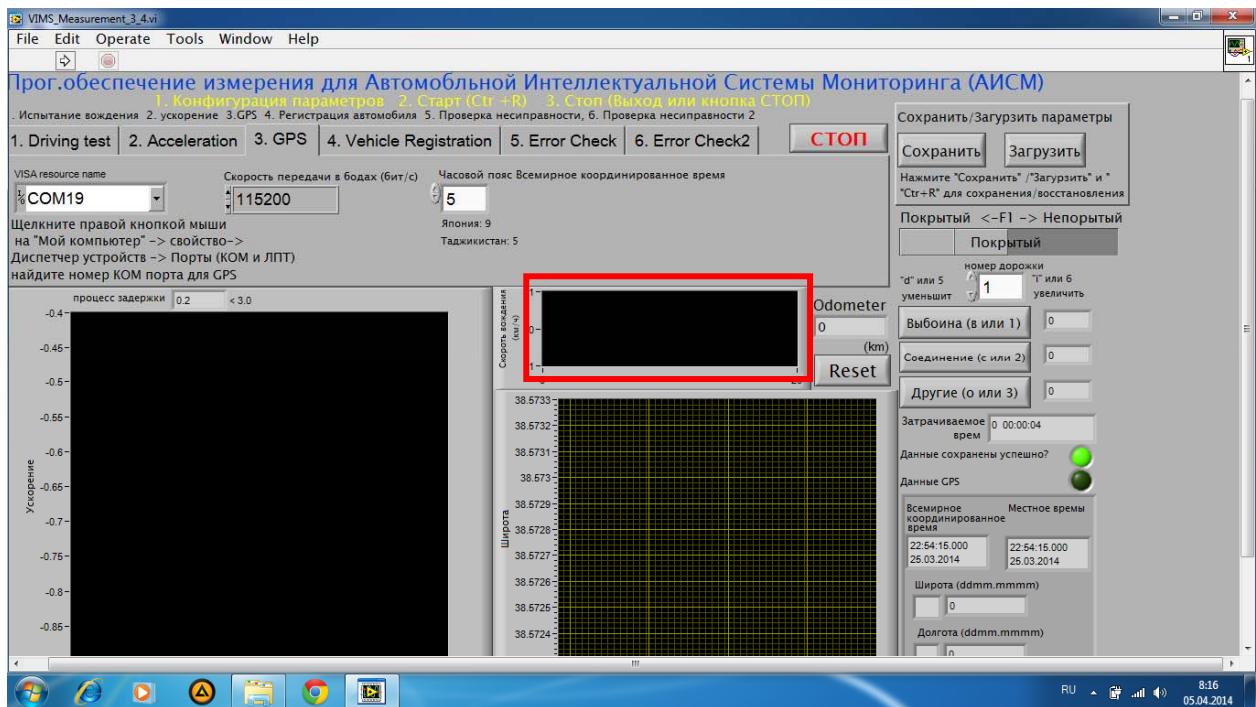
When you start measuring, you normally follow below procedure. After setting up, you can save and load the input data.



Save : Press “save”, and “Ctrl+R”
 Load : Press “Load”, and “Ctrl+R”

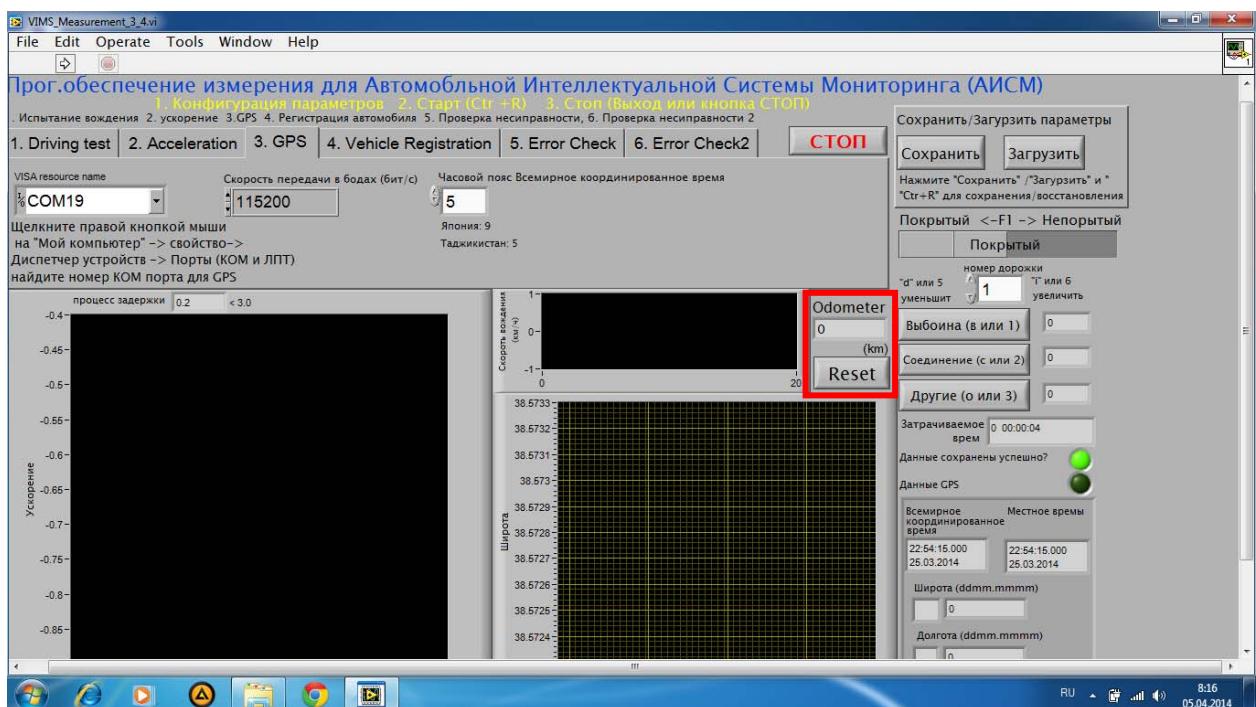
(2) Speed Meter

Below window shows driving speed. When in speed calibration, you can refer to present driving speed from this window.



(3) Odometer

Below window shows odometer. When in IRI estimation, you can refer to the distance from starting point (from the moment you pressed “Ctrl+R”).



(4) Type of Pavement

When in IRI estimation, you can record type of pavement.

Покрытый <-F1 -> Непокрытый	
Покрытый	
номер дорожки	
"d" или 5 уменьшить	1
"i" или 6 увеличить	
Выбоина (в или 1)	0
Соединение (с или 2)	0
Другие (о или 3)	0

(5) Target Lane

When in IRI estimation, you can record the lane where you are driving in multi lane road.

(6) Deterioration of Pavement

When in IRI estimation, you can record number of deterioration of pavement during executing software.

(7) Comment

You can input the comment which you would like to record (Ex; Bridge, Intersection or notable building, etc.) at any point during executing software.

7.2 Analysis Software

(1) IRI Threshold

You can define IRI threshold.

(2) Speed Threshold

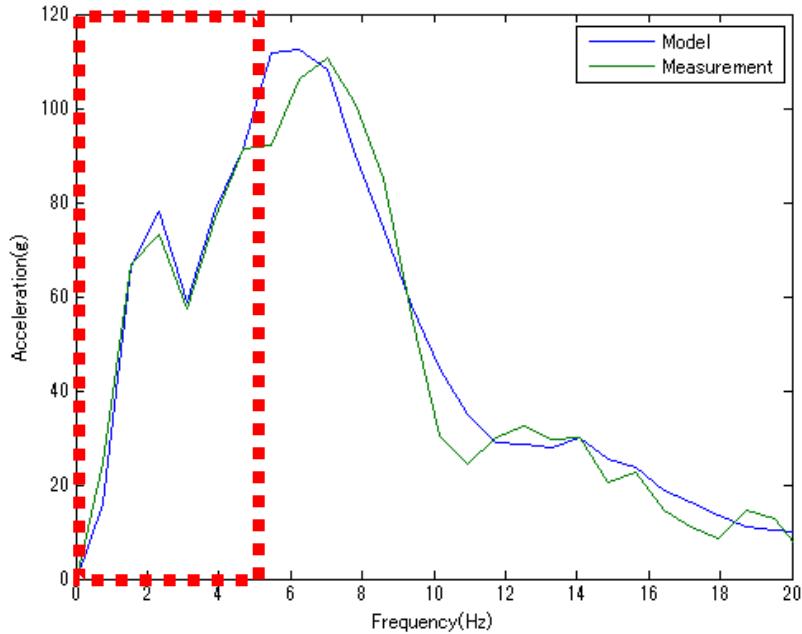
You can define Driving threshold.

- Предел МИШ (а, б, в, г, д)	[0, 2, 4, 7, 10]
- Предел скорости (а, б, в, г, д)	[0, 20 40 60 80 100]
4. Запустить расчет	

CHAPTER 8 EVALUATION CRITERIA FOR CALIBRATION RESULT

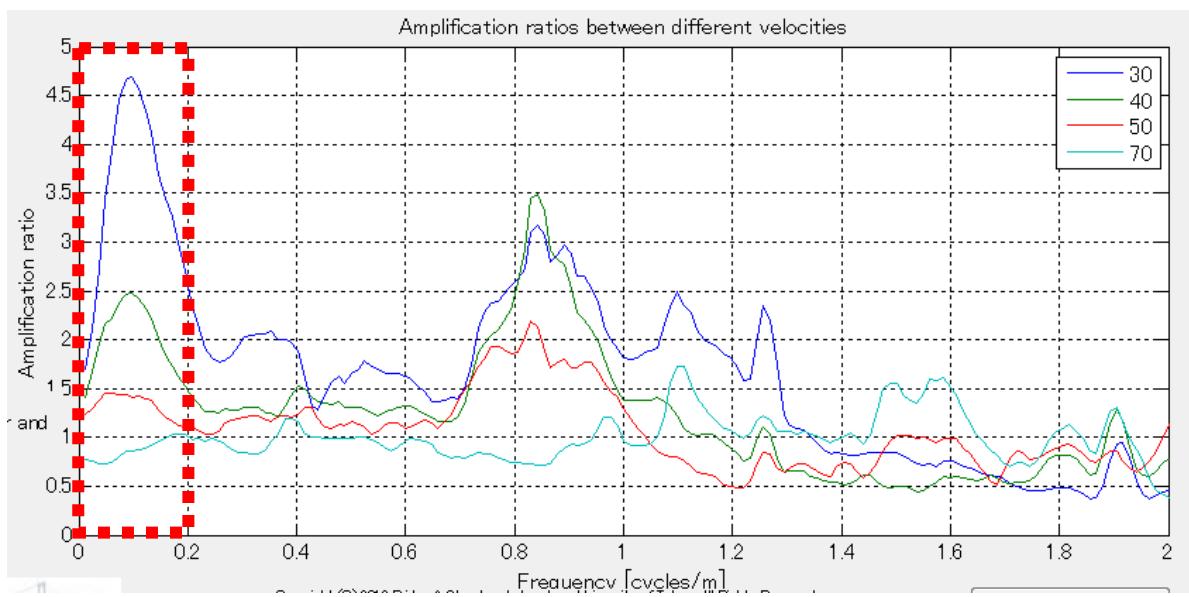
8.1 Criteria for Hump Calibration Result

If the “Model” and “Measurement” lines are almost same in target area framed by dot line (0 to 0.5Hz) in below figure, the hump calibration result is judged as valid.



8.2 Criteria for Speed Calibration Result

If the arrangement of lines in descending velocity order is shown target area framed by dot line (0 to 0.2cycle/m) in below figure, the speed calibration result is judged as valid.



DRIMS操作チェックリスト

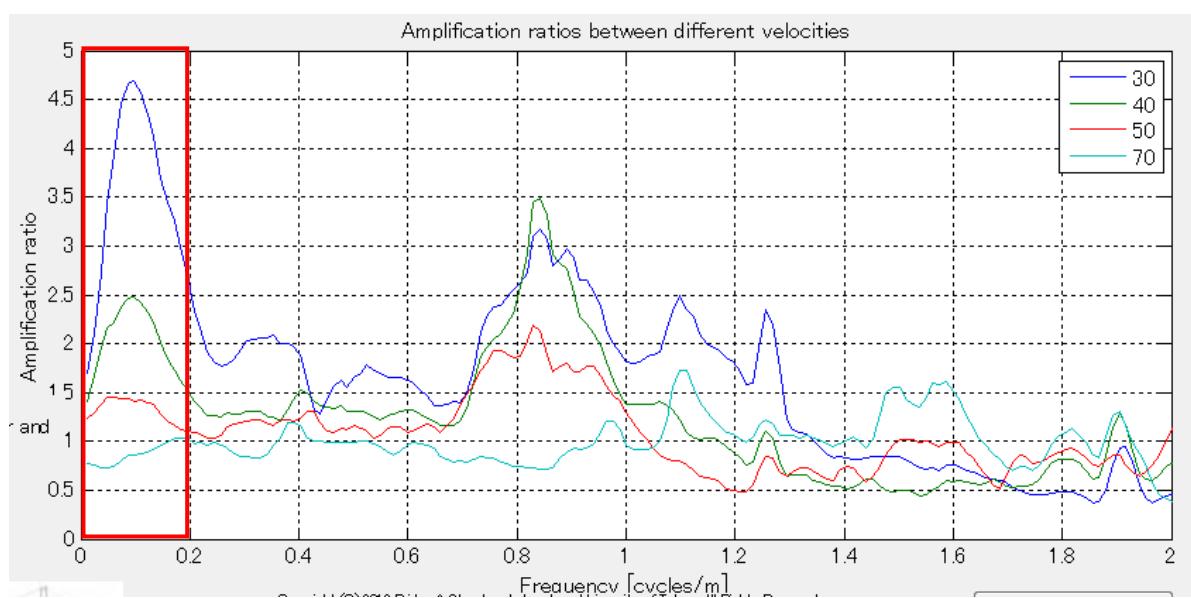
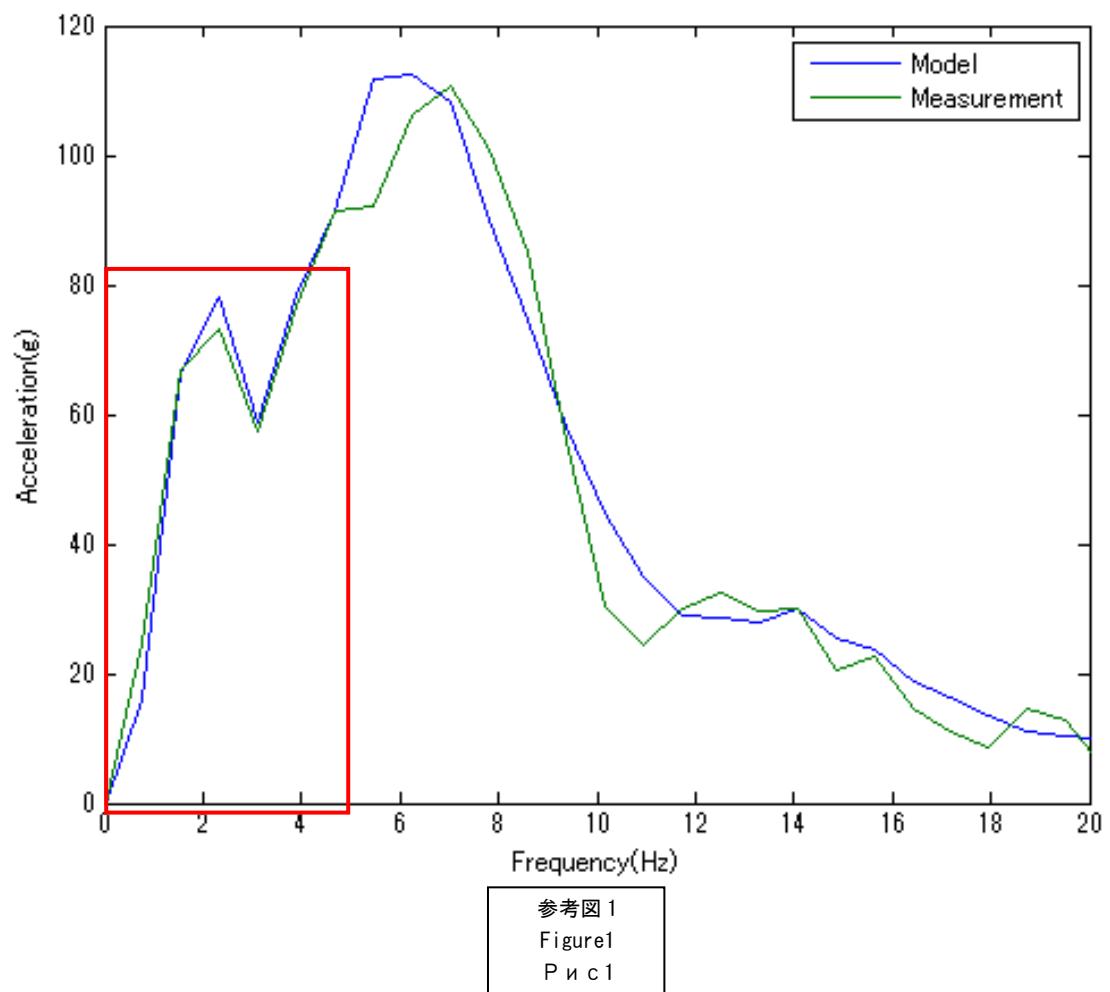
DRIMS Operation Checklist

Проверка работы ДРИСМ

種別 Category Категория	No	チェック内容 Baseline Исходные данные	結果 Result Результат
A. 機器の設置 Installation Установка	A-1	加速度計が水平に上下方向正しく固定されている。 Acceleration meter is being fixed on the level and direction of upper plane is correct. Акселерометр установлен на уровне и направление верхней плоскости правильно.	
	A-2	加速度計付近に荷物等がない。 There are no obstructing objects near acceleration meter. Нет препятствующих объектов вблизи акселерометра.	
	A-3	加速度計が外側後輪上のボディ（車体フレーム）に設置されている。 Acceleration meter is being directly installed on the vehicle body. Акселерометр напрямую установлен в корпусе автомобиля.	
	A-4	ケーブル長に余裕がある。 Cables have a margin. Кабель имеет резерв.	
	A-5	ケースが車体に固定されている。 Protective box is being fixed. Защитная коробка установлена.	
	A-6	DAQ配線がケースに触れていない。 Wires connecting to DAQ are not contact with protective box. Провода, подключенные к DAQ не находятся в контакте с защитной коробкой.	
	A-7	GPSが窓際に設置されている。 GPS is set at window side. GPS находится вблизи окна.	
B. 初期設定 Initial Setup Исходная установка	B-1	DAQからのUSBケーブルがUSB3.0ポートに接続されている。 USB cable from DAQ is being connected to USB 3.0 port. Кабель USB DAQ подсоединен к порту USB 3.0.	
	B-2	GPSを衛星を捉えた後にPCに接続している。 GPS is connected to computer after making sure of capturing satellite signal. GPS подсоединен в компьютер после захвата спутникового сигнала.	
	B-3	データ入力が適切に行われている（道路名、車名、日時）。 Data input is properly done (Road name, vehicle type, and date) Данные правильно введены (название дороги, тип машины и дата).	
	B-4	データ入力後にフォルダが生成されたことを確認している。 Existence of new folder, which was generated after data input, is checked. Папка которая появиться после введения данных, проверена.	
	B-5	初期動作確認を行っている。 Initial operation check is done. Исходная проверка работы сделана.	
	B-6	計測開始時の加速度波形が1000gal付近で推移していることを確認している。 Initial acceleration wave to be shown around 1000gal is checked. Проверен исходные волны ускорения в пределе 1000 Гал.	
C. ハンプキャリ ブレーション Hump Calibration Калибровка на бугорке	C-1	十分な広さがあり、かつ安全な場所で行われている。 Measurement is done in sufficiently large and safe place. Измерение выполнено в достаточно большом и безопасном месте.	
	C-2	5回以上計測している。 Measurement is done at least 5 times. По крайней мере измерение проведено 5 раз.	
	C-3	計測時を想定した人数（2~3名）を車に乗せて行っている。 Measurement is being done carrying 2 or 3 passengers to be expected as measurer during IRI measurement. Измерение проводится 2-3 человеками, которые являются измерителями во время измерения МИН.	
	C-4	始点と起点の目印を配置し、起終点と経路を明確にしている。 Start point and end point are clarified by landmark objects. Начальная и конечная точка указано красками.	

種別 Category Категория	No	チェック内容 Baseline Исходные данные	結果 Result Результат
C. ハンプ calibration Hump calibration Russian here	C-5	ハンプ通過時の速度が20km/hである。 Passing speed on a hump is 20km/h at a constant. Скорость прохождения по бугорке 20км/час стабильная.	
	C-6	ハンプ通過後に5秒以上、20km/hで等速走行している。 After passing hump, it is being continued to drive at a constant 20 km/h for 5 second or more. После прохождения бугорка нужно продолжать ездить по скорости 20км/ч еще 5 секунд.	
	C-7	フォルダ内に残ったエラーファイルが削除されている。 Remaining error files are being deleted. Некорректные файлы должны быть удалены.	
	C-8	ハンプキャリブレーション後に加速度センサーの外れが無いか確認している。 Status of acceleration meter is checked if it is properly fixed after hump calibration. Нужно проверить акселерометр после калибровки бугорка.	
	C-9	計測後すぐにその場で解析が行われている。 Hump calibration analysis is done immediately after measurement. Анализы бугорка должны проводиться сразу после измерения.	
	C-10	計測結果がほぼ同じ軌跡を示している。 The results of vehicle traveling locus are almost same. Результаты места проезда должны быть почти одинаковыми.	
	C-11	解析がガイドラインに準じて行われている。 Hump calibration analysis complies with the guidelines. Анализы калибровки совпадают с руководством.	
	C-12	解析結果において、振動数が0～約5Hzまでの間で、モデルと実測の加速度がほぼ一致している。 (参考図1) Result of model and measurement in the graph roughly match within the range from 0 to 5Hz (see figure 1). Результат модели и измерения в графике примерно соответствуют в пределе от 0 до 5 Гц (см. рис1).	
	D-1	歩行者が少なく、かつ安全と判断できる場所にて行っている。 Measurement is done in less pedestrian and safe place. Измерение проводится в безопасном месте и где мало пешехода.	
	D-2	30、40、50、60、70km/hで各3回、計15回計測を行っている。 15 times of measurement, which are 3 times each at a 30, 40, 50, 60 and 70 km/h, are done. Измерение 15 раз, которые 3 раза в каждой скорости 30, 40, 50, 60, 70 км/час	
	D-3	計測時を想定した人数(2～3名)を車に乗せて行っている。 Measurement is done carrying 2 or 3 passengers to be expected as measurer during IRI measurement. Измерение проводится 2-3 человеками, которые являются измерителями во время измерения МИН.	
D. スピードキャリブレーション Speed Calibration Russian here	D-4	起点、終点通過時、上記の走行速度である。 Passing speed at a start point and end point is equal to above. Скорость езды на начальной и конечной точки должна быть как было упомянуто.	
	D-5	始点と起点の目印を配置し、起終点と経路を明確にしている。 Start point and end point are clarified by landmark objects. Начальная и конечная точка должна быть отмечена.	
	D-6	計測区間が1200m以上確保されている。 1200m or more length for measurement is secured. Для измерения нужно выбрать 1200 м или больше.	
	D-7	計測後、すぐにファイルの存在を確認している。 After finishing measurement each time, existence of the file that was created is checked. После каждого измерения нужно проверить организовалась ли файл.	
	D-8	計測後すぐにその場で解析が行われている。 Speed calibration analysis is done immediately after measurement. Анализ калибровки скорости должна быть проведена сразу после измерения.	
	D-9	解析方法がガイドラインに準じている。 Speed calibration analysis complies with the guidelines. Анализы калибровки скорости соответствуют требованиям руководства.	
	C-10	解析結果において、振動数が0～0.2cycle/mまでの間で、伝達関数比が速度の降順に上から下に配置されている。(参考図2) Results of amplification ratio are arranged in descending velocity order in the range from 0 to 0.2cycle/m in the graph (see figure 2). Результаты соотношения амплификации расположены в порядке снижения скорости в диапазоне от 0 до 0.2 / м на графике (рисунок 2).	

種別 Category Категория	No	チェック内容 Baseline Исходные данные	結果 Result Результат
E. 計測 IRI Measurement Измерение МИН	E-1	起点・終点を把握している。 Start point and end point are clarified. Начальная и конечная точка определена.	
	E-2	起点を通過時の速度が30km/h以上である。 Passing speed at a start point and end point is 30km/h or more. Скорость прохождения начальной и конечной точки 30км/час.	
	E-3	キャリブレーション時と同じ条件(乗車人数、車両)で計測している。 Measurement is done on the same condition (number of passengers and type of vehicle) as hump and speed calibration. Измерение проведено в том же состоянии (к-во пассажиров и вид машины) как в калибровке бугорка и скорости.	
	E-4	計測中のACCファイルとGPSファイルのサイズが大きくなっていることを確認している。 Increment of file size is being checked during measurement. Увеличения размера файла наблюдается во время измерения.	
	E-5	加速度波形が止まった場合、ガイドラインに準じた方法で対処がなされている。 In case that acceleration wave stopped on the way of measurement, proper measures are taken in accordance with the guidelines. Если волны ускорения остановились во время измерения, нужно принять необходимые меры в соответствии руководства.	
	E-6	加速度波形が止まった場合、途中から再計測されている。または最初からやり直している。 In case that acceleration wave stopped on the way of measurement, re-measurement is done or measurement is done again from the beginning. Если волны ускорения остановились во время измерения, нужно заново провести измерения с начала.	
F. 解 析 Analysis Анализы	F-1	解析方法がガイドラインに準じている。 Analysis complies with the guidelines. Анализы должны соответствовать руководству.	
	F-2	正しい車両のキャリブレーションデータを使用している。 Calibration data of the vehicle that was used for calibration is used. Нужно использовать калибровку той же машины которая была использованы	
	F-3	適切なデータ管理がなされている。 Data is managed properly. Данные являются правильными	
	F-4	IRIマップを表示できる。 IRI map is shown. Карта МИН показано.	
	F-5	解析が途中で止まった場合、ガイドラインに準じて対処がなされている。 In case that analysis stopped on the way, proper measures are taken. Если во время анализов остановиться, нужно принять необходимые меры.	
	F-6	解析が始まっすぐに、CPU使用率を確認している。 Status of computer is checked immediately after starting analysis. Нужно проверить статус компьютера после запуска анализов	
G. Form1作成 Form1 making Создание формы 1	G-1	必要なエクセルファイルを開ける。 Required excel files are opened. Необходимые файлы excel открываются.	
	G-2	100mピッチの平均IRIをエクセル上で算出できる。 Average IRI at 100m interval is calculated in excel. Средний МИН на интервале по 100 м подсчитывается в excel.	
	G-3	Form1に適切にインプットできる。 To input the data into Form1 is correctly done. Нужно правильно вводить данные на Форме 1	
	G-4	編集したエクセルファイルを名前を付けて保存できる。 Edited excel file is saved as new name. Редактированный файл excel сохраняется под новым именем.	




Харитаи самти роххо ва
сүтунчахой КМ-ри

Virtual Kilo-Post Map

2015

Накшай роххое, ки тахти назорати МД ИХРА минтакаи Хиссор ва Кургонтеппа карор доранд



Р у й х а т и р о х х о е , к и б а м и н т а к а и Х и с о р т а а л л у к д о р а н д . 2015

No.	раками роҳ SEHM	МДИРА Road ID	Роҳи ахмият доштаи Int or national	Номгуи роҳҳо ¹ Road Name	Начало Starting Point	Конец Ending Point	Дарозии роҳ. (км) Length GPS 2015	Traffic Volume	МИШ IRI			
									Средний Average	>10	>7	
1	Рудаки (Zulckumor)	Py-01	Байнал International Чумхури National	Душ-Кургонтеппа Dush.-Kurgan	Корвон	Фаҳробод	24.0	176.0	34,791	3.9	1%	3%
		Py-02		Душ.-Чимтеппа Dush.-Chimteppa	Пост ГАИ	ҷор.Лоҳур	11.6		30,993	4.8	2%	12%
		Py-03		Рудаки-Ёвон Rudaki- Yovon	Заправка	Султонобод	23.0		12,721	4.8	0%	8%
		Py-04		Эсанбой-Шуртагай Esanboy-Shurtgai	ҷор.Лоҳур	Сайёд	82.9		3,945	5.4	1%	2%
		Py-05		Лоҳур Lohur	Хадамот	Заправка	2.0		176	5.9	0%	20%
		Py-06		Душ-Айни- Хисор Dush-Aini- Hisor	Пост ГАИ	Дарвоз.Хисор	7.8		26,346	4.9	0%	8%
		Py-07		х.Россия-Гулистон hog.Russia-Guliston	Дарвоза	Мактаб	9.2		25,184	6.4	3%	36%
		Py-08		Чам.саҳом Улҷабой G.Sahomi Ulchaboy	Ленинград	Дарвоза	9.5		18,345	5.2	2%	11%
		Py-09		Чимтеппа-Хисор Chimteppa-Hisor	Пост ГАИ	Дарвоза	6.0		13,335	5.9	0%	30%
2	Хисор (Umed)	X-01	Байнал International Чумхури National	Душ.-Турсунзода Dush.-Tursunzoda	Дарвоза	Туда	24.0	66.7	12,740	1.5	0%	0%
		X-02		Чимтеппа-Хисор Chimteppa-Hisor	Чимтеппа	Хисор	13.0		13,335	4.5	5%	12%
		X-03		Даромади Хисор Entrance-Hisor	Мости Жӣ	АЗС			1,042			
		X-04		Душ-Айни- Хисор Dush-Aini- Hisor	Дарвоза	бозори Хисор	8.4		3,086	5.3	0%	14%
		X-05		Даром-и Алмоси Entrance of Almosi	АЗС	Хонақо	12.6		1,478	4.2	1%	3%
		X-06		Даром-и Шоҳамбр. Entrance of Shoham.	Ошхона	Истироҳатгоҳ	8.7		2,421	5.6	5%	21%
3	Шаҳринав Shahrinav (Isomoil, Sayora)	IIIax-01	Байнал International Чумхури National	Душ.-Турсунзода Dush.-Tursunzoda	Узун	Шаҳринав	11.6	24.8	13,605	1.4	0%	0%
		IIIax-02		Даром.Чептура Entrance Cheptura	Шаҳринав	Станция	6.0		2,903	3.6	0%	0%
		IIIax-03		Дар.истир.Каратог ent.istir. Karatog	Шаҳринав	дом.от.Каратог	3.1		81	5.5	0%	29%
		IIIax-04		Дар.даҳаи Каратог Ent.village Karatog	Шаҳринав	даҳаи Каратог	4.1		942	5.0	0%	5%
4	Турсунзода Tur sunzoda (Vailijon)	Typ-01	Байнал International Чумхури National	Душ.-Турсунзода Dush.-Tursunzoda	Батош	гранича Узбекистон	20.8	26.6	6,914	1.5	0%	0%
		Typ-02		Дар. ноТурсунзода Ent.Tursunzoda	дар-ди Турсун-да	Сентер	3.0		5,891	3.6	0%	0%
		Typ-03		Дар.п.Турсунзода Ent.Tur sunzod-city	дар-ди шаҳри Турсун-да	Масҷит	2.8		4,956	4.1	0%	0%
5	Ваҳдат Vahdat (Husein, Ismoil)	Bax-01	Байнал International	Вах-Рашт-Чиргатол Vah-Rash-t-Jirgatol	Колцевой	Бустон	13.8	109.9	13,277	2.7	0%	2%
		Bax-02		Душ-Кулоб-Кулма Dush-Kulob-Kulma	дарвоз.Душанбе	тонел Чормагзак	30.8		15,710	1.4	0%	0%
		Bax-03	Чумхури National	Ваҳдат-Ромит Vahdat-Romit	Дарвоза	Ромит	36.8		4,839	6.0	1%	10%
		Bax-04		иНО Норак-Бустон NBO norak-Buston	Бустон Гургхурда	Бустон	9.1		1,054	5.6	4%	19%
		Bax-05		Улҷабоев-Ваҳдат Uljaboев-Vahdat	Хокикатор	Ваҳдат	13.6		2,329	5.8	8%	26%
		Bax-06		Зардолу-Найзирак Zardolu-Naizirak	Зардолу	Найз. Чормагзак	5.8		700	5.6	0%	14%
6	Варзоб Varzob (Zuhro, Zulokumr)	Bap-01	Чумхури National	Хоча-оби-гарм Скоя-obi-Garm	Хушери	осониш.Хоча-ОбиГарм	5.1	67.6	270	4.9	0%	8%
		Bap-02		роҳи ҷашм.Сангҳо Rohi hash.Sangeko	Сероҳ Ағба	ҷашмаи Сангҳо	11.7		70	9.6	39%	81%
		Bap-03		Пугус-Тагоб-Сафедор Pugus-Tagob-Safedorak	Пугус	базаи Лижарони	18.0		395	9.2	39%	75%
		Bap-04		Варзоб Гес-Харонгон-сан. Дусти Varzob Ges-Charangon-sanat Dusti	гардиш МДИРА	нио.лагери Дусти	10.4		1,920	6.7	14%	34%
		Bap-05		Майху-Анзоб-Такф maykura-anzob-takfon	табл-и Майхура	то кӯлаи Кӯҳ	22.4		150	9.4	43%	79%
7	Норак Norak (Ascar)	Hop-01	Чумхури National	Душ-Кулоб-Кулма Dush-Kulob-Kulma	накби Ҳатлон	накби Озоди	21.8	48.9	6,530	1.8	0%	0%
		Hop-02		роҳи Шар-Шар Shar-Shar road	гардиш Вамени	пости Шар-Шар	8.3		18	5.6	5%	23%
		Hop-03		Дар.шарҳи Норак Entrants Norak city	дарвозаи Норак	Гравзавод	5.5		3,300	4.5	0%	0%
		Hop-04		Дар.дех.Хучалон Entr.to villag Ckuchalon	накби Ҳатлон	гардиши Ёвон	4.4		5,700	4.4	0%	0%
		Hop-05		Чормагзак-Ёвон Chormagzak-Yovon	дарвозаи Ёвон	заводи Цемент	8.9		2,003	4.7	5%	21%
		Hop-06		Зардолу-чормагзак-Найзирак Zardolu chormagzak-Nayzirak	пости Чормагзак	мазори Балогардон			1,103			
8	Файзобод Fayzobod (Odil, Usmon)	Фай-01	Байнал International	Вах-Рашт-Чиргатол Vah-Rash-t-Jirgatol	дарв.Файзобод	дех.Сарой	48.0	51.5	8,605	2.5	0%	0%
		Фай-02	Чумхури National	Дар.шах.Файзобод Entr. Fayzobad town	даром.Шаҳрак	баром.Шаҳрак	3.5		50	5.4	0%	14%
9	Рогун Rogun (Odil, Usmon)	Por-01	Байнал International	Вах-Рашт-Чиргатол Vah-Rash-t-Jirgatol	дех.Сичорог	байраки Сарой	25.1	35.9	3,900	3.5	1%	4%
		Por-02	Чумхури National	Дар.шах.Рогун Entr.Rogun town	даром.Шаҳрак		10.8			7.5	8%	57%

**Байнал
International** **219.90km**
**Чумхури
National** **388.00km** **4.9** **5%** **17%**
Средний

Рўйхаттироҳҳоекибаминтакаи Курганталукдоранд. 2015

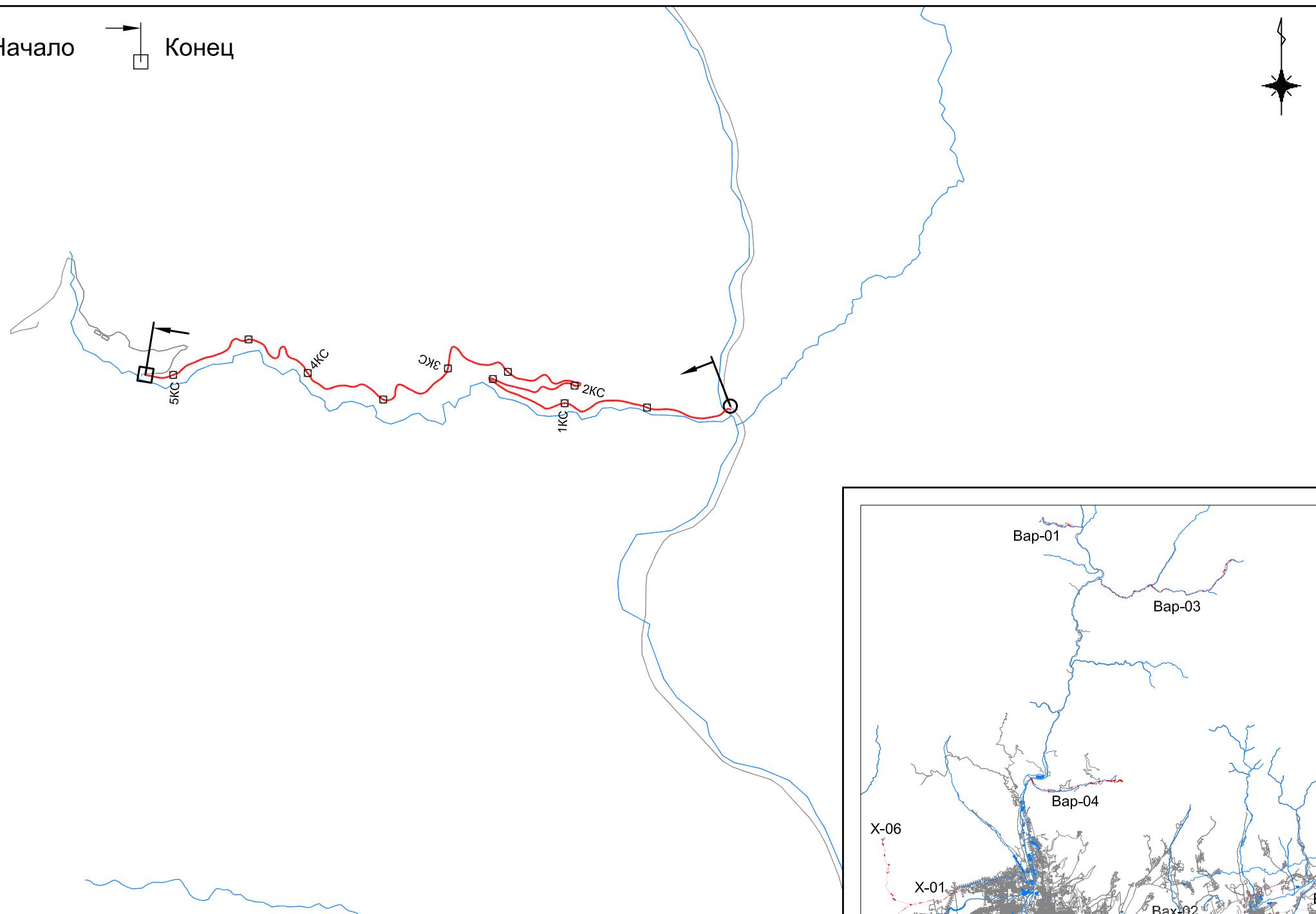
No.	МДНРА Road ID	раками роҳ SEHM	Роҳи ахмият доштаи Int or national	Номгуи роҳҳо Road Name	Саршавии роҳ Starting Point	Нуктаи охир. Ending Point	Дарозии роҳ. (km) Length GPS 2015	Traffic Volume	МИШ IRI		
									Средний Average	>10	>7
1	Боҳтар Bohtar	Боҳ-01	Байнал International	Душ.-Кургантеппа Dush-Kurgan-Tube	Киз-калъа	Виён	24.5	53.8	8,402	2.0	0%
		Боҳ-02		Кургантеппа-Дангара KurganTub-Dangara	Хочи Шариф	роҳи Охан	5.5		3,559	5.1	0%
		Боҳ-03	Чумхури National	гирдгаши Кургантепп Around Kurgantube	Автовокзал	Круг.Шахло	10.4		7,924	4.6	5.8%
		Боҳ-04		Кургантеппа-Вахш KurganTub-Vacksh	Кур-па	Вахш	13.4		1,964	3.8	0%
2	Вахш Vacksh	Вахш-01	Чумхури National	Вахш-Дангара Vacksh-Dangara	центр Вахш	пост ГАИ	49.0	67.1	154	7.1	3%
		Вахш-02		Исаев-Гулистон-Вахш Isaev-guliston-Vacks	Гулистан	Вахш	18.1		728	9.2	38%
3	Сарбанд Sarband	Cap-01	Байнал International	Кургантеппа-Дангара KurganTub-Dangara	Мости ЖД	Мазор	36.4	51.4	1,464	6.2	2%
		Cap-02	Чумхури National	роҳи охани Кургон Kurgan rail station	Ошхона	станц-и роҳи Охан	1.0		1,166	6.9	0%
		Cap-03		дар.шах.Сарбанд Entr.Sarband town	Заправка	Мактаб	2.0		1,516	4.9	0%
		Cap-04		ГЕС-и Сангтуда Ges Sangtuda	пост ГАИ	Асфалт завод	12.0		839	6.9	8%
4	Хуросон Hurosон	хур-01	Байнал International	Душ.-Кургантеппа Dush-Kurgan-Tube	дарв.Фаҳробод	Кизилкала	50	73	9,143	4.9	0%
		хур-02		Кизилкала-Чорбуча Kizilkala-Chorbucha	Кизилкала	Чорбуча	23		790	5.5	3.8%
5	Чоми Jomi	Чом-01	Чумхури National	Рудаки-Ёвон-Чоми-Уяли Rudaki-Yovon-Jomi-Uiali	дарвозаи Ёвон-Чоми	Уяли	31.1	42.6	2,574	5.9	6%
		Чом-02		Чоми-Кизилкала Jomi-Kizilkala	AЗС	Сарбанд	11.5		1,293	6.0	7%
6	Руми Rumi	Руми-01	Байнал International	Душ-Кург-Ағ-границ Dush-Kurg-Afg.borde	Виён	Ворошил роҳи Ленин	34.1	69.1	2,280	1.1	0%
		Руми-02	Чумхури National	Узун-Чиликул Uzun-Jilikul	Узун	даромади Чиликул	6.8		815	4.1	0%
		Руми-03		Руми-Чиликул Rumi-Jilikul	Ворошилобод	Мазор	4.4		618	8.3	31%
		Руми-04		Исаев-Вахш Isoev-Vacksh	МДНРА	Гулистан	23.8		191	6.8	10%
7	Кумсангир Kumsangir	Кум-01	Байнал International	Душ-Кург-Ағ-границ Dush-Kurg-Afg.borde	Мактаб	бандар	34.6	68.5	705	2.5	0%
		Кум-02		Гулистан-фарҳор-Панҷ-Дустӣ Guliston-Farkor-Piyan-Dusti	Авто-Вокзал	дарвозаи Панҷ	25.3		327	4.9	0.4%
		Кум-03	Чумхури National	Комсомол-Паҳтакор Komsomol-Packtakor	Гулшан	Гардиши Чиликул	8.6		628	7.2	12%
8	Панҷ Piyang	Панҷ-01	Байнал International	Гулистан-фарҳор-Панҷ-Дустӣ Guliston-Farkor-Piyan-Dusti	Околотка	дарвозаи Панҷ	46.8	46.8	158	5.0	1.3%
9	Чиликул Jilikul	Чил-01	Байнал International	Кизилкала-Чорбуча Kizilkala-Chorbucha	Дар-и Чиликул	Мазор	37.6	79	840	5.8	1.9%
		Чил-02	Чумхури National	Узун-Чиликул Uzun-Jilikul	Дар-и Чиликул	центр Чиликул	21.1		821	3.9	0%
		Чил-03		Чиликул-Гароутӣ Jilikul-Garouti	центр Чиликул	пос. Гароутӣ	9.2		588	5.7	1.1%
		Чил-04		Дустӣ-Чиликул Dusti-Jilikul	Гулшан	Мазор	5.8		518	5.4	0%
		Чил-05		Руми-Чиликул Rumi-Jilikul	Мазор	Чиликул	5.3		546	5.7	9%
10	Кабодиён Kabodiyon	Каб-01	Байнал International	Кизилкала-Чорбуча Kizilkala-Chorbucha	Мазор	Шаҳритус	35.9	35.9	899	5.5	1.1%
11	Шаҳритус Shahritus	Шах-01	Байнал International	Кизилкала-Чорбуча Kizilkala-Chorbucha	дар.Шаҳритус	Айвоч	38.8	38.8	766	4.4	1.3%
12	Н.Хусрав N.Ckusrav	Хуср-01	Байнал International	Кизилкала-Чорбуча Kizilkala-Chorbucha	Айвоч	Чорбуча	31.6	31.6	358	5.3	1%
13	Ёвон Yovon	Ёвон-01	Чумхури National	Чормагзак-Ёвон Chormagzak-Yovon	AЗС	з/д Цемент	12.3	68.7	1,151	6.1	9%
		Ёвон-02		Рудаки-Ёвон-Чоми Rudaki-Yovon-Jomi	аз 23км	то 75 км	51.3		2,916	6.3	1%
		Ёвон-03		Тоҷик-тон-Корӯмииё Tojikiston-Kipr.Kimiyo	аз 0. км	4,5 км	5.1		1,308	6.7	10%

**Байнал
International** **424.10km**
**Чумхури
National** **726.30km**
Средний **5.4** **6%** **23%**

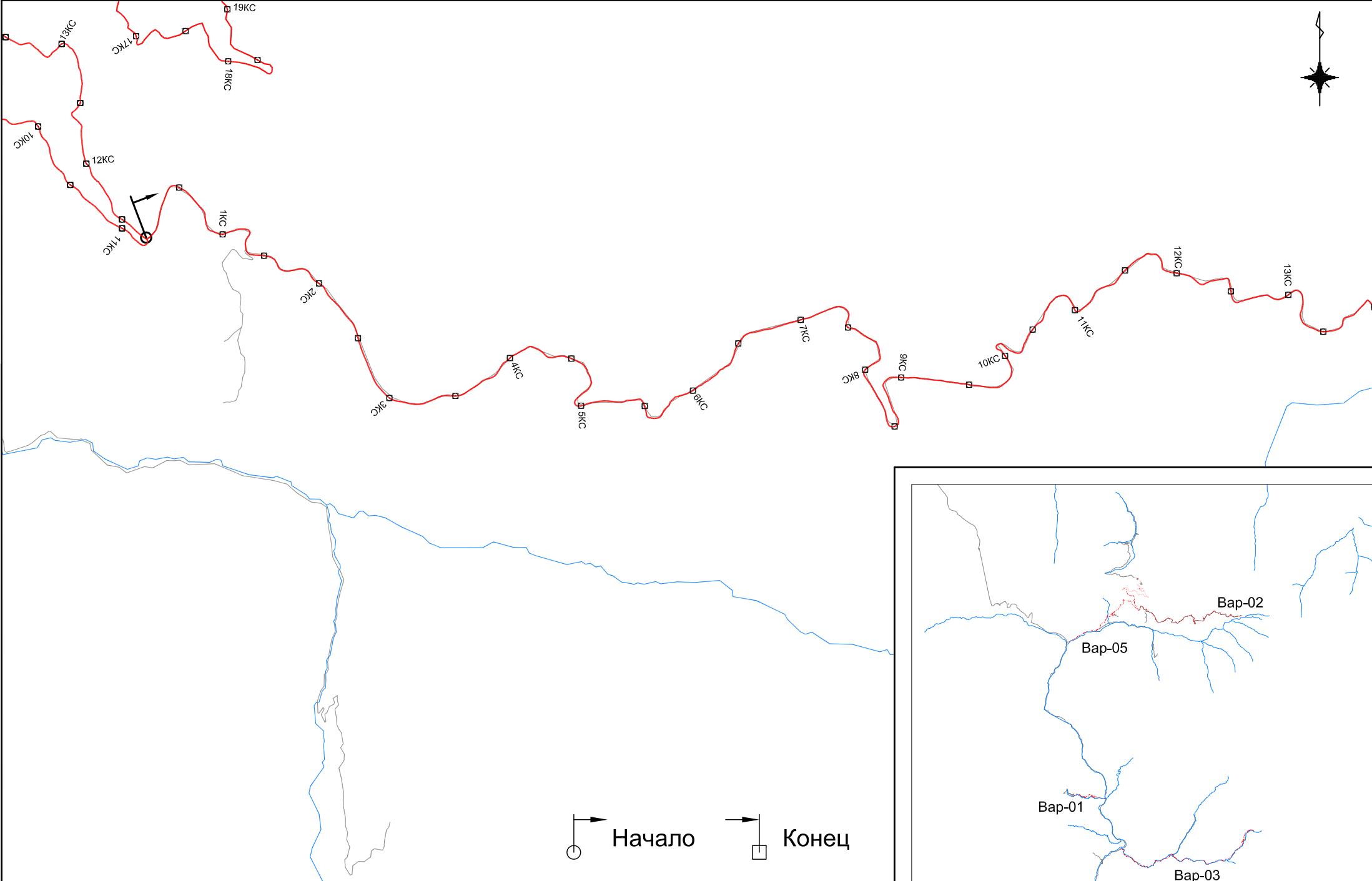
Варзоб-01

Начало

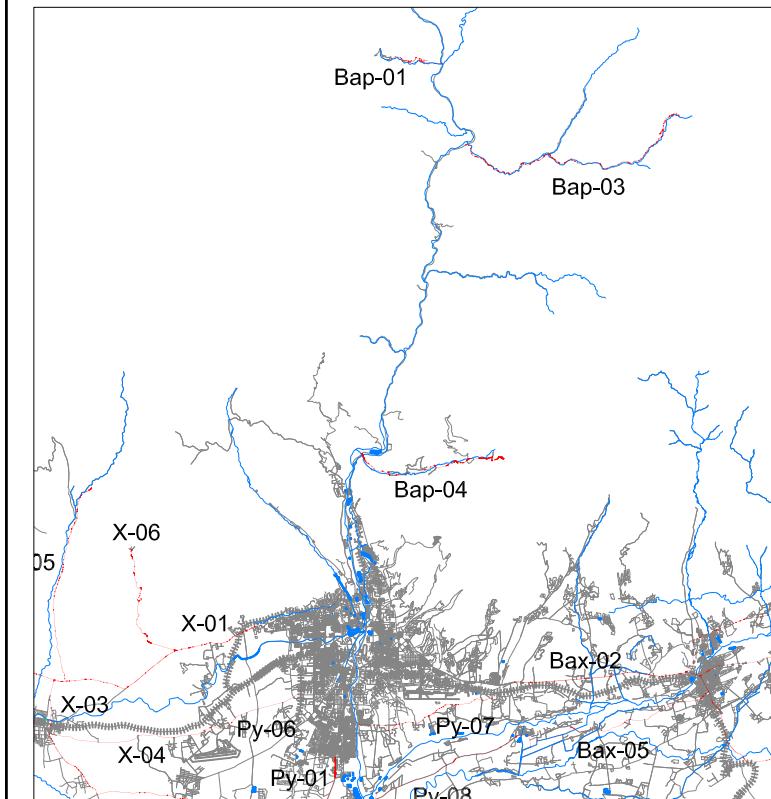
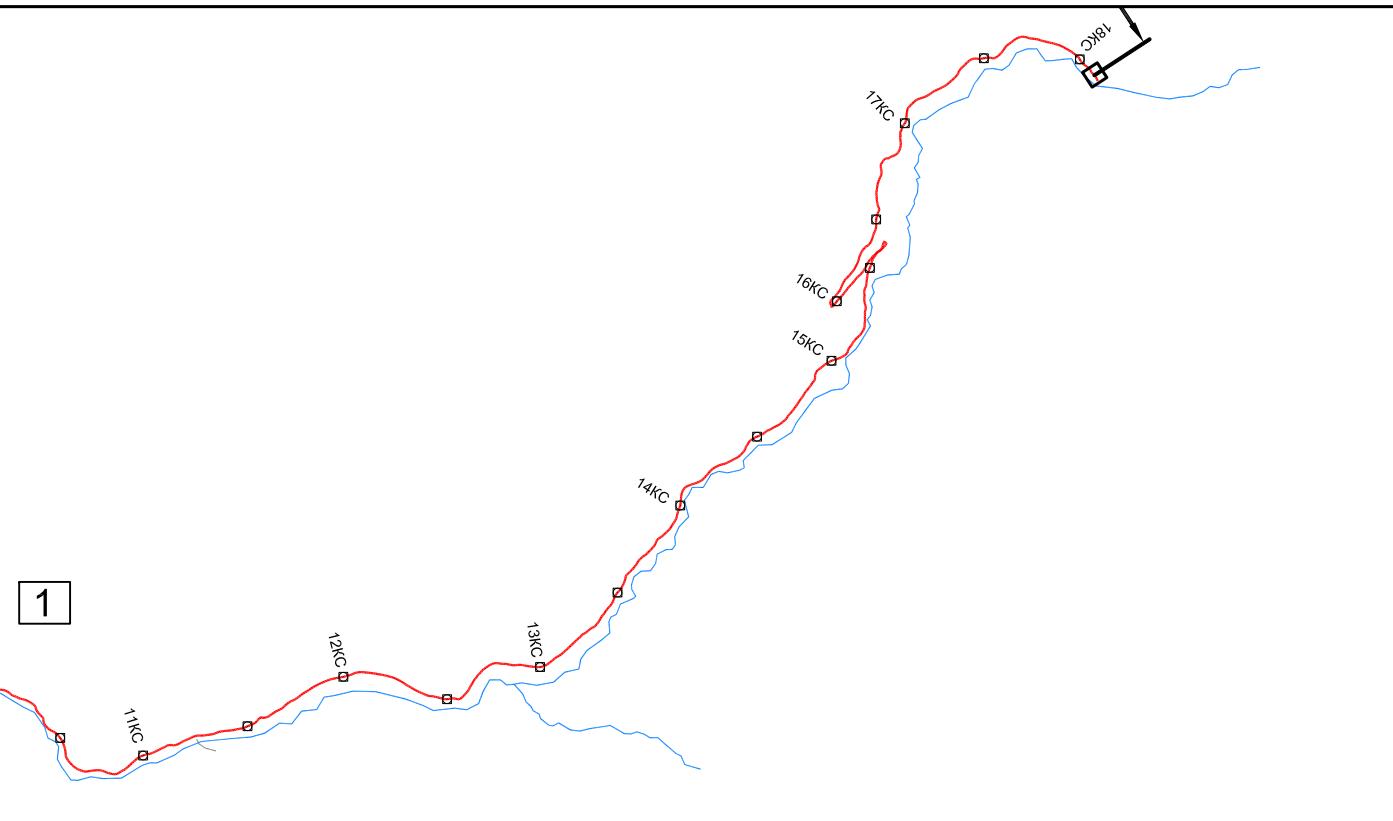
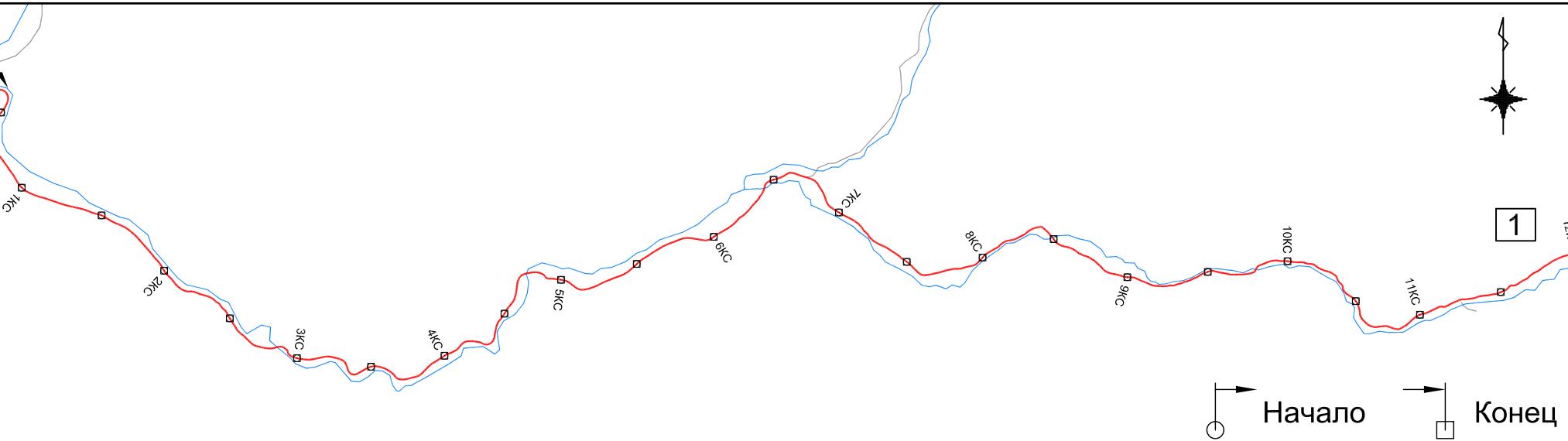
Конец



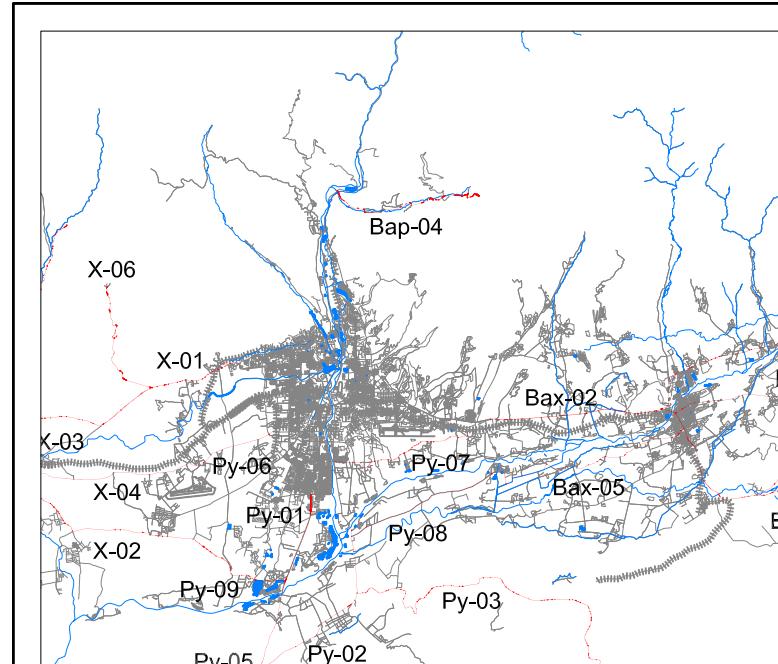
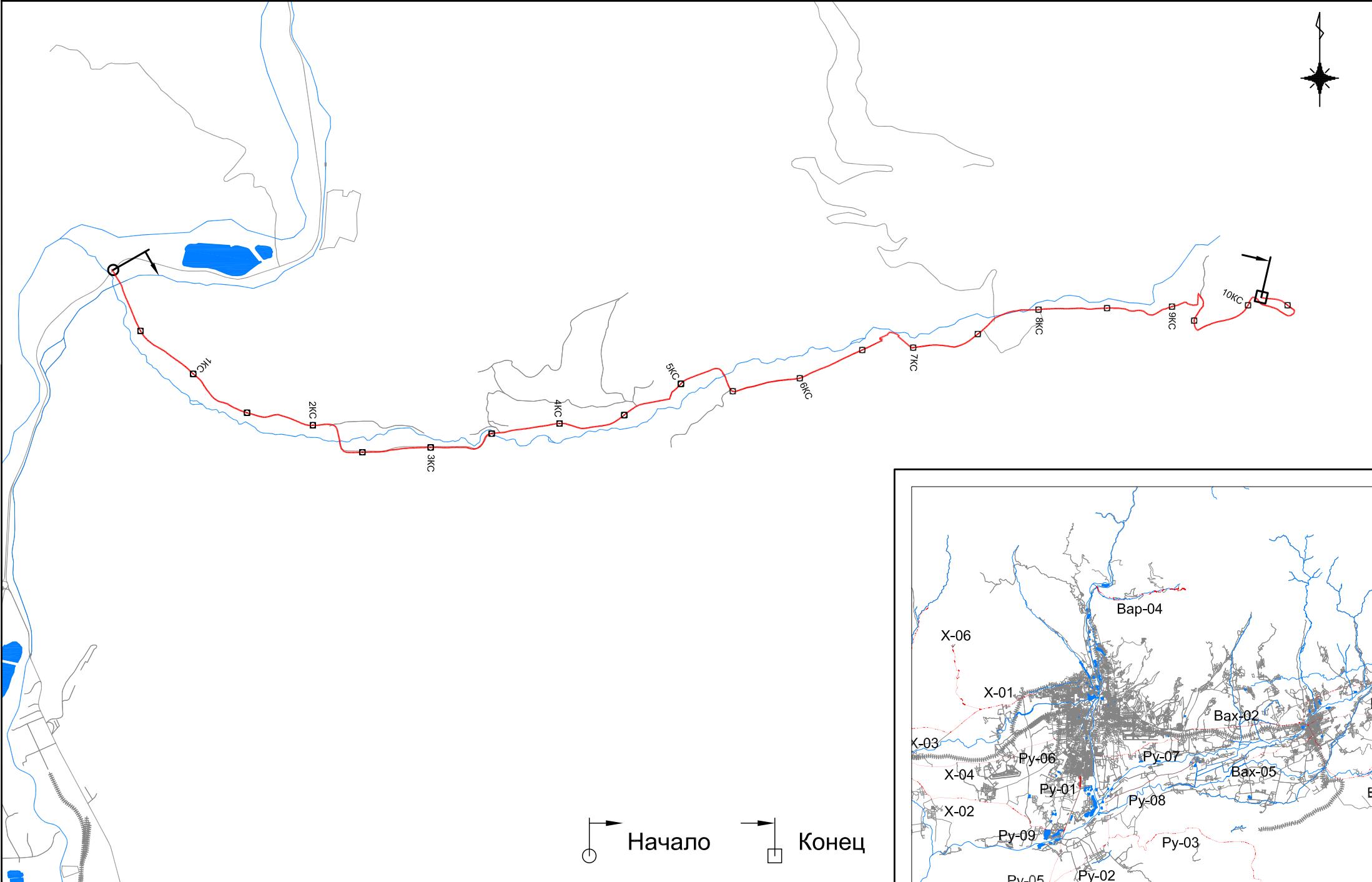
Варзоб-02



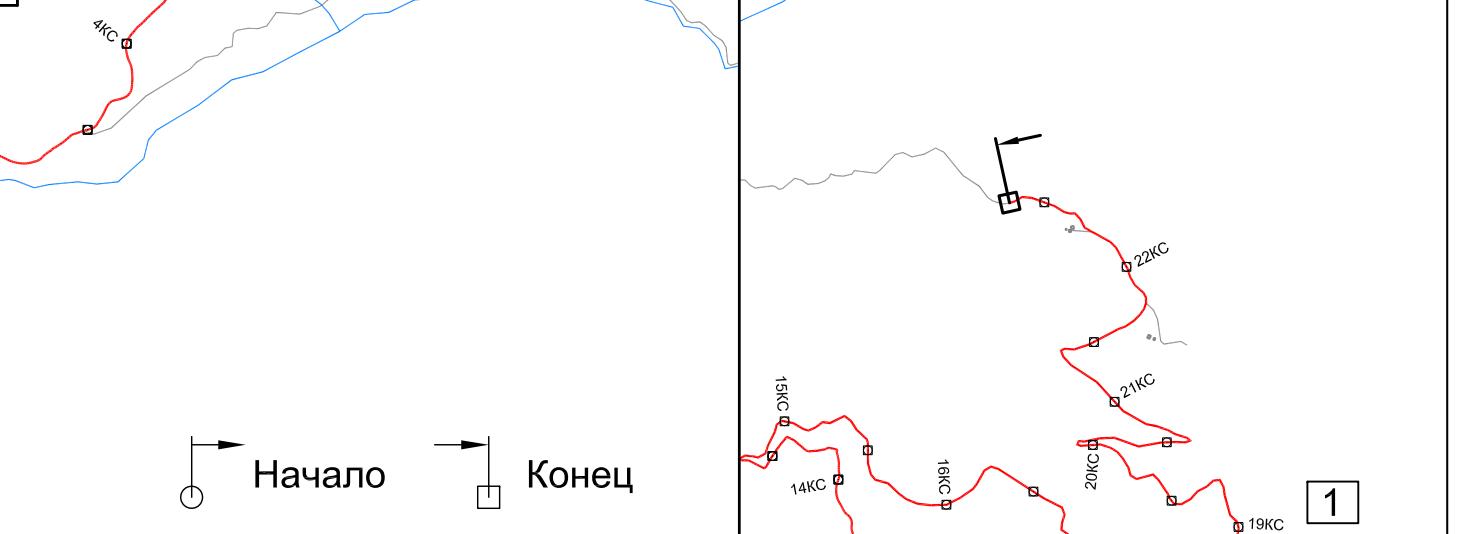
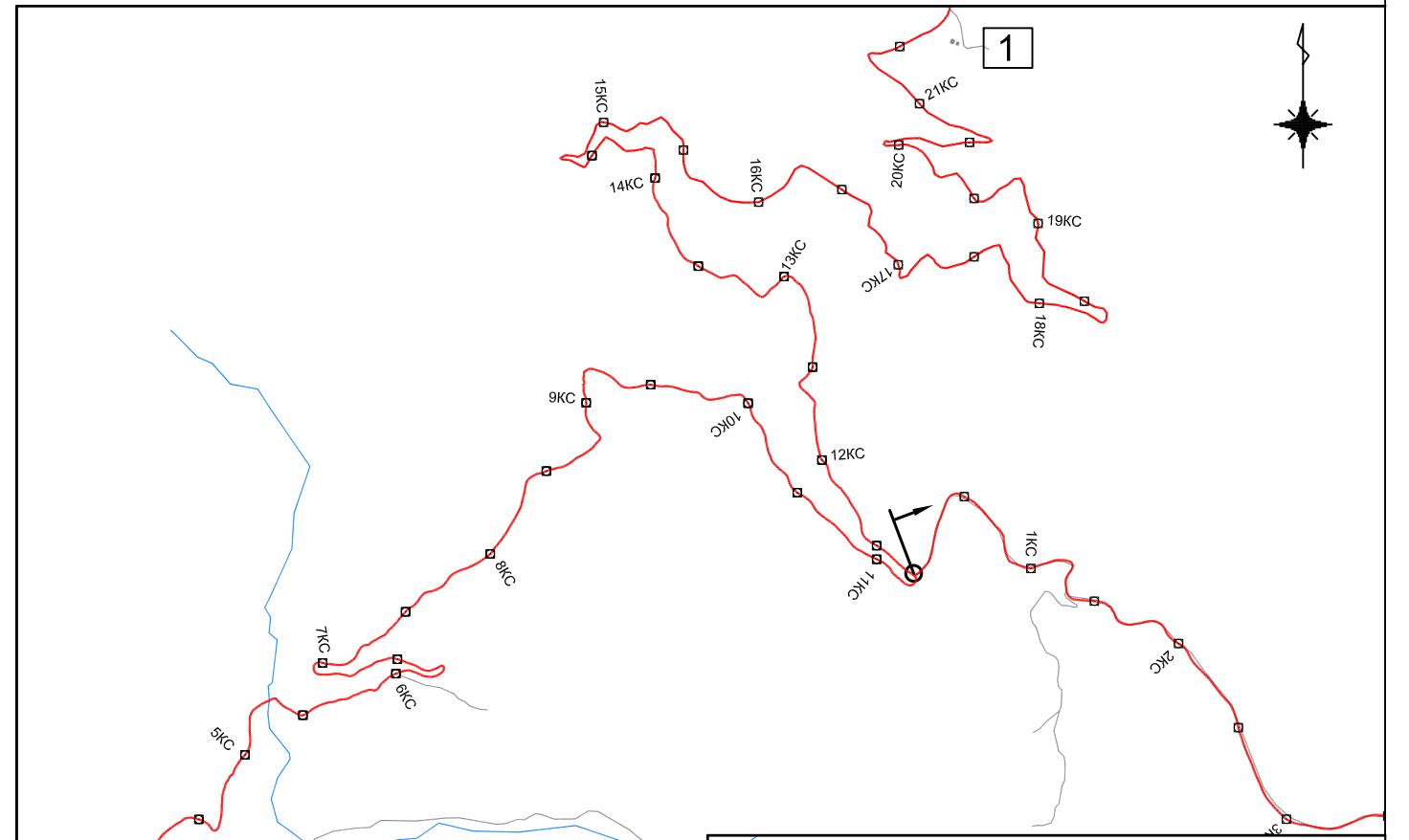
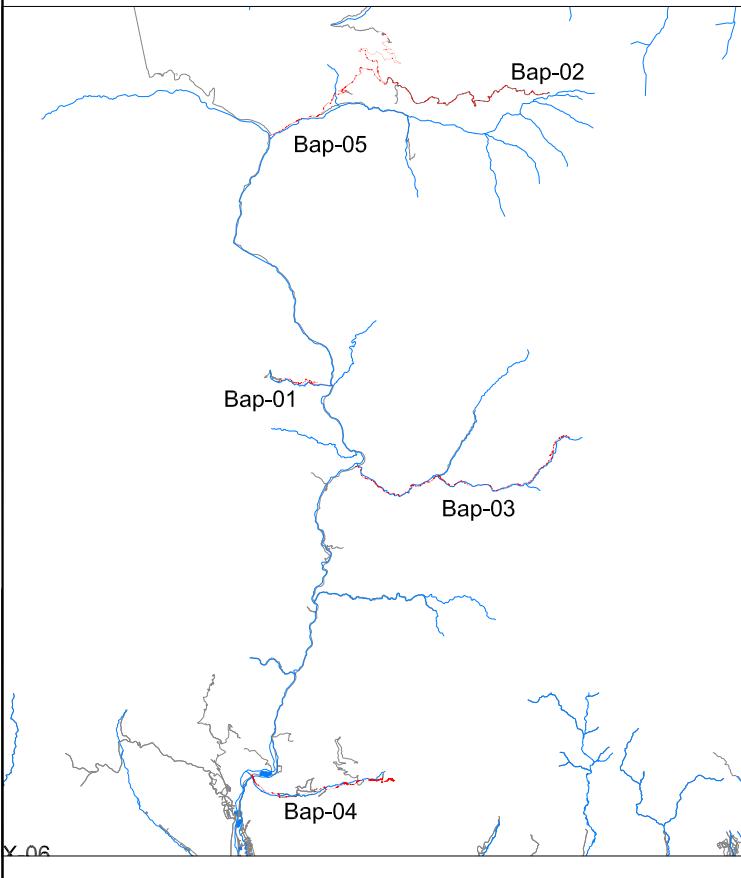
Варзоб-03



Варзоб-04



Варзоб-05



Начало

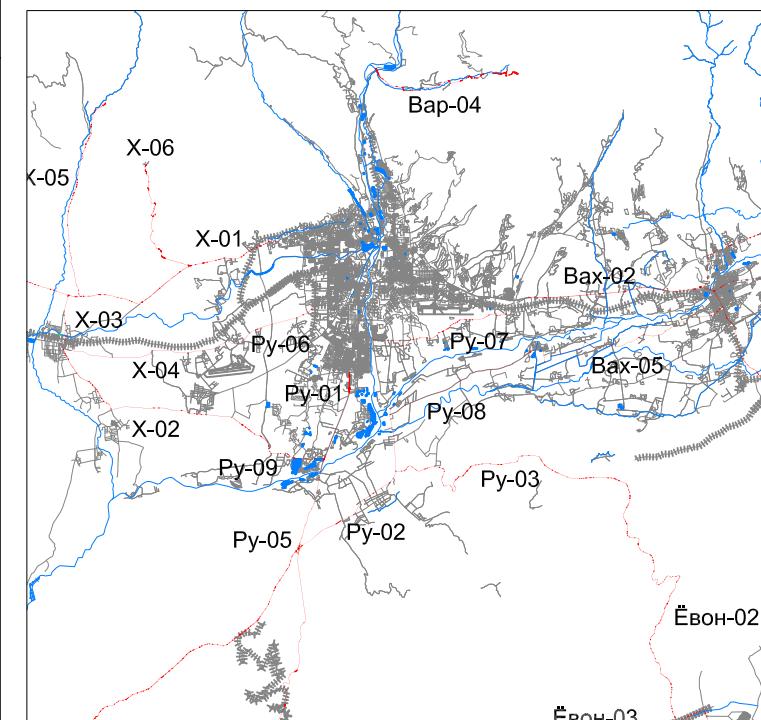
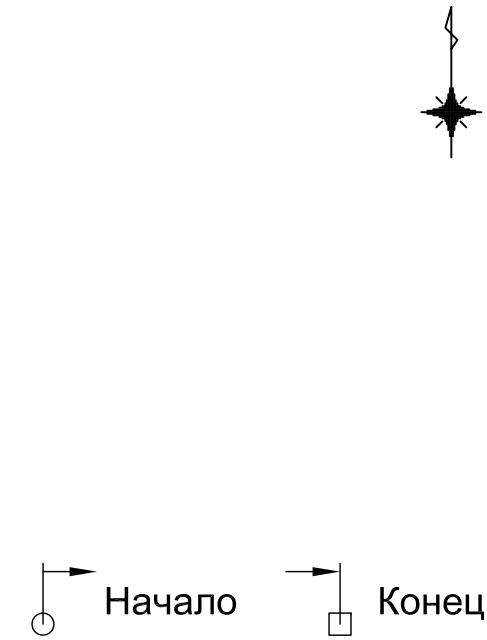
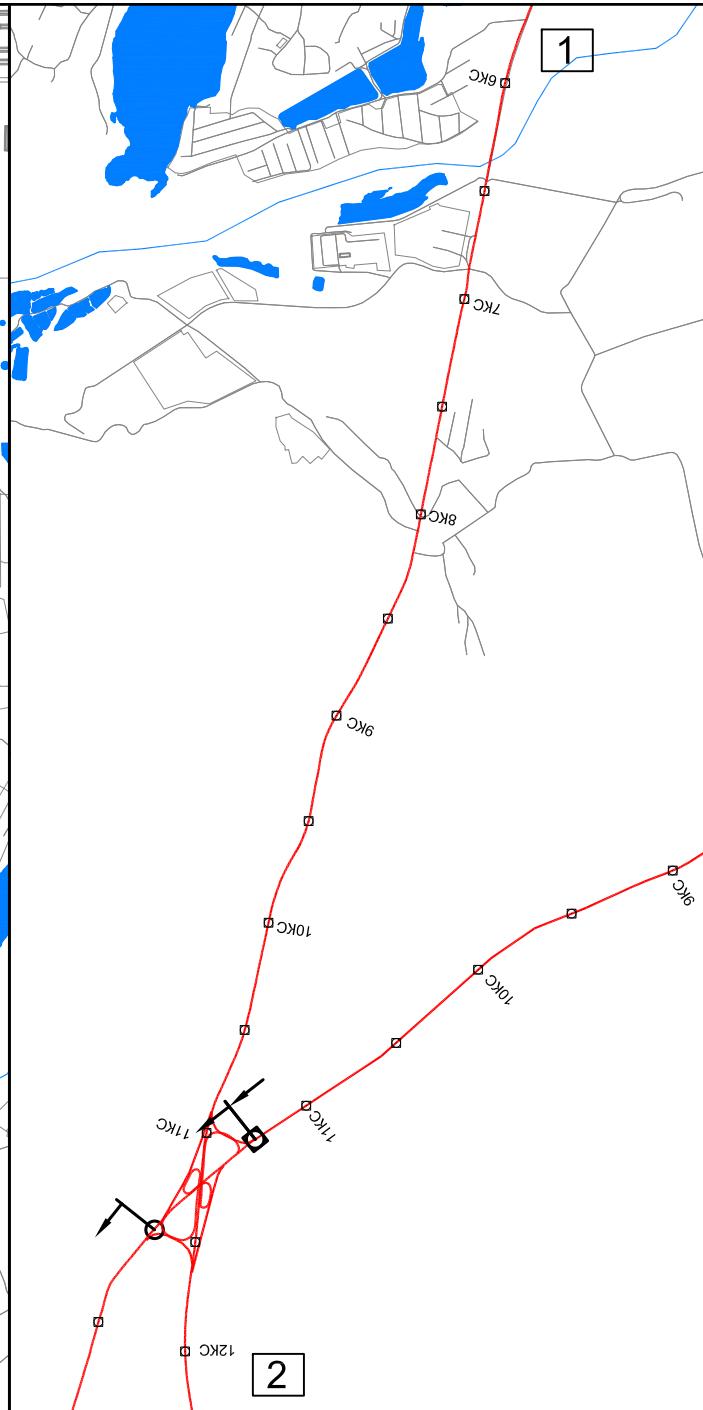
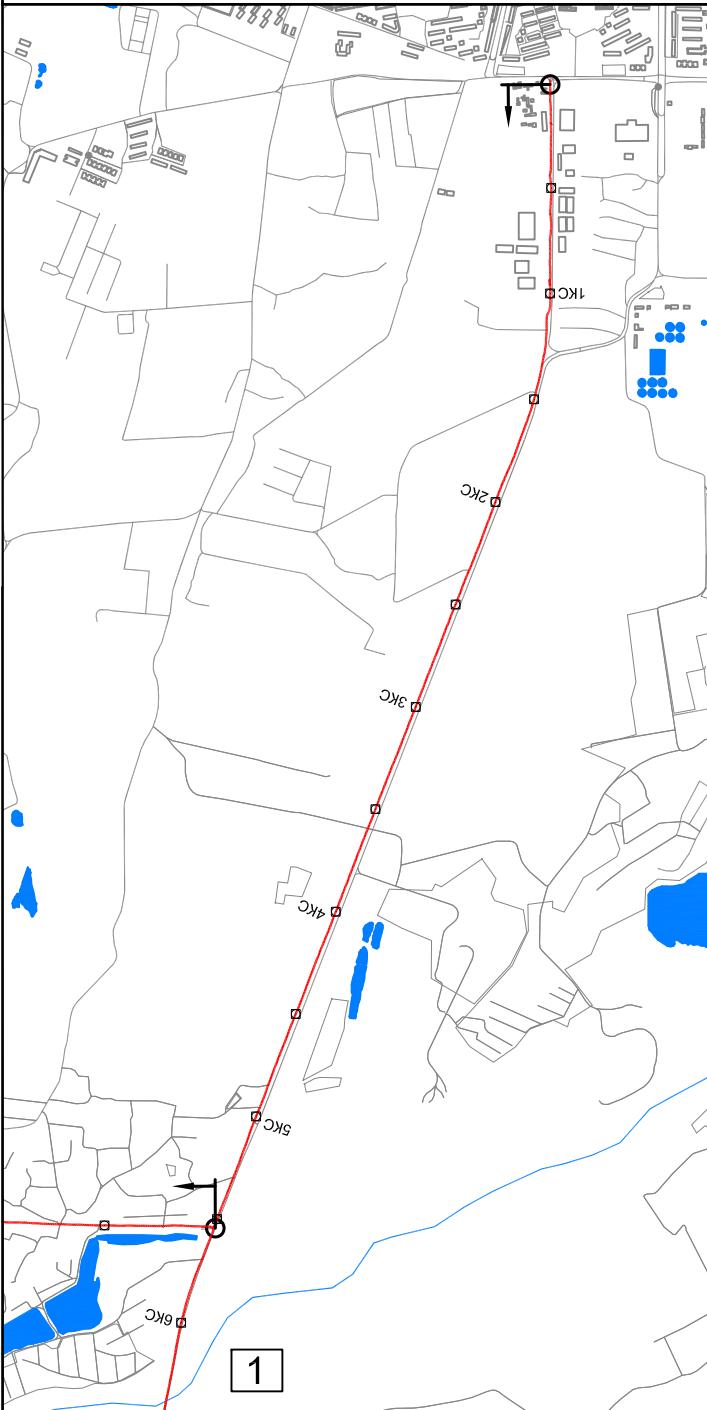


