

REPUBLIC OF SERBIA  
THE CITY OF BELGRADE  
BELGRADE LAND DEVELOPMENT PUBLIC AGENCY (LDA)  
BELGRADE WATERWORKS AND SEWERAGE (BVK)

**PREPARATORY SURVEY REPORT  
ON  
THE SEWERAGE SYSTEM IMPROVEMENT PROJECT  
FOR  
THE CITY OF BELGRADE  
IN  
REPUBLIC OF SERBIA**

**VOLUME IV  
DRAWINGS**

**MAY 2013**

**JAPAN INTERNATIONAL COOPERATION AGENCY**

**TEC INTERNATIONAL CO., LTD.**

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THE CITY OF BELGRADE  
BELGRADE LAND DEVELOPMENT PUBLIC AGENCY (LDA)  
BELGRADE WATERWORKS AND SEWERAGE (BVK)

**PREPARATORY SURVEY REPORT  
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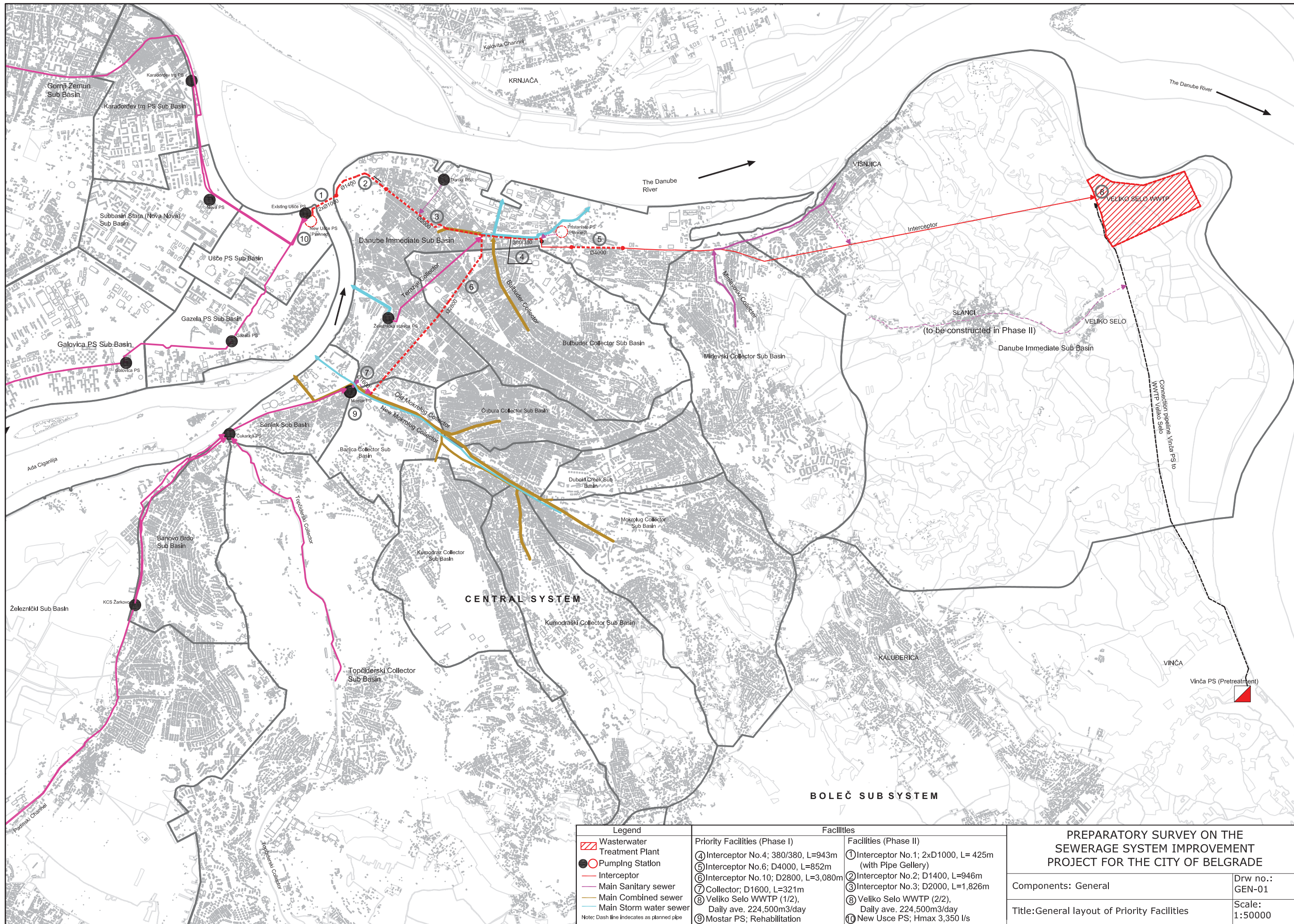
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DRW.NO	TITLE	DRW.NO	TITLE	DRW.NO	TITLE
<b>General Plan</b>		SEW-38	Connection Structure No.1, Section D, Section 1-1	<b>Veliko Selo Wastewater Treatment Plant</b>	
GEN-01	General Layout of Priority Facilities	SEW-39	Connection Structure No.1, Section D, Section 2-2	WWTP-01	General Layout
		SEW-40	Connection Structure No.1, Section D, Section 3-3, 4-4	WWTP-02	Hydraulic Profile
<b>Intercprptor</b>		SEW-41	Connection Structure No.2, Elevation 78.15 m	WWTP-03	Sewage Treatment Process
SEW-01	Interceptor-General Layout - 01	SEW-42	Connection Structure No.2, Elevation 74.00 m	WWTP-04	Sludge Treatment Process
SEW-02	Interceptor-General Layout - 02	SEW-43	Connection Structure No.2, Section-1	WWTP-05	General Layout
SEW-03	Interceptor-General Layout - 03	SEW-44	Connection Structure No.2, Section-2	WWTP-06	Lift Pumping Station
SEW-04	Interceptor-General Layout - 04	SEW-45	Connection Structure No.3	WWTP-07	Lift Pumping Station
SEW-05	Interceptor-General Layout - 05	SEW-45-1	Shaft NO.3	WWTP-08	Lift Pumping Station
SEW-06	Interceptor-General Layout - 06	SEW-45-2	Shaft NO.4	WWTP-09	Pretreatment
SEW-07	Interceptor-General Layout - 07	SEW-46	Typical inspection chamber	WWTP-10	Pretreatment
SEW-08	Interceptor-General Layout - 08	SEW-47	Interceptor No10, General layout-15	WWTP-11	Primary Settling Tank
SEW-09	Interceptor-General Layout - 09	SEW-48	Interceptor No.10, General layout-16	WWTP-12	Bioreactor
SEW-10	Interceptor-General Layout - 10	SEW-49	Interceptor NO.10, Longitudinal profile - 05	WWTP-13	Bioreactor
SEW-11	Interceptor-General Layout - 11	SEW-50	Collector from Mostar PS, General layout	WWTP-14	Bioreactor
SEW-12	Interceptor-General Layout - 12	SEW-51	Collector , Longitudinal profile	WWTP-15	Blower Building
SEW-13	Interceptor-General Layout - 13	SEW-52	Connection Structure No.4	WWTP-16	Blower Building
SEW-14	Interceptor-General Layout - 14	SEW-53	Manhole No.T1, T2, and T3	WWTP-17	Secondary Settling Tank
SEW-15	Interceptor, Longitudinal profile - 01			WWTP-18	Return Sludge Pumping House
SEW-16	Interceptor, Longitudinal profile - 02	<b>Usce Pumping Station</b>		WWTP-19	Return Sludge Pumping House
SEW-17	Interceptor, Longitudinal profile - 03	UPS-01	General Layout	WWTP-20	Filtration
SEW-18	Interceptor, Longitudinal profile - 04	UPS-02	Pumping Station	WWTP-21	Filtration
SEW-19	Shaft No.1 and No.2	UPS-03	Pumping Station	WWTP-22	Gravity Thickener
SEW-20	Longitudinal profile of pipe gallery under Sava River	UPS-04	Electrical System and MICRO-SCADA System	WWTP-23	Anaerobic Digester
SEW-21	Manhole No.1 and Manhole No.2			WWTP-24	Anaerobic Digester Auxiliaries Building
SEW-22	Manhole No.3-1			WWTP-25	Congeneration Building
SEW-23	Manhole No.3-2			WWTP-26	Sludge Dewatering Building
SEW-24	Manhole No.4			WWTP-27	Sludge Dewatering Building
SEW-25	General Layout of Connection Structure No.1	<b>Mostar Pumping Station</b>		WWTP-28	Administration Building
SEW-26	Stormwater Collector Ø2500	MPS-01	Pumping Station	WWTP-29	Substation and Generator Building
SEW-27	Sanitary Sewage Collector Ø400	<b>MPS-02</b>	Pumping Station	WWTP-30	Electrical System (Singl Line Diagram)
SEW-28	Stormwater Collector Ø2500, Inspection Manhole S-01	MPS-03	Electrical System and MICRO-SCADA System	WWTP-31	SCADA System Configuration
SEW-29	Stormwater Collector, Inspection Manhole No.2			WWTP-32	Instrumentation List (WWTP)
SEW-30	Connection Structure No.1, Section A, Plan A-A			WWTP-33	Instrumentation List (STP)
SEW-31	Connection Structure No.1, Section A, Section 1-1				
SEW-32	Connection Structure No.1, Section A, Section 2-2, 3-3				
SEW-33	Connection Structure No.1, Section B, Plan A-A				
SEW-34	Connection Structure No.1, Section B, Section 1-1				
SEW-35	Connection Structure No.1, Section B, Section 2-2, 3-3				
SEW-36	Connection Structure No.1, Section C, Plan A-A, Section 1-1, 2-2				
SEW-37	Connection Structure No.1, Section D, Plan A-A				











Legend		Facilities	
	Wastewater Treatment Plant	Priority Facilities (Phase I)	
	Pumping Station	④ Interceptor No.4; 380/380, L=943m	① Interceptor No.1; 2xD1000, L= 425m (with Pipe Gallery)
	Interceptor	⑤ Interceptor No.6; D4000, L=852m	② Interceptor No.2; D1400, L=946m
	Main Sanitary sewer	⑥ Interceptor No.10; D2800, L=3,080m	③ Interceptor No.3; D2000, L=1,826m
	Main Combined sewer	⑦ Collector; D1600, L=321m	⑧ Veliko Selo WWTP (1/2), Daily ave. 224,500m <sup>3</sup> /day
	Main Storm water sewer	⑧ Veliko Selo WWTP (2/2), Daily ave. 224,500m <sup>3</sup> /day	⑩ New Usce PS; Hmax 3,350 l/s
Note: Dash line indicates as planned pipe		⑨ Mostar PS; Rehabilitation	

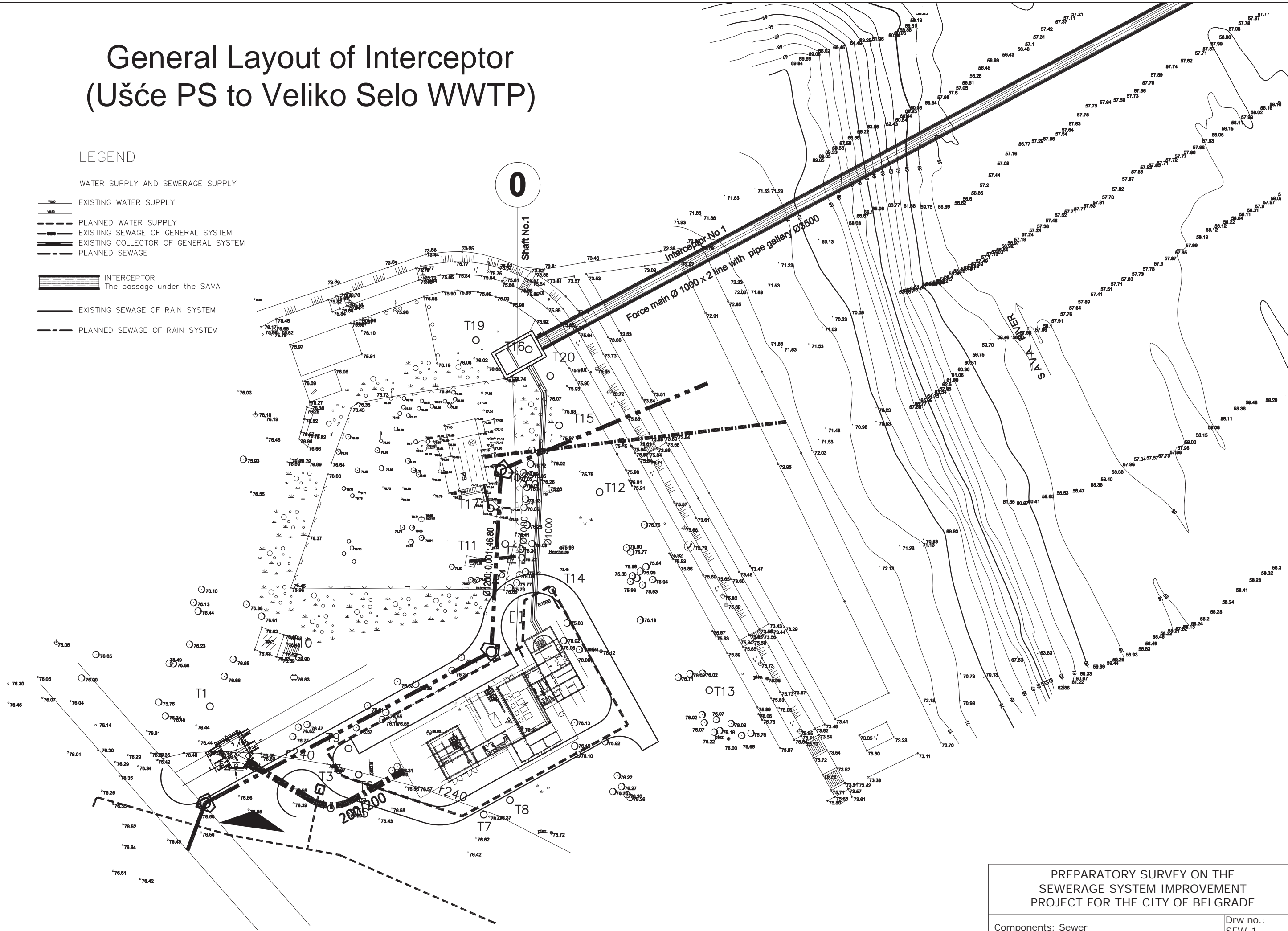
PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: General	Drw no.: GEN-01
Title: General layout of Priority Facilities	Scale: 1:50000

# General Layout of Interceptor (Ušće PS to Veliko Selo WWTP)

## LEGEND

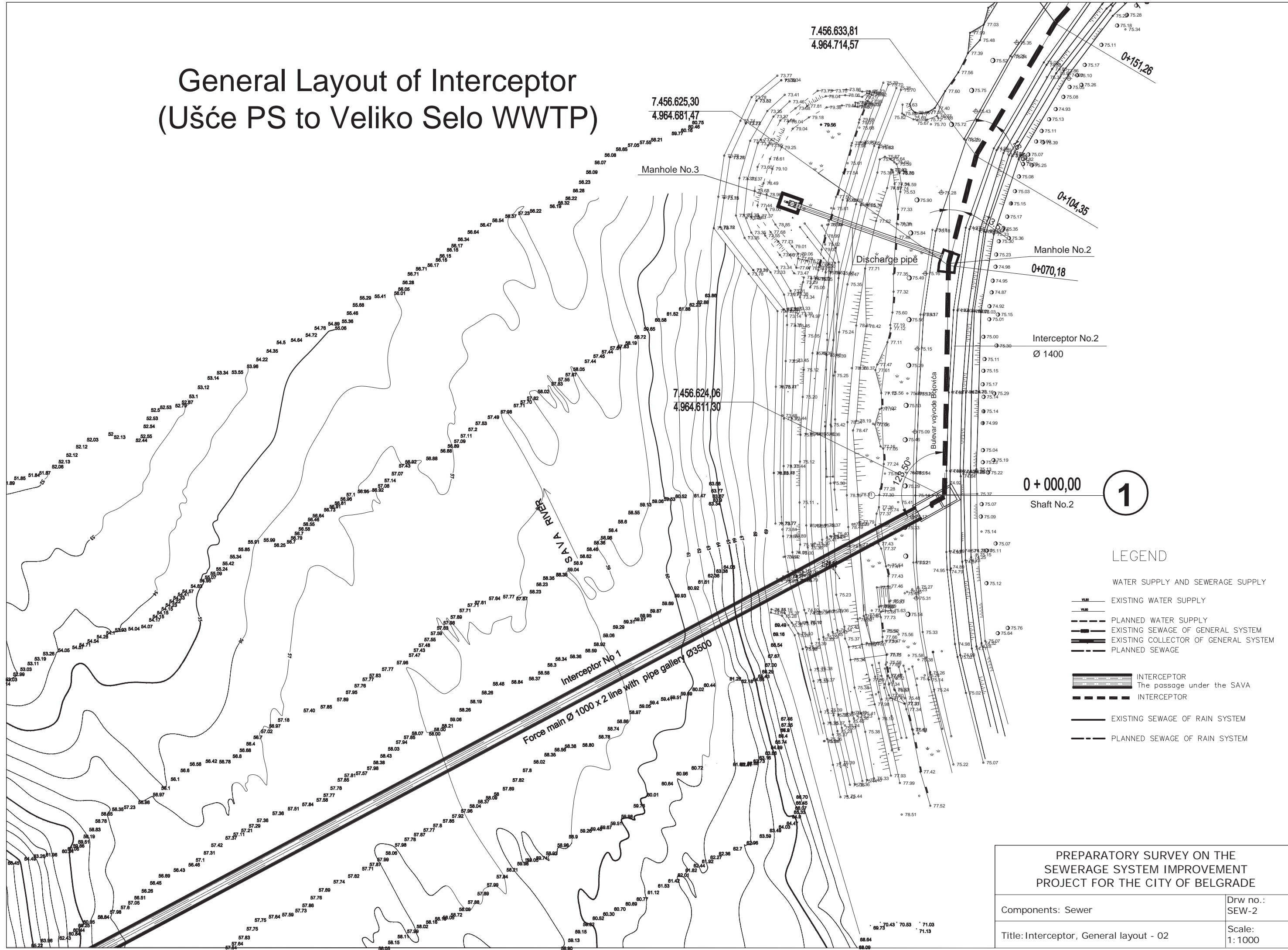
WATER SUPPLY AND SEWERAGE SUPPLY

-  EXISTING WATER SUPPLY
-  PLANNED WATER SUPPLY
-  EXISTING SEWAGE OF GENERAL SYSTEM
-  EXISTING COLLECTOR OF GENERAL SYSTEM
-  PLANNED SEWAGE
  
-  INTERCEPTOR  
The passage under the SAVA
-  EXISTING SEWAGE OF RAIN SYSTEM
-  PLANNED SEWAGE OF RAIN SYSTEM



<p>PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE</p>	
<p>Components: Sewer</p>	<p>Drw no.: SEW-1</p>
<p>Title: Interceptor, General layout - 01</p>	<p>Scale: 1: 1000</p>

# General Layout of Interceptor (Ušće PS to Veliko Selo WWTP)



1

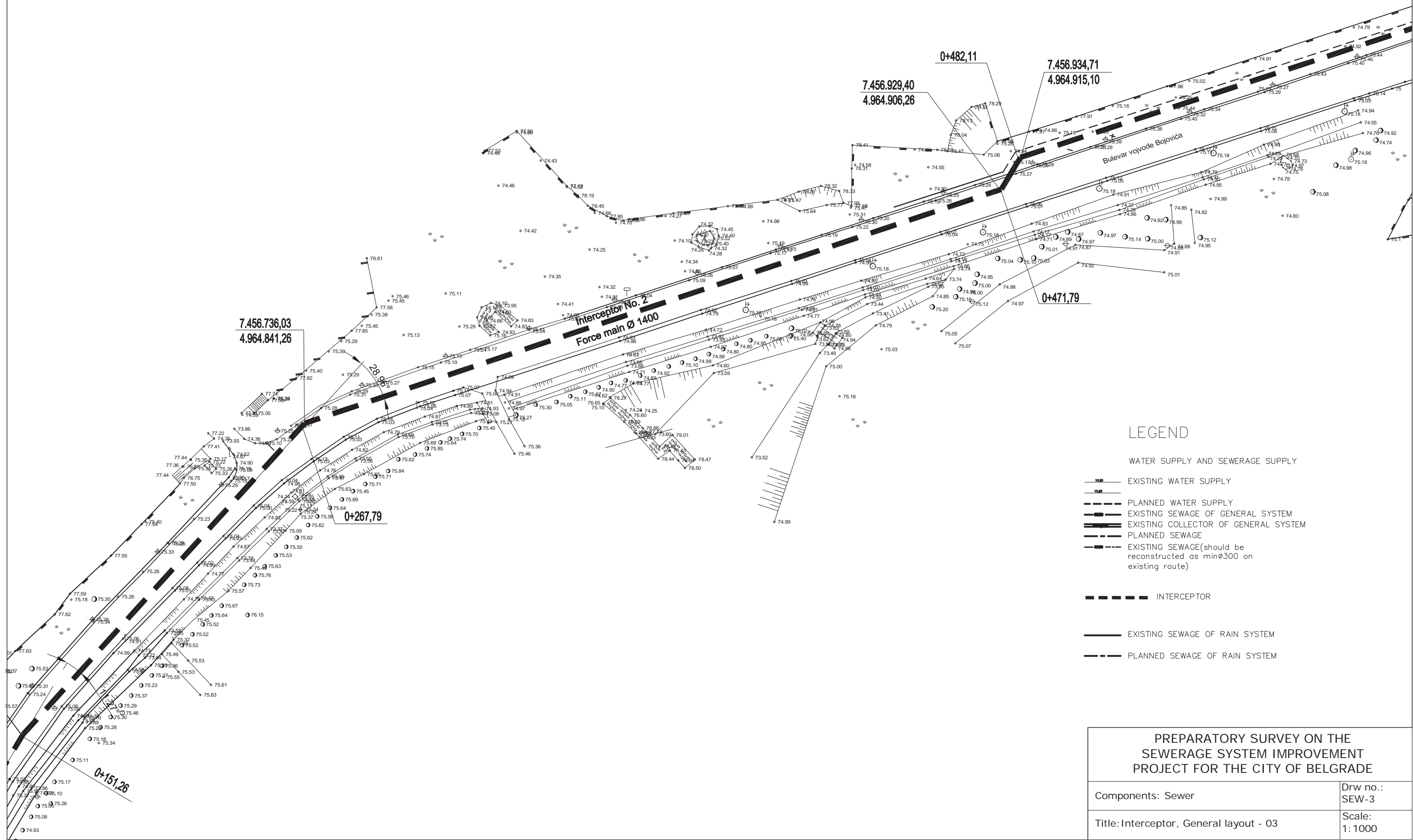
### LEGEND

- WATER SUPPLY AND SEWERAGE SUPPLY
- EXISTING WATER SUPPLY
  - PLANNED WATER SUPPLY
  - EXISTING SEWAGE OF GENERAL SYSTEM
  - EXISTING COLLECTOR OF GENERAL SYSTEM
  - PLANNED SEWAGE
- INTERCEPTOR
- ▬ The passage under the SAVA
  - ▬ INTERCEPTOR
- EXISTING SEWAGE OF RAIN SYSTEM
- PLANNED SEWAGE OF RAIN SYSTEM

<p>PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE</p>	
Components: Sewer	Drw no.: SEW-2
Title: Interceptor, General layout - 02	Scale: 1:1000

# General Layout of Interceptor (Ušće PS to Veliko Selo WWTP)

7.457.058,1  
4.964.955,1



## LEGEND

- WATER SUPPLY AND SEWERAGE SUPPLY
- EXISTING WATER SUPPLY
  - PLANNED WATER SUPPLY
  - EXISTING SEWAGE OF GENERAL SYSTEM
  - EXISTING COLLECTOR OF GENERAL SYSTEM
  - PLANNED SEWAGE
  - EXISTING SEWAGE (should be reconstructed as min  $\phi$  300 on existing route)
  - INTERCEPTOR
  - EXISTING SEWAGE OF RAIN SYSTEM
  - PLANNED SEWAGE OF RAIN SYSTEM

PREPARATORY SURVEY ON THE  
SEWERAGE SYSTEM IMPROVEMENT  
PROJECT FOR THE CITY OF BELGRADE

Components: Sewer

Drw no.:  
SEW-3

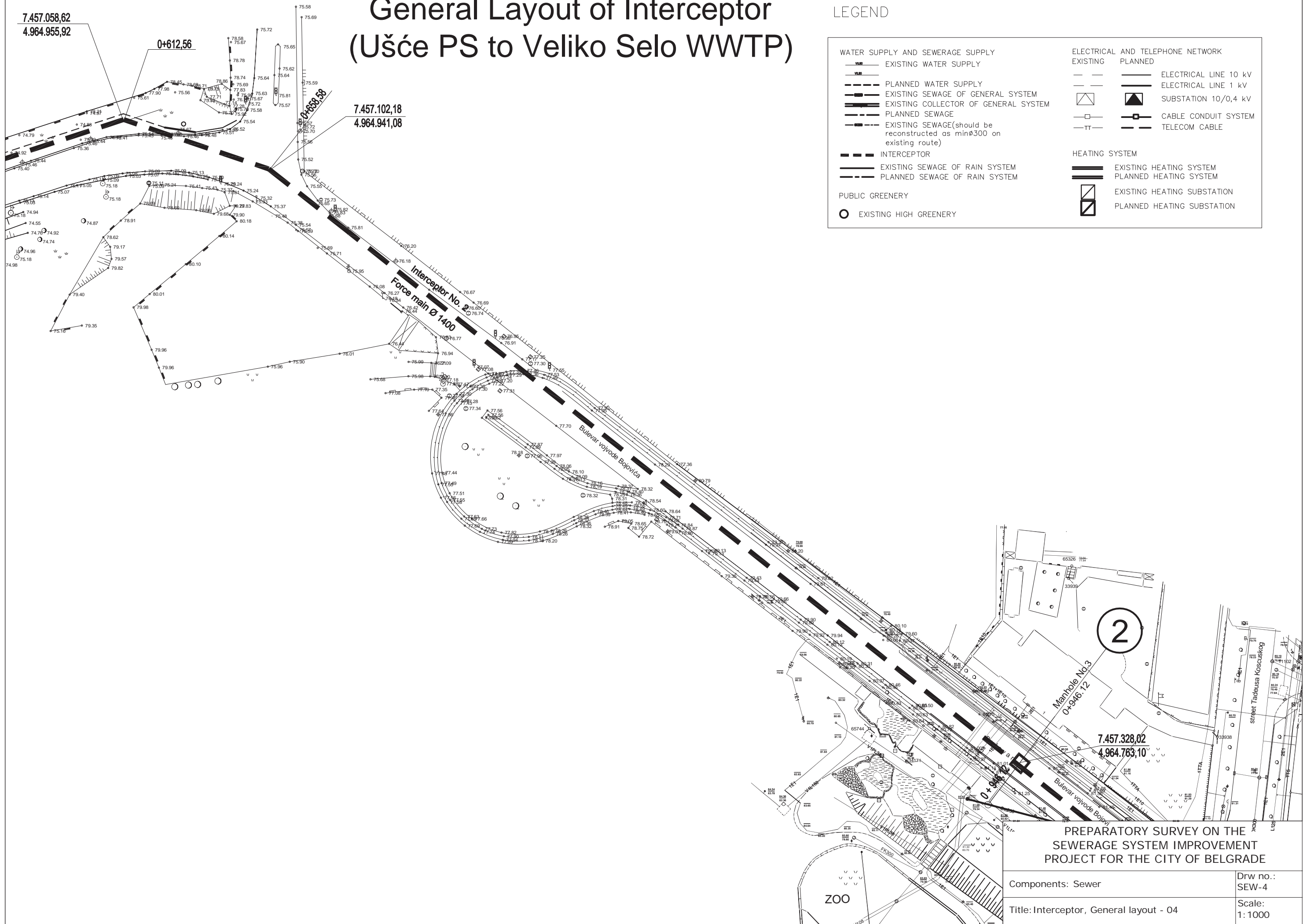
Title: Interceptor, General layout - 03

Scale:  
1: 1000

# General Layout of Interceptor (Ušće PS to Veliko Selo WWTP)

## LEGEND

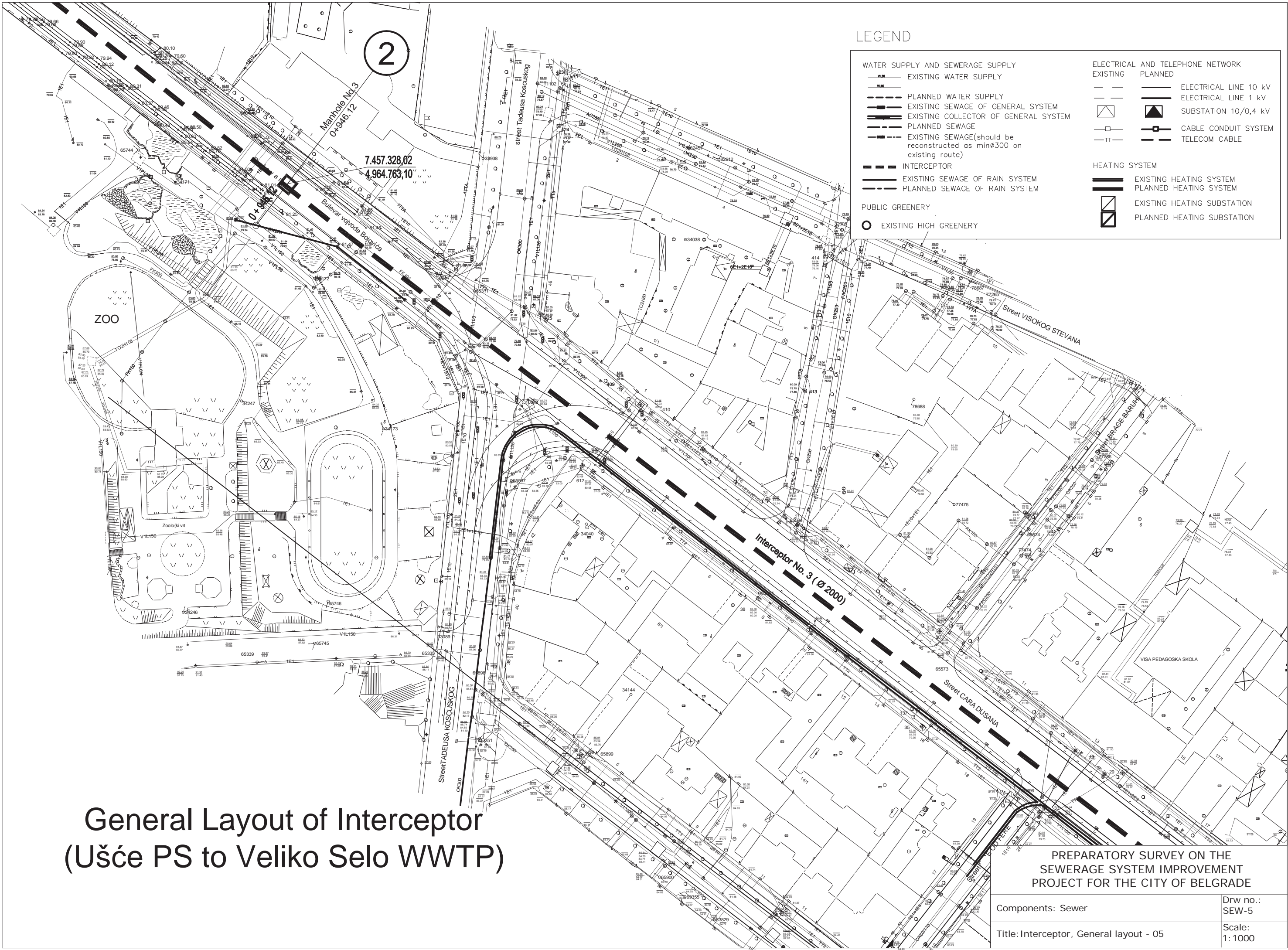
WATER SUPPLY AND SEWERAGE SUPPLY		ELECTRICAL AND TELEPHONE NETWORK	
—	EXISTING WATER SUPPLY	—	EXISTING
—	PLANNED WATER SUPPLY	—	PLANNED
—	EXISTING SEWAGE OF GENERAL SYSTEM	—	ELECTRICAL LINE 10 kV
—	EXISTING COLLECTOR OF GENERAL SYSTEM	—	ELECTRICAL LINE 1 kV
—	PLANNED SEWAGE	□	SUBSTATION 10/0,4 kV
—	EXISTING SEWAGE (should be reconstructed as min Ø300 on existing route)	—	CABLE CONDUIT SYSTEM
—	INTERCEPTOR	—TT—	TELECOM CABLE
—	EXISTING SEWAGE OF RAIN SYSTEM	HEATING SYSTEM	
—	PLANNED SEWAGE OF RAIN SYSTEM	—	EXISTING HEATING SYSTEM
○	EXISTING HIGH GREENERY	—	PLANNED HEATING SYSTEM
		□	EXISTING HEATING SUBSTATION
		□	PLANNED HEATING SUBSTATION