Конец

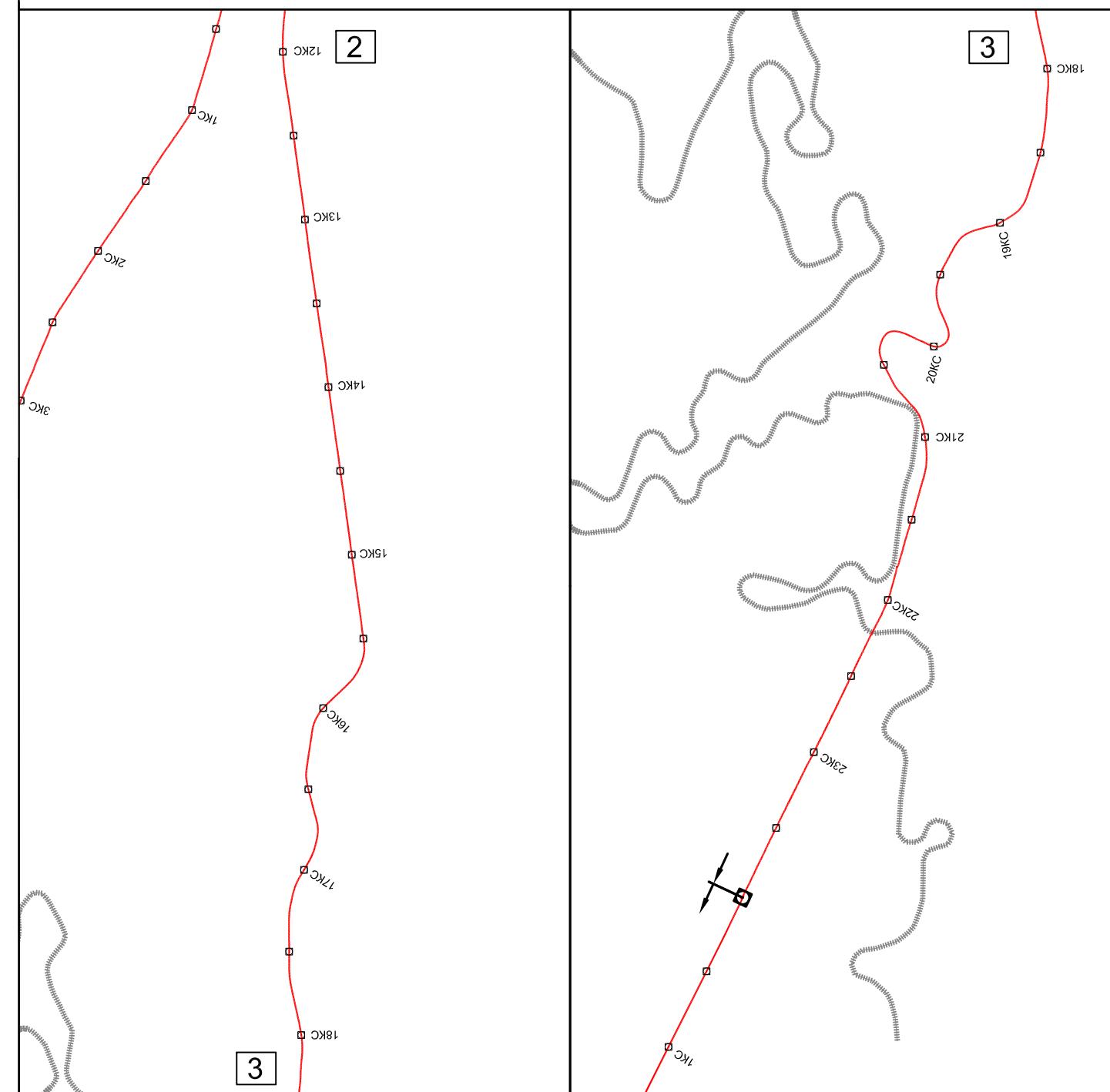


1

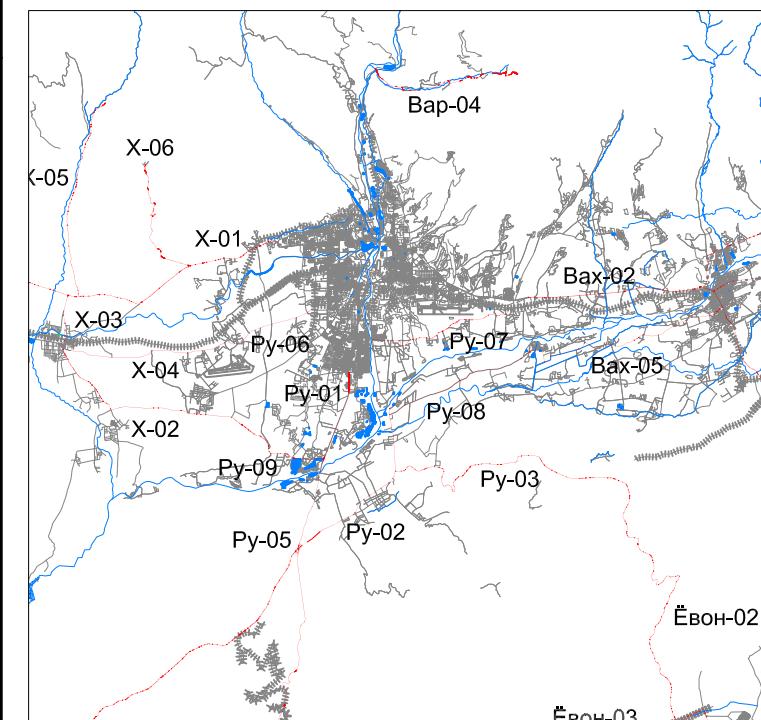
Рудаки-01(1)



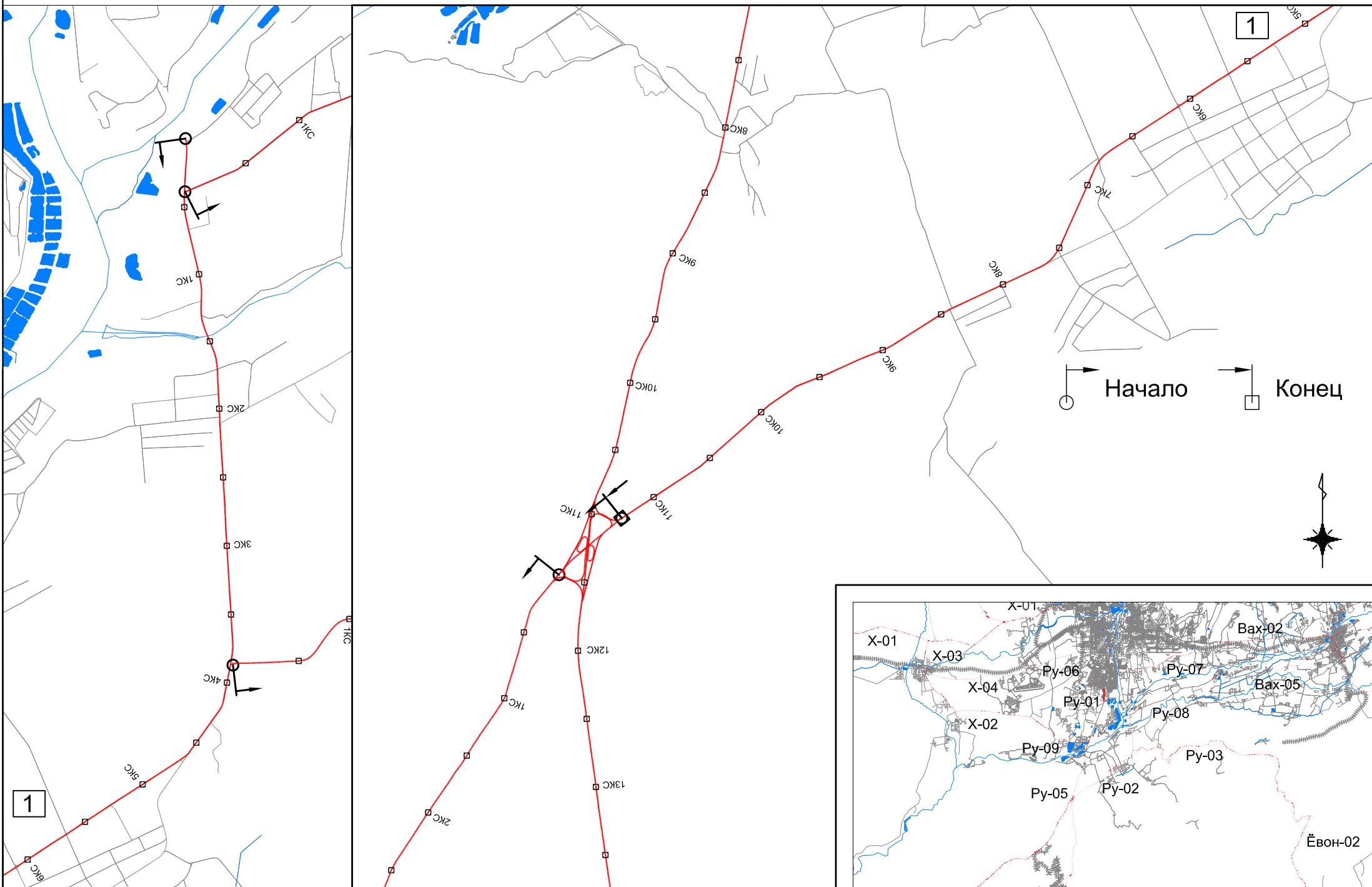
Рудаки-01(2)



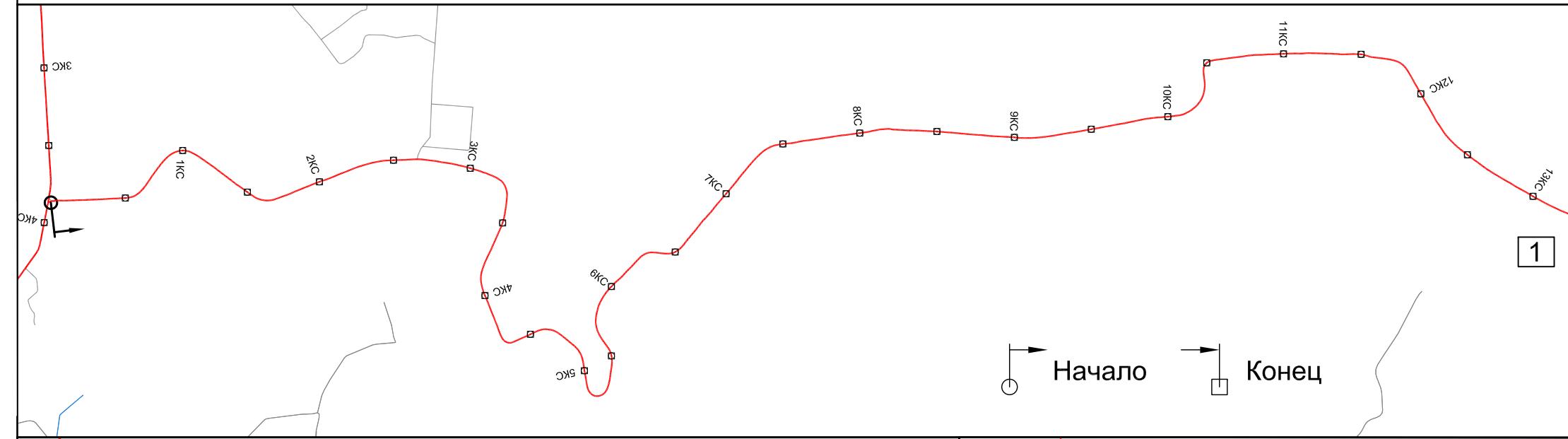
Начало Конец



Рудаки-02

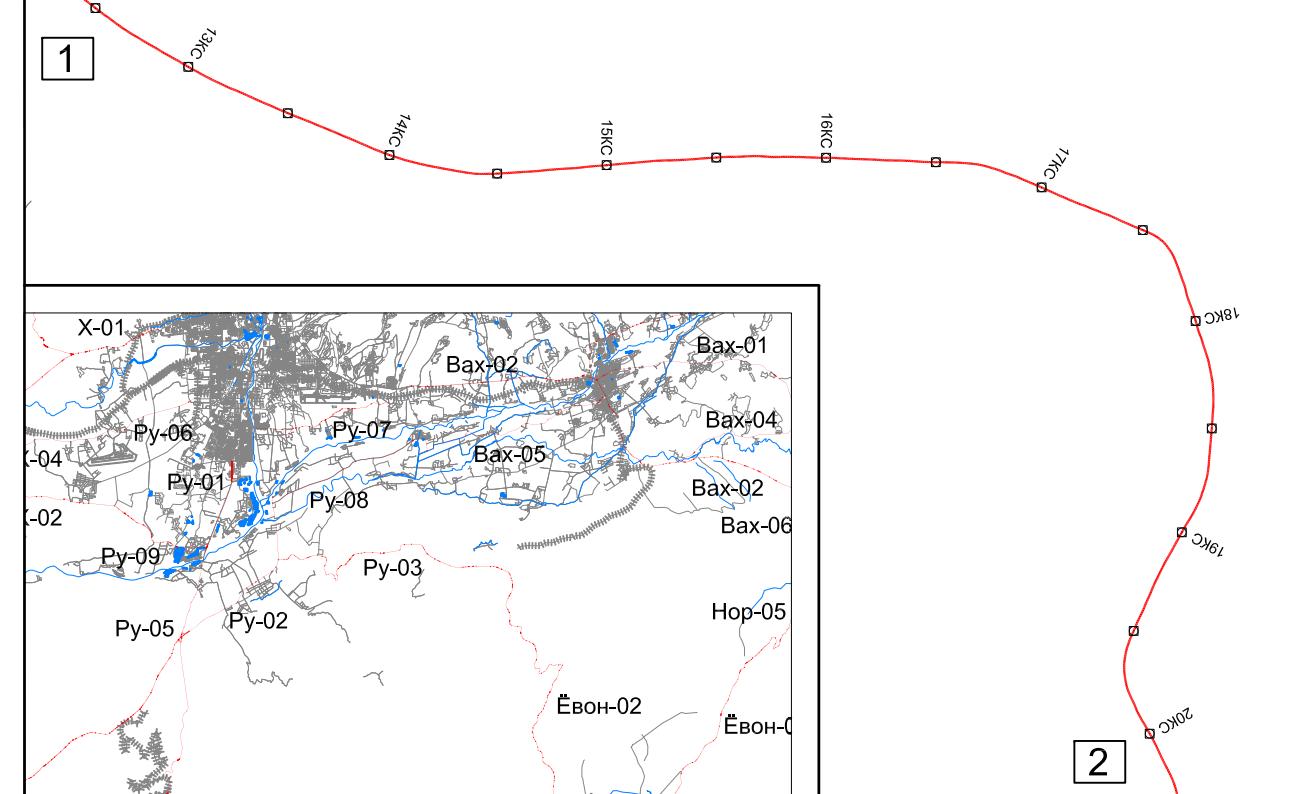


Рудаки-03

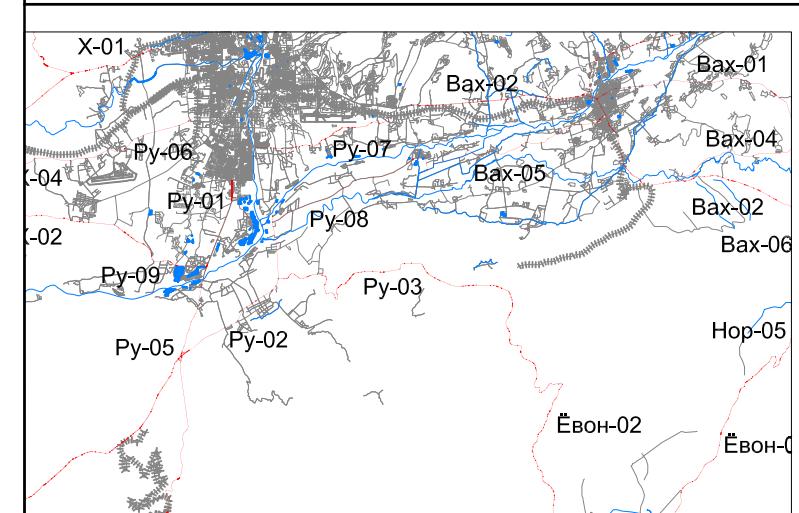


1

Начало Конец



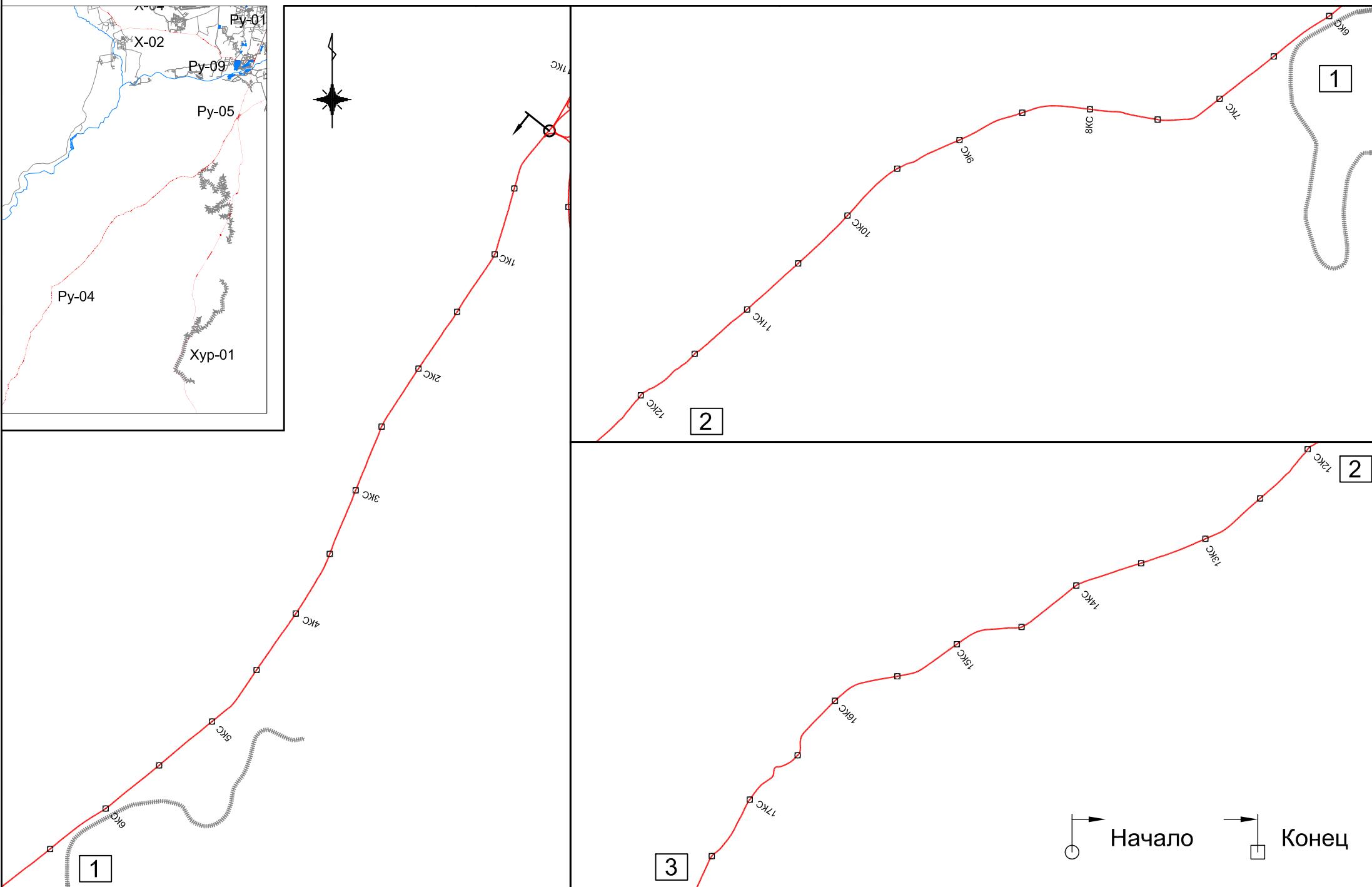
2



2

3

Рудаки-04(1)

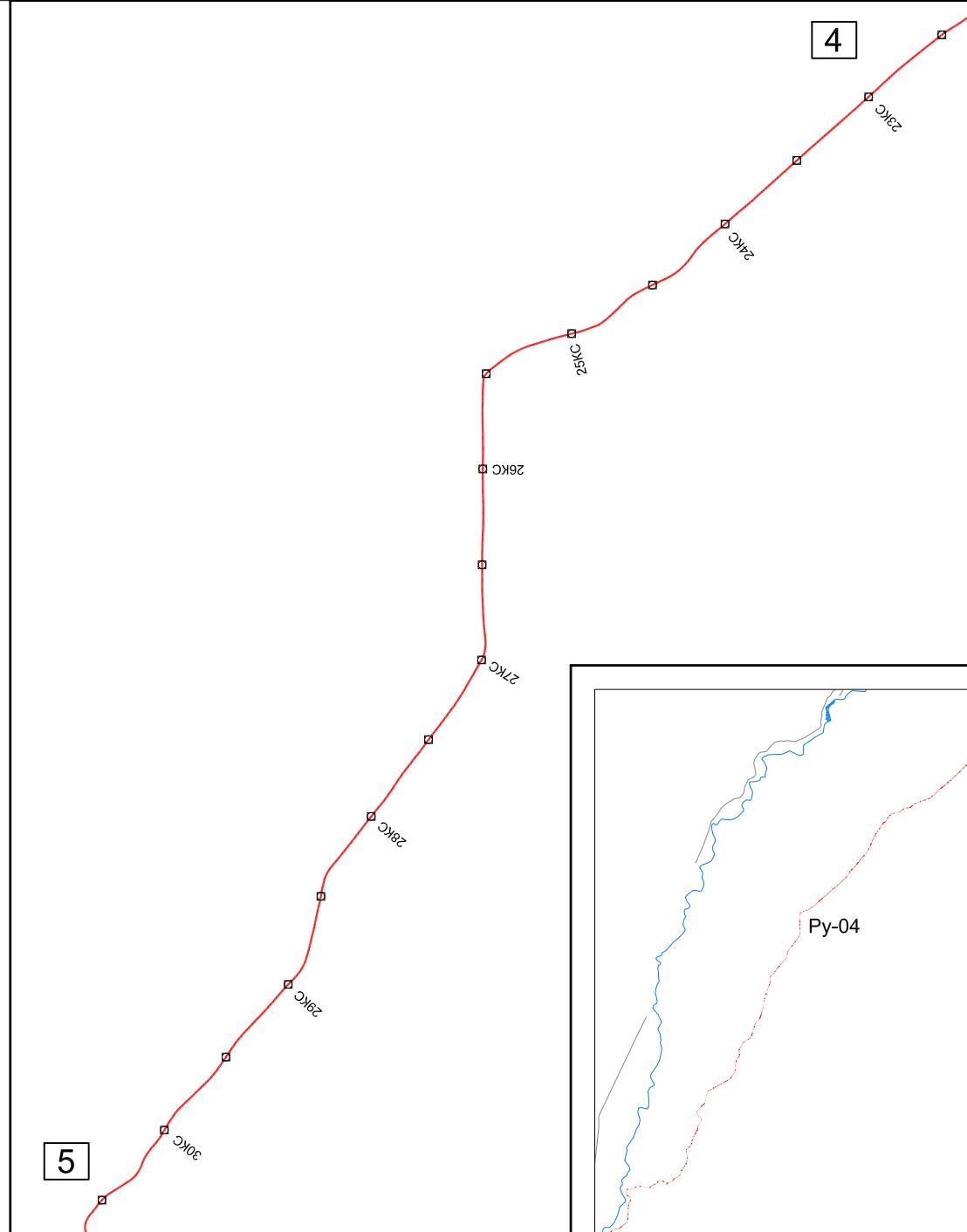
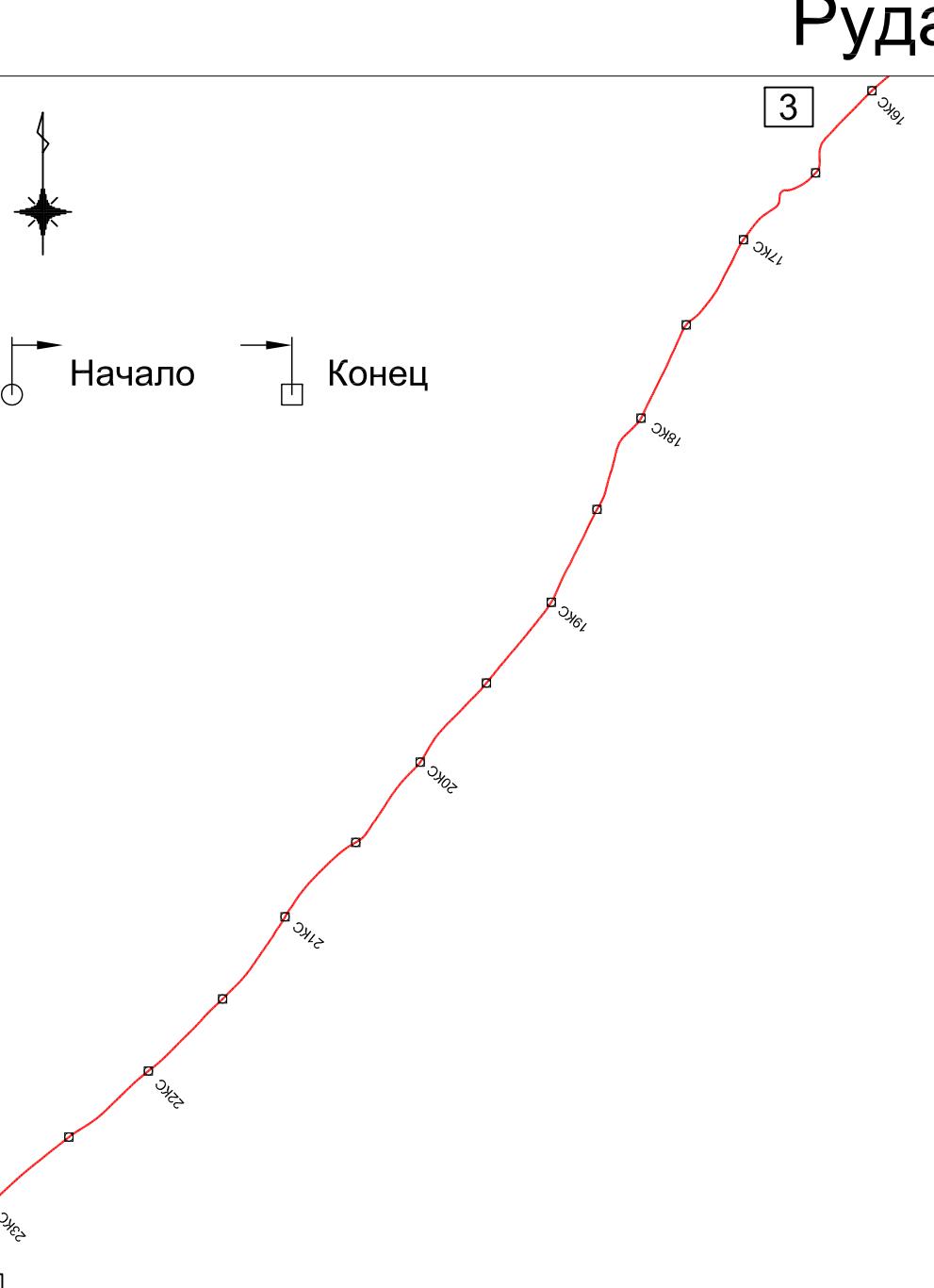


Рудаки-04(2)



Начало

Конец

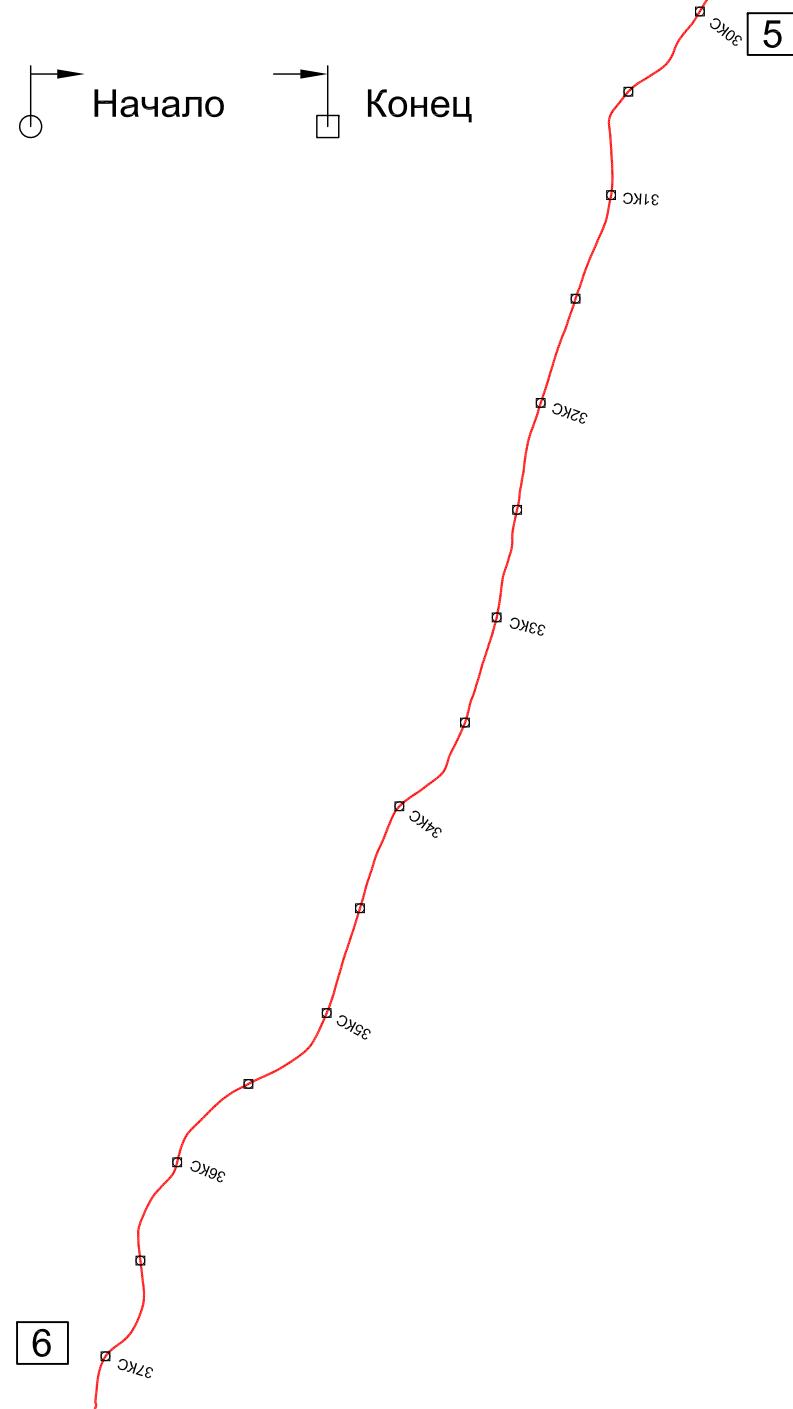


Рудаки-04(3)

Начало

Конец

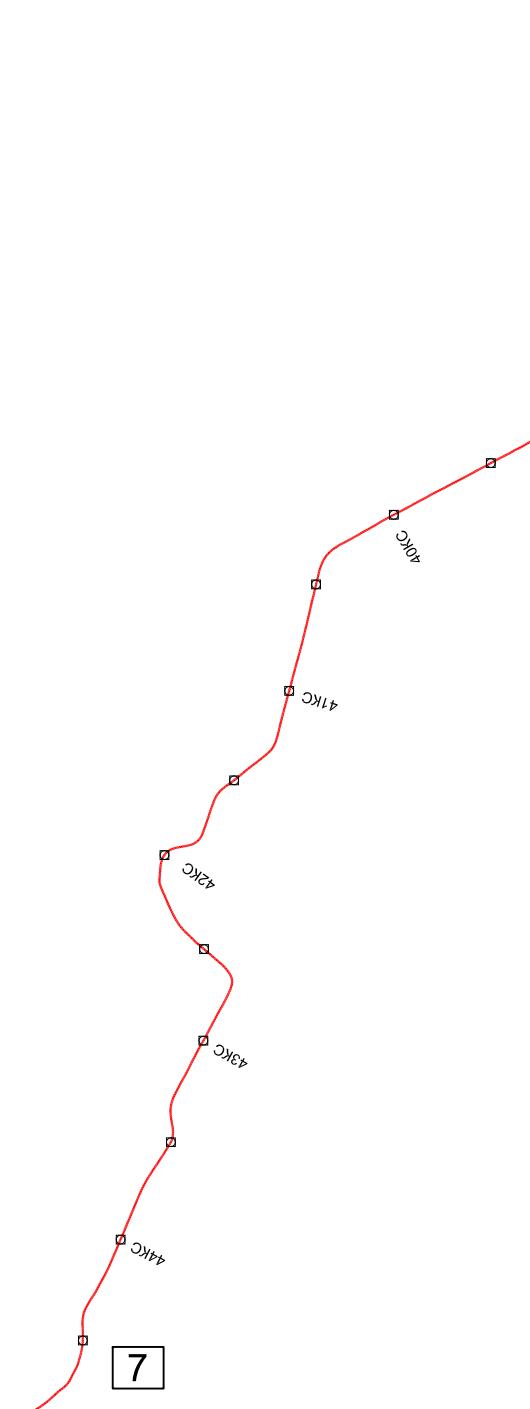
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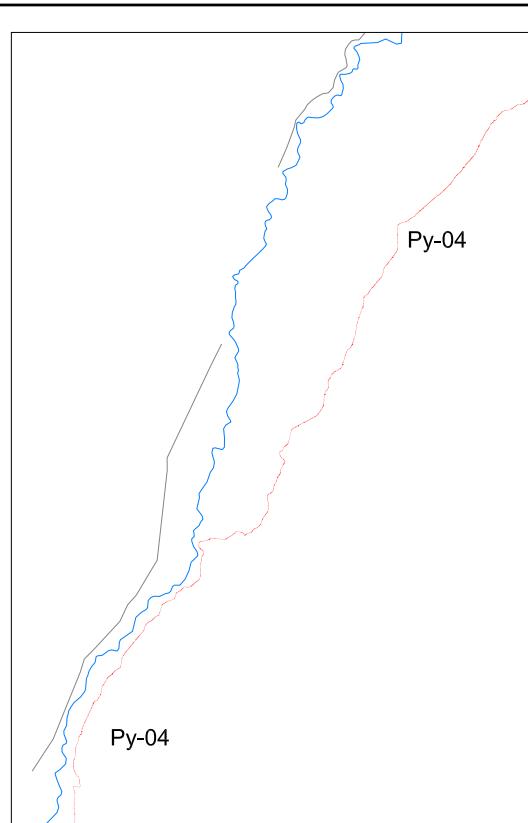
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6

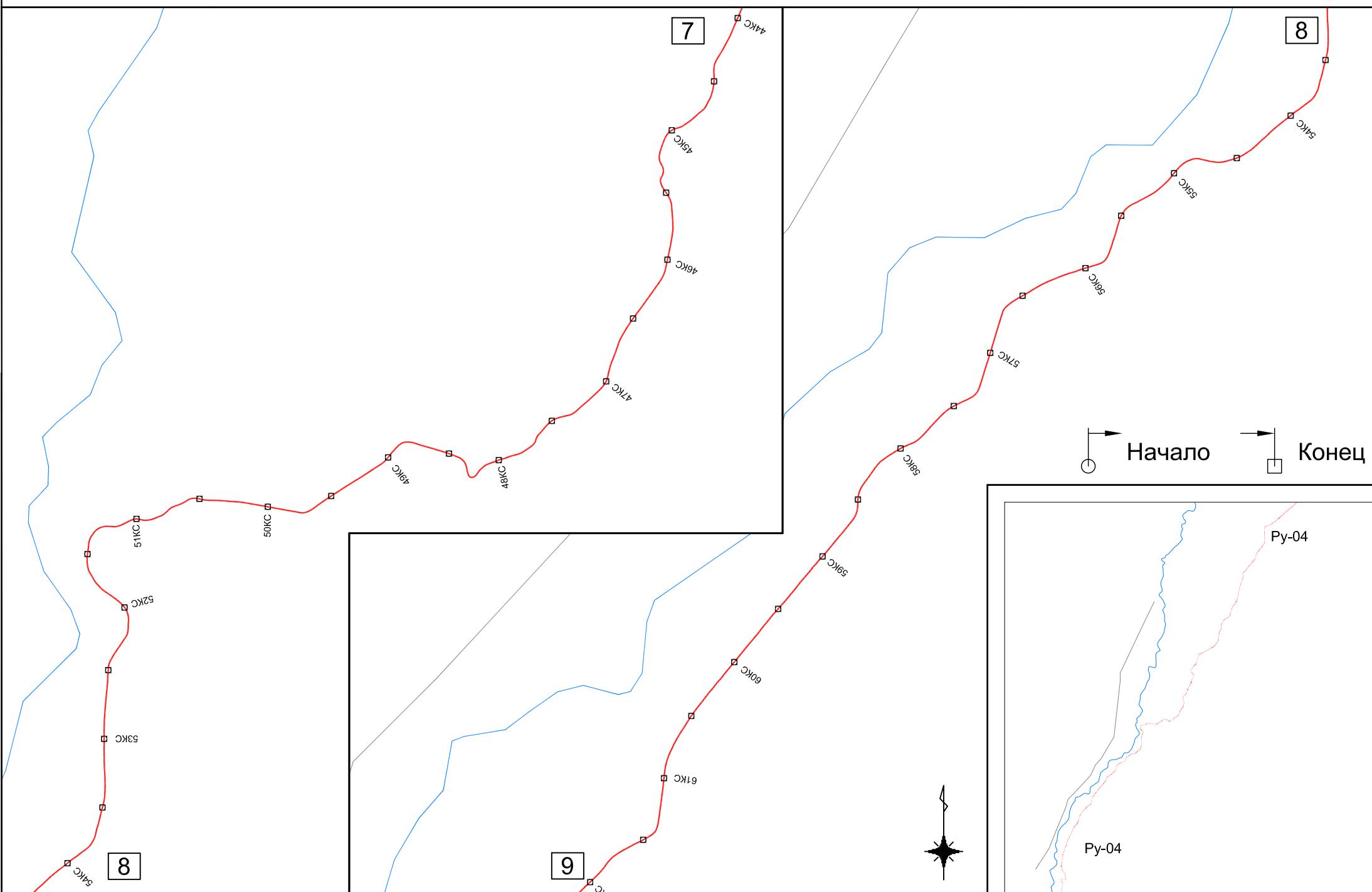
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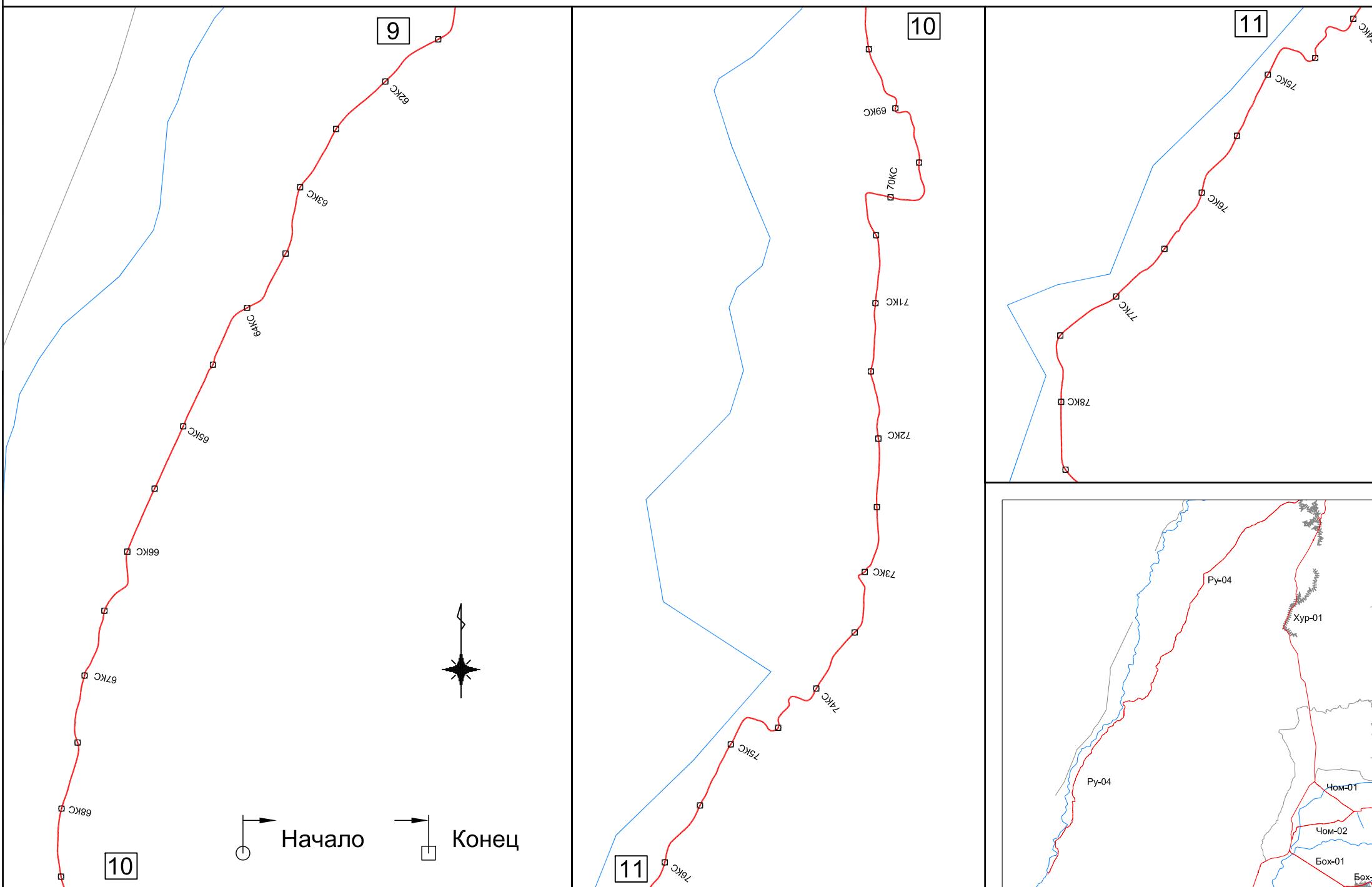
Py-04



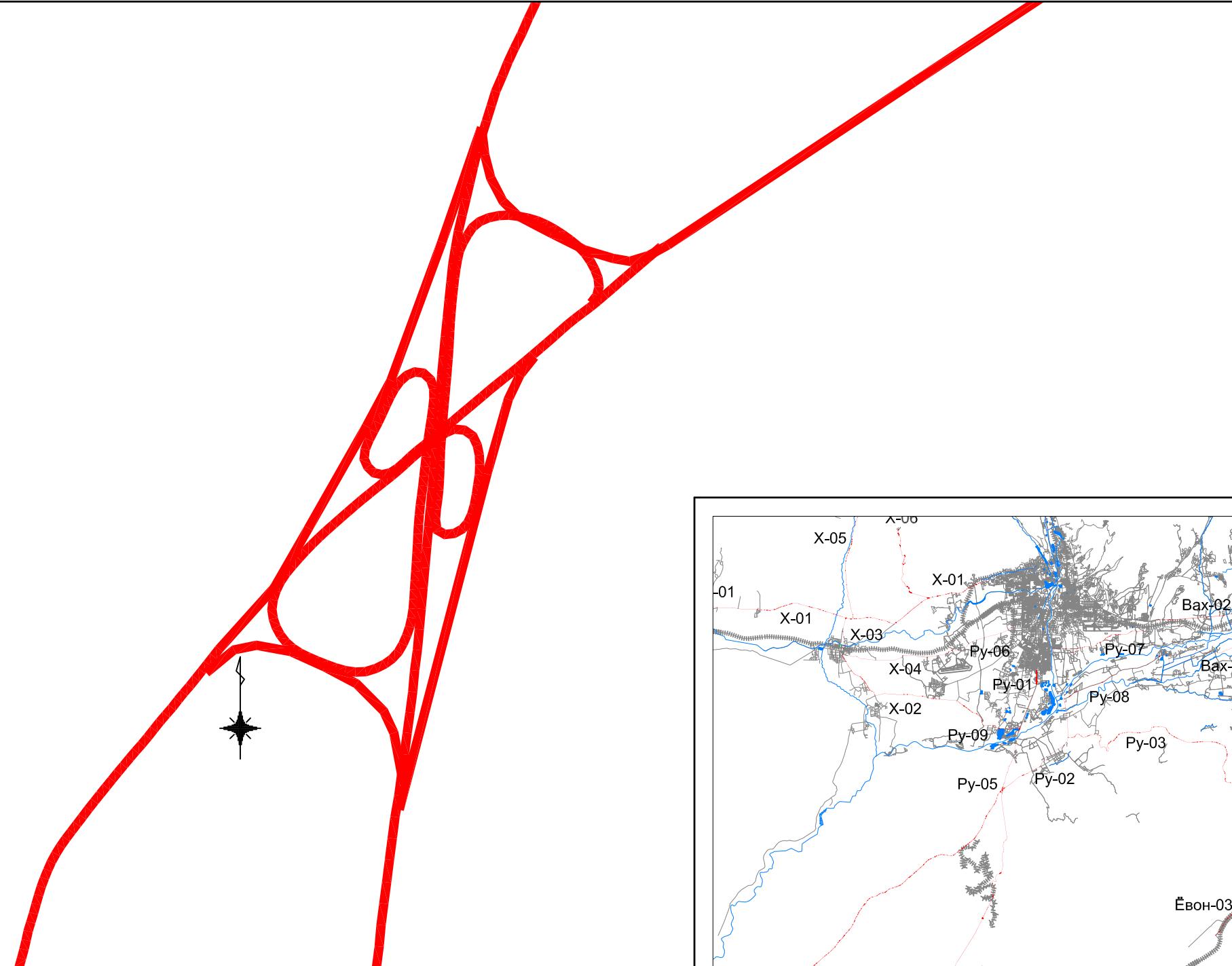
Рудаки-04(4)



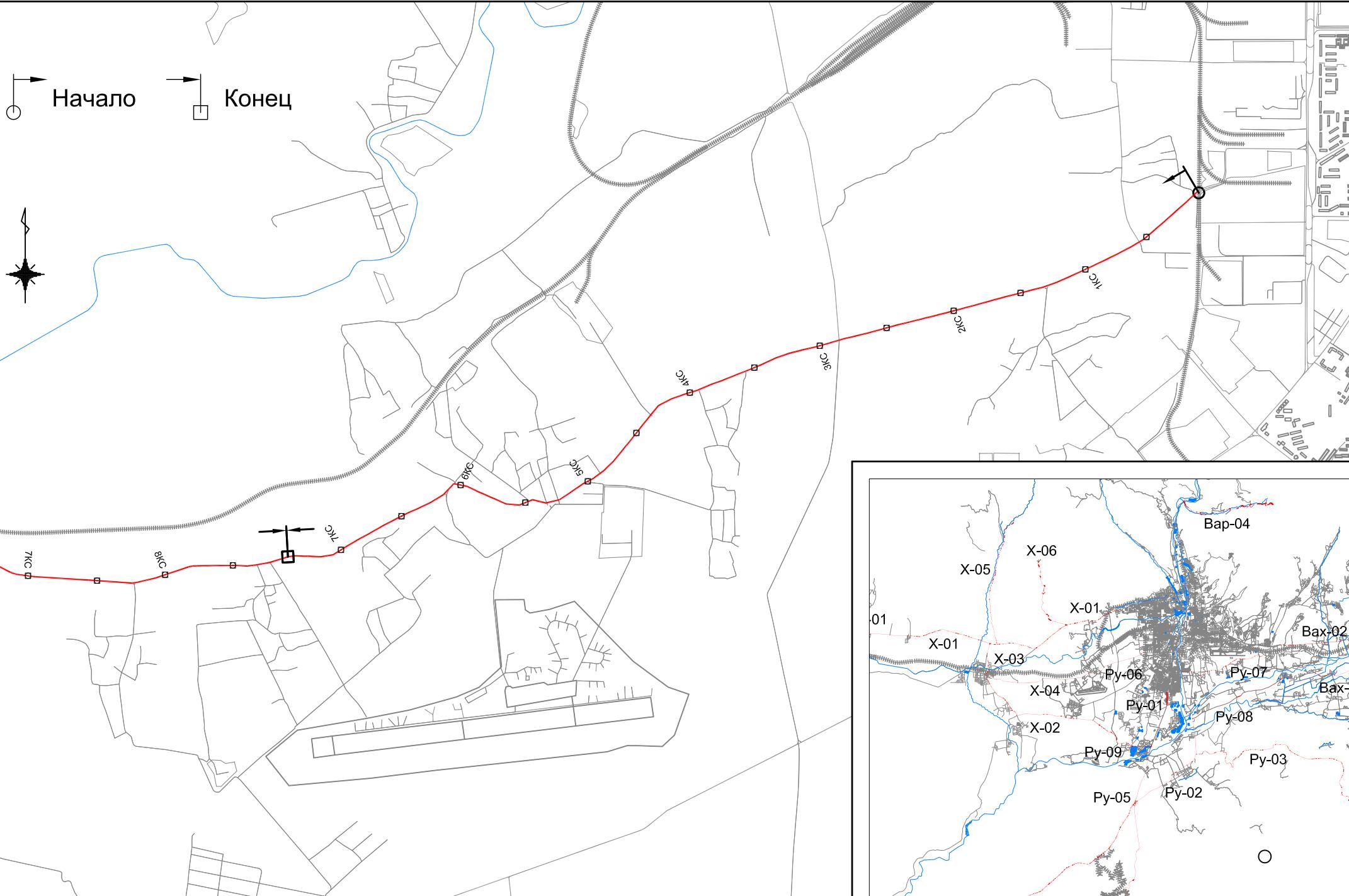
Рудаки-04(5)



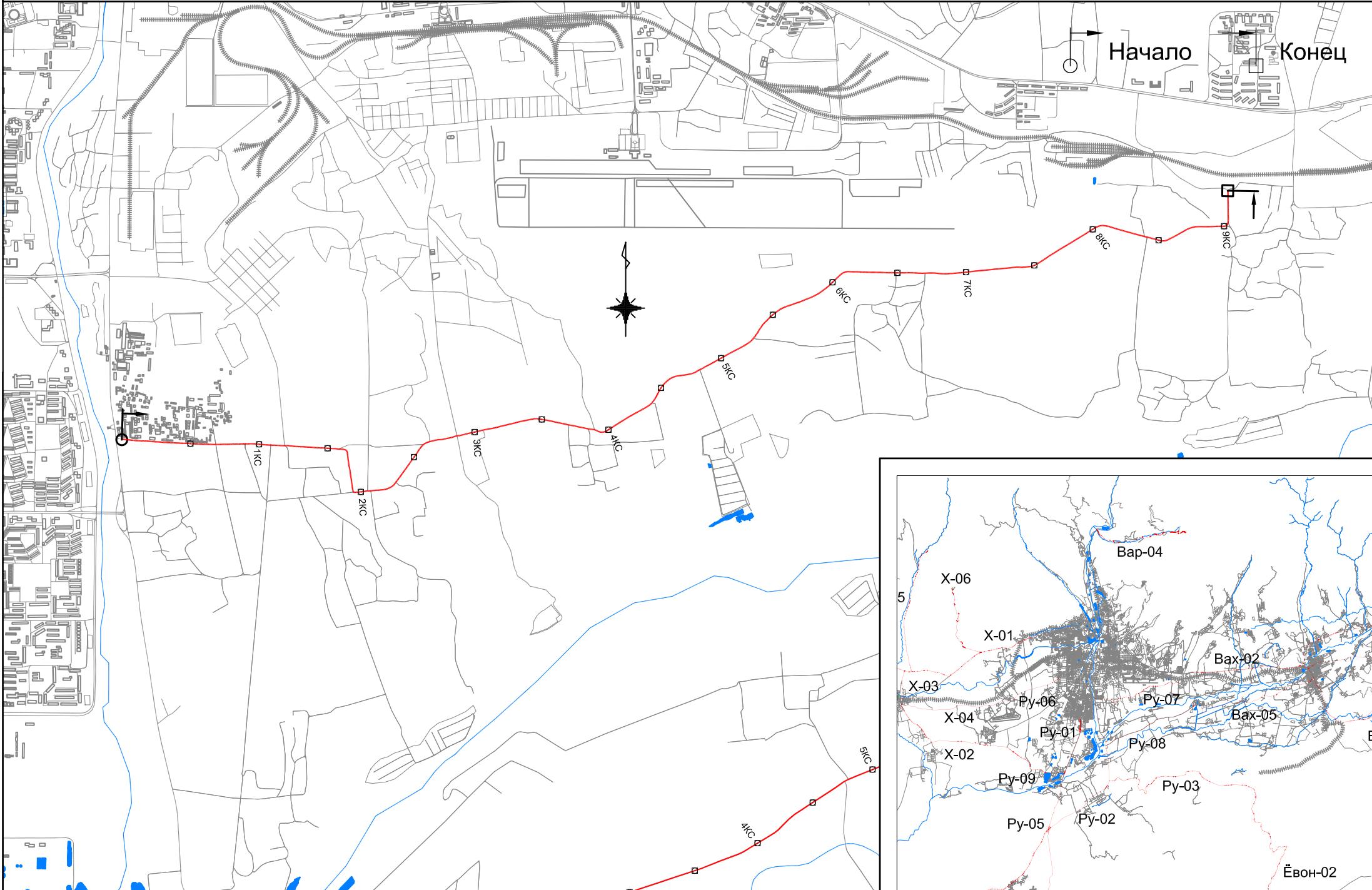
Рудаки-05



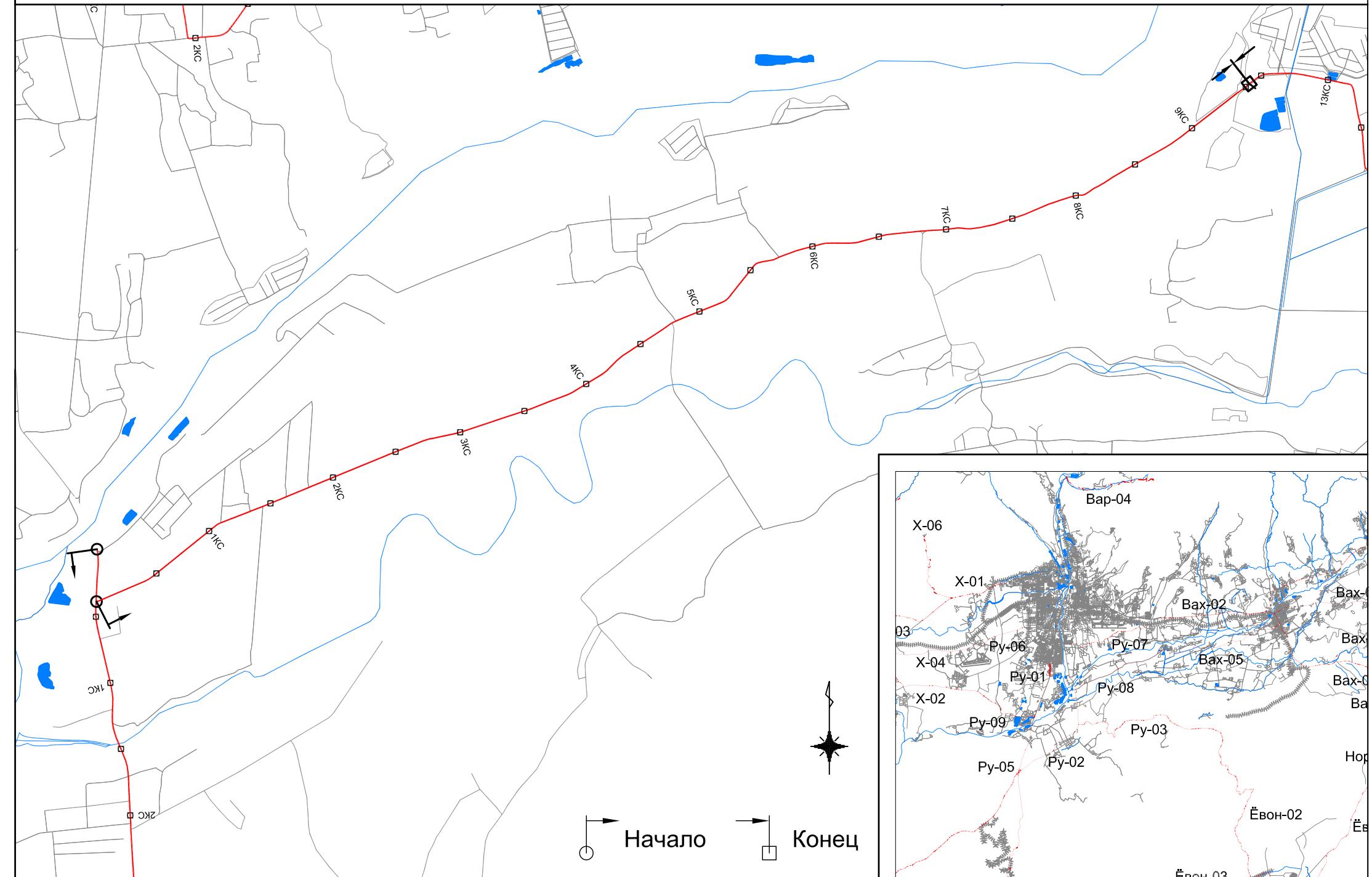
Рудаки-06



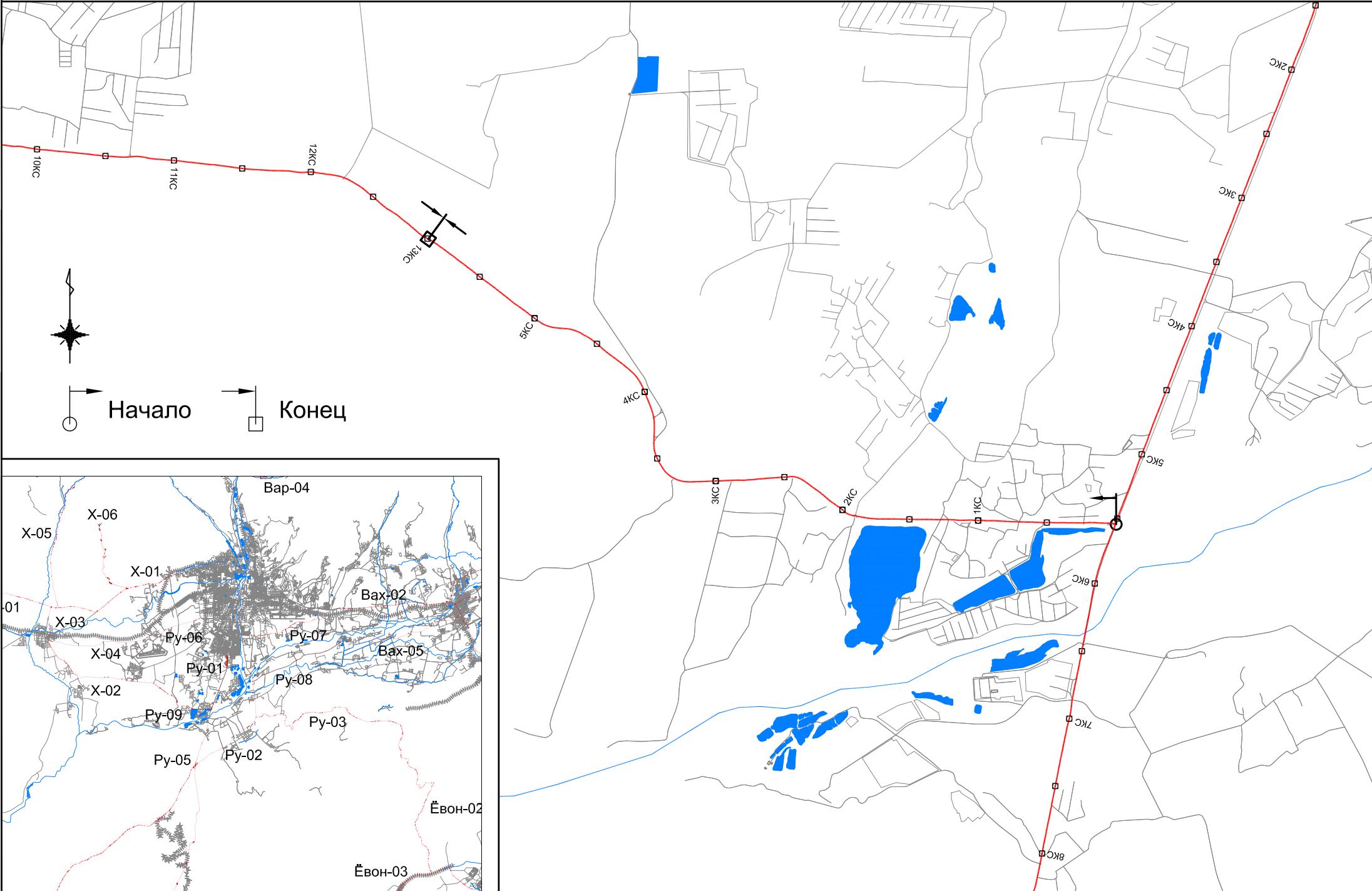
Рудаки-07



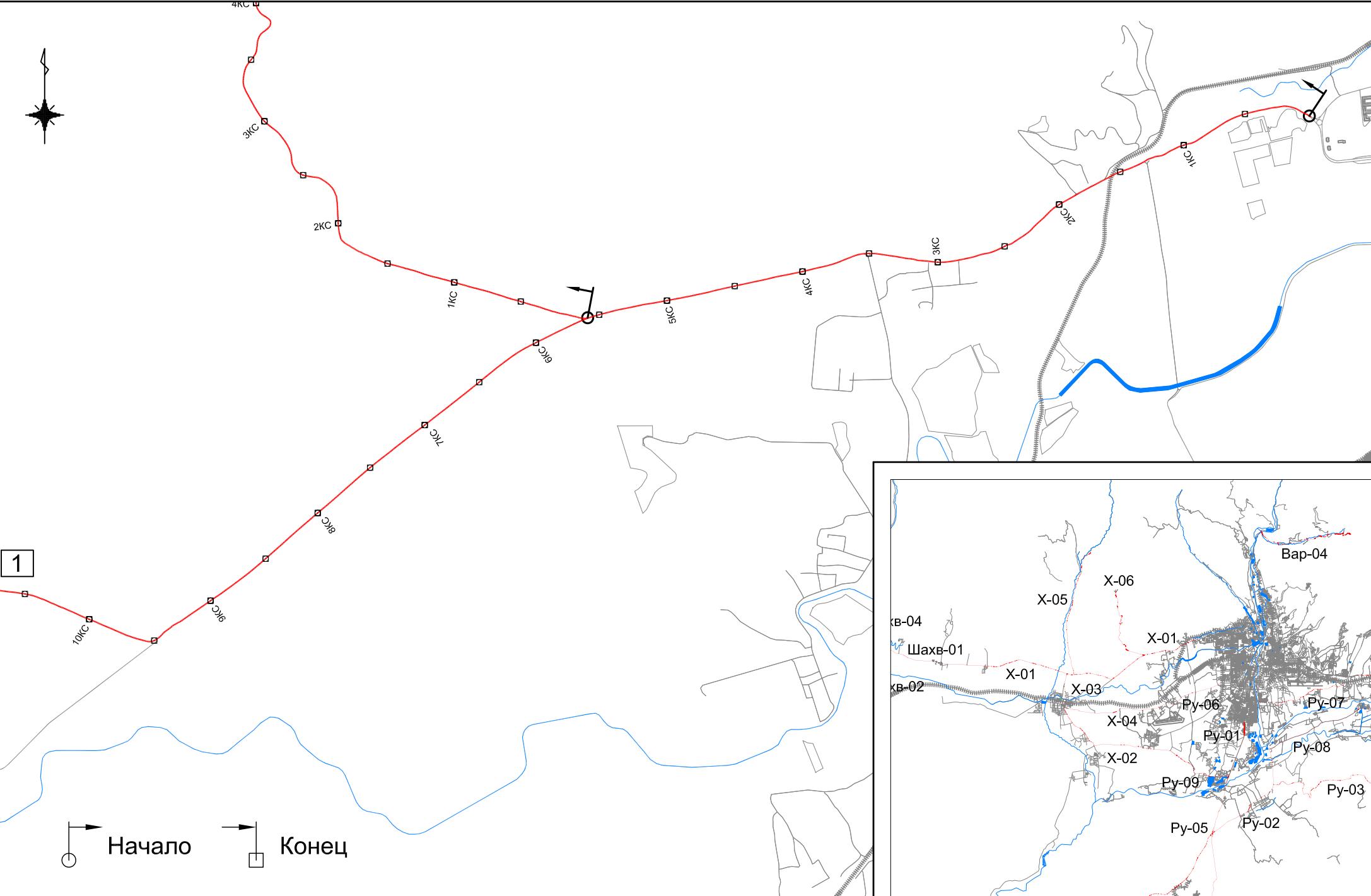
Рудаки-08



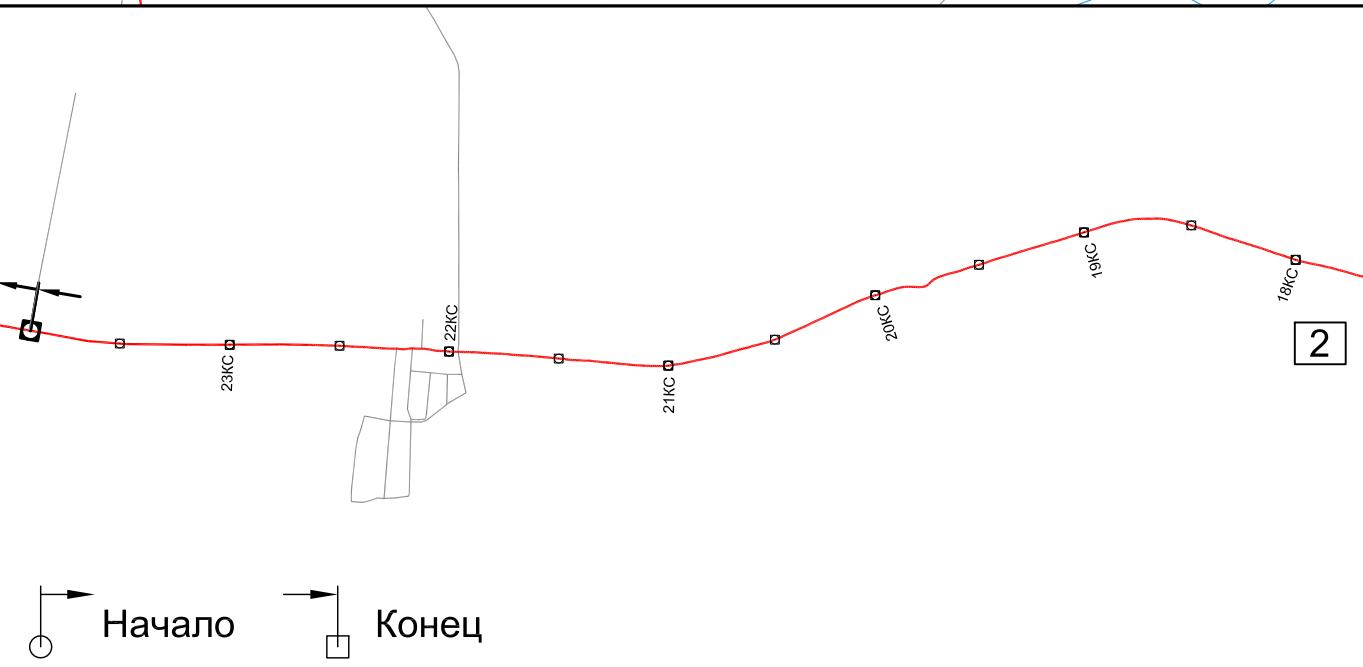
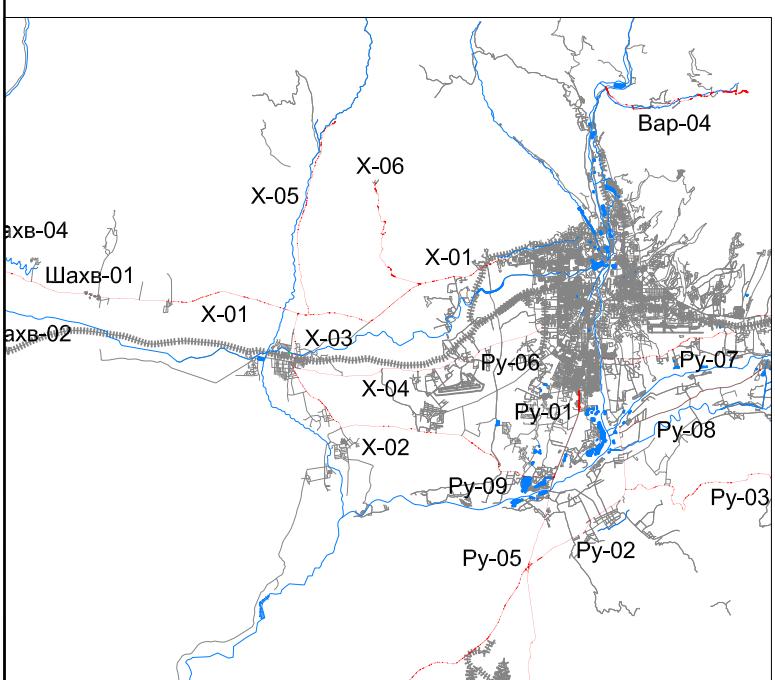
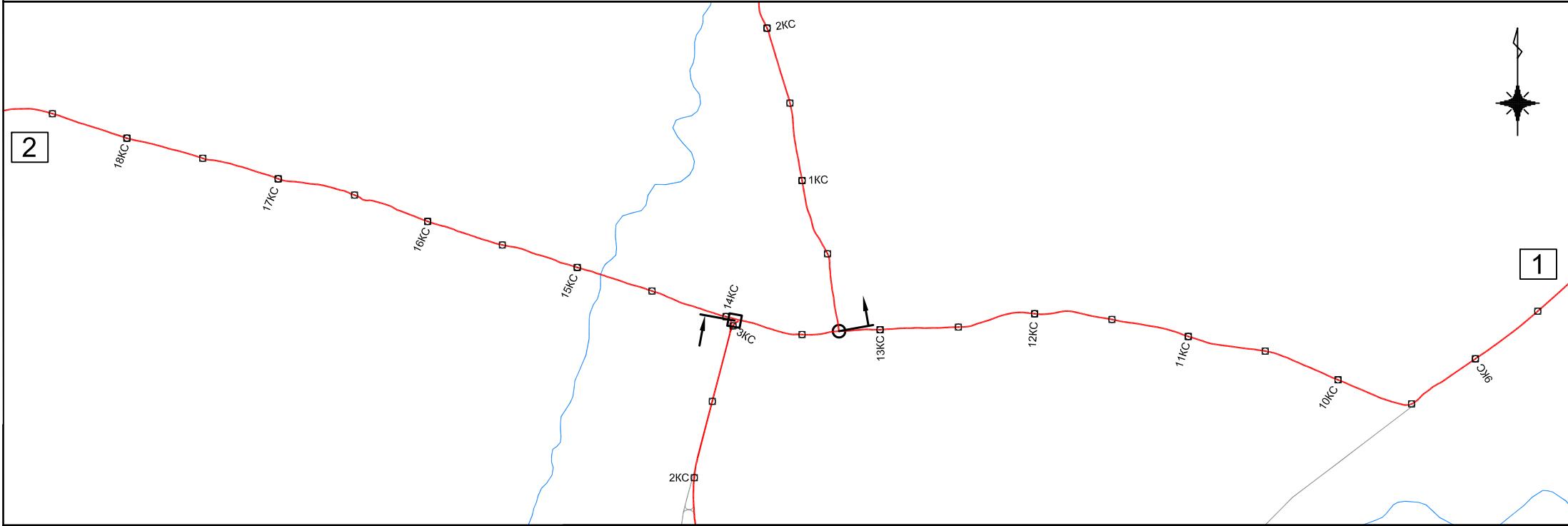
Рудаки-09



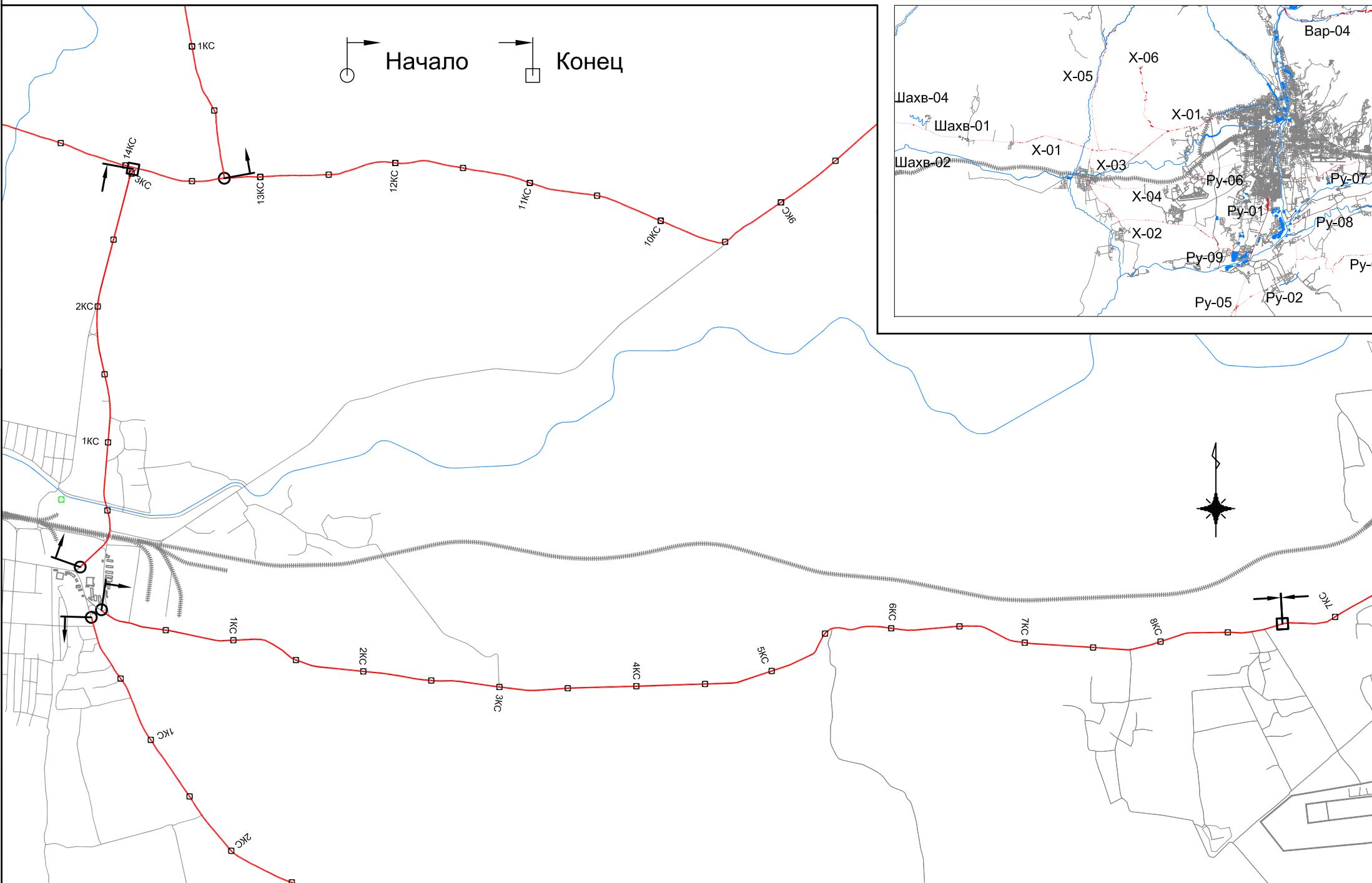
Хисор-01(1)