PREPARATORY SURVEY ON THE  
SEWERAGE SYSTEM IMPROVEMENT  
PROJECT FOR THE CITY OF BELGRADE

Components: Sewer	Drw no.: SEW-4
Title: Interceptor, General layout - 04	Scale: 1: 1000





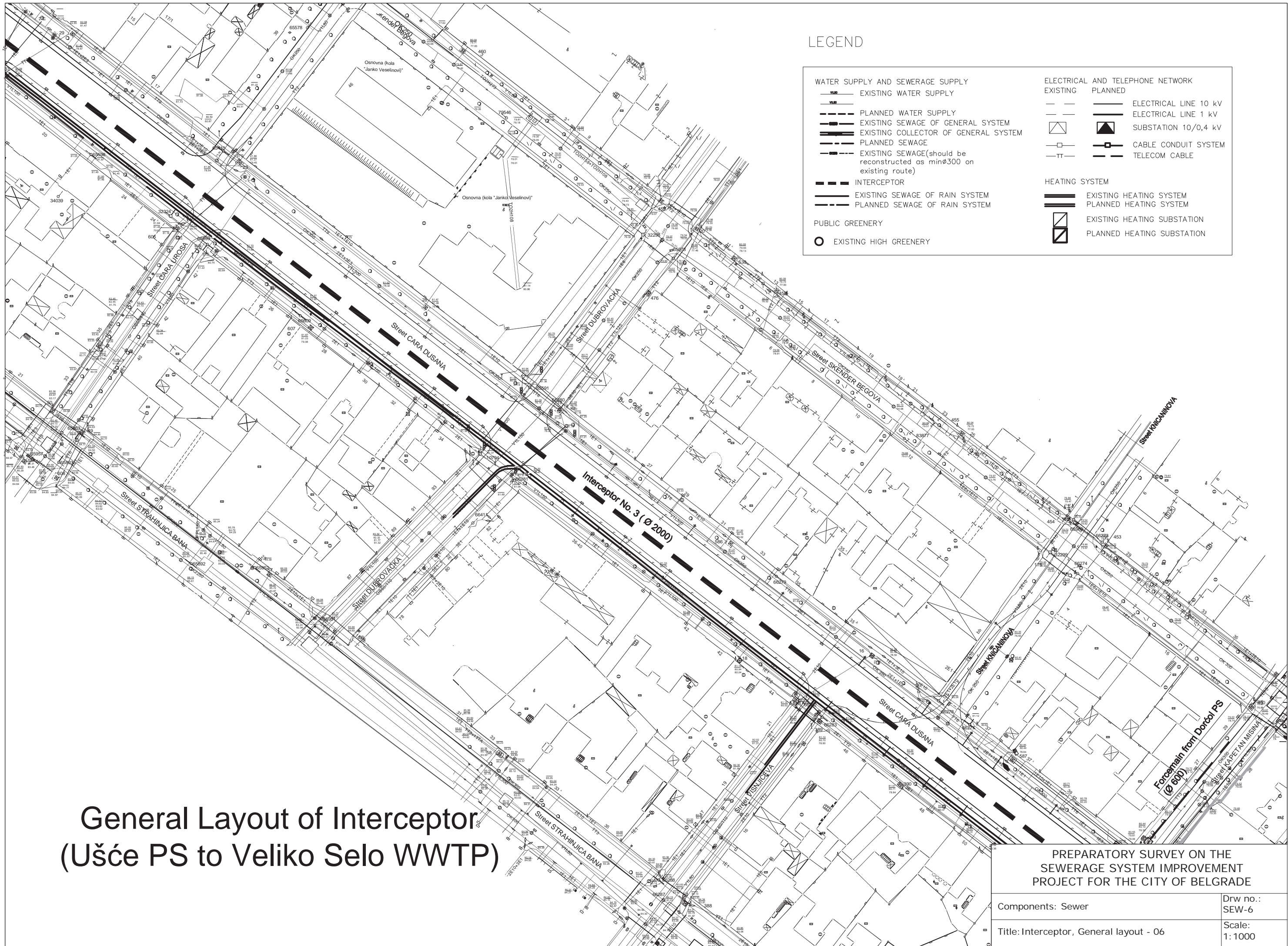
LEGEND

- |                                  |  |                                  |                             |
|----------------------------------|--|----------------------------------|-----------------------------|
| WATER SUPPLY AND SEWERAGE SUPPLY |  | ELECTRICAL AND TELEPHONE NETWORK |                             |
| —                                | EXISTING WATER SUPPLY  | —                                | EXISTING                    |
| - - -                            | PLANNED WATER SUPPLY   | —                                | PLANNED                     |
| —                                | EXISTING SEWAGE OF GENERAL SYSTEM                                      | —                                | ELECTRICAL LINE 10 kV       |
| - - -                            | EXISTING COLLECTOR OF GENERAL SYSTEM                                   | —                                | ELECTRICAL LINE 1 kV        |
| - - -                            | PLANNED SEWAGE   | □                                | SUBSTATION 10/0,4 kV        |
| - - -                            | EXISTING SEWAGE (should be reconstructed as minØ300 on existing route) | □                                | CABLE CONDUIT SYSTEM        |
| - - -                            | INTERCEPTOR  | TT                               | TELECOM CABLE               |
| - - -                            | EXISTING SEWAGE OF RAIN SYSTEM   | HEATING SYSTEM                   |                             |
| - - -                            | PLANNED SEWAGE OF RAIN SYSTEM  | —                                | EXISTING HEATING SYSTEM     |
| PUBLIC GREENERY                  |  | —                                | PLANNED HEATING SYSTEM      |
| ○                                | EXISTING HIGH GREENERY   | □                                | EXISTING HEATING SUBSTATION |
|                                  |  | □                                | PLANNED HEATING SUBSTATION  |

General Layout of Interceptor  
(Ušće PS to Veliko Selo WWTP)

PREPARATORY SURVEY ON THE  
SEWERAGE SYSTEM IMPROVEMENT  
PROJECT FOR THE CITY OF BELGRADE

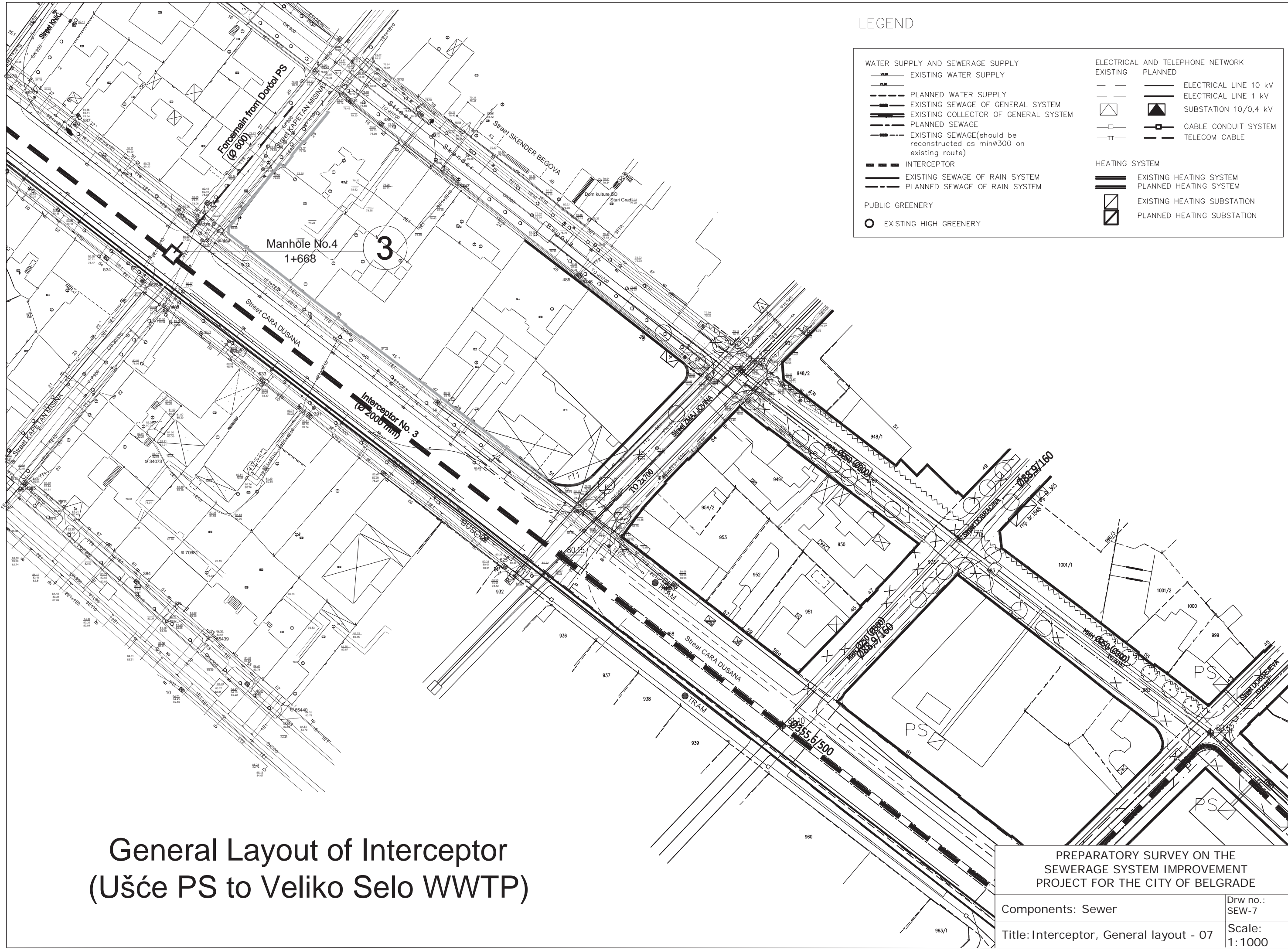
Components: Sewer	Drw no.: SEW-5
Title: Interceptor, General layout - 05	Scale: 1:1000



# General Layout of Interceptor (Ušće PS to Veliko Selo WWTP)

PREPARATORY SURVEY ON THE  
SEWERAGE SYSTEM IMPROVEMENT  
PROJECT FOR THE CITY OF BELGRADE

Components: Sewer	Drw no.: SEW-6
Title: Interceptor, General layout - 06	Scale: 1:1000



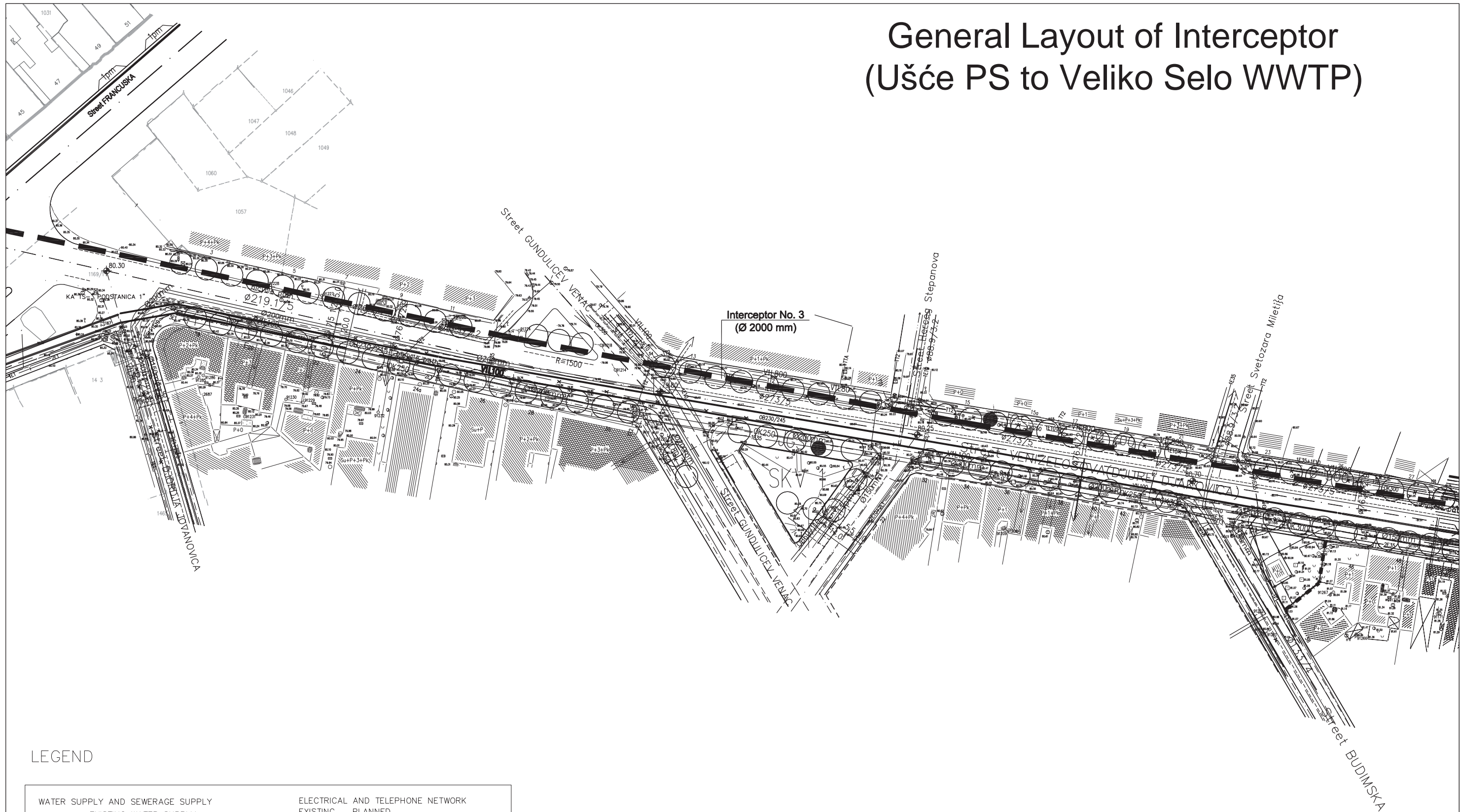
LEGEND

- |                                  |   |                                  |                             |
|----------------------------------|---|----------------------------------|-----------------------------|
| WATER SUPPLY AND SEWERAGE SUPPLY |   | ELECTRICAL AND TELEPHONE NETWORK |                             |
| —                                | EXISTING WATER SUPPLY   | —                                | EXISTING                    |
| - - -                            | PLANNED WATER SUPPLY  | —                                | PLANNED                     |
| —                                | EXISTING SEWAGE OF GENERAL SYSTEM                                       | —                                | ELECTRICAL LINE 10 kV       |
| —                                | EXISTING COLLECTOR OF GENERAL SYSTEM                                    | —                                | ELECTRICAL LINE 1 kV        |
| - - -                            | PLANNED SEWAGE  | □                                | SUBSTATION 10/0,4 kV        |
| - - -                            | EXISTING SEWAGE (should be reconstructed as min Ø300 on existing route) | □                                | CABLE CONDUIT SYSTEM        |
| - - -                            | INTERCEPTOR   | —TT—                             | TELECOM CABLE               |
| - - -                            | EXISTING SEWAGE OF RAIN SYSTEM  | HEATING SYSTEM                   |                             |
| - - -                            | PLANNED SEWAGE OF RAIN SYSTEM   | —                                | EXISTING HEATING SYSTEM     |
| PUBLIC GREENERY                  |   | —                                | PLANNED HEATING SYSTEM      |
| ○                                | EXISTING HIGH GREENERY  | □                                | EXISTING HEATING SUBSTATION |
|                                  |   | □                                | PLANNED HEATING SUBSTATION  |

General Layout of Interceptor  
(Ušće PS to Veliko Selo WWTP)

PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Sewer	Drw no.: SEW-7
Title: Interceptor, General layout - 07	Scale: 1:1000

# General Layout of Interceptor (Ušće PS to Veliko Selo WWTP)



## LEGEND

WATER SUPPLY AND SEWERAGE SUPPLY		ELECTRICAL AND TELEPHONE NETWORK	
— — —	EXISTING WATER SUPPLY	— —	EXISTING
— — —	PLANNED WATER SUPPLY	— —	PLANNED
— — —	EXISTING SEWAGE OF GENERAL SYSTEM	— —	ELECTRICAL LINE 10 kV
— — —	EXISTING COLLECTOR OF GENERAL SYSTEM	— —	ELECTRICAL LINE 1 kV
— — —	PLANNED SEWAGE	□	SUBSTATION 10/0,4 kV
— — —	EXISTING SEWAGE(should be reconstructed as minØ300 on existing route)	□	CABLE CONDUIT SYSTEM
— — —	INTERCEPTOR	—TT—	TELECOM CABLE
— — —	EXISTING SEWAGE OF RAIN SYSTEM	HEATING SYSTEM	
— — —	PLANNED SEWAGE OF RAIN SYSTEM	— —	EXISTING HEATING SYSTEM
— — —	PUBLIC GREENERY	— —	PLANNED HEATING SYSTEM
○	EXISTING HIGH GREENERY	□	EXISTING HEATING SUBSTATION
		□	PLANNED HEATING SUBSTATION

PREPARATORY SURVEY ON THE  
SEWERAGE SYSTEM IMPROVEMENT  
PROJECT FOR THE CITY OF BELGRADE

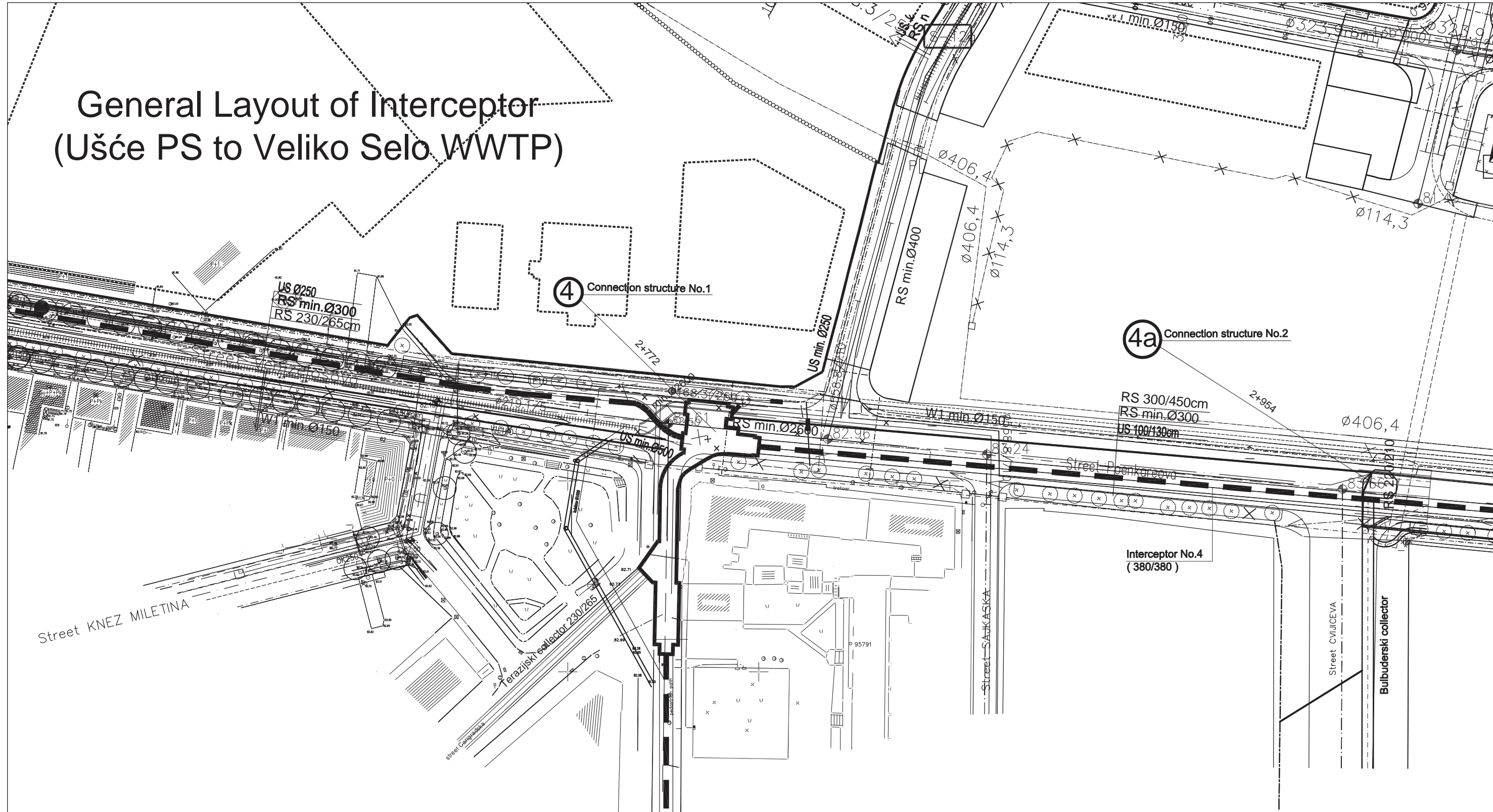
Components: Sewer

Drw no.:  
SEW-8

Title: Interceptor, General layout - 08

Scale:  
1: 1000

# General Layout of Interceptor (Ušće PS to Veliko Selo WWTP)



## LEGEND

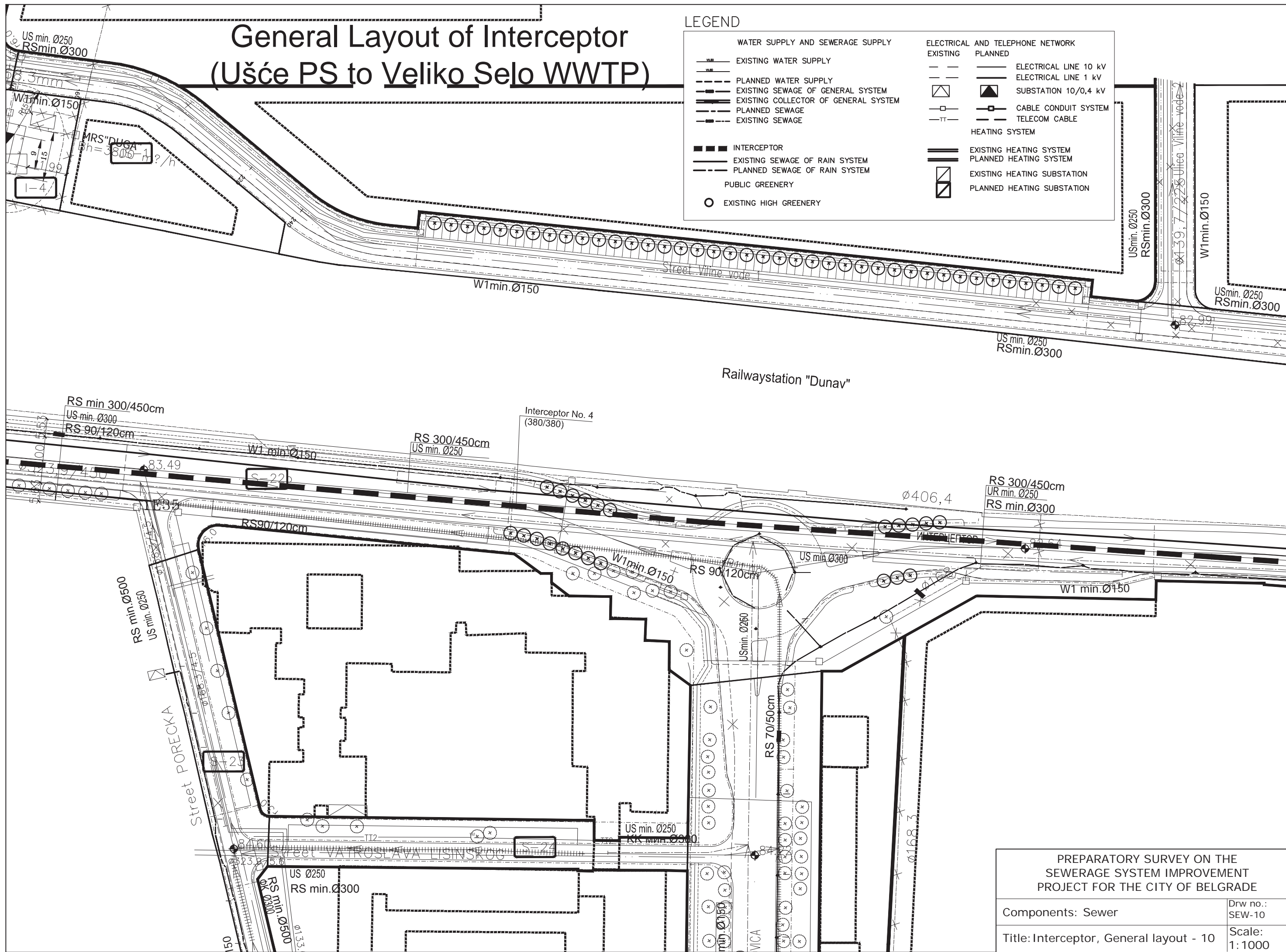
WATER SUPPLY AND SEWERAGE SUPPLY		ELECTRICAL AND TELEPHONE NETWORK	
	EXISTING WATER SUPPLY		EXISTING
	PLANNED WATER SUPPLY		PLANNED
	EXISTING SEWERAGE OF GENERAL SYSTEM		ELECTRICAL LINE 10 kV
	EXISTING COLLECTOR OF GENERAL SYSTEM		ELECTRICAL LINE 1 kV
	PLANNED SEWERAGE		SUBSTATION 10/0,4 kV
	EXISTING SEWERAGE		CABLE CONDUIT SYSTEM
	INTERCEPTOR		TELECOM CABLE
	EXISTING SEWERAGE OF RAIN SYSTEM	HEATING SYSTEM	
	PLANNED SEWERAGE OF RAIN SYSTEM		EXISTING HEATING SYSTEM
	PUBLIC GREENERY		PLANNED HEATING SYSTEM
	EXISTING HIGH GREENERY		EXISTING HEATING SUBSTATION
			PLANNED HEATING SUBSTATION

PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Sewer	Drw no.: SEW-9
Title: Interceptor, General layout - 09	Scale: 1:1000

# General Layout of Interceptor (Ušće PS to Veliko Selo WWTP)

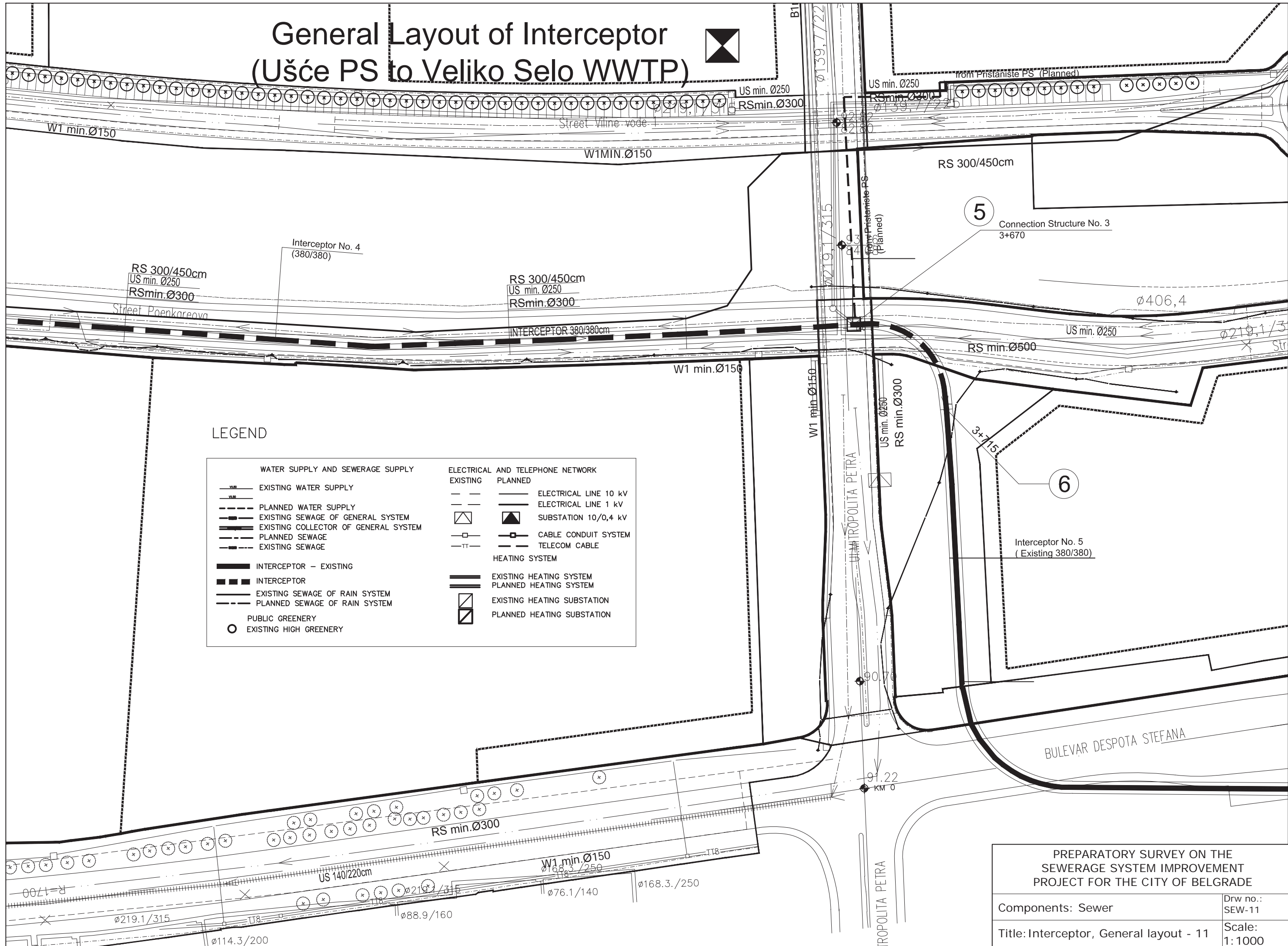
## LEGEND

WATER SUPPLY AND SEWERAGE SUPPLY		ELECTRICAL AND TELEPHONE NETWORK	
		EXISTING	PLANNED
	EXISTING WATER SUPPLY		ELECTRICAL LINE 10 kV
	PLANNED WATER SUPPLY		ELECTRICAL LINE 1 kV
	EXISTING SEWAGE OF GENERAL SYSTEM		SUBSTATION 10/0,4 kV
	EXISTING COLLECTOR OF GENERAL SYSTEM		CABLE CONDUIT SYSTEM
	PLANNED SEWAGE		TELECOM CABLE
	EXISTING SEWAGE	HEATING SYSTEM	
	INTERCEPTOR		EXISTING HEATING SYSTEM
	EXISTING SEWAGE OF RAIN SYSTEM		PLANNED HEATING SYSTEM
	PLANNED SEWAGE OF RAIN SYSTEM		EXISTING HEATING SUBSTATION
	PUBLIC GREENERY		PLANNED HEATING SUBSTATION
	EXISTING HIGH GREENERY		



PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Sewer	Drw no.: SEW-10
Title: Interceptor, General layout - 10	Scale: 1:1000