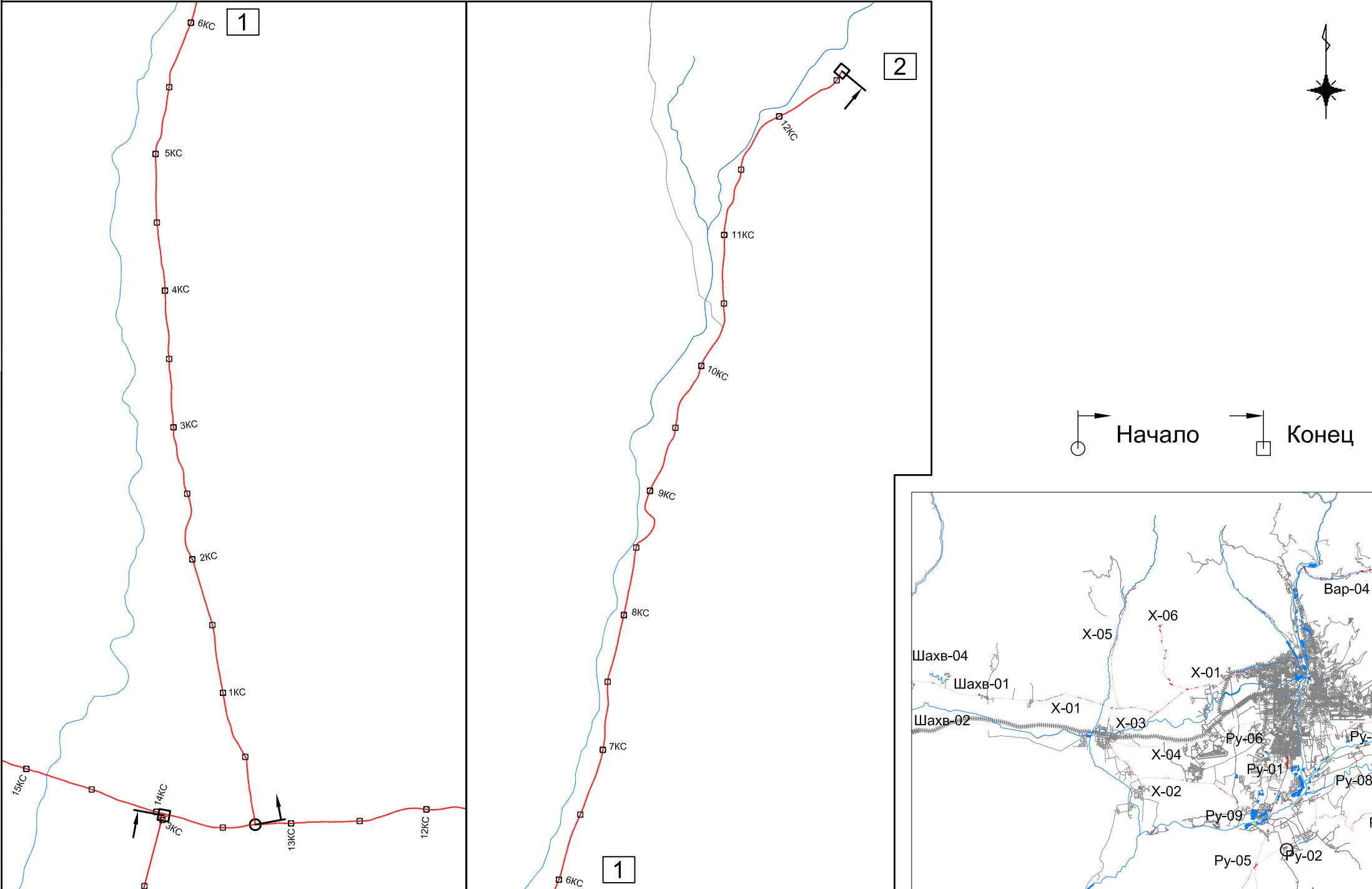
Хисор-01(2)



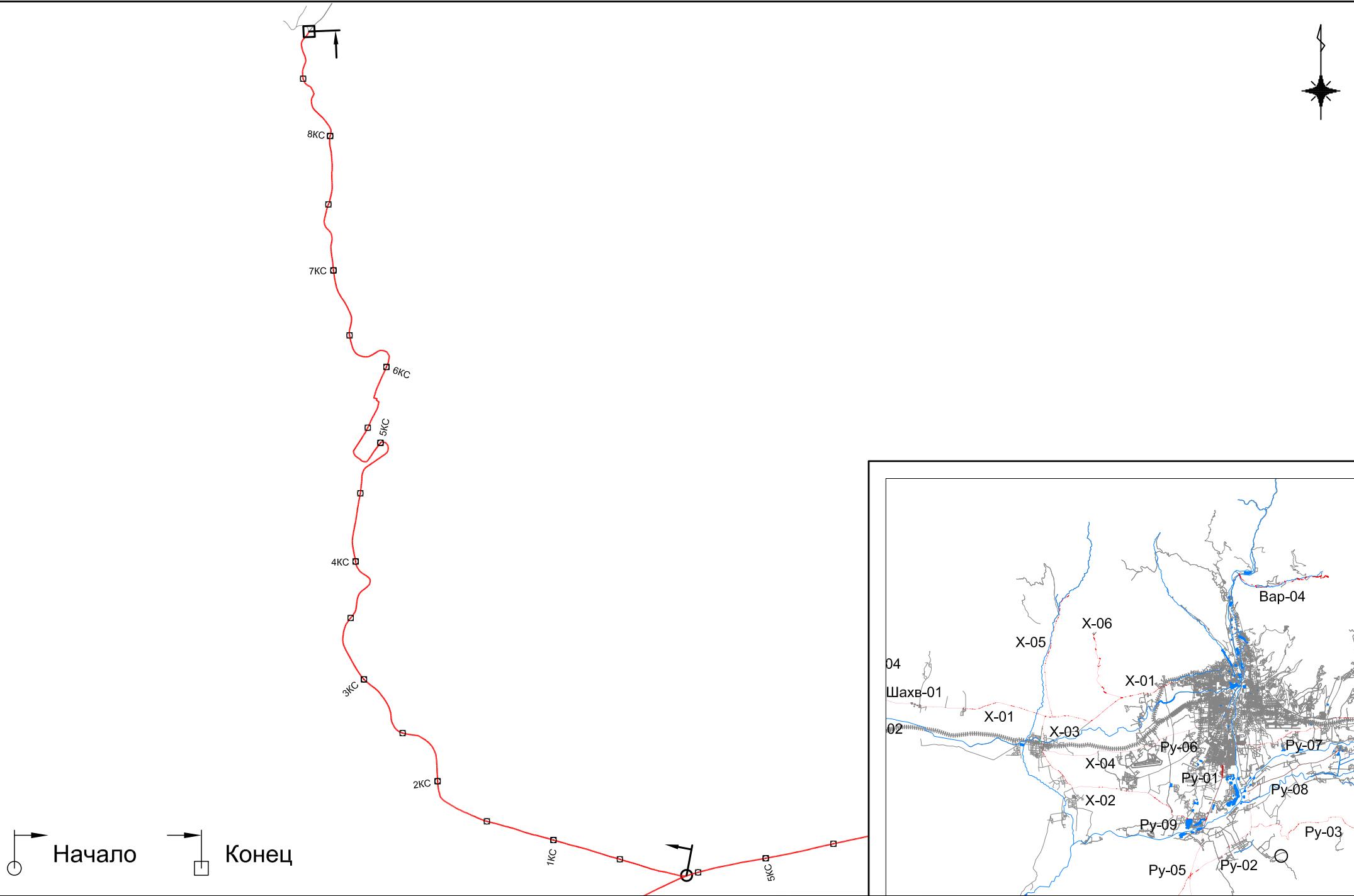
Хисор-03, 04



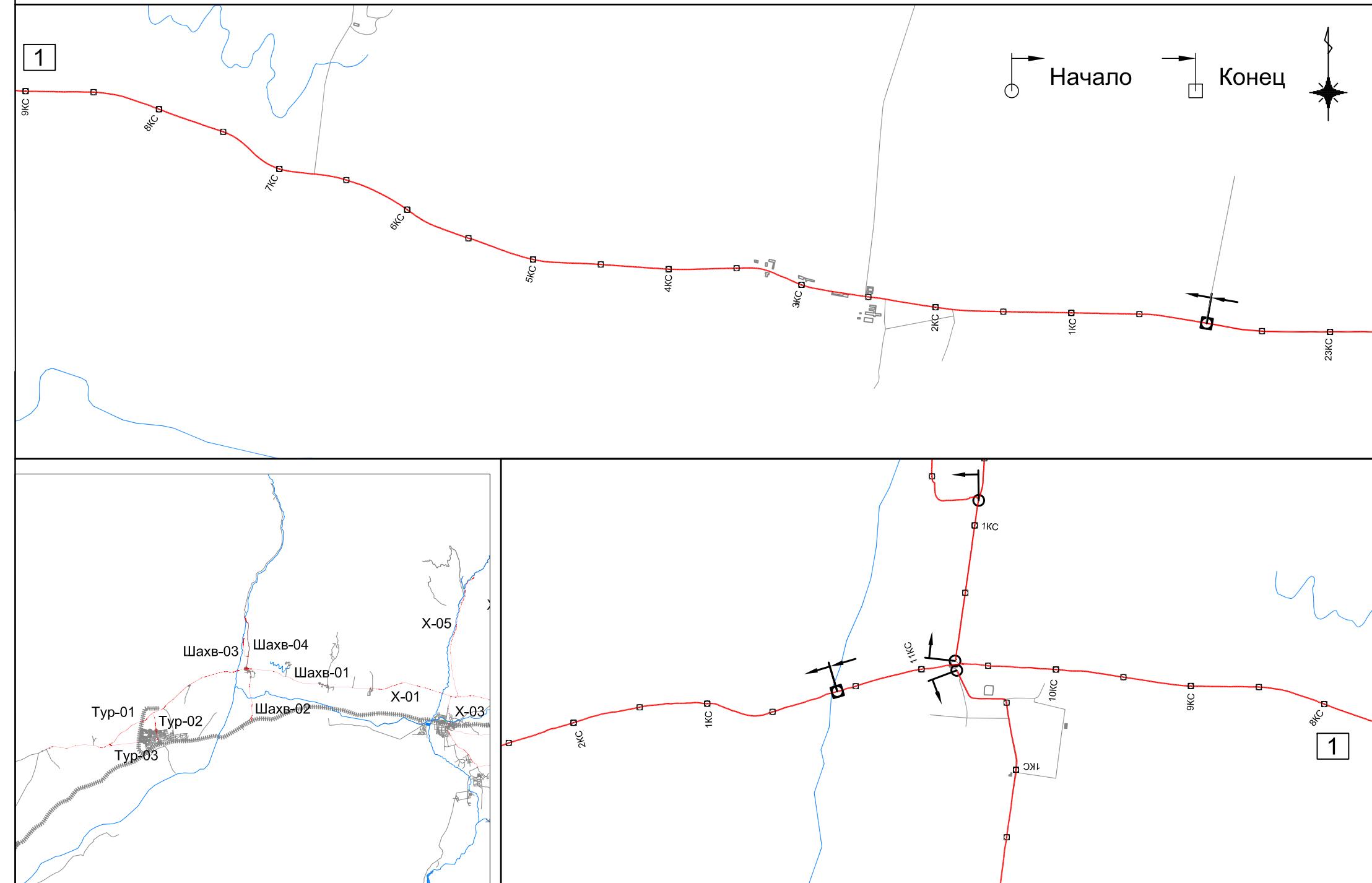
Хисор-05



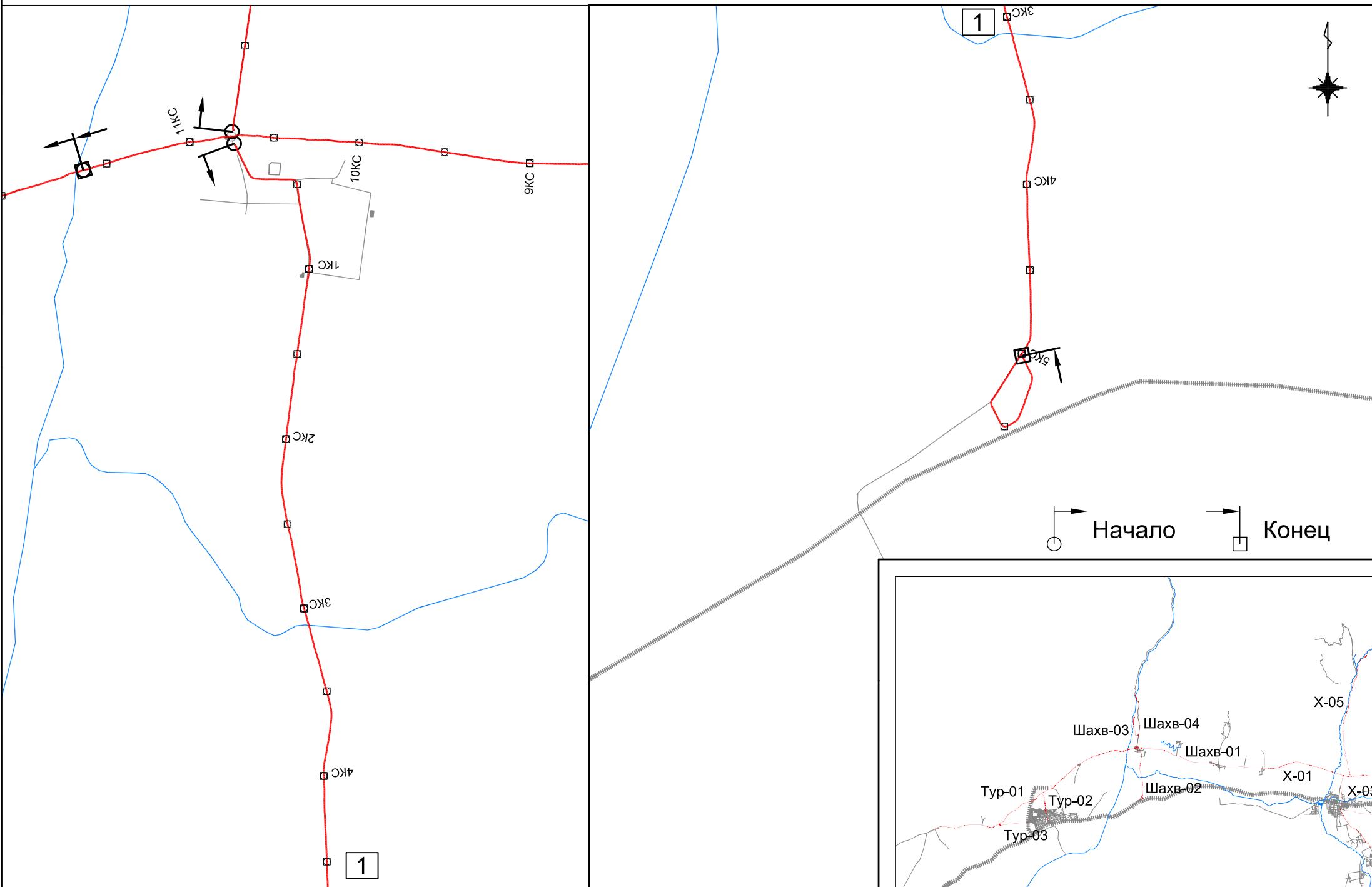
Хисор-06



Шахринав-01



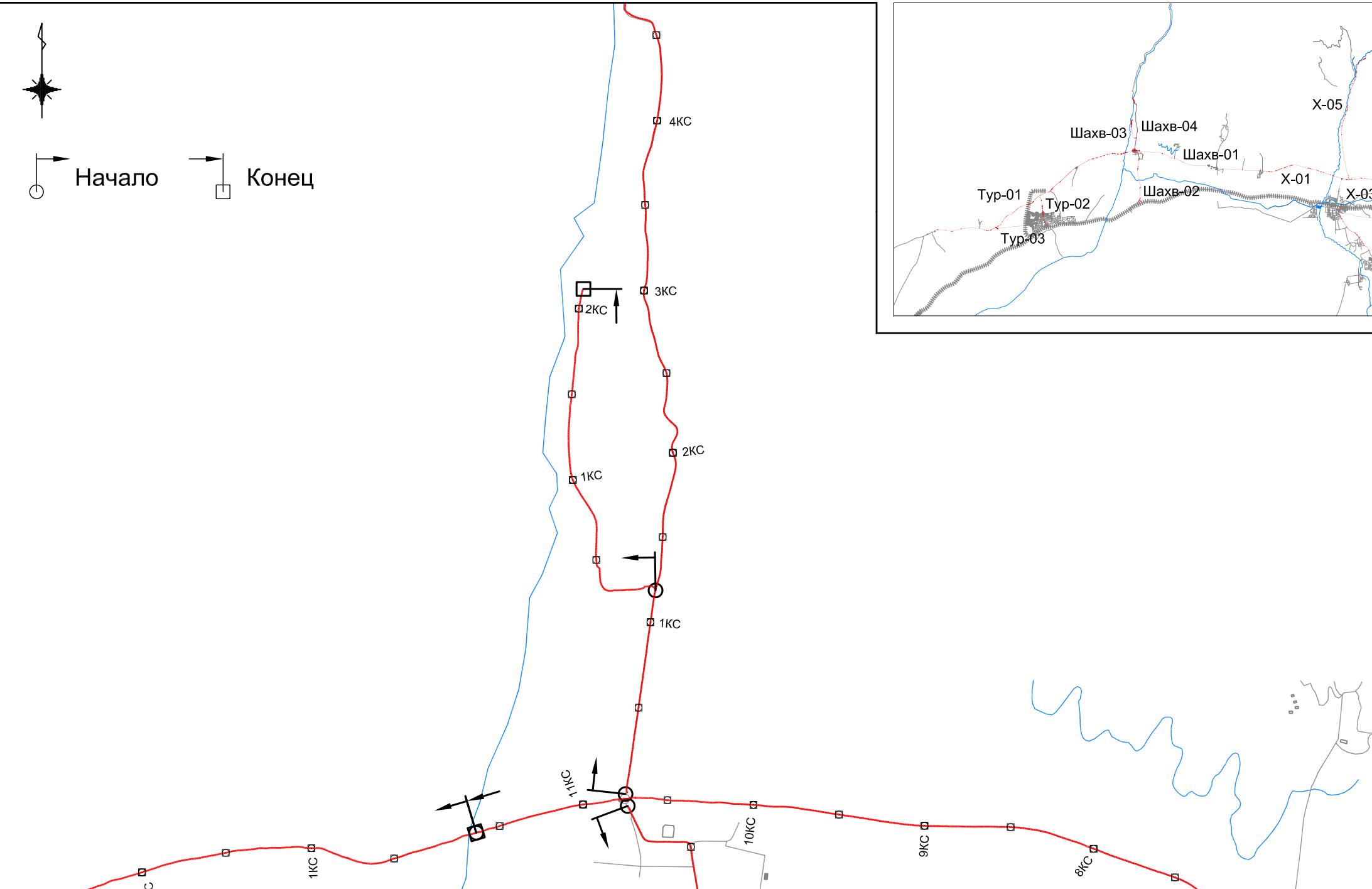
Шахринав-02



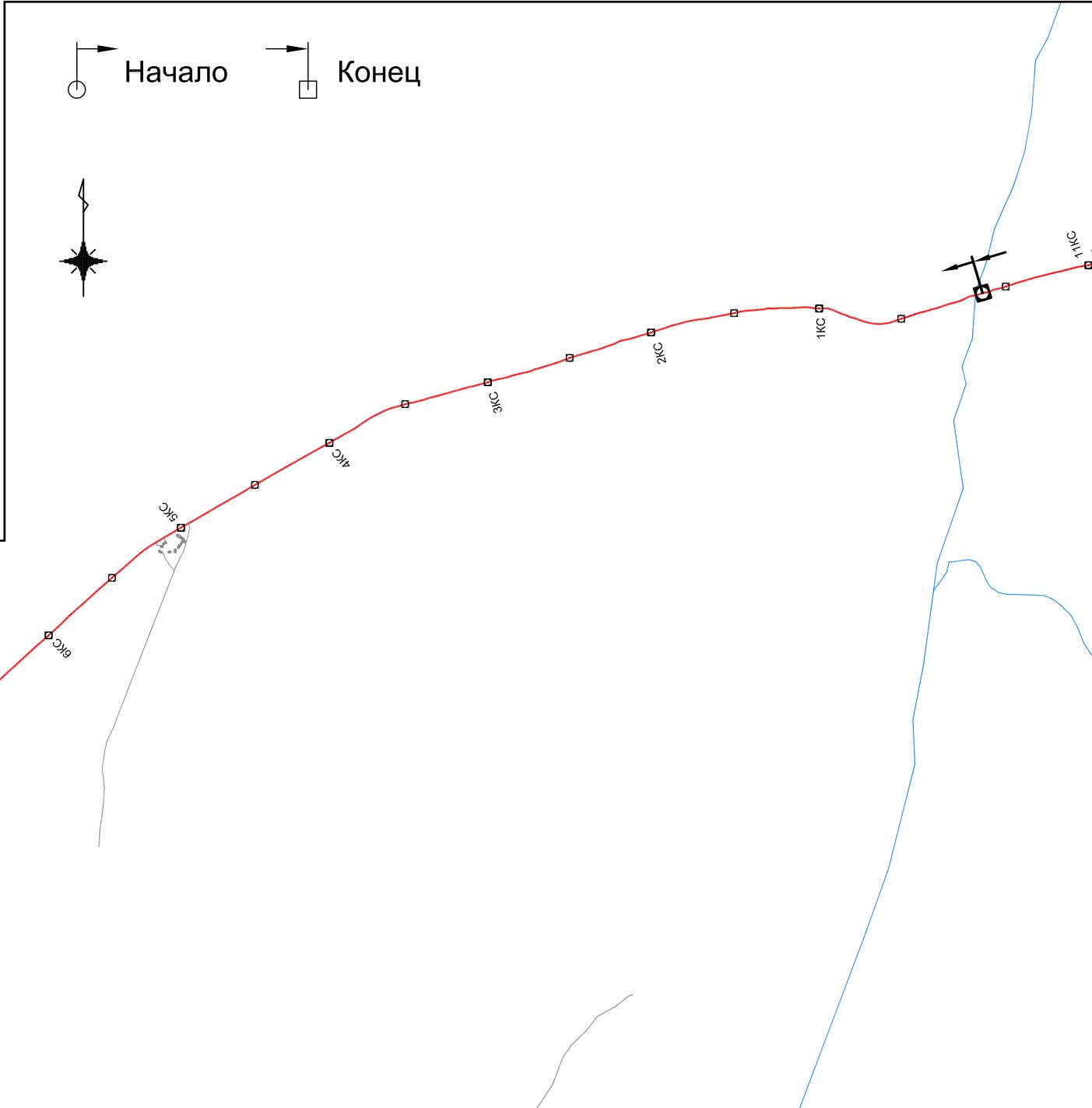
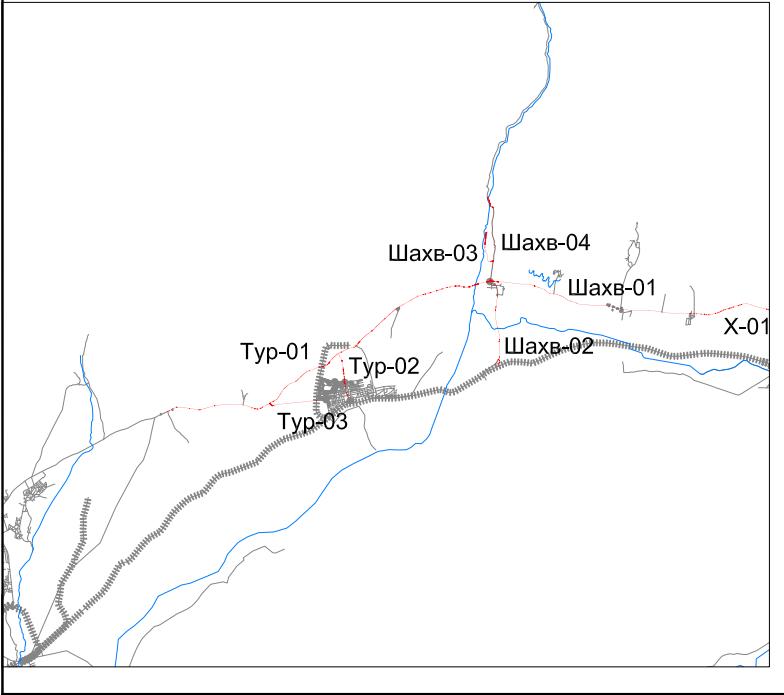
Шахринав-03, 04



Начало Конец



Турсунзода-01(1)



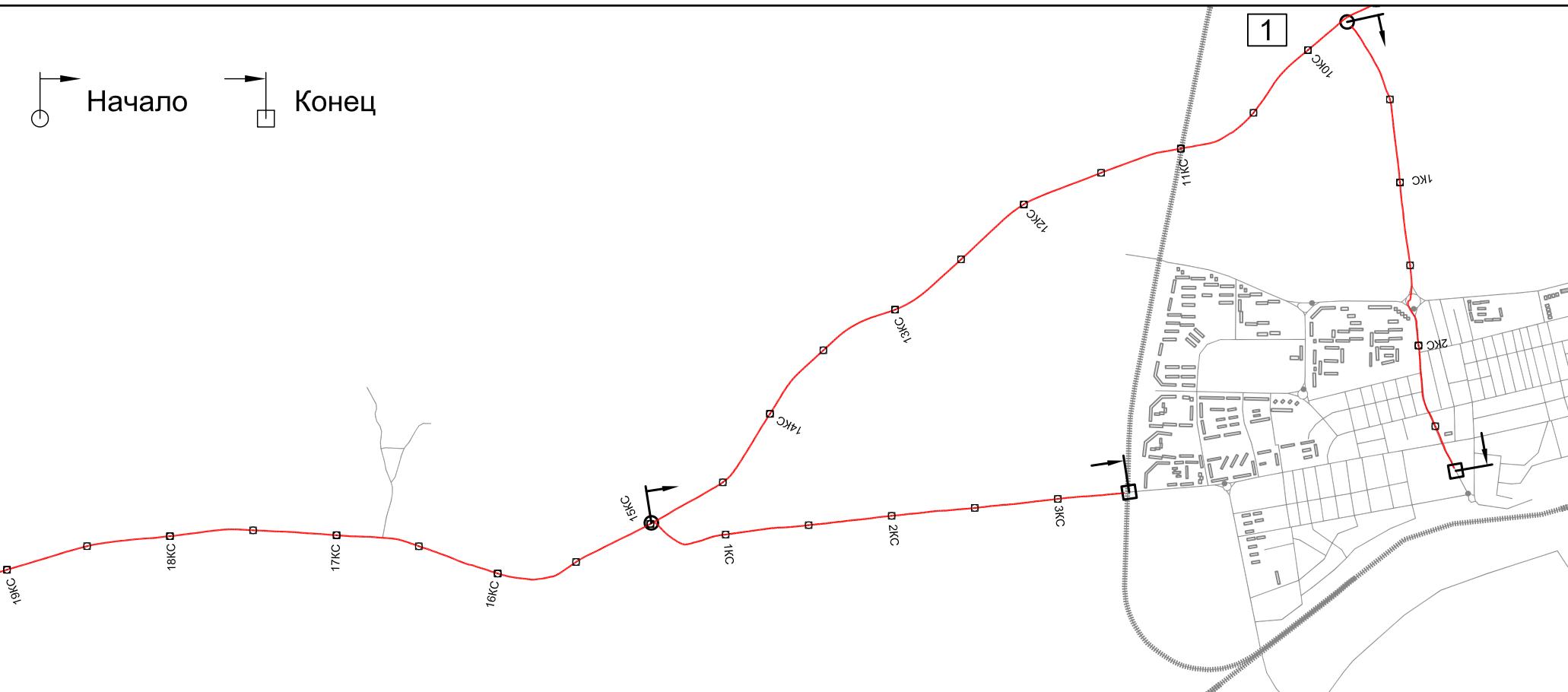
Турсунзода-01(2)



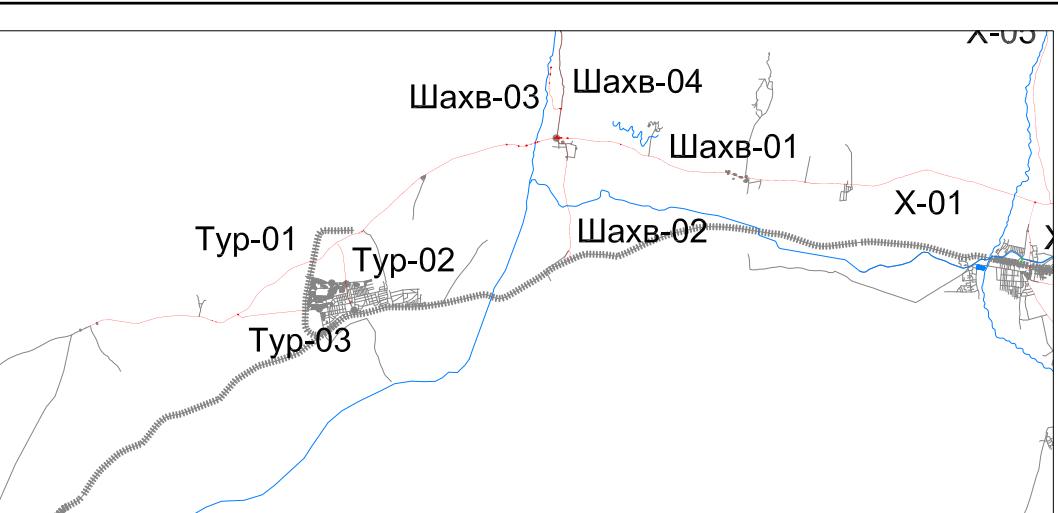
Начало

Конец

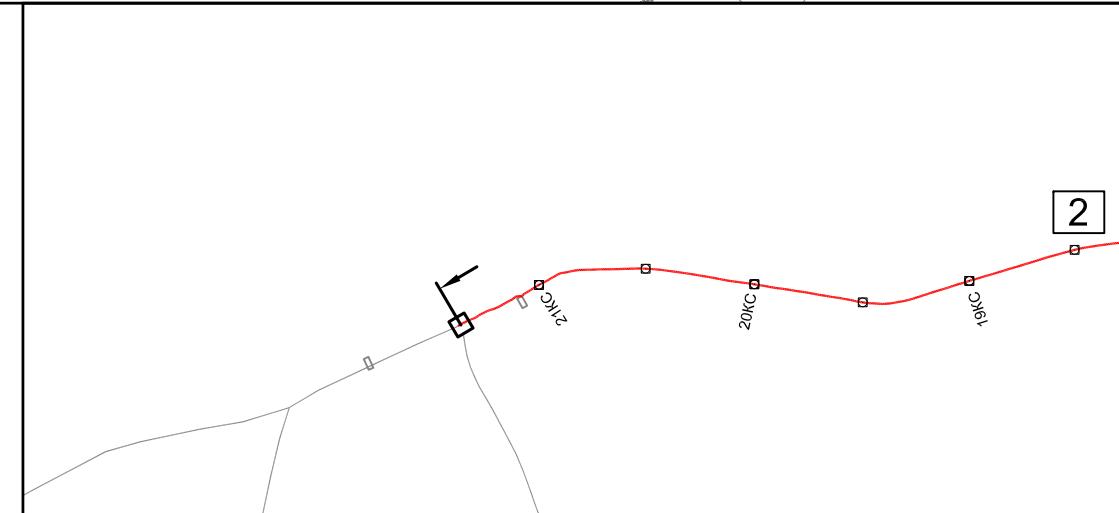
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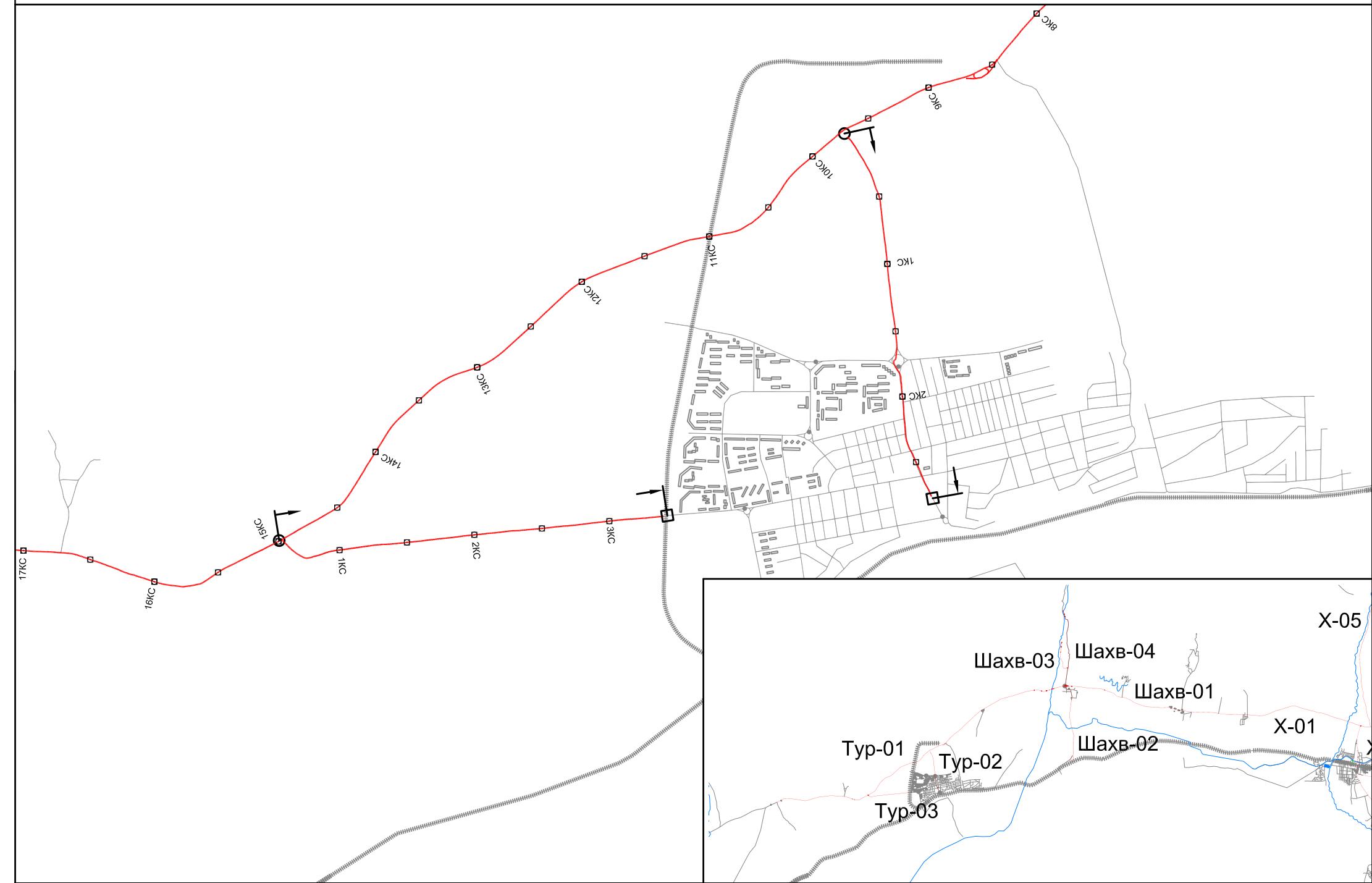
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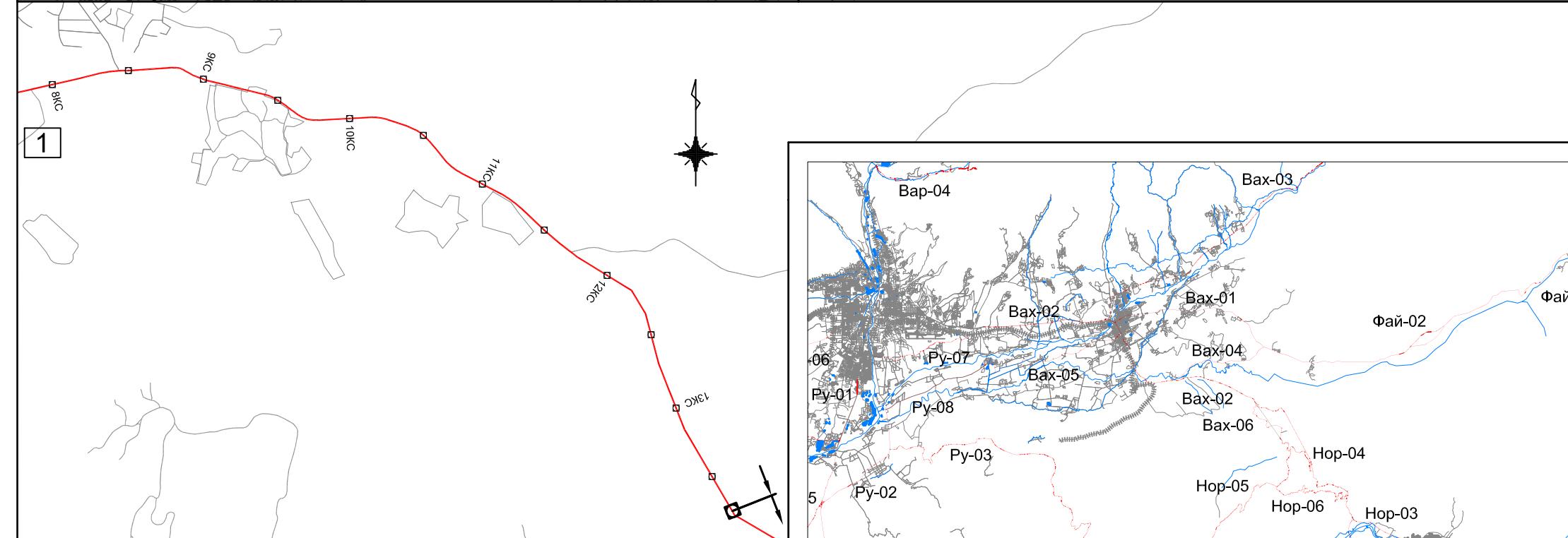
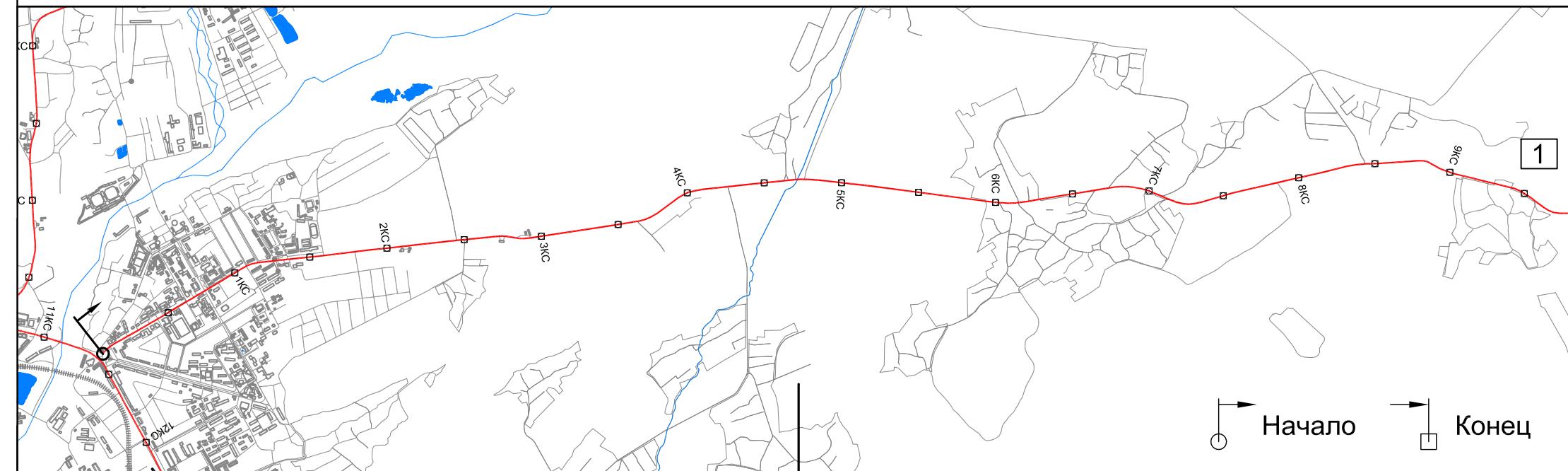
2



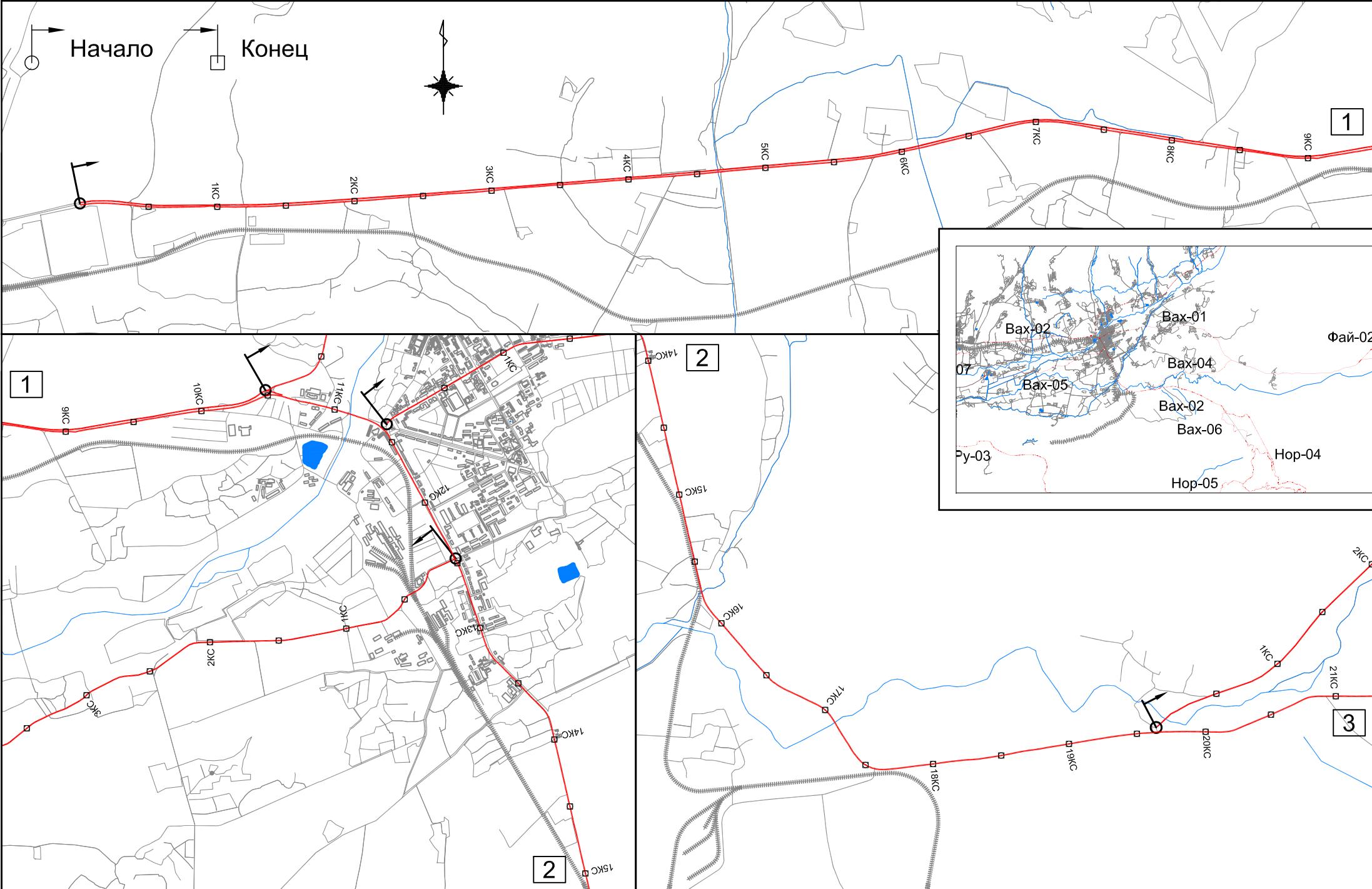
Турсунзода-02, 03



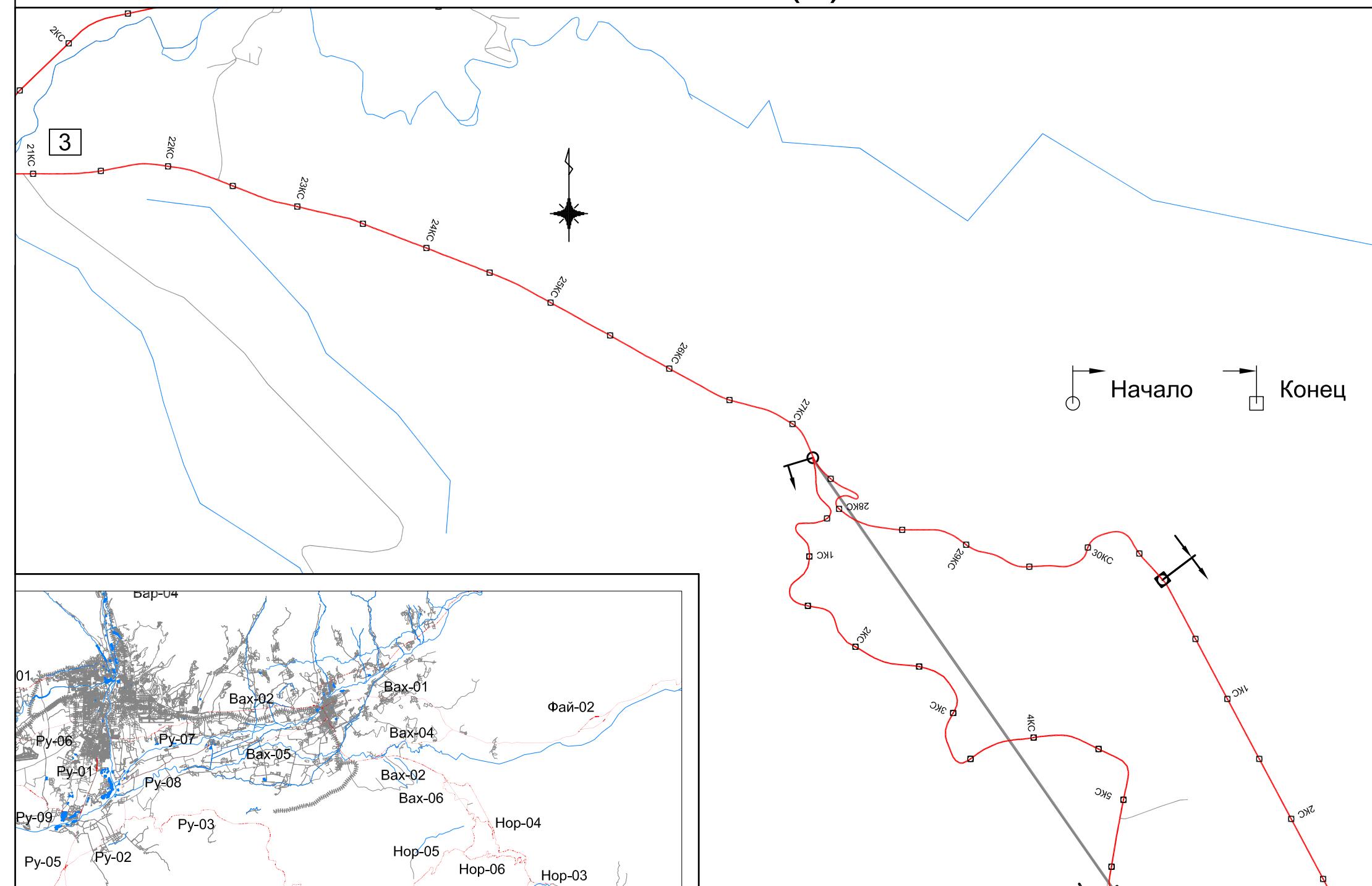
Вахдат-01



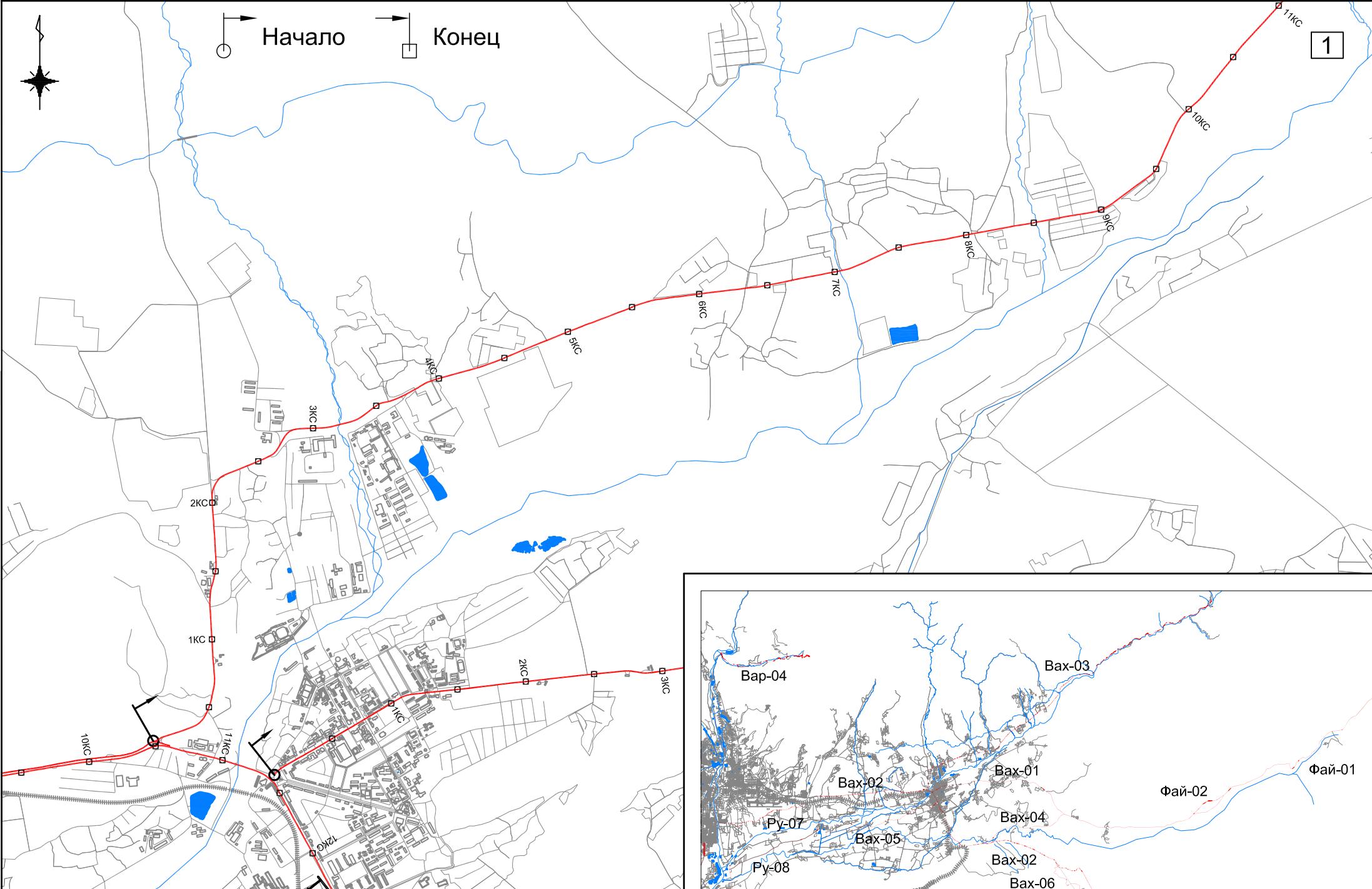
Вахдат-02(1)



Вахдат-02(2)



Вахдат-03(1)



Вахдат-03(2)

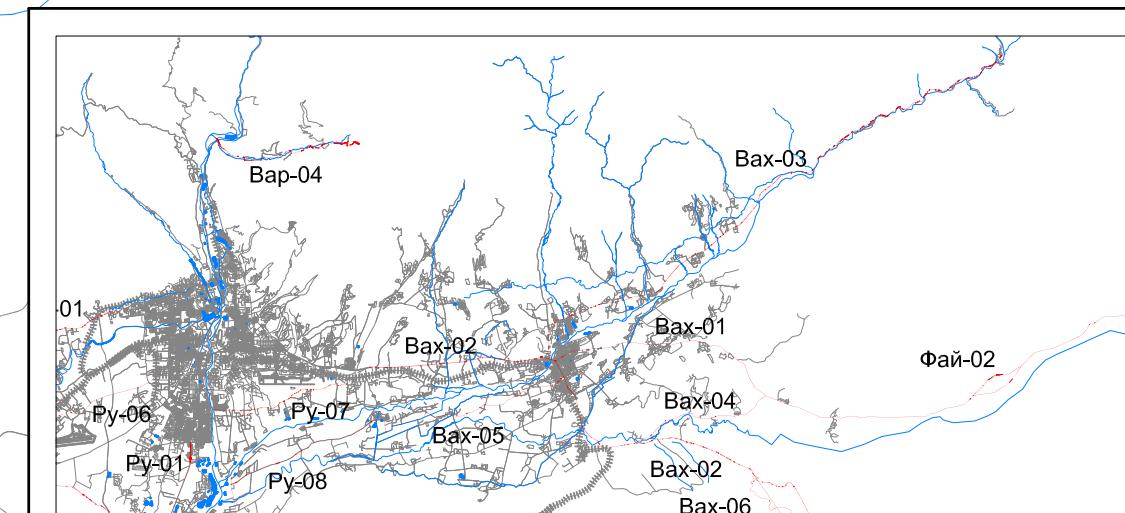


1



Начало

Конец



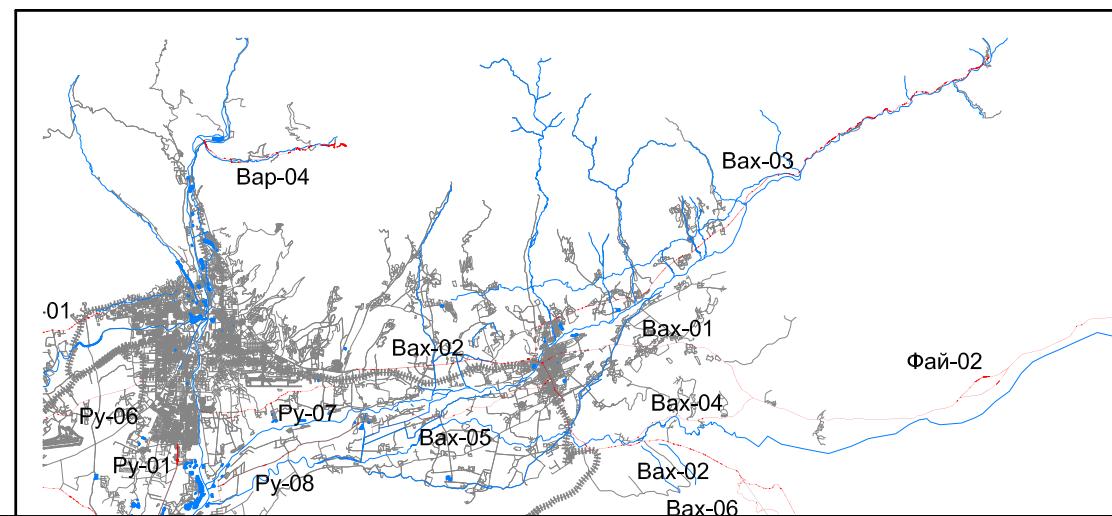
Вахдат-03(3)



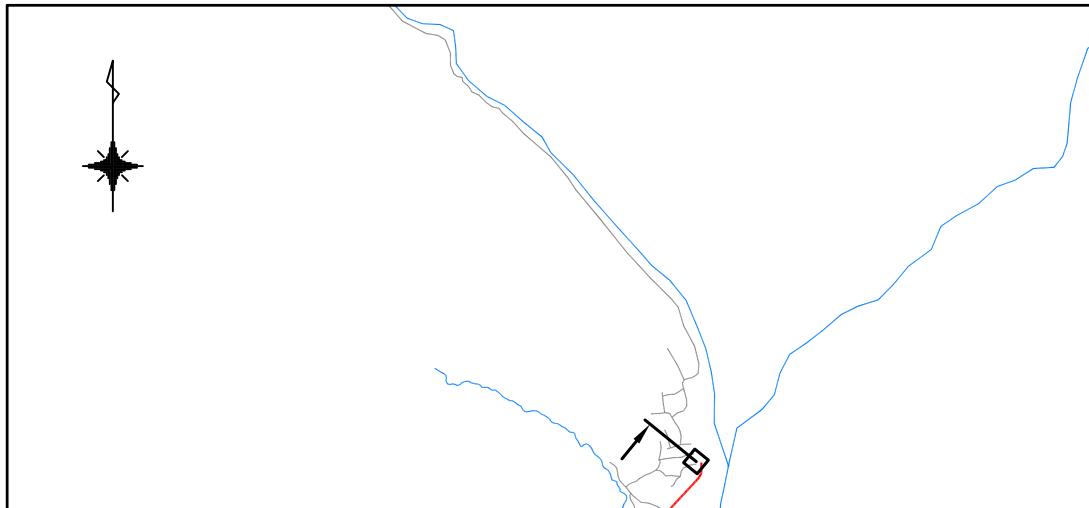
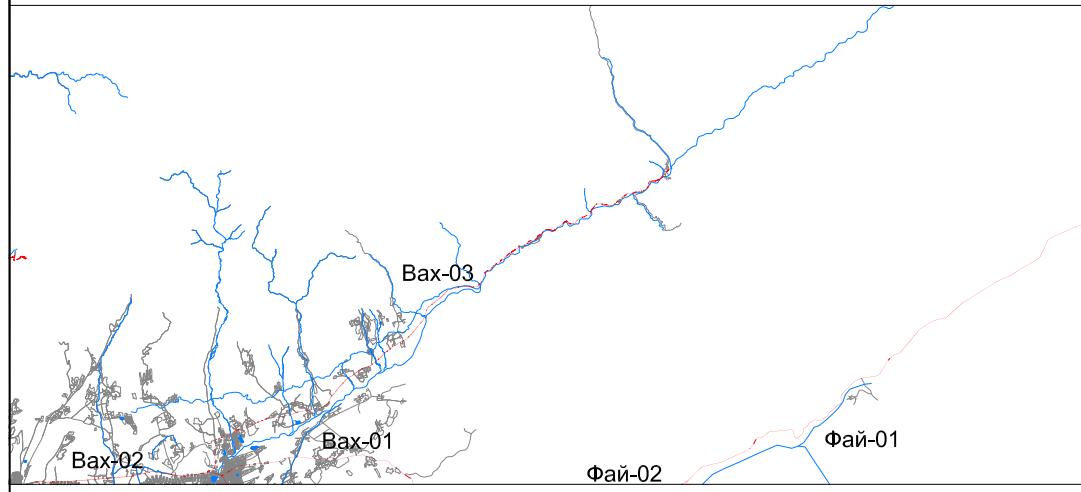
3

2

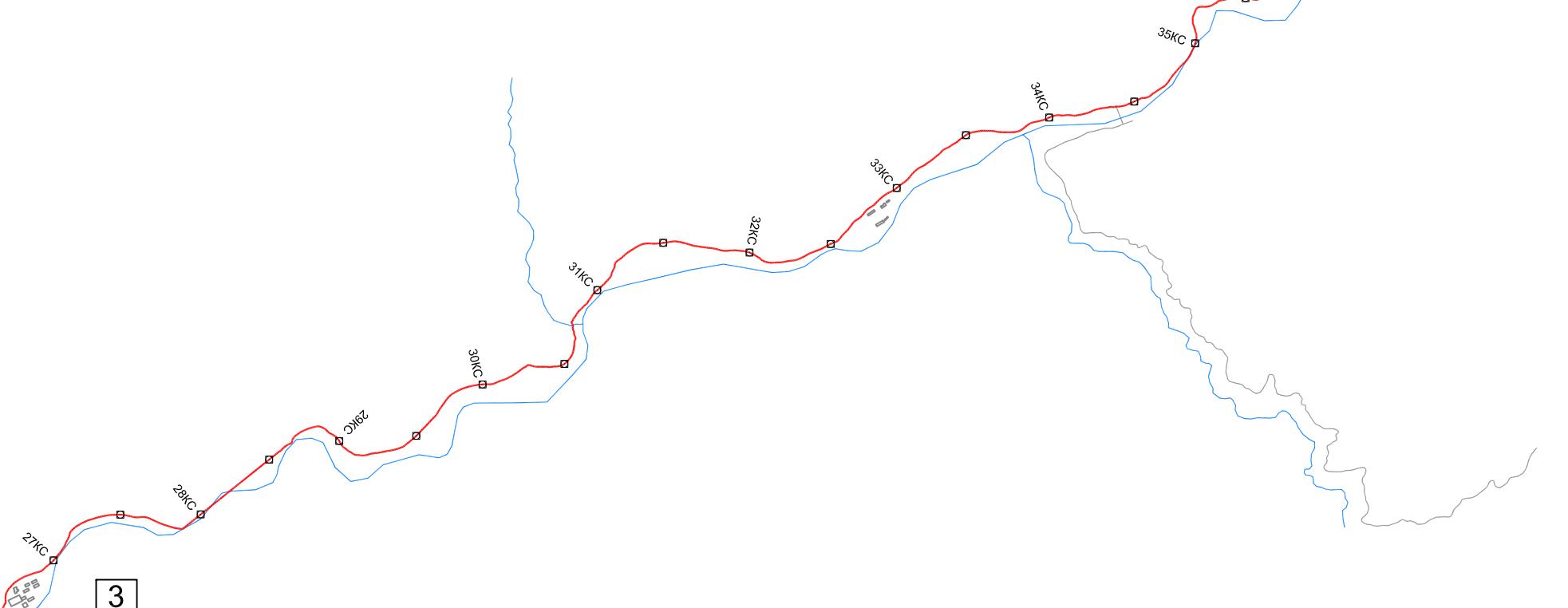
Начало Конец



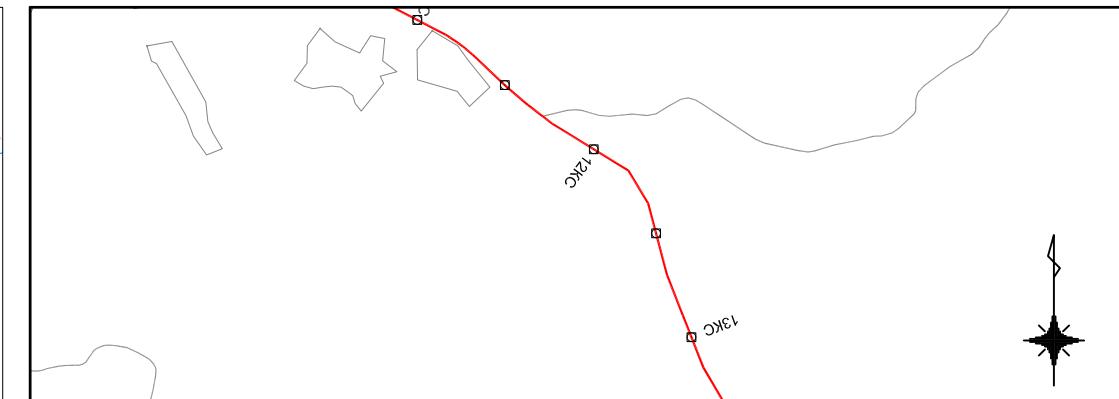
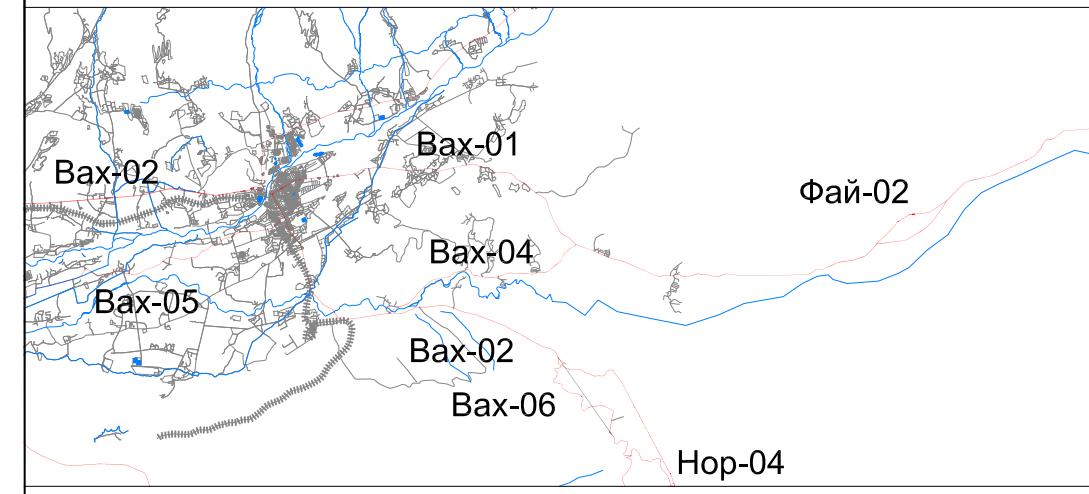
Вахдат-03(4)



Начало Конец

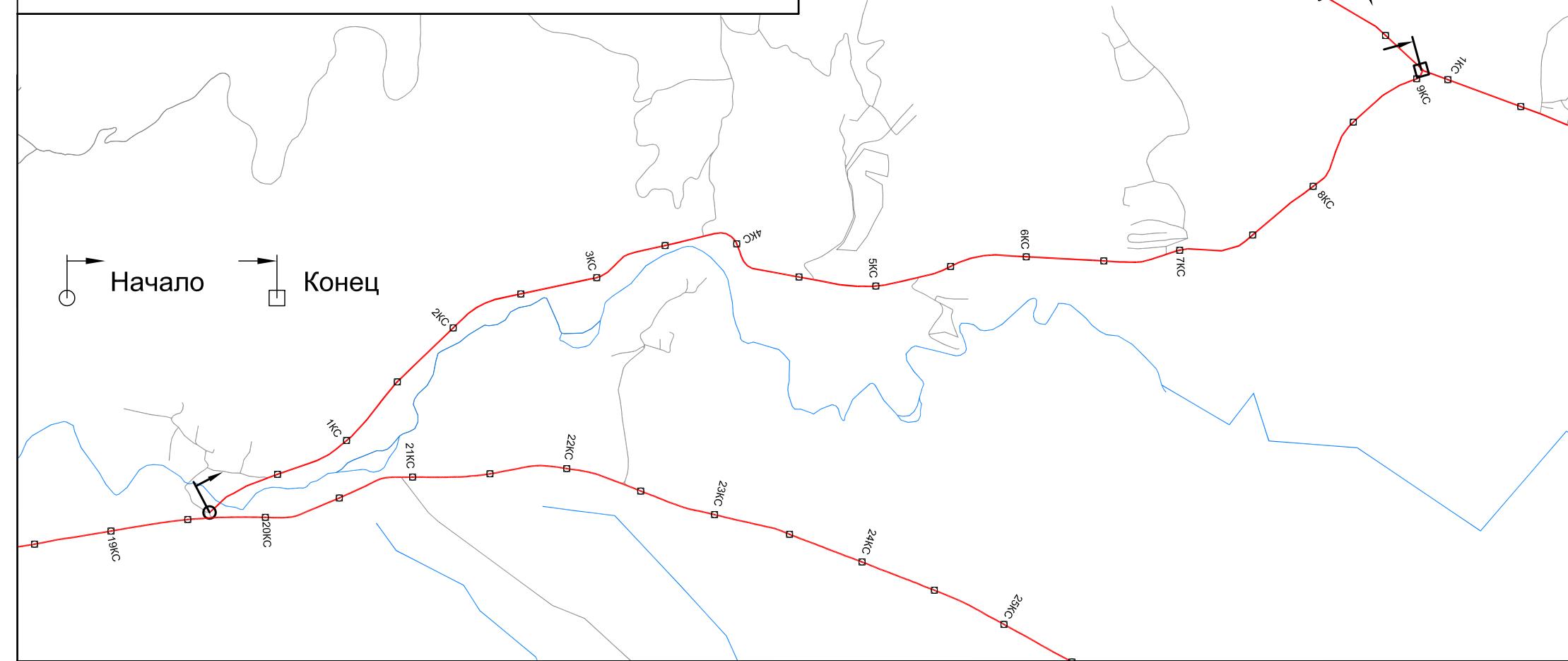


Вахдат-04

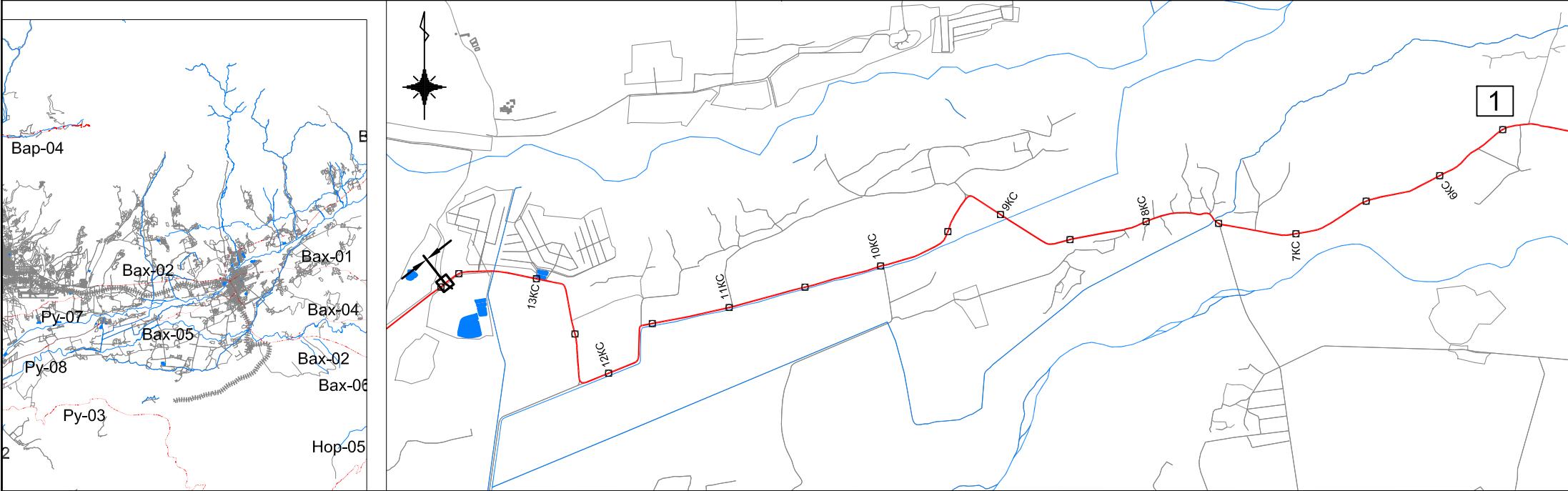
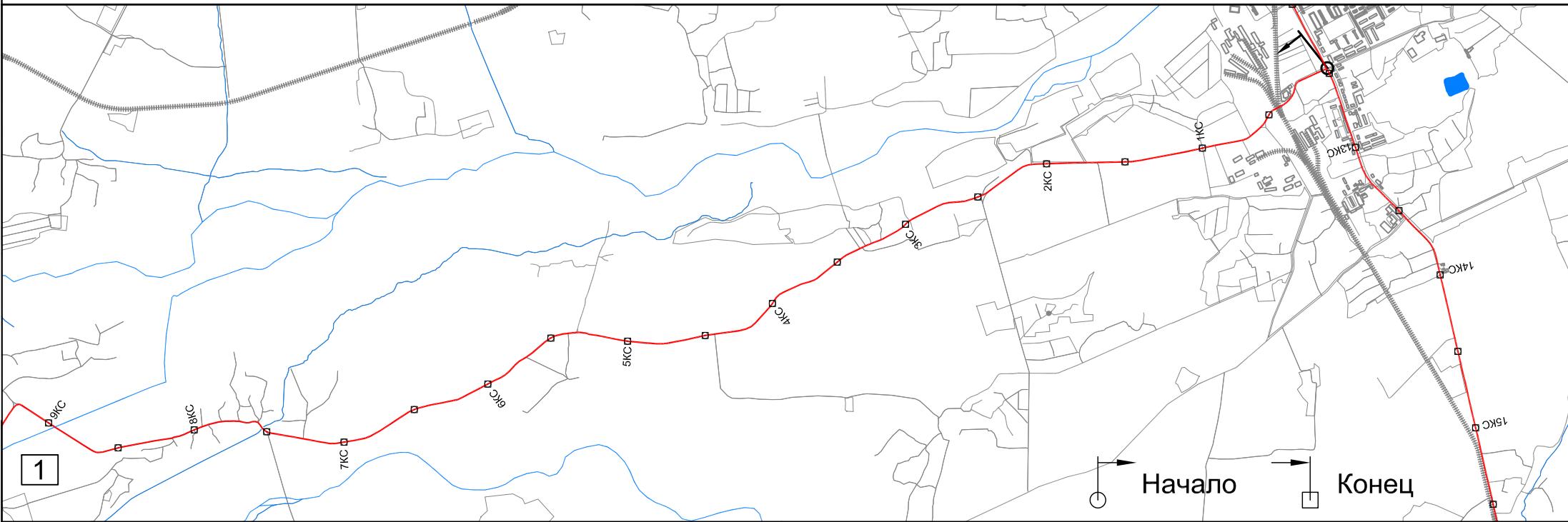


Начало

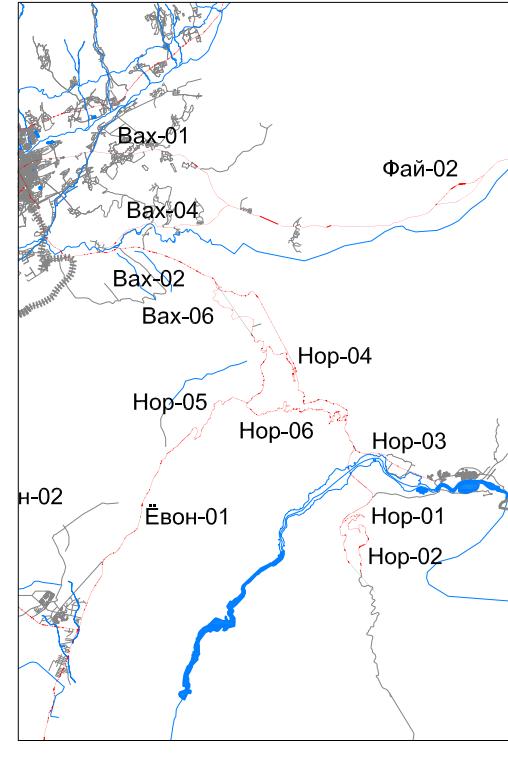
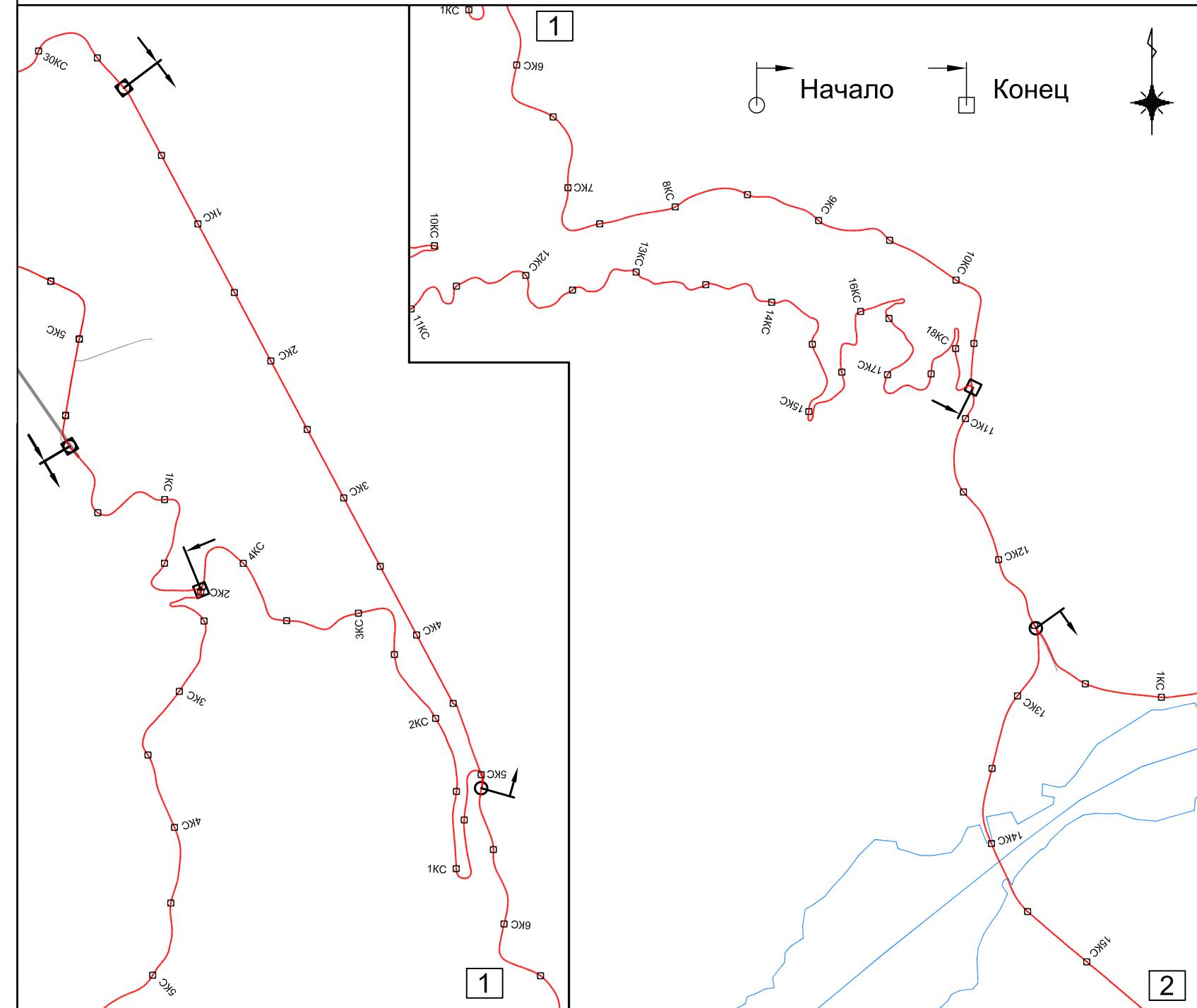
Конец



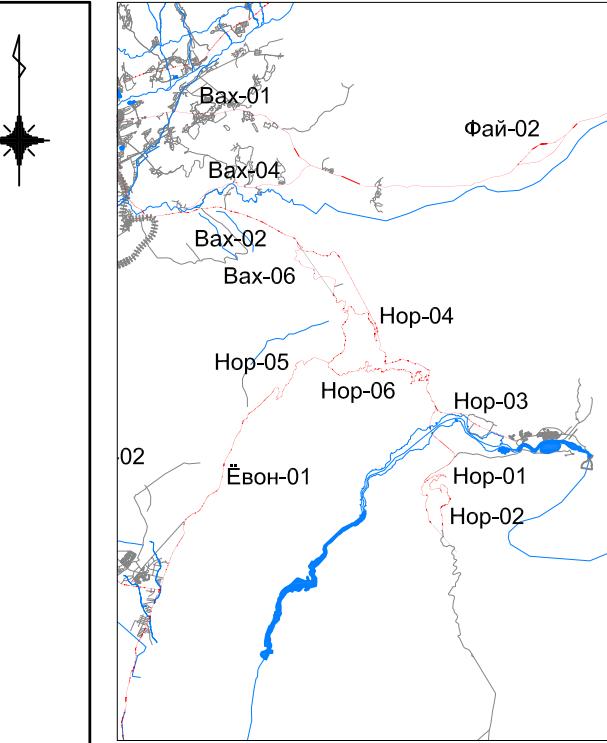
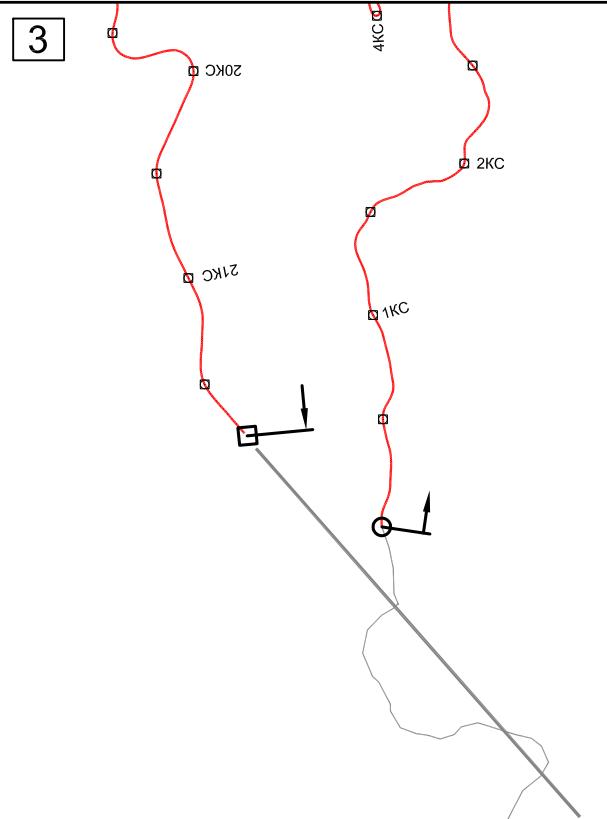
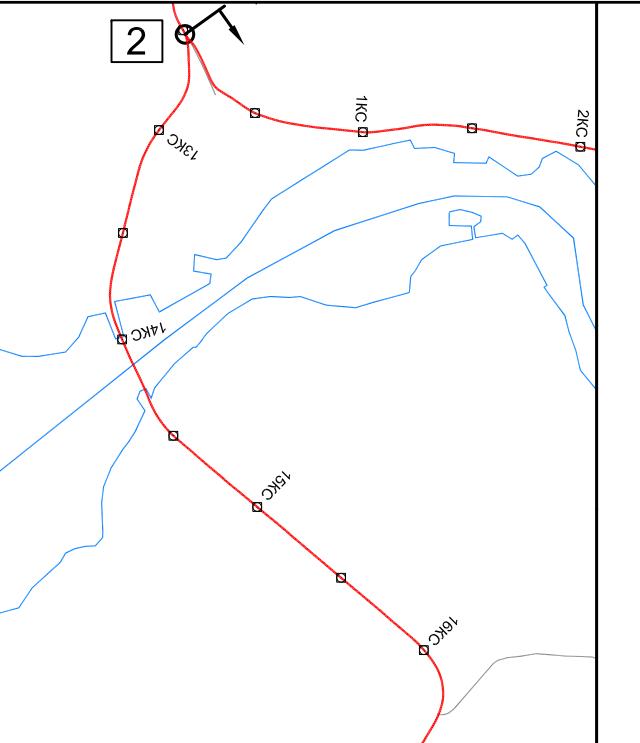
Вахдат-05



Норак-01(1)



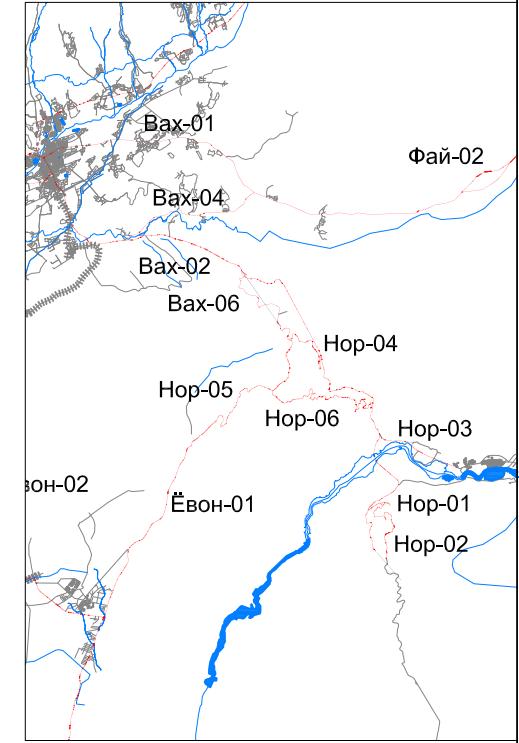
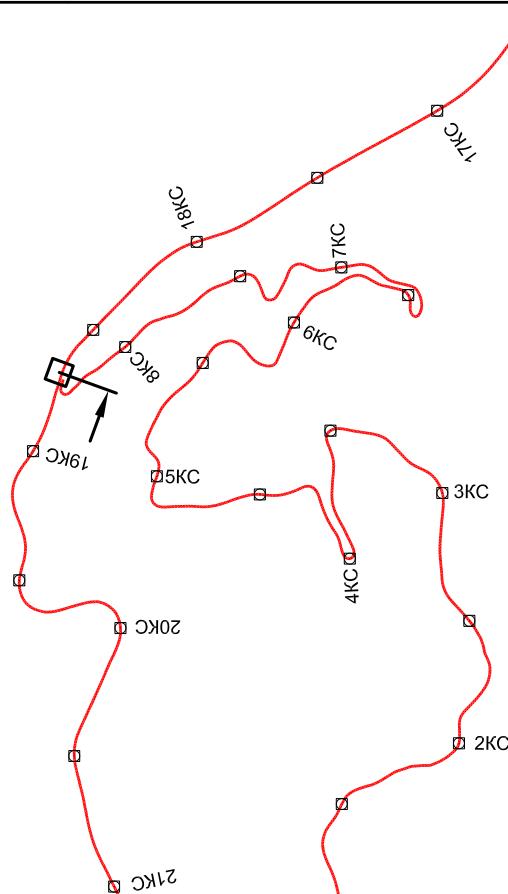
Норак-01(2)



Начало

A small icon representing the end of a section, consisting of a vertical line with a square at the bottom and a diagonal line extending from the top-left corner of the square.