# General Layout of Interceptor (Ušće PS to Veliko Selo WWTP)



## LEGEND

WATER SUPPLY AND SEWERAGE SUPPLY		ELECTRICAL AND TELEPHONE NETWORK	
EXISTING	PLANNED	EXISTING	PLANNED



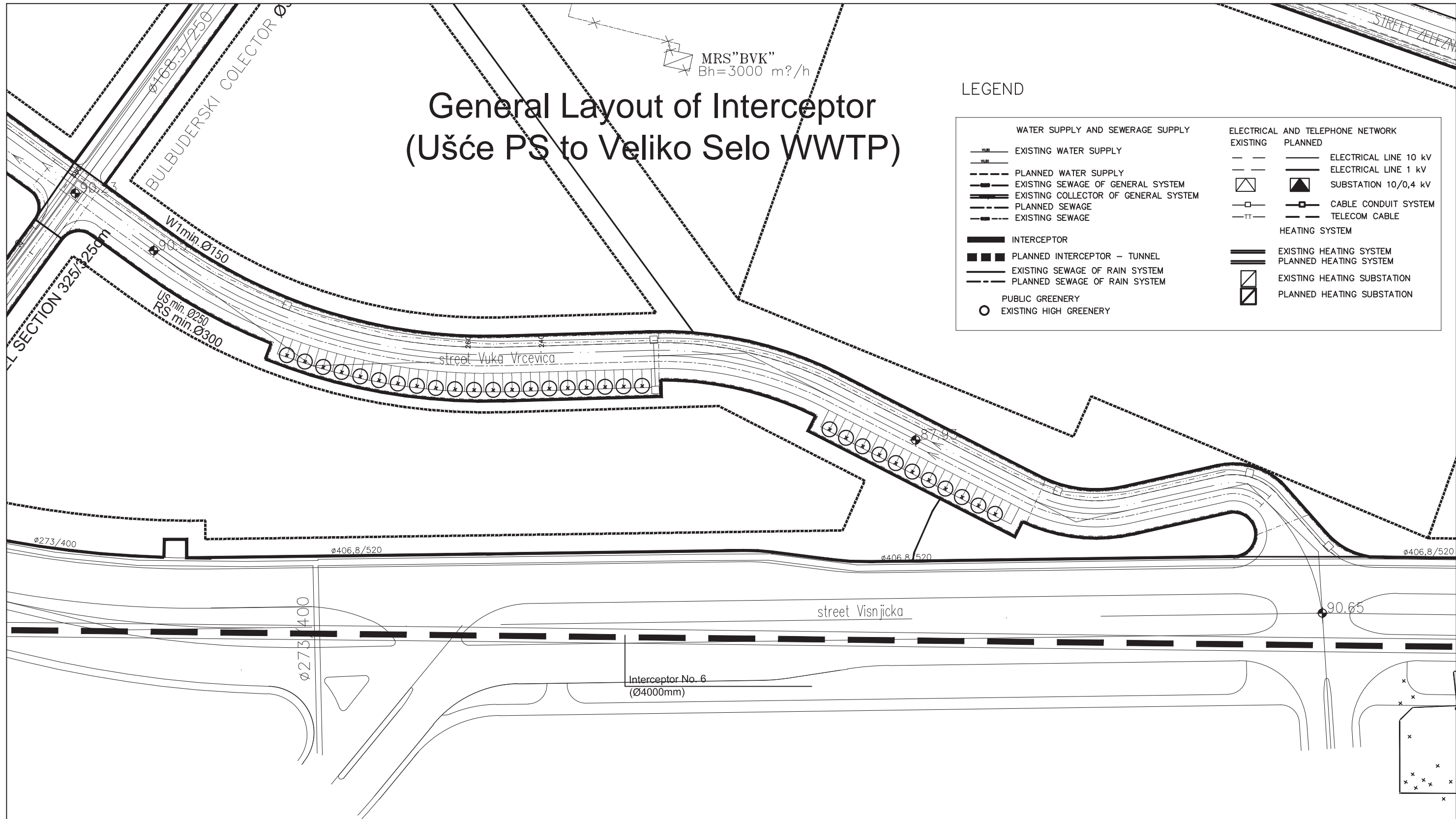


# General Layout of Interceptor (Ušće PS to Veliko Selo WWTP)

MRS "BVK"  
Bh=3000 m<sup>2</sup>/h

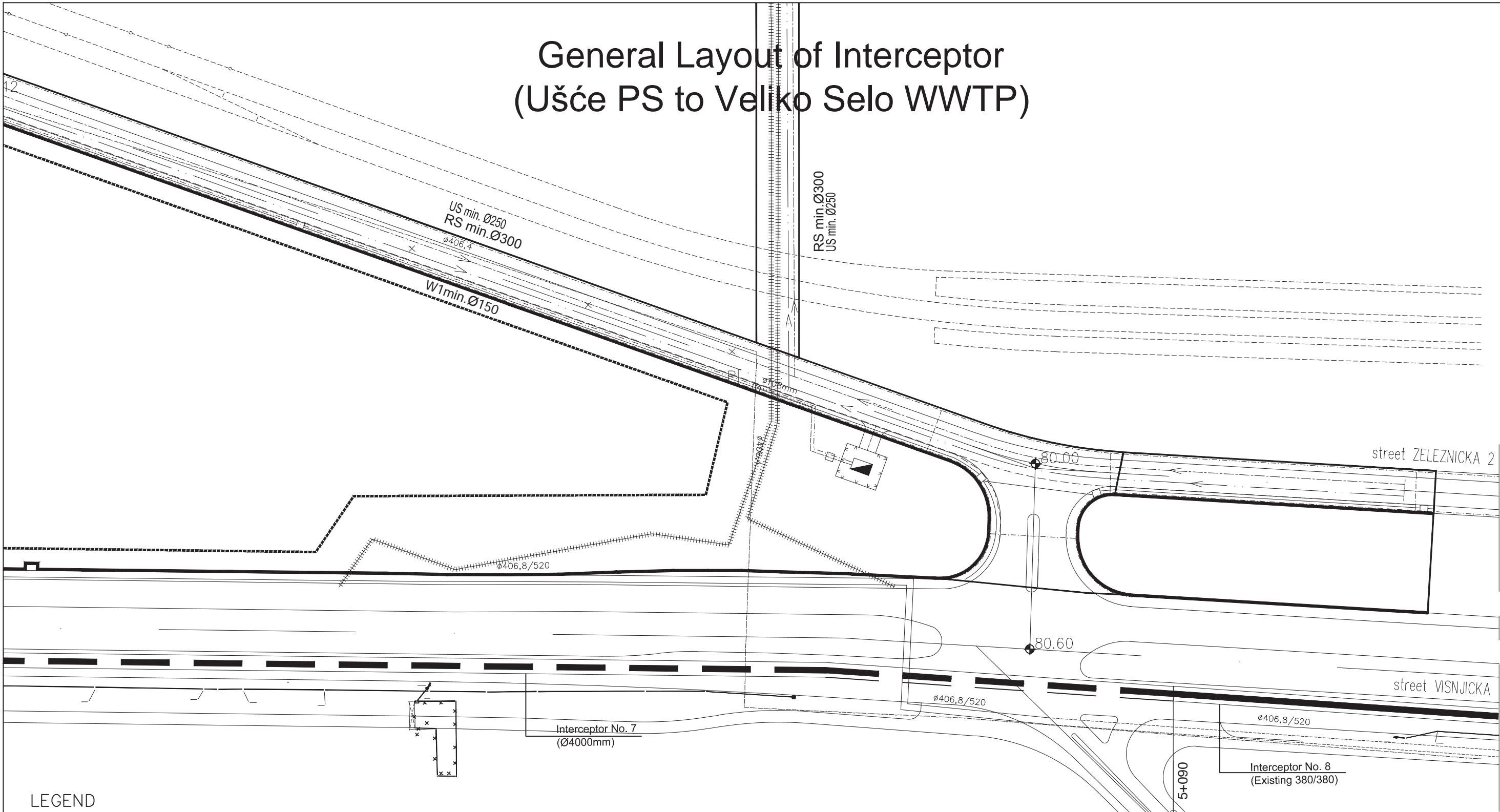
## LEGEND

WATER SUPPLY AND SEWERAGE SUPPLY		ELECTRICAL AND TELEPHONE NETWORK	
EXISTING	PLANNED	EXISTING	PLANNED
EXISTING WATER SUPPLY	PLANNED WATER SUPPLY	ELECTRICAL LINE 10 kV	ELECTRICAL LINE 1 kV
EXISTING SEWAGE OF GENERAL SYSTEM	PLANNED SEWAGE OF GENERAL SYSTEM	SUBSTATION 10/0,4 kV	SUBSTATION 10/0,4 kV
EXISTING COLLECTOR OF GENERAL SYSTEM	PLANNED COLLECTOR OF GENERAL SYSTEM	CABLE CONDUIT SYSTEM	CABLE CONDUIT SYSTEM
EXISTING SEWAGE	PLANNED SEWAGE	TELECOM CABLE	TELECOM CABLE
		HEATING SYSTEM	
INTERCEPTOR	PLANNED INTERCEPTOR - TUNNEL		
		EXISTING HEATING SYSTEM	PLANNED HEATING SYSTEM
EXISTING SEWAGE OF RAIN SYSTEM	PLANNED SEWAGE OF RAIN SYSTEM		
		EXISTING HEATING SUBSTATION	PLANNED HEATING SUBSTATION
		PUBLIC GREENERY	
EXISTING HIGH GREENERY	PLANNED HIGH GREENERY		



PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Sewer	Drw no.: SEW-13
Title: Interceptor, General layout - 13	Scale: 1:1000

# General Layout of Interceptor (Ušće PS to Veliko Selo WWTP)



**LEGEND**

WATER SUPPLY AND SEWERAGE SUPPLY		ELECTRICAL AND TELEPHONE NETWORK	
	EXISTING WATER SUPPLY		EXISTING
	PLANNED WATER SUPPLY		PLANNED
	EXISTING SEWAGE OF GENERAL SYSTEM		ELECTRICAL LINE 10 kV
	EXISTING COLLECTOR OF GENERAL SYSTEM		ELECTRICAL LINE 1 kV
	PLANNED SEWAGE		SUBSTATION 10/0,4 kV
	EXISTING SEWAGE		CABLE CONDUIT SYSTEM
	INTERCEPTOR		TELECOM CABLE
	PLANNED INTERCEPTOR - TUNNEL	HEATING SYSTEM	
	EXISTING SEWAGE OF RAIN SYSTEM		EXISTING HEATING SYSTEM
	PLANNED SEWAGE OF RAIN SYSTEM		PLANNED HEATING SYSTEM
	PUBLIC GREENERY		EXISTING HEATING SUBSTATION
	EXISTING HIGH GREENERY		PLANNED HEATING SUBSTATION

8

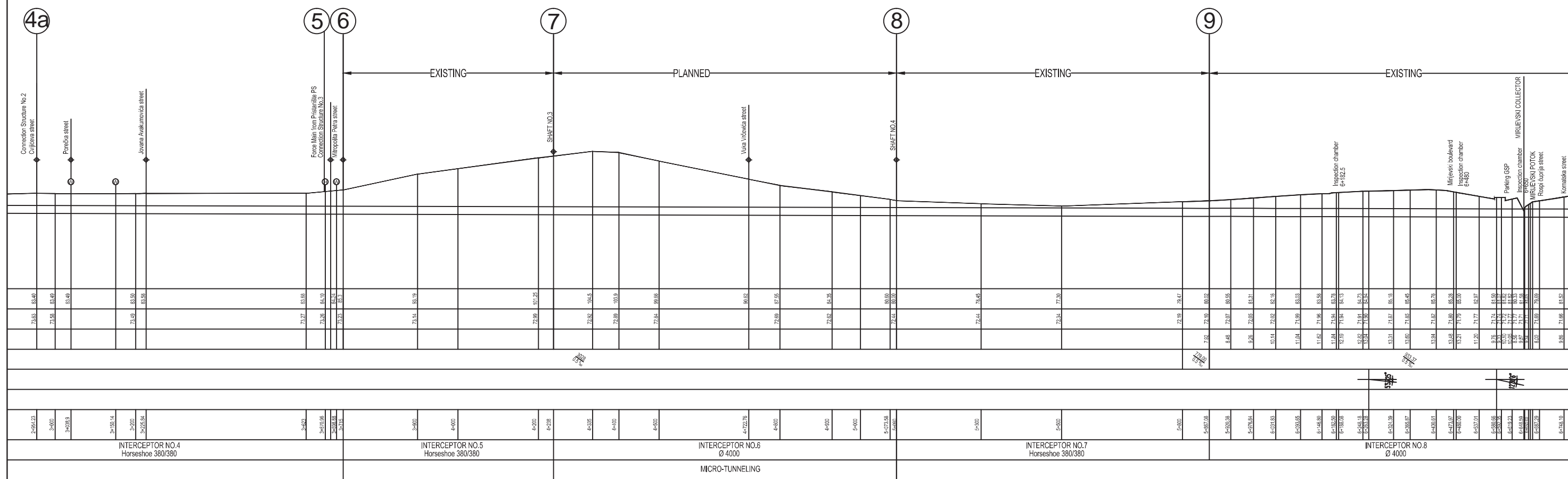
PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Sewer	Drw no.: SEW-14
Title: Interceptor, General layout - 14	Scale: 1:1000



# Longitudinal Profile of Interceptor ( Ušće PS to Veliko Selo WWTP )

## LEGEND

- (E) Electrical Cables
- (W) Water System
- (S) Sewerage System
- (H) Heating System
- (T) Tram



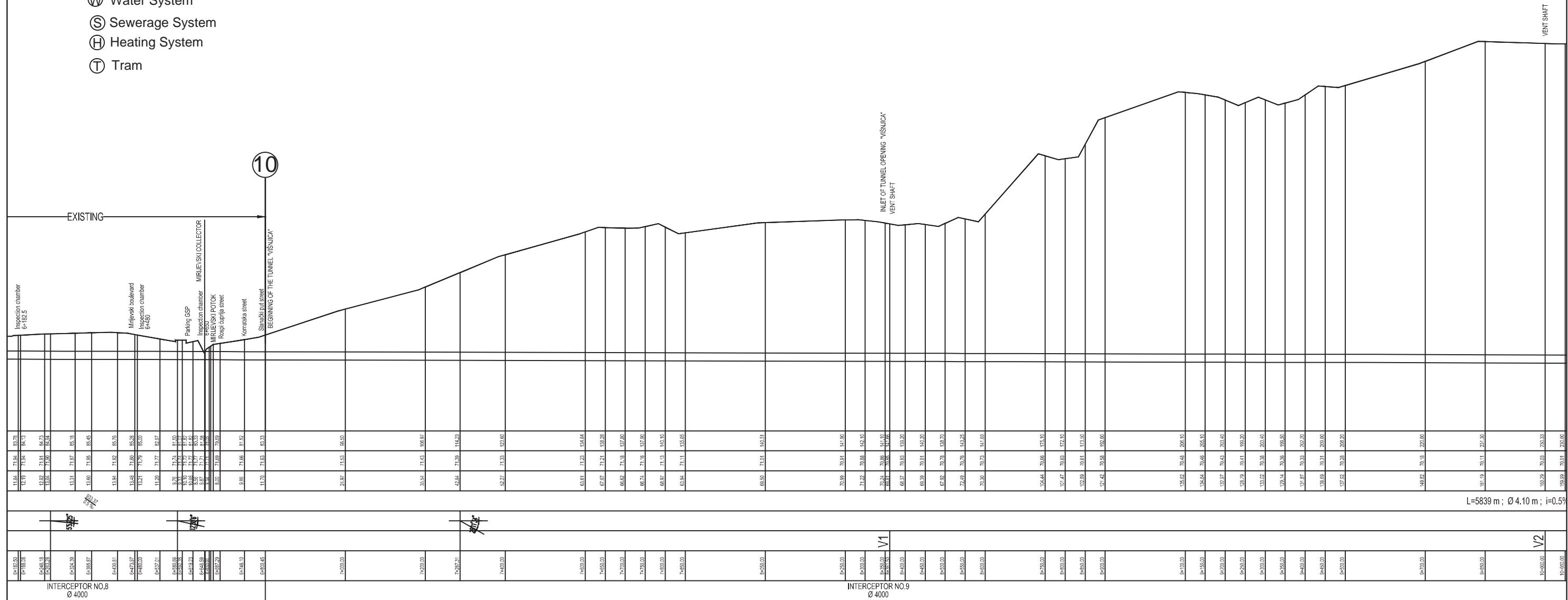
### PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE

Components: Sewer	Drw no.: SEW-16
Title: Interceptor, Longitudinal profile - 02	Scale: H 1:100 V 1:20

# Longitudinal Profile of Interceptor ( Ušće PS to Veliko Selo WWTP )

## LEGEND

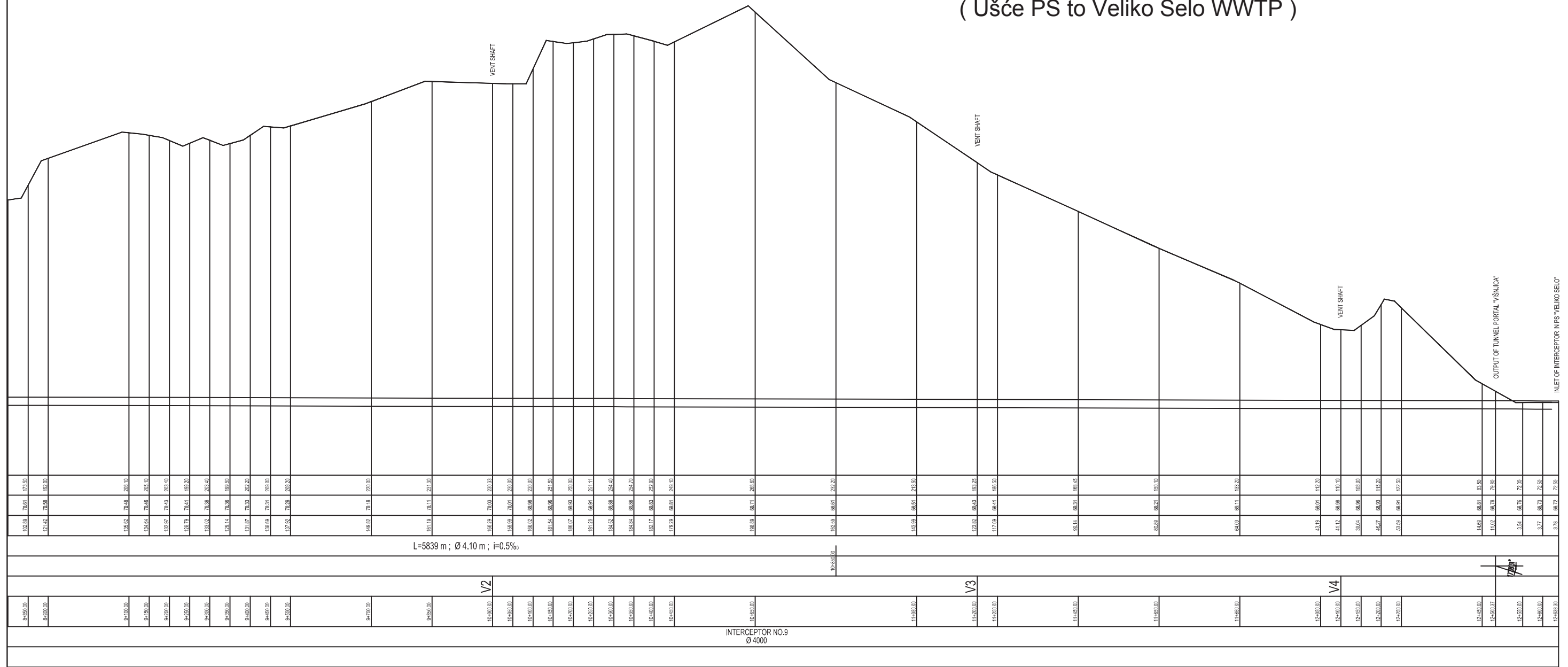
- ⓔ Electrical Cables
- Ⓜ Water System
- Ⓢ Sewerage System
- Ⓜ Heating System
- Ⓣ Tram



## PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE

Components: Sewer	Drw no.: SEW-17
Title: Interceptor, Longitudinal profile - 03	Scale: H 1:100 V 1:20

# Longitudinal Profile of Interceptor ( Ušće PS to Veliko Selo WWTP )



L=5839 m ; Ø 4.10 m ; i=0.5‰

INTERCEPTOR NO.9  
Ø 4000

- LEGEND**
- ⓔ Electrical Cables
  - Ⓦ Water System
  - Ⓢ Sewerage System
  - Ⓜ Heating System
  - Ⓣ Tram
  - V1 - V4 Vent Shafts

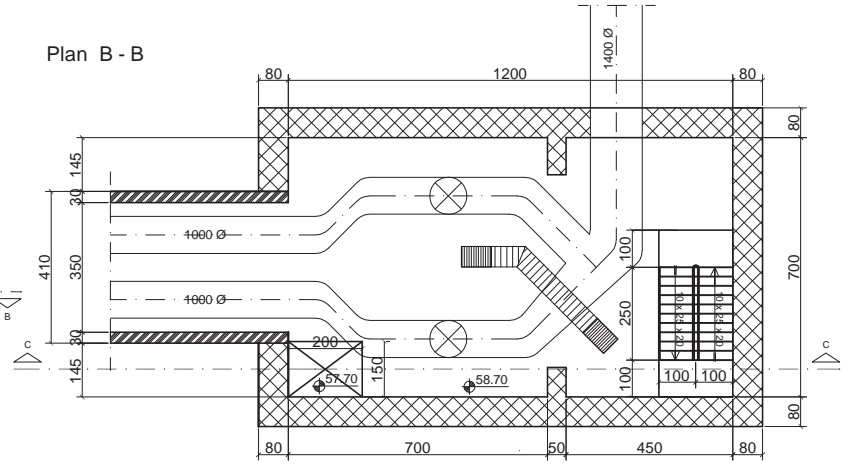
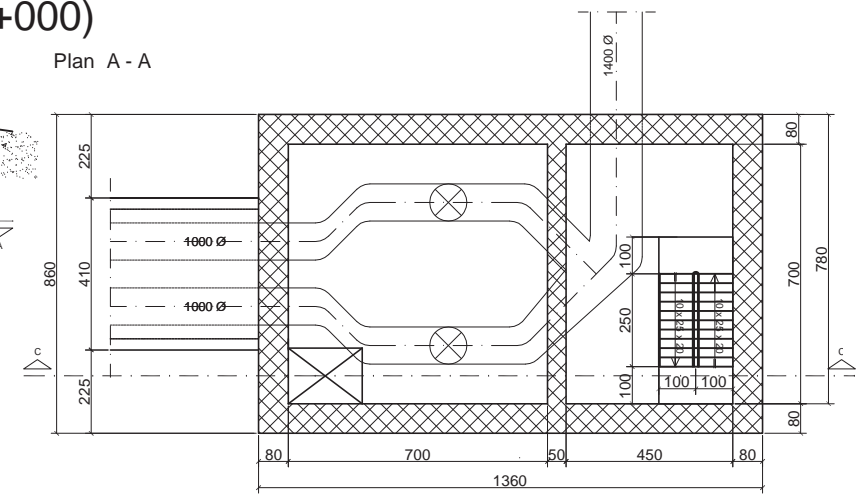
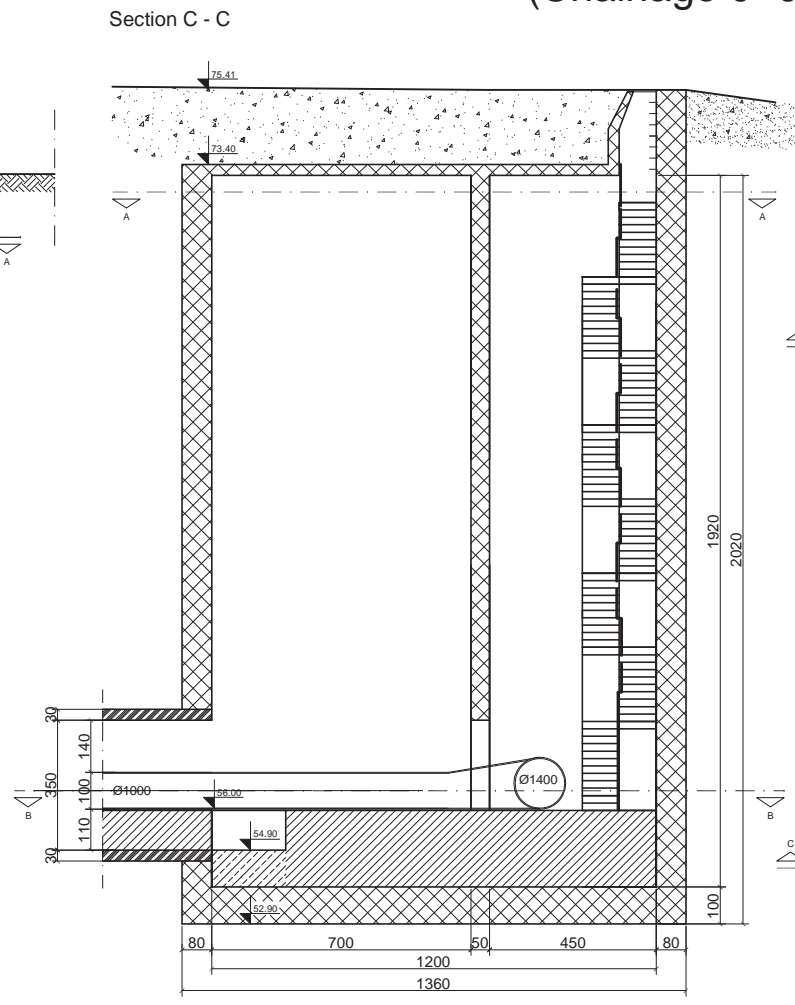
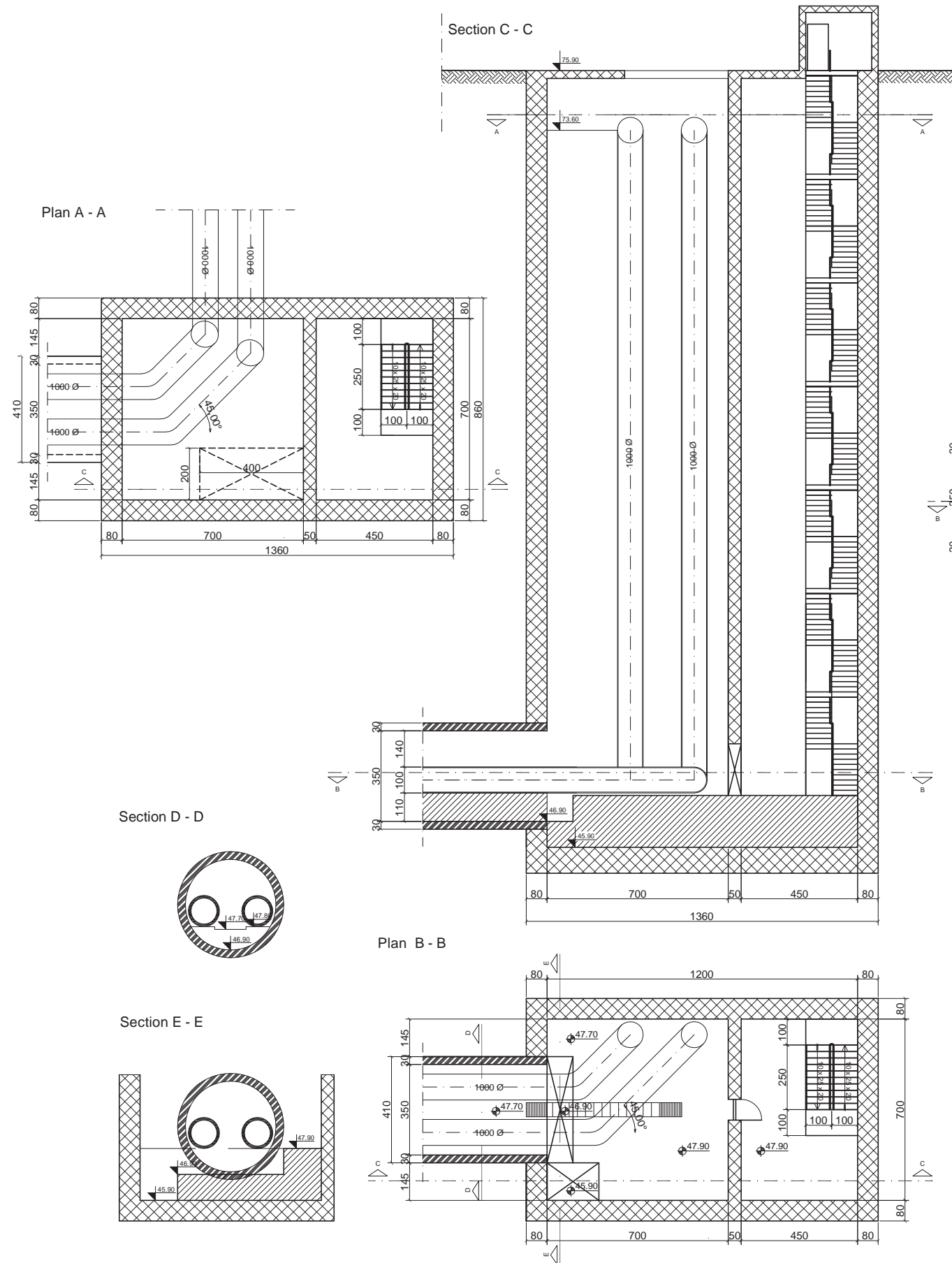
**PREPARATORY SURVEY ON THE  
SEWERAGE SYSTEM IMPROVEMENT  
PROJECT FOR THE CITY OF BELGRADE**

Components: Sewer	Drw no.: SEW-18
Title: Interceptor, Longitudinal profile - 04	Scale: H 1:100 V 1:20

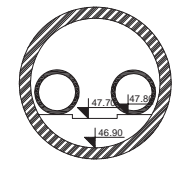
# Shaft No.1 and No.2

## Shaft No. 1 (Beginning of Interceptor No.1)

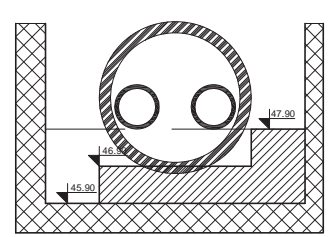
## Shaft No. 2 (Chainage 0+000)



Section D - D

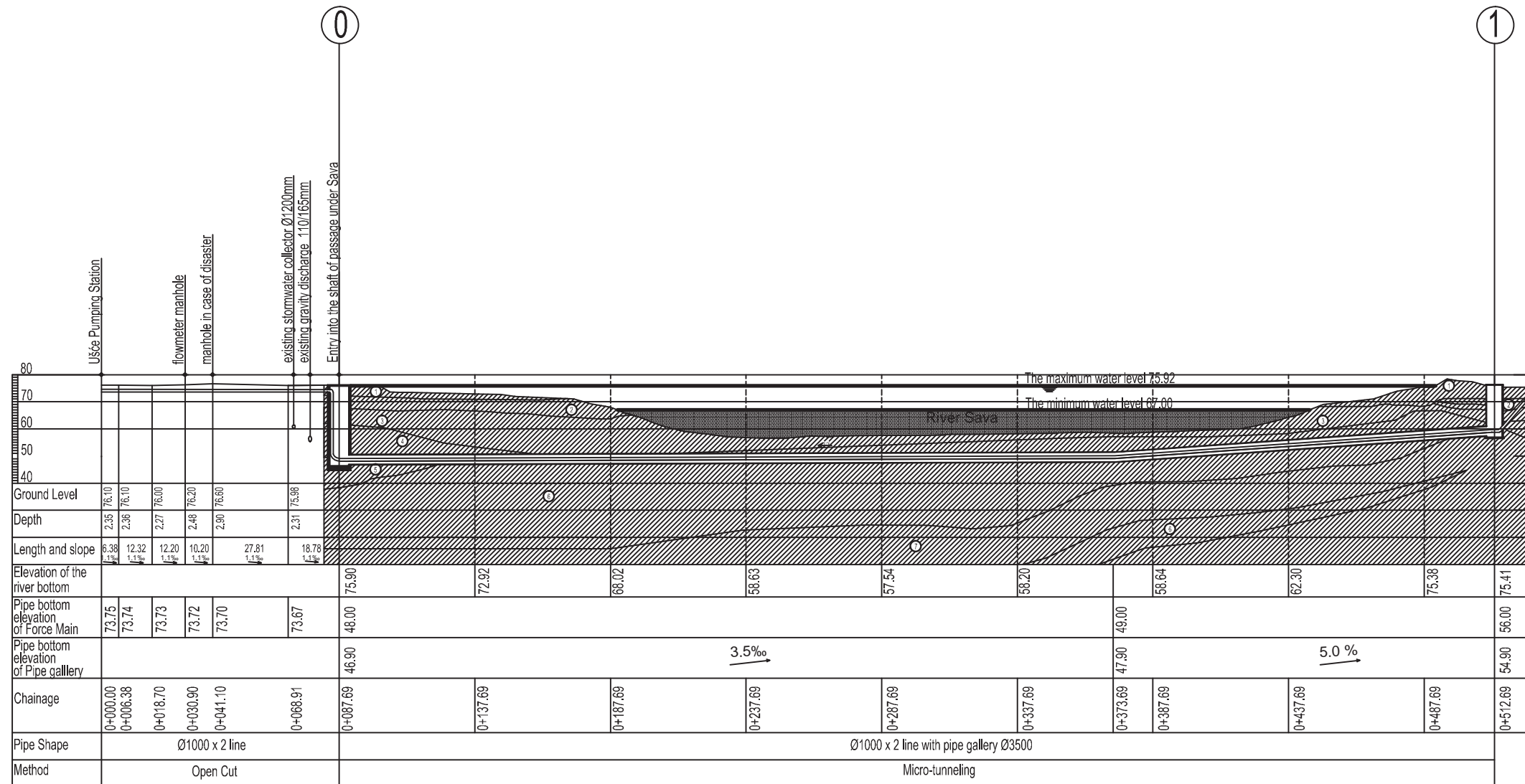


Section E - E



<p>PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE</p>	
Components: Sewer	Drw no.: SEW-19
Title: Shaft No.1 and No.2	Scale: 1:200

# Longitudinal Profile of Pipe Gallery under Sava River



## LEGEND

- ① n Causeway
- ② ③ Q<sub>2a</sub> Alluvial sediments
- ④ Q<sub>aj</sub> Lake sediments
- ⑤ PLP Pliocene sands
- ⑥ M<sub>2</sub>K Tortonian limestones
- ⑦ M<sub>2</sub>Ps Tortonian sandstones

PREPARATORY SURVEY ON THE SEWERAGE  
SYSTEM IMPROVEMENT PROJECT FOR THE CITY  
OF BELGRADE

Components: Sewer

Drw no.:  
SEW-20

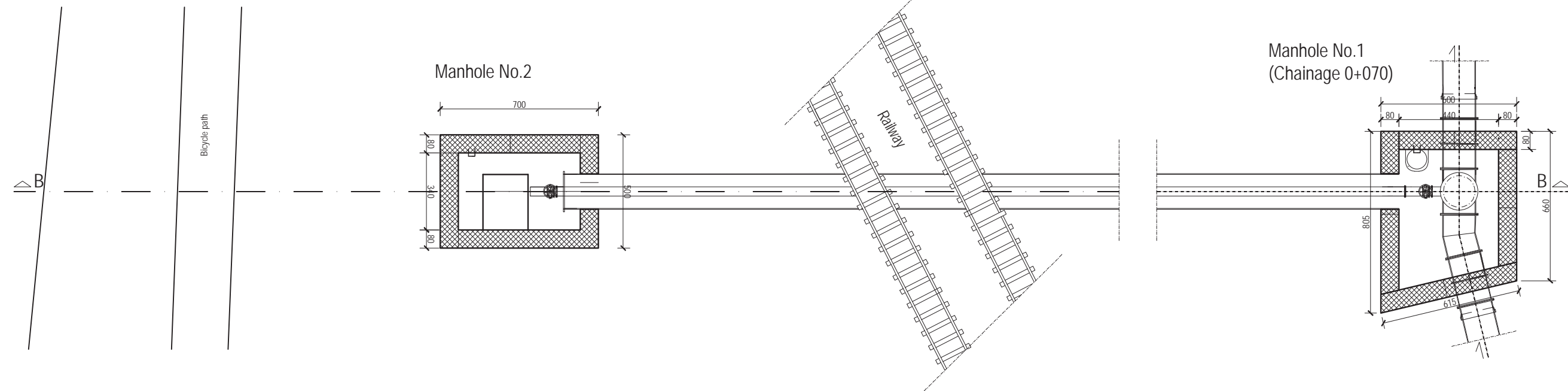
Title: Longitudinal profile of pipe gallery under Sava River

Scale:  
1:2000

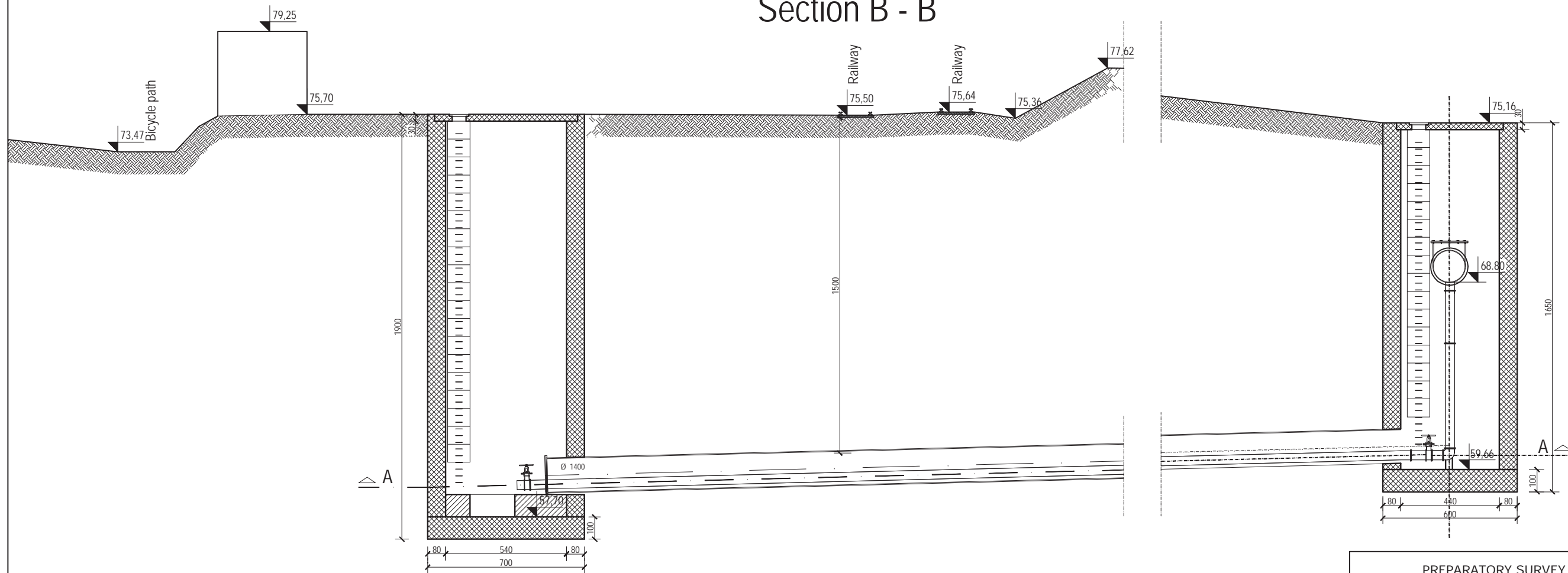


# Manhole No.1 and No.2

## Plan A - A



## Section B - B



PREPARATORY SURVEY ON THE SEWERAGE  
SYSTEM IMPROVEMENT PROJECT FOR THE CITY  
OF BELGRADE

Components: Sewer

Drw no:  
SEW-21

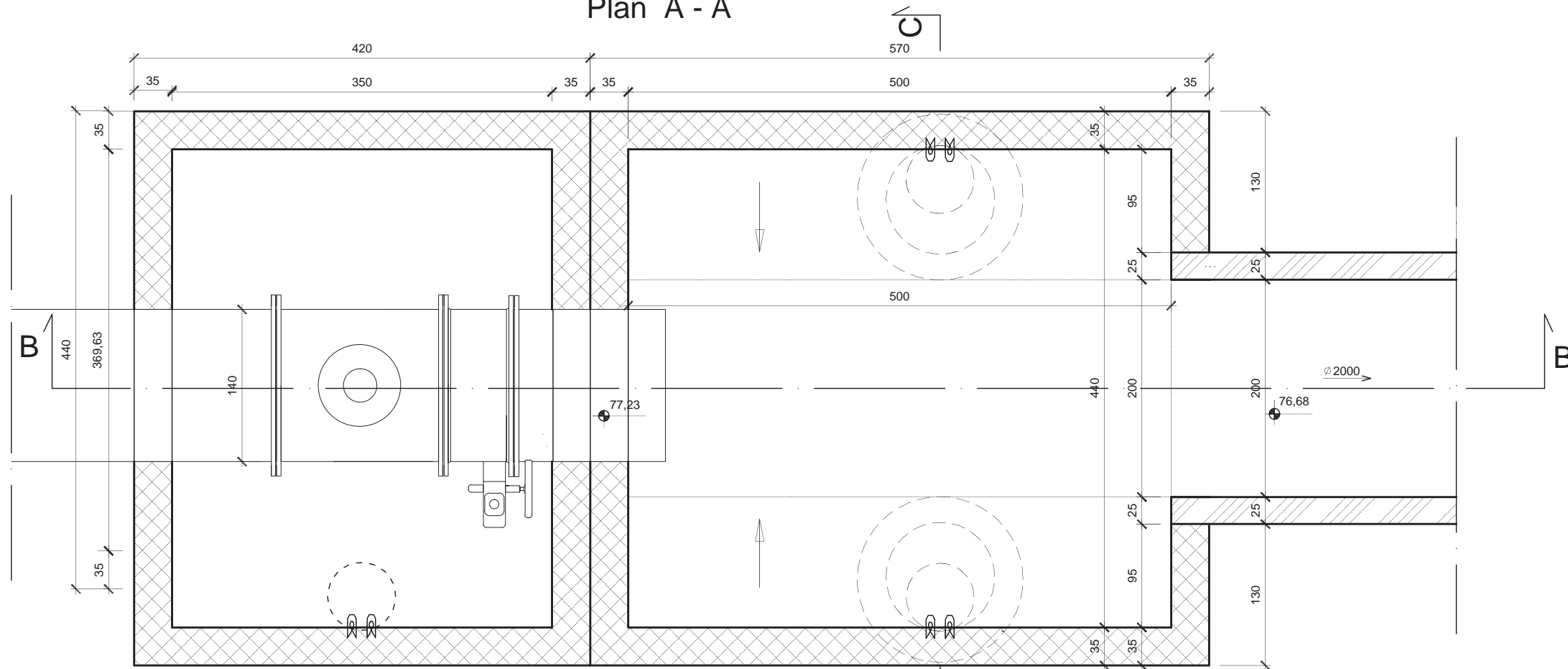
Title: Manhole No.1, Manhole No.2

Scale:  
1:200

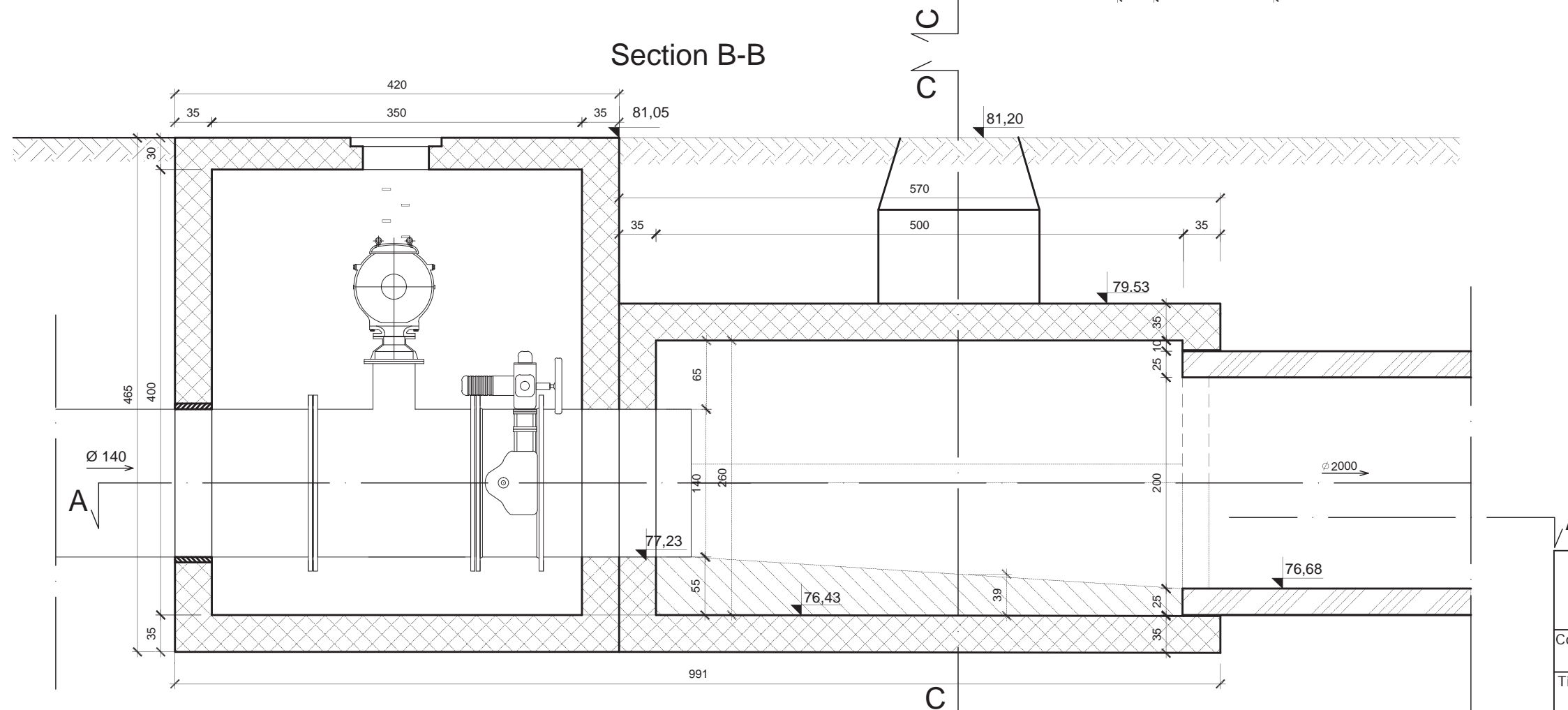
# Manhole No.3

Chainage 0+946.12

Plan A - A



Section B-B



PREPARATORY SURVEY ON THE SEWERAGE  
SYSTEM IMPROVEMENT PROJECT FOR THE CITY  
OF BELGRADE

Components: Sewer

Drw no:  
SEW-22

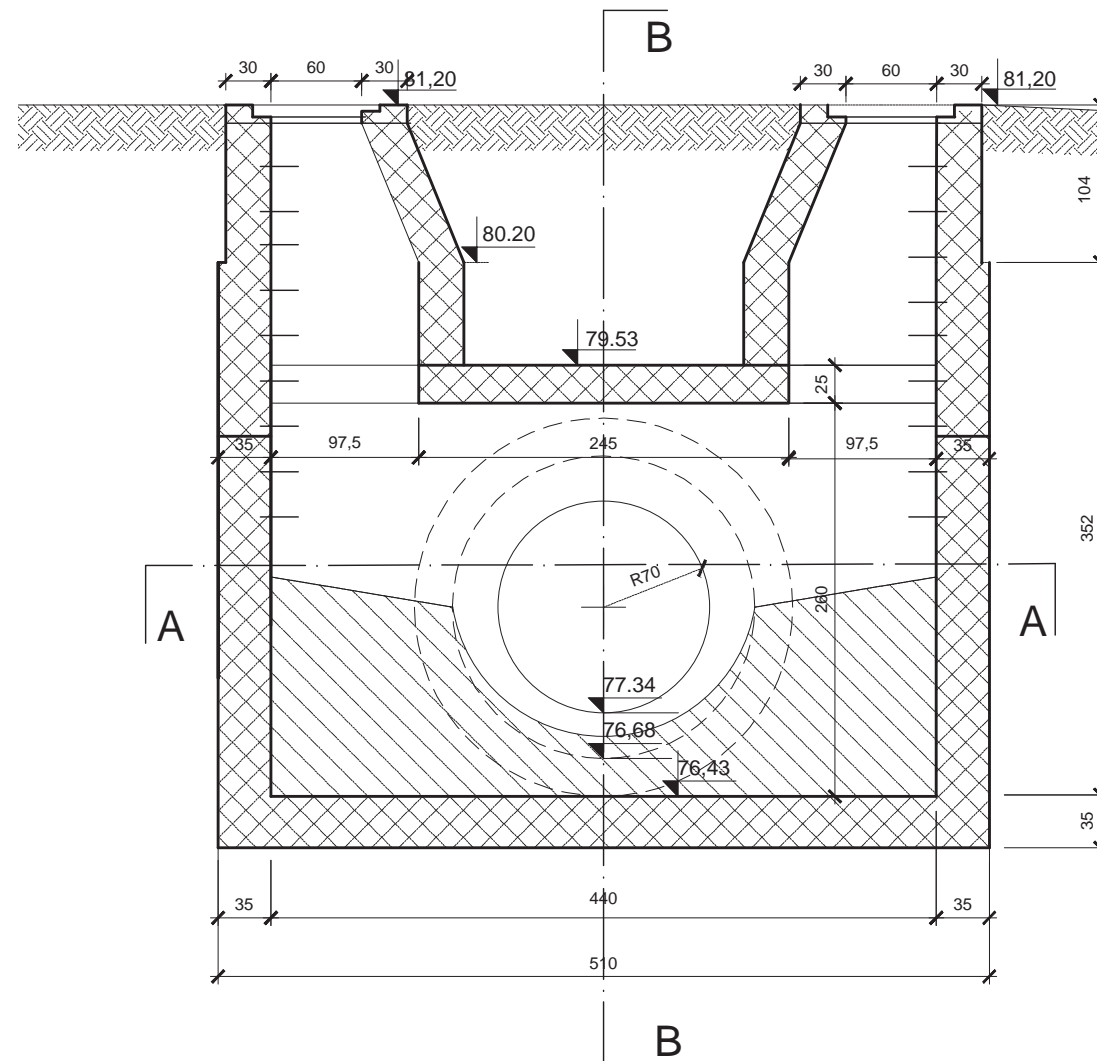
Title: Manhole No.3

Scale:  
1:50

# Manhole No.3

Chainage 0+946.12

## Section C-C



PREPARATORY SURVEY ON THE SEWERAGE  
SYSTEM IMPROVEMENT PROJECT FOR THE CITY  
OF BELGRADE

Components: Sewer

Drw no:  
SEW-23

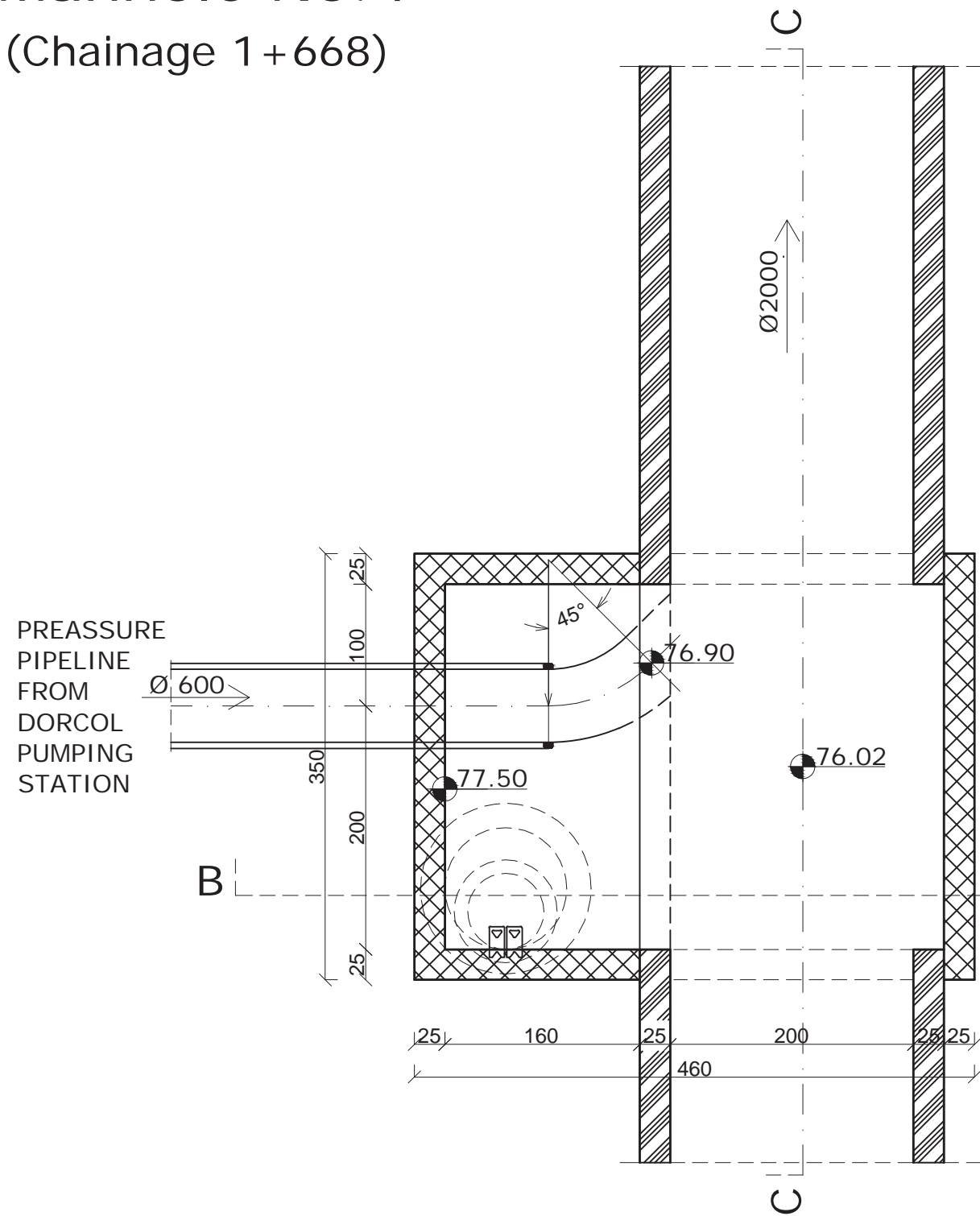
Title: Manhole No. 3

Scale:  
1:50

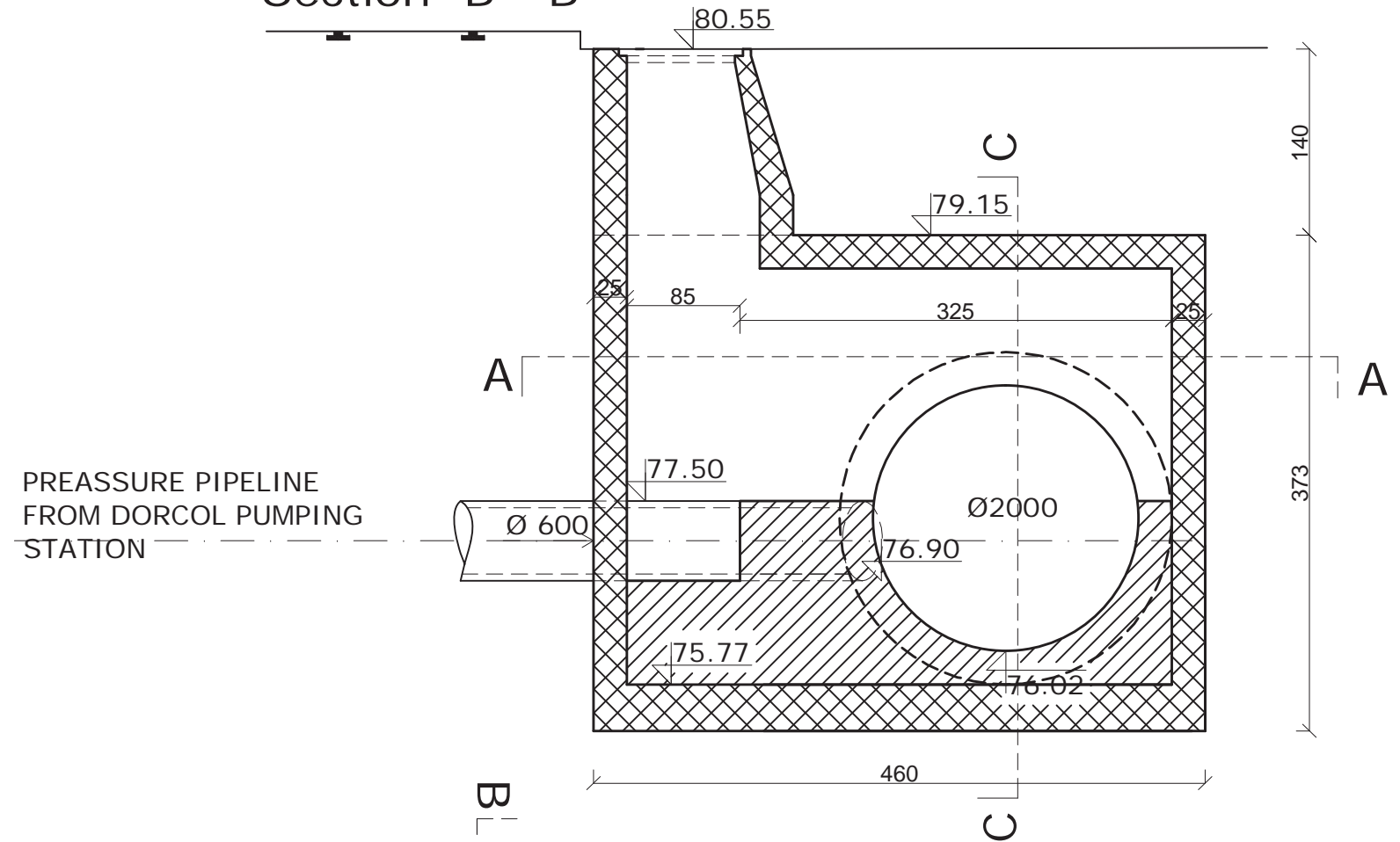
# Manhole No.4

(Chainage 1+668)