Норак-02

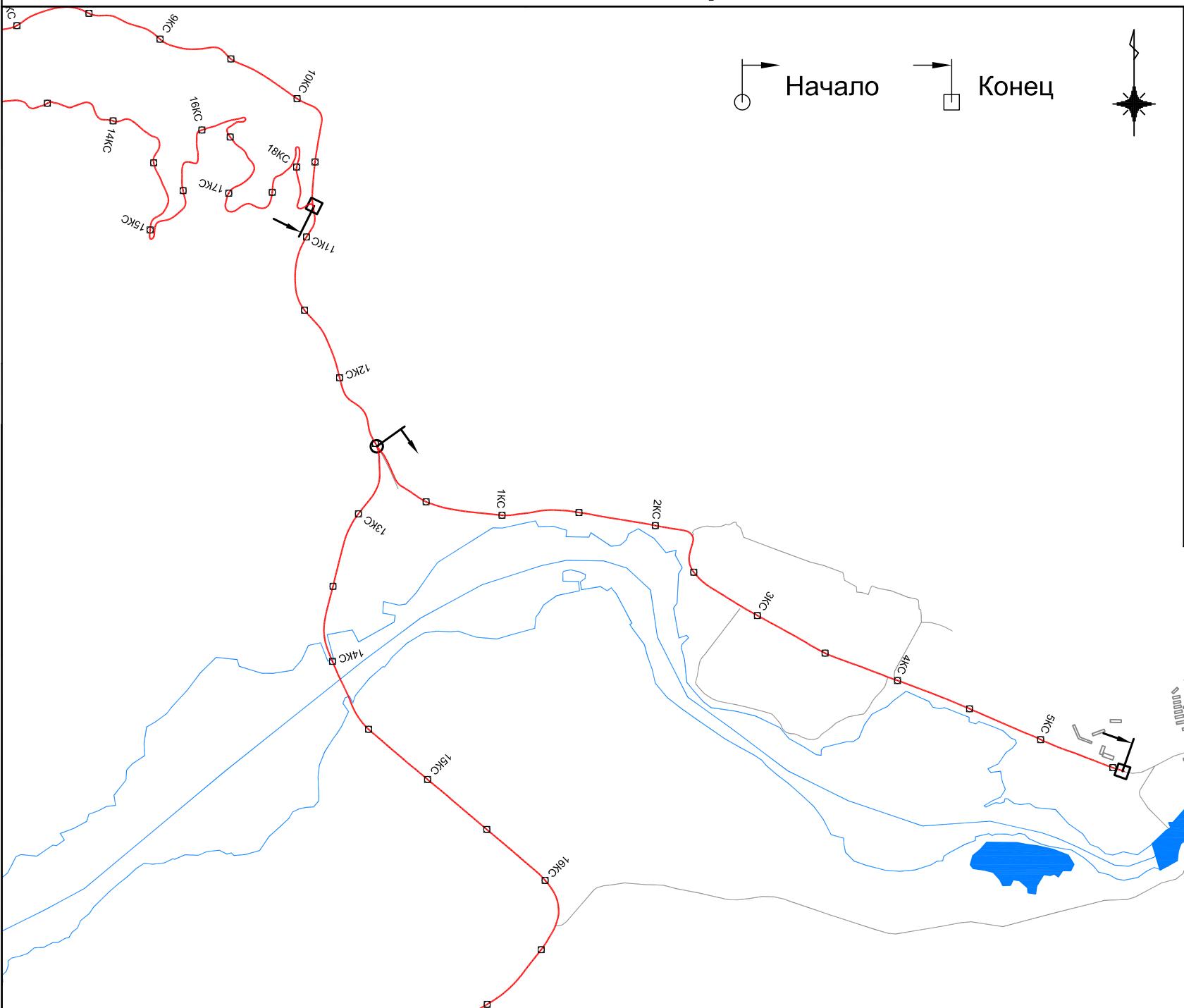
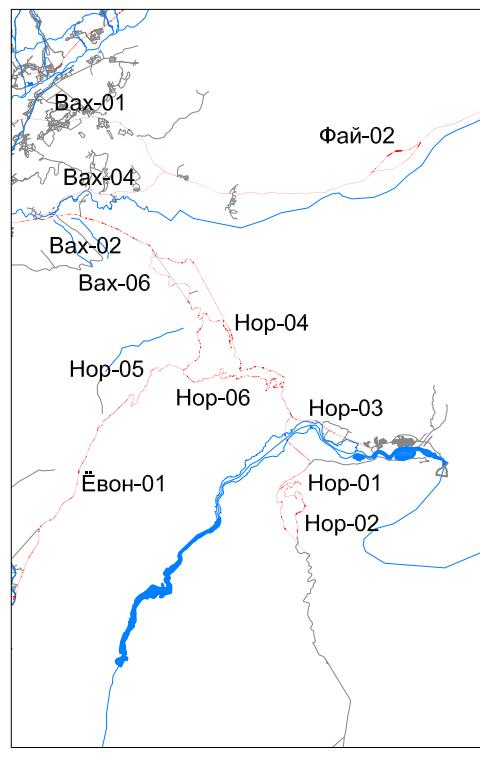


Начало Конец

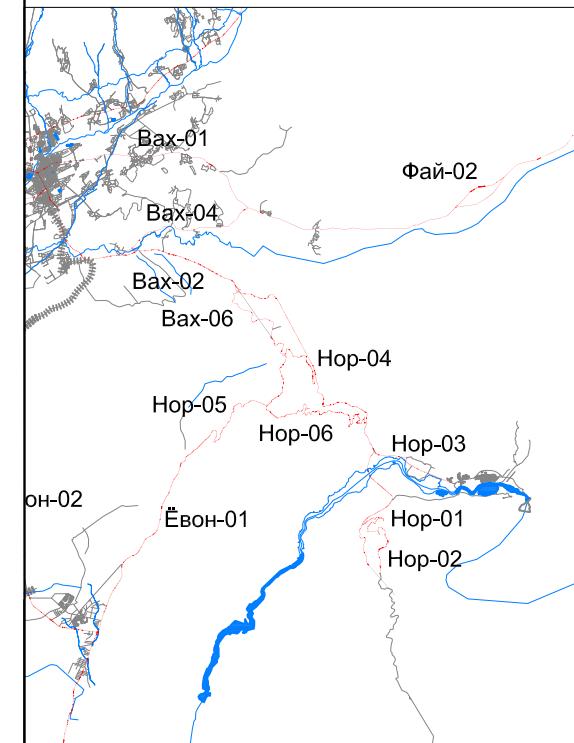
Норак-03

Начало

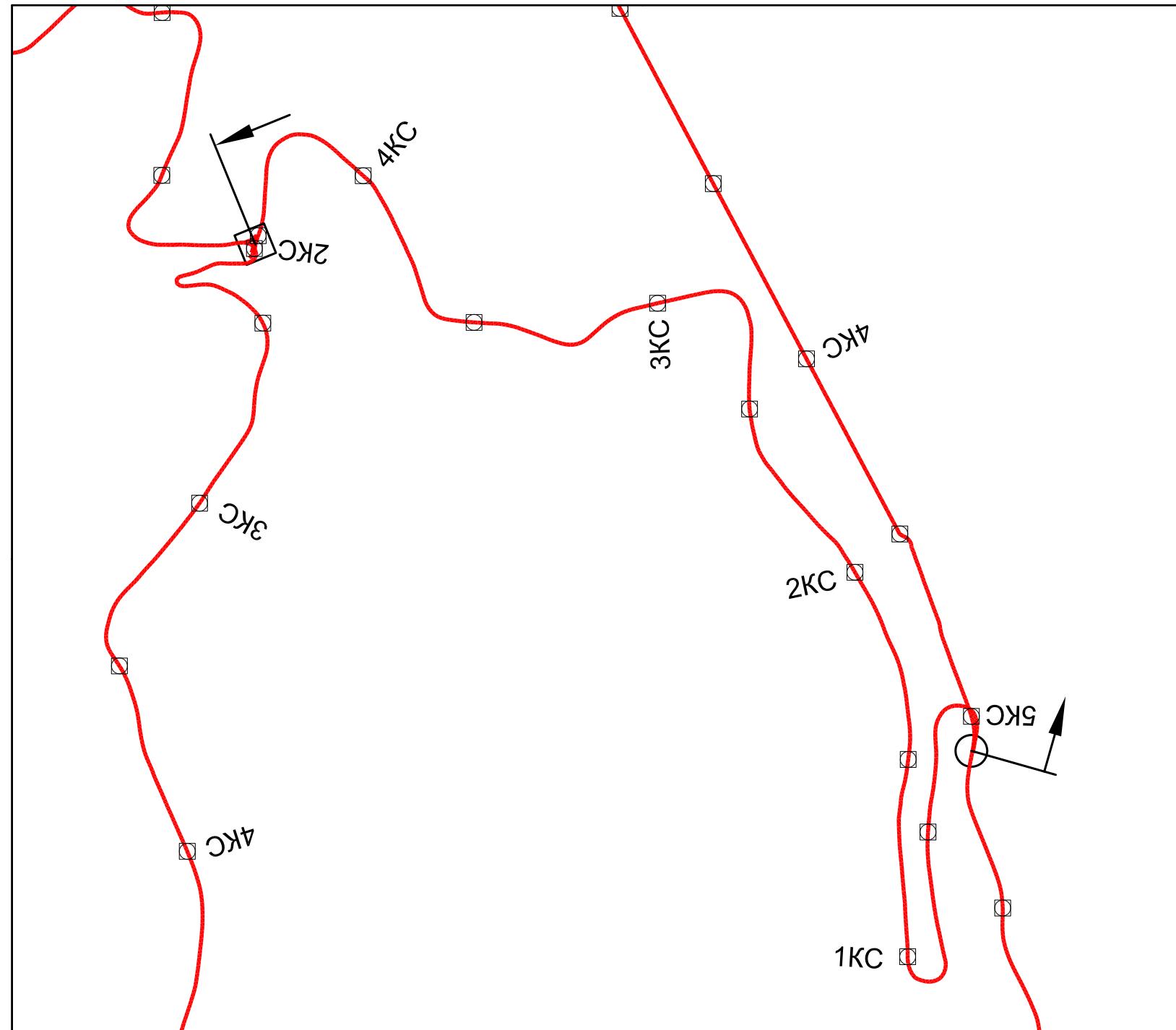
Конец



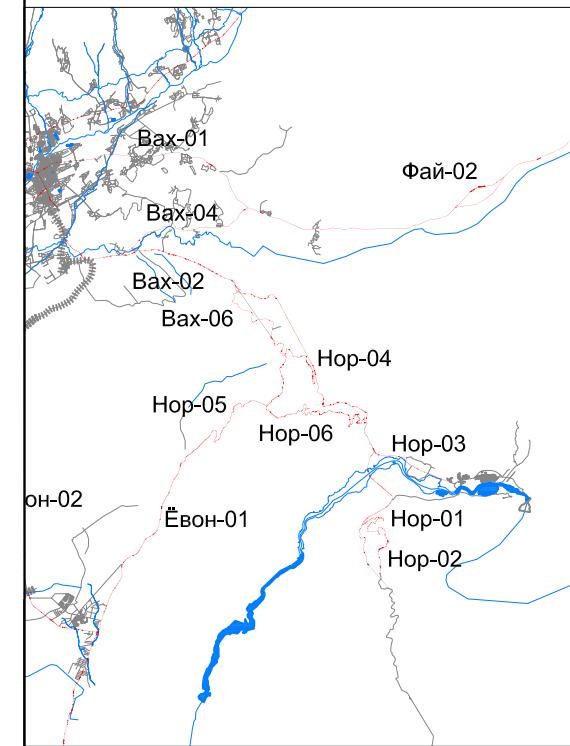
Норак-04



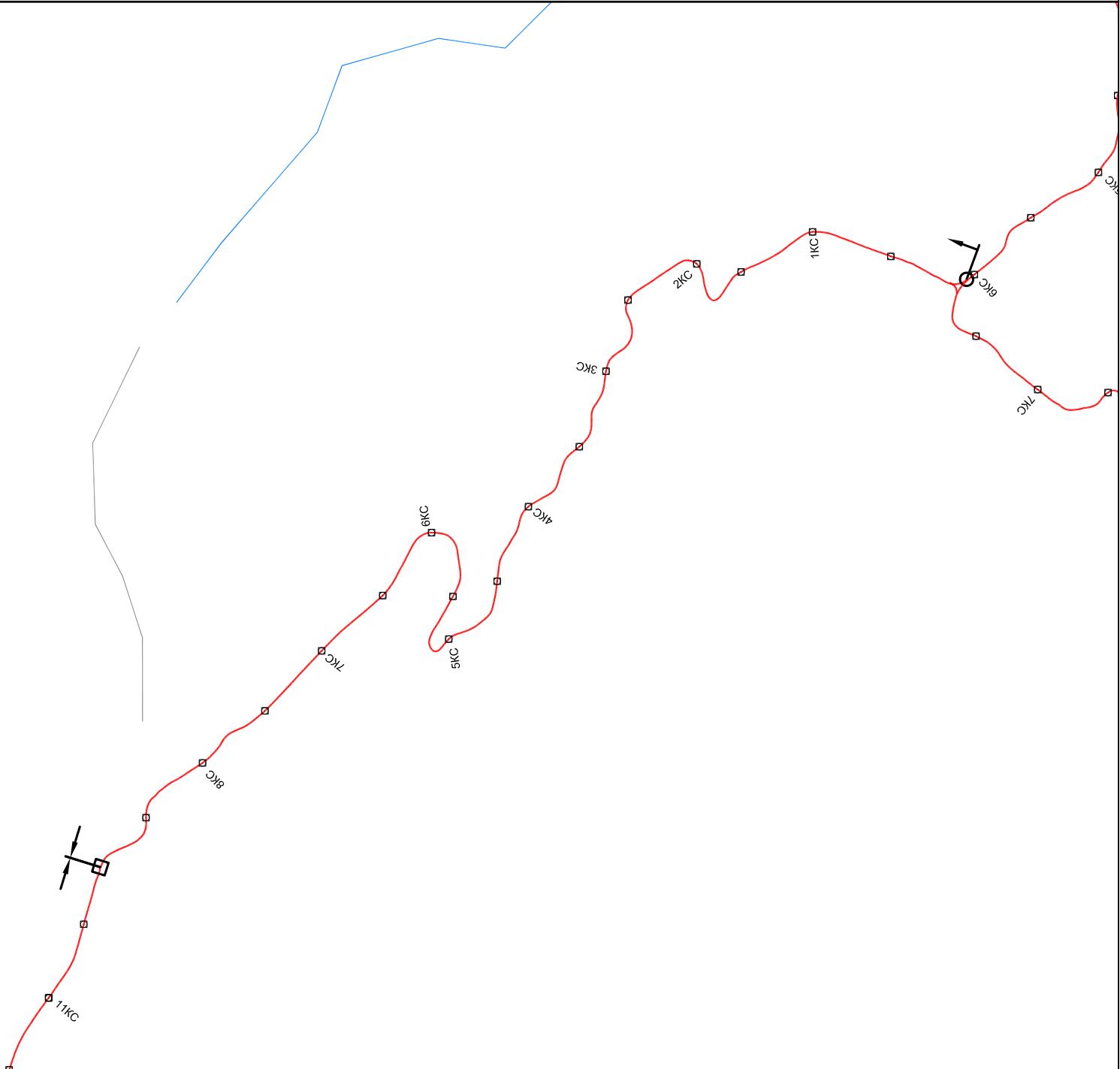
Начало Конец



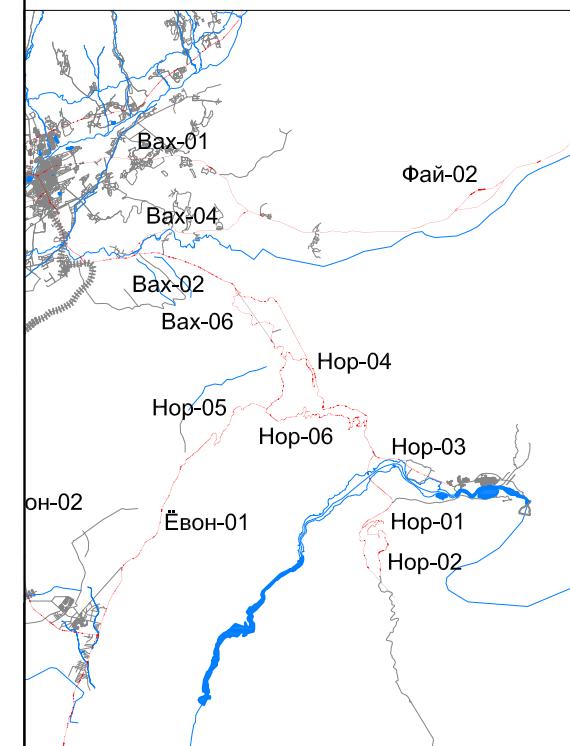
Норак-05



Начало Конец

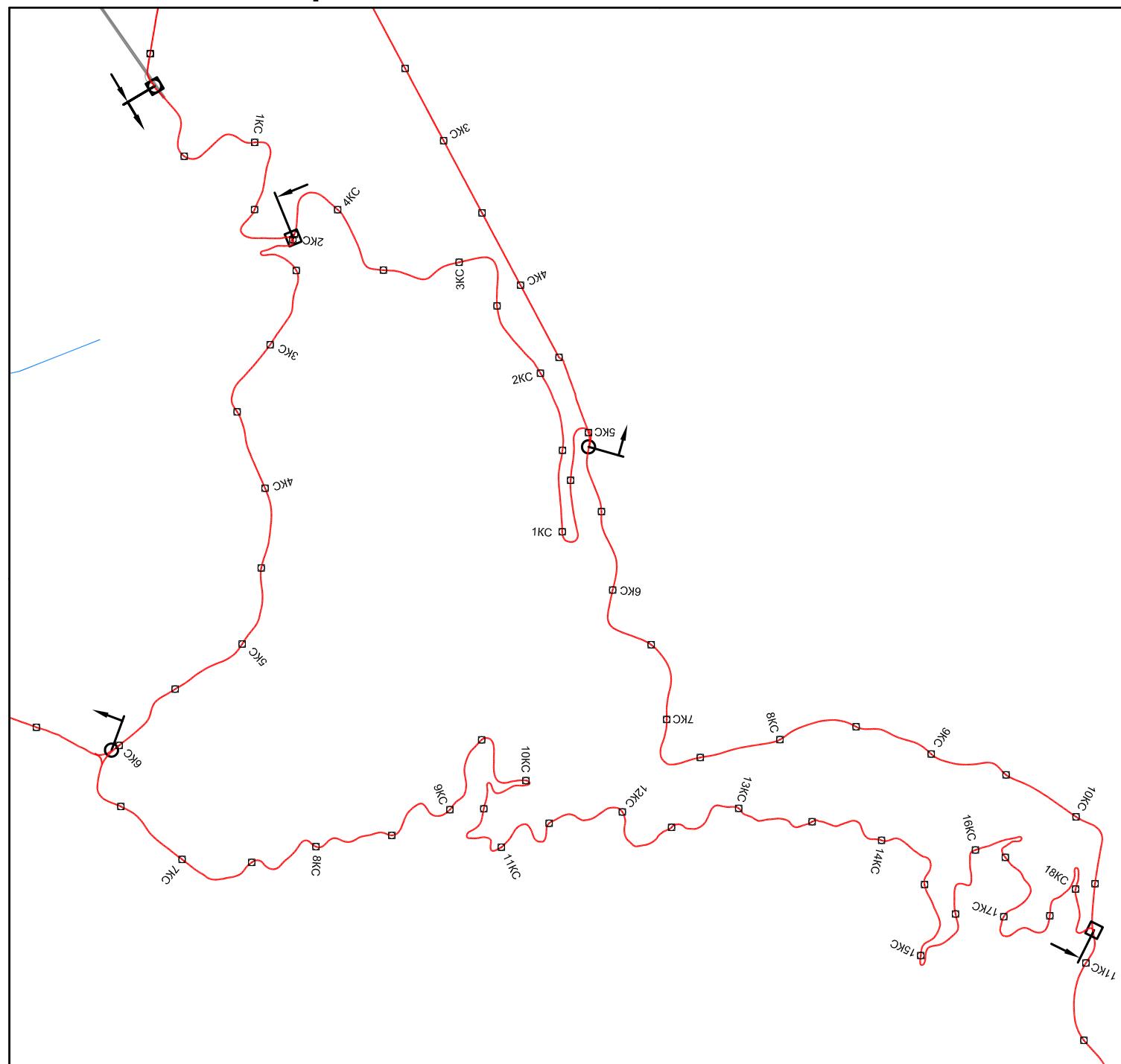


Нопак-05, 06

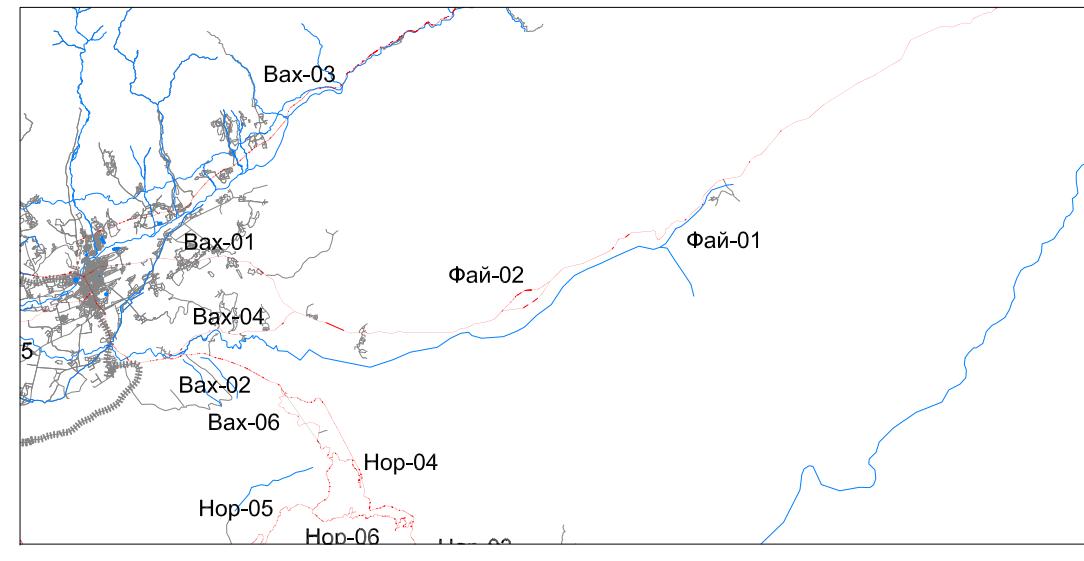
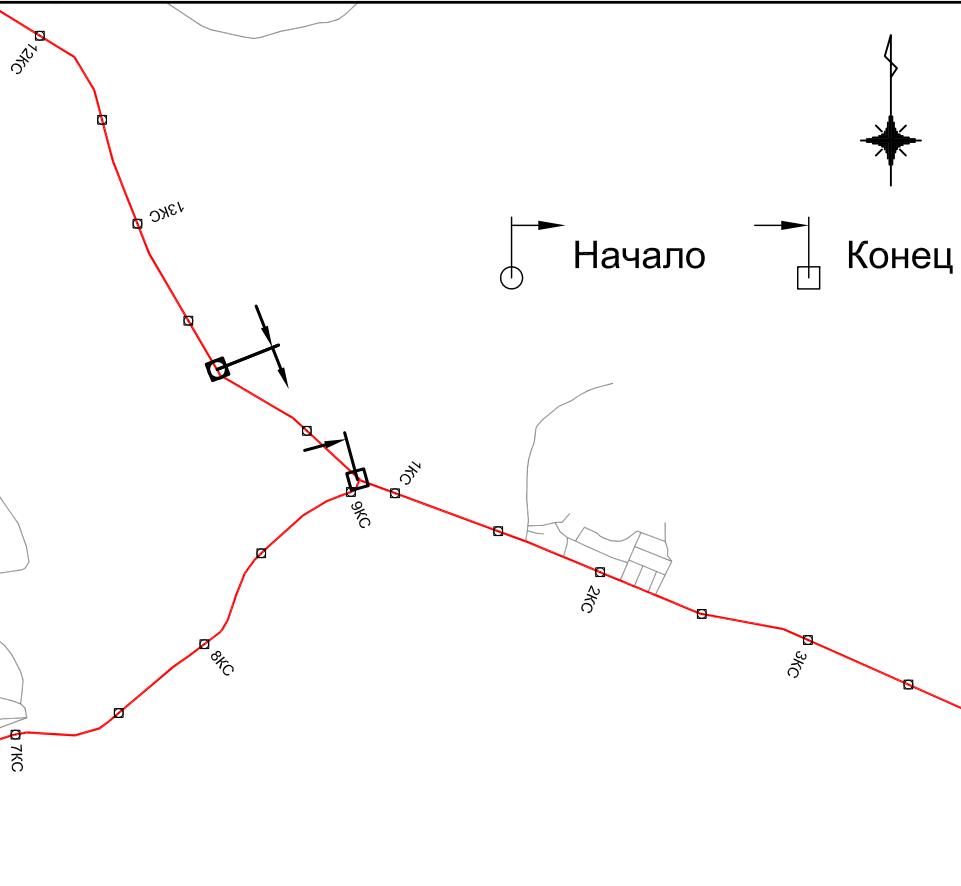


Начало

Конец

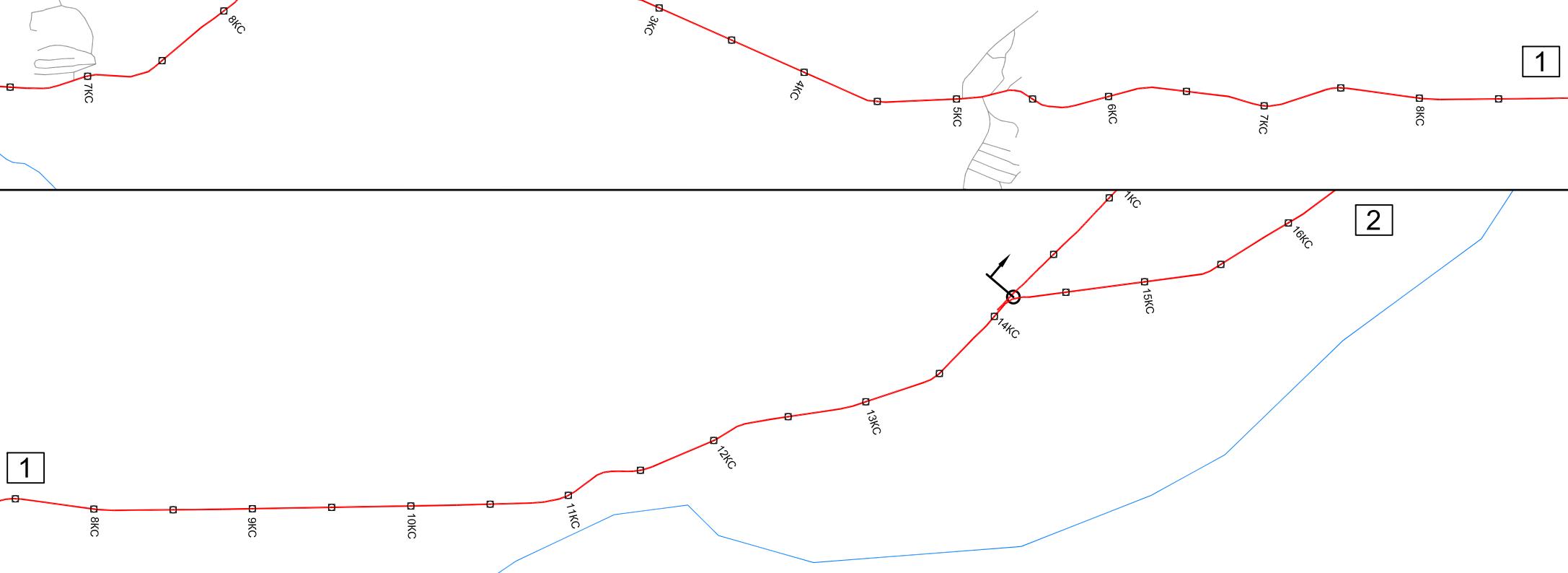


Файзобод-01(1)



1

2



1

Файзобод-01(2)

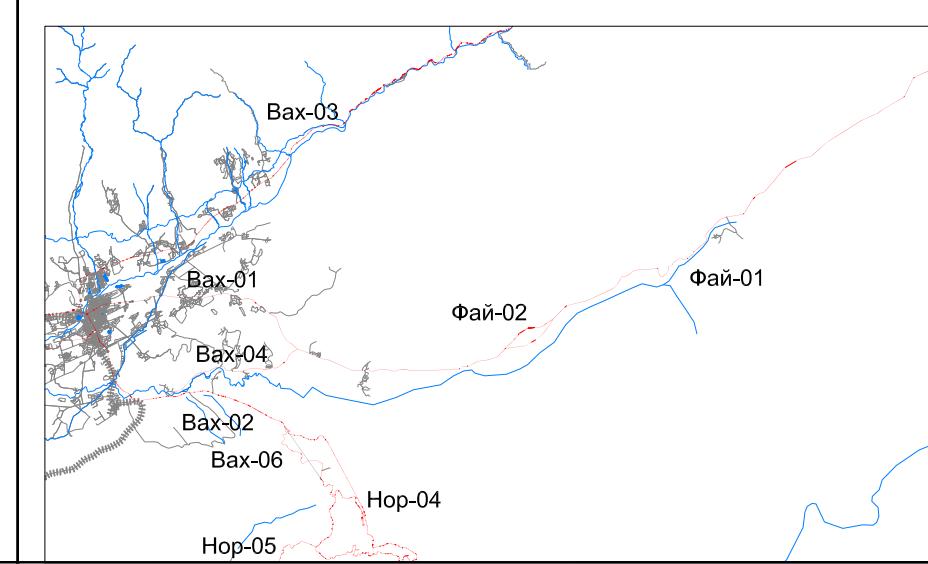
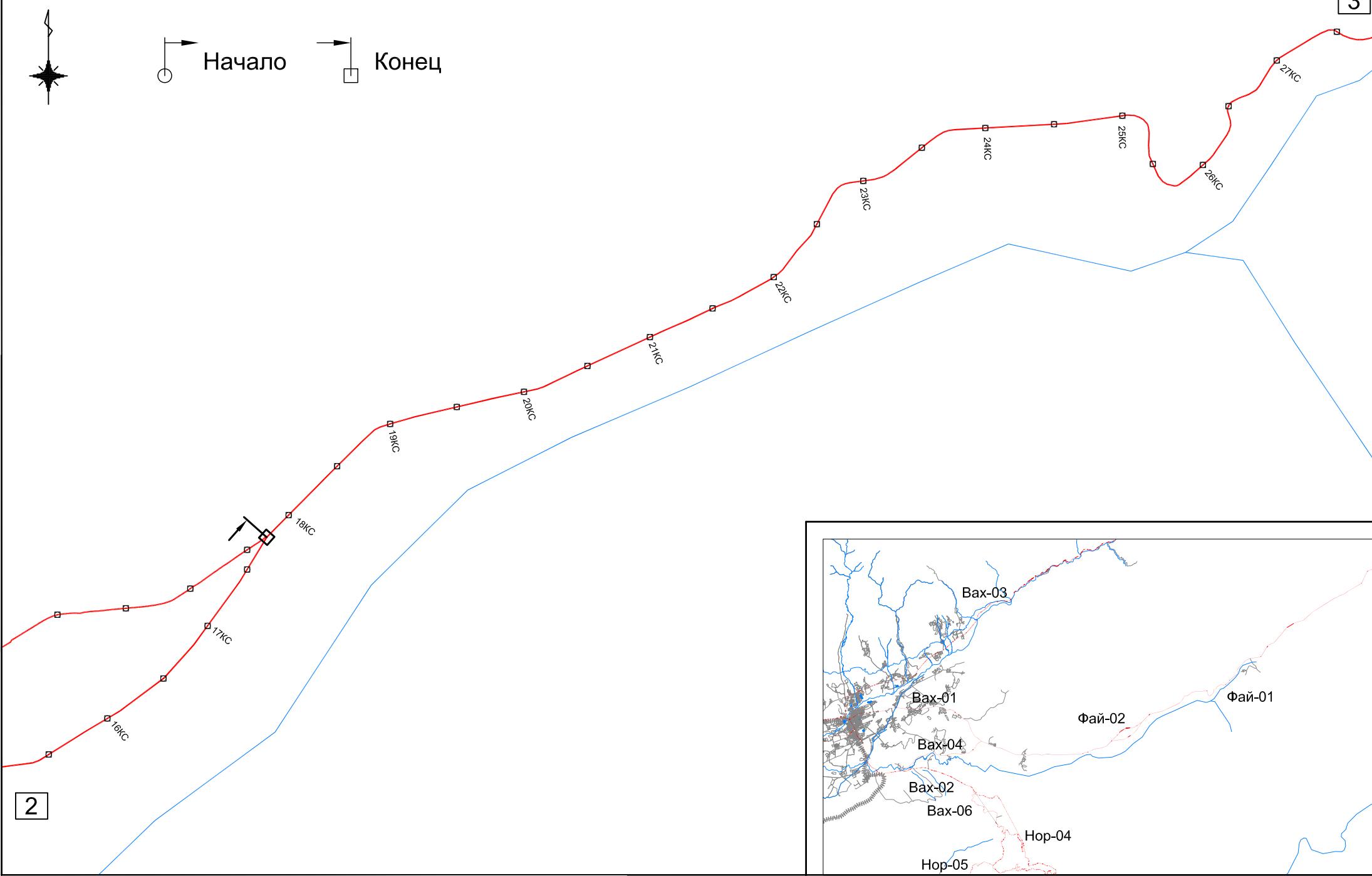
3



Начало

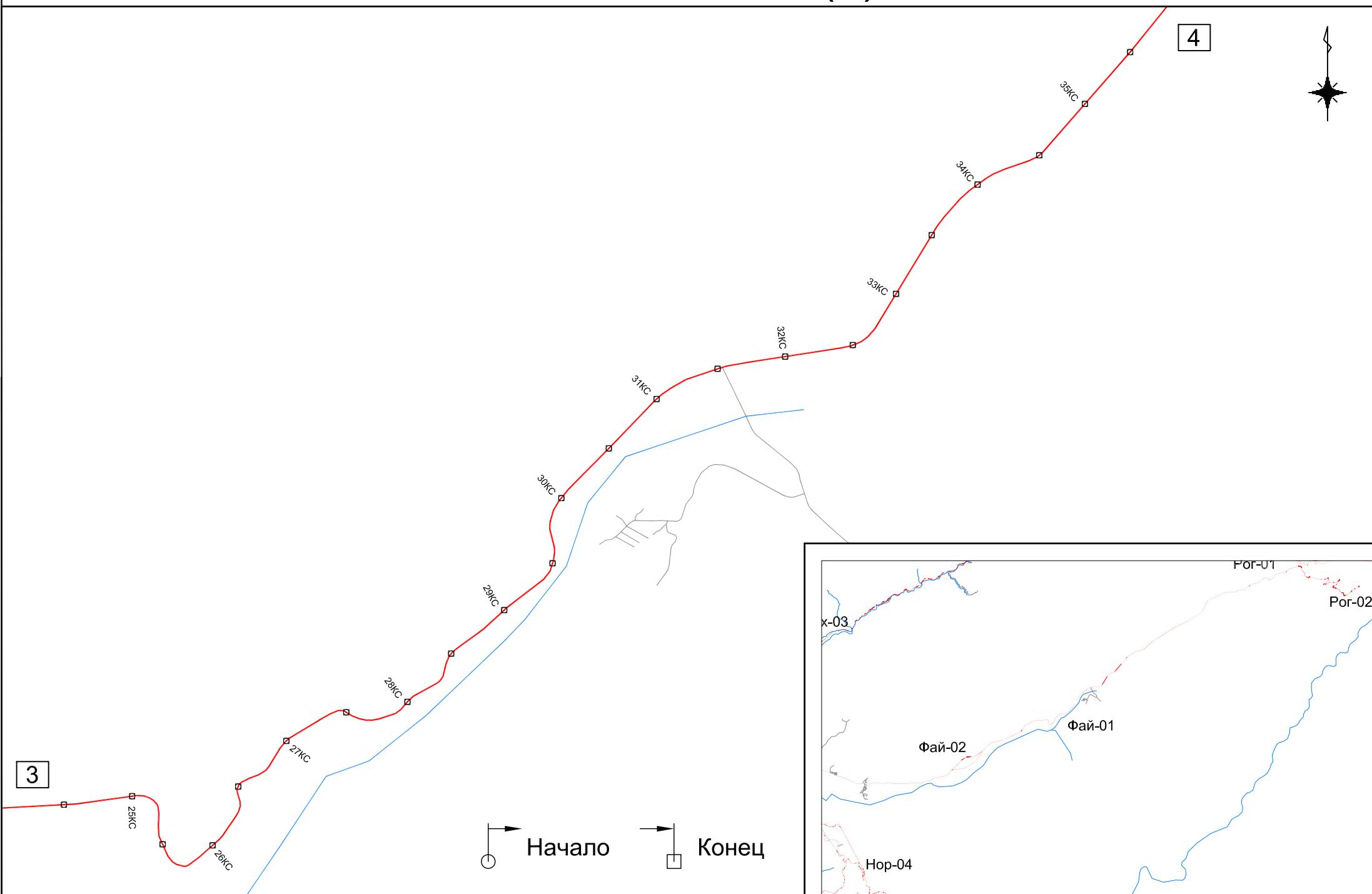


Конец

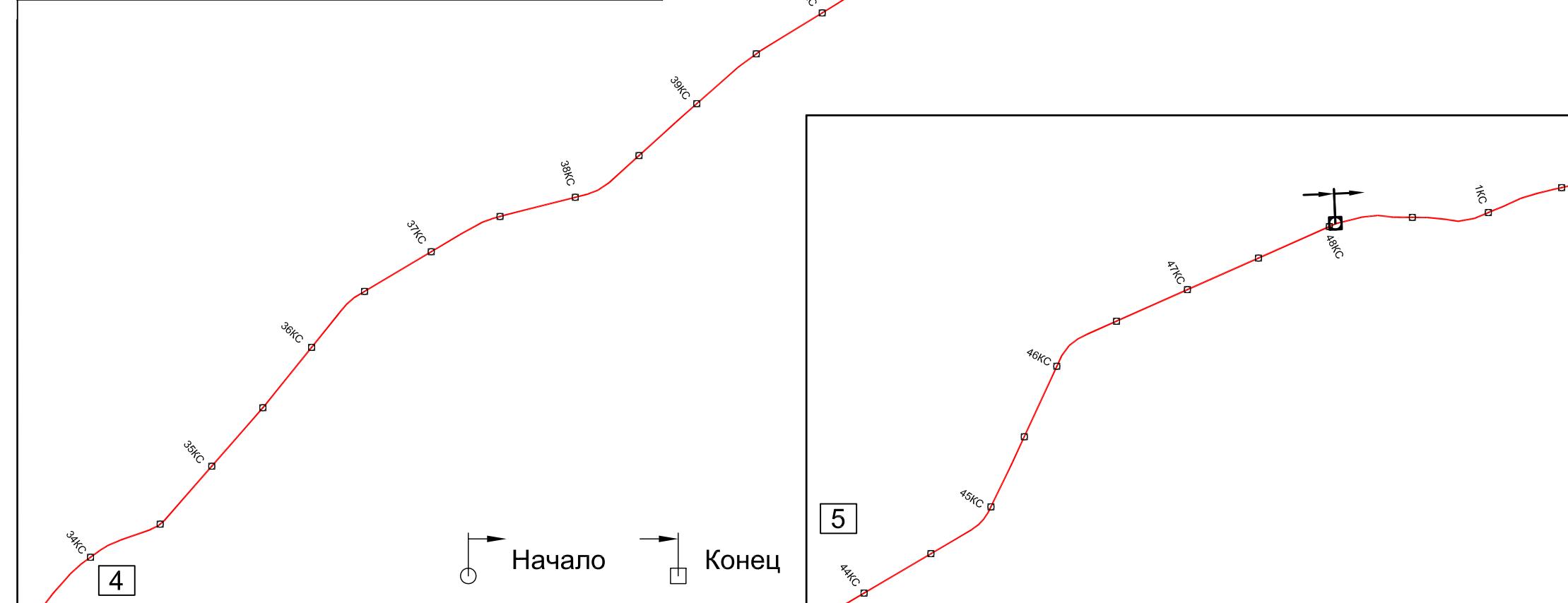
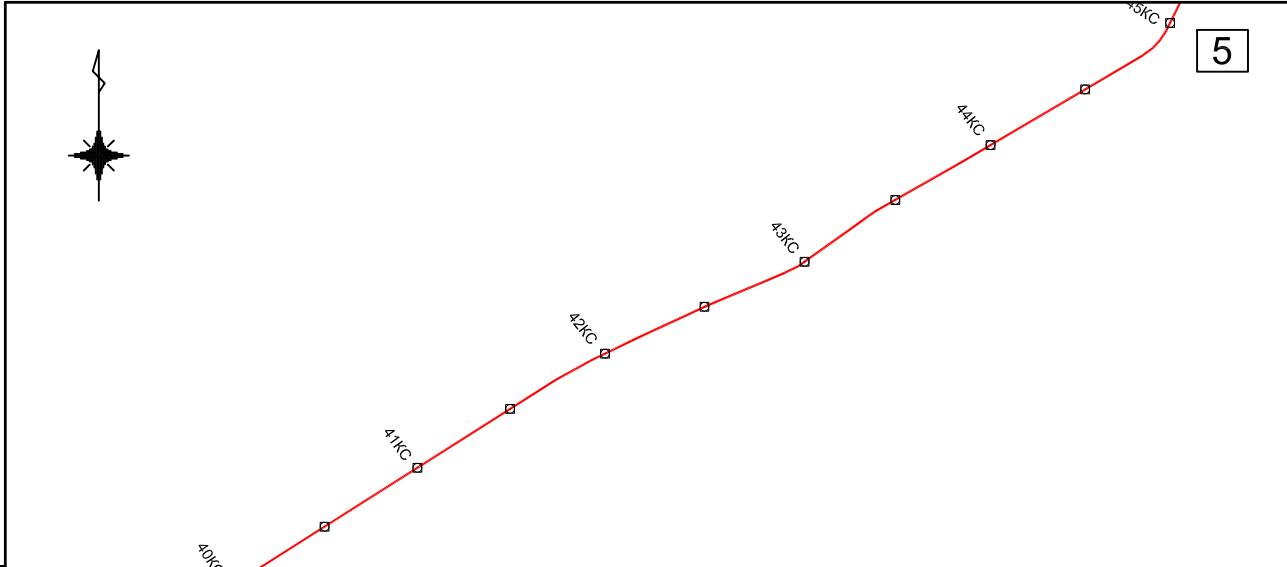
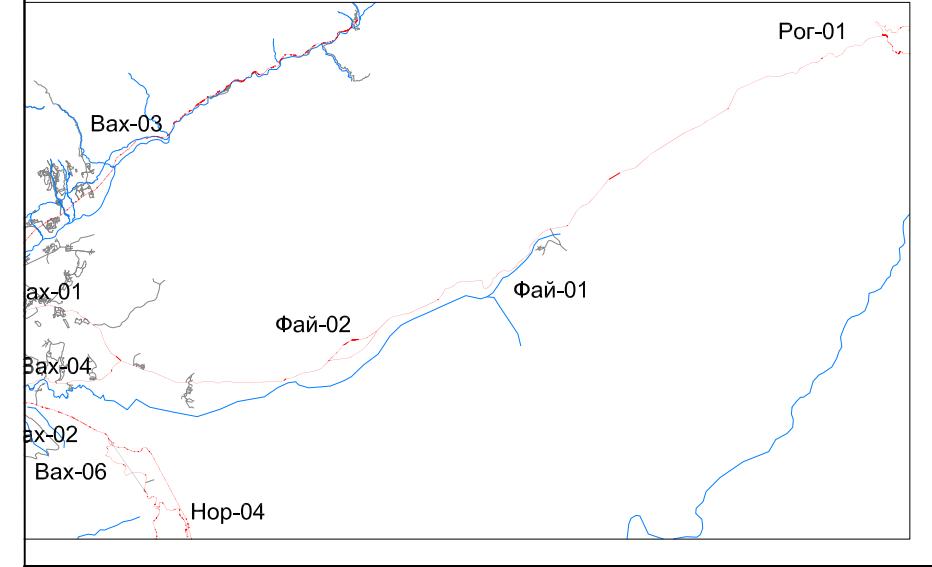


Файзобод-01(3)

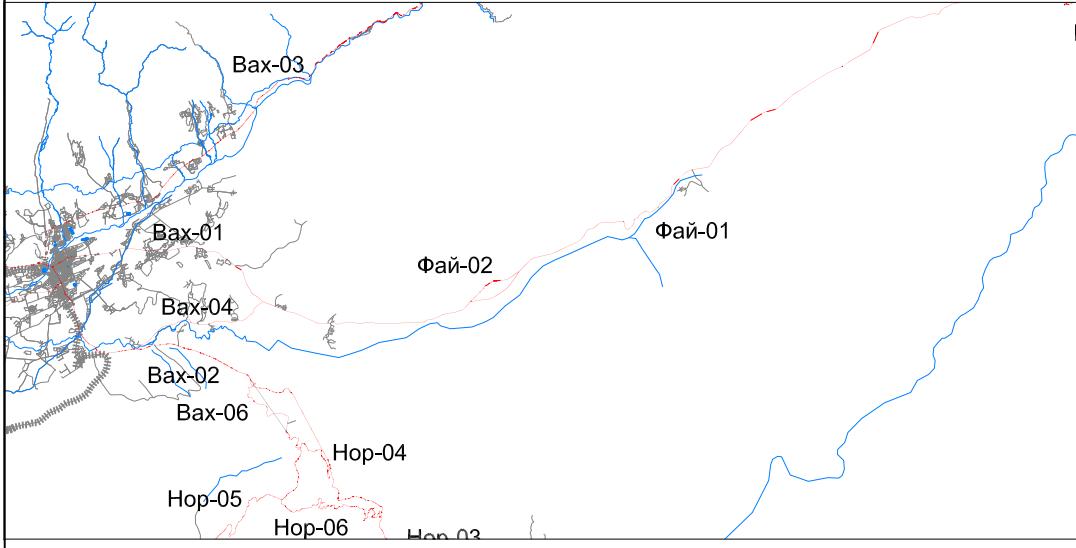
4



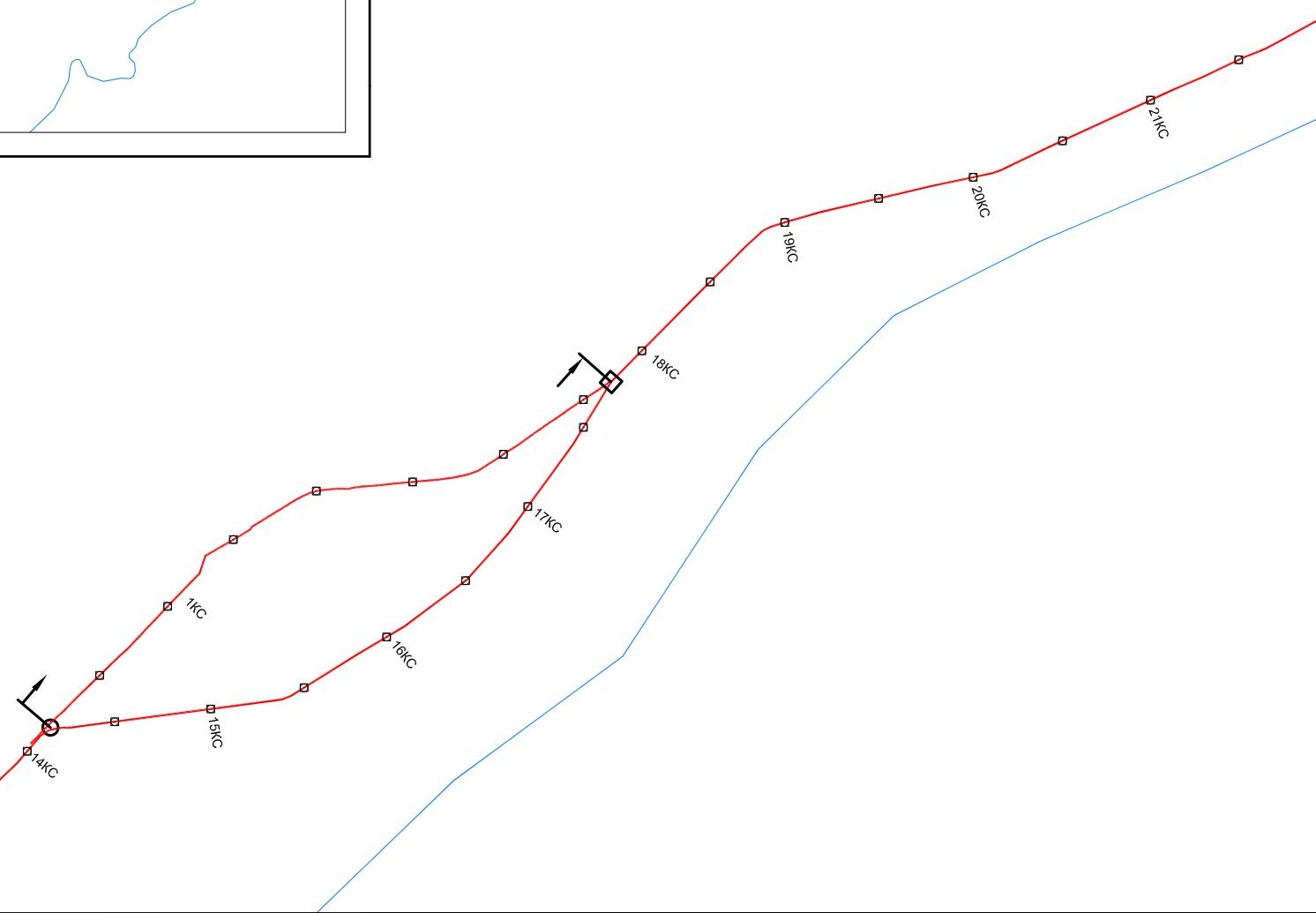
Файзобод-01(4)



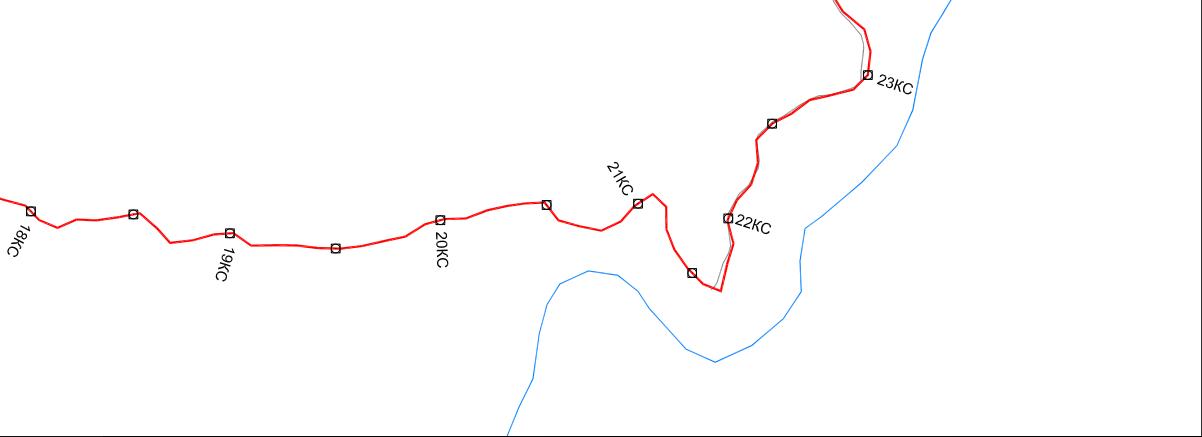
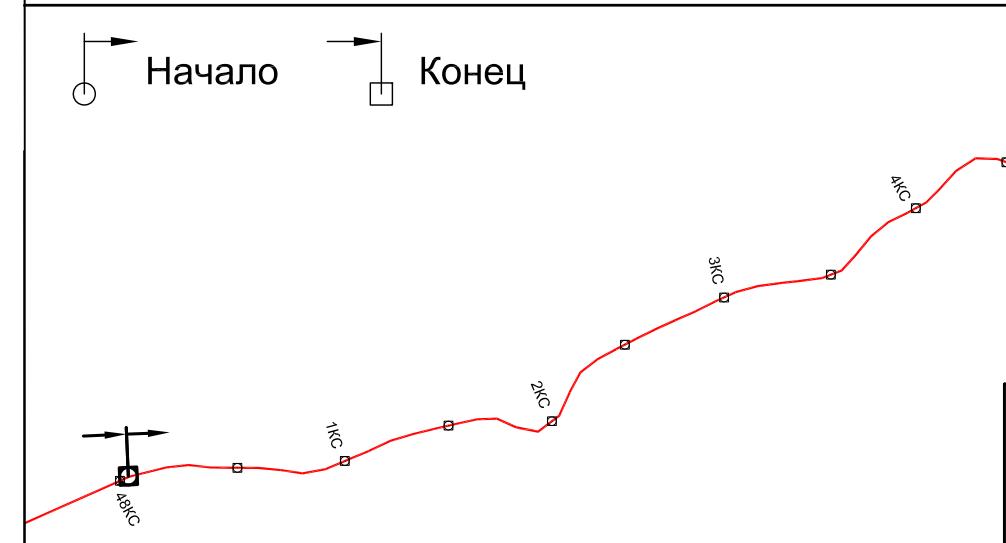
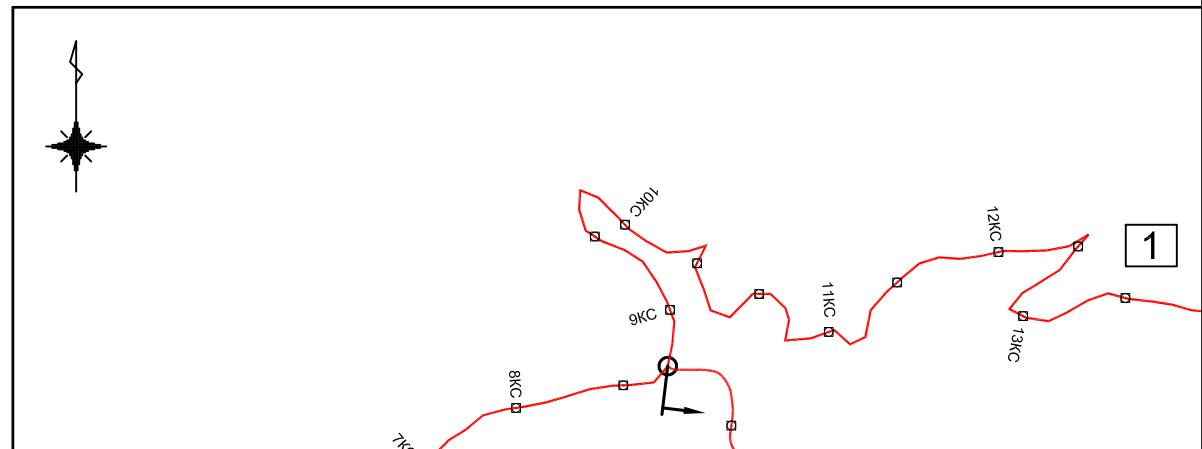
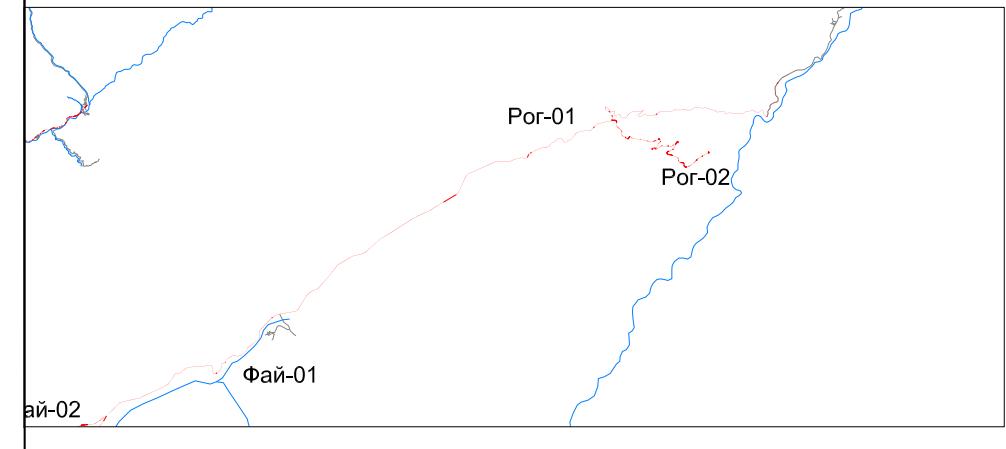
Файзобод-02 (1), (2)



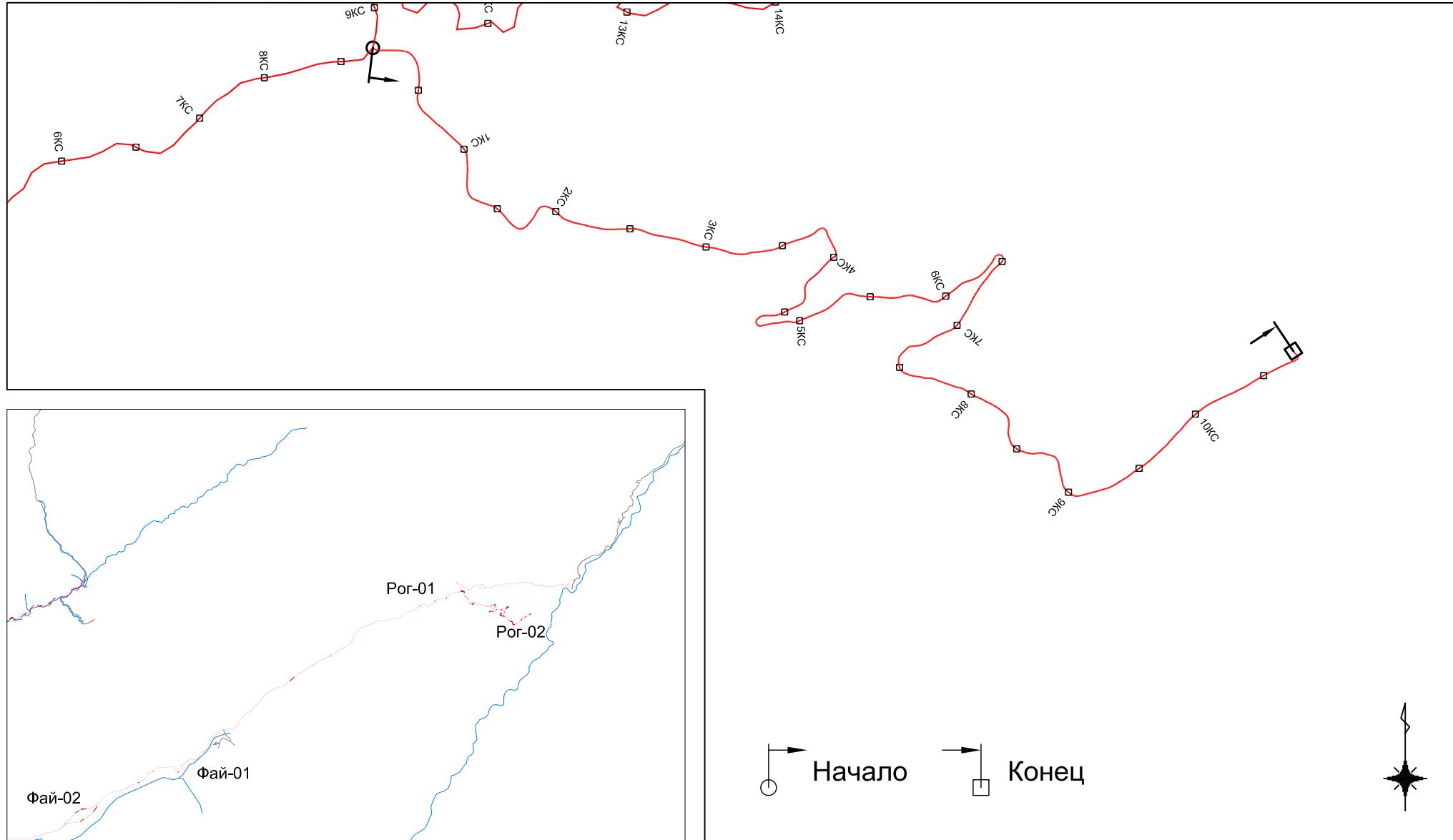
Начало Конец



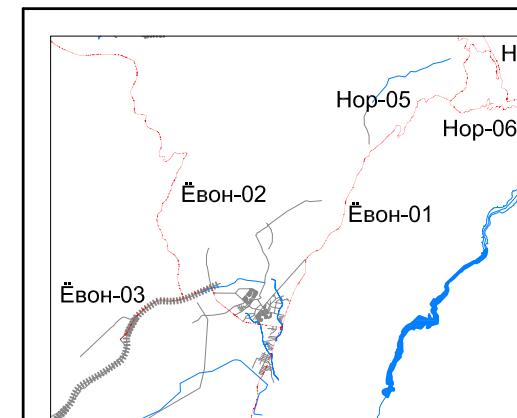
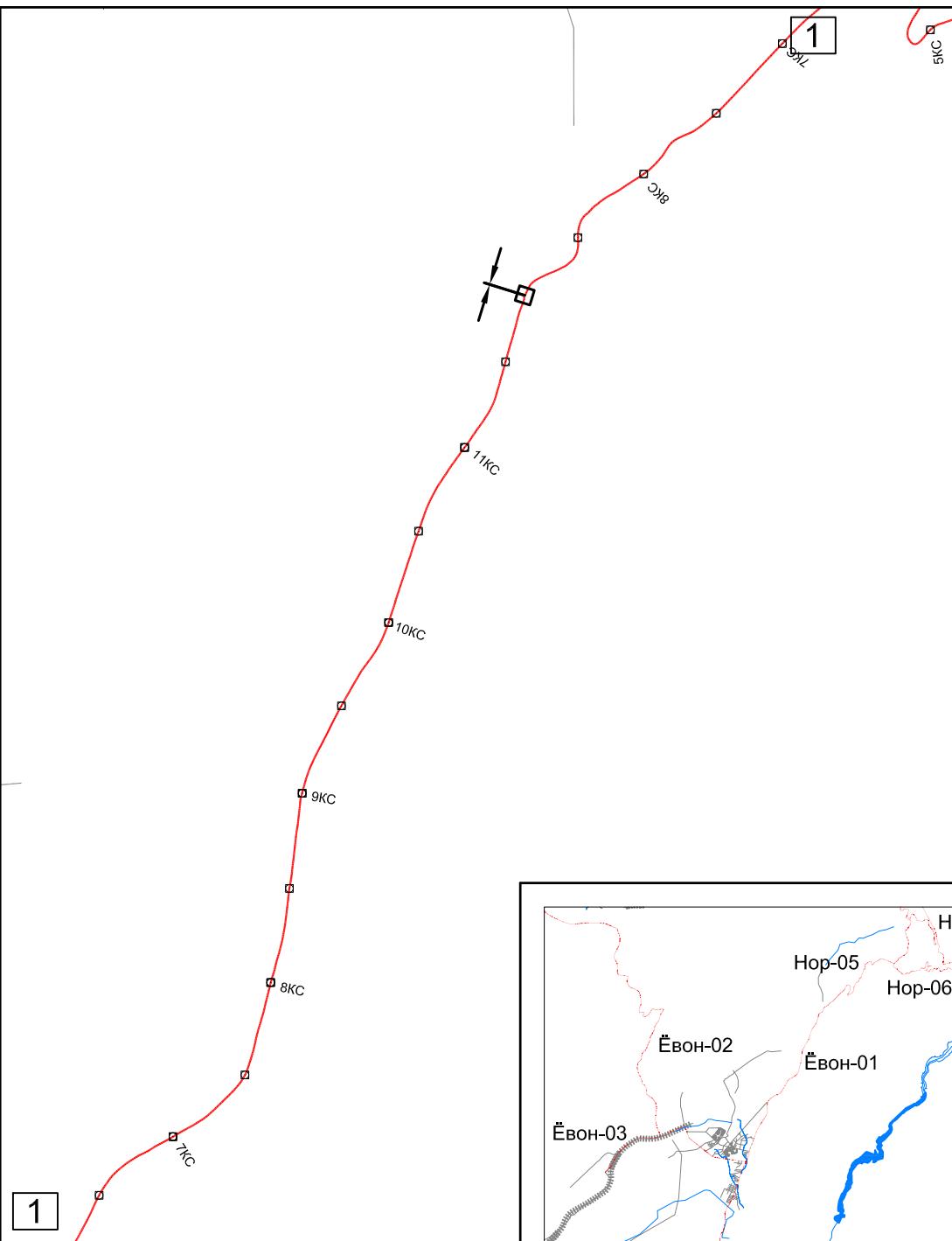
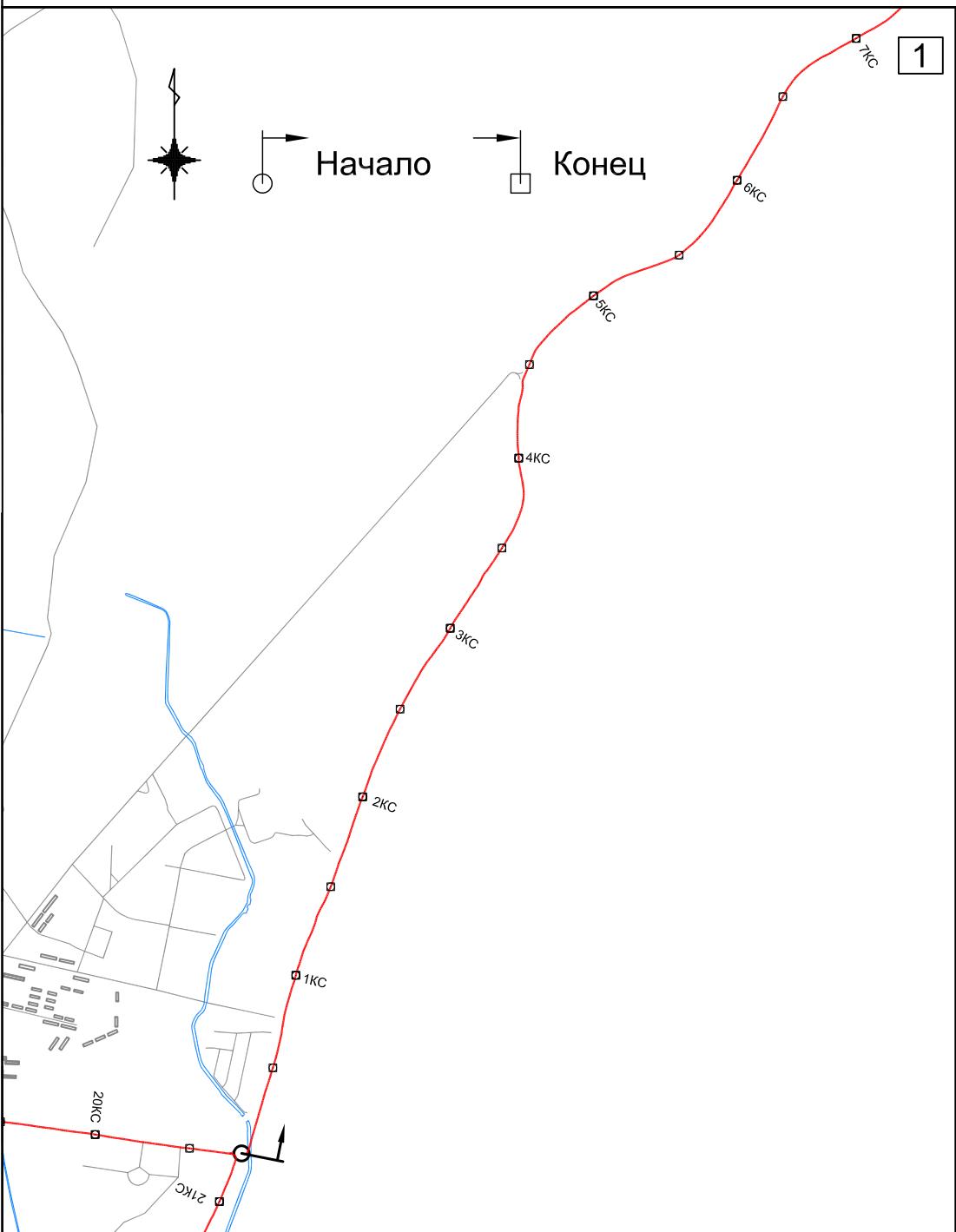
Рогун-01