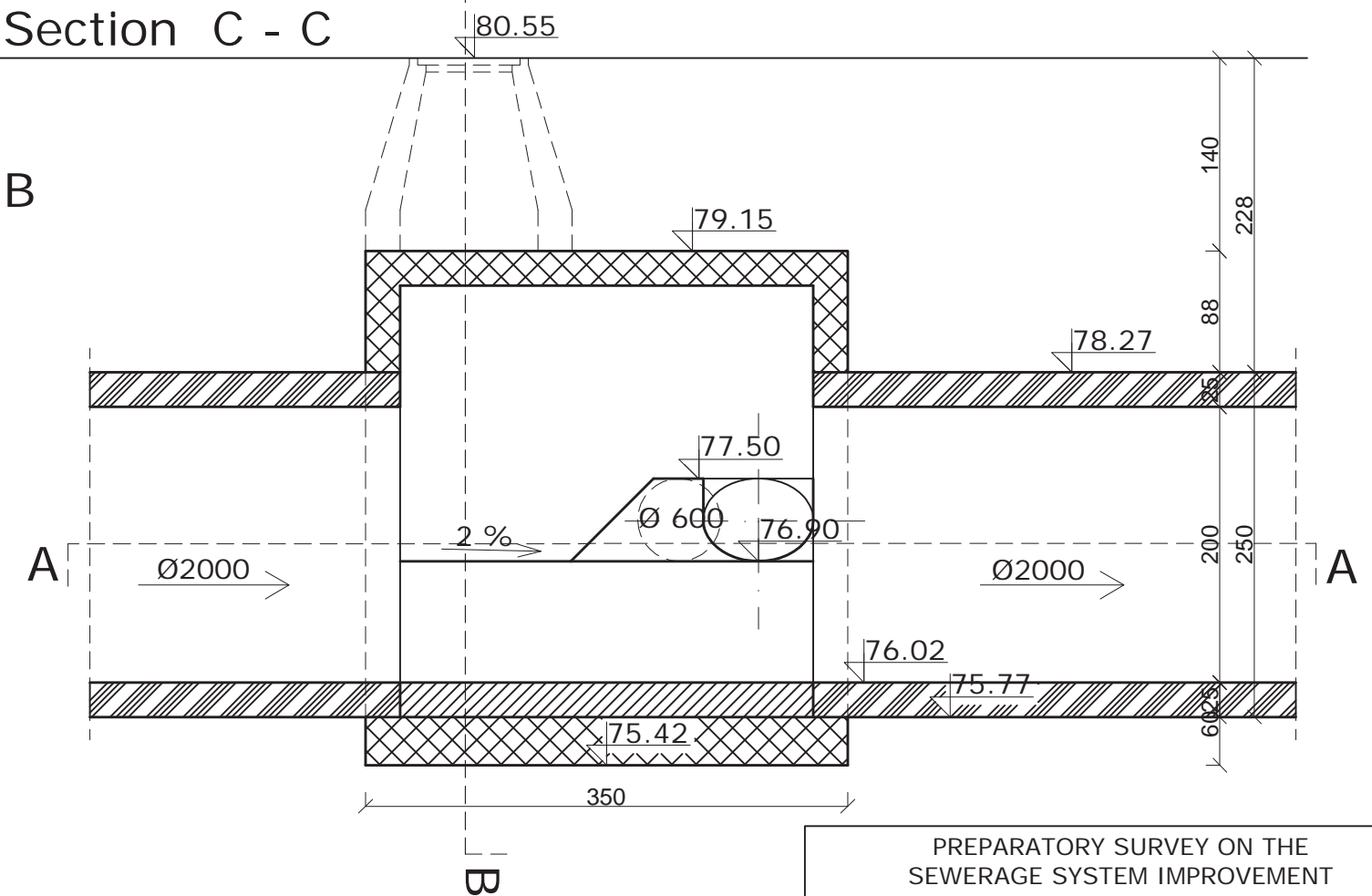
Plan A - A



Section B - B



Section C - C



PREPARATORY SURVEY ON THE  
SEWERAGE SYSTEM IMPROVEMENT  
PROJECT FOR THE CITY OF BELGRADE

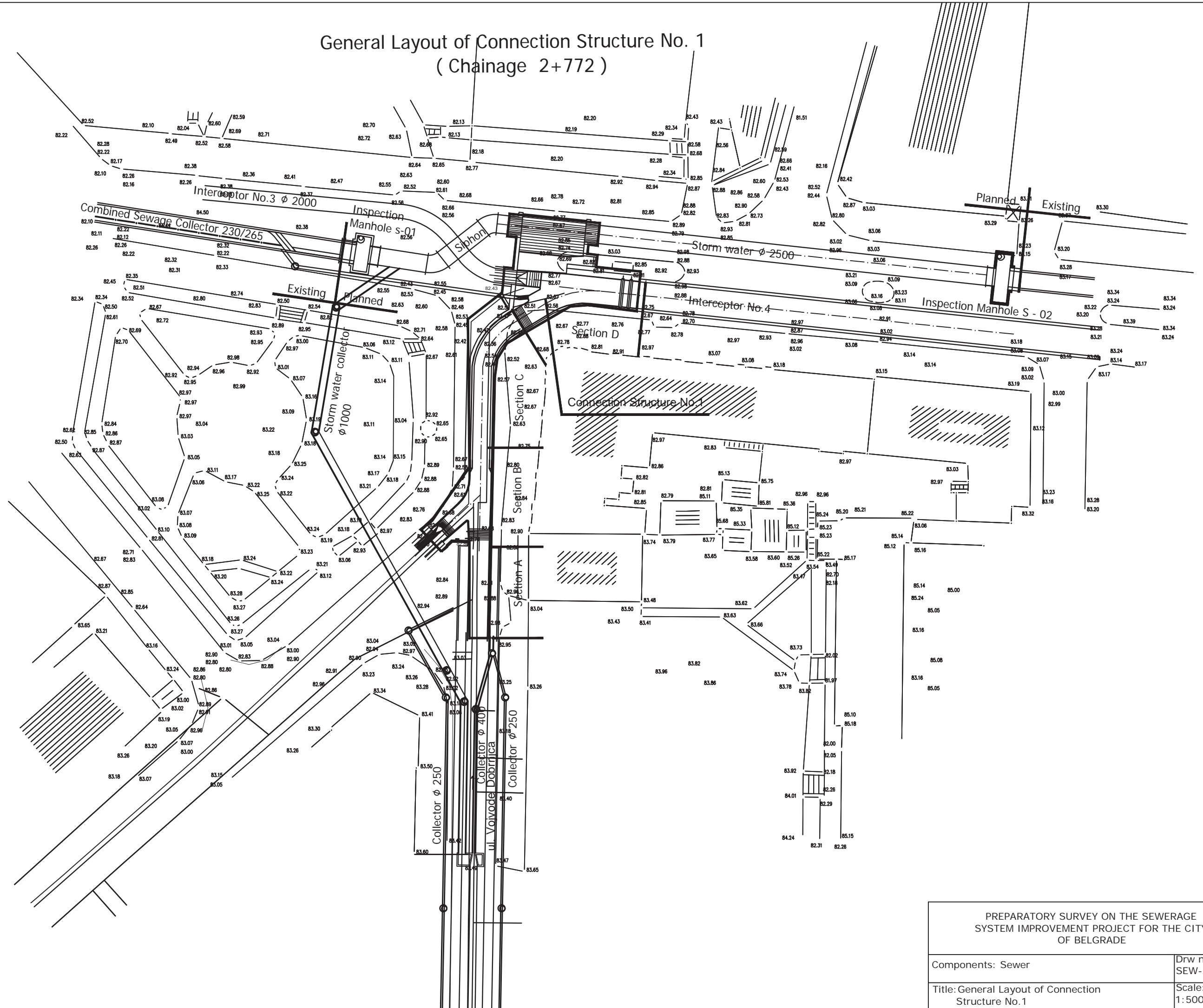
Components: Sewer

Drw no.:  
SEW-24

Title: Manhole No.4, Plan and Section

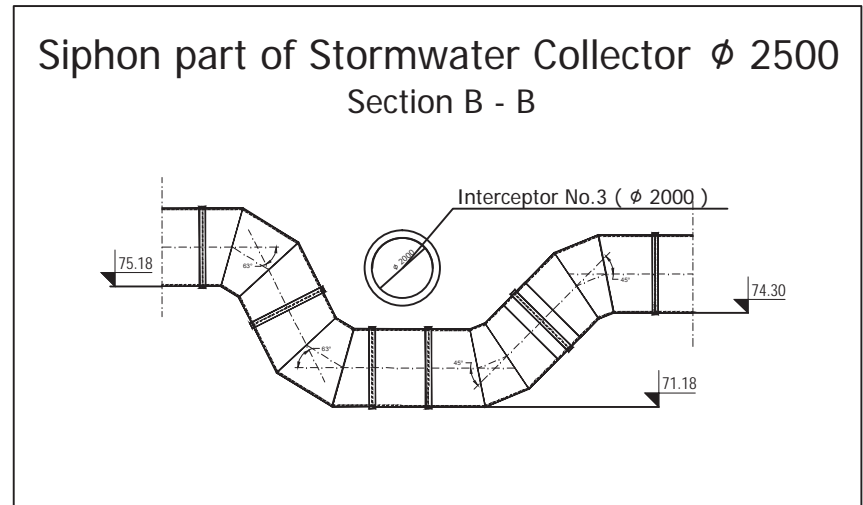
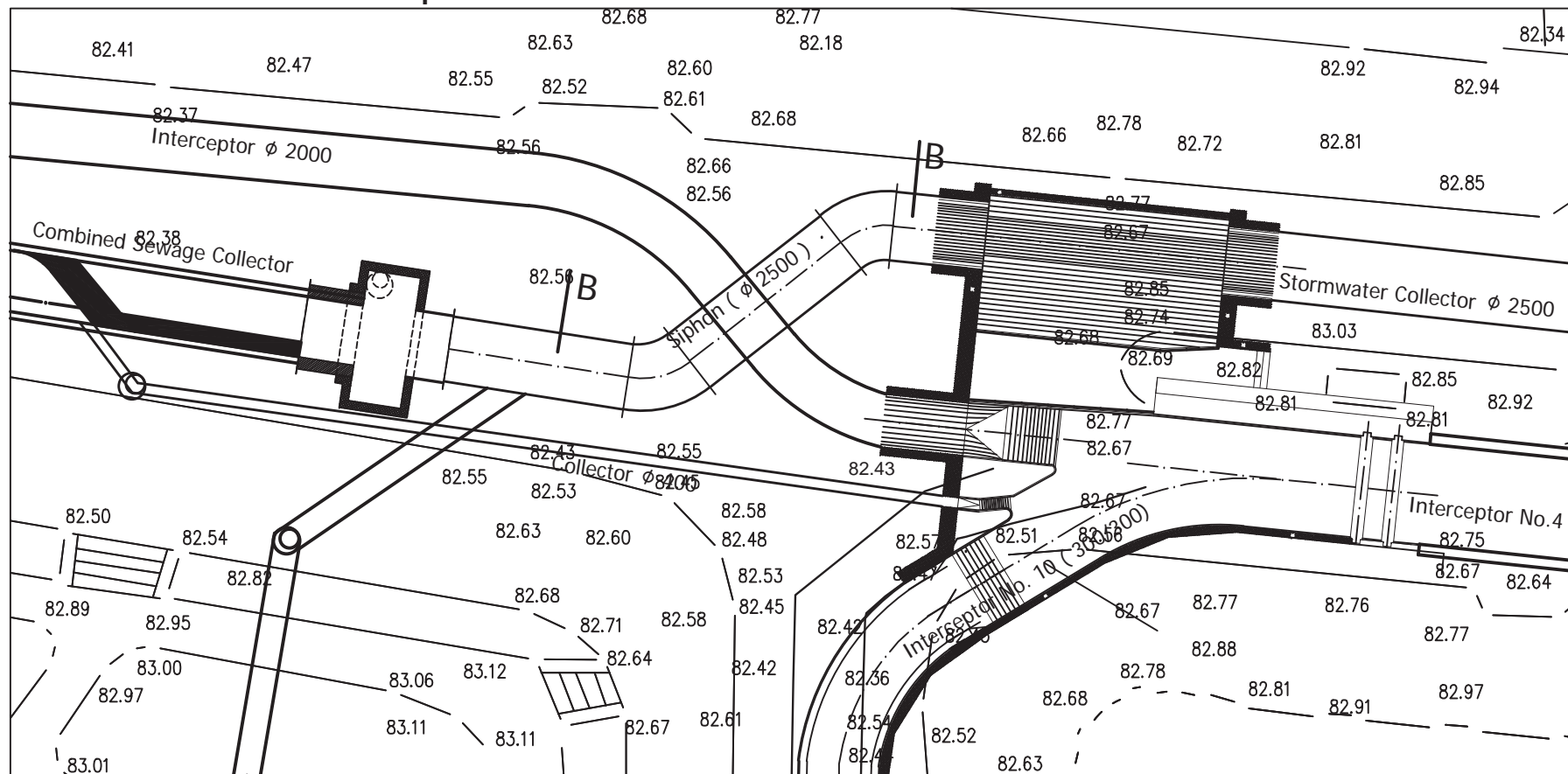
Scale:  
1:50

# General Layout of Connection Structure No. 1 (Chainage 2+772)

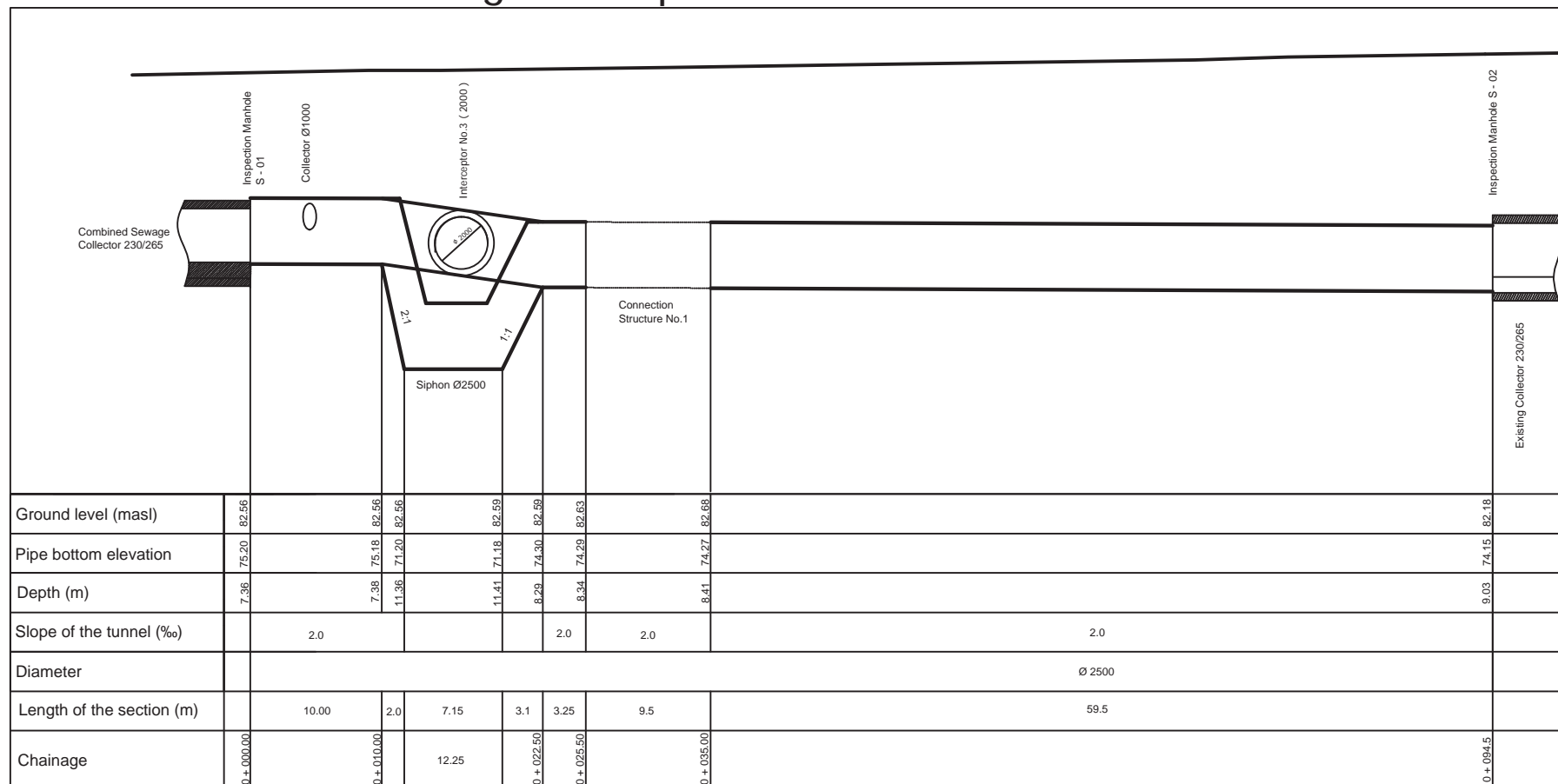


PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Sewer	Drw no: SEW-25
Title: General Layout of Connection Structure No.1	Scale: 1:500

## Replacement of Stormwater Collector $\phi$ 2500



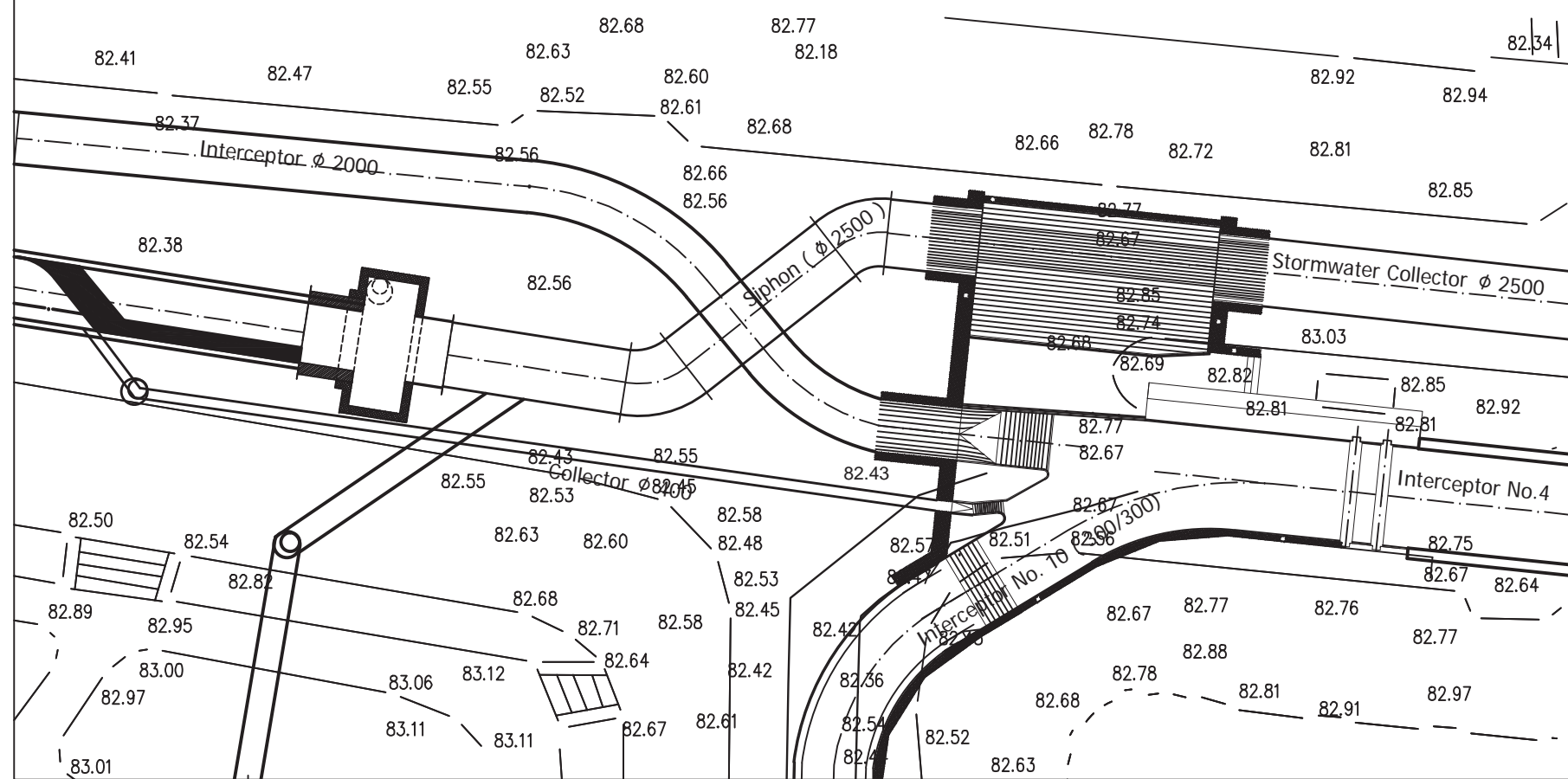
## Longitudinal profile of Storm water Collector $\phi$ 2500



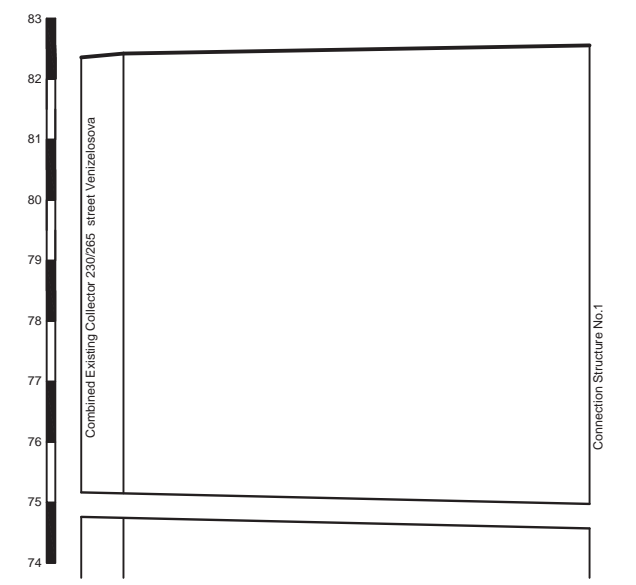
PREPARATORY SURVEY ON THE SEWERAGE  
SYSTEM IMPROVEMENT PROJECT FOR THE CITY  
OF BELGRADE

Components: Sewer	Drw no: SEW-26
Title: Stormwater Collector $\phi$ 2500	Scale: 1: 250

# Sanitary Sewage Collector Ø400



# Longitudinal Profile of Collector Ø400



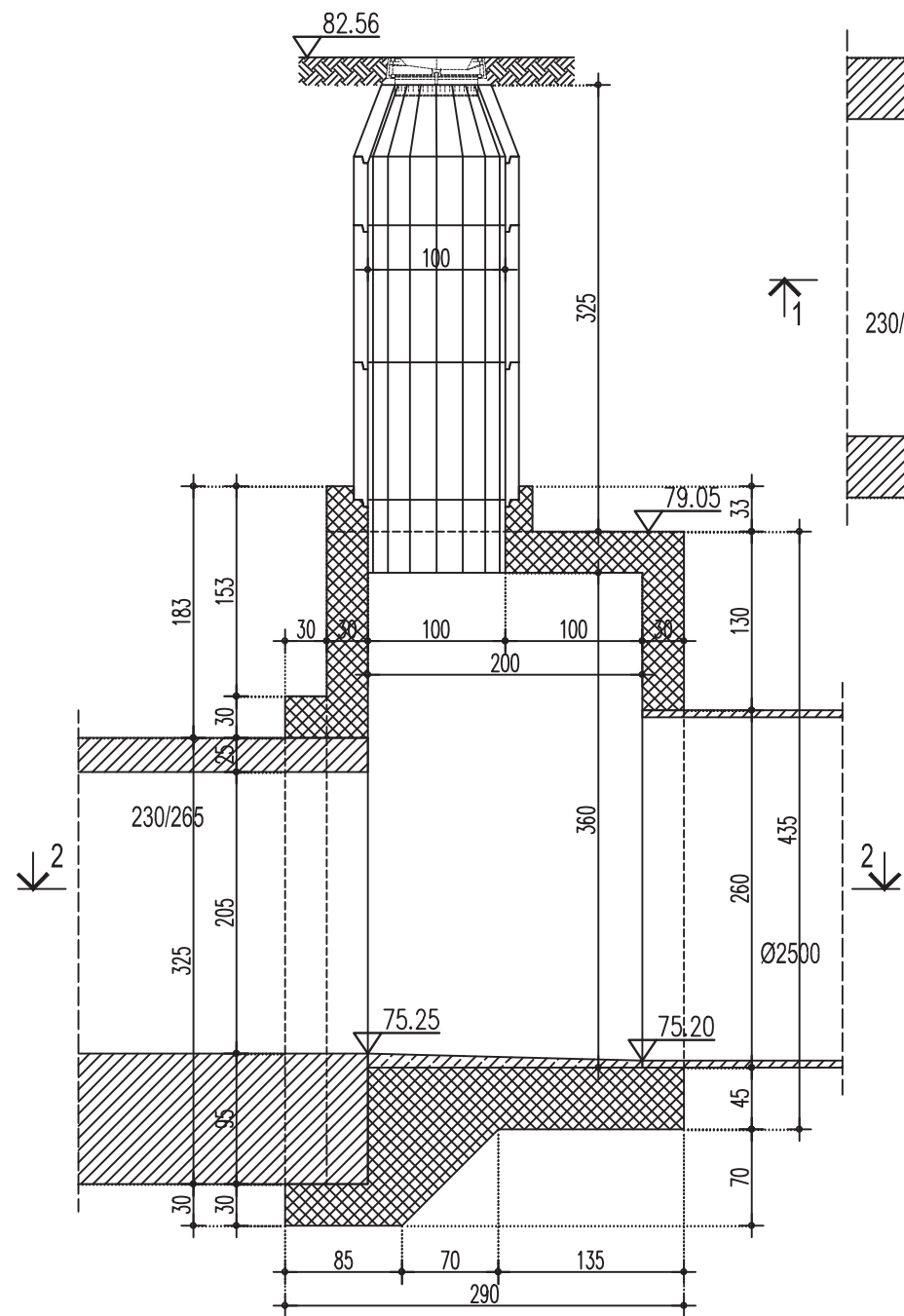
Ground level (masl)	82.35	82.42	82.55
Pipe bottom elevation	74.76	74.74	74.57
Depth (m)	7.59	7.68	7.98
Slope of the tunnel (‰)	5.5	5.5	
Diameter	Ø 400		
Length of the section (m)	2.8	30.8	
Chainage	0+000.00	0+002.80	0+033.60

# Inspection Manhole S - 01

R 1:50

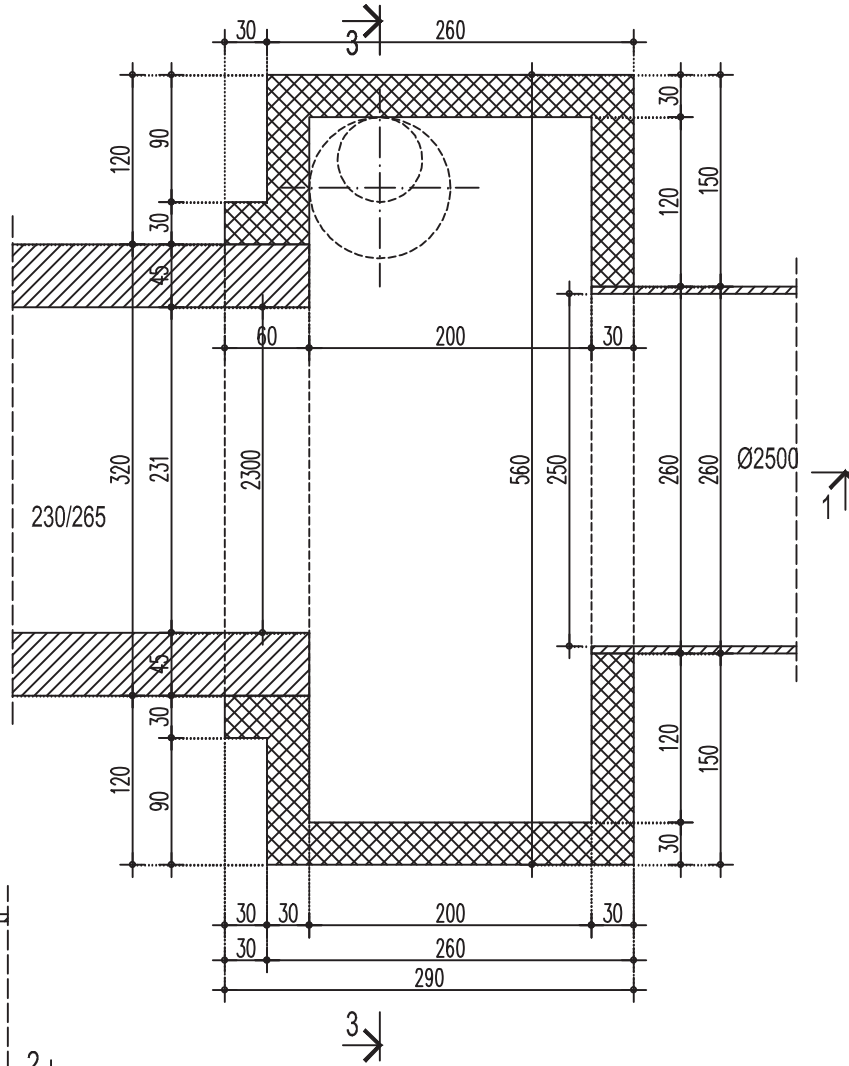
## Section 1-1

R 1:50



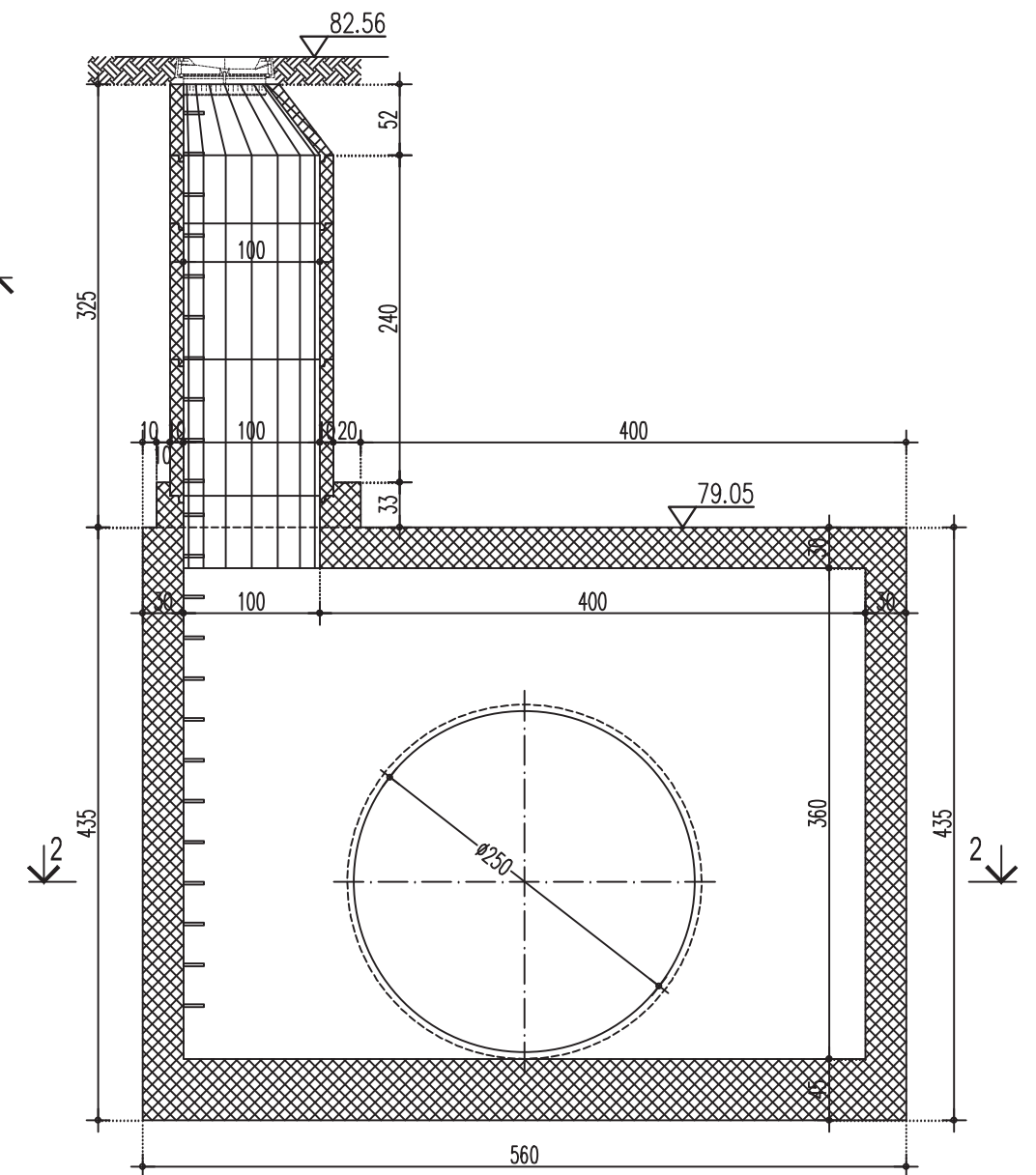
## Section 2-2

R 1:50



## Section 3-3

R 1:50



PREPARATORY SURVEY ON THE SEWERAGE  
SYSTEM IMPROVEMENT PROJECT FOR THE CITY  
OF BELGRADE

Components: Sewer

Drw no:  
SEW-28

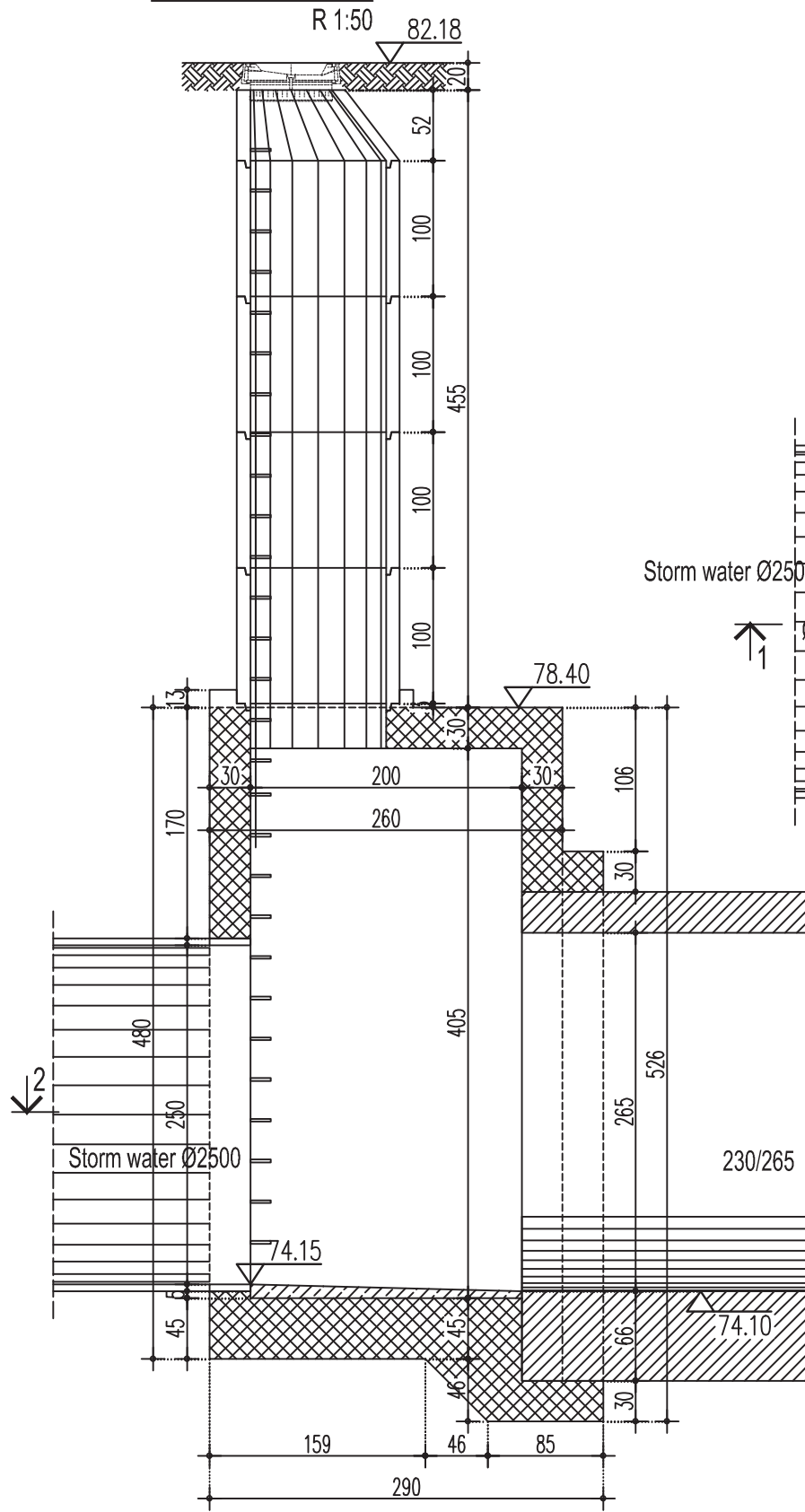
Title: Storm water Collector Ø2500  
Inspection Manhole S-01

Scale:  
1:50

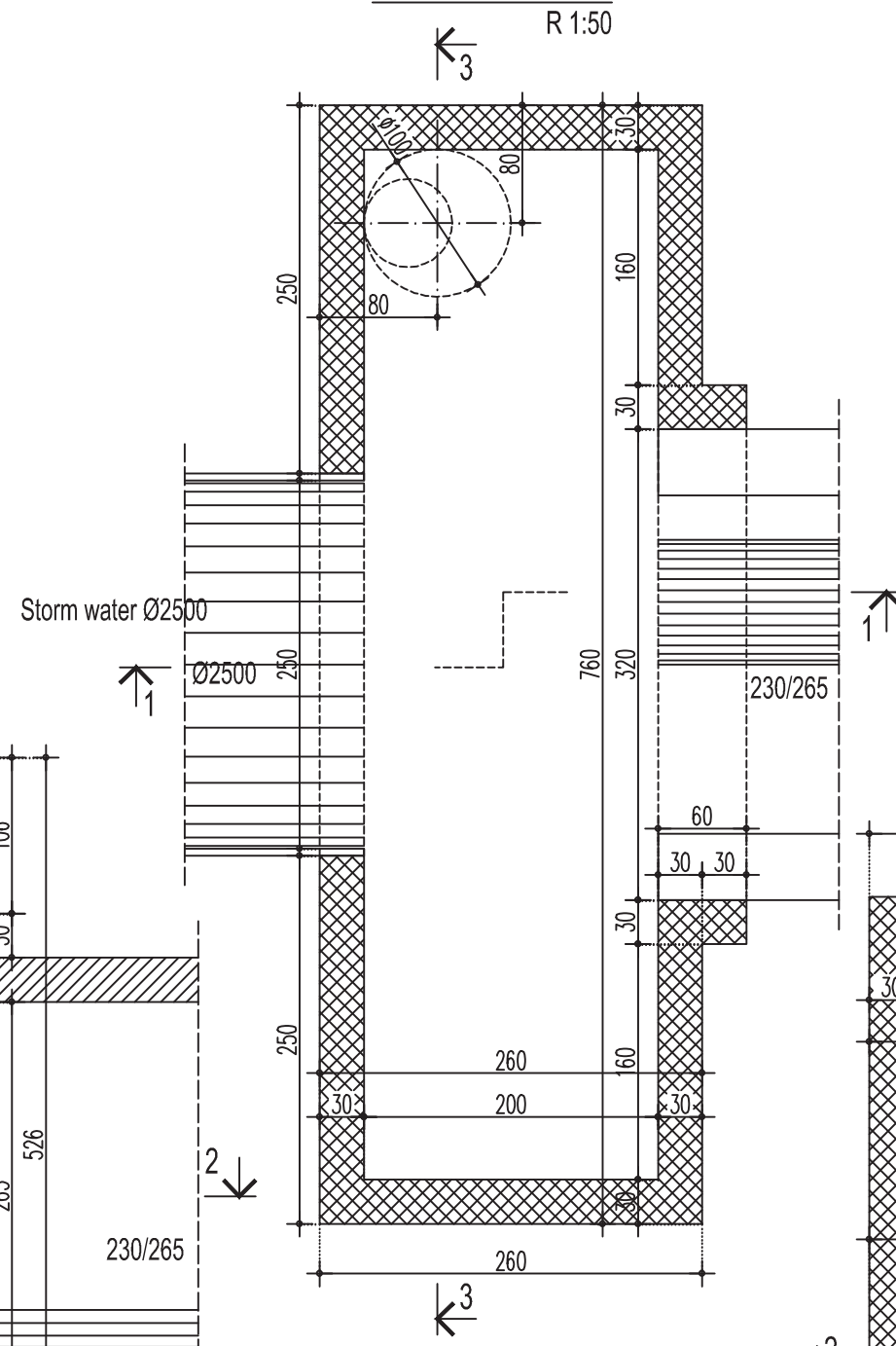


# Inspection Manhole S - 02

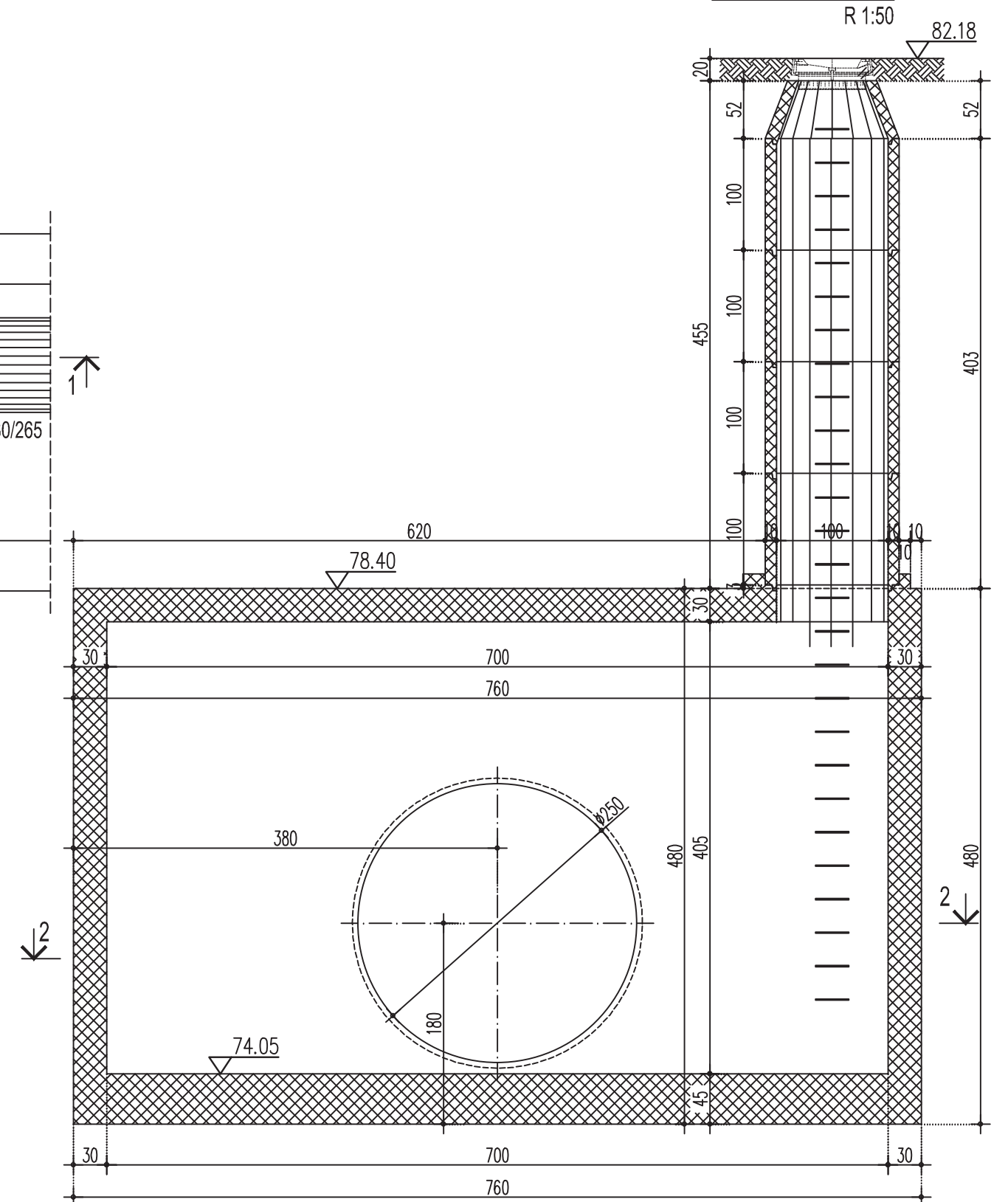
## Section 1-1



## Section 2-2



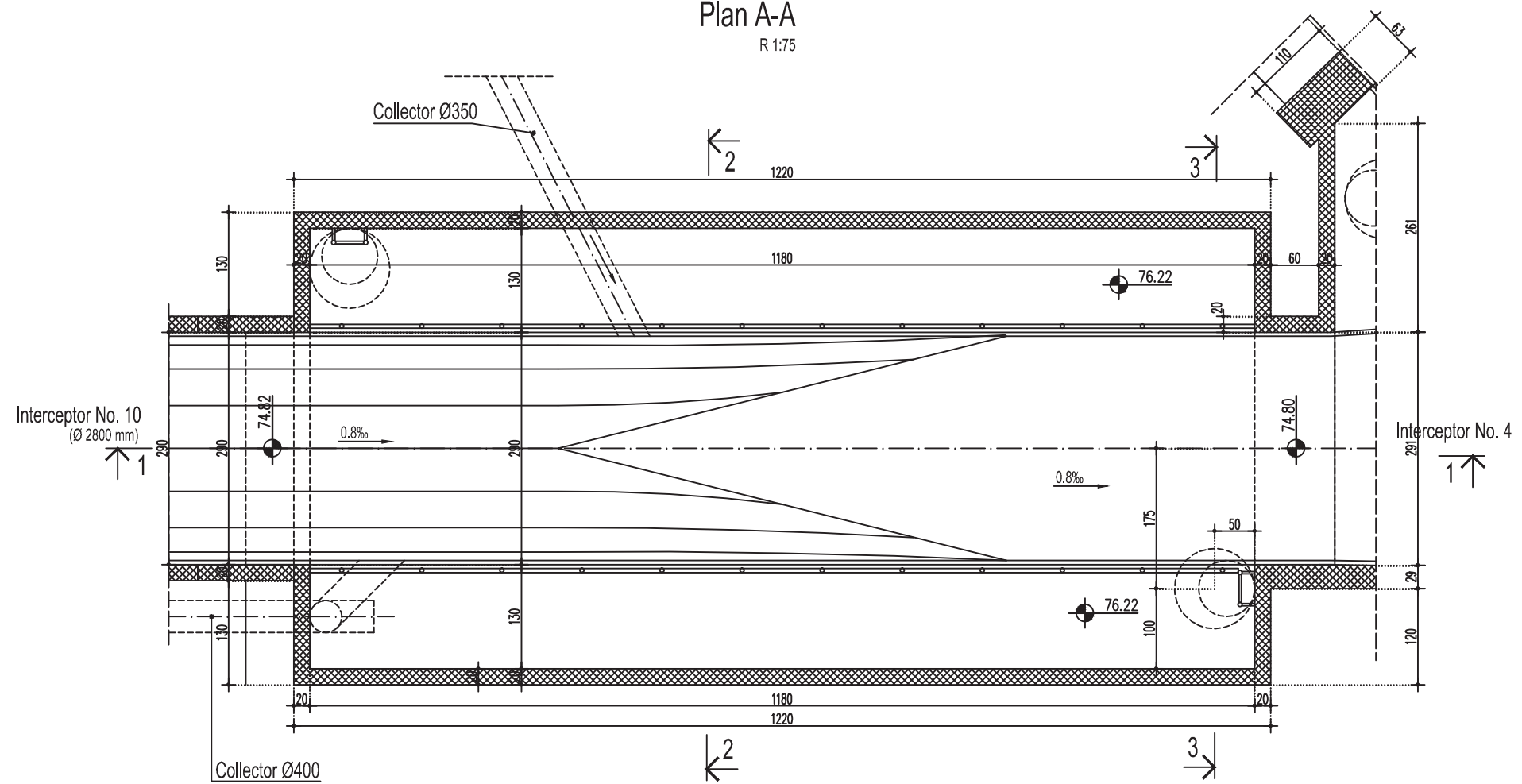
## Section 3-3



PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Sewer	Drw no: SEW-29
Title: Storm water Collector, Inspection Manhole No.2	Scale: 1:50

Connection structure No.1 Section A  
 (Receiving shaft of Interceptor No.10)

Plan A-A  
 R 1:75



PREPARATORY SURVEY ON THE SEWERAGE  
 SYSTEM IMPROVEMENT PROJECT FOR THE CITY  
 OF BELGRADE

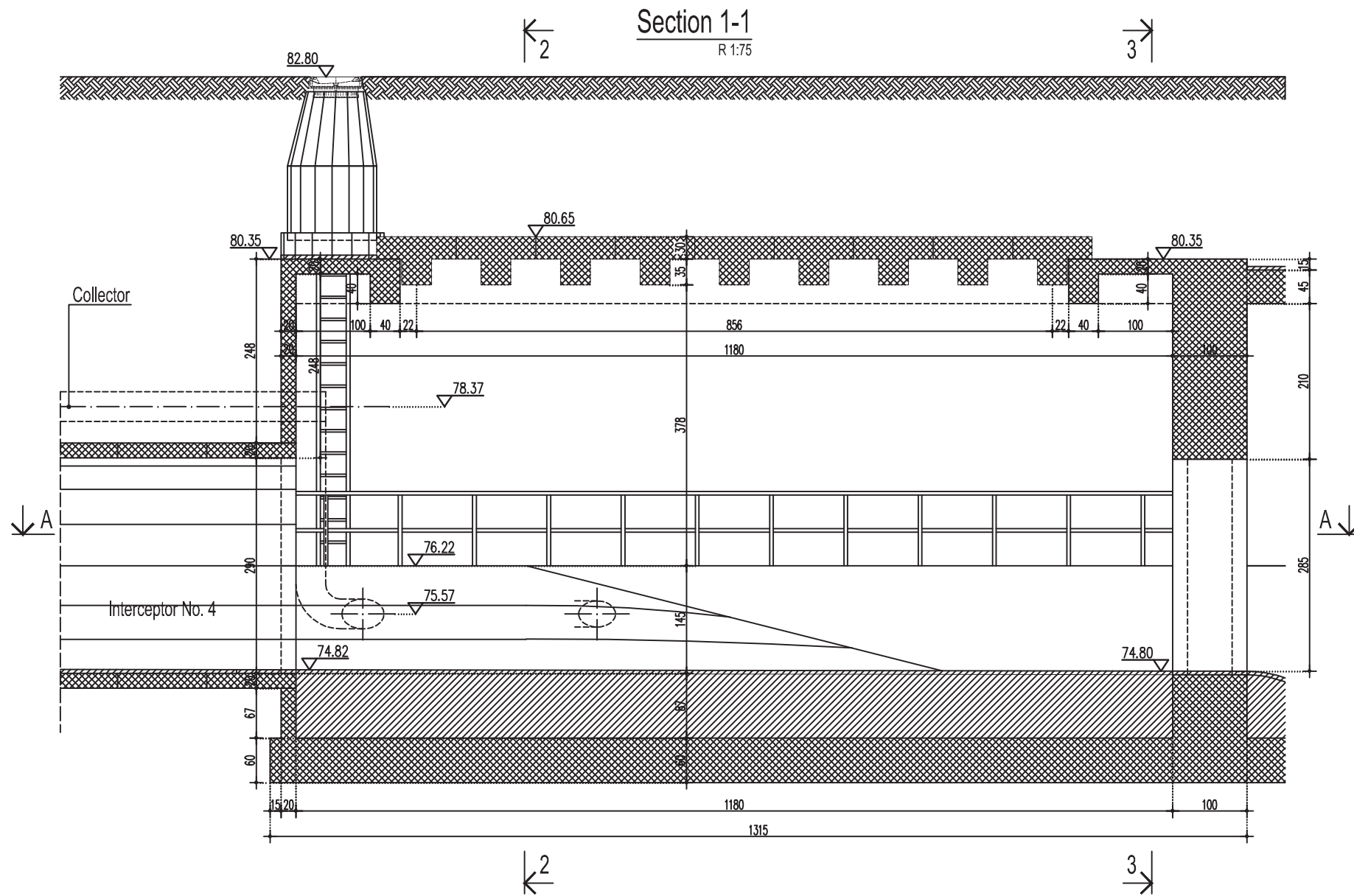
Components: Sewer

Drw no:  
 SEW-30

Title: Connection Structure No.1 Section A  
 Plan A-A

Scale:  
 1:75

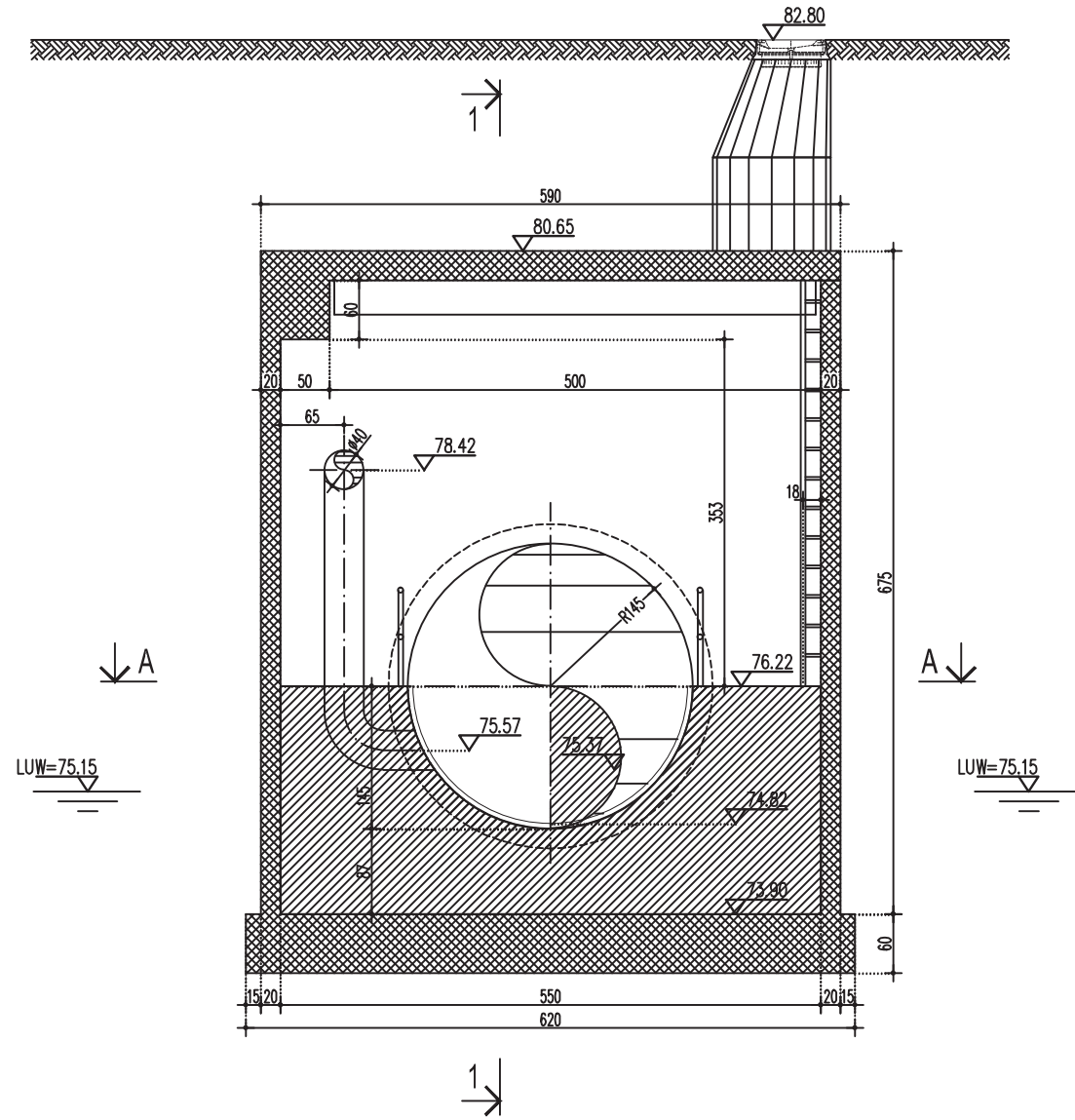
Connection structure No.1 Section A  
 (Receiving shaft of Interceptor No.10)



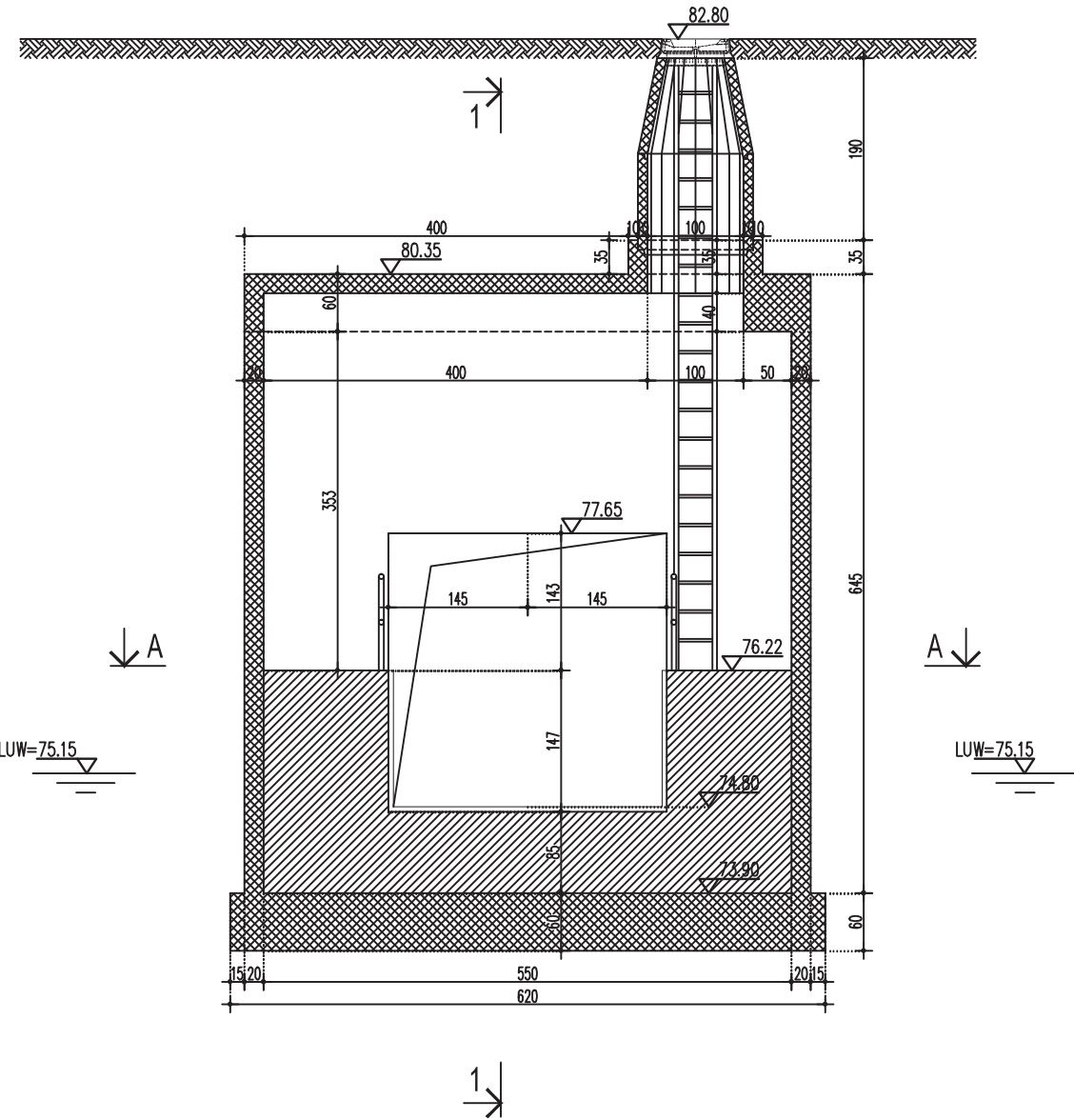
PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Sewer	Drw no.: SEW-31
Title: Connection structure No.1 Section A Section 1-1	Scale: 1: 75

Connection Structure No.1 Section A  
 (Receiving shaft of Interceptor No.10)

Section 2-2  
 R 1:75



Section 3-3  
 R 1:75



PREPARATORY SURVEY ON THE  
 SEWERAGE SYSTEM IMPROVEMENT  
 PROJECT FOR THE CITY OF BELGRADE

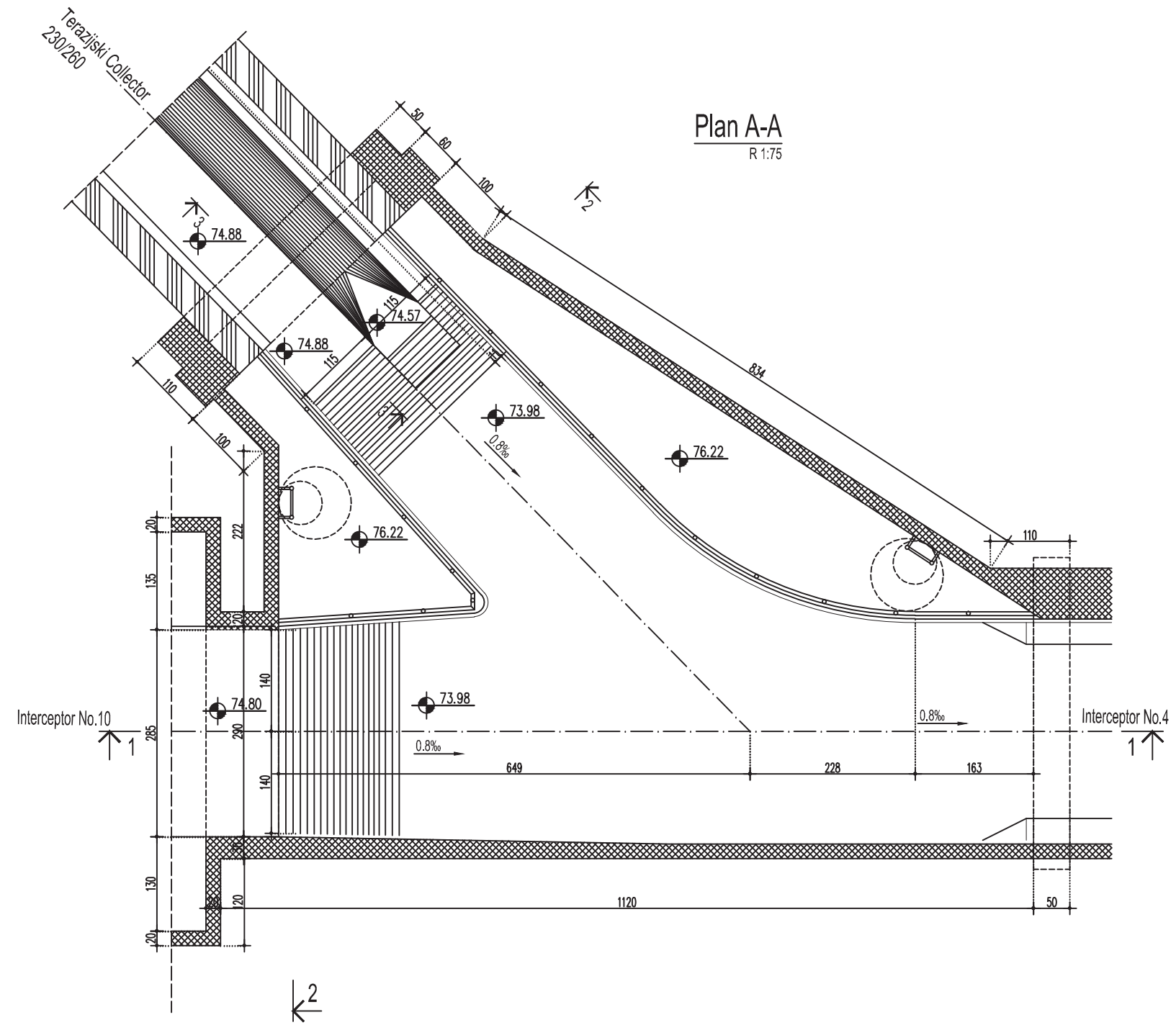
Components: Sewer

Drw no.:  
 SEW-32

Title: Connecting structure No.1 Section A  
 Section 2-2 Section 3-3

Scale:  
 1:75

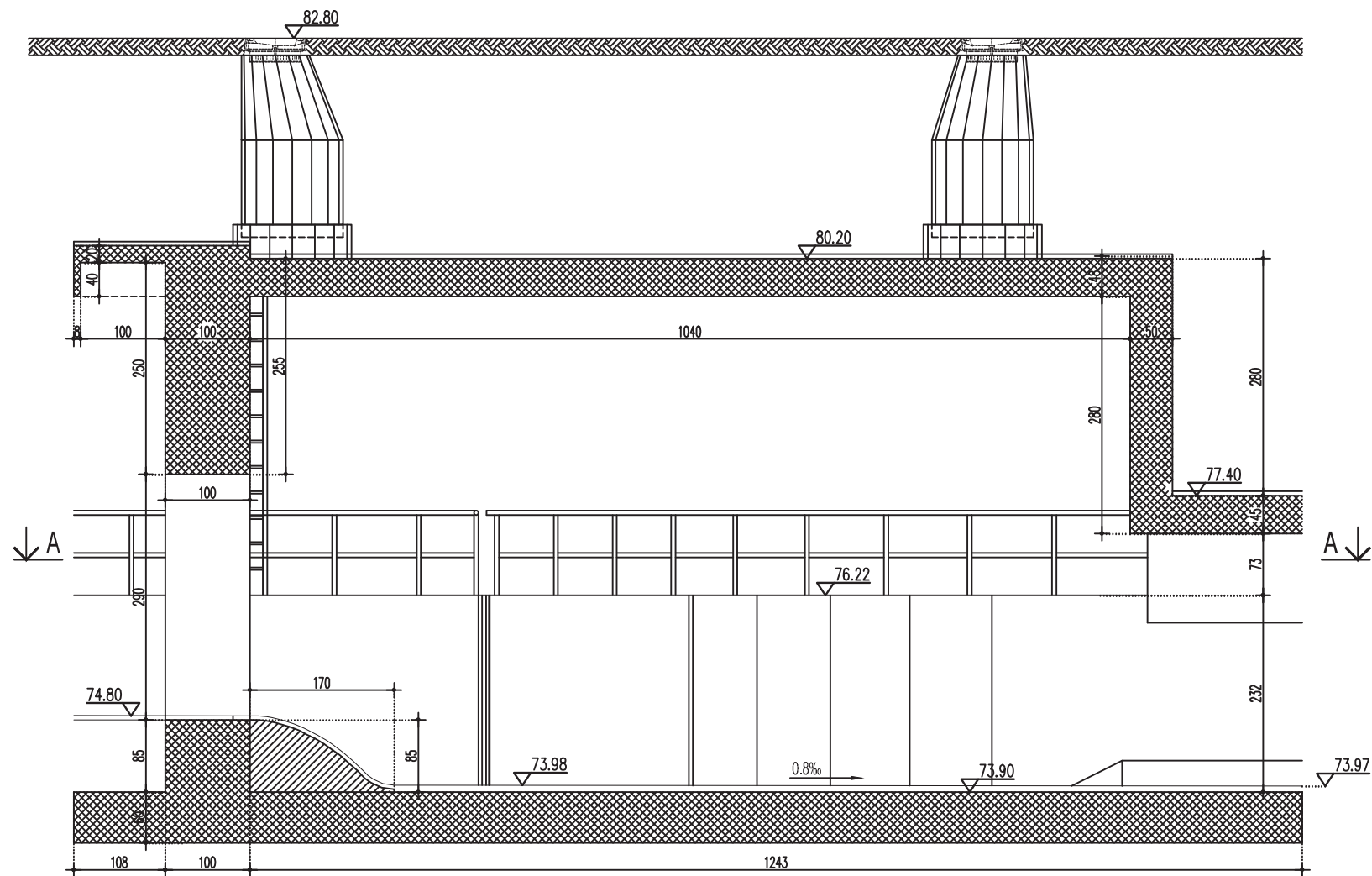
Connection Structure No.1 Section B  
 ( Connection with Terazijski Collector and Interceptor No.10)



PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Sewer	Drw no: SEW-33
Title: Connection Structure No.1 Section B Plan A-A	Scale: 1:75

Connection Structure No.1 Section B  
 ( Connection with Terazijski Collector and Interceptor No.10)

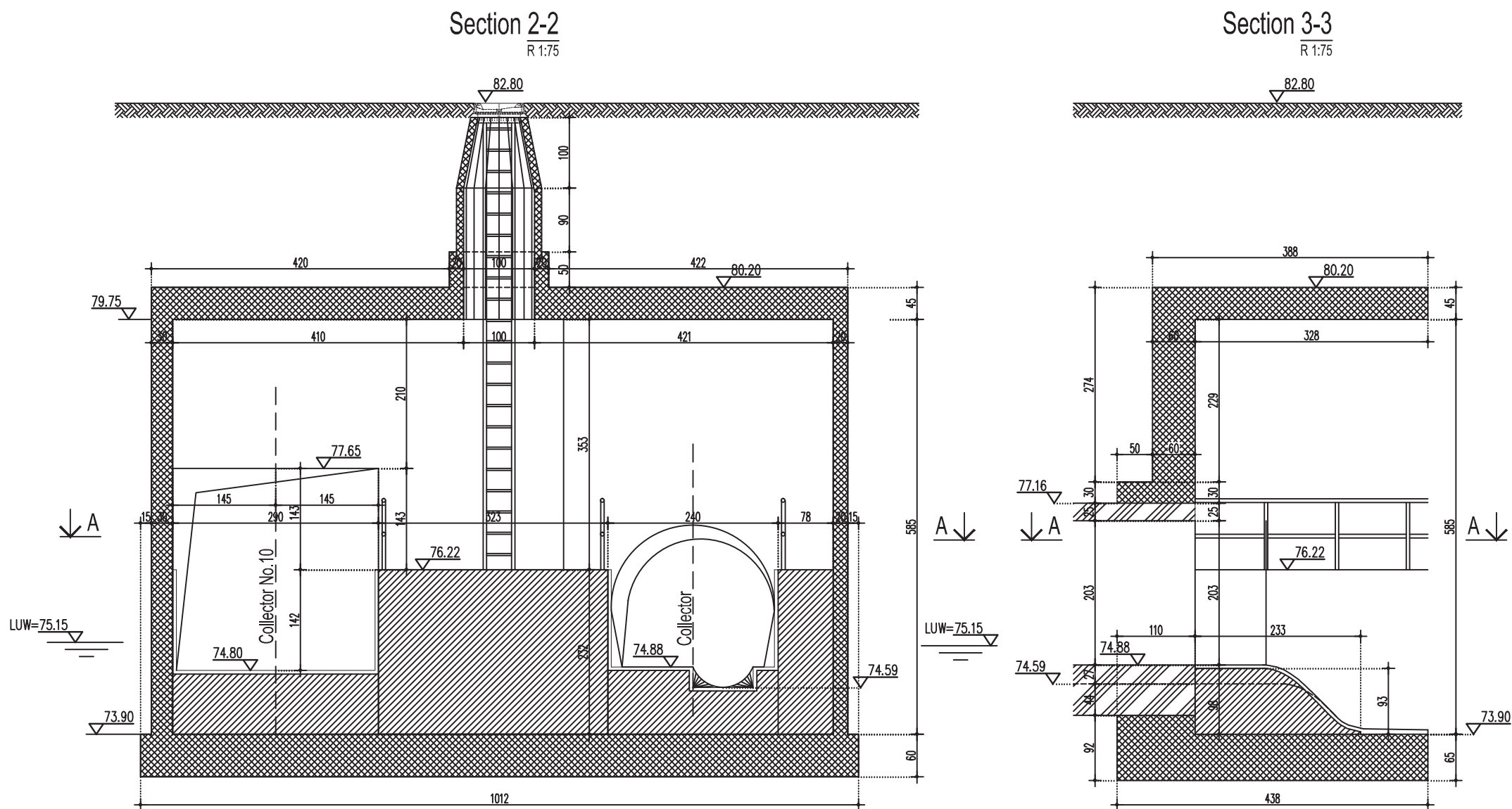
Section 1-1  
 R 1:75



PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Sewer	Drw no: SEW-34
Title: Connection Structure No.1 Section B Section 1-1	Scale: 1:75