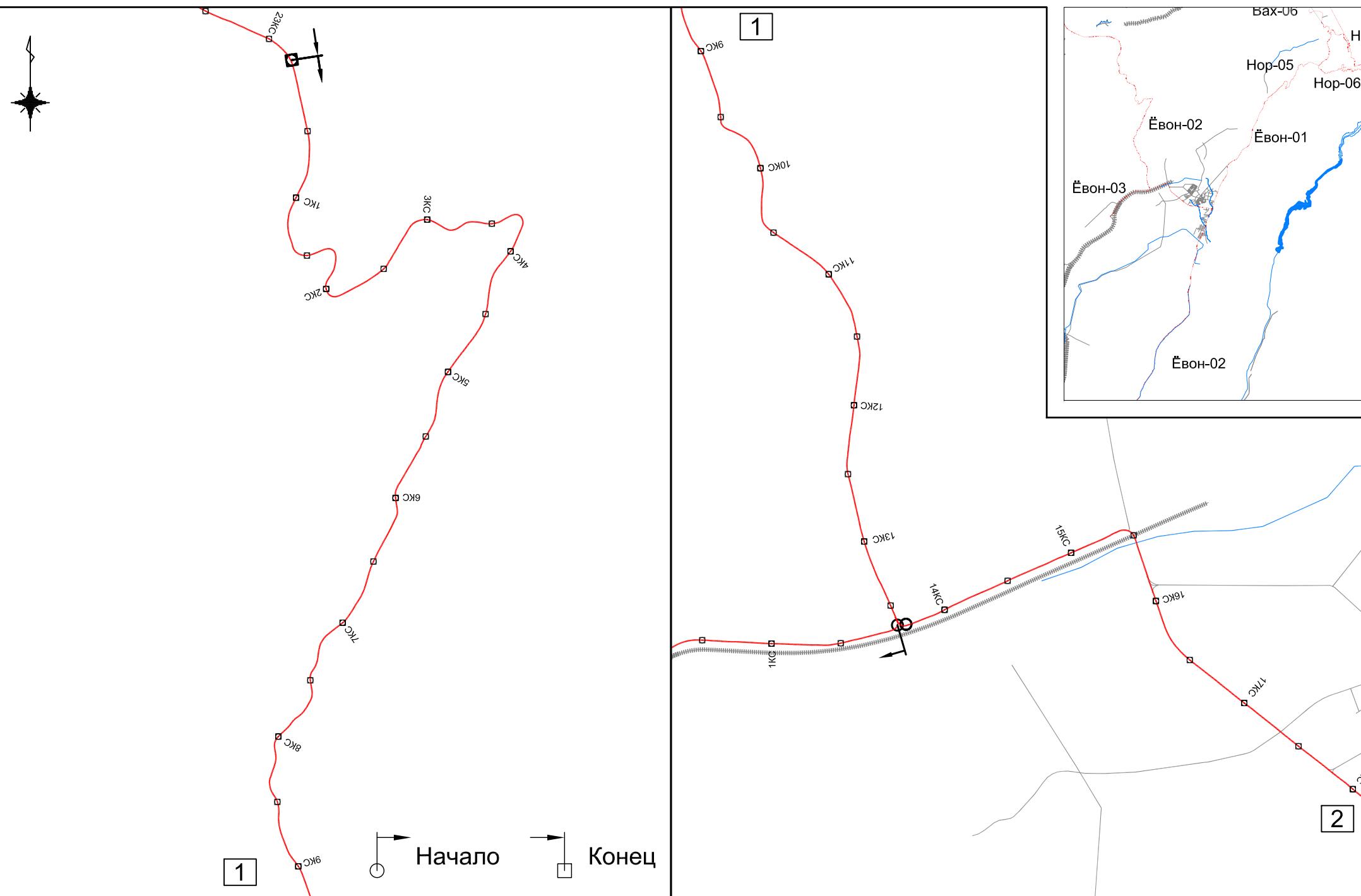
Рогун-02



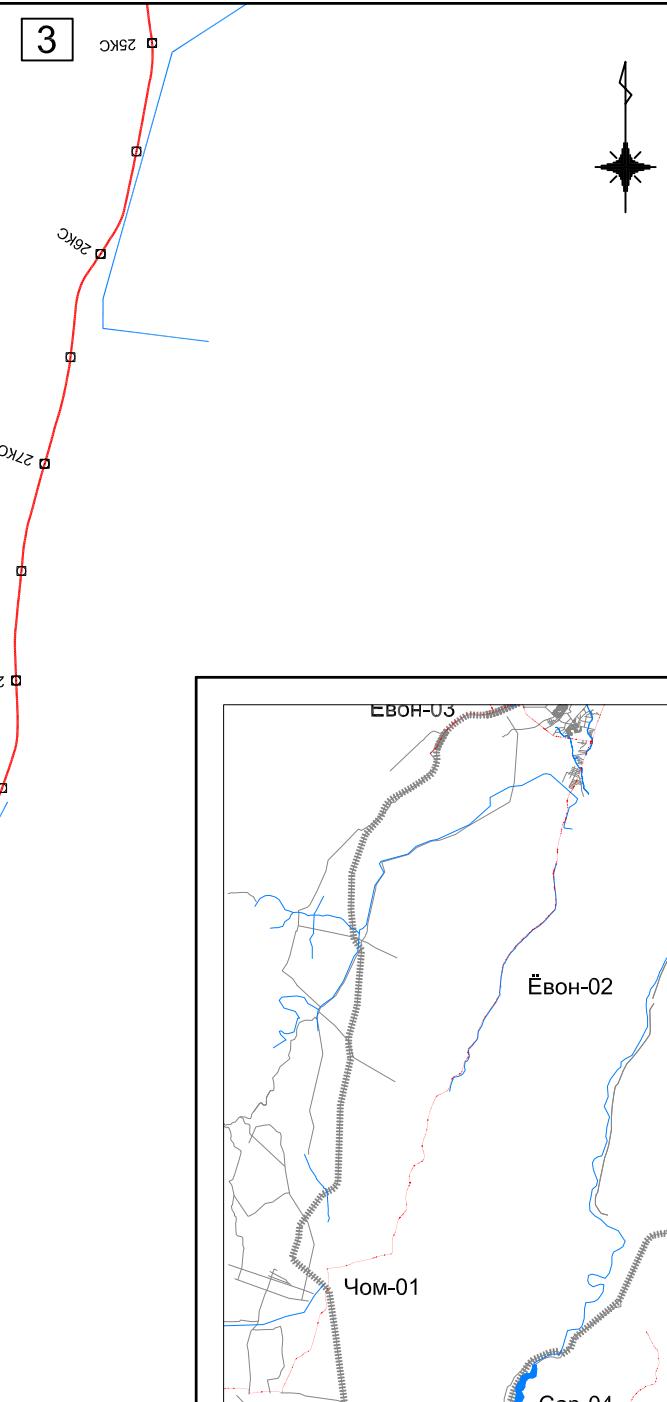
Ёвон-01



Ёвон-02(1)



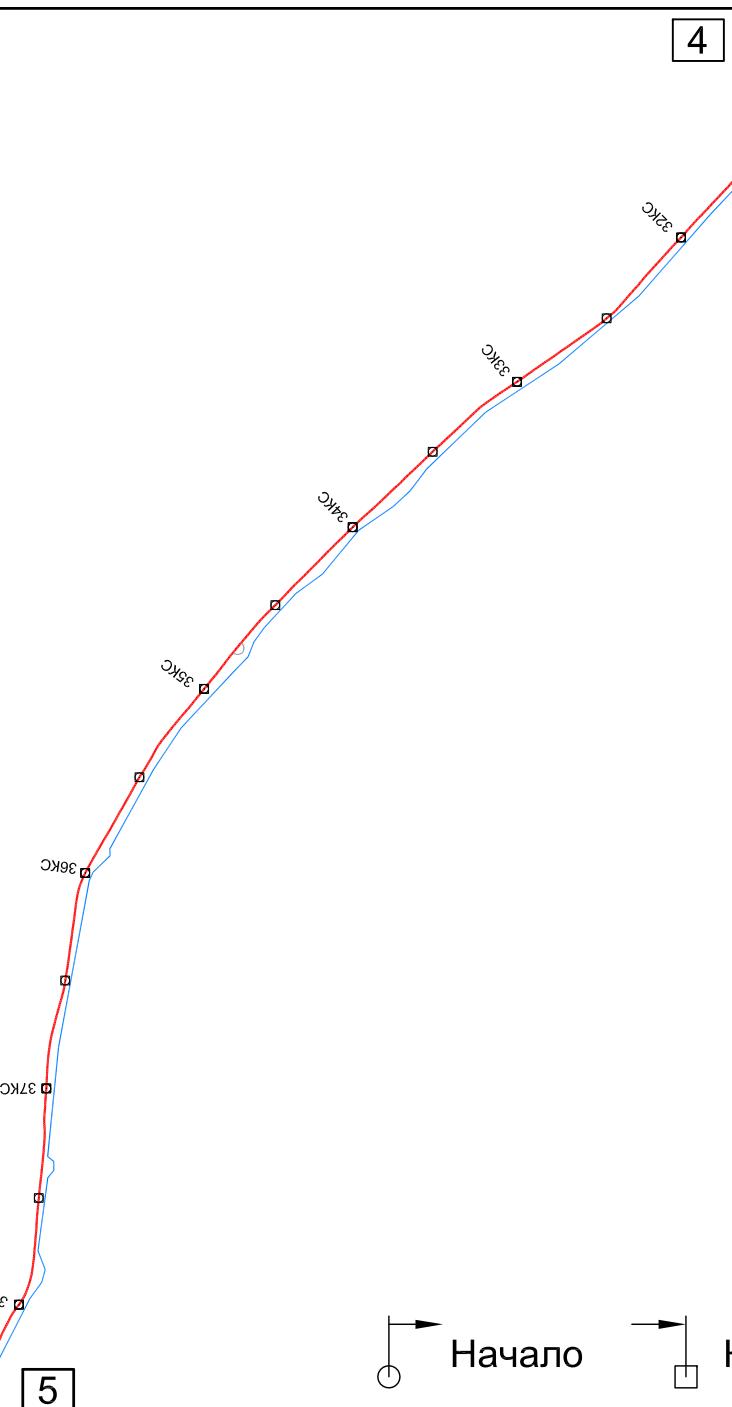
Ёвон-02(2)



Ёвон-02(3)



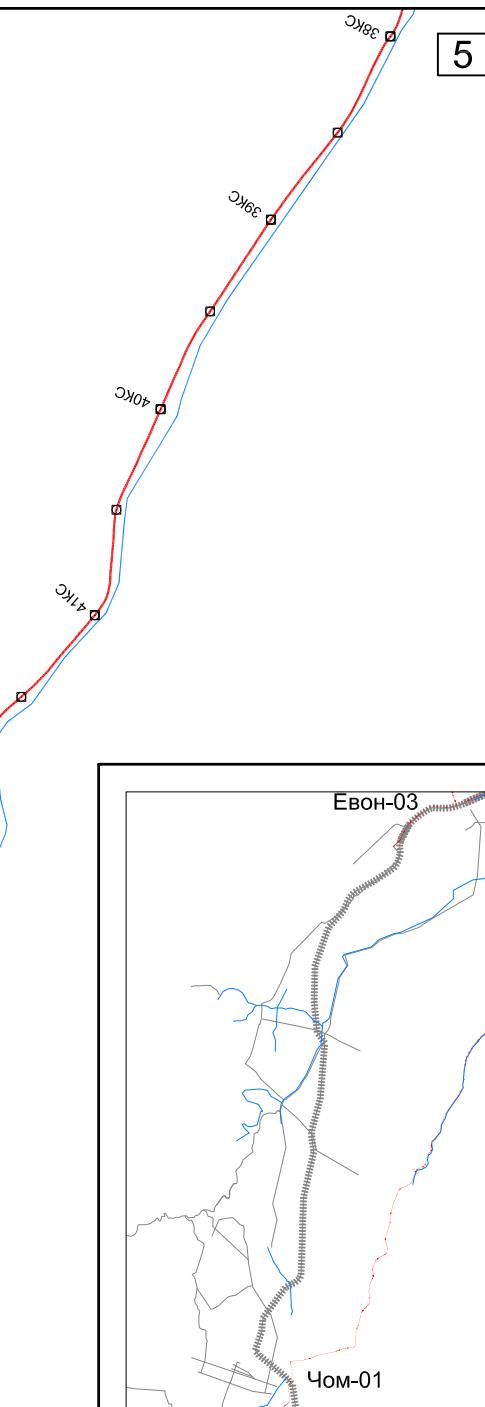
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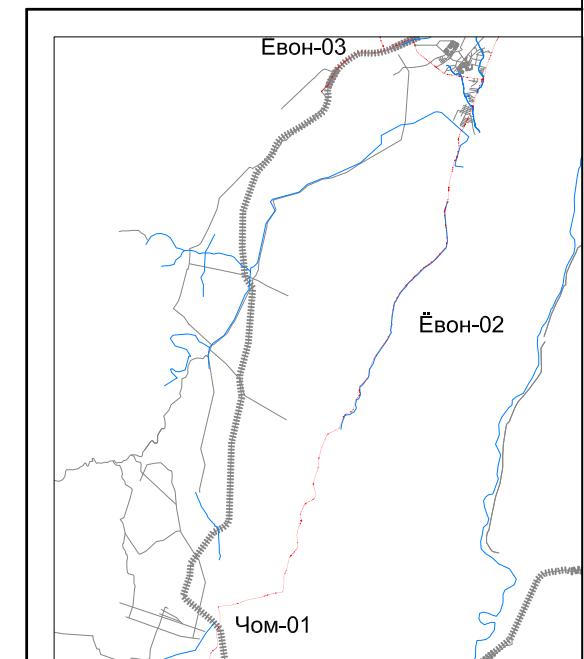
Начало

Конец

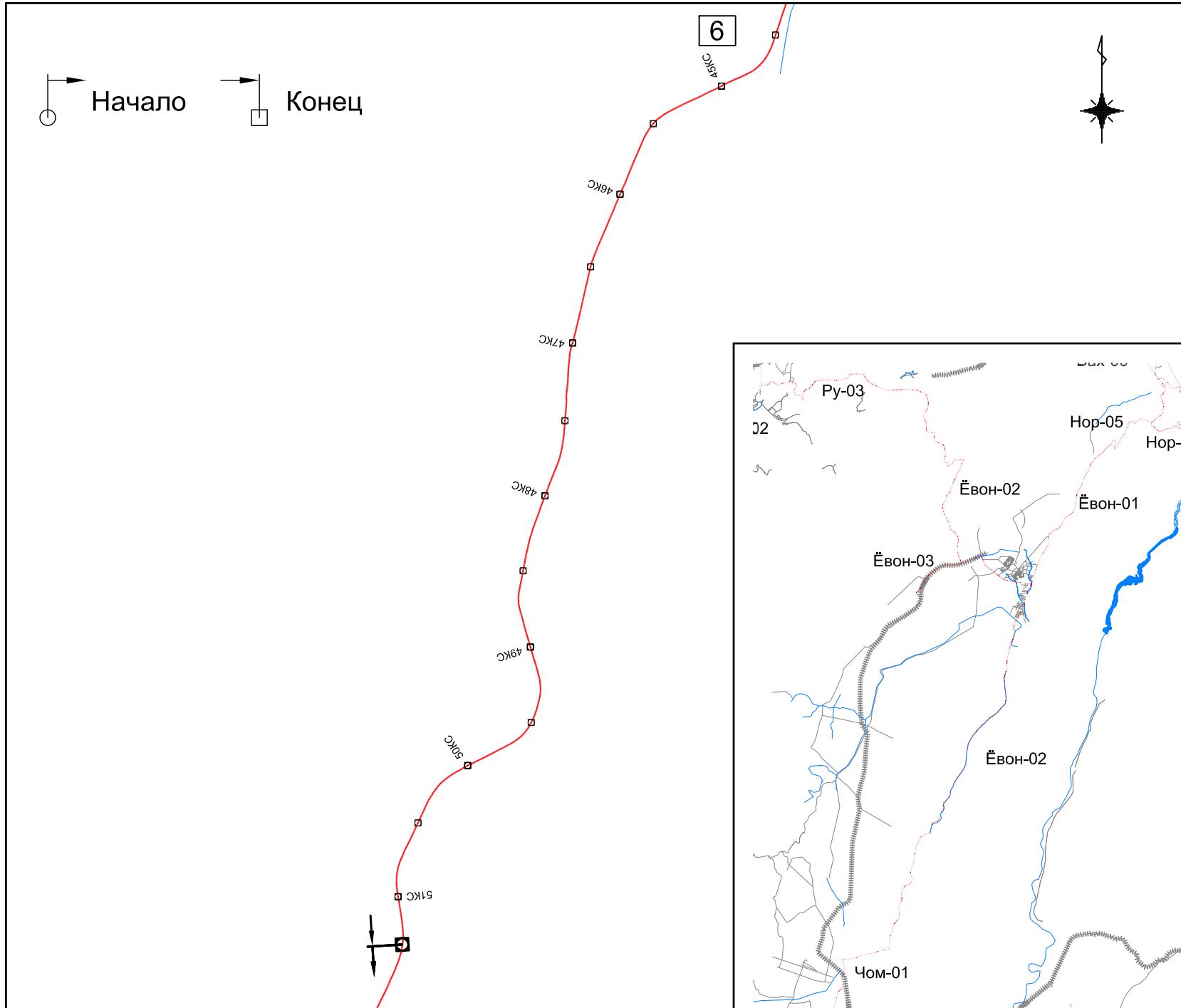
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6



Ёвон-02(4)

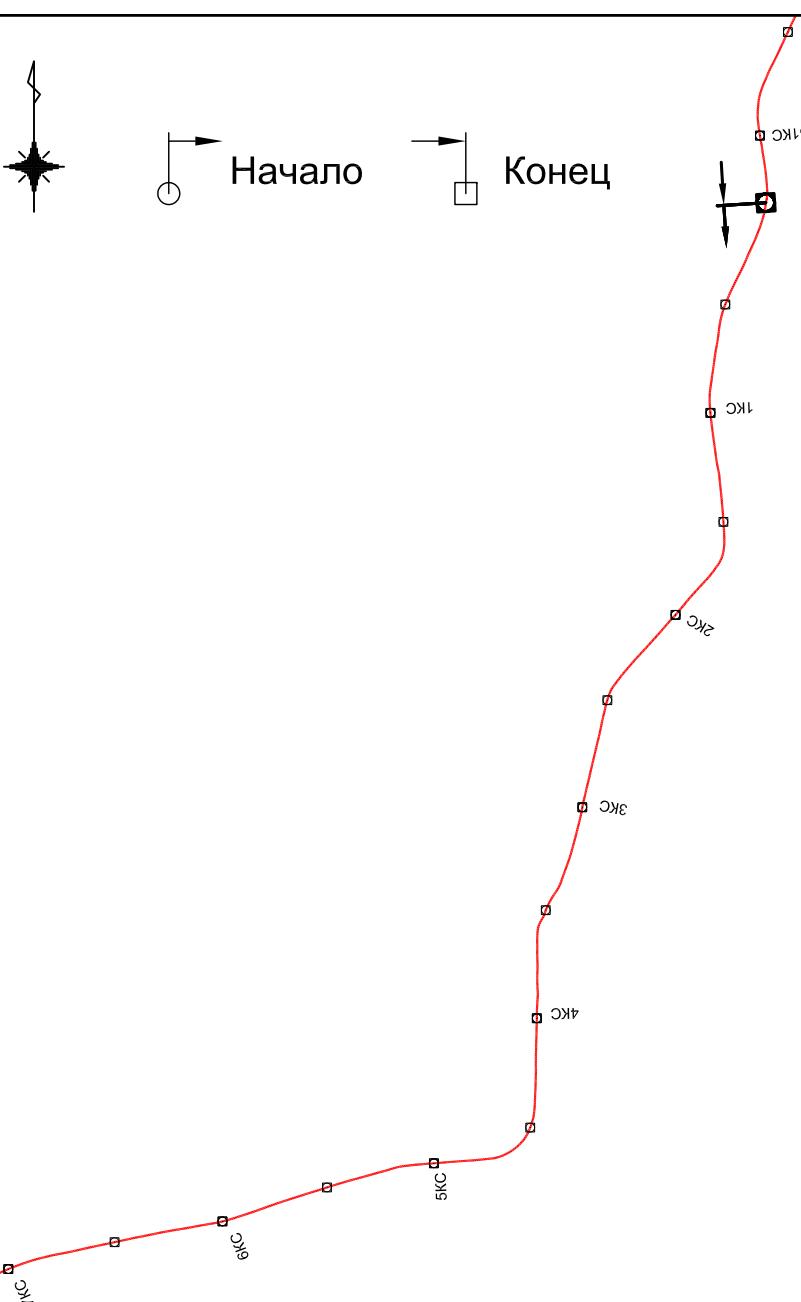


Чоми-01(1)

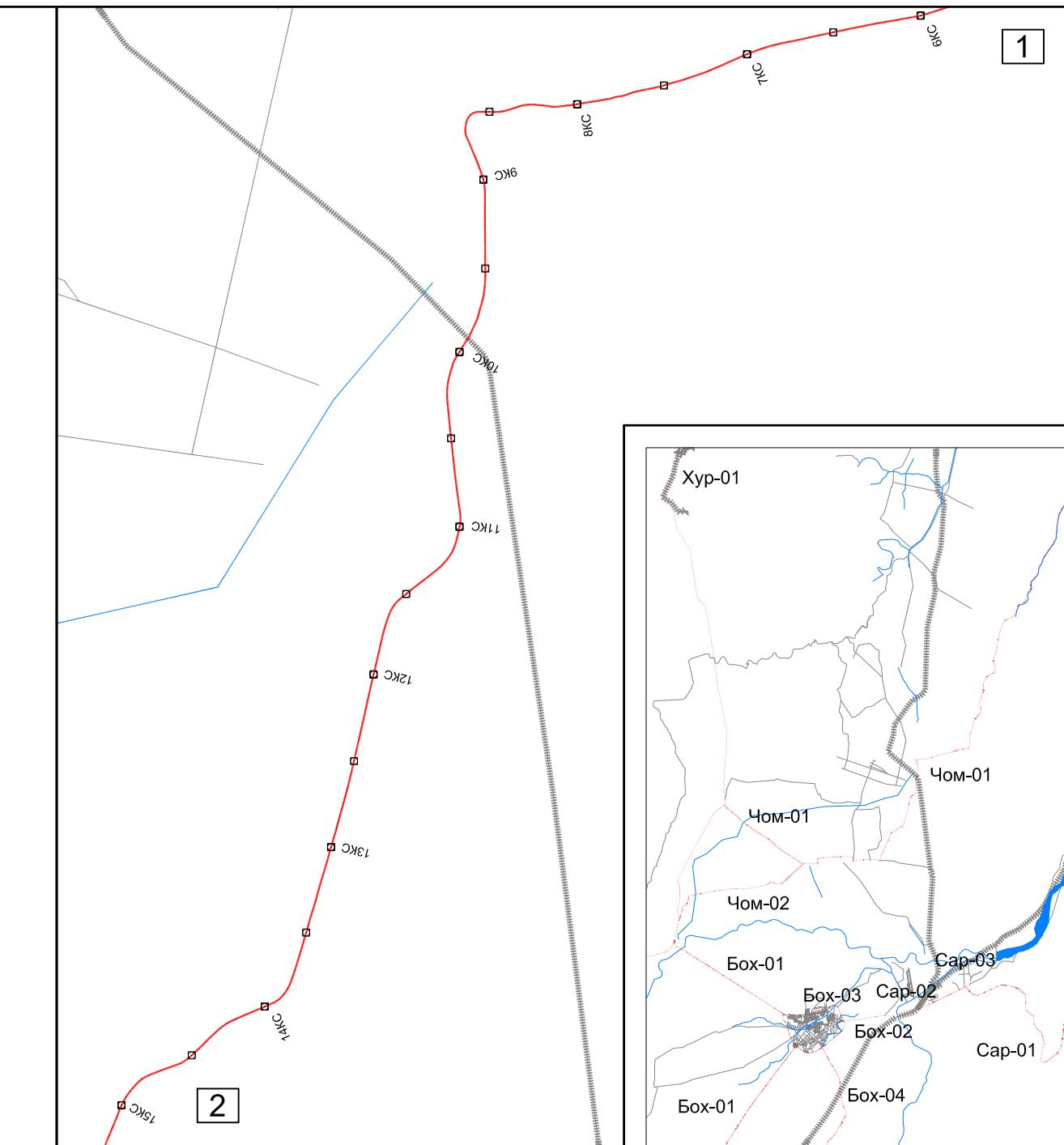


Начало

Конец

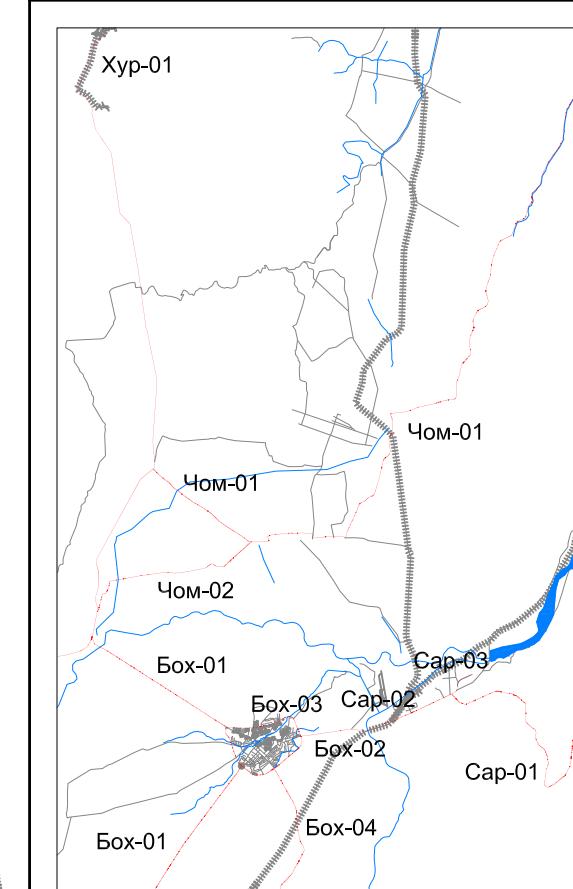


1

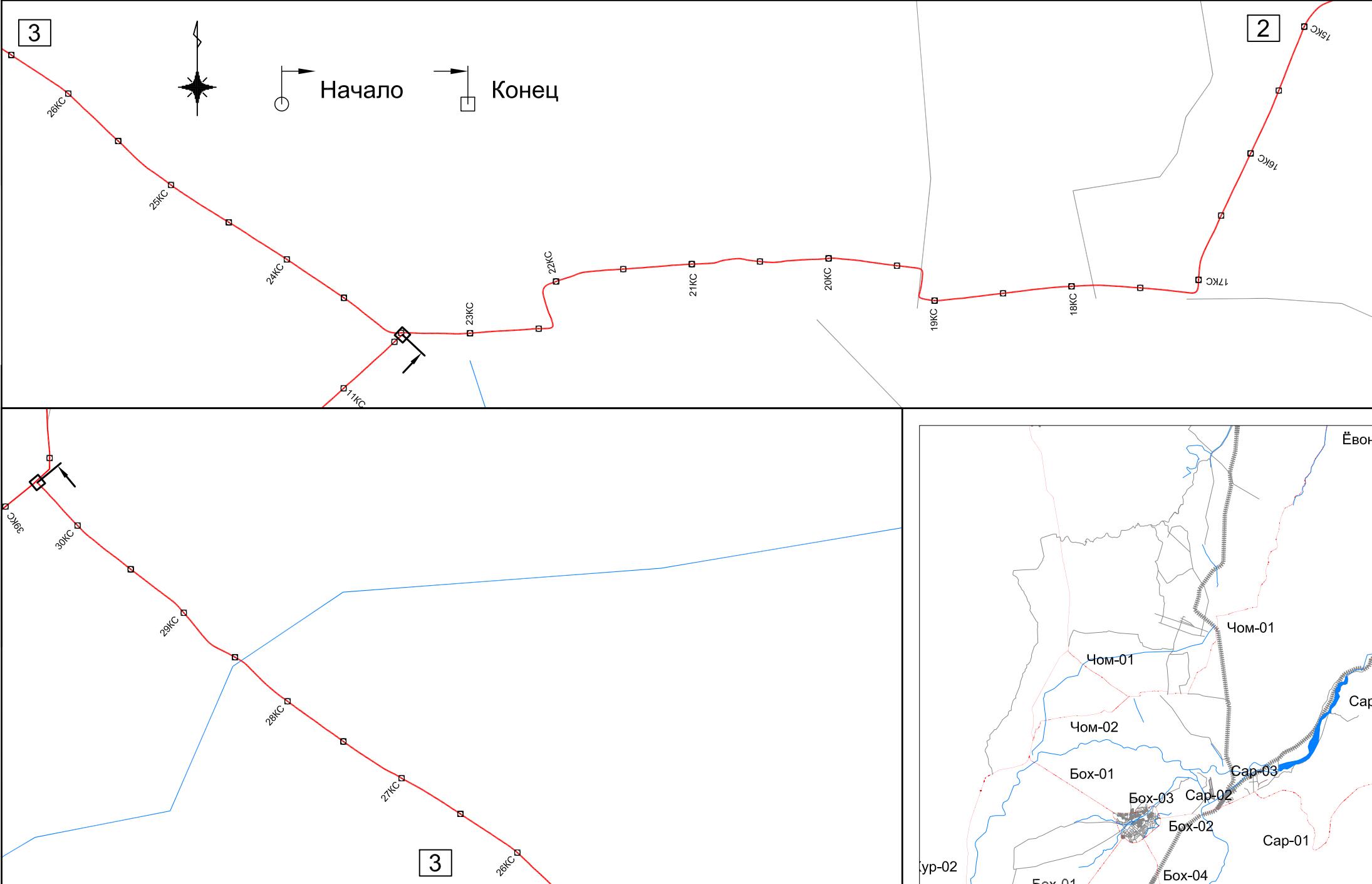


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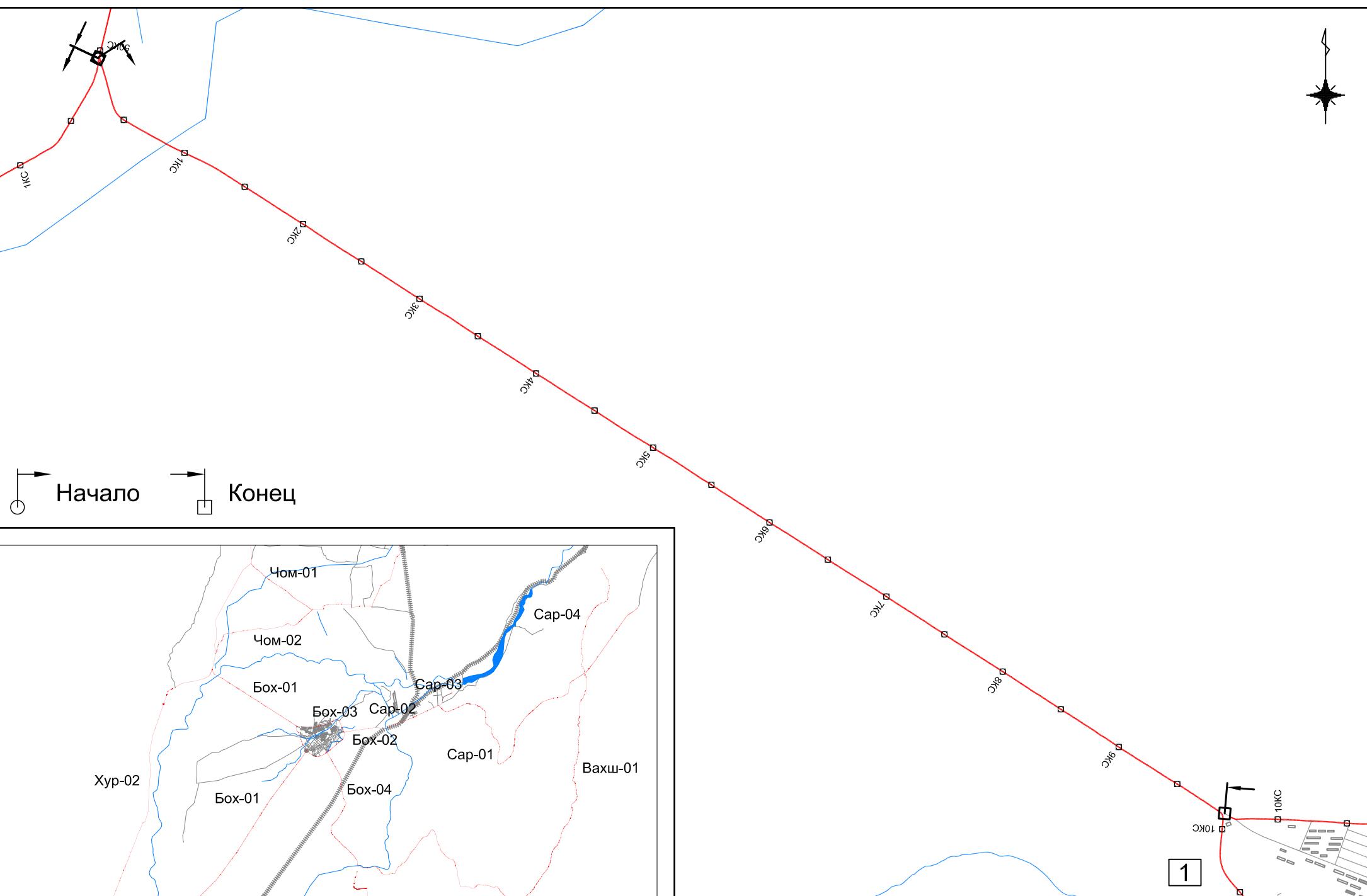
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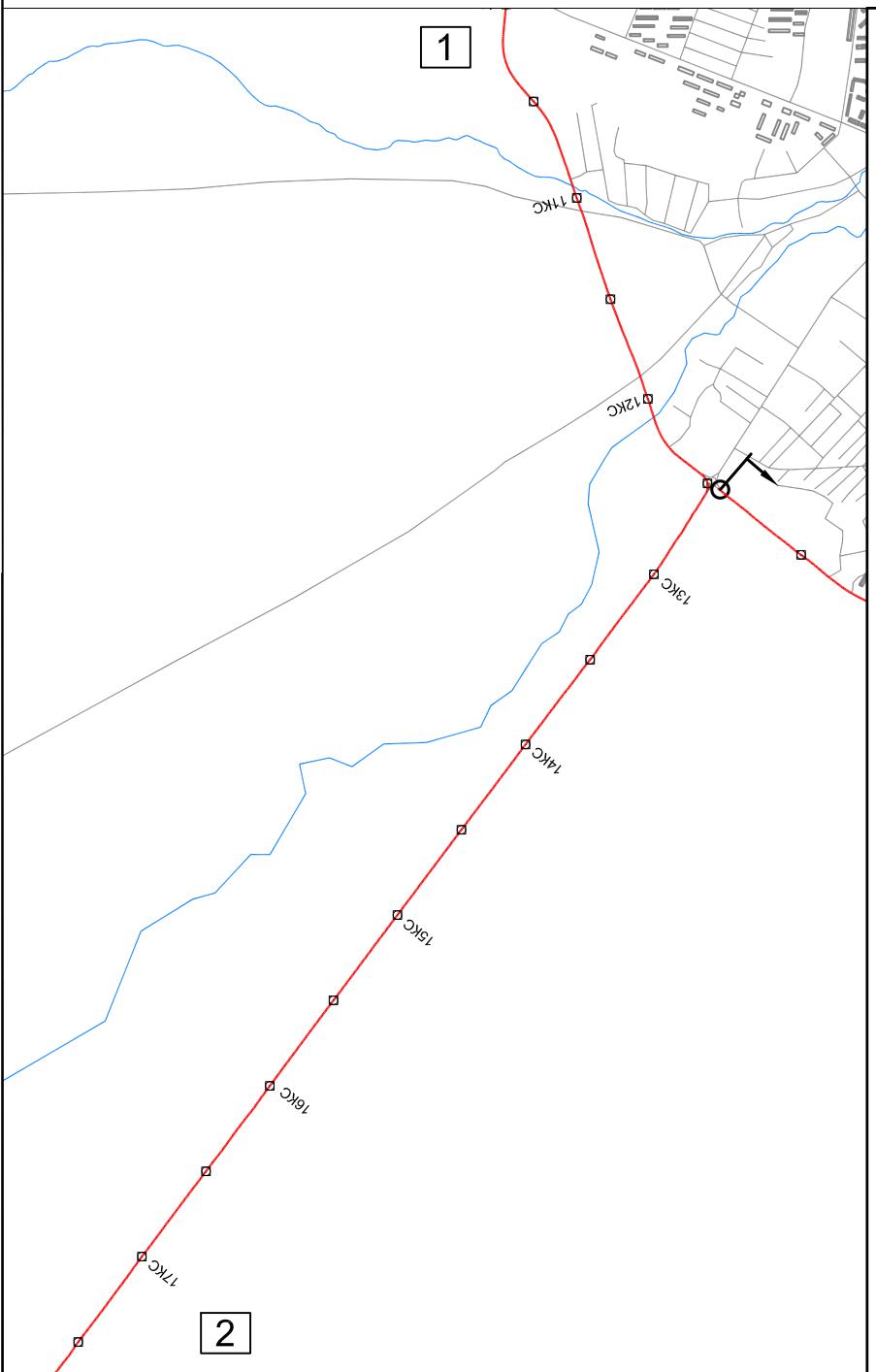
Чоми-01(2)



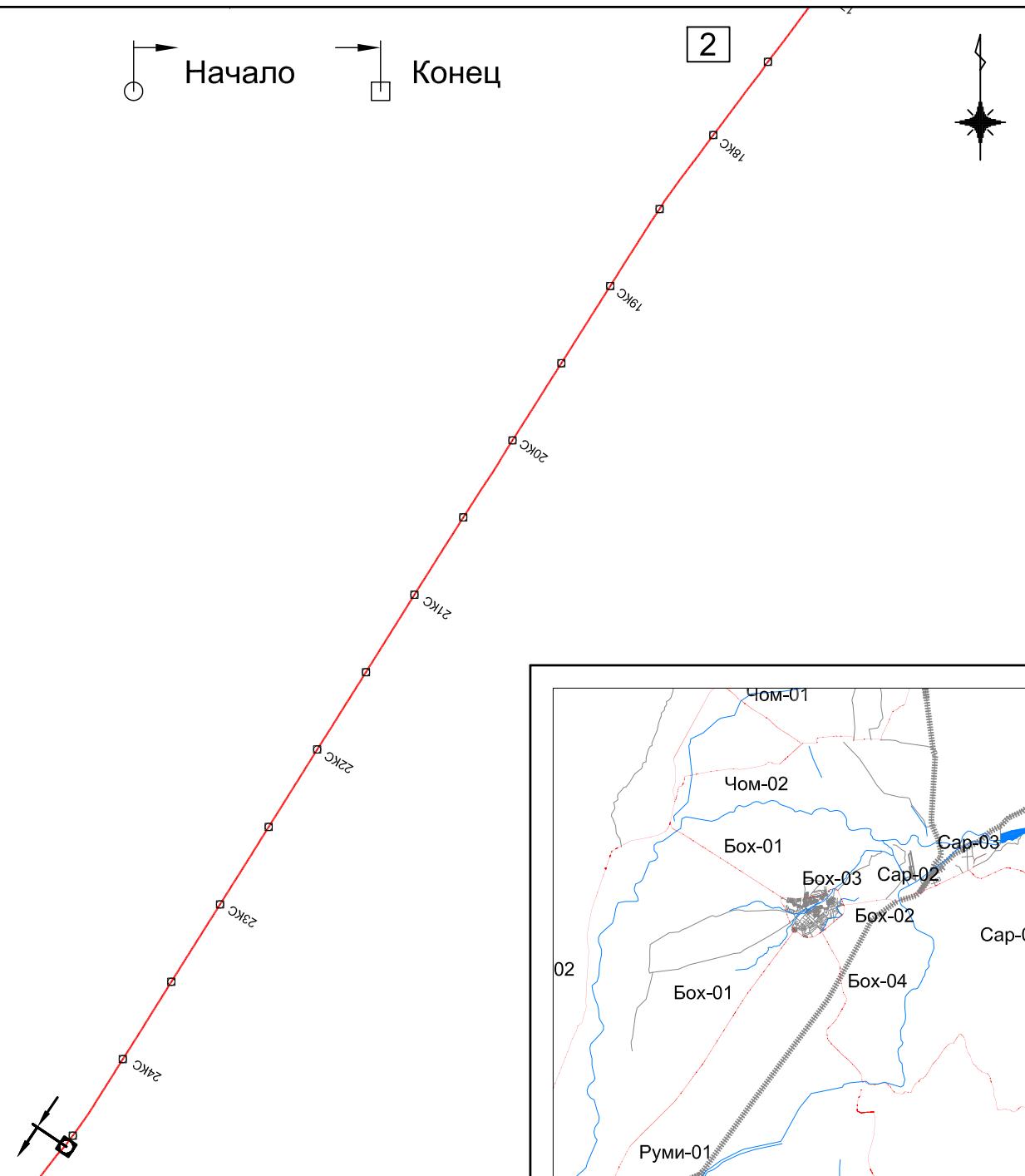
Бохтар-01(1)



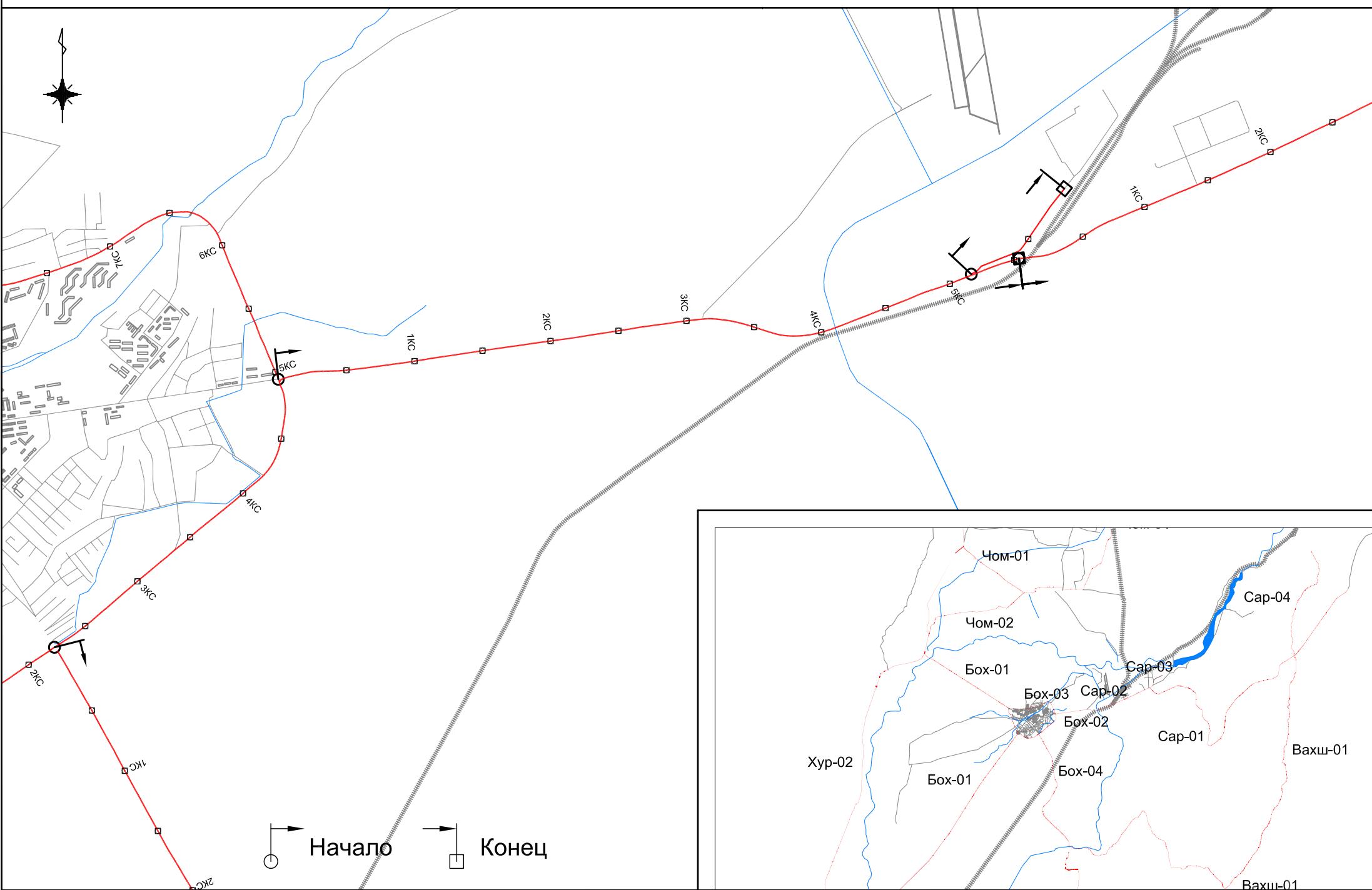
Бохтар-01(2)



Конец



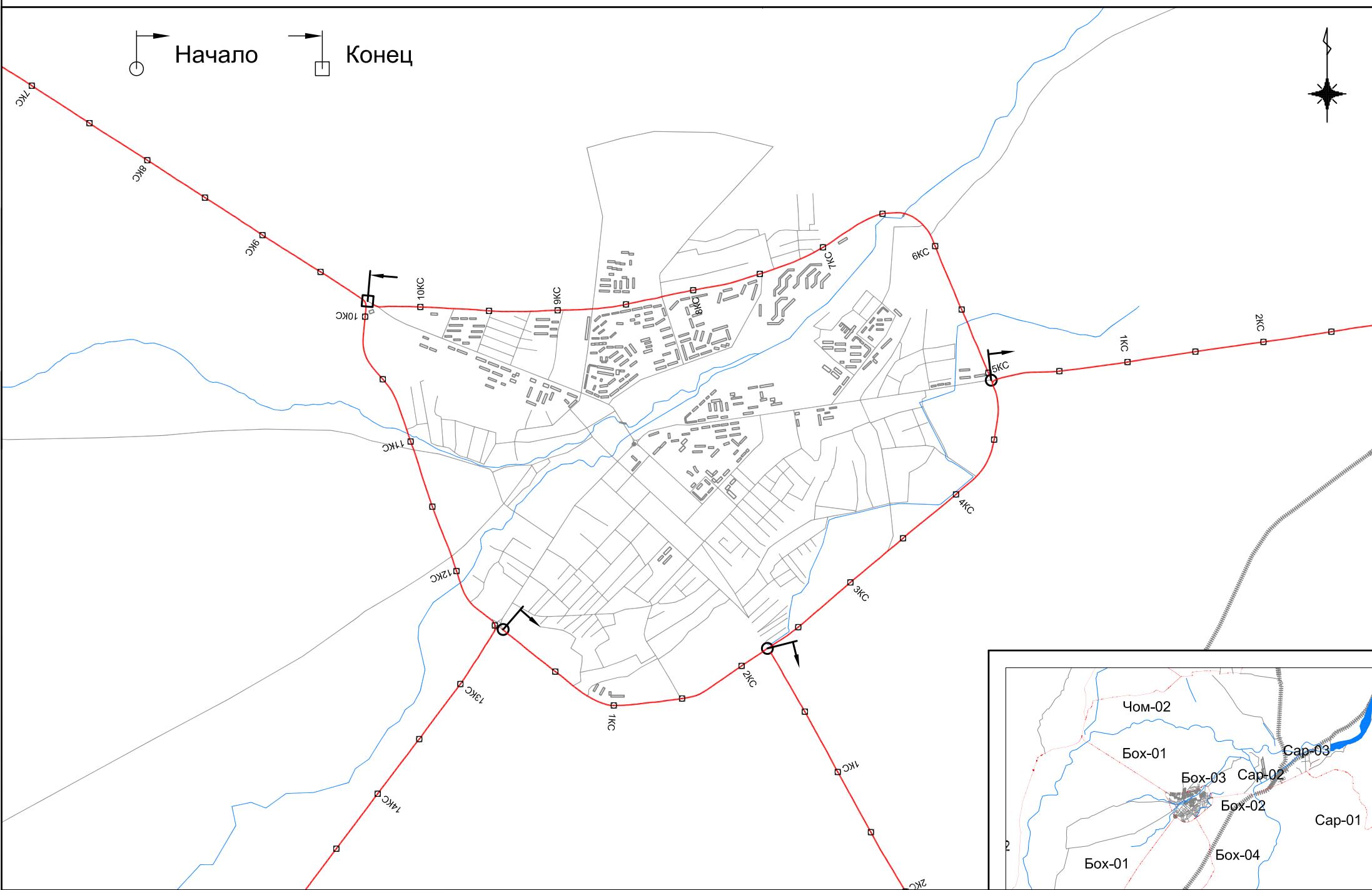
Бохтар-02



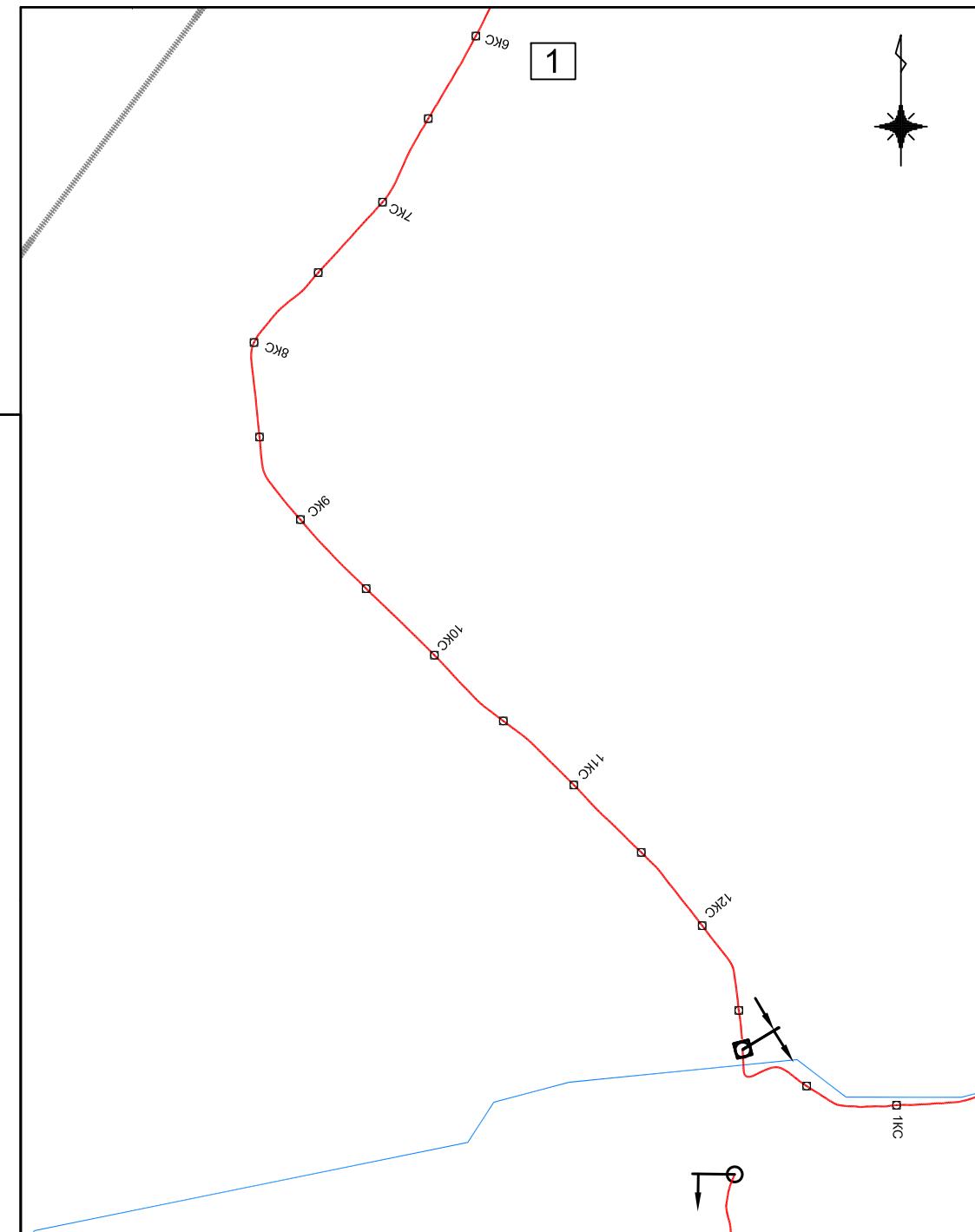
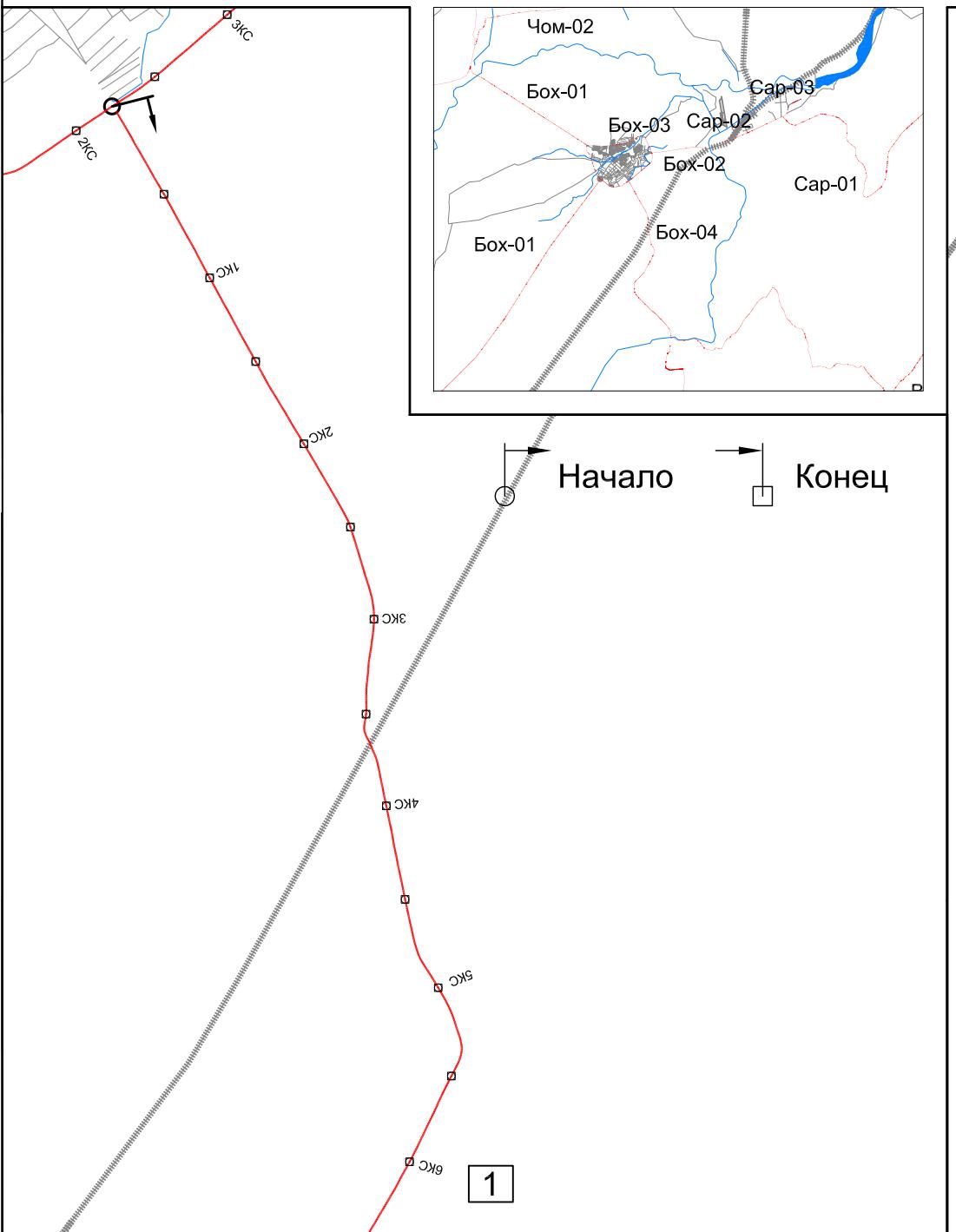
Бохтар-03

Начало

Конец

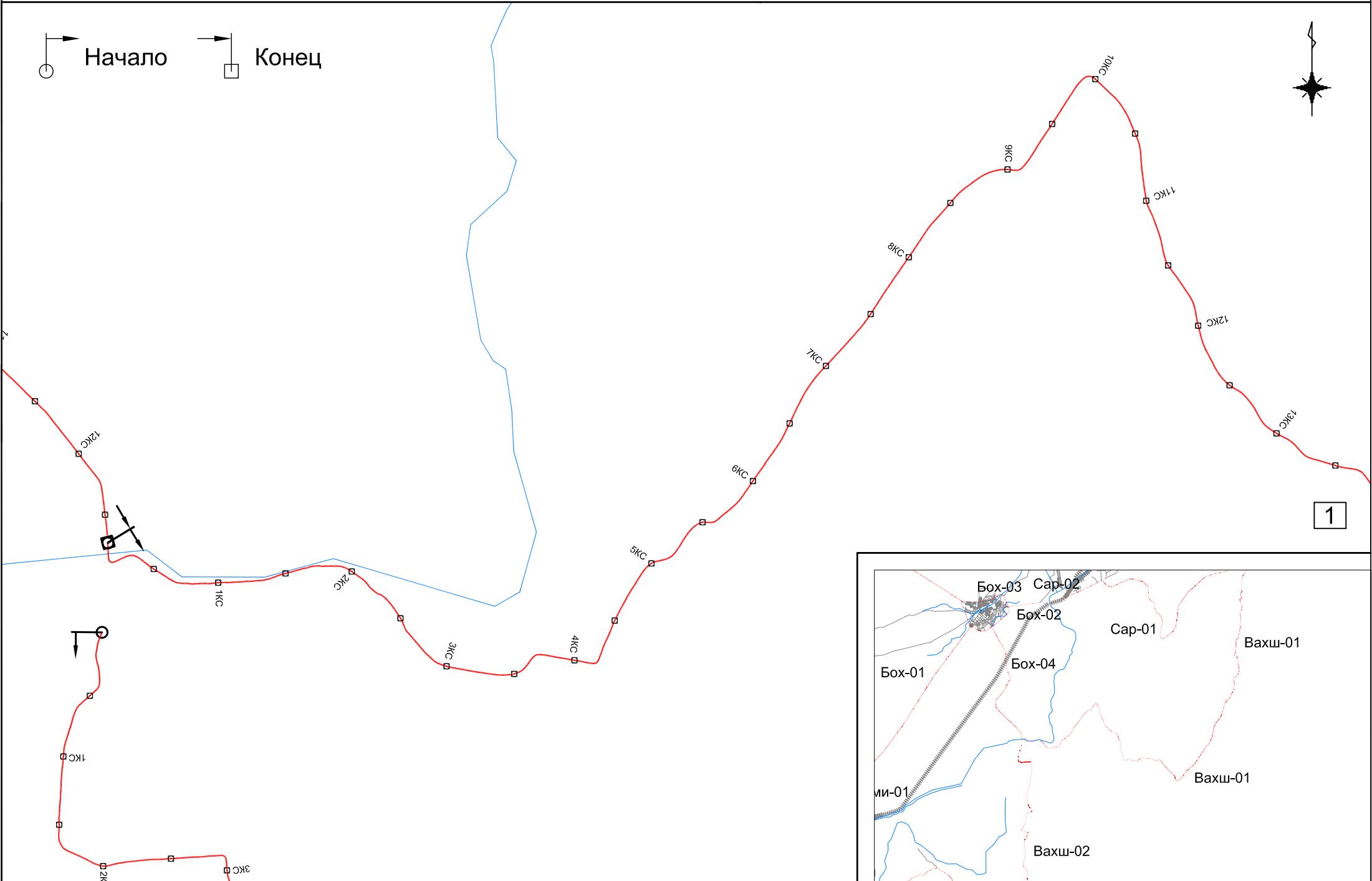


Бохтар-04



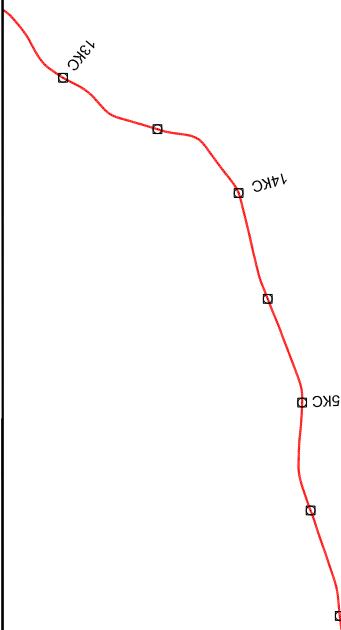
Вахш-01(1)

Конец



Вахш-01(2)

1

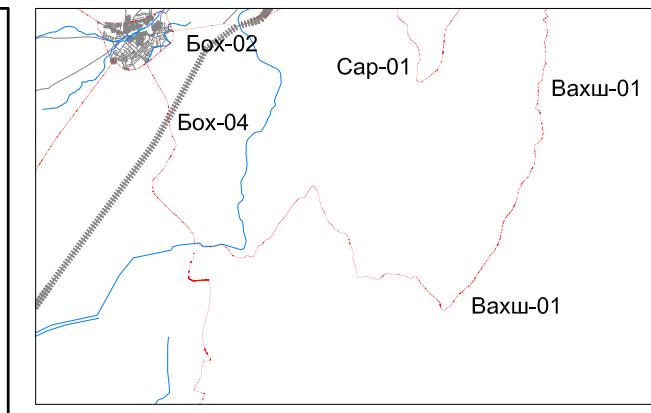


Начало

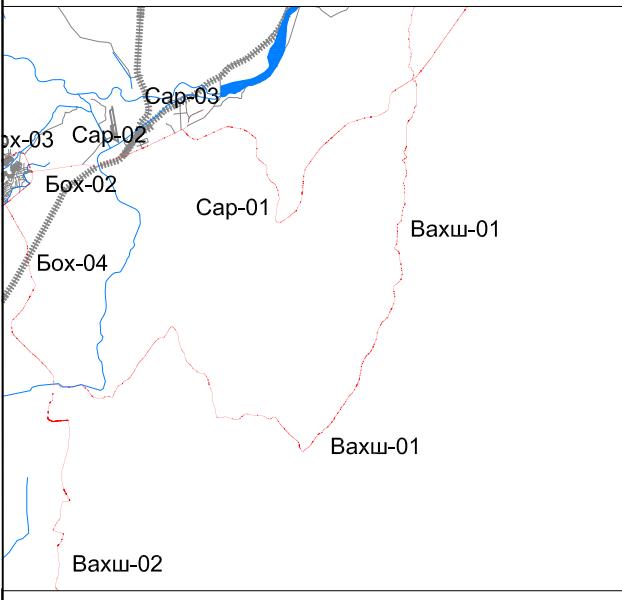


Конец

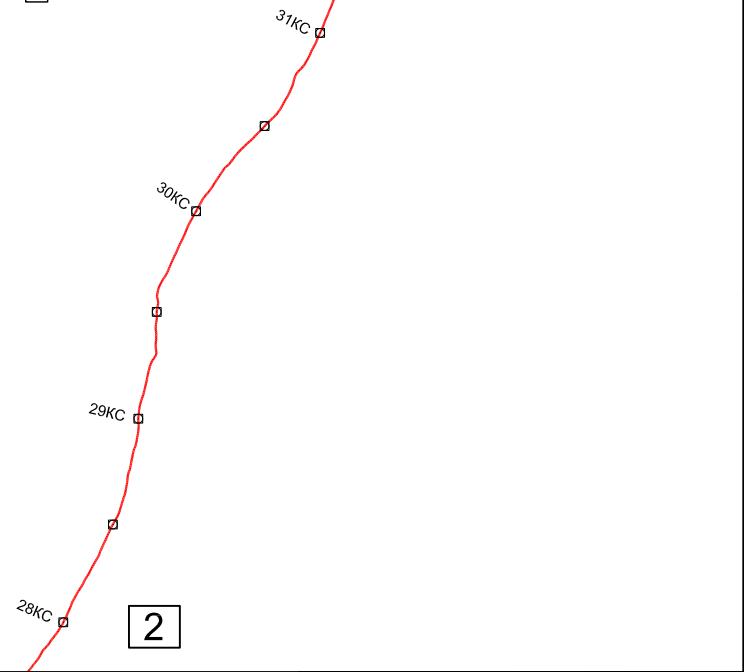
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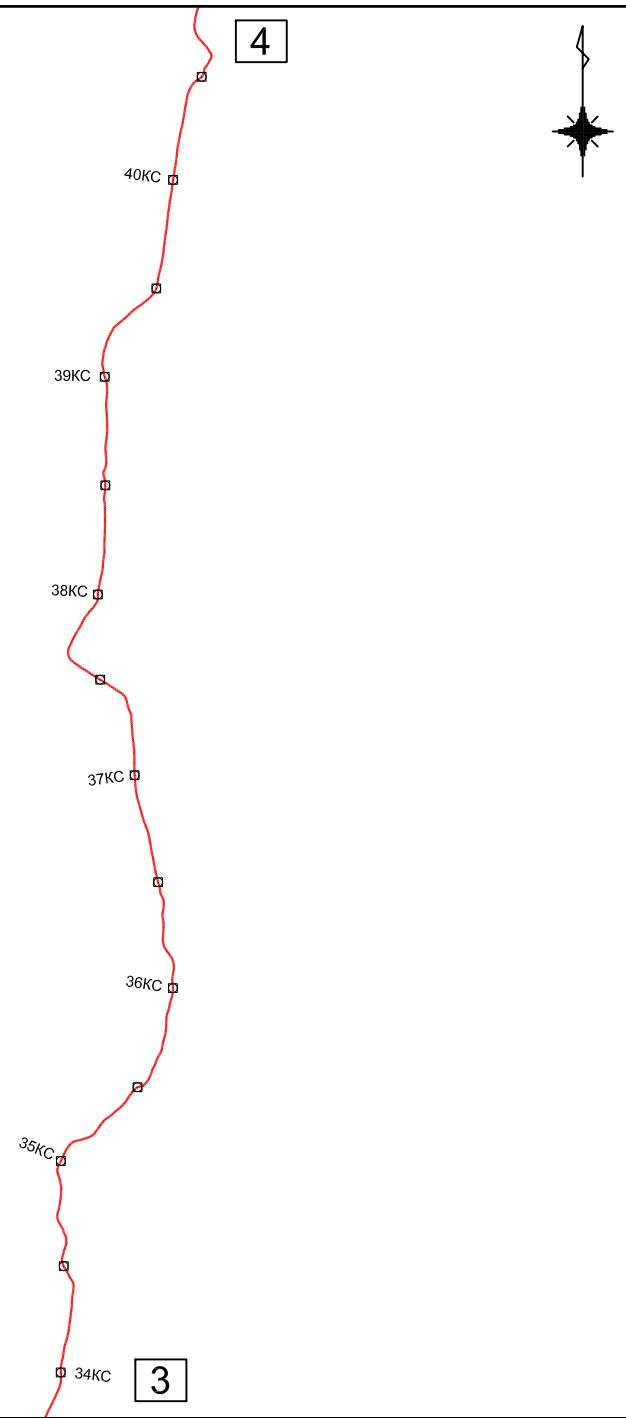
Вахш-01(3)



Начало Конец



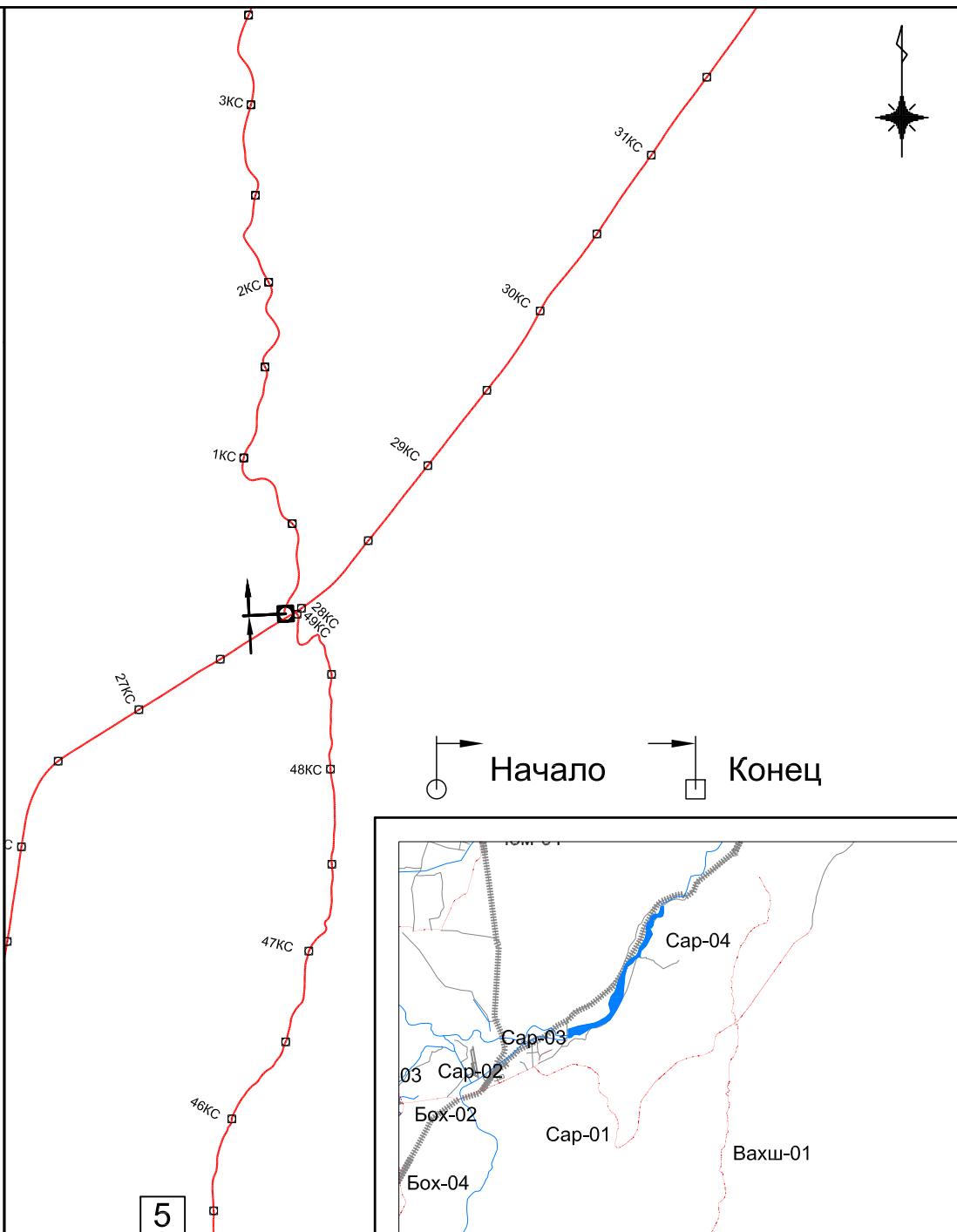
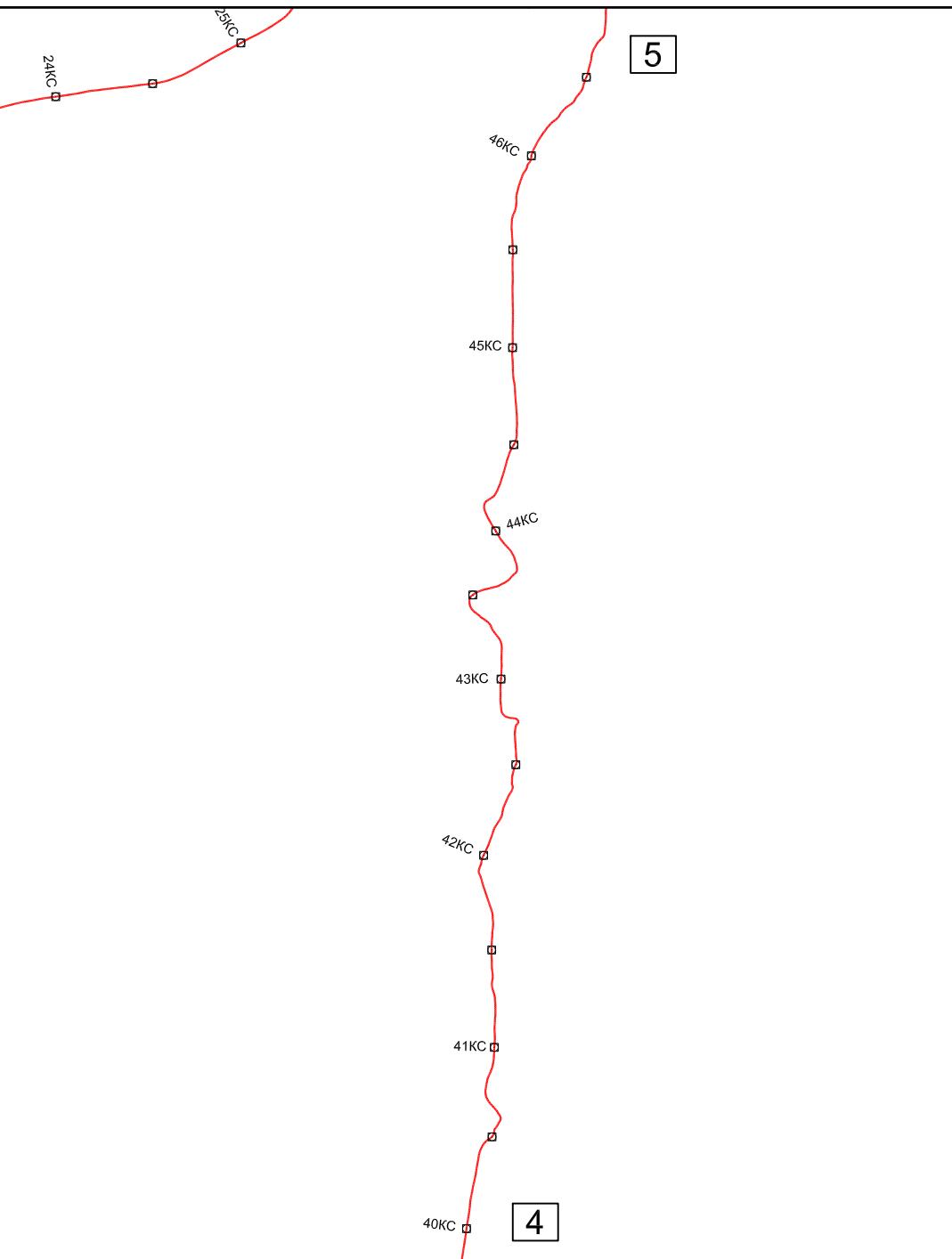
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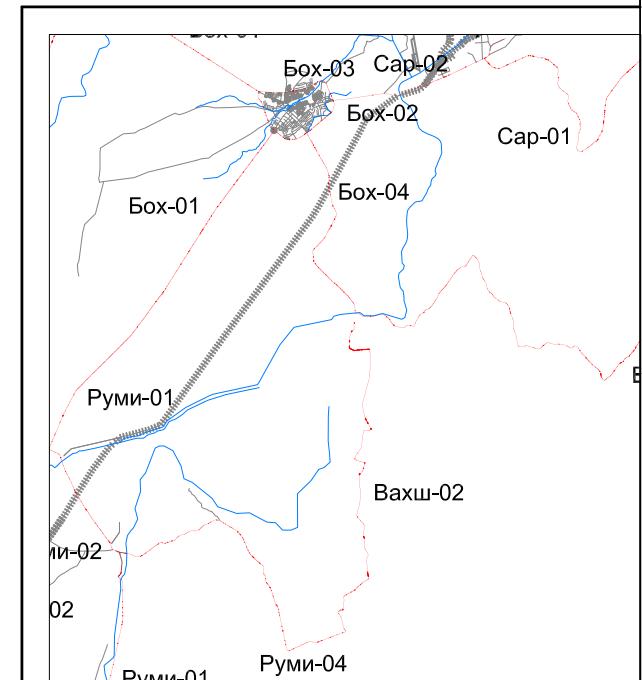
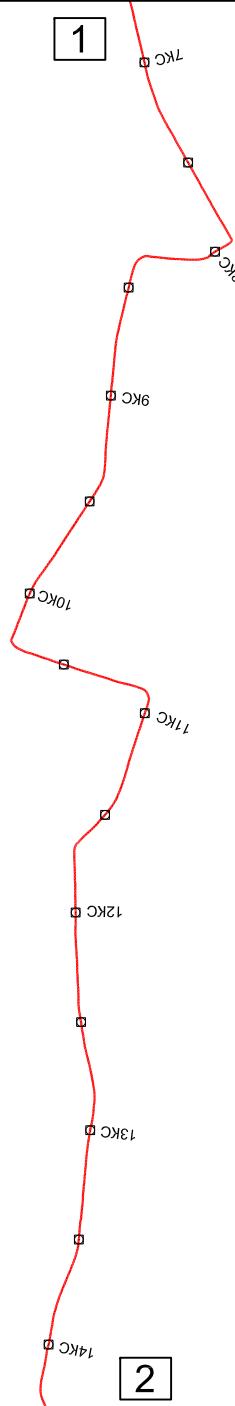
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Вахш-01(4)

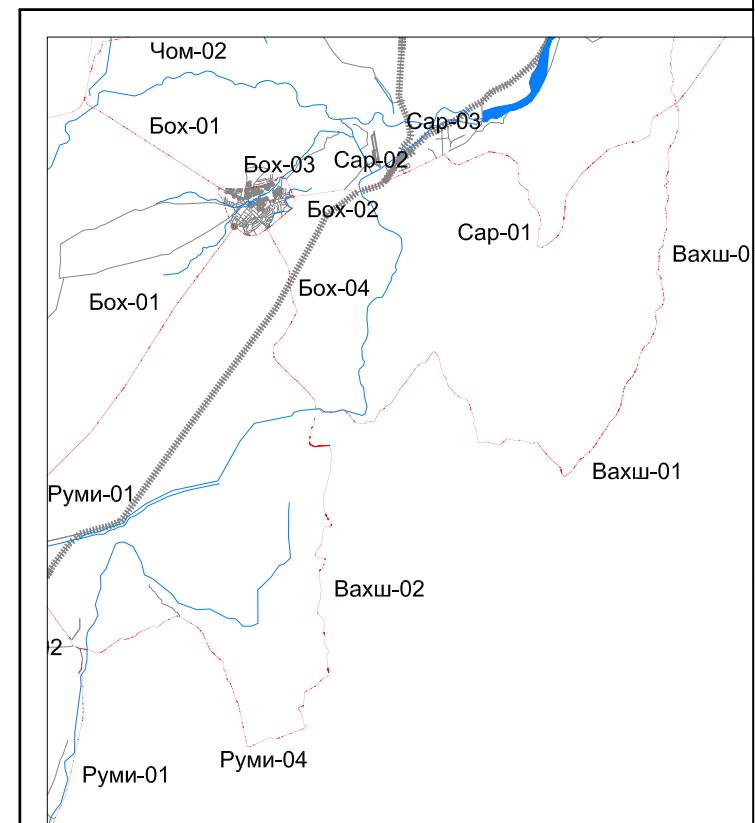
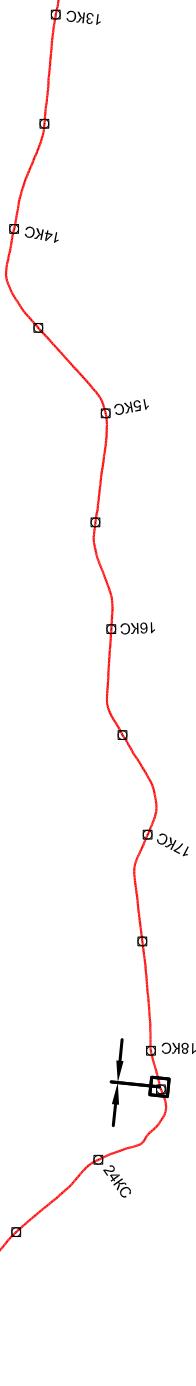


Вахш-02(1)

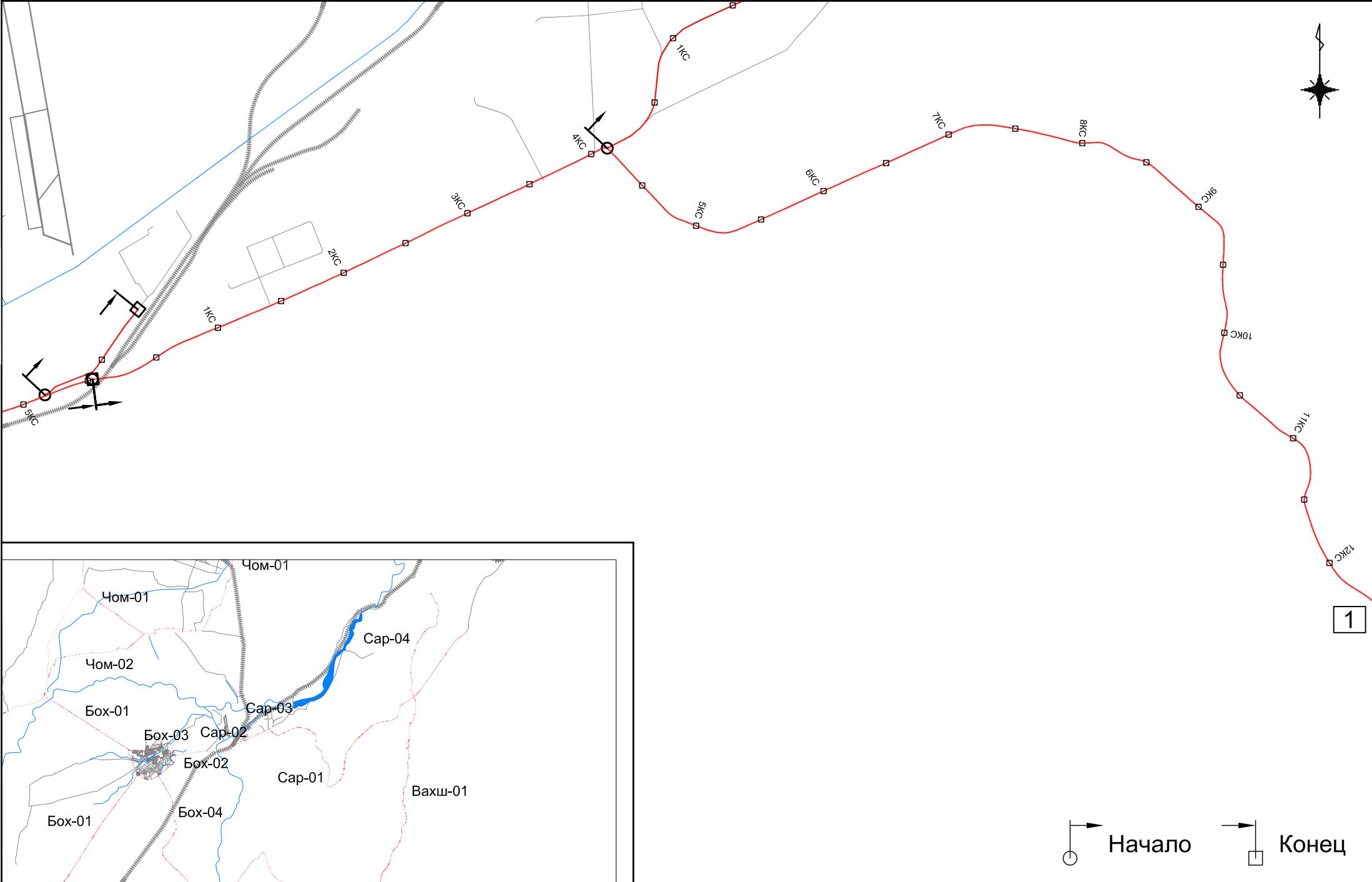


Вахш-02(2)

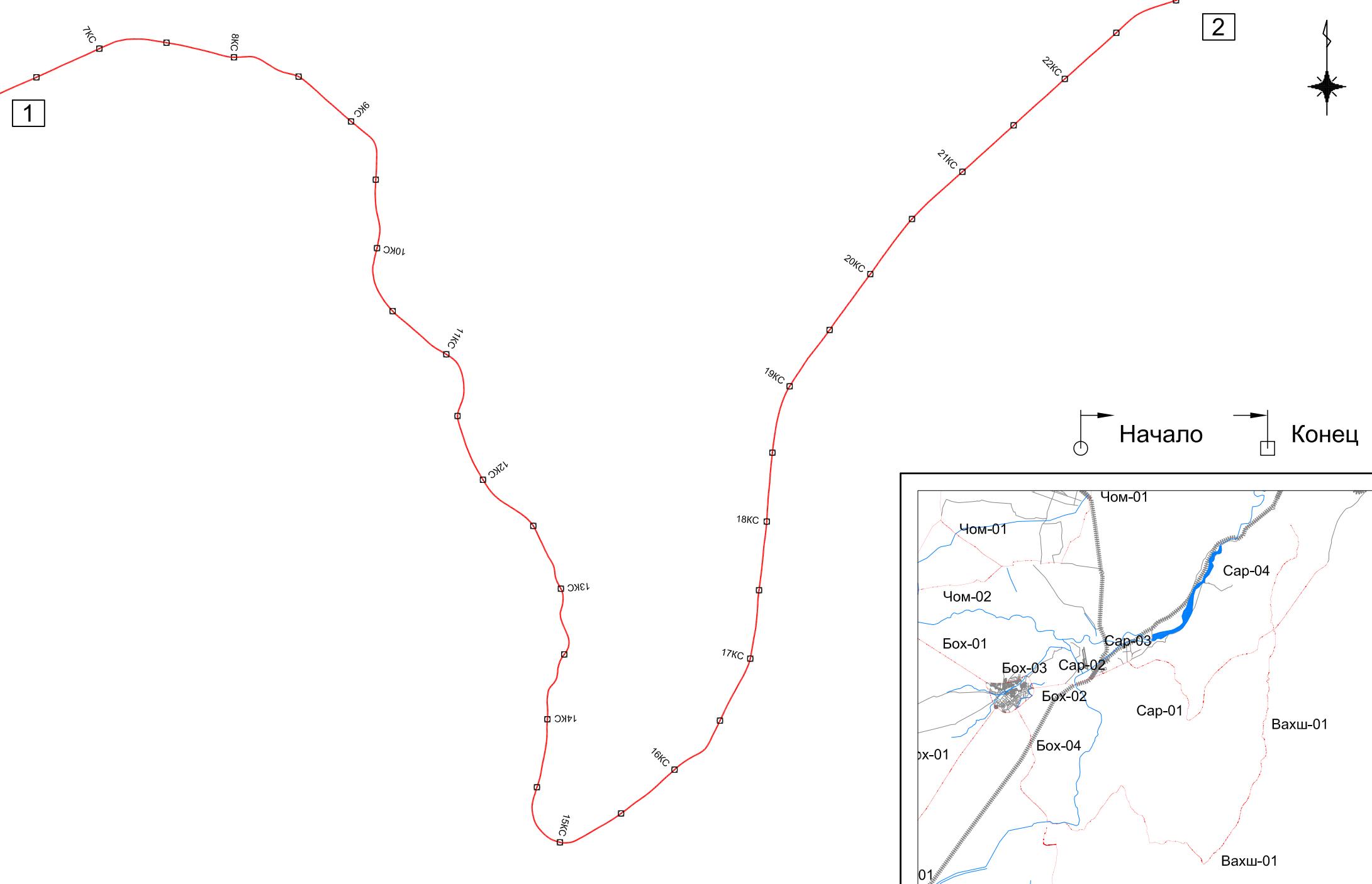
2



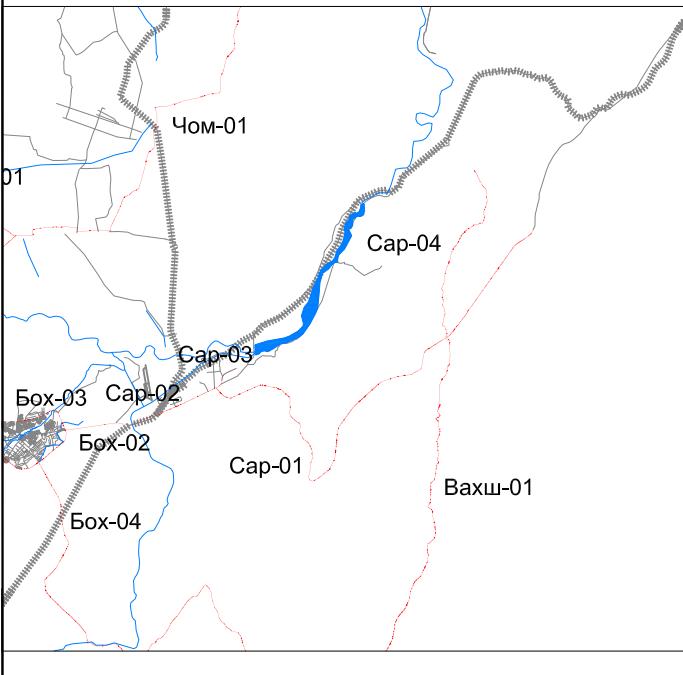
Сарбанд-01(1)



Сарбанд-01(2)

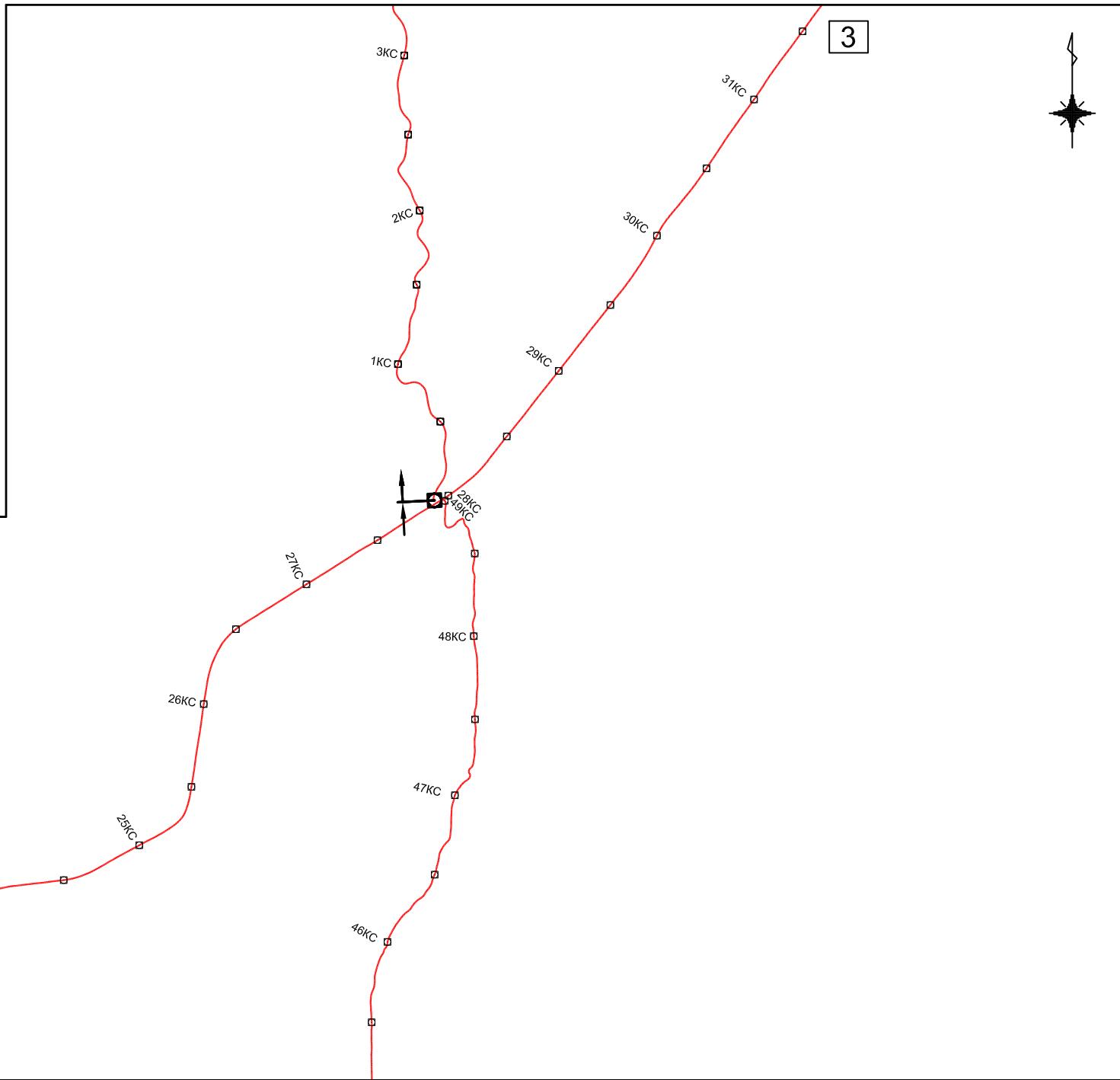


Сарбанд-01(3)



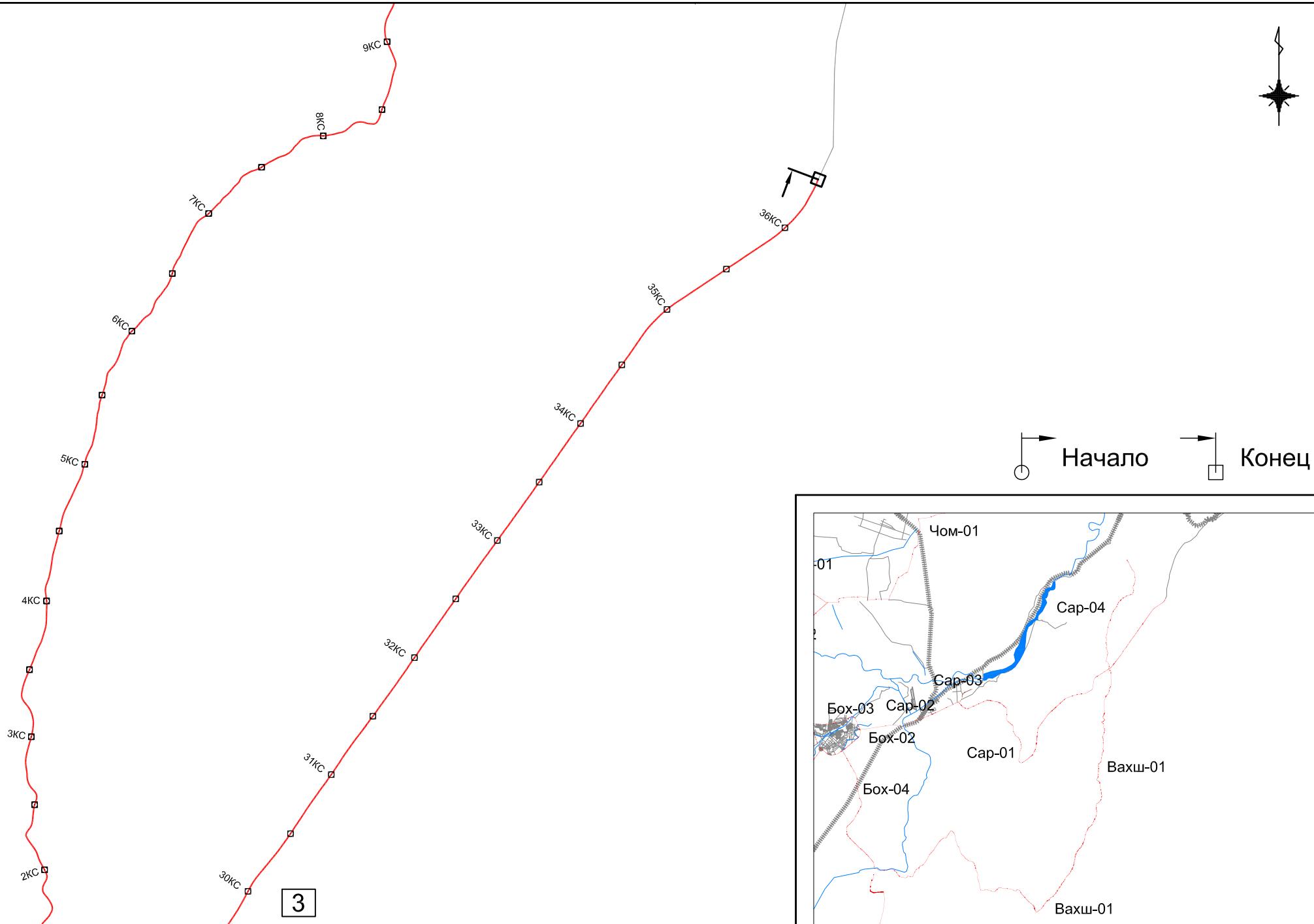
Начало

Конец

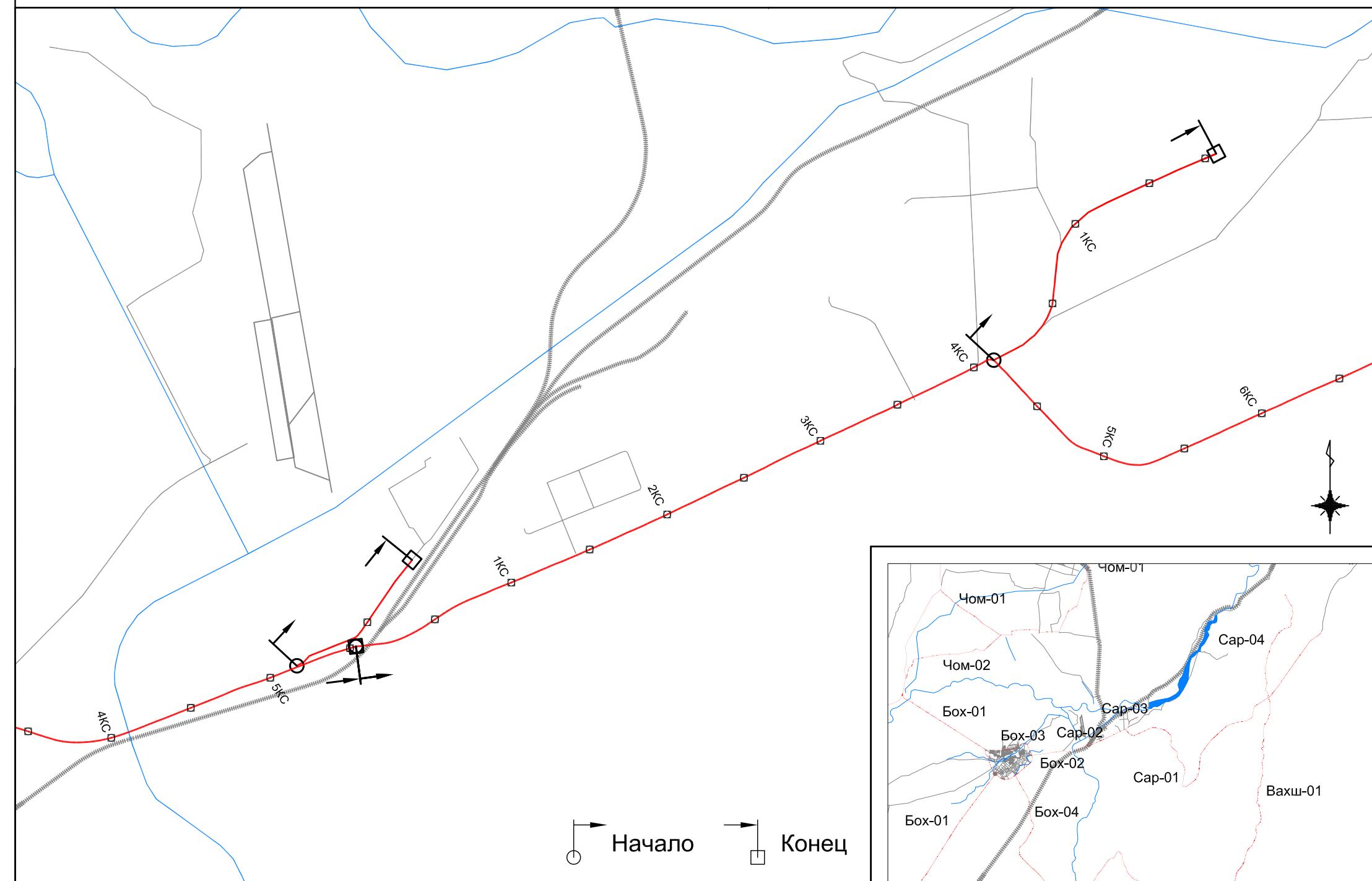


2

Сарбанд-01(4)



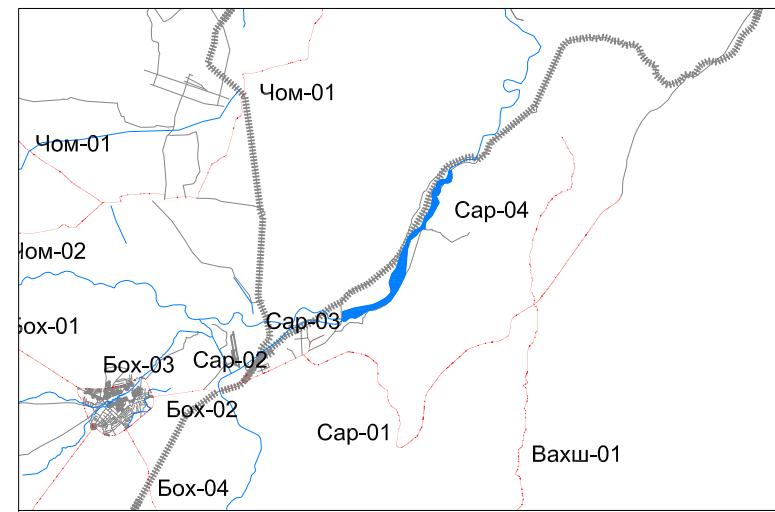
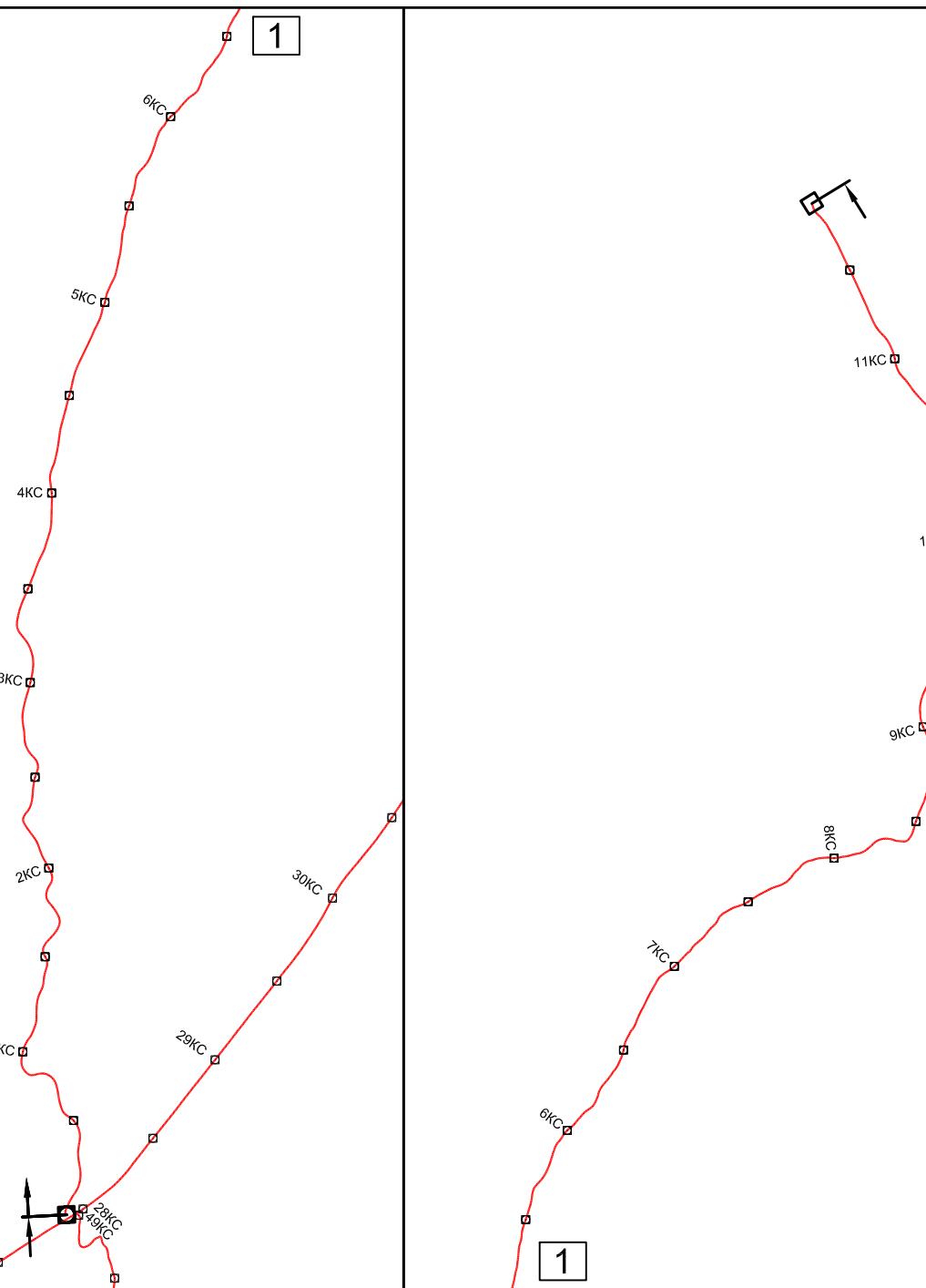
Сарбанд-02, 03



Сарбанд-04



1

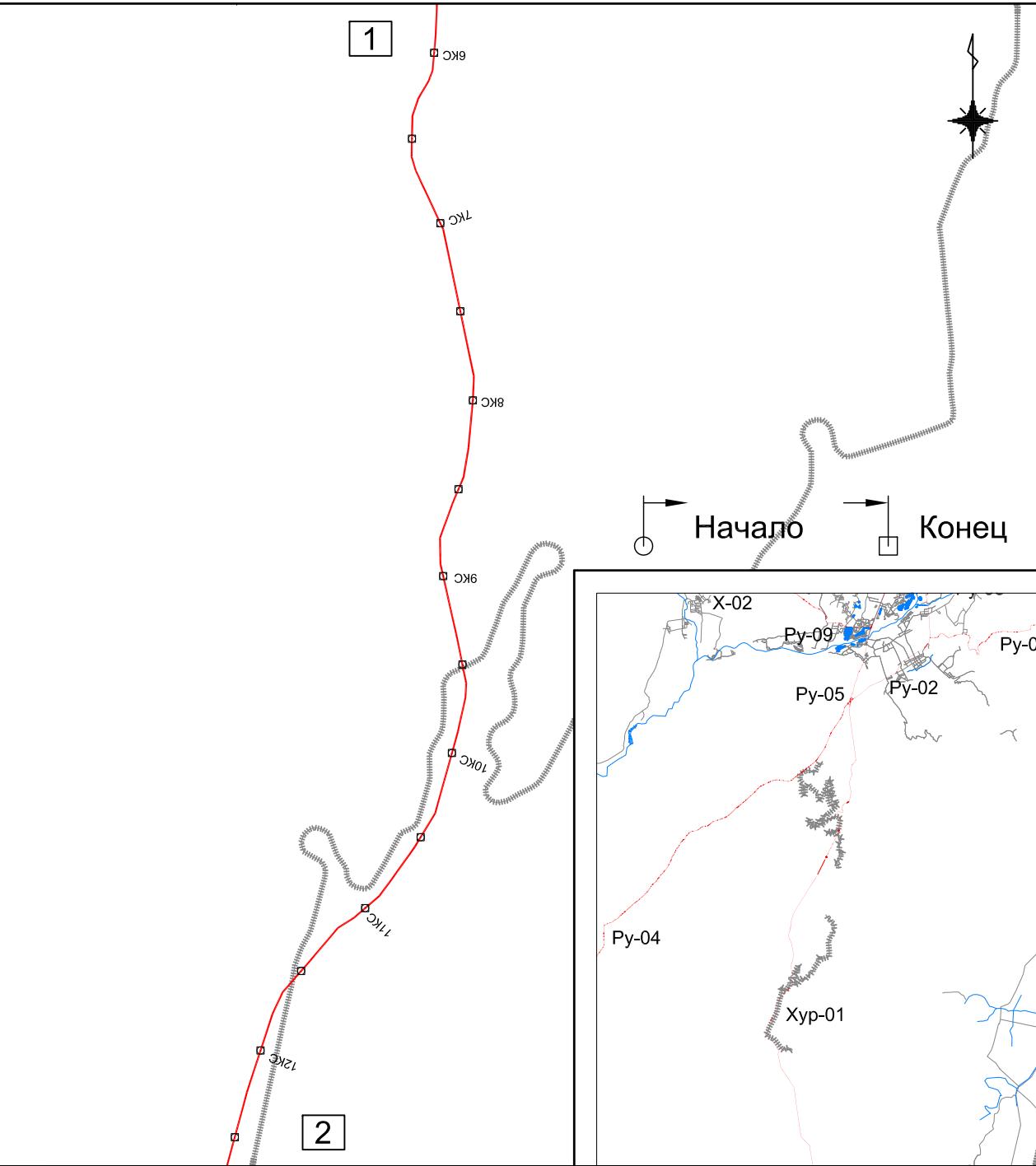
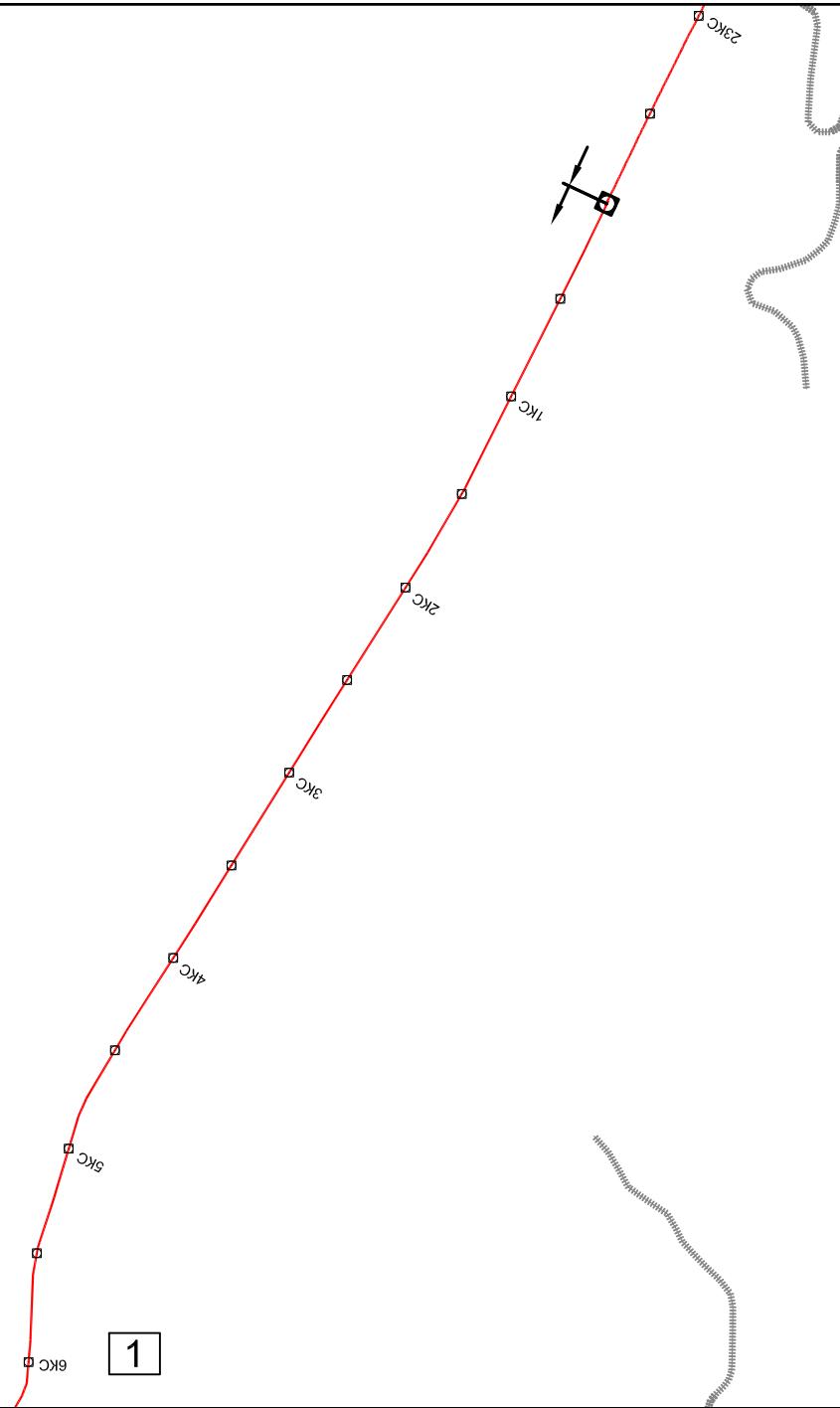


Начало



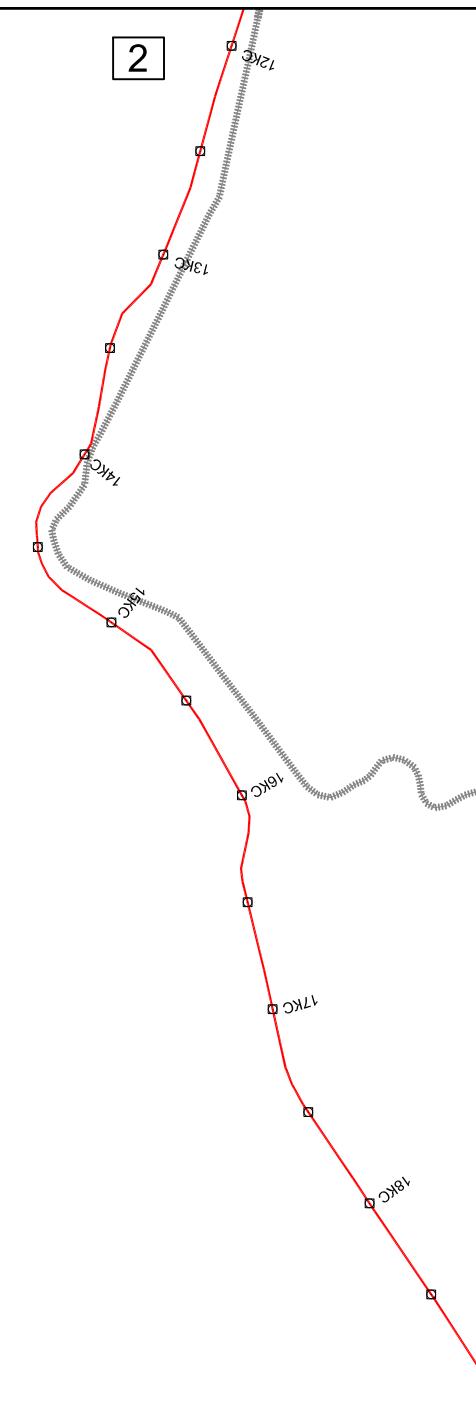
Конец

Хурносон-01(1)

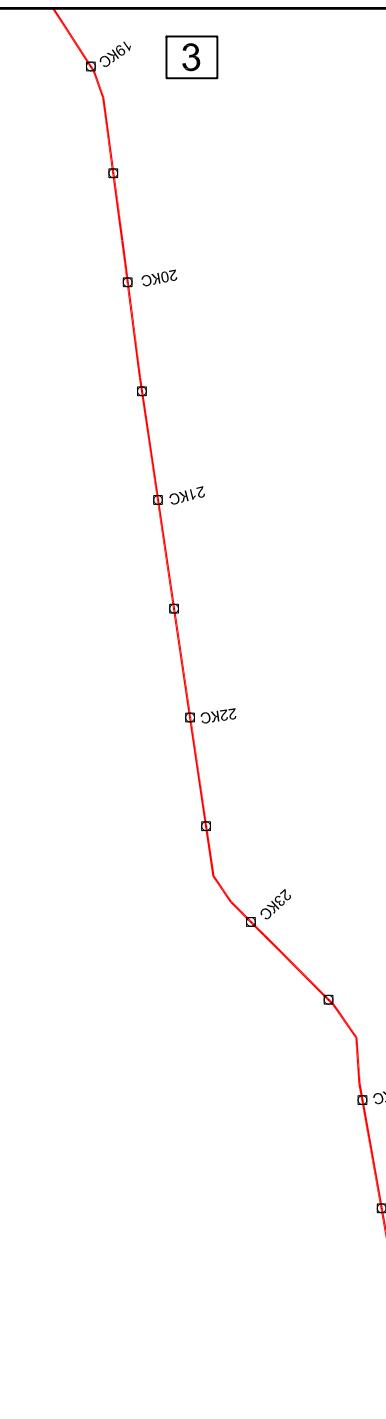


Хурносон-01(2)

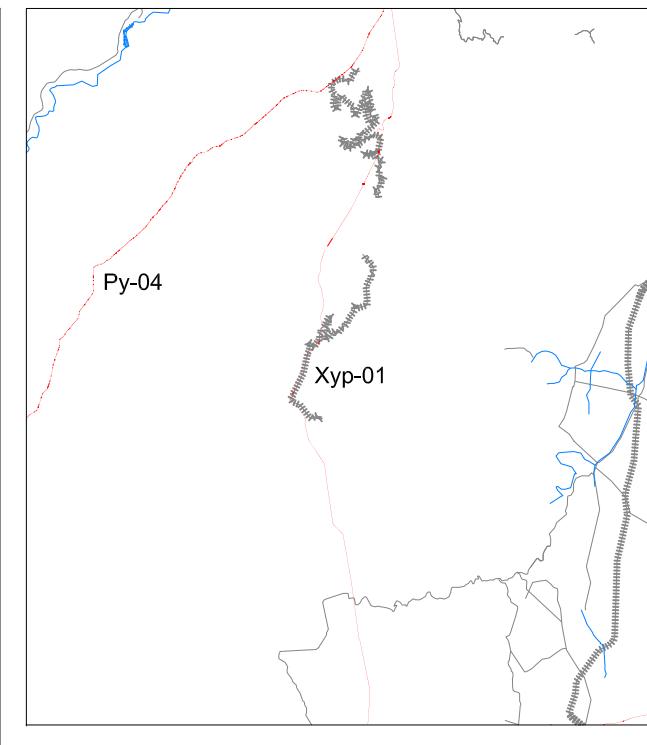
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3



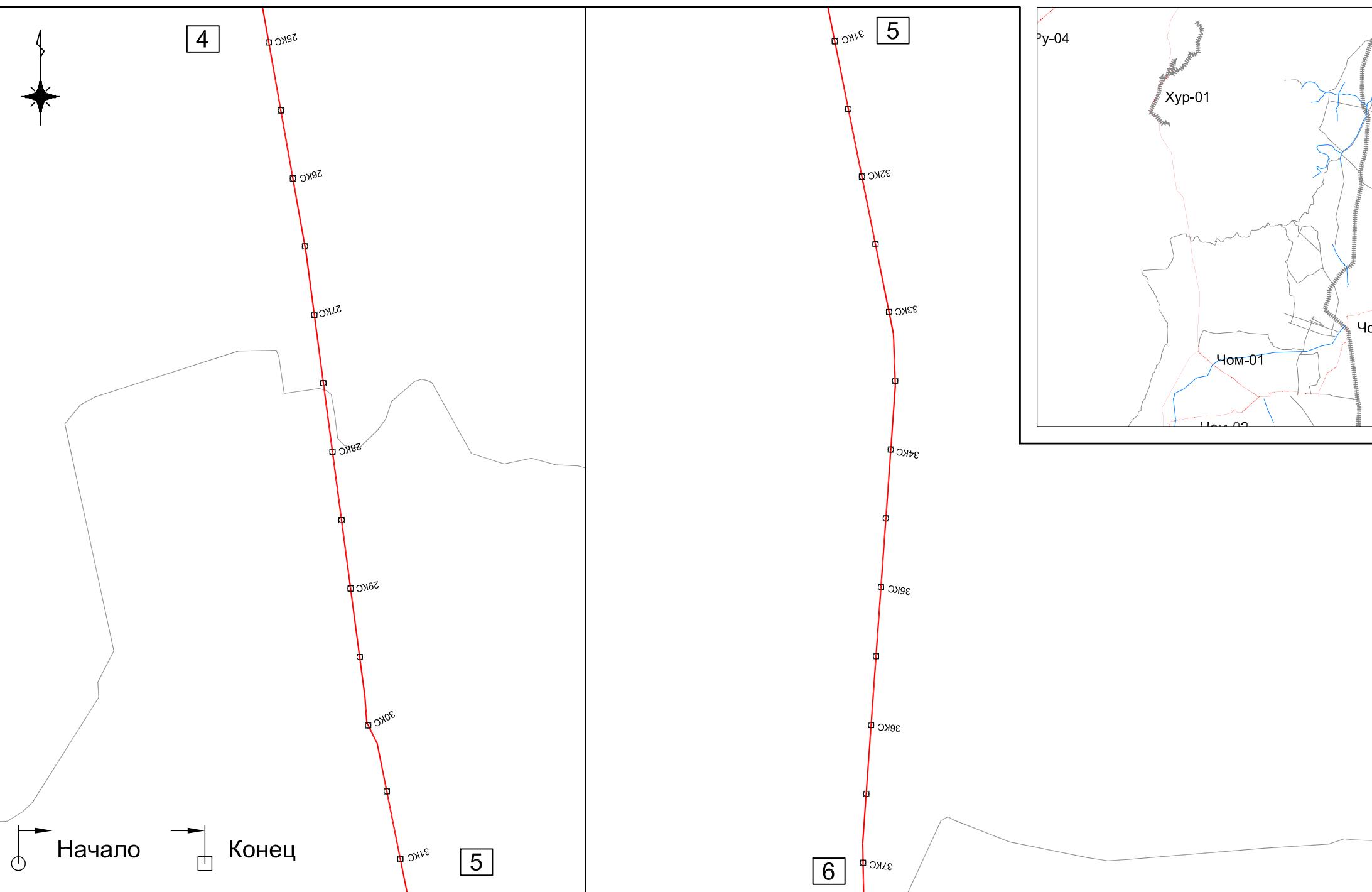
4



Начало

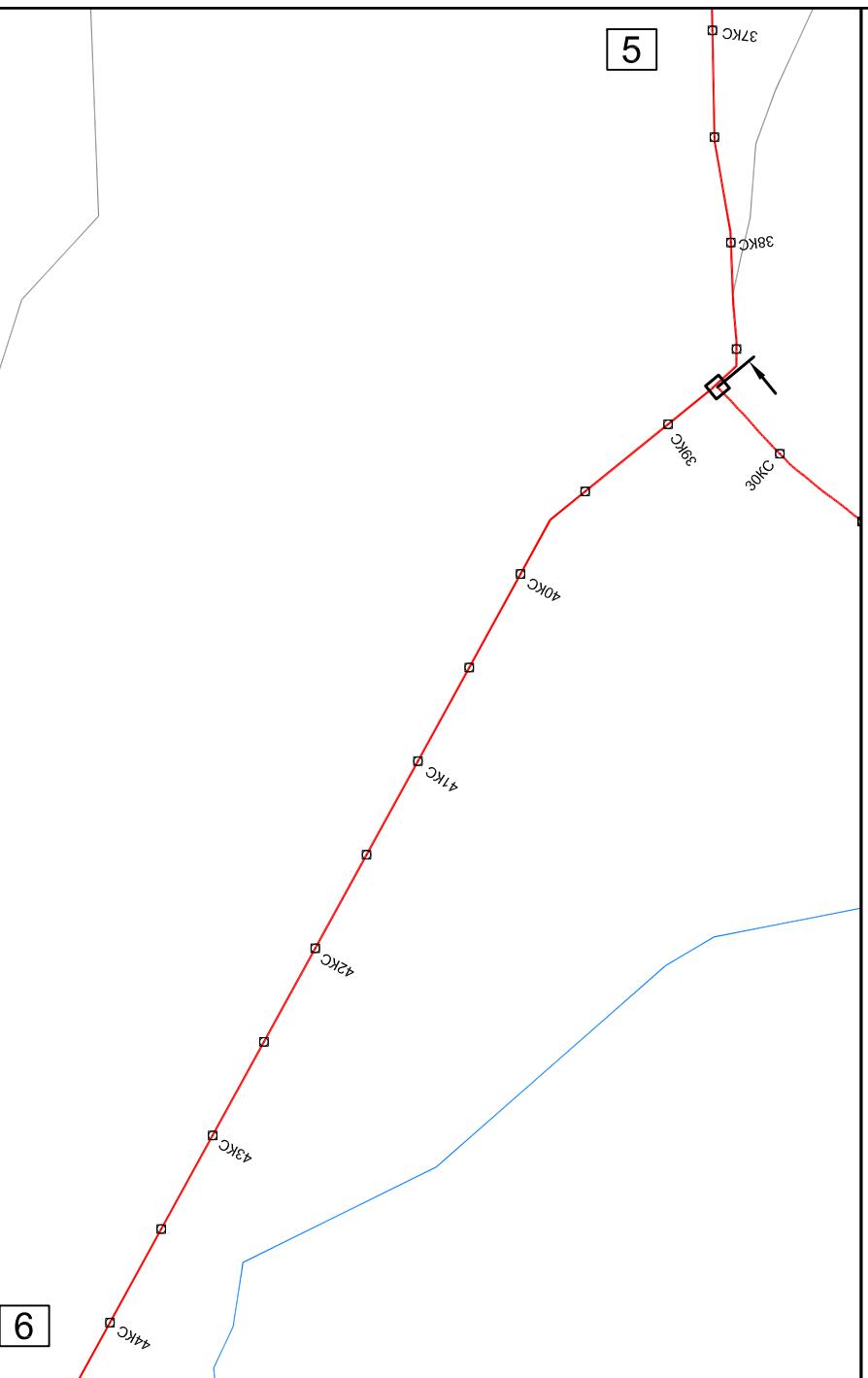
Конец

Хурносон-01(3)

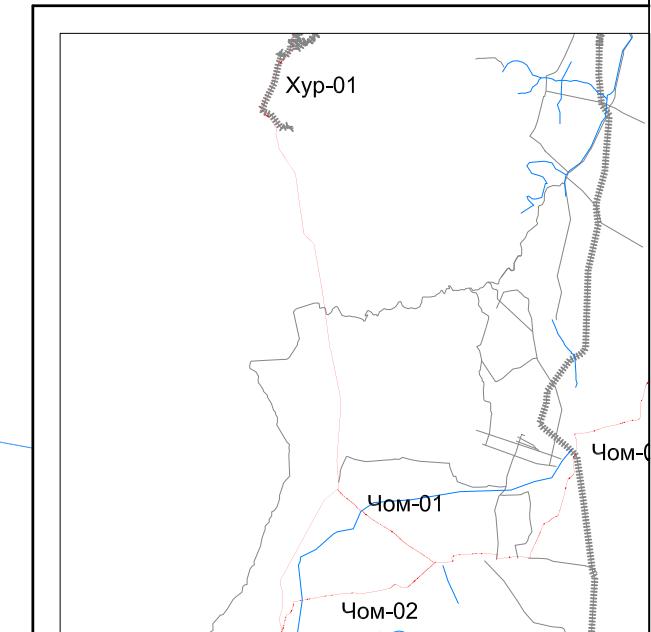
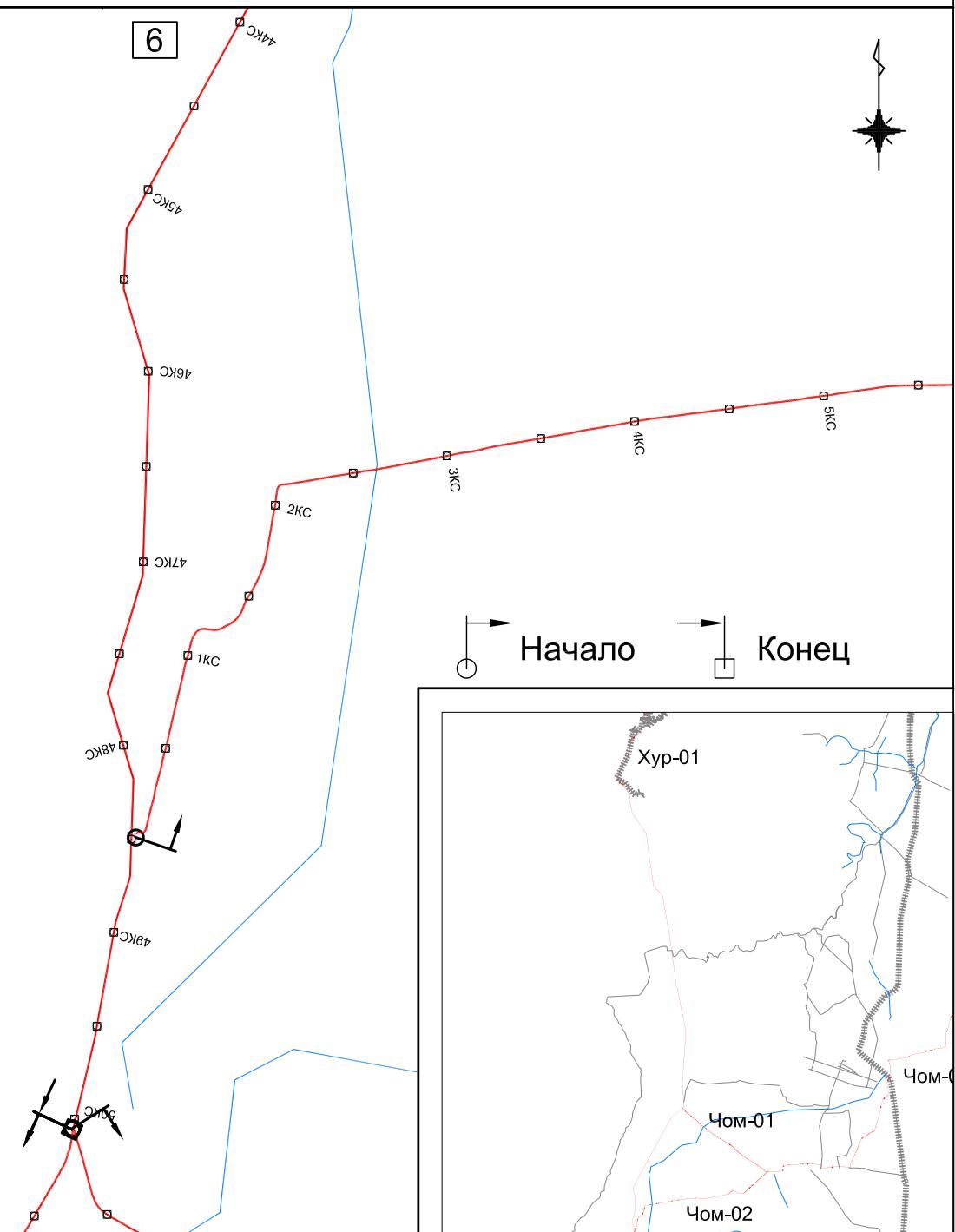


Хурсон-01(4)

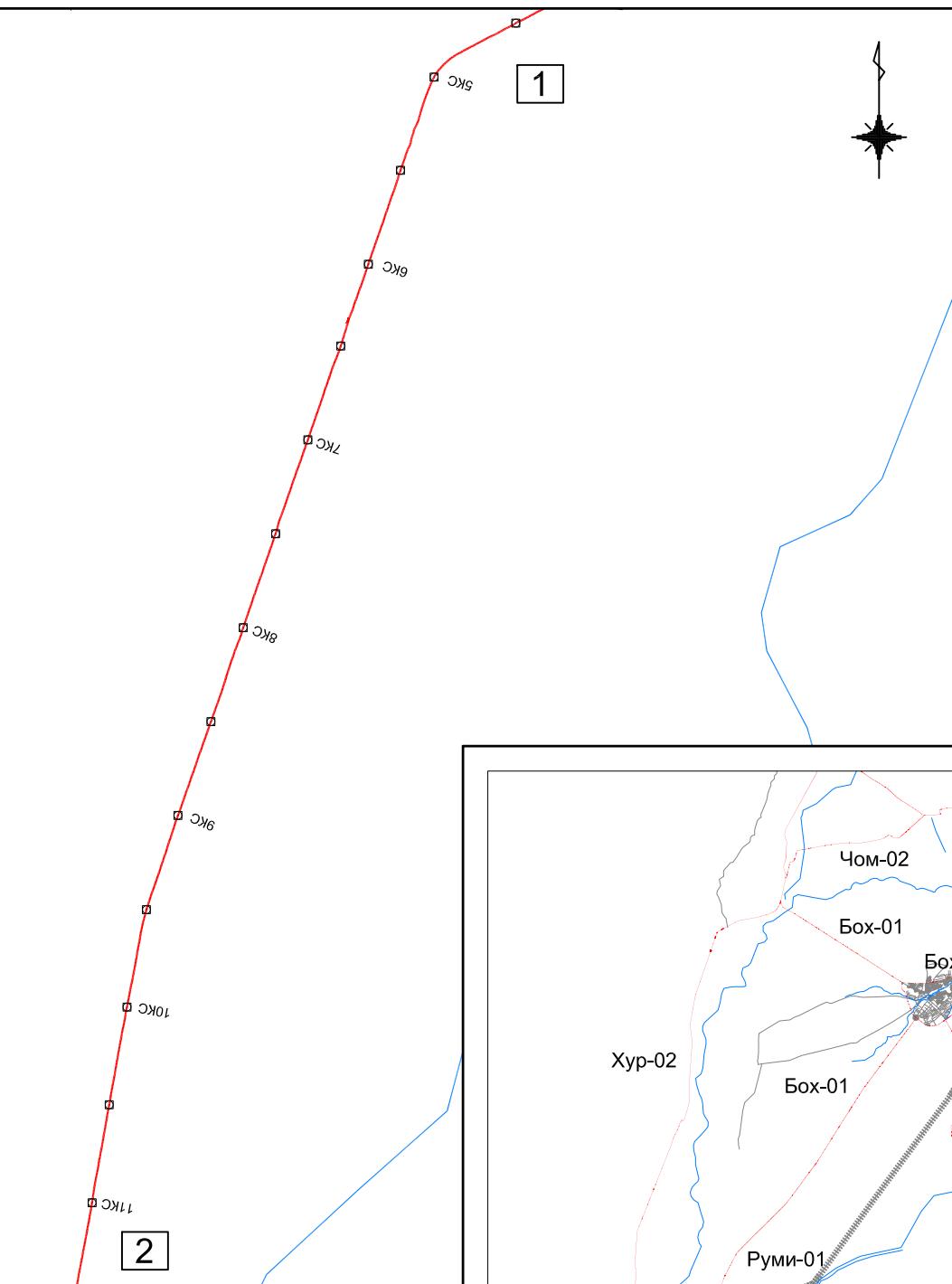
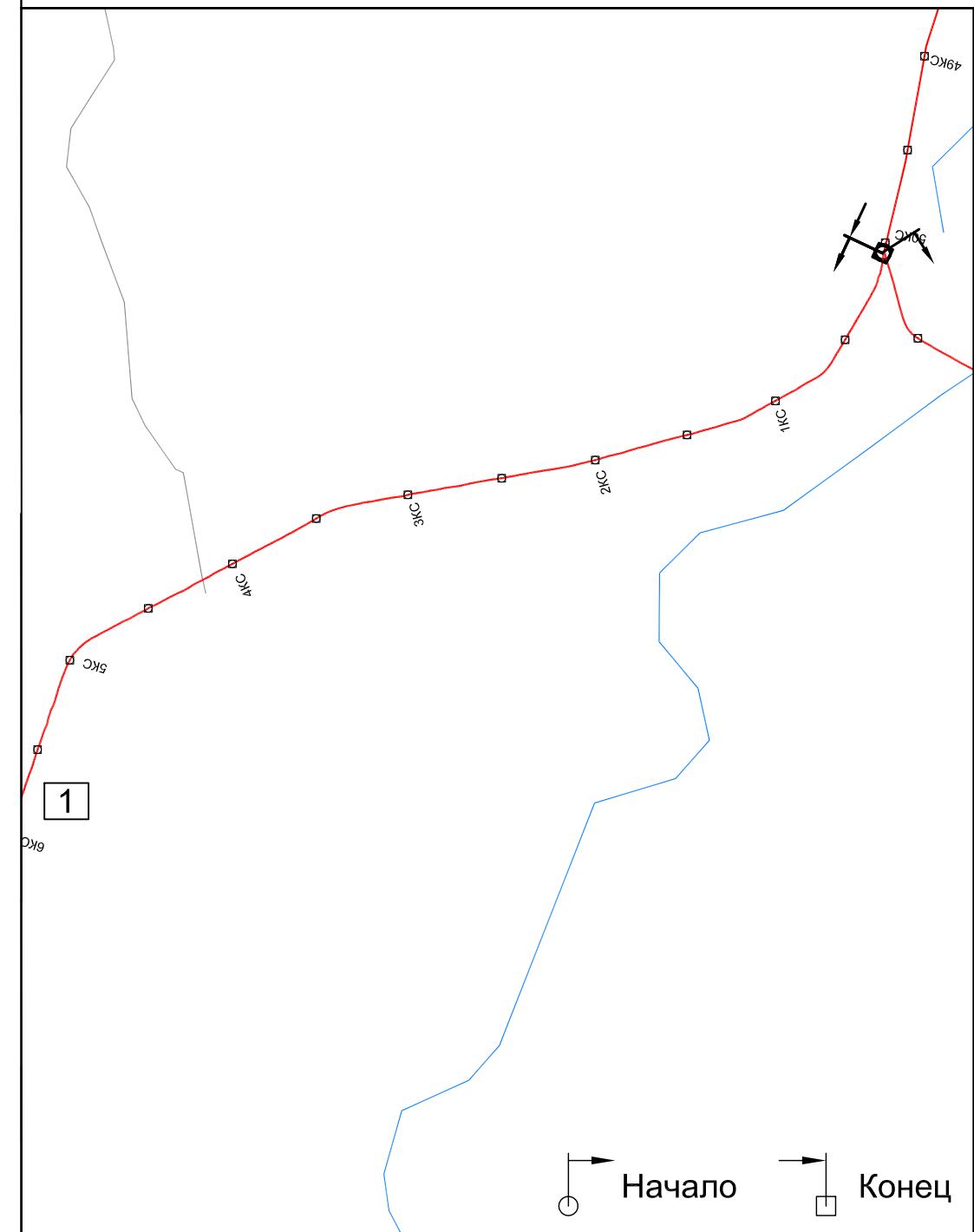
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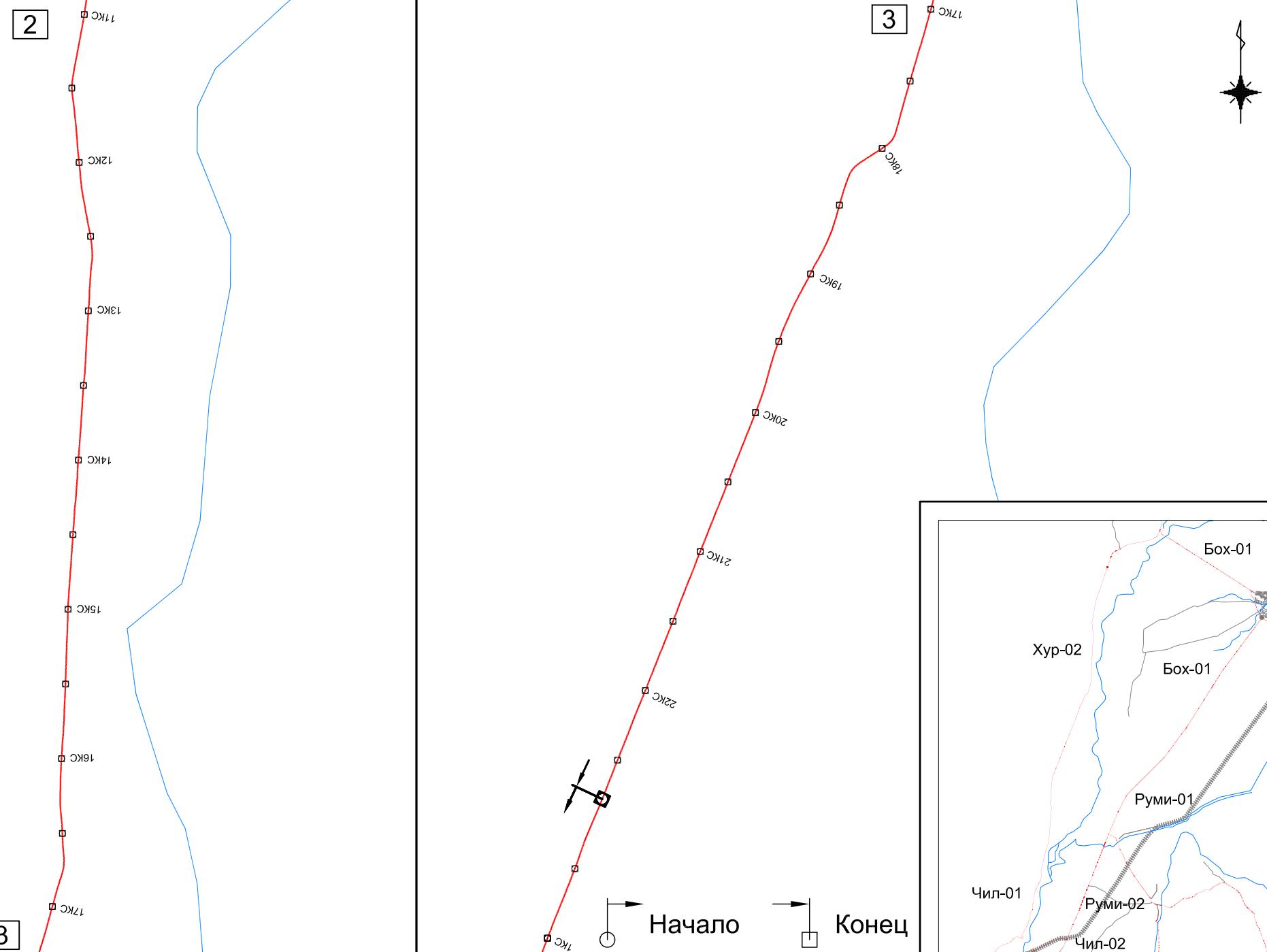
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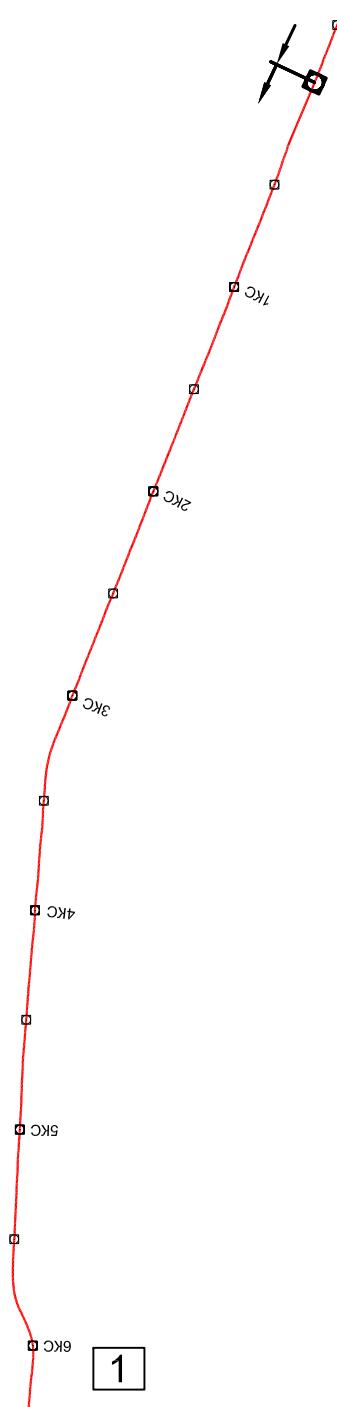
Хурносон-02(1)



Хүрэсэн-02(2)



Чиликул-01(1)



1

1

2

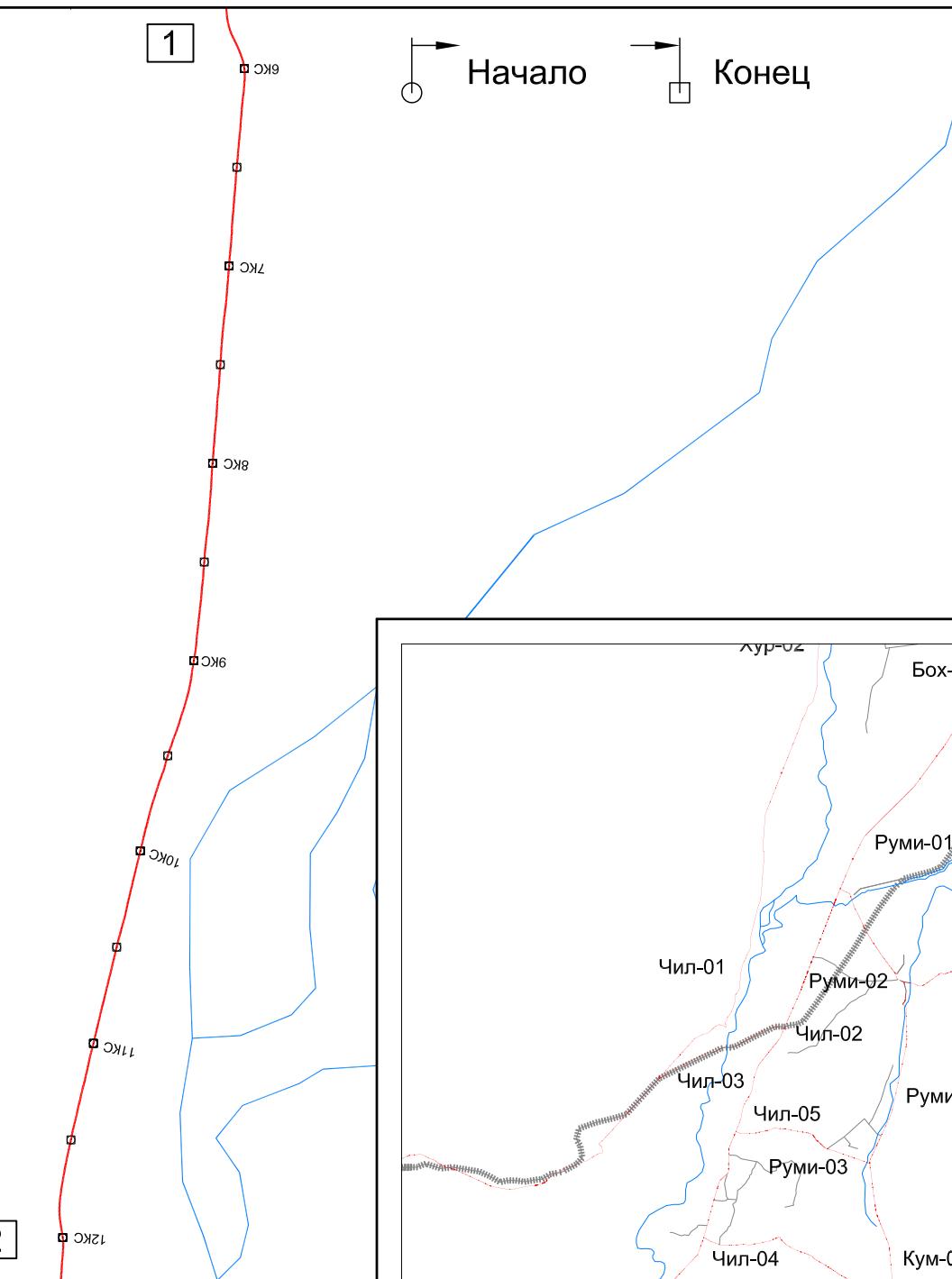
2



Начало



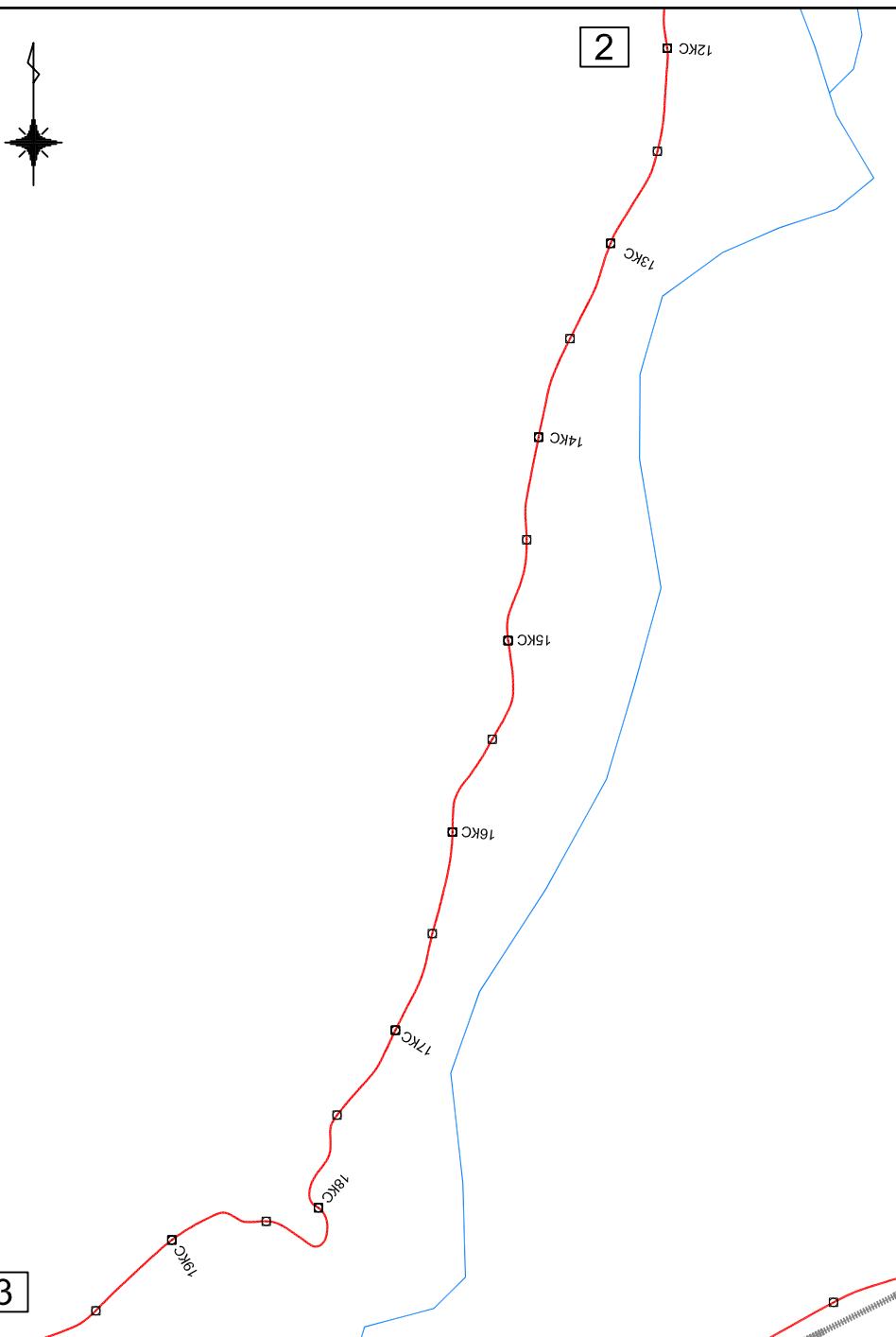
Конец



Чиликул-01(2)



2

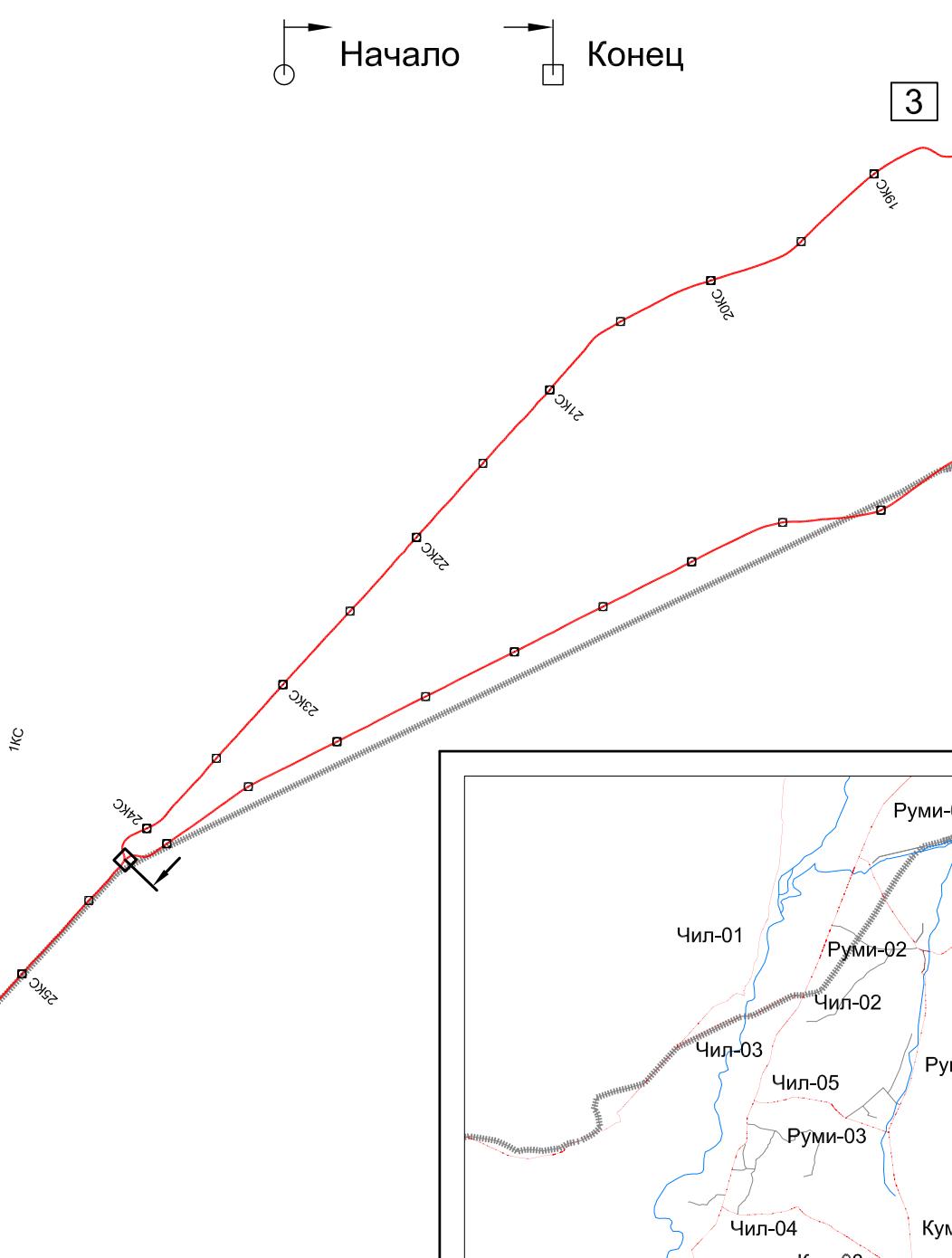


Начало



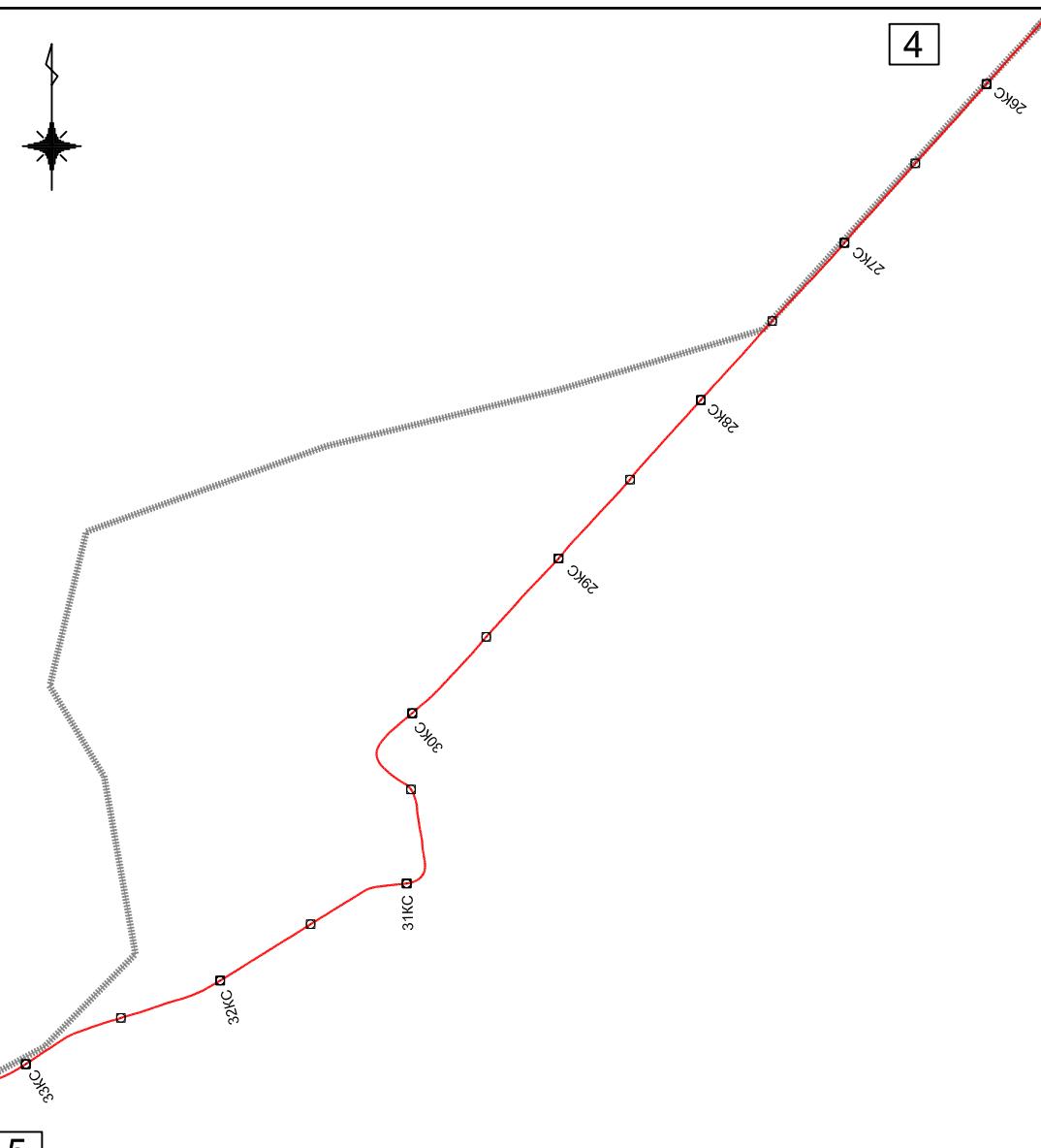
Конец

3



4

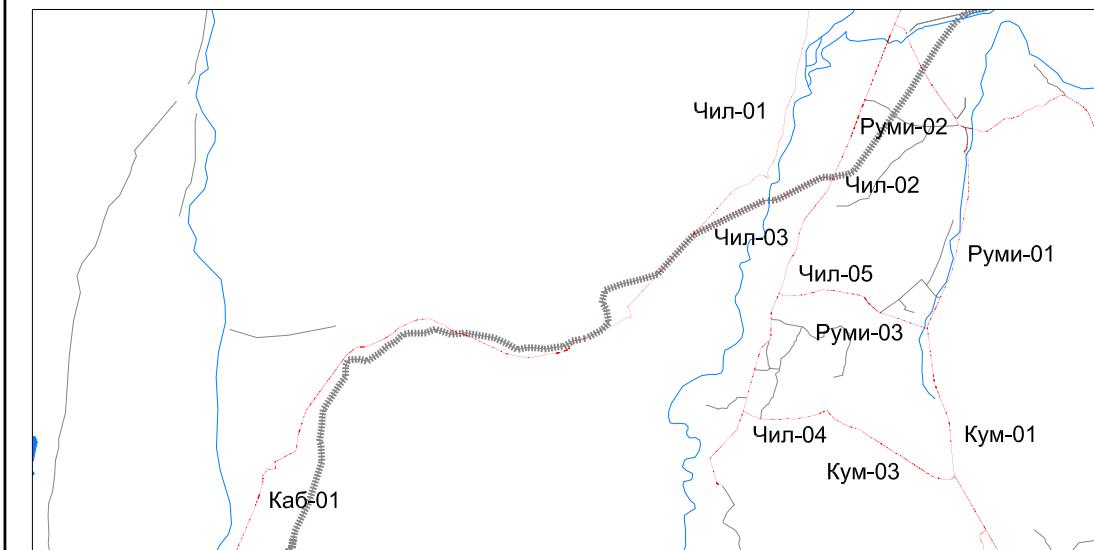
Чиликул-01(3)