## Connection Structure No.1 Section A

( Connection with Terazijski Collector and Interceptor No.10)

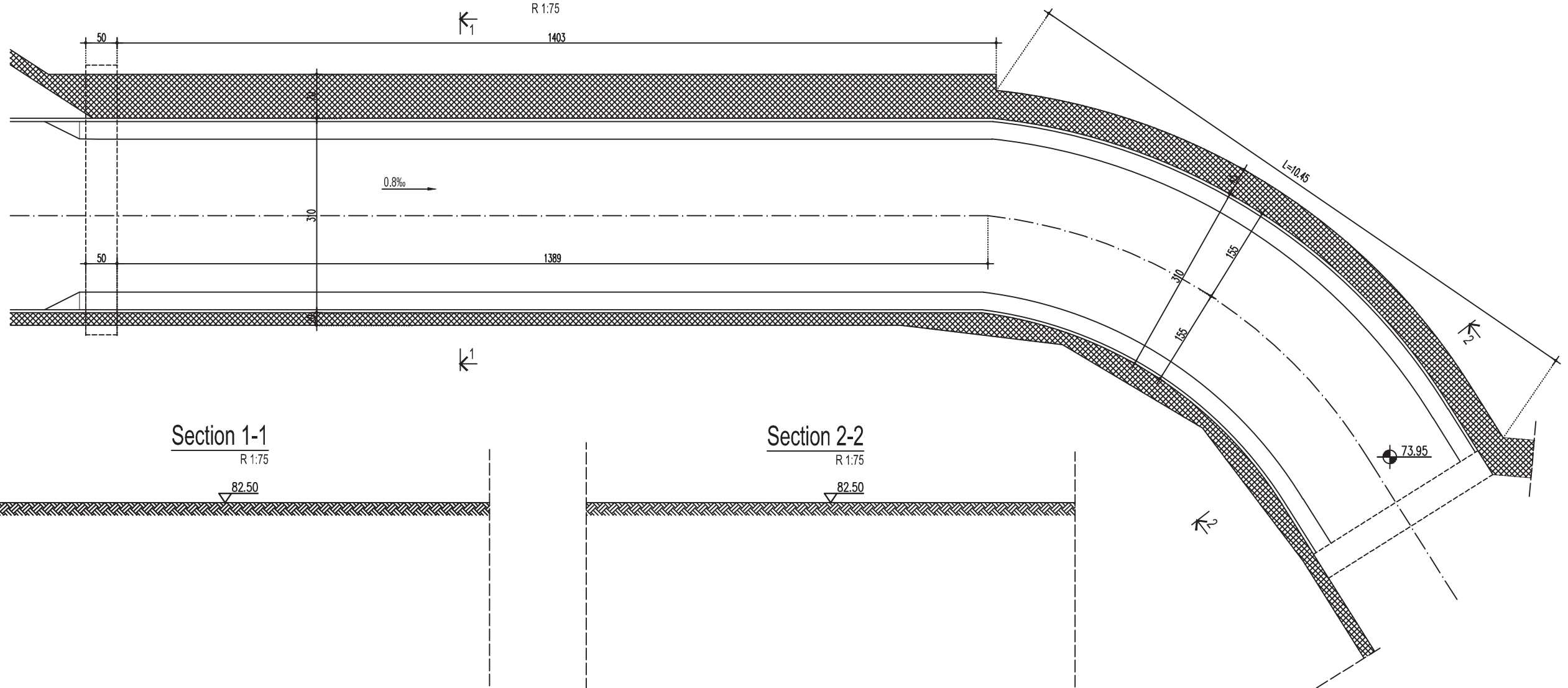


PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Sewer	Drw no: SEW-35
Title: Connection Structure Section B Section 2-2, Section 3-3	Scale: 1:75

Connection Structure No.1 Section C  
 (Open cut part of Interceptor No.10)

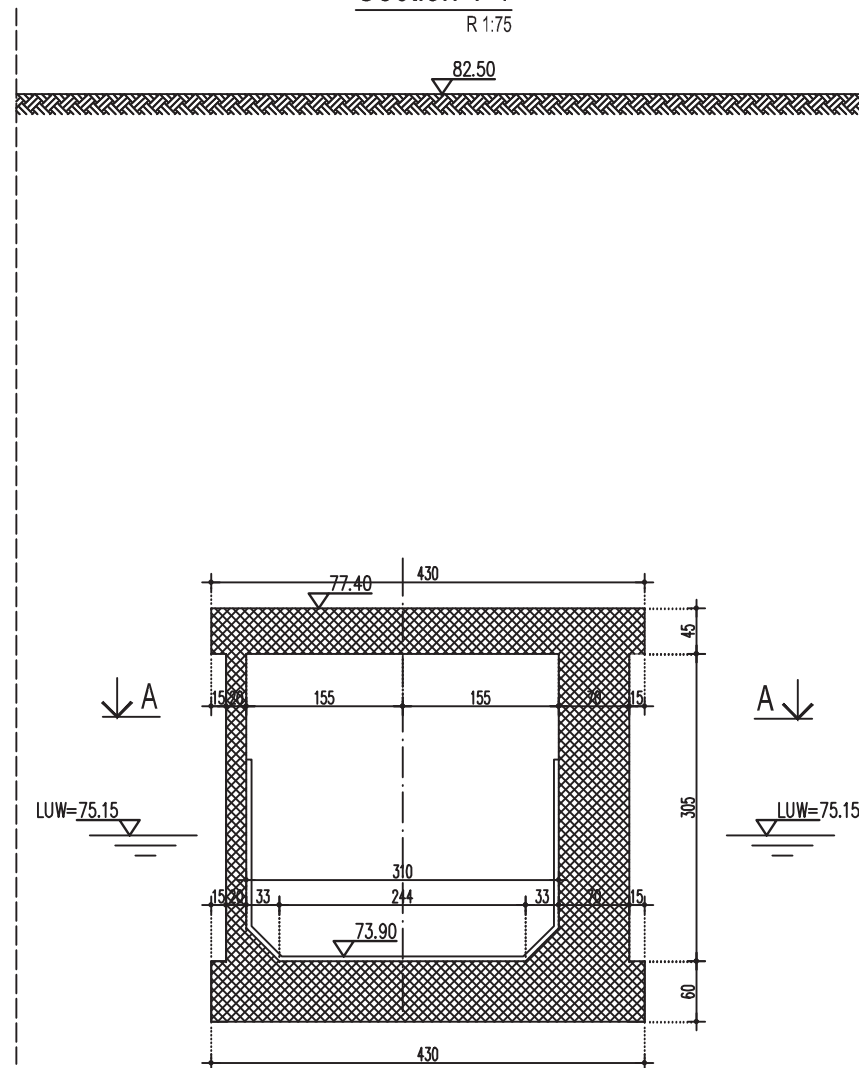
Plan A-A

R 1:75



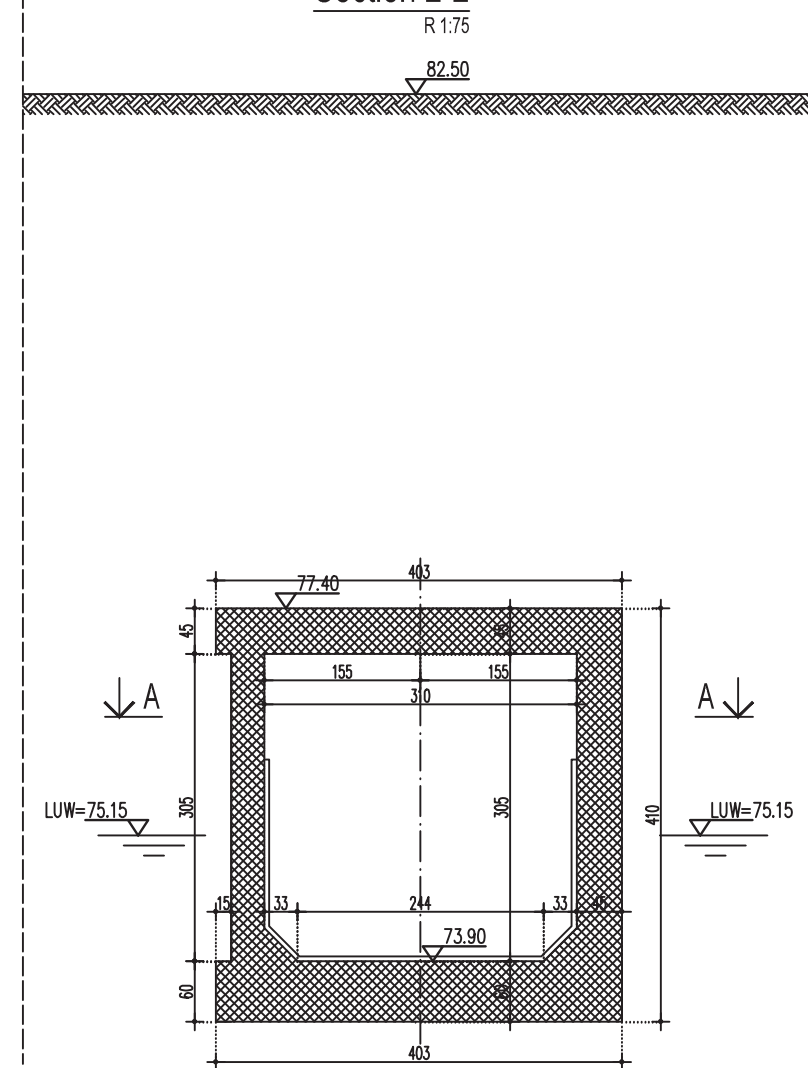
Section 1-1

R 1:75



Section 2-2

R 1:75



PREPARATORY SURVEY ON THE SEWERAGE  
 SYSTEM IMPROVEMENT PROJECT FOR THE CITY  
 OF BELGRADE

Components: Sewer

Drw no:  
SEW-36

Title: Connection Structure No.1 Section C  
 Plan A-A, Section 1-1, Section 2-2

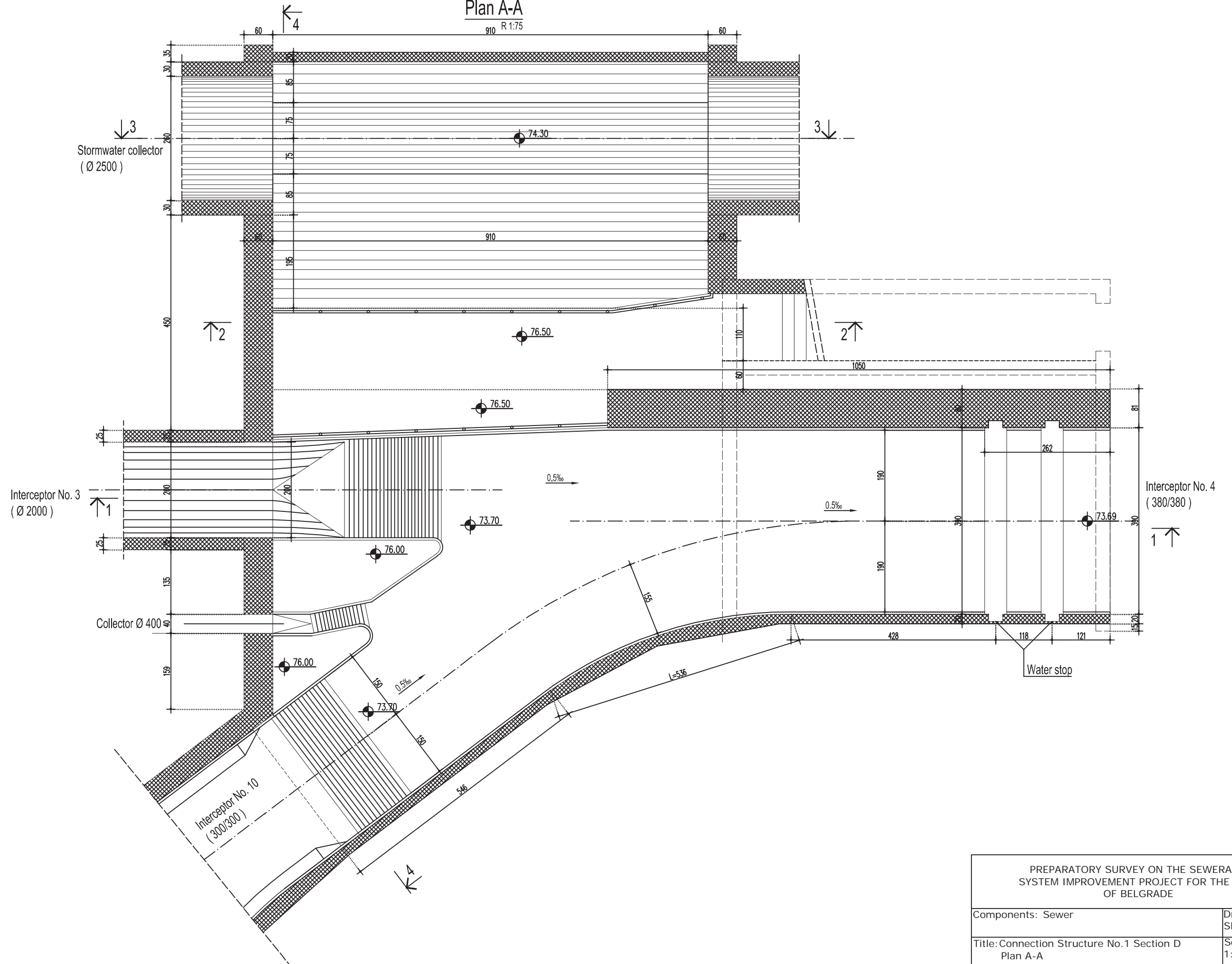
Scale:  
1:75



Connection Structure No.1 Section D  
 ( Connection with Interceptor No.4 and No.10)

Plan A-A

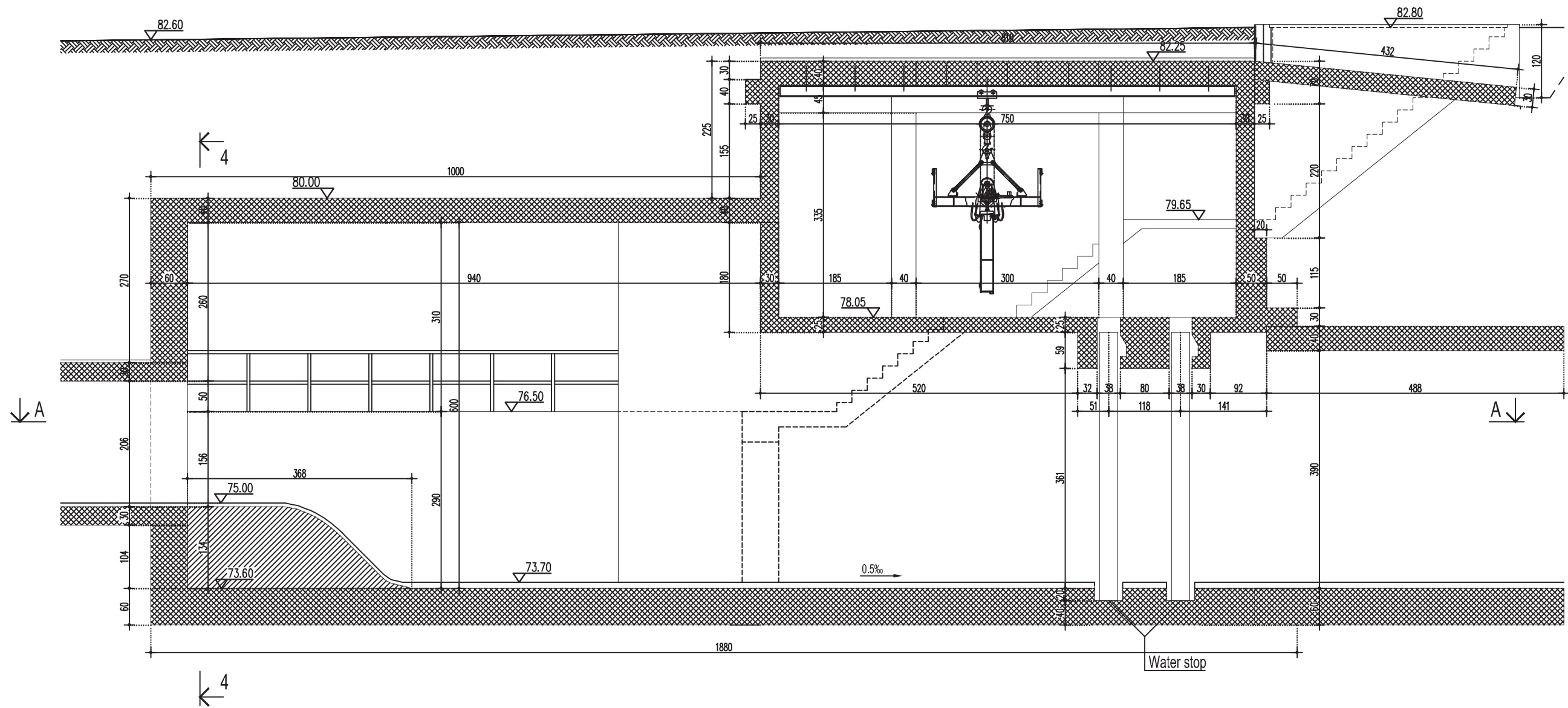
910 R 1:75



PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Sewer	Drw no: SEW-37
Title: Connection Structure No.1 Section D Plan A-A	Scale: 1:75

Connection Structure No.1 Section D  
 ( Connection with Interceptor No.4 and No.10)

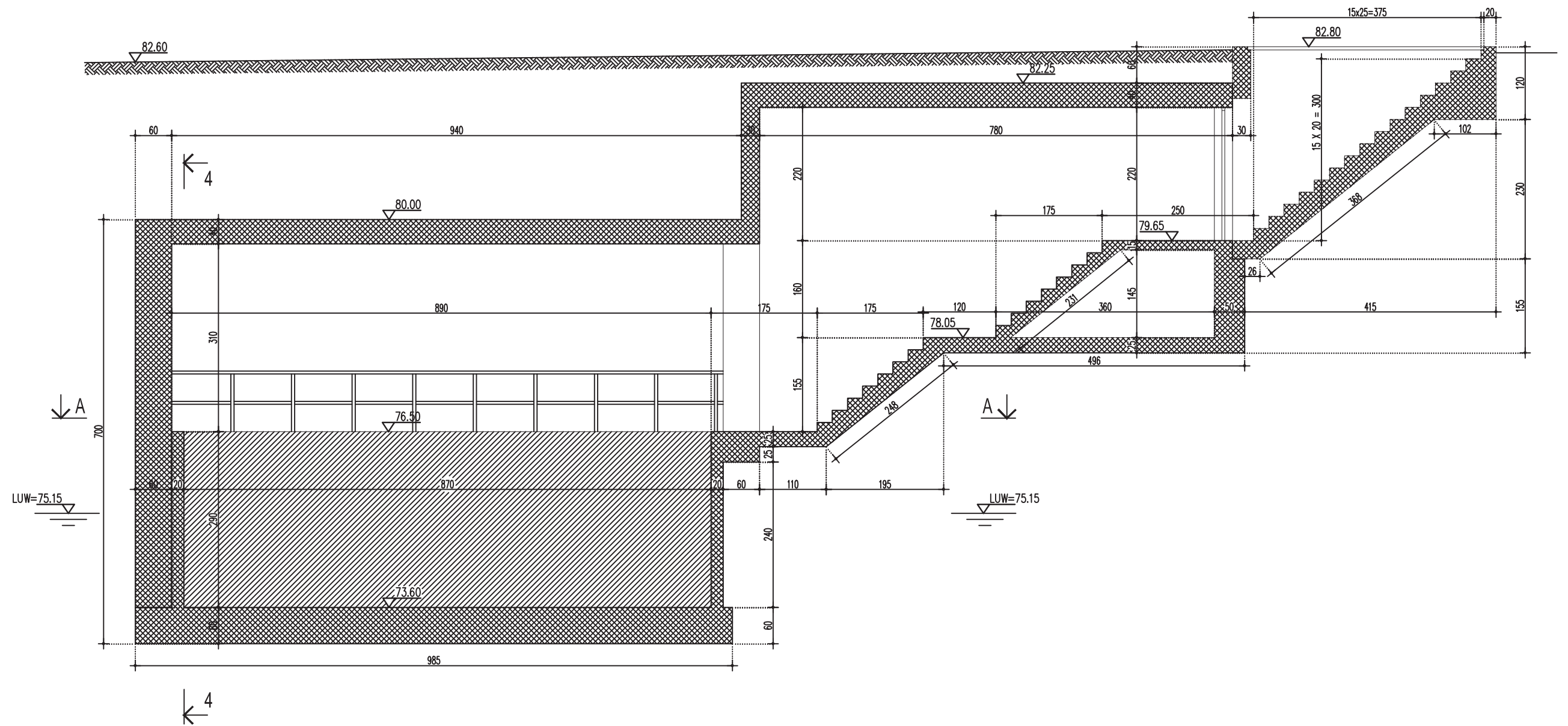
Section 1-1  
 R 1:75



PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Sewer	Drw no: SEW-38
Title: Connection Structure No.1 Section D Section 1-1	Scale: 1:75

Connection Structure No.1 Section D  
 ( Connection with Interceptor No.4 and No.10)

Section 2-2  
 R 1:75



PREPARATORY SURVEY ON THE SEWERAGE  
 SYSTEM IMPROVEMENT PROJECT FOR THE CITY  
 OF BELGRADE

Components: Sewer

Drw no:  
 SEW-39

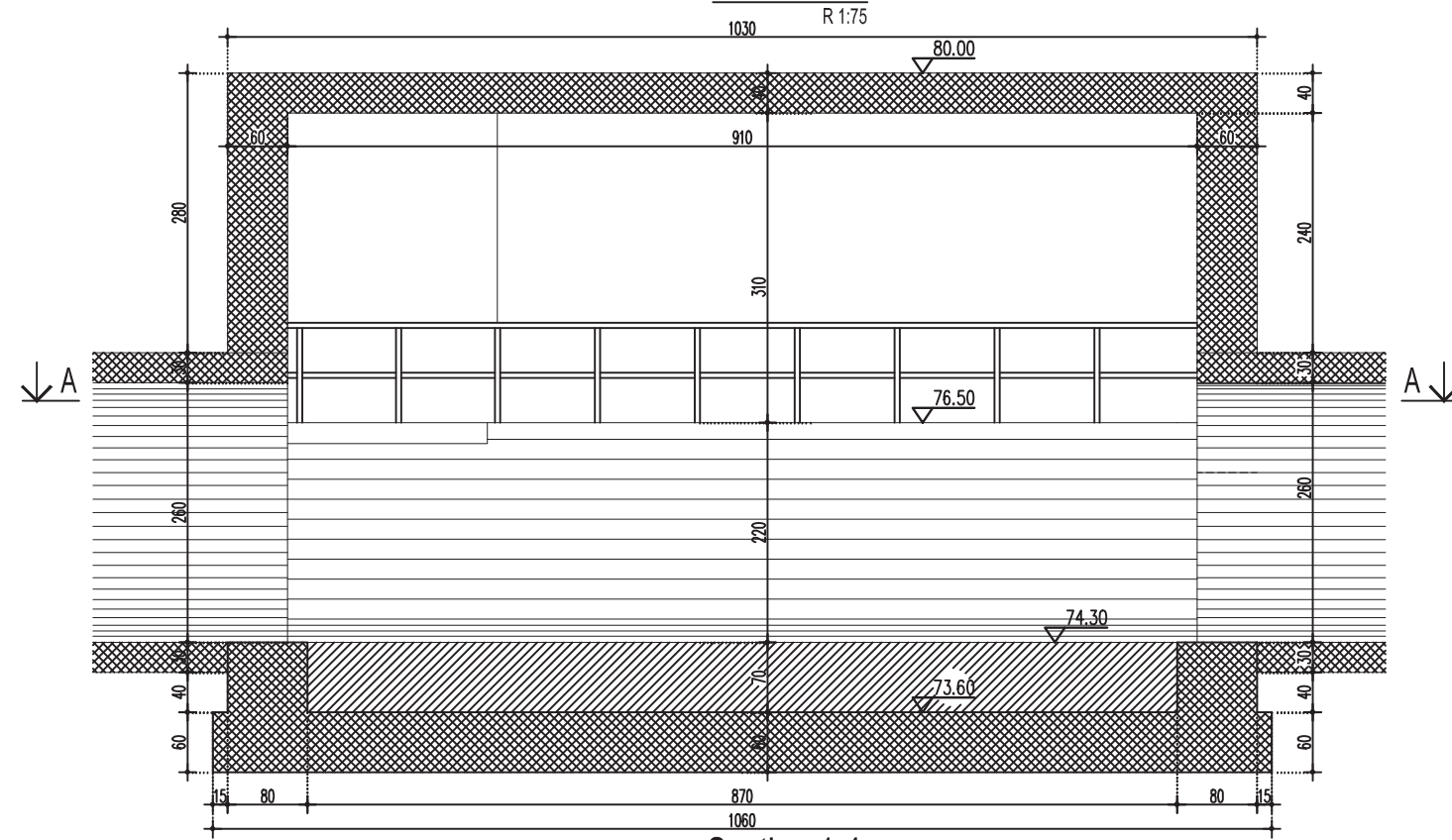
Title: Connection Structure No.1 Section D  
 Section 2-2

Scale:  
 1:75

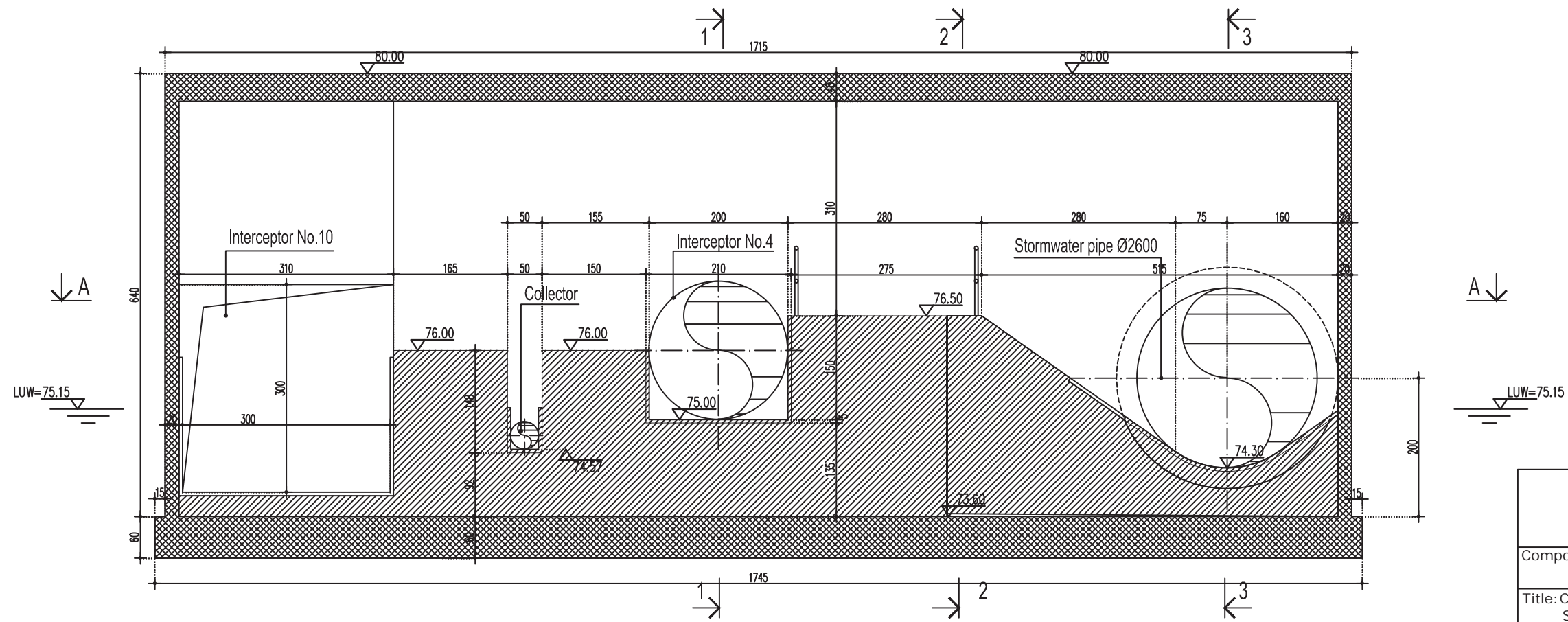
# Connection Structure No.1 Section D

( Connection with Interceptor No.4 and No.10)