4

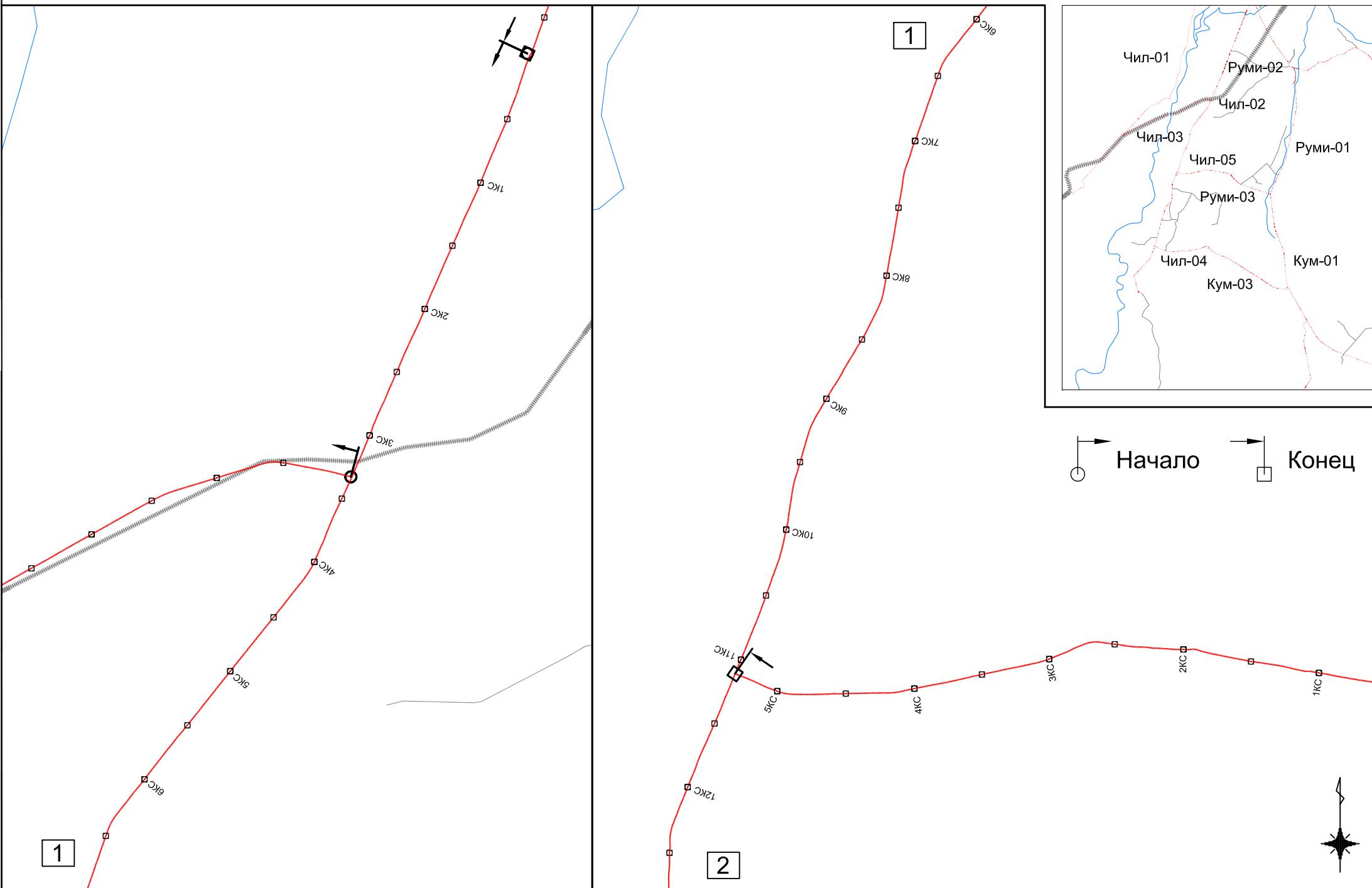


Начало Конец



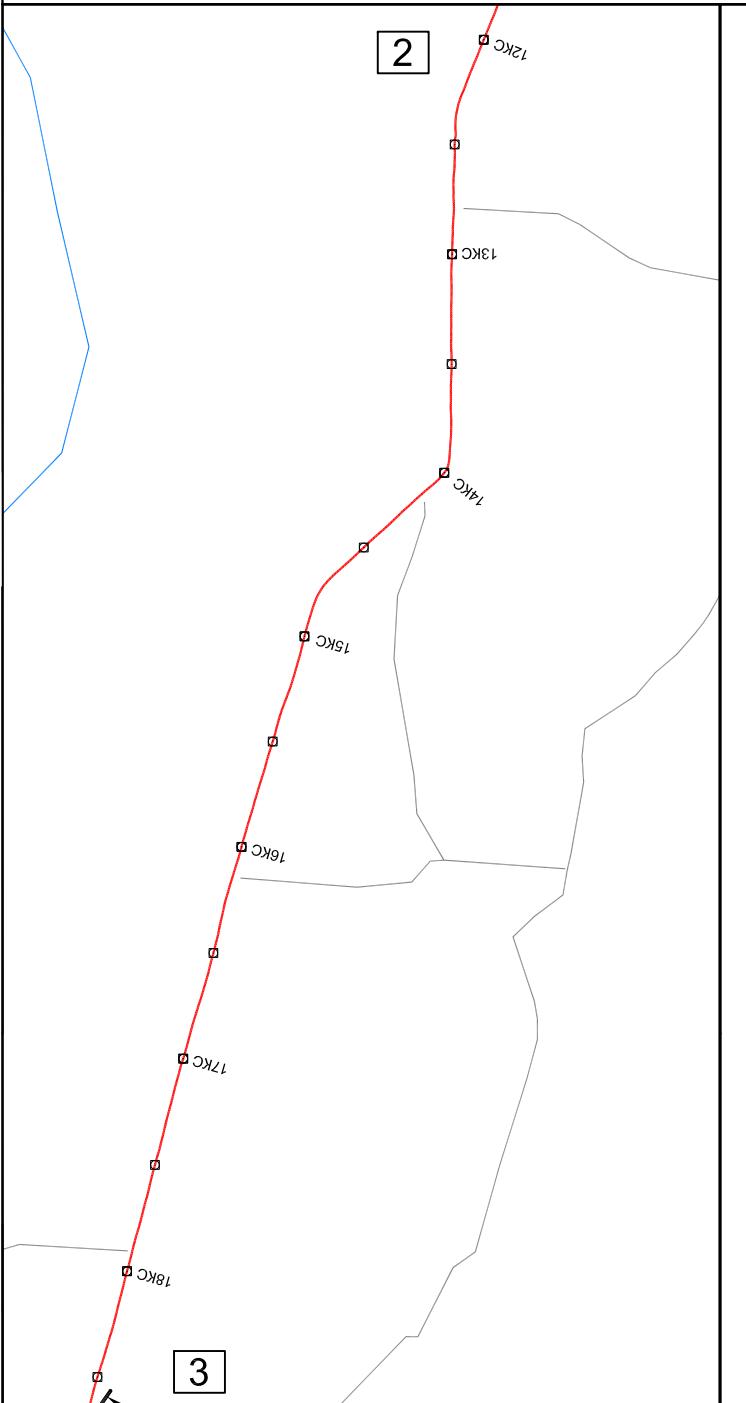
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Чиликул-02(1)

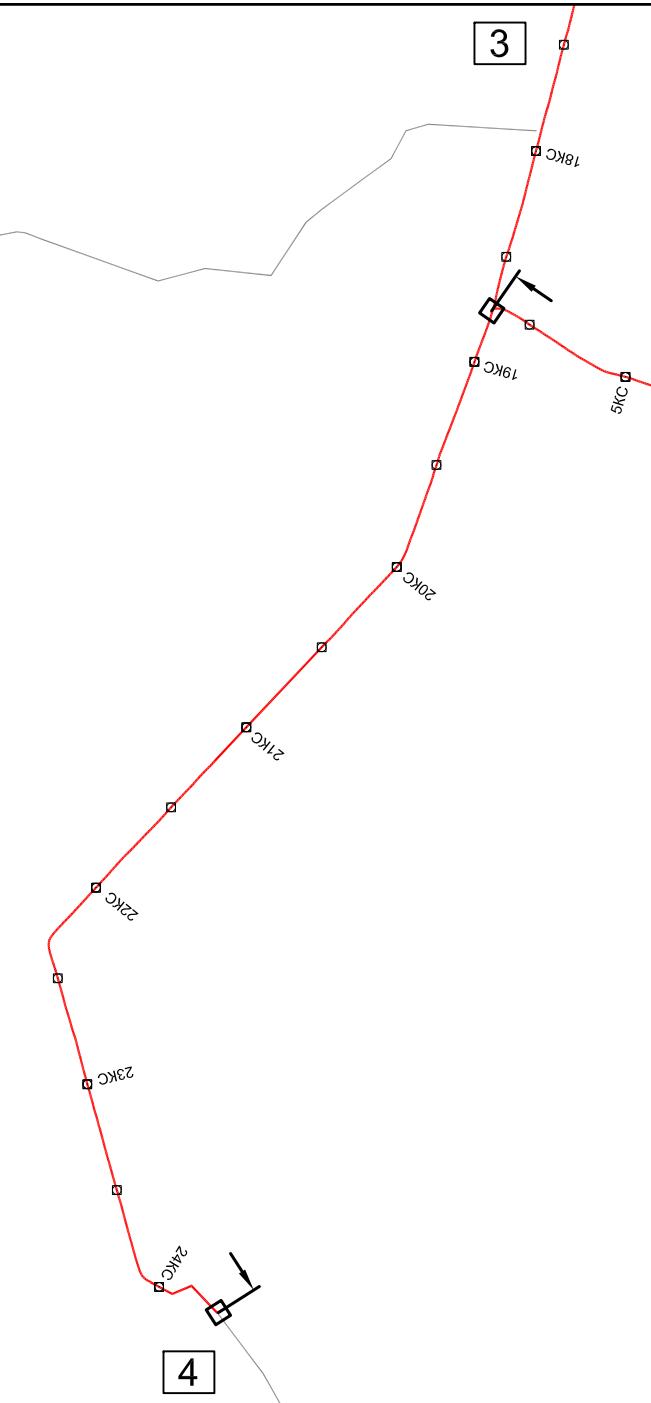


Чиликул-02(2)

2

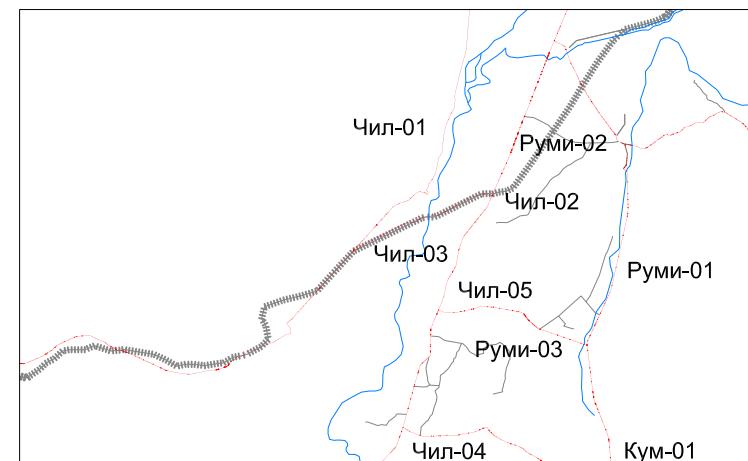


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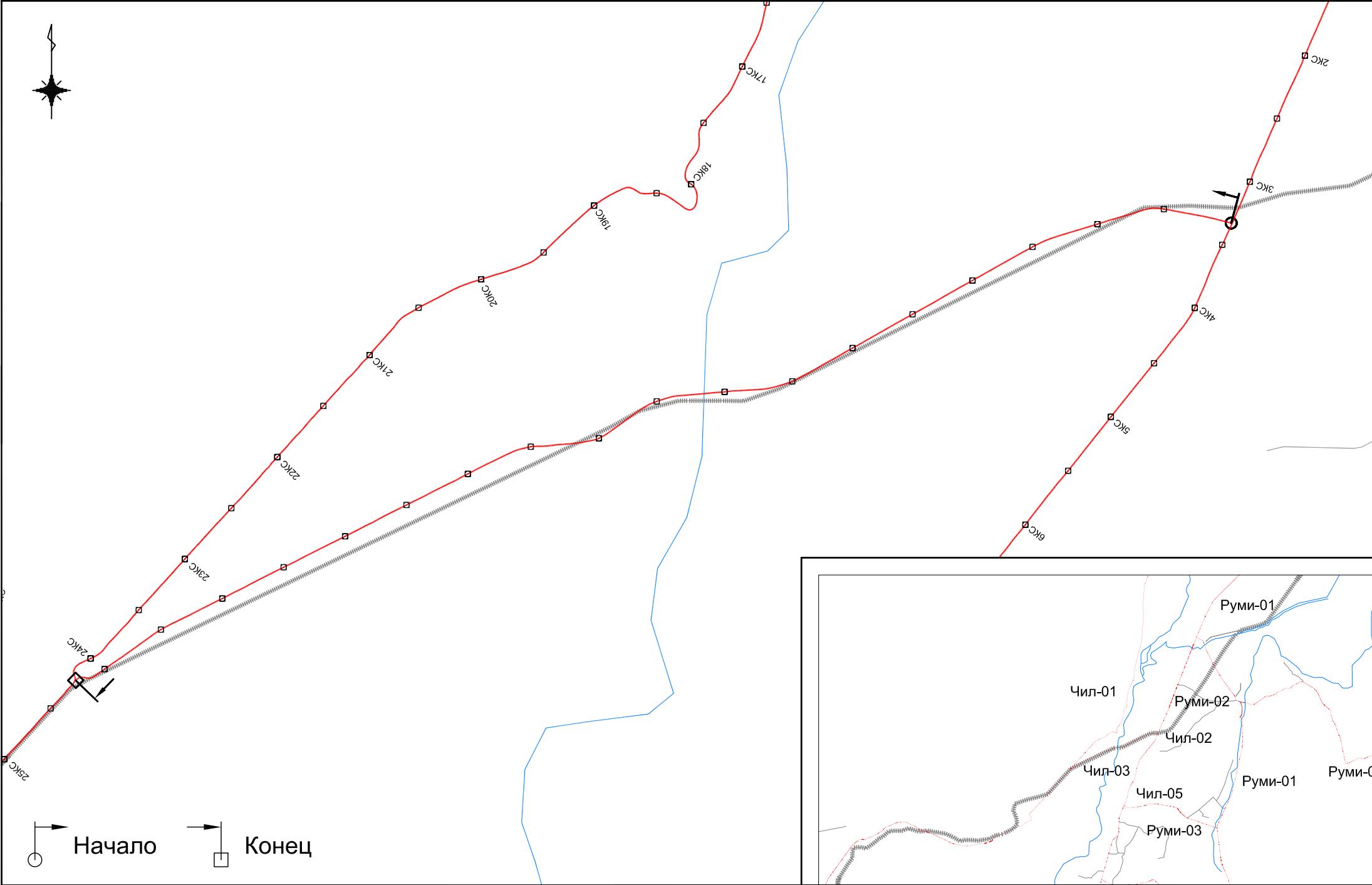


Начало

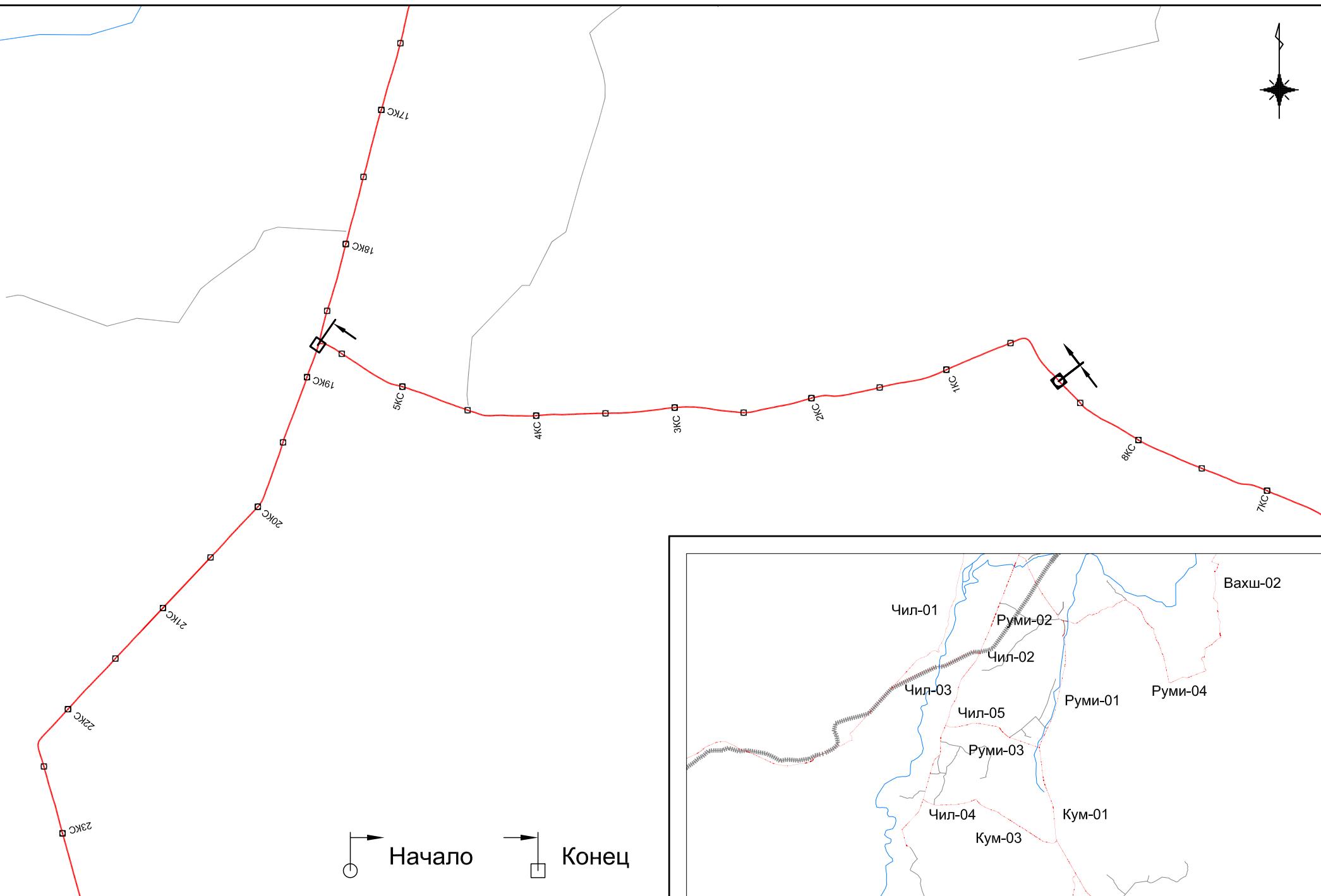
Конец



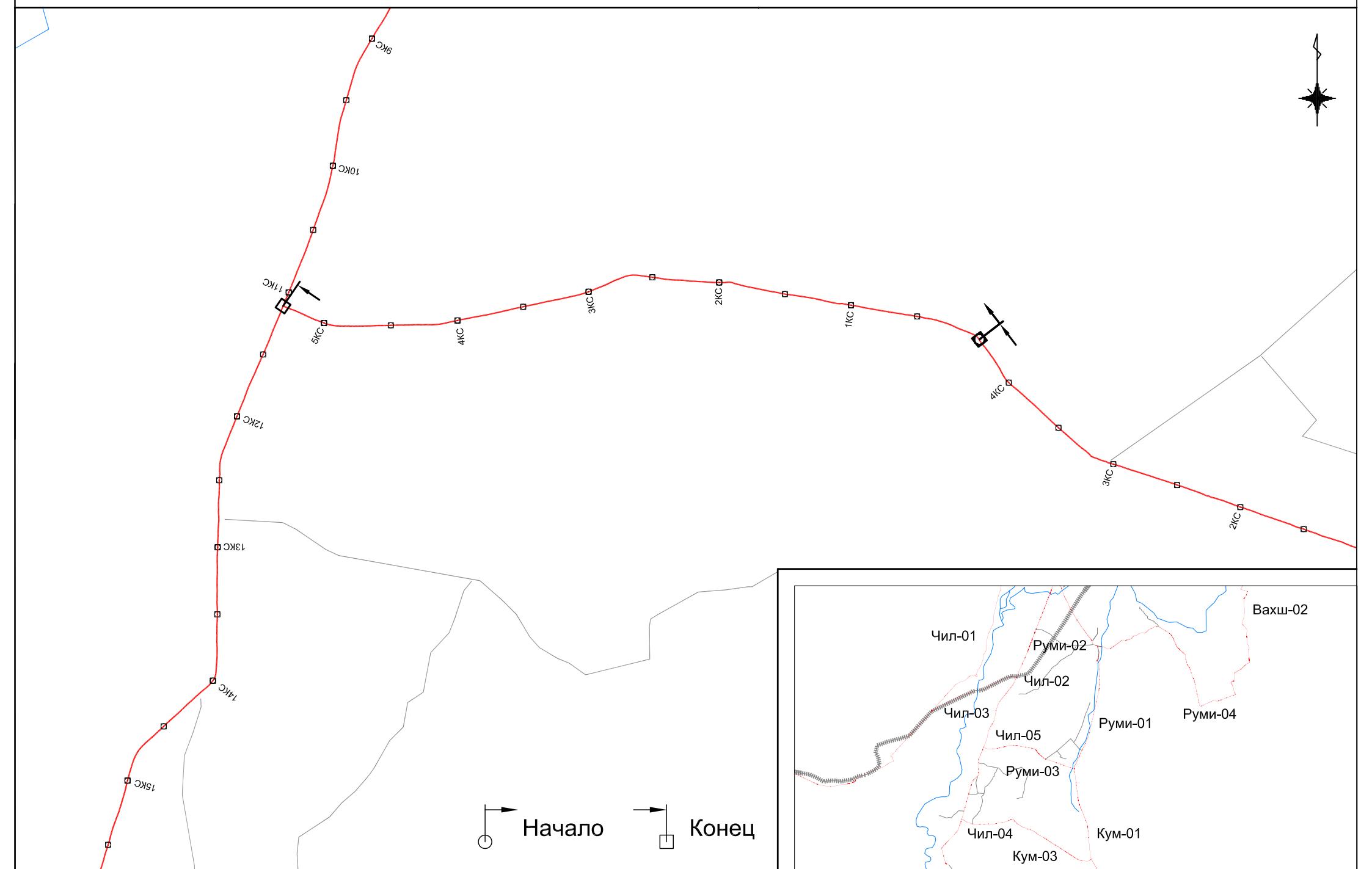
Чиликул-03



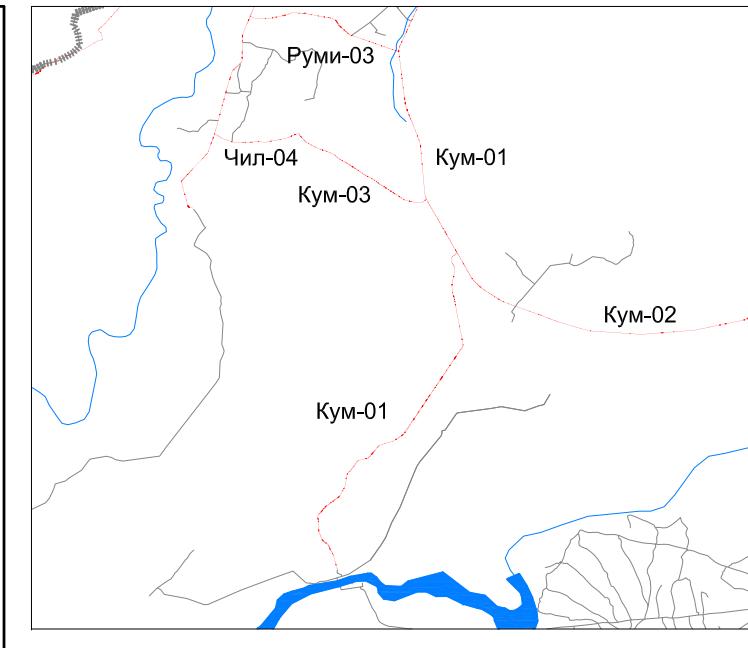
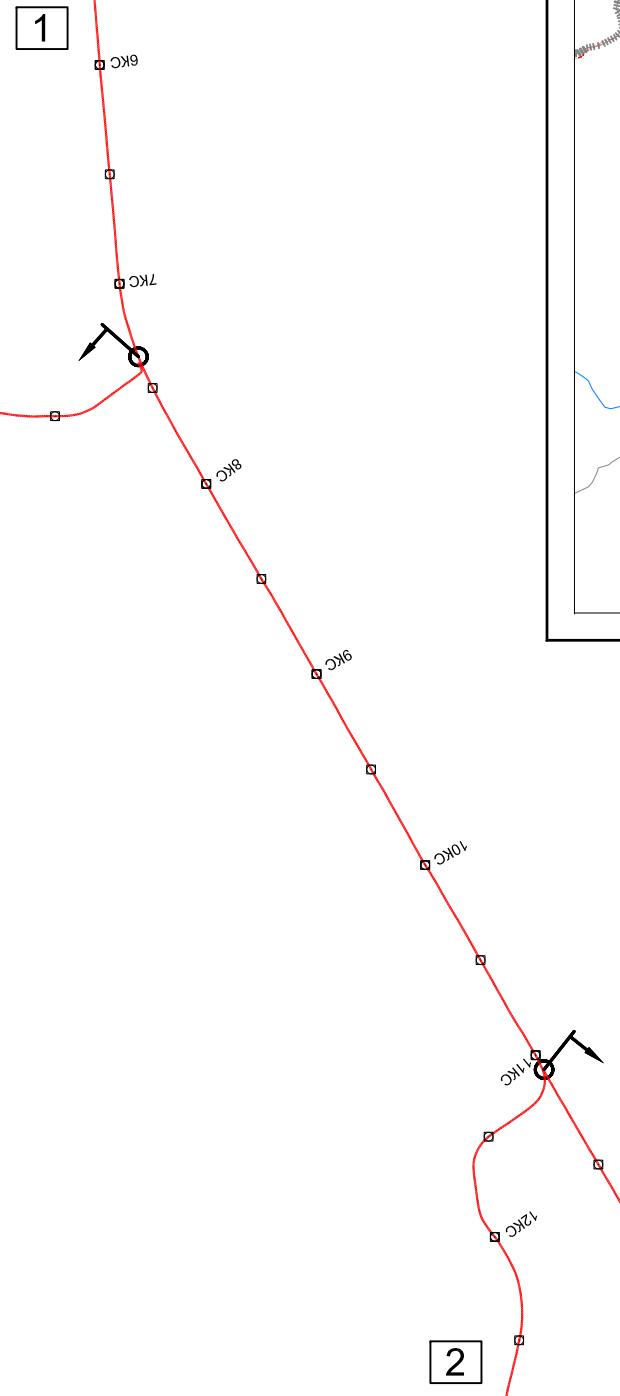
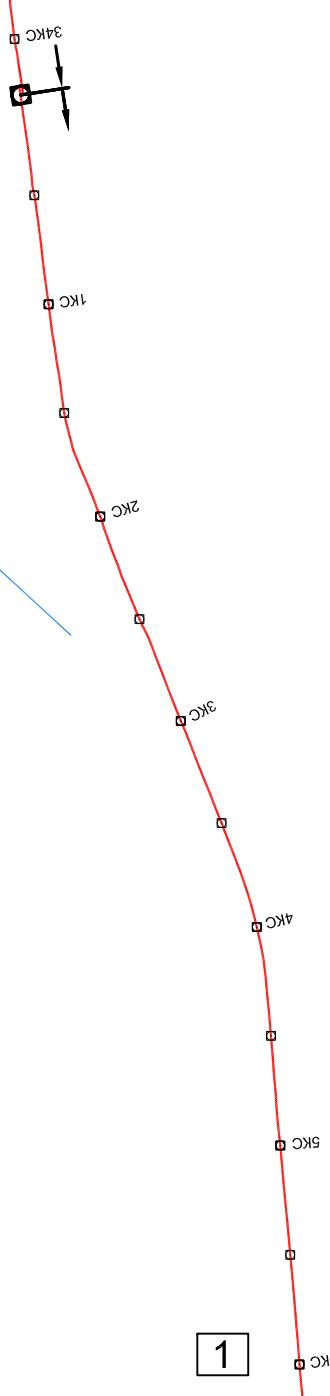
Чиликул-04



Чиликул-05



Кумсангир-01(1)



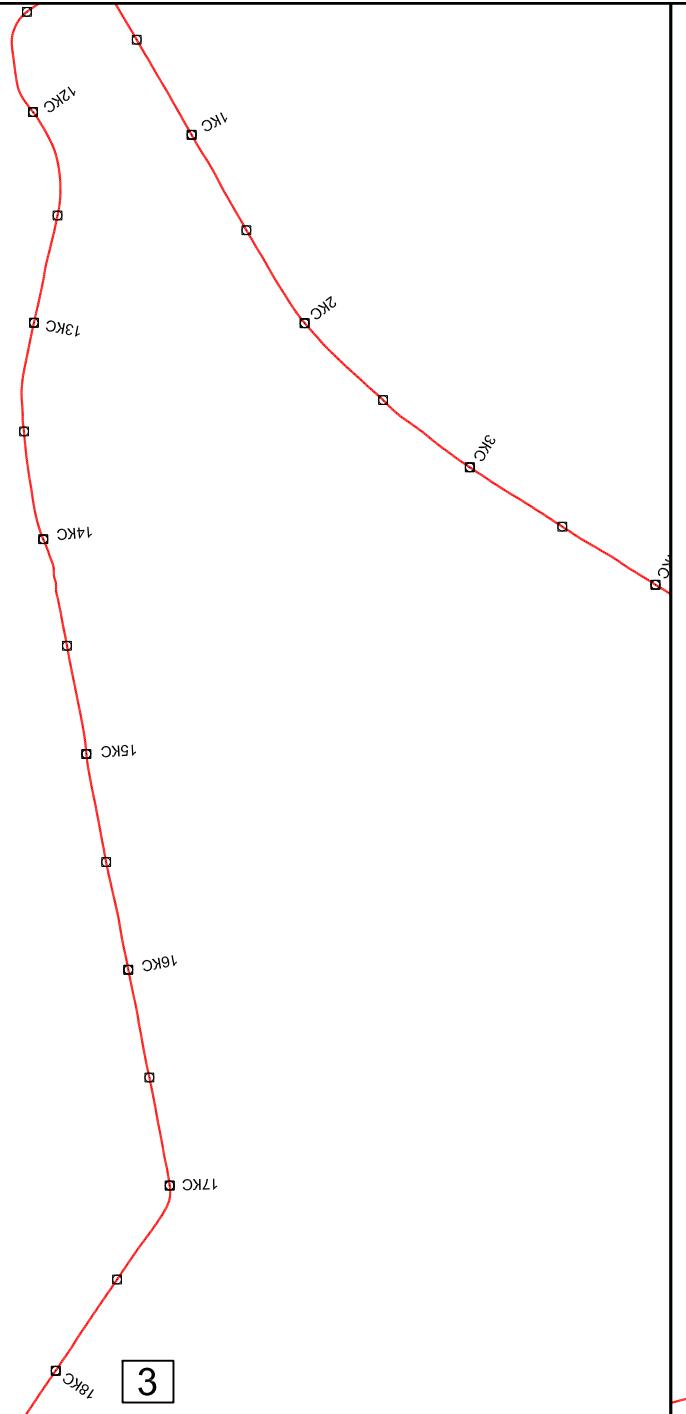
Начало

Конец



Кумсангир-01(2)

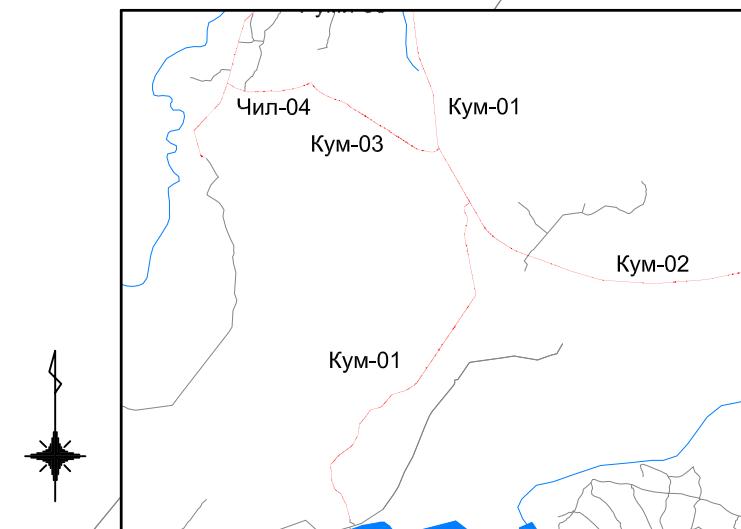
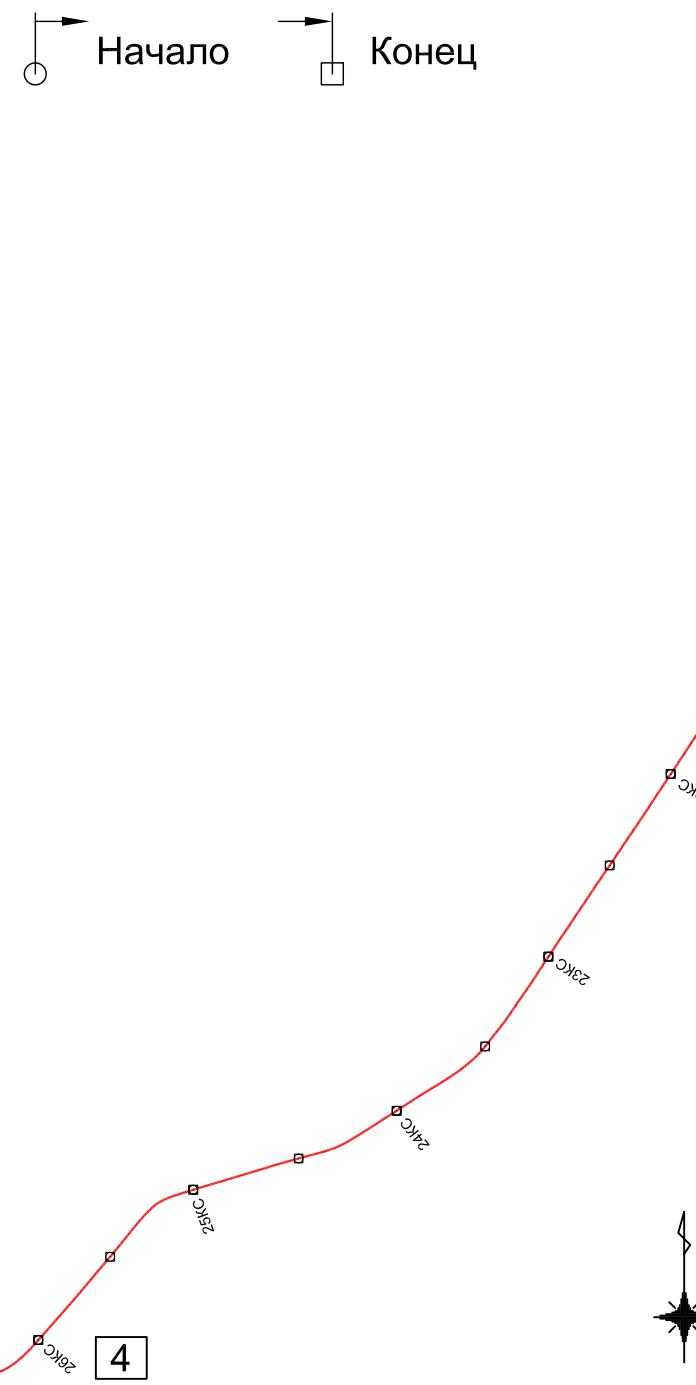
2



3

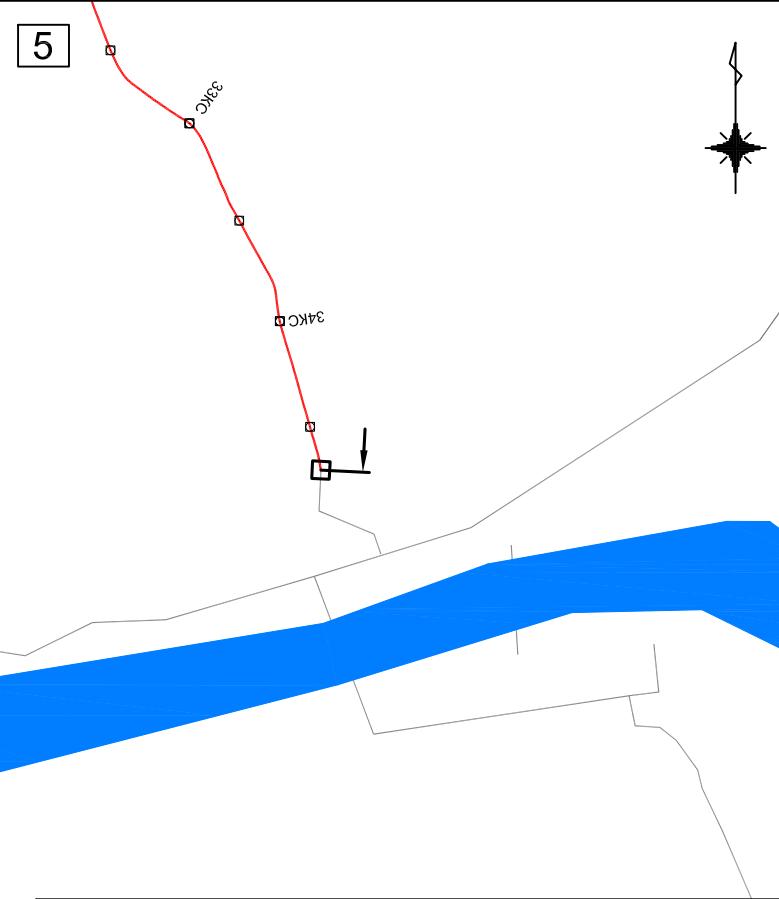
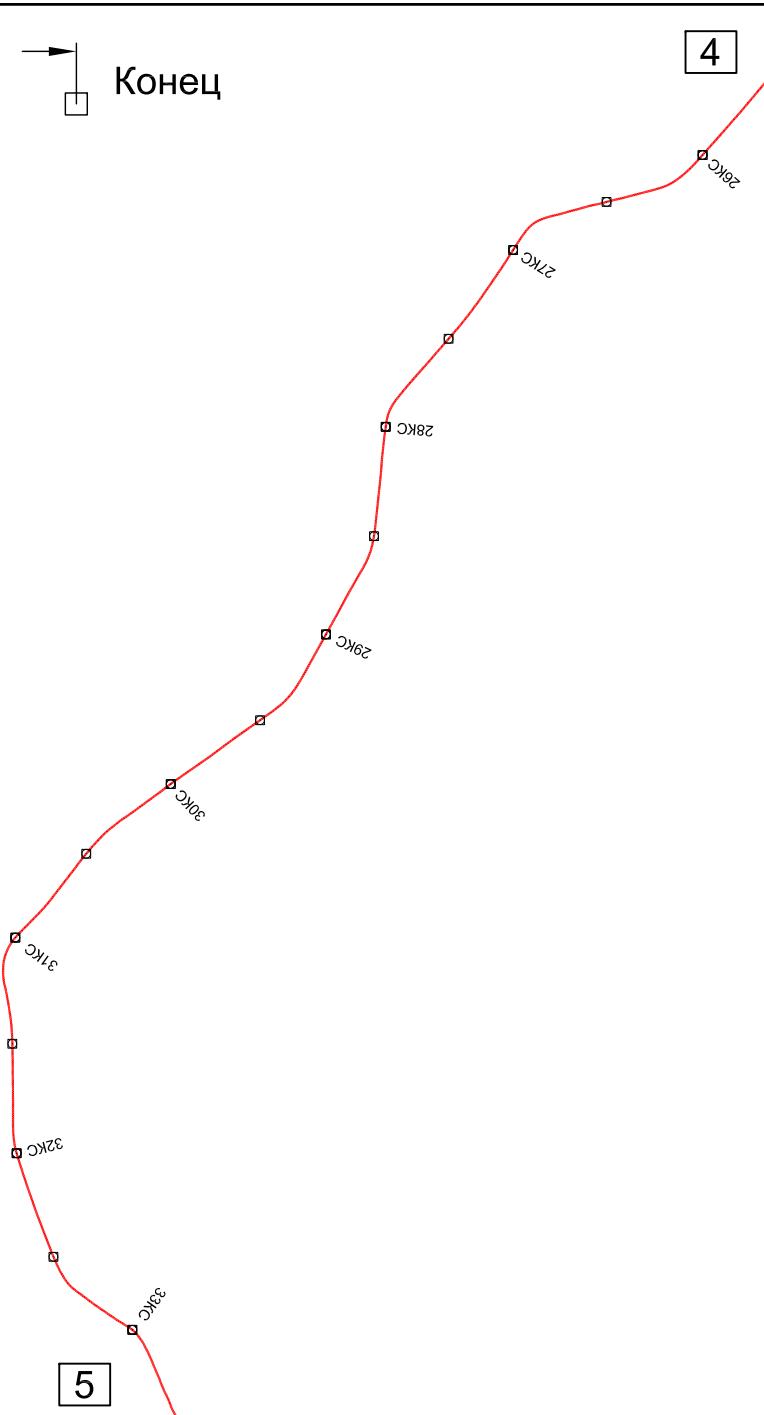
Начало Конец

4

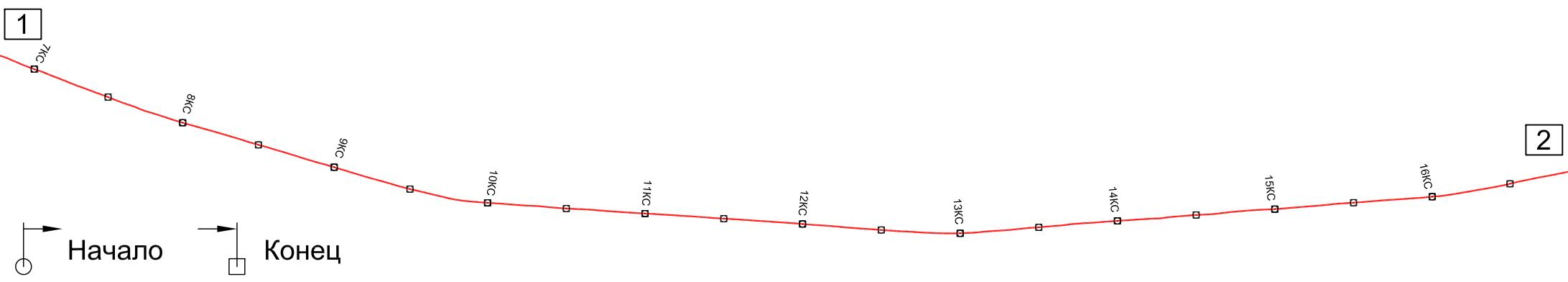
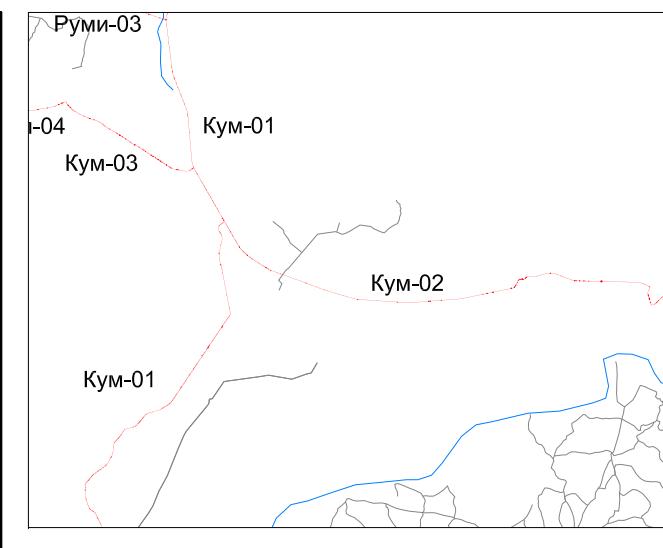
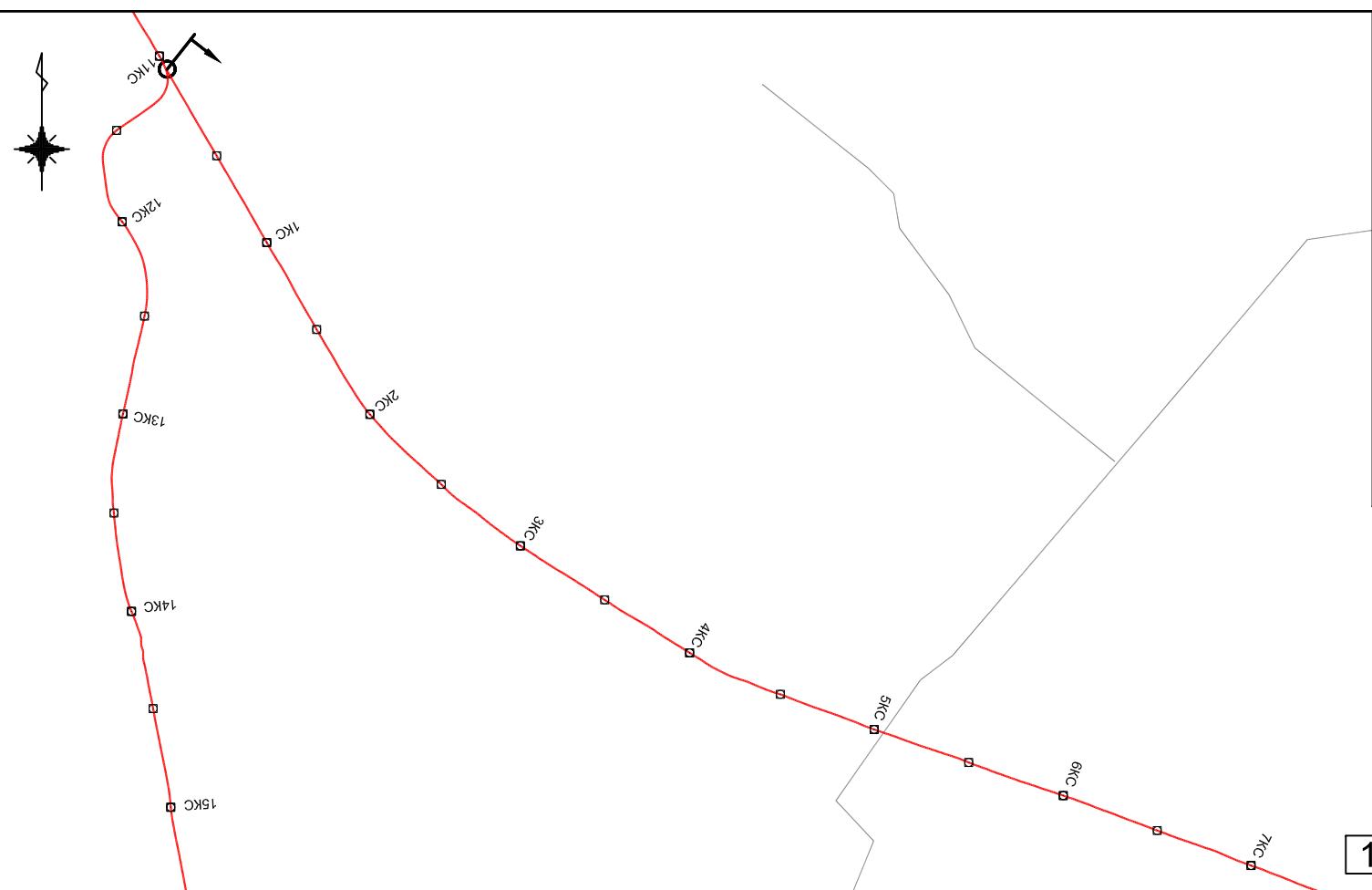


Кумсангир-01(3)

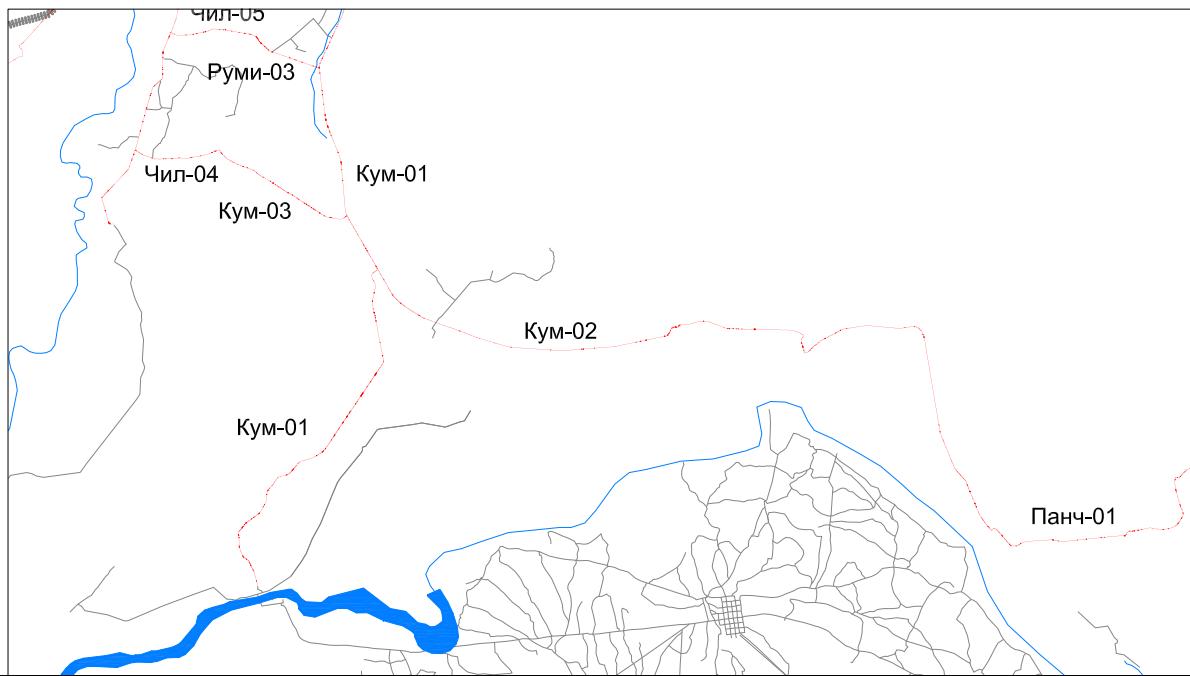
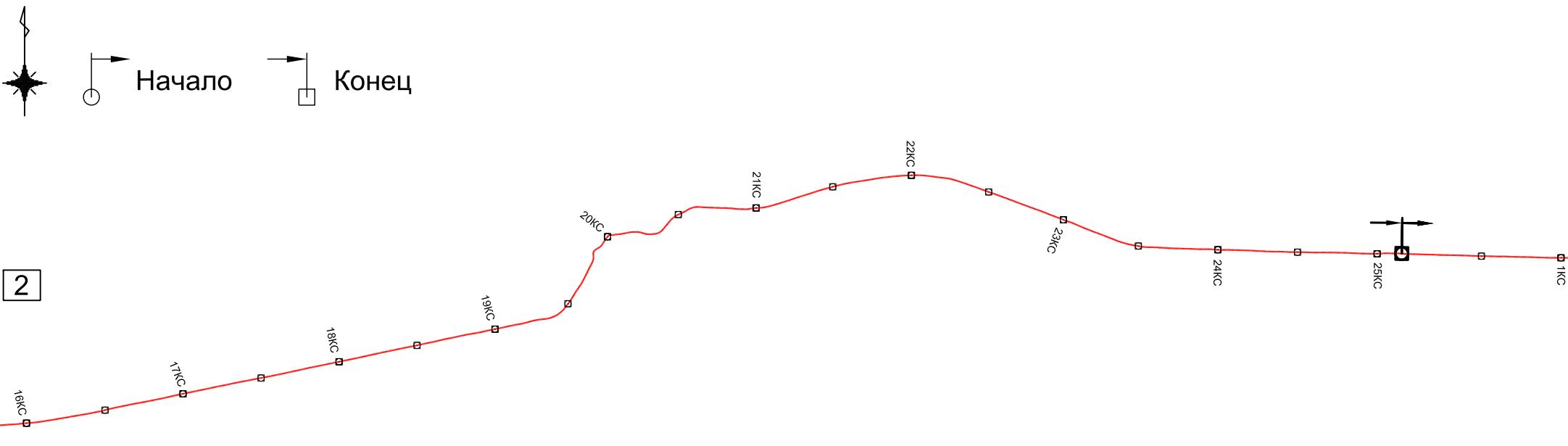
Начало Конец



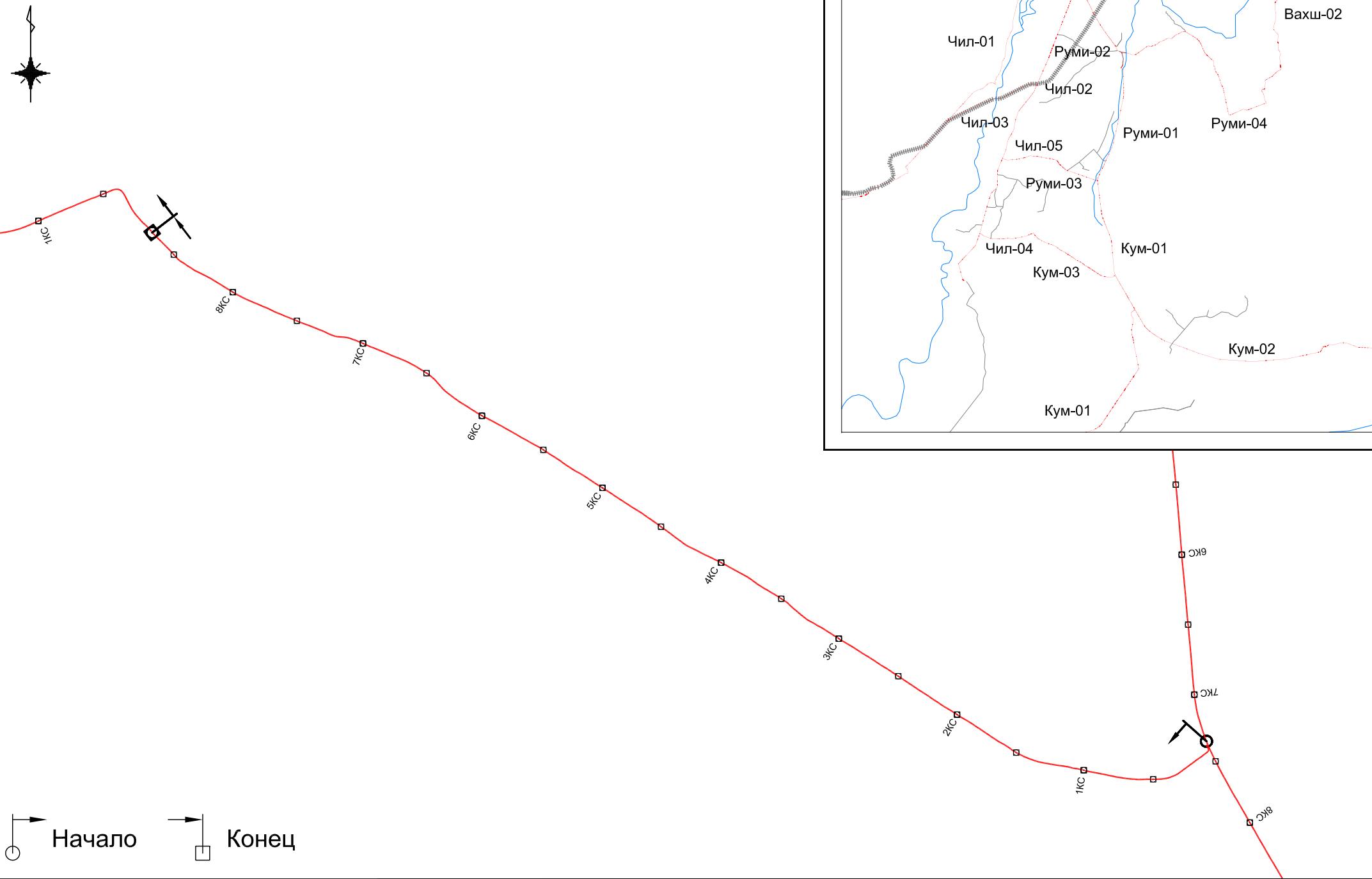
Кумсангир-02(1)



Кумсангир-02(2)



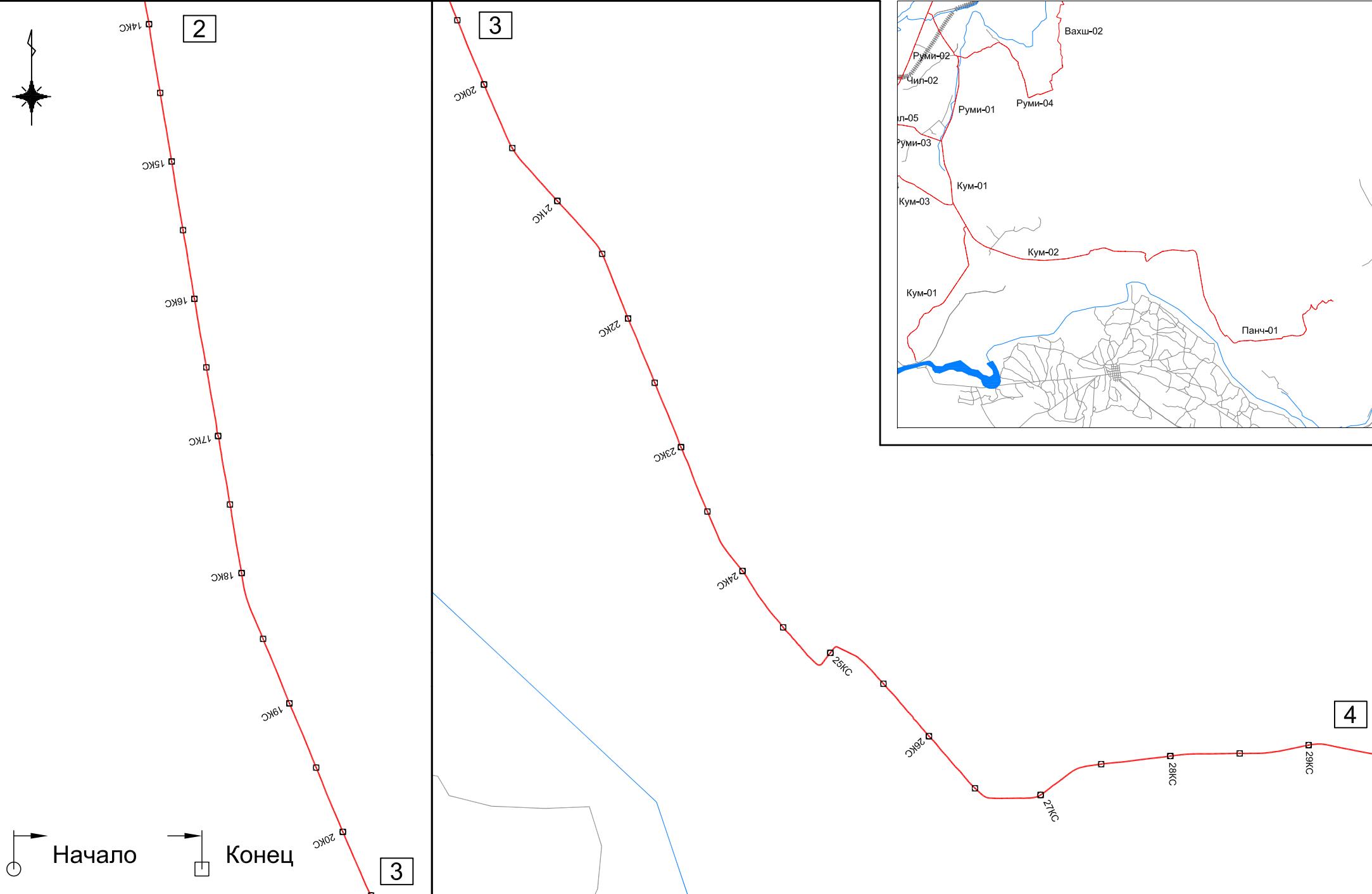
Кумсангир-03



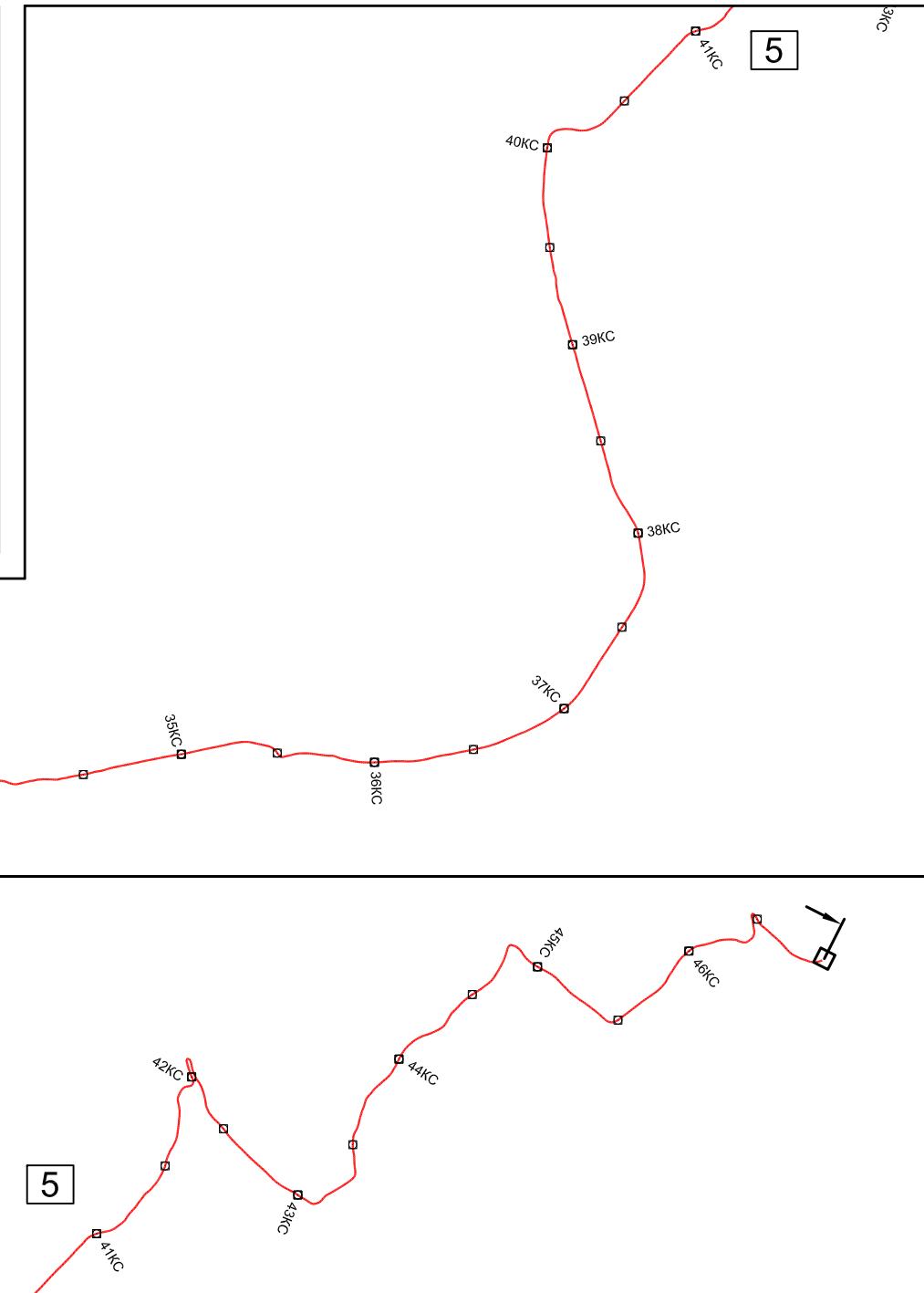
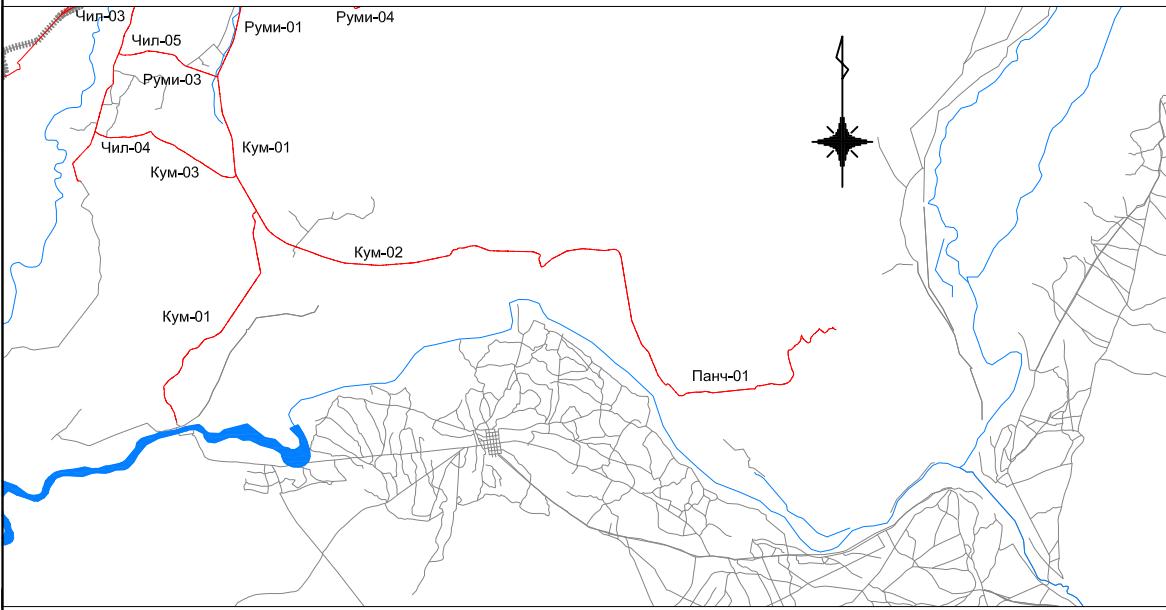
Панч-01(1)



Панч-01(2)



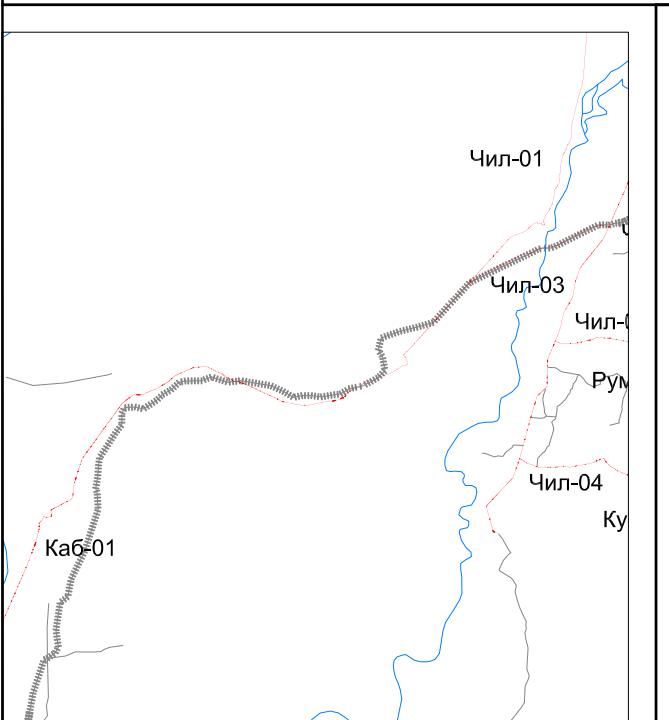
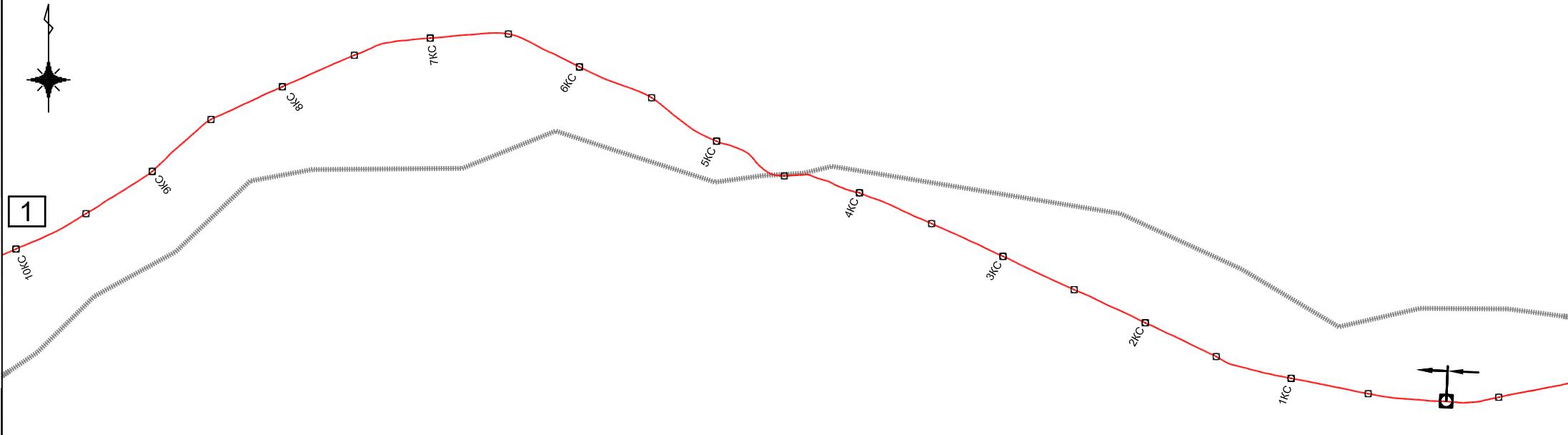
Панч-01(3)



Начало

Конец

Кабодиён-01(1)

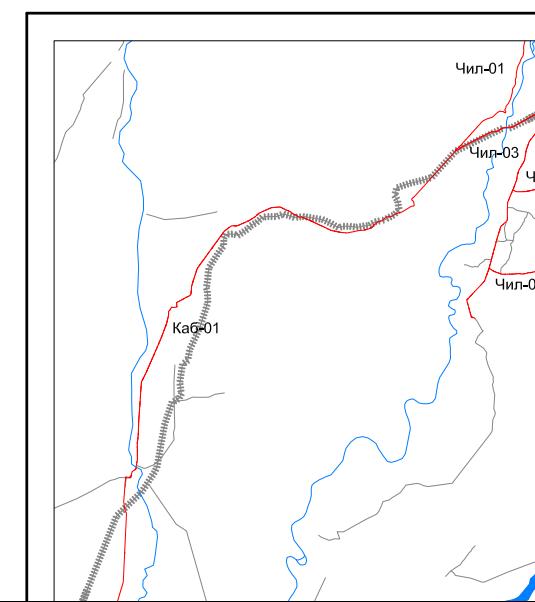
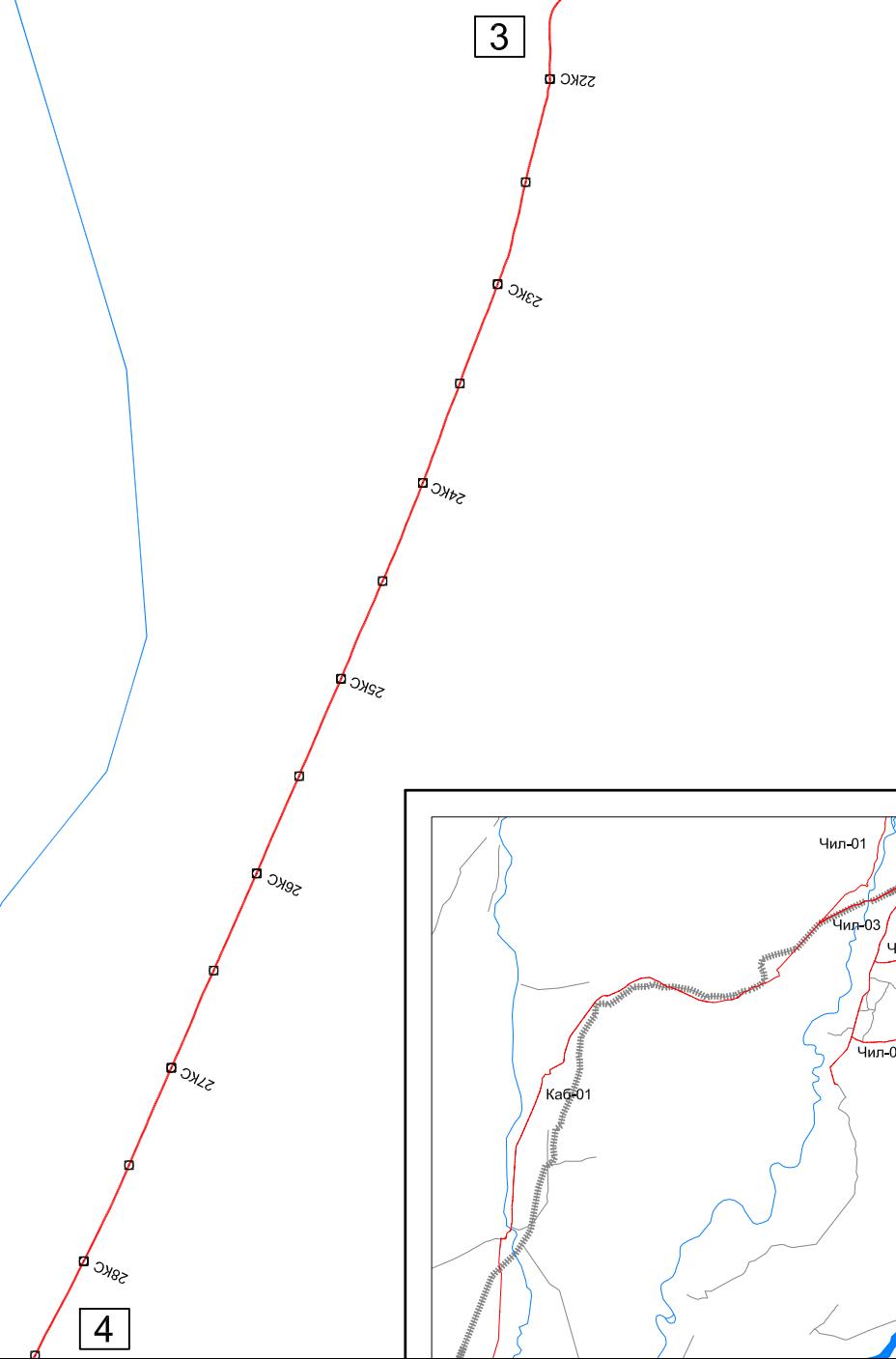
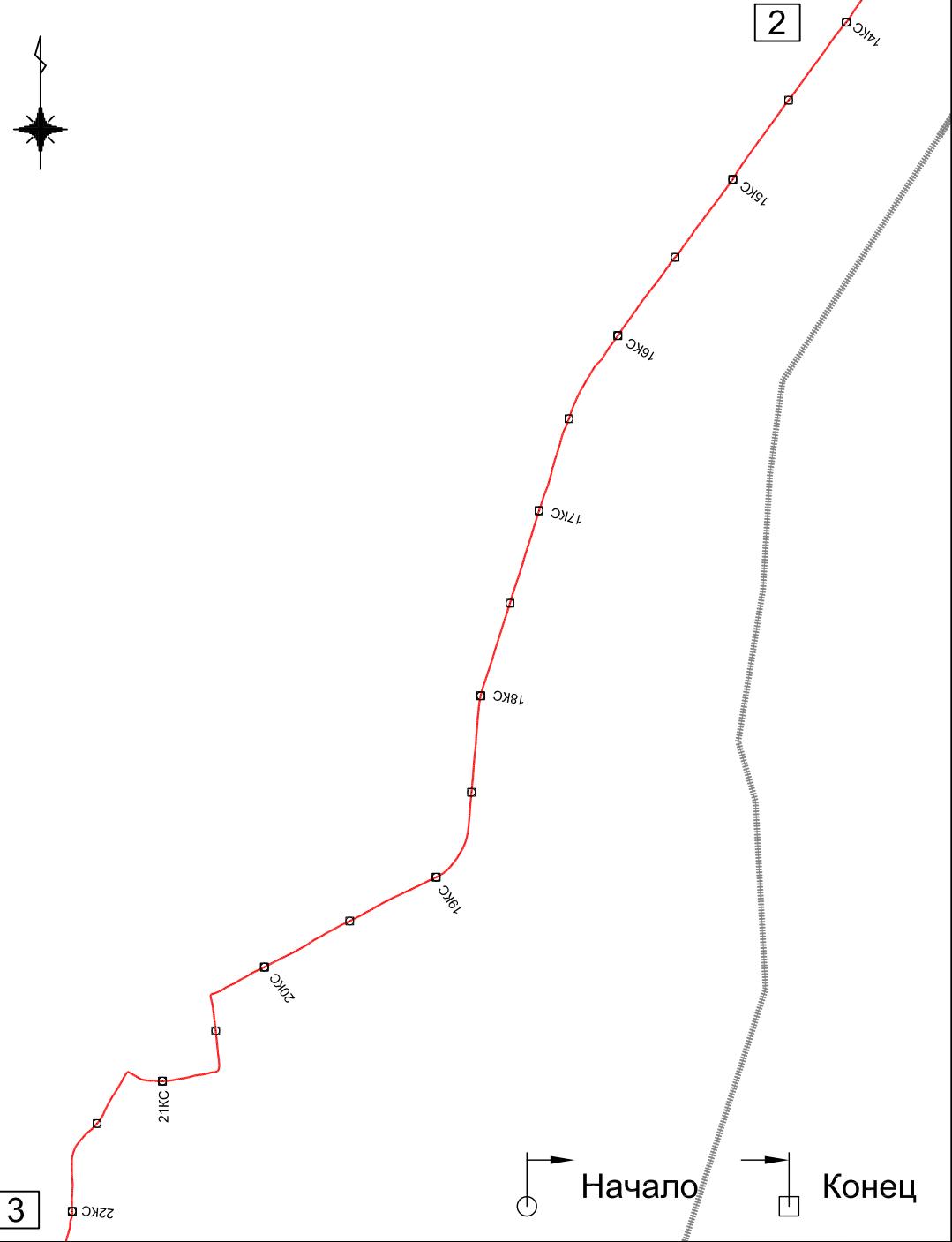


2

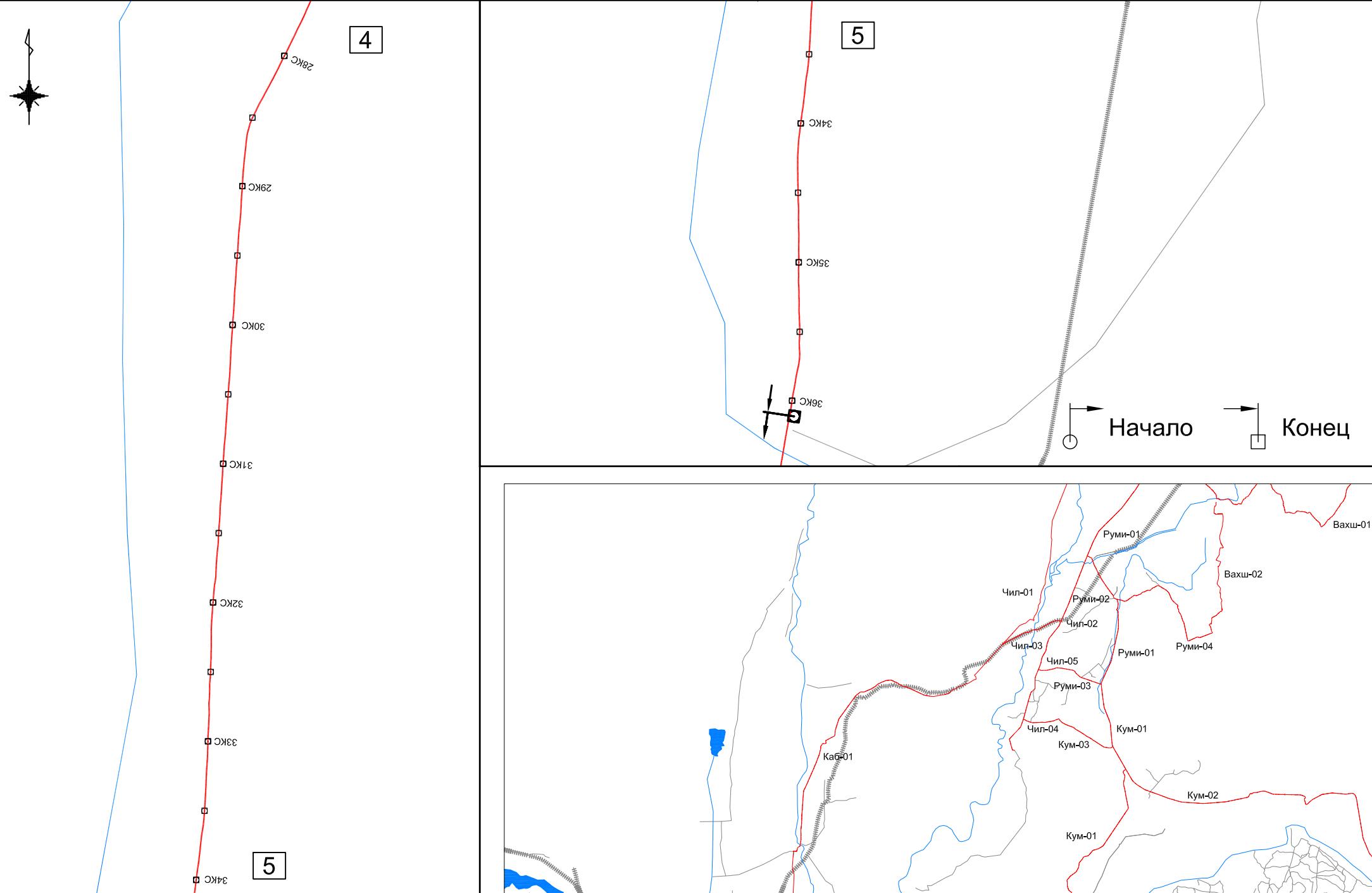
Начало

Конец

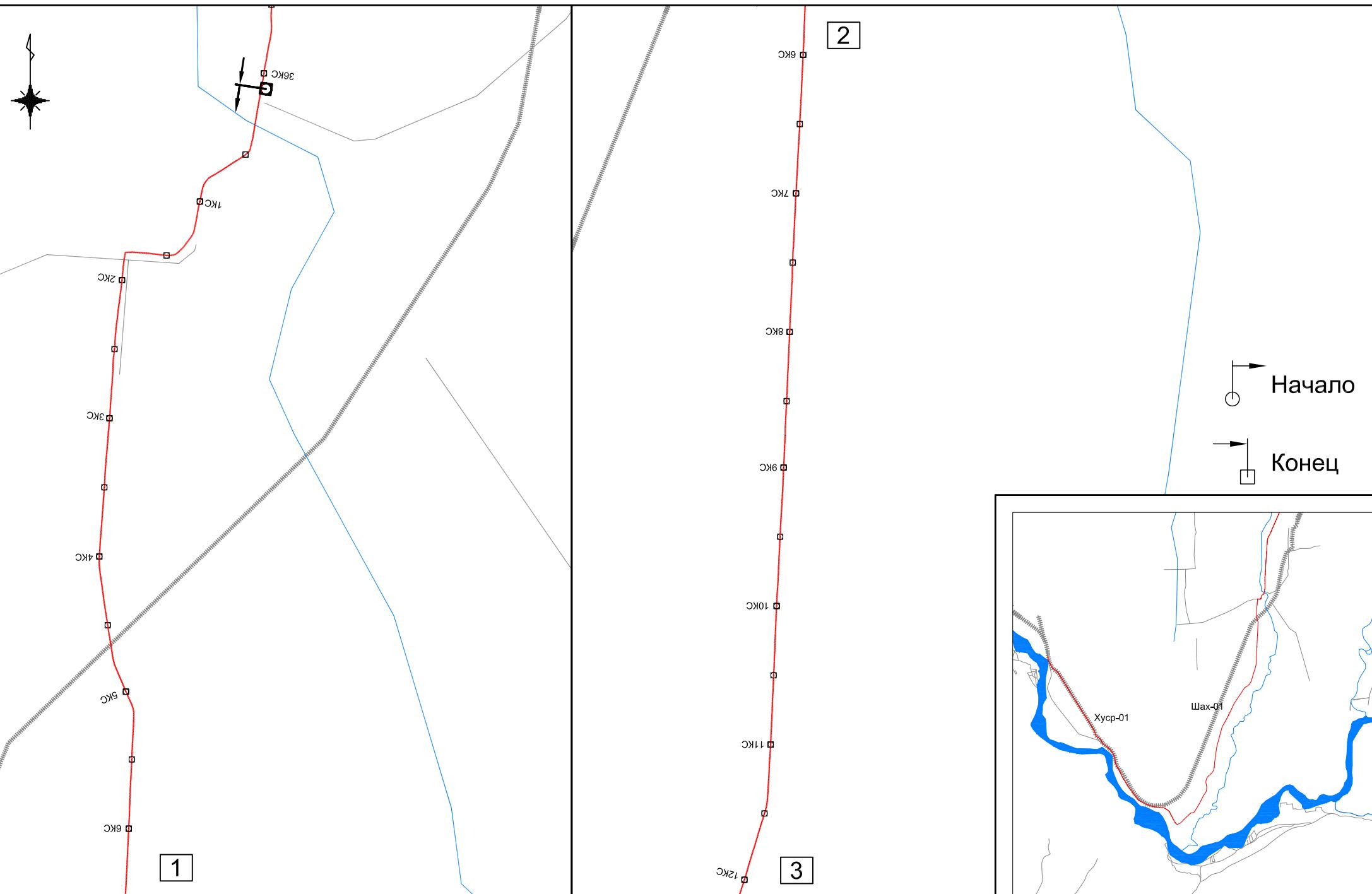
Кабодиён-01(2)



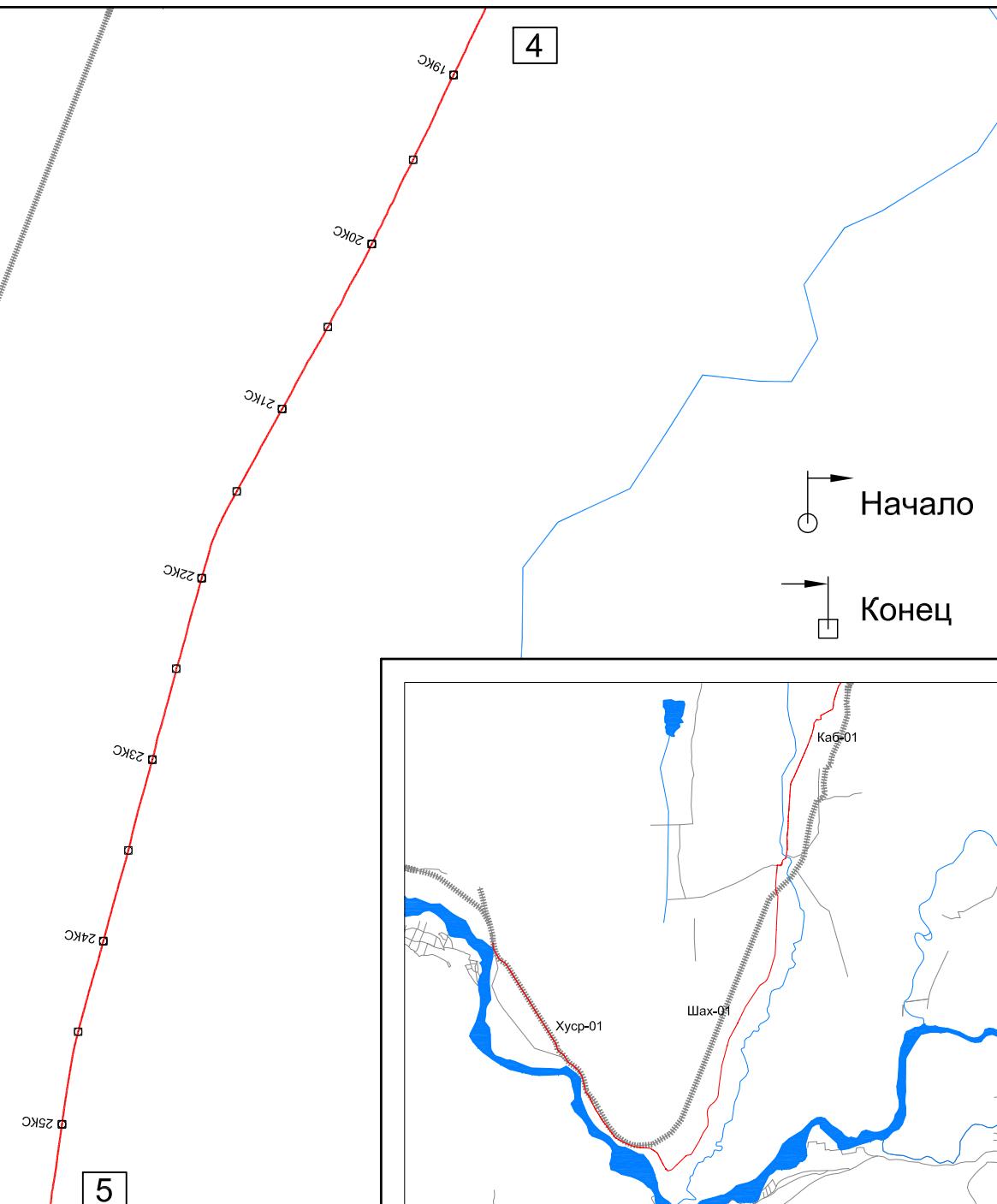
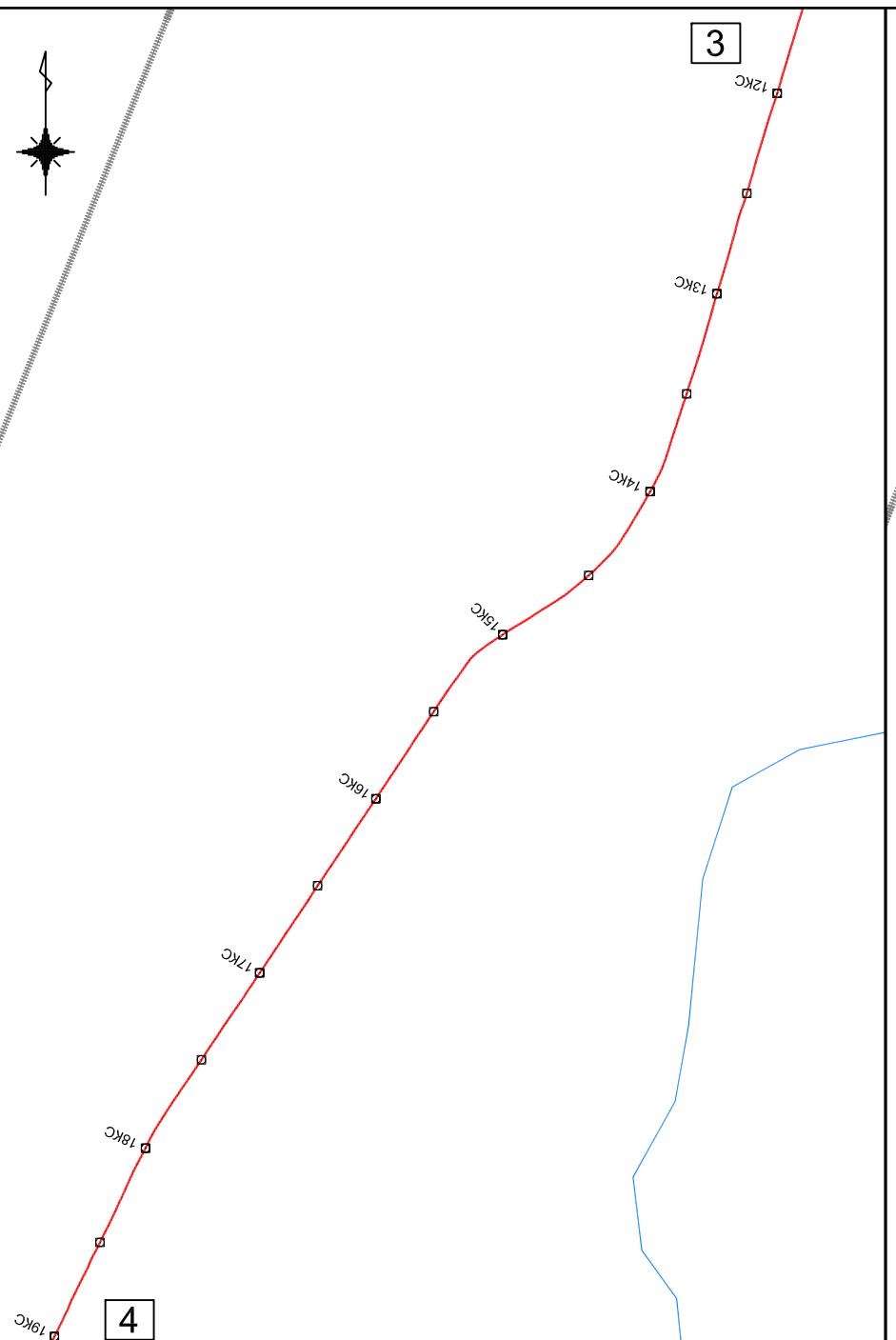
Кабодиён-01(3)



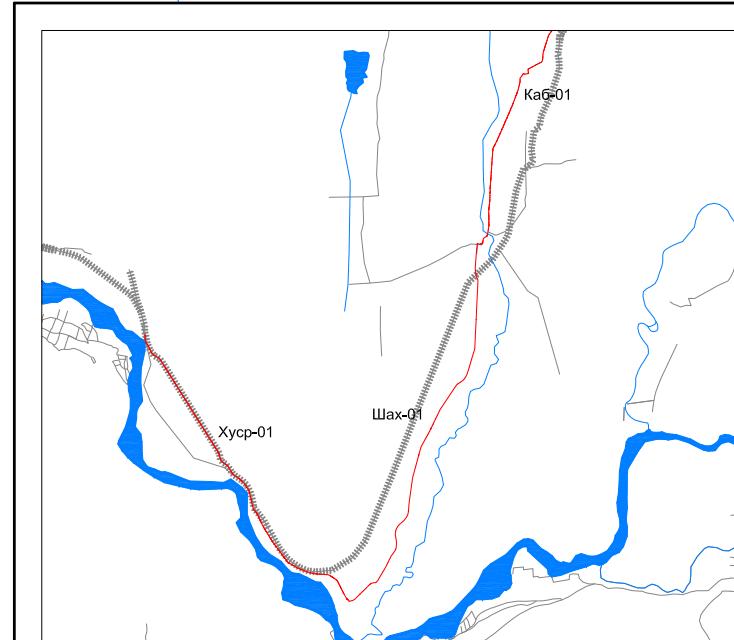
Шахритус-01(1)



Шахритус-01(2)



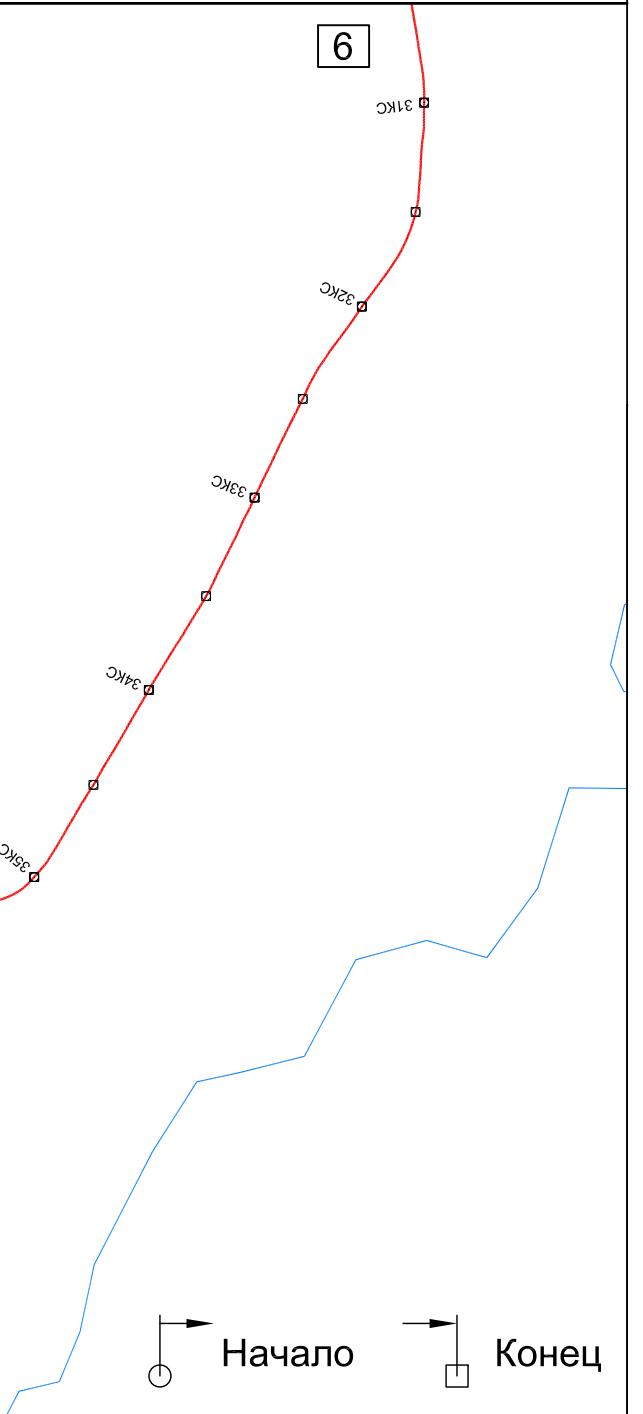
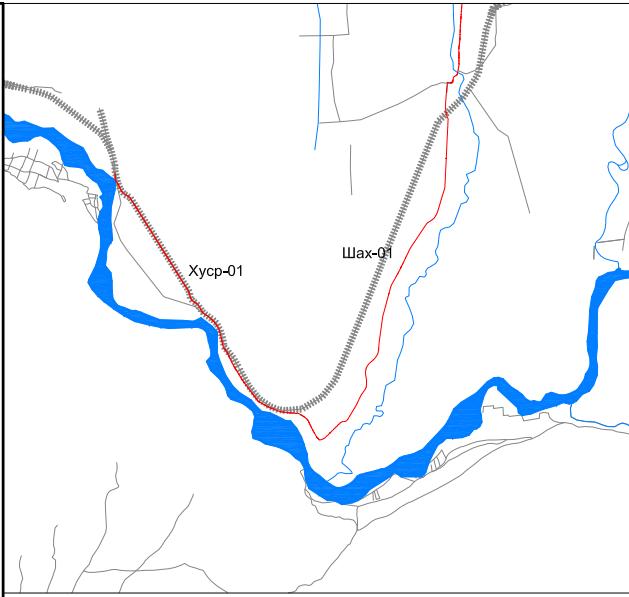
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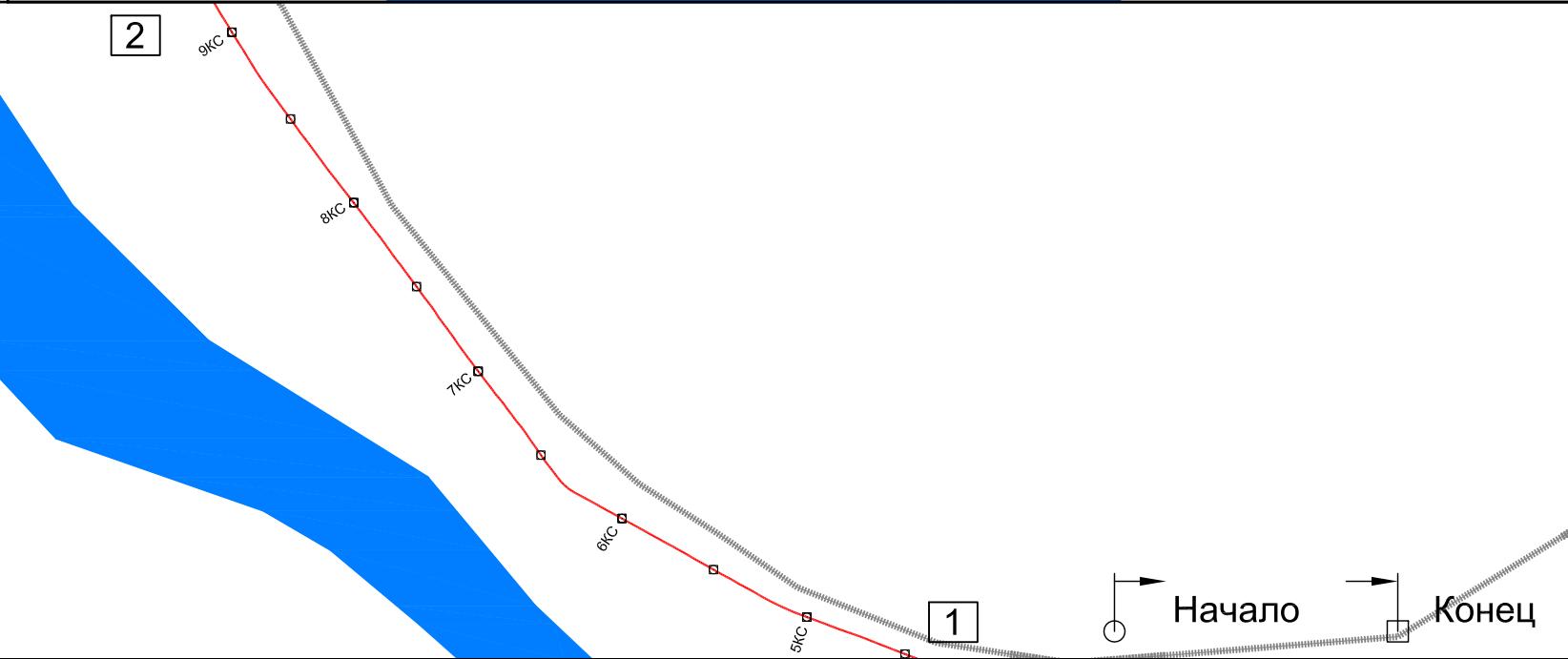
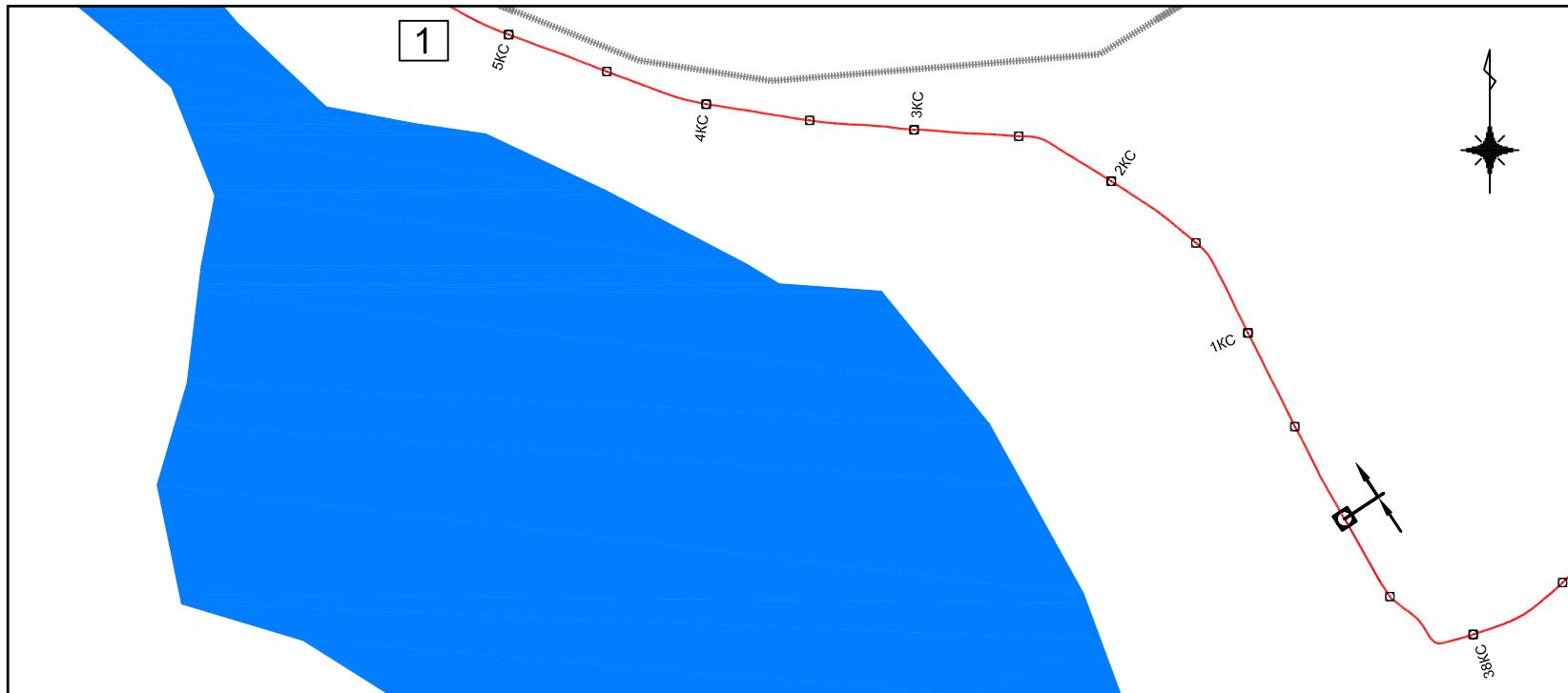
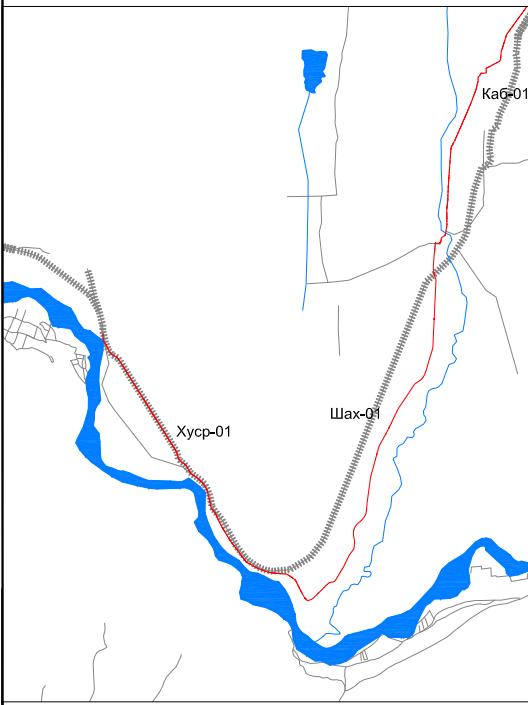
Начало

Конец

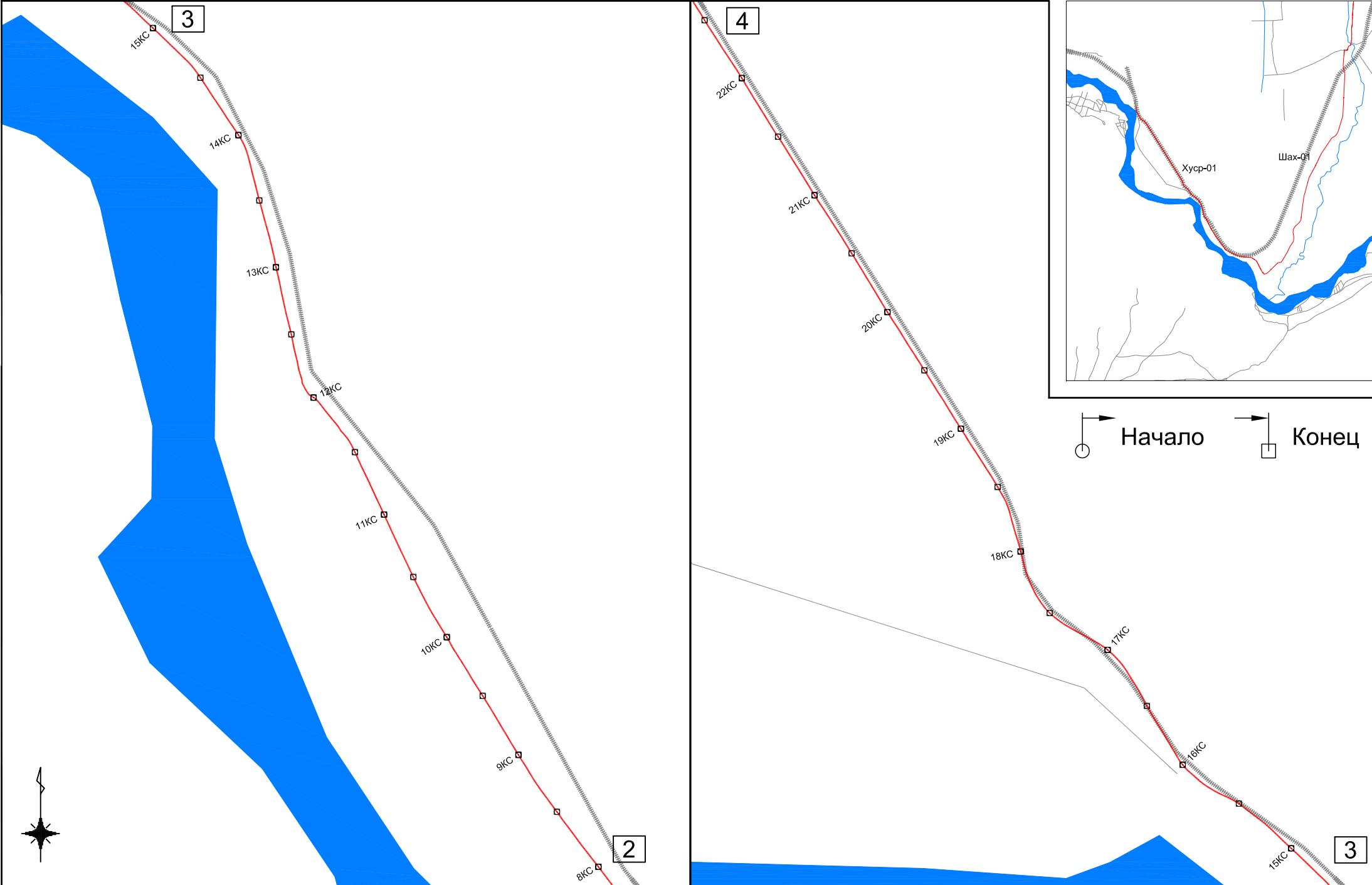
Шахритус-01(3)



Н.Хусрав-01(1)



Н.Хусрав-01(2)



Н.Хусрав-01(3)

5

29KC

28KC

27KC

26KC

25KC

24KC

23KC

4

22KC



5

Шах-01

Хуср-01

Начало

Конец

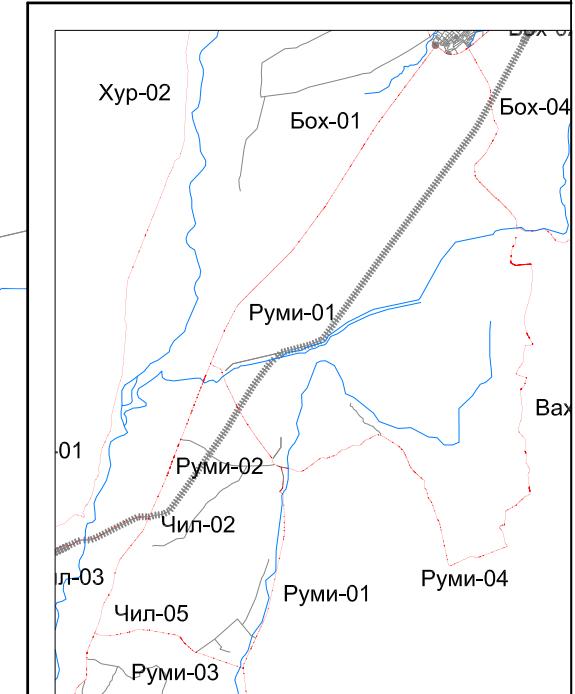
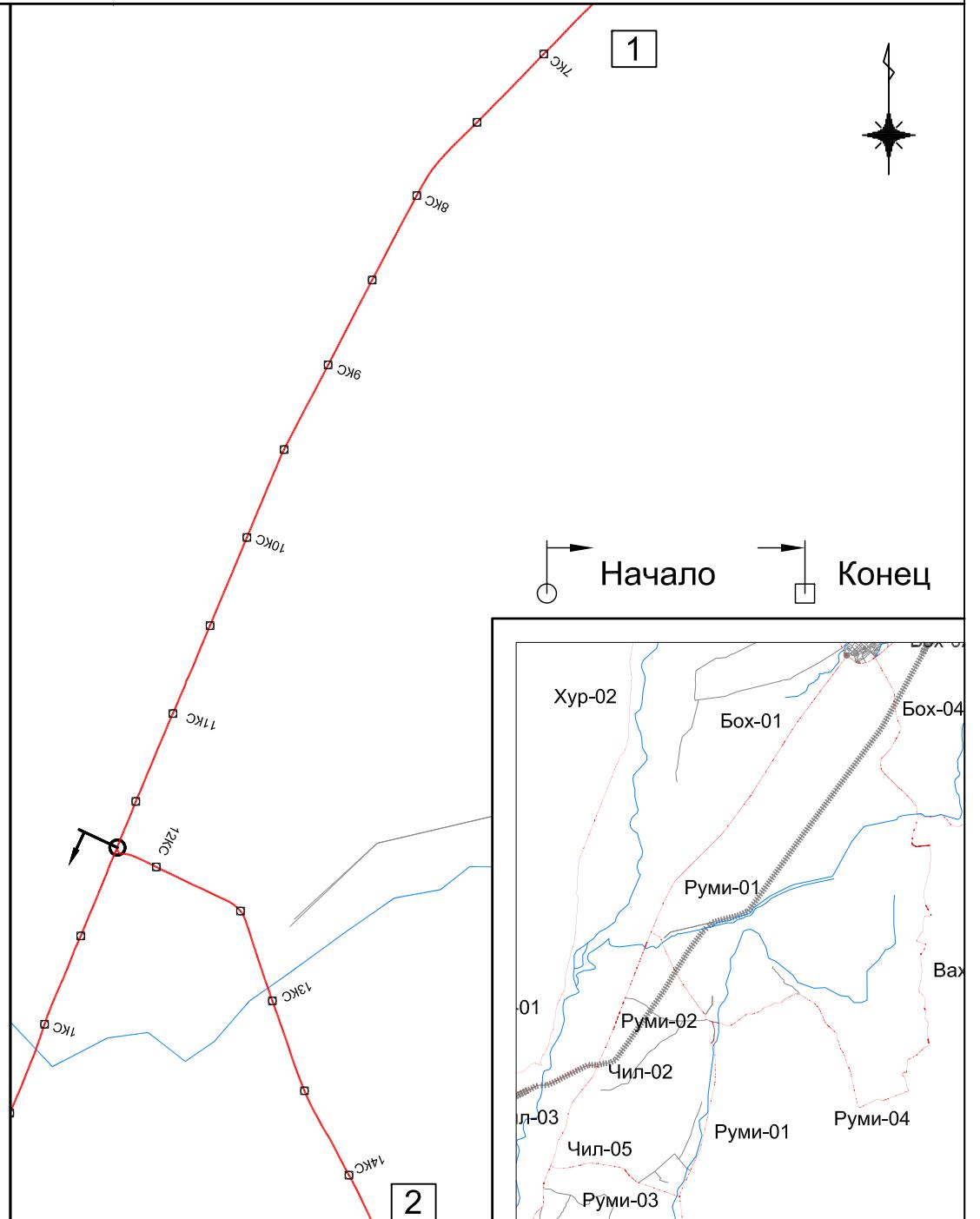
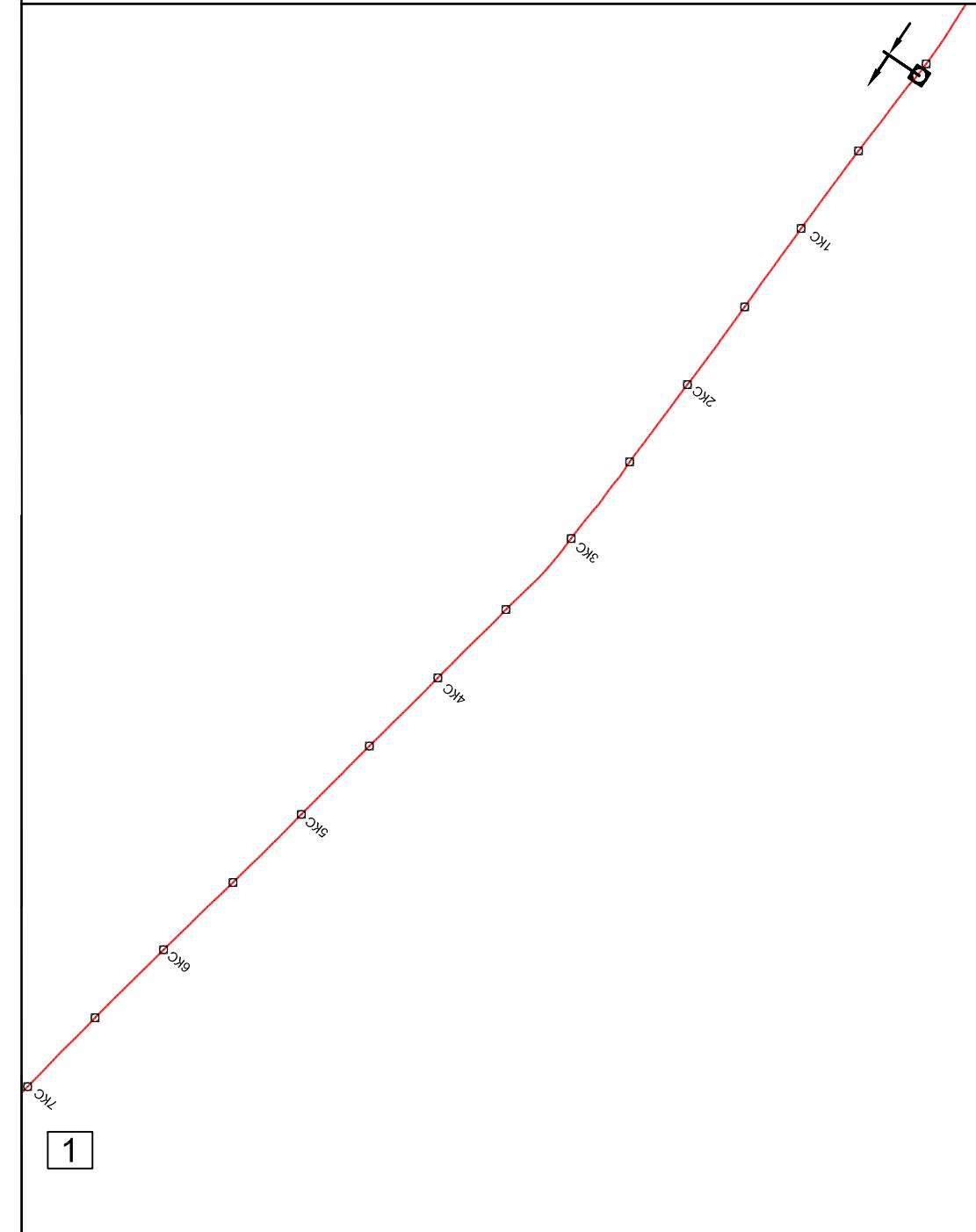
31KC

30KC

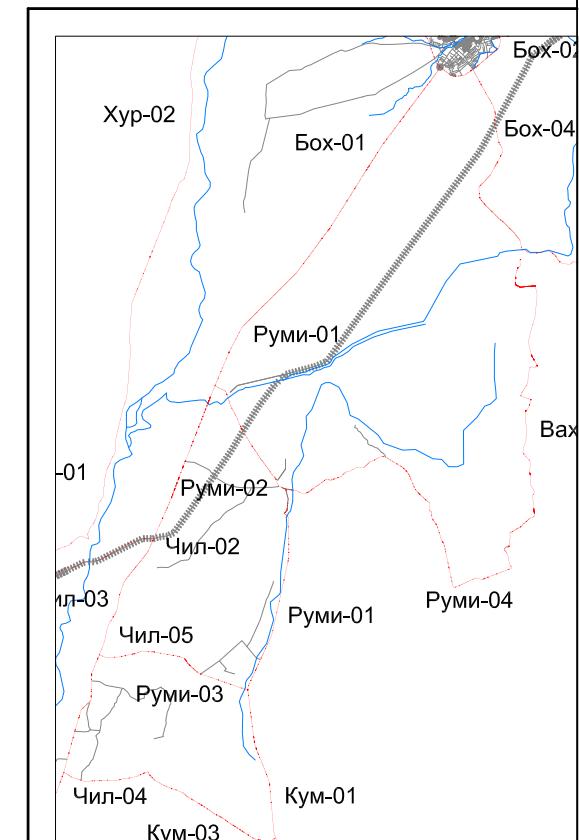
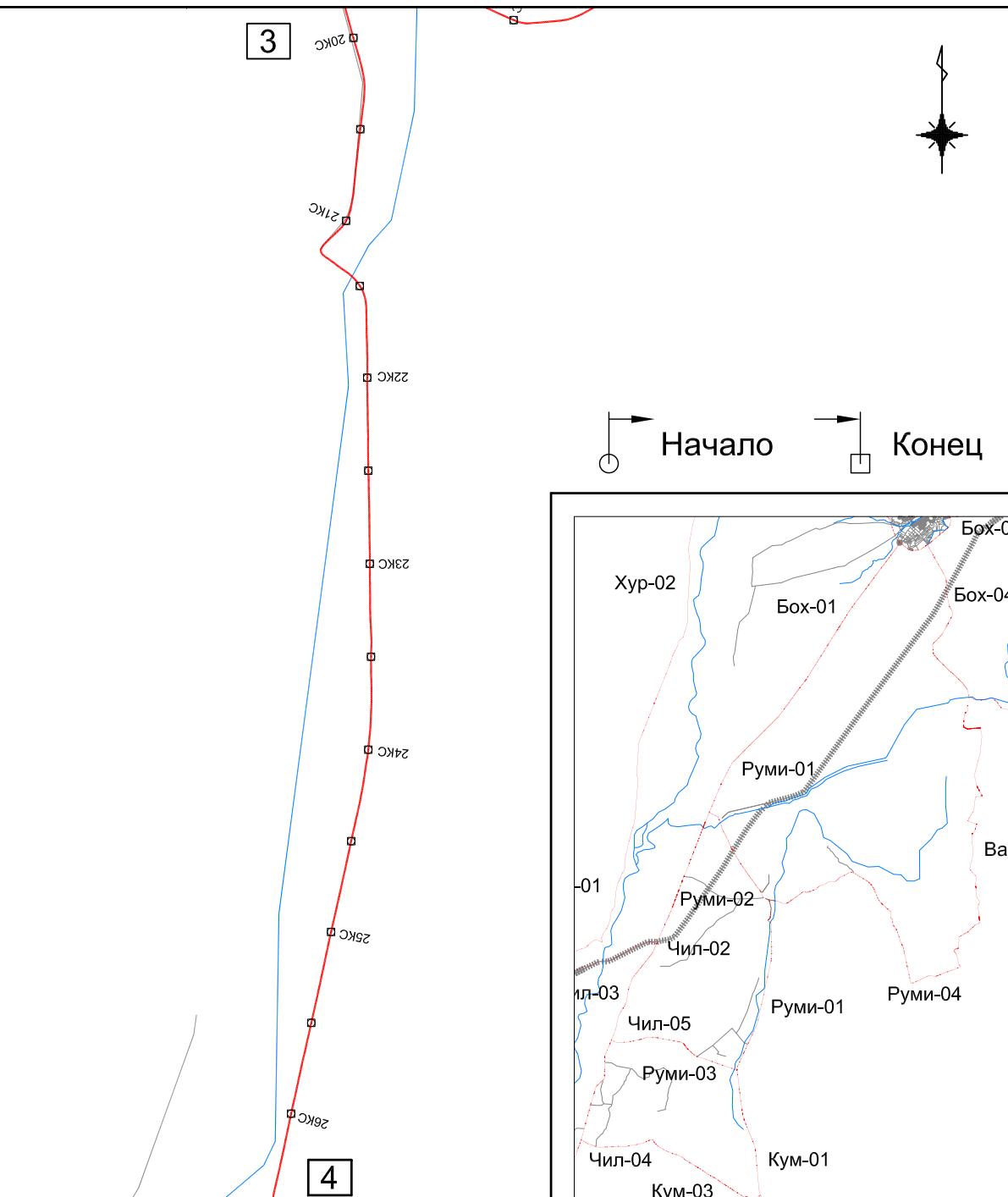
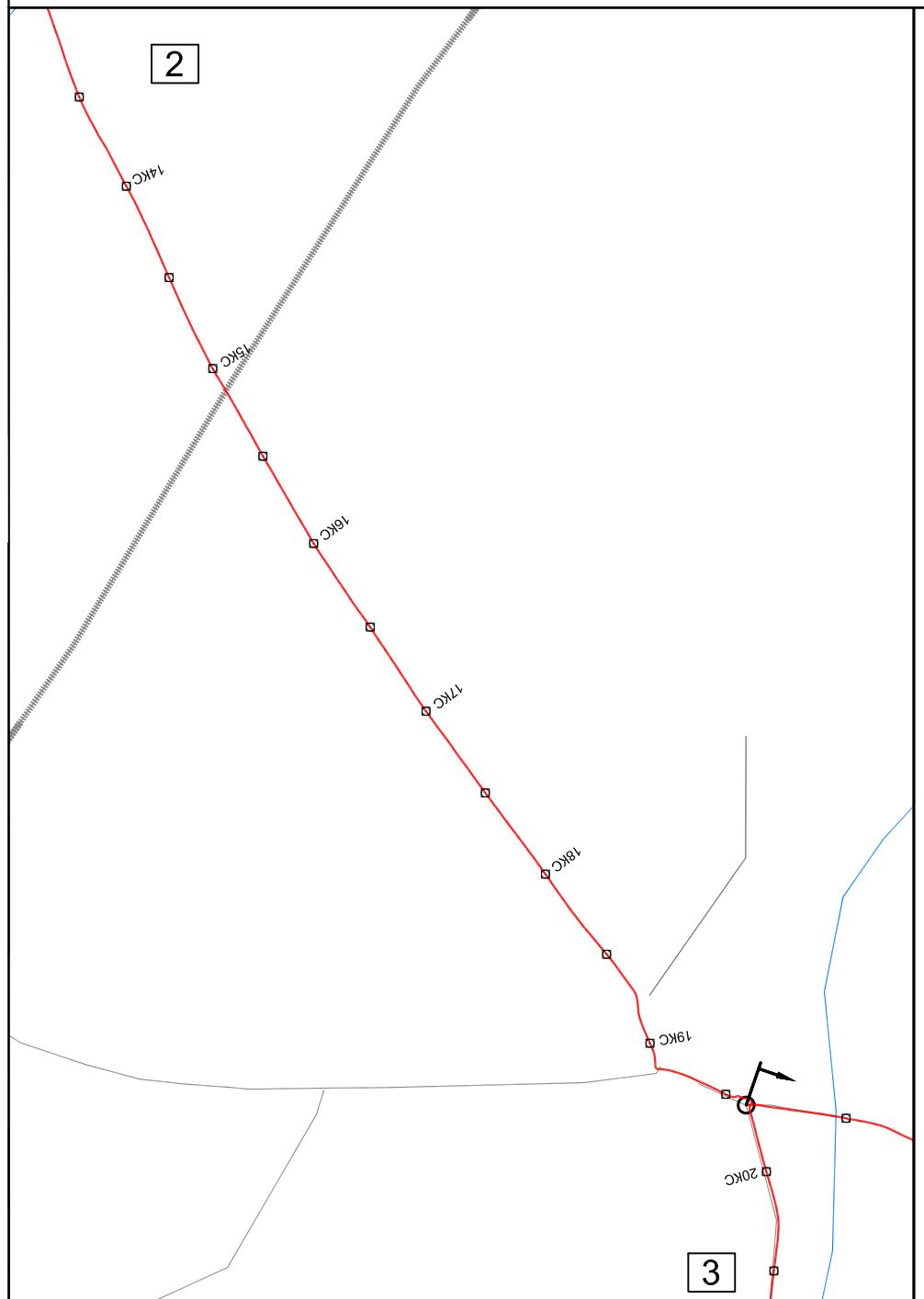
29KC

5

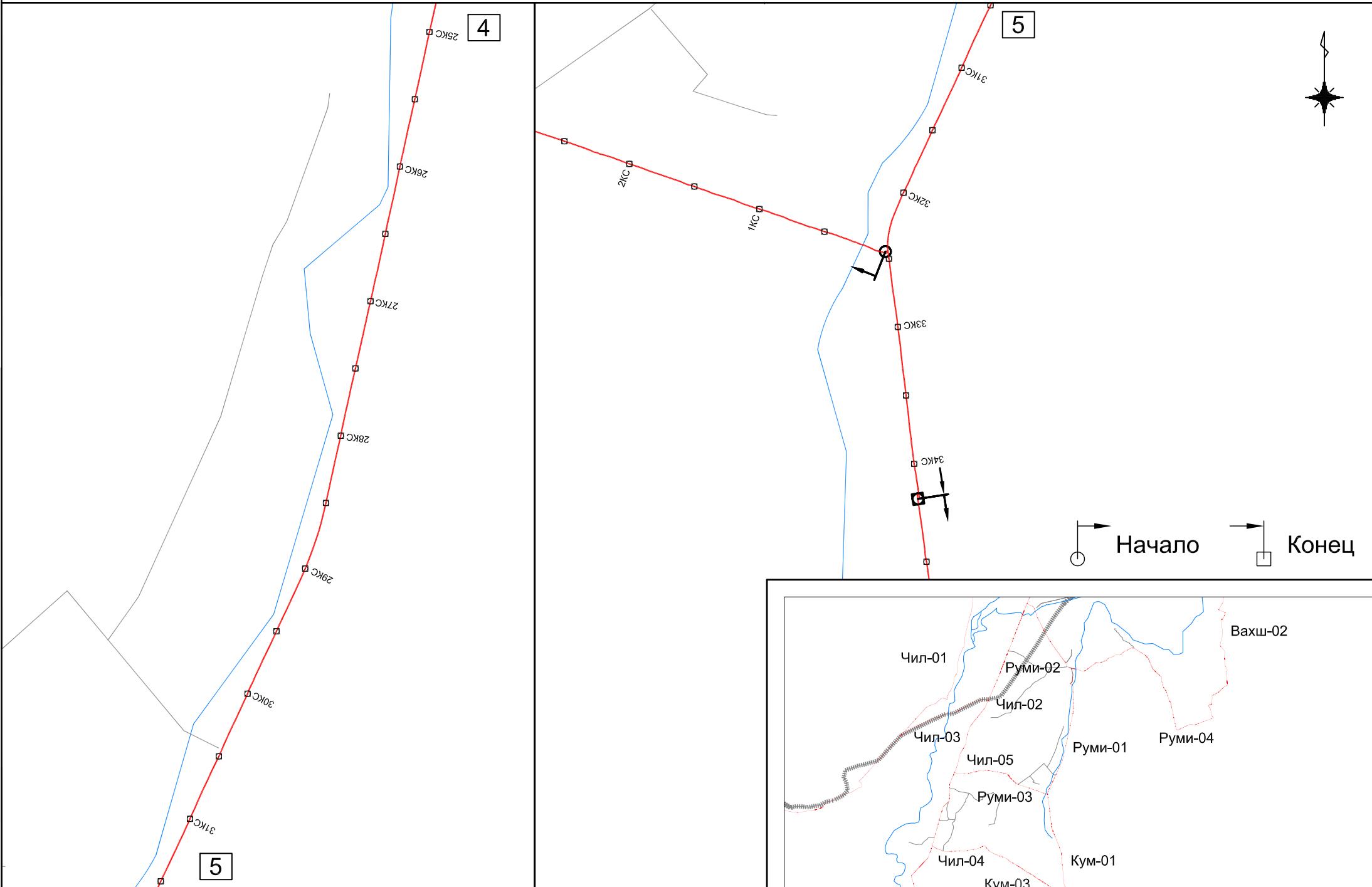
Руми-01(1)



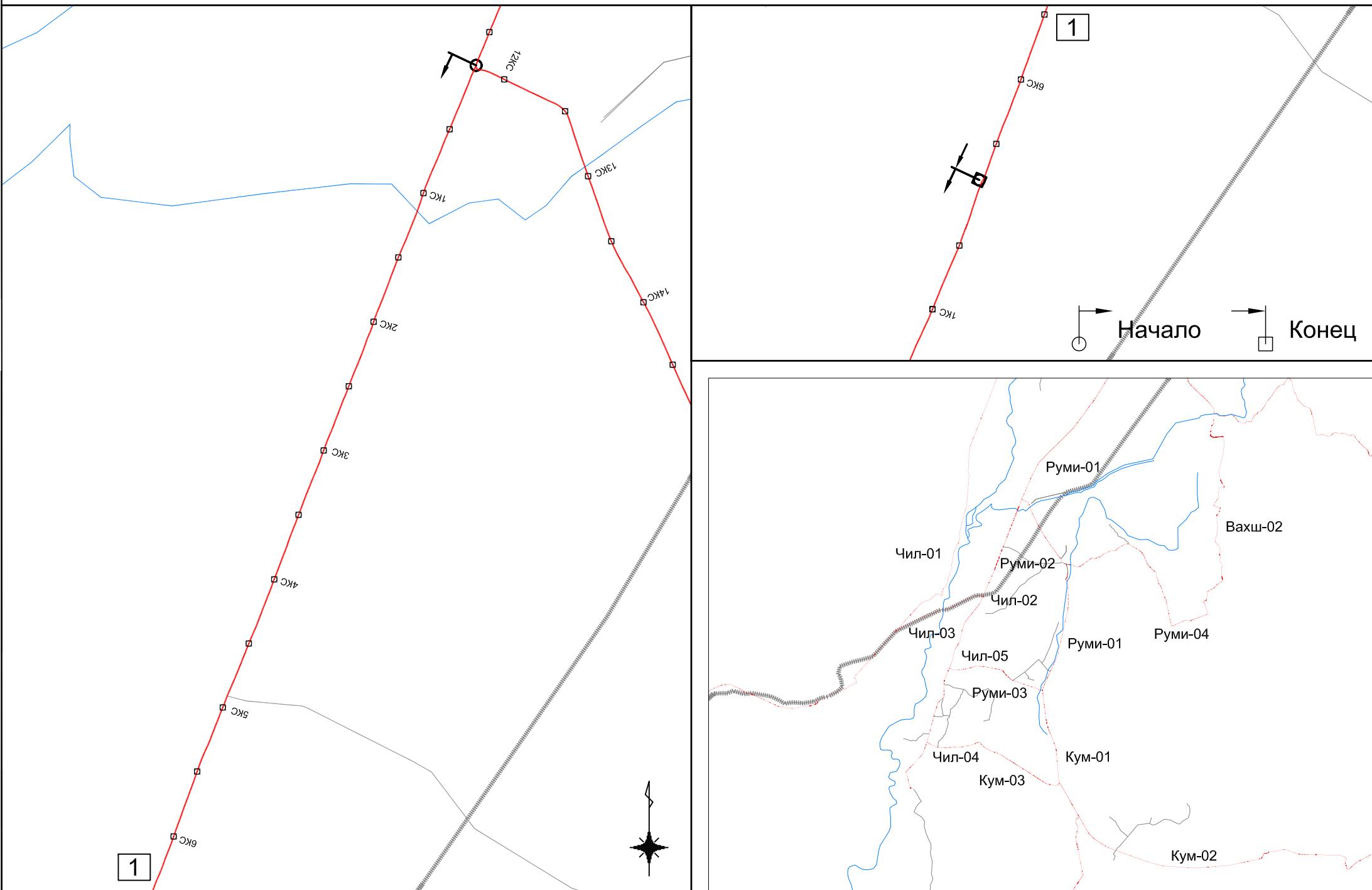
Руми-01(2)



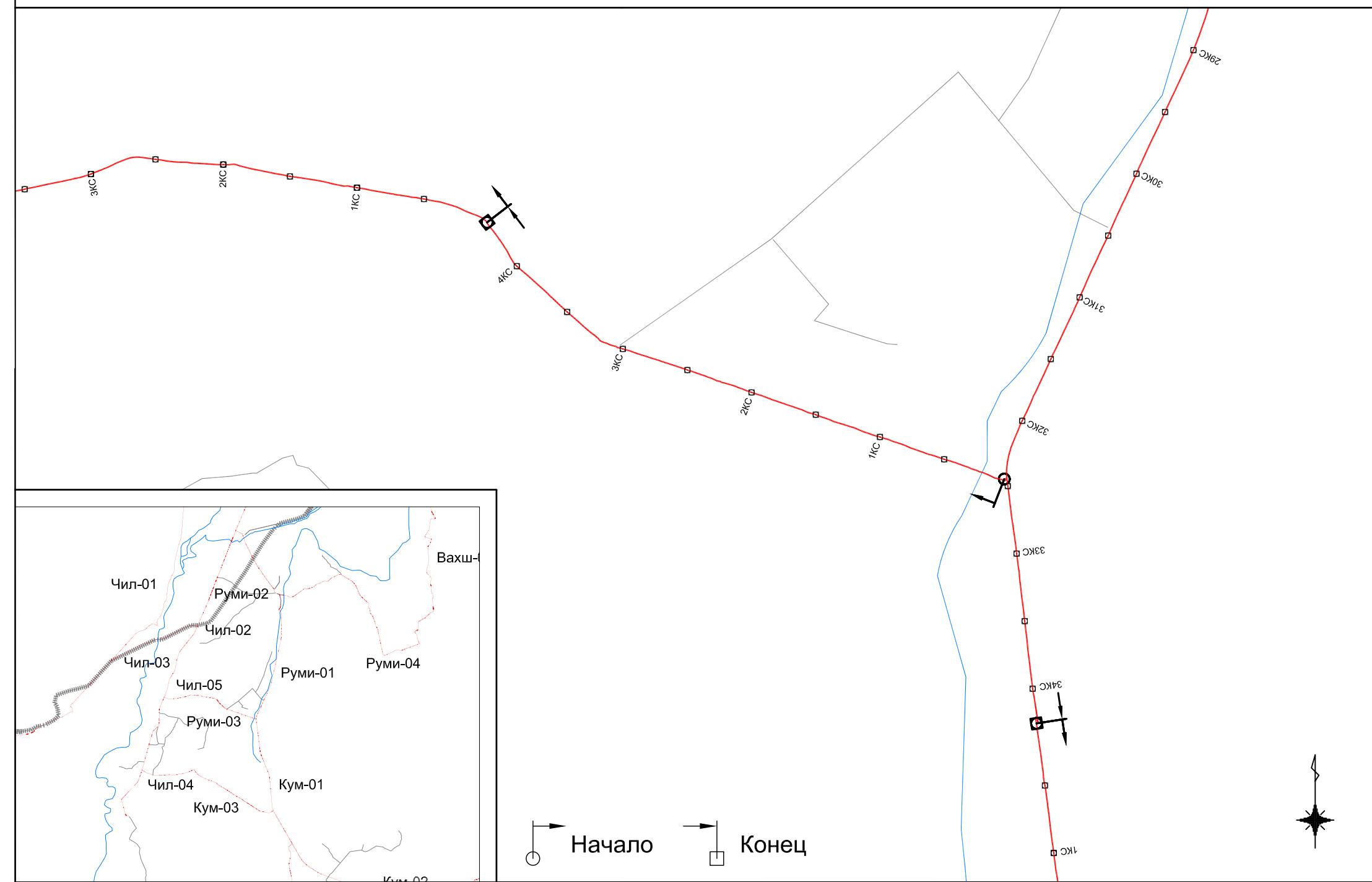
Руми-01(3)



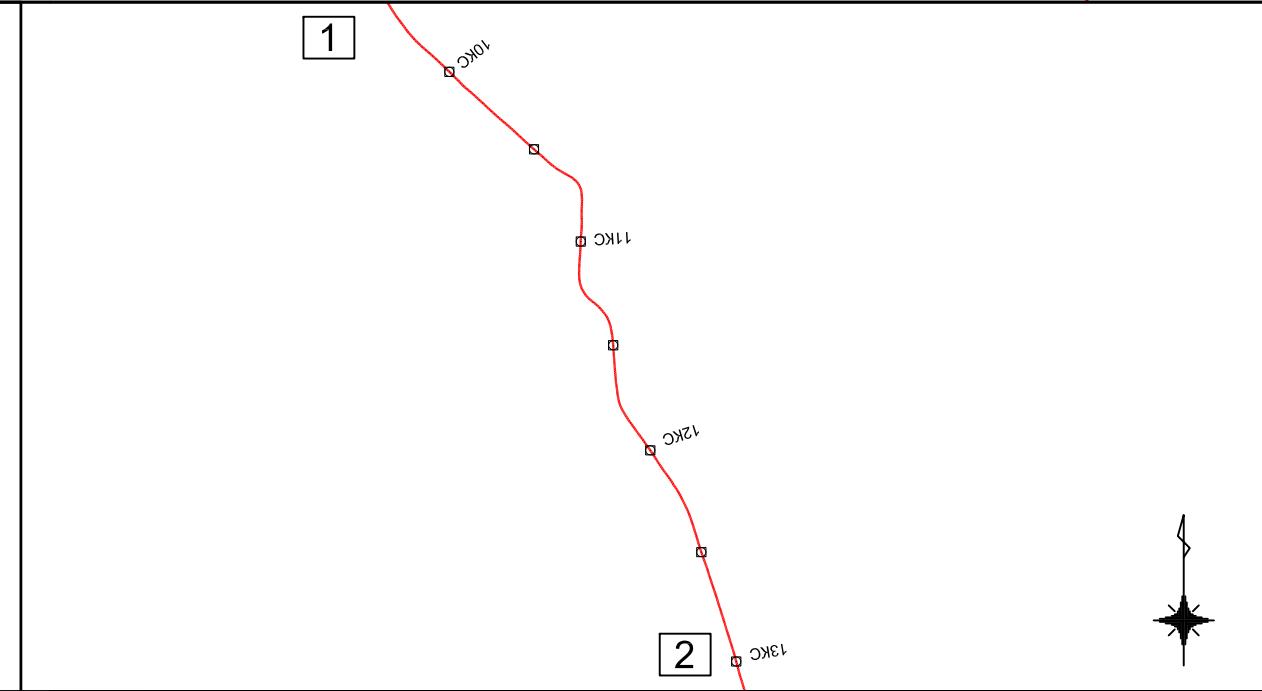
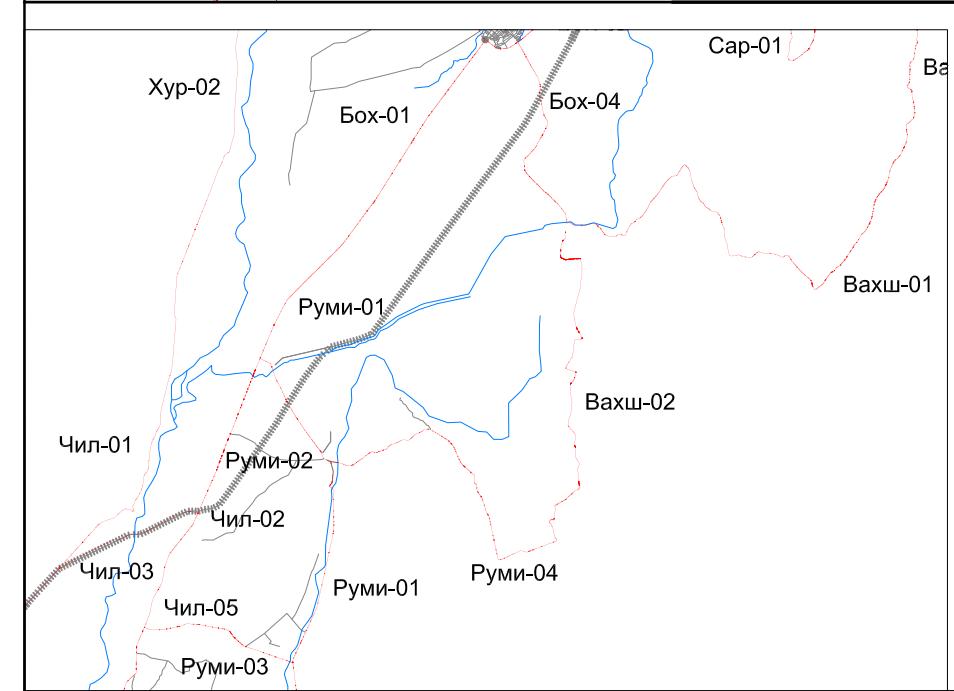
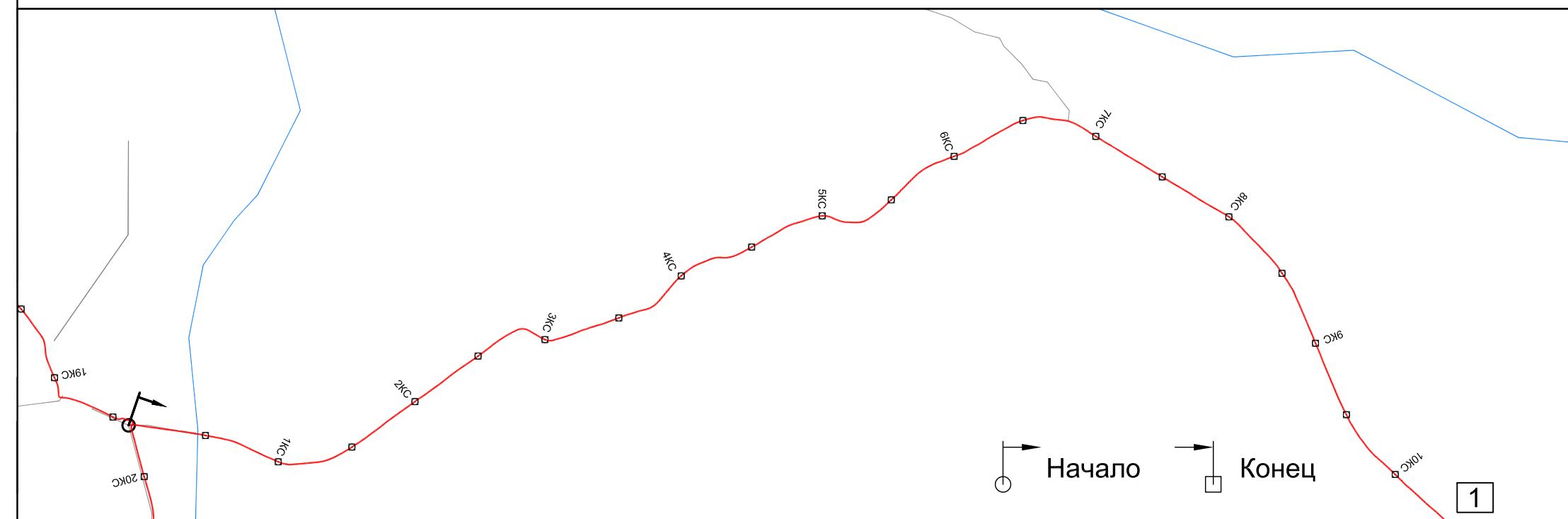
Руми-02



Руми-03

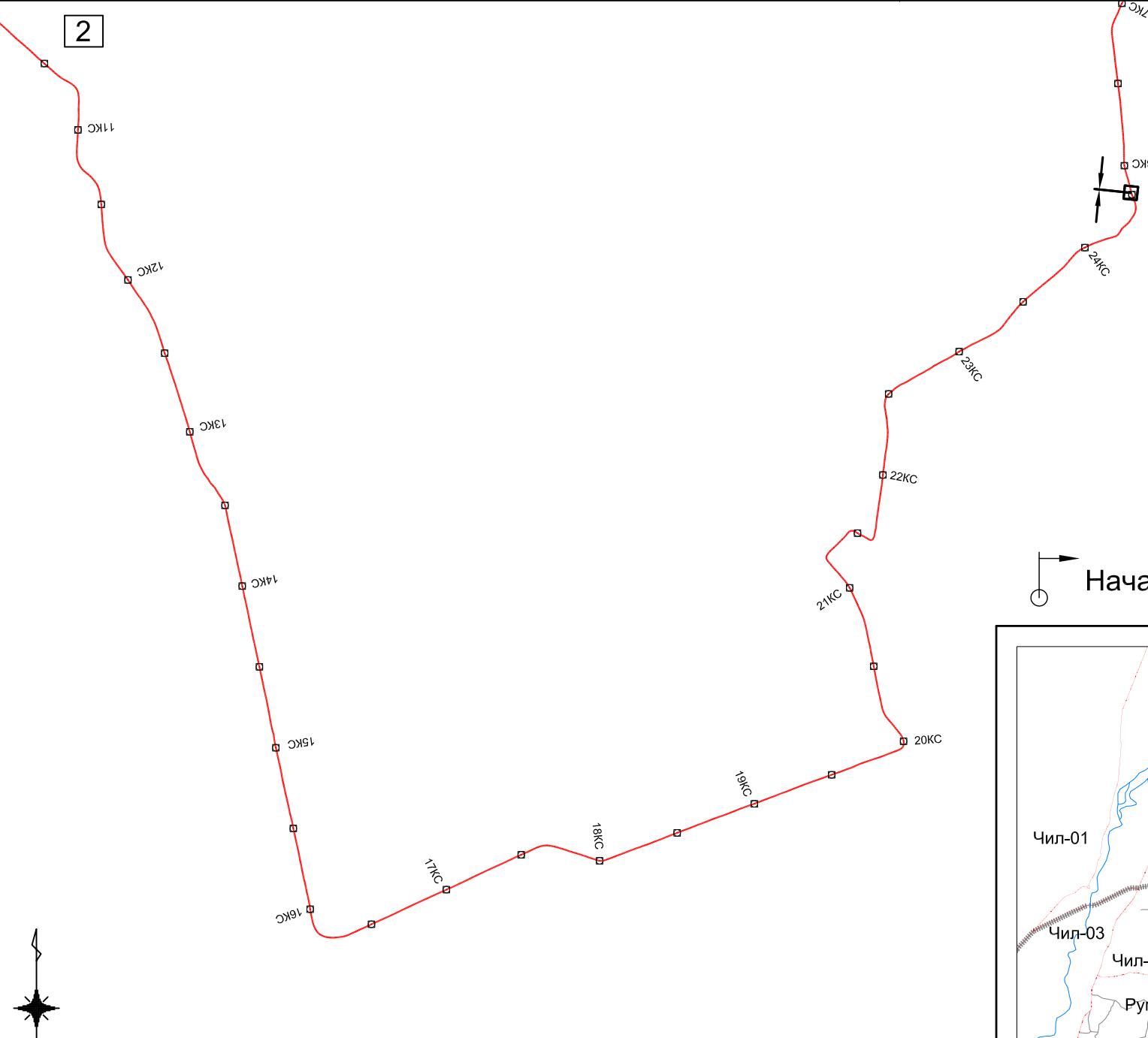


Руми-04(1)



Руми-04(2)

2



Начало



Конец