## Section 3-3



## Section 4-4



PREPARATORY SURVEY ON THE SEWERAGE  
SYSTEM IMPROVEMENT PROJECT FOR THE CITY  
OF BELGRADE

Components: Sewer

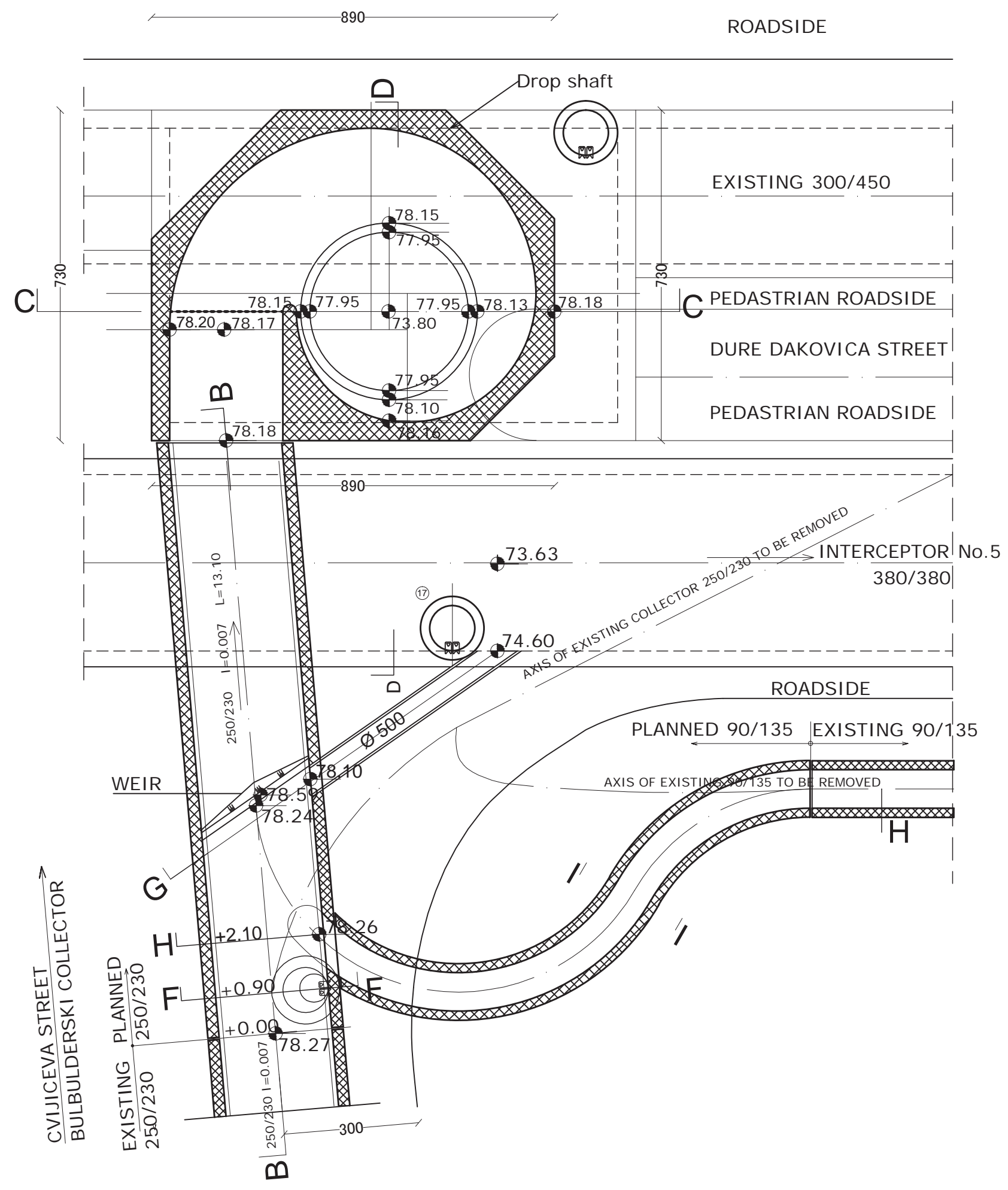
Drw no:  
SEW-40

Title: Connection Structure No.1 Section D  
Section 3-3 Section 4-4

Scale:  
1:75

# Plan A-A

# Connection Structure No.2 Elevation 78.15 m (Chainage 2+954)



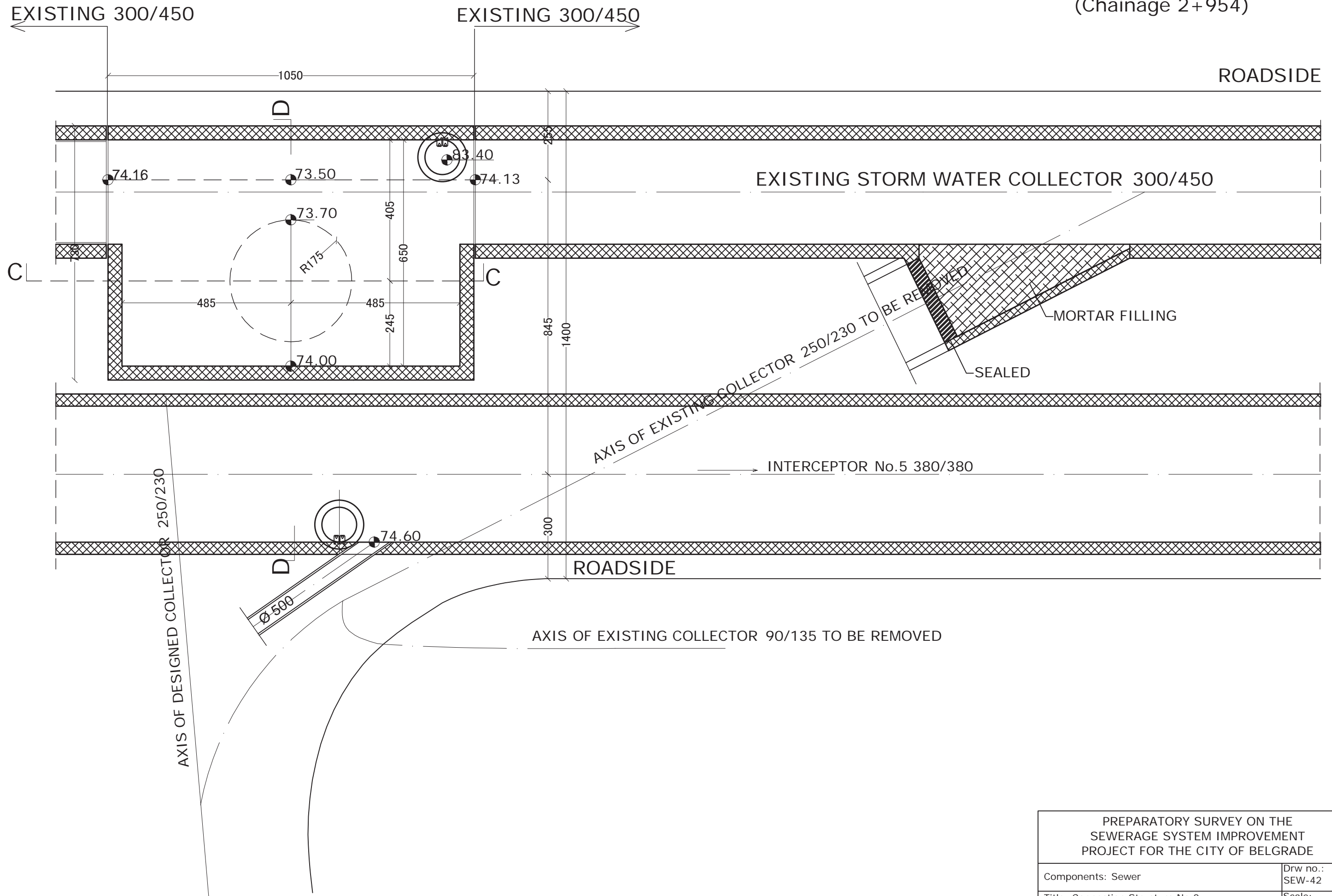
PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Sewer	Drw no.: SEW-41
Title: Connection Structure No.2 Elevation 78.15 m	Scale: 1:100

Plan B - B

Connection Structure No.2

Elevation 74.00 m

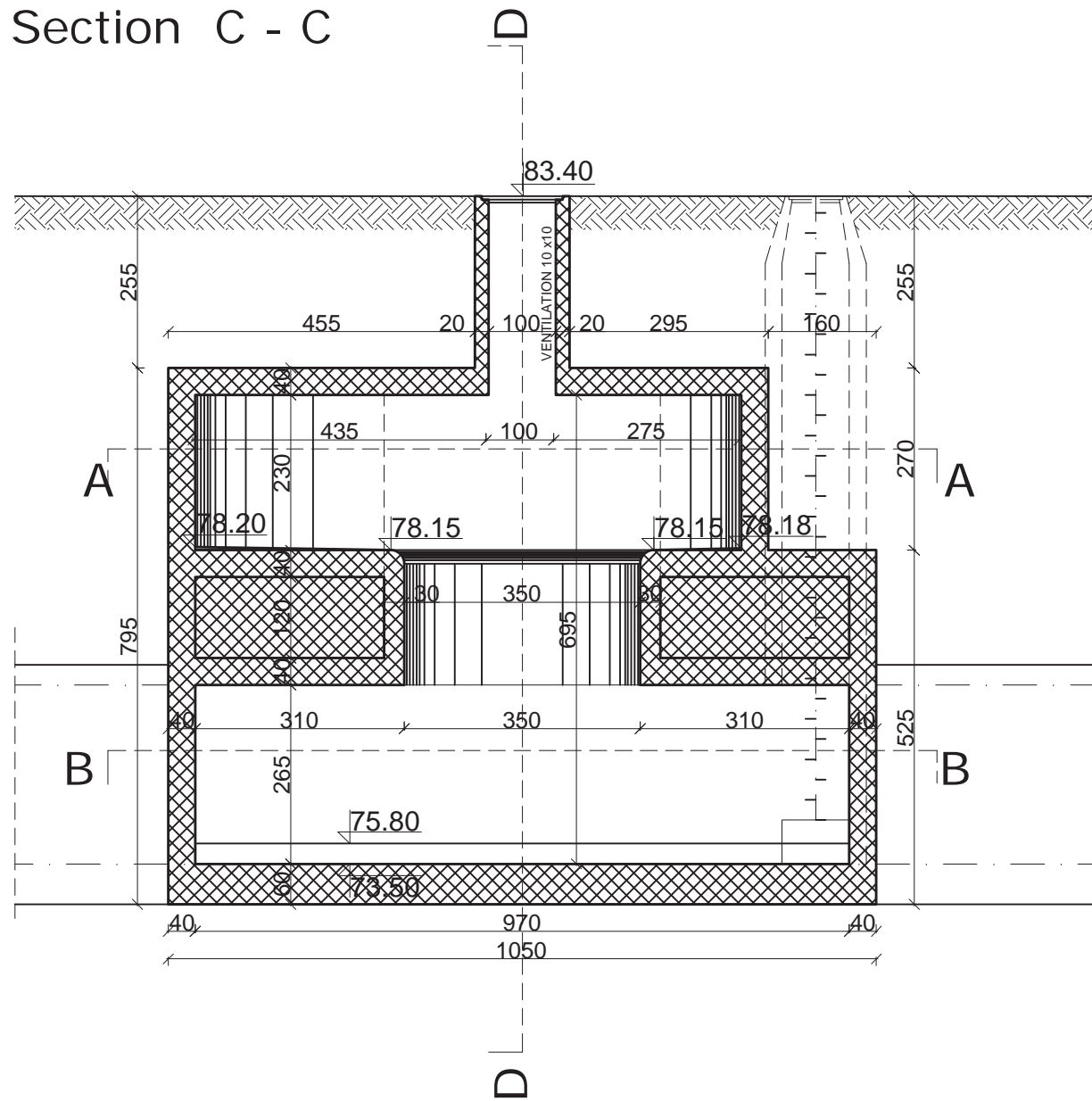
(Chainage 2+954)



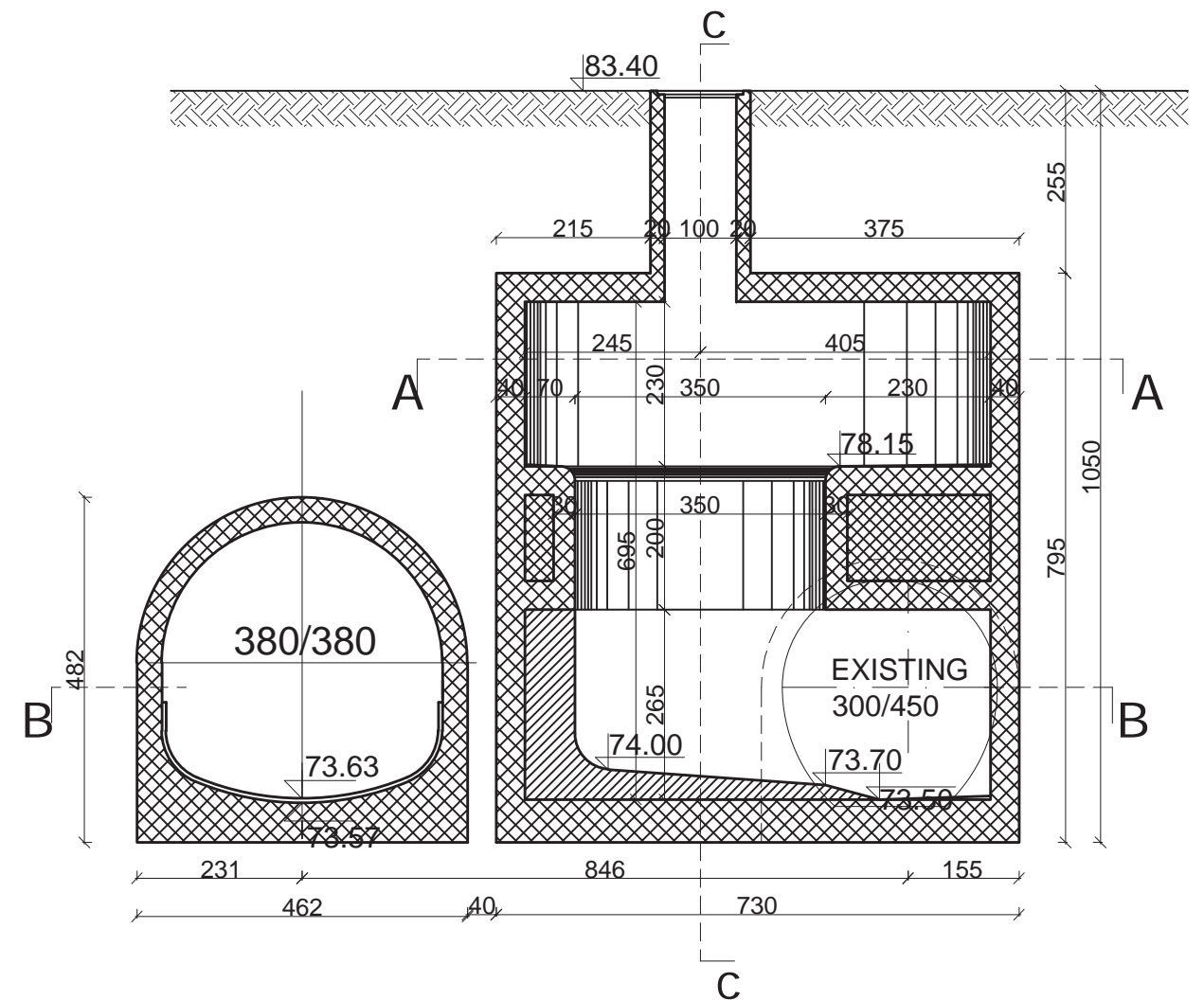
PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Sewer	Drw no.: SEW-42
Title: Connection Structure No.2 Elevation 74.00 m	Scale: 1:100

# Connection Structure No.2

## Section C - C



## Section D - D



PREPARATORY SURVEY ON THE  
SEWERAGE SYSTEM IMPROVEMENT  
PROJECT FOR THE CITY OF BELGRADE

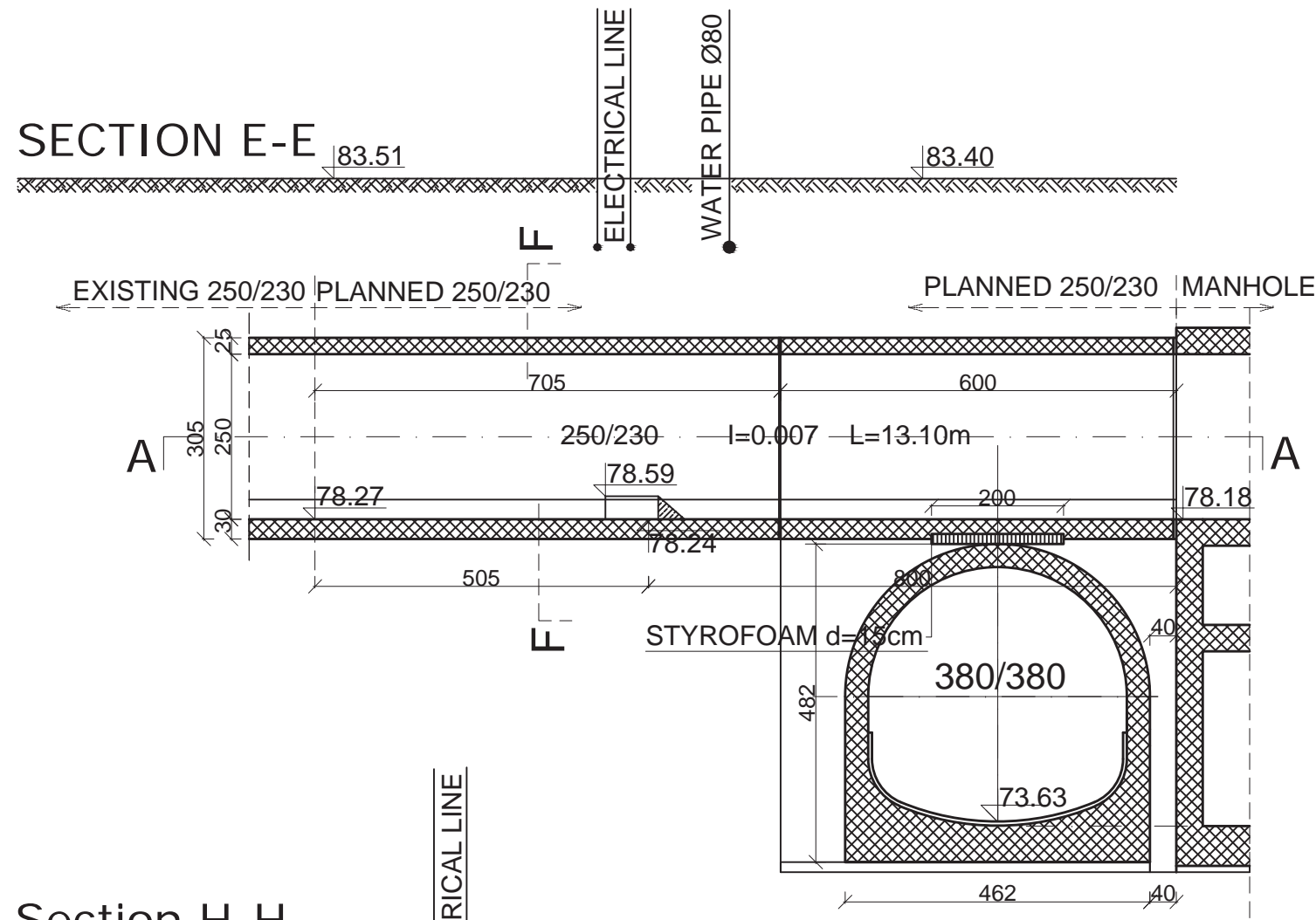
Components: Sewer

Drw no.:  
SEW-43

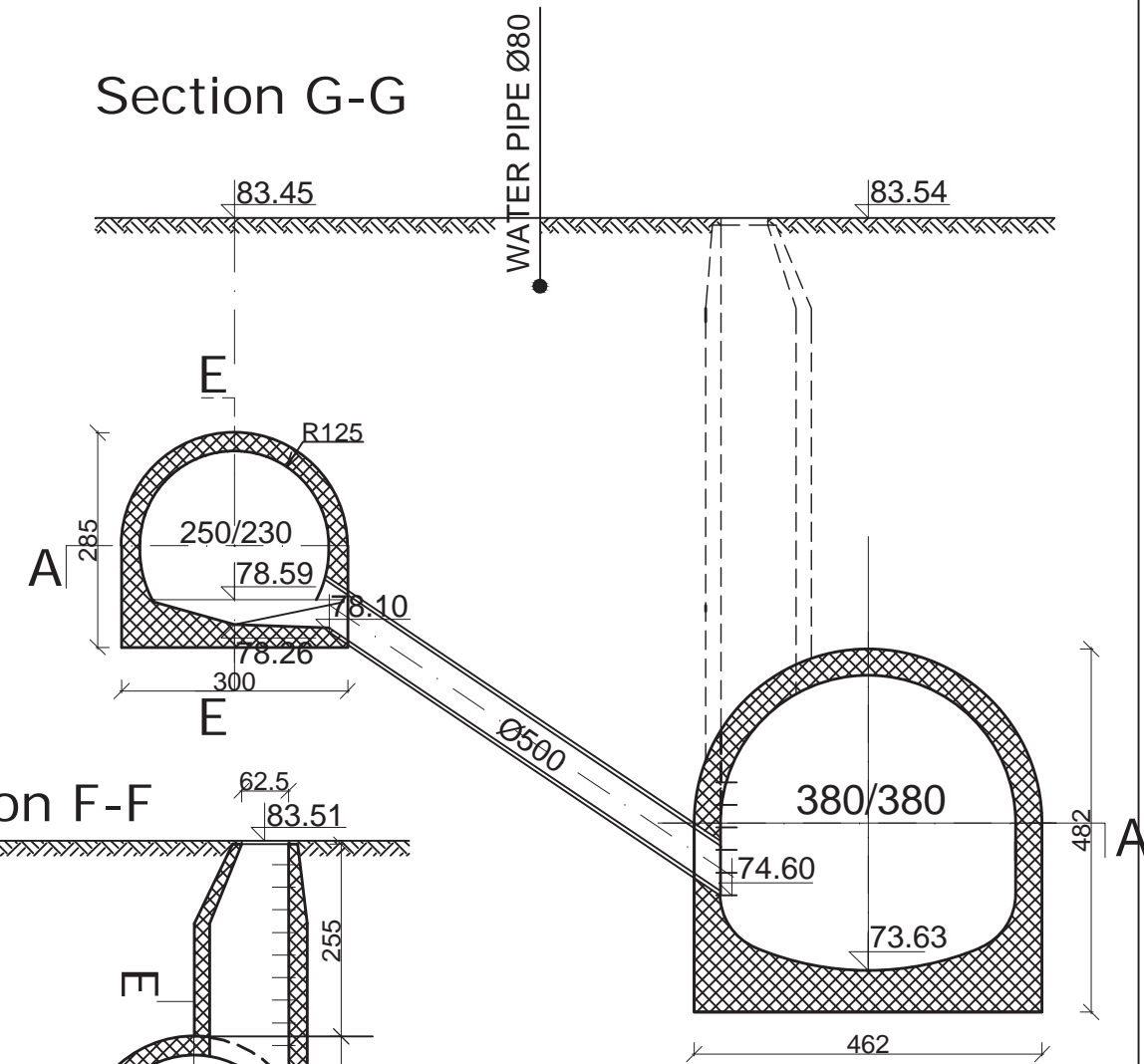
Title: Connection Structure No.2  
Section - 1

Scale:  
1:100

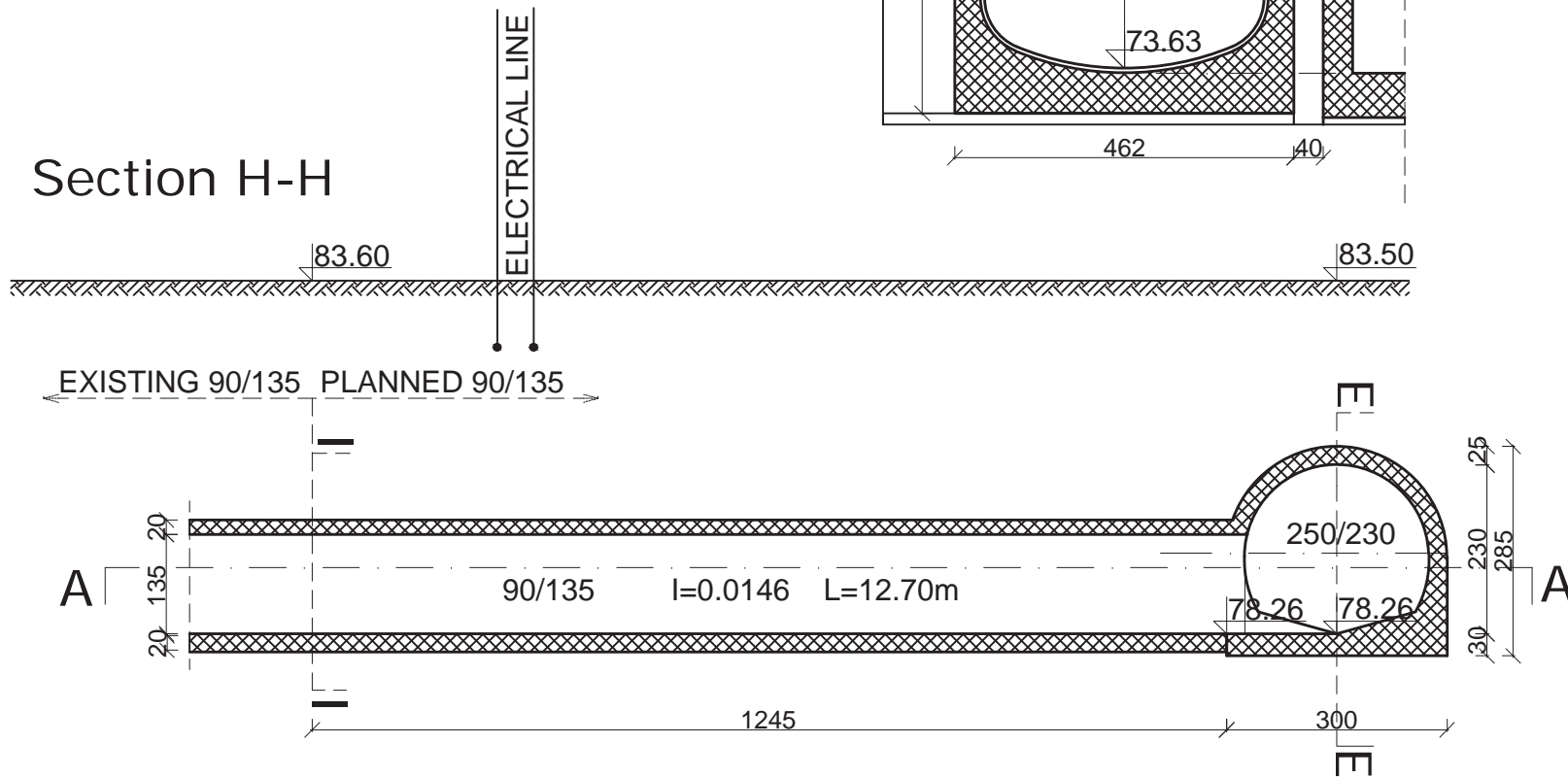
# Connection Structure No.2



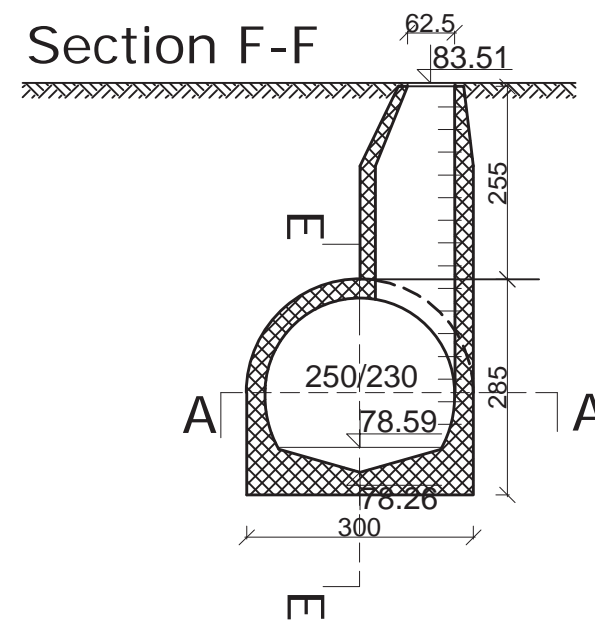
### Section G-G



### Section H-H

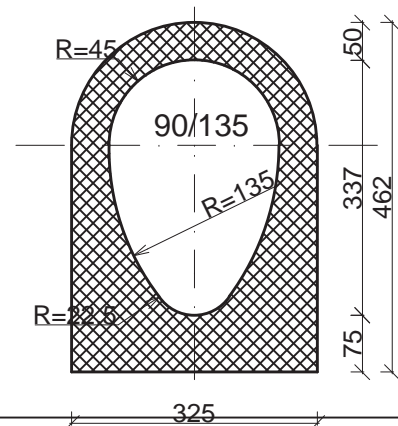


### Section F-F



### Section I-I

R = 1:20



PREPARATORY SURVEY ON THE  
SEWERAGE SYSTEM IMPROVEMENT  
PROJECT FOR THE CITY OF BELGRADE

Components: Sewer

Drw no.:  
SEW-44

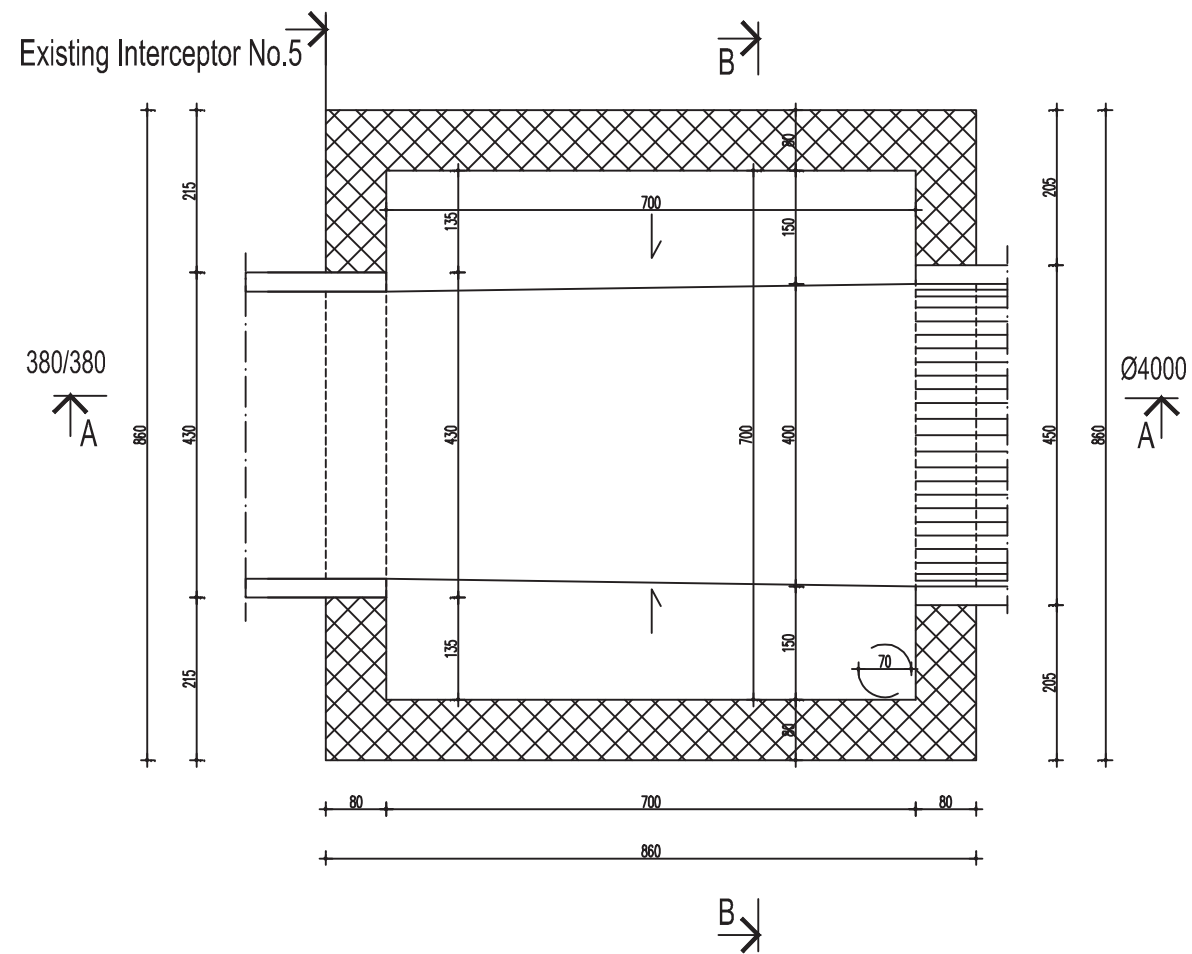
Title: Connection Structure No.2  
Section - 2

Scale:  
1:100

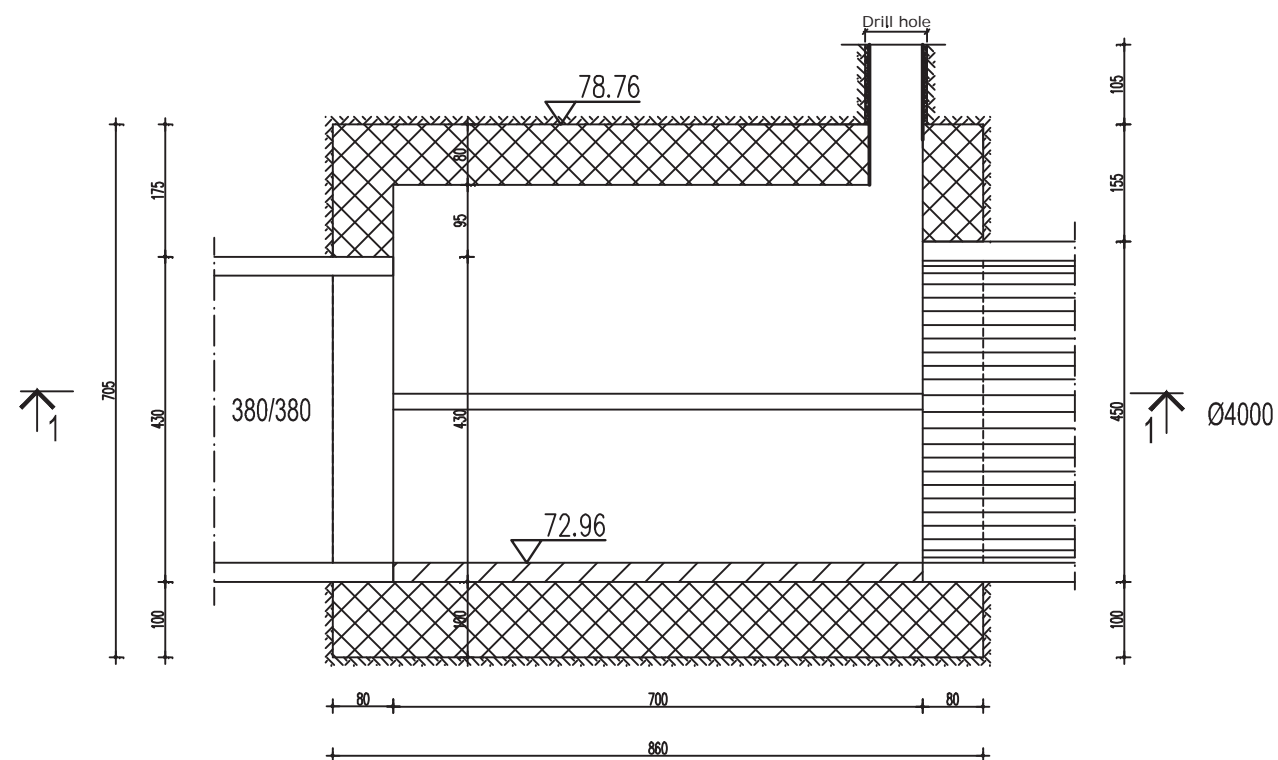


# Shaft No.3 (Chainage 4+238)

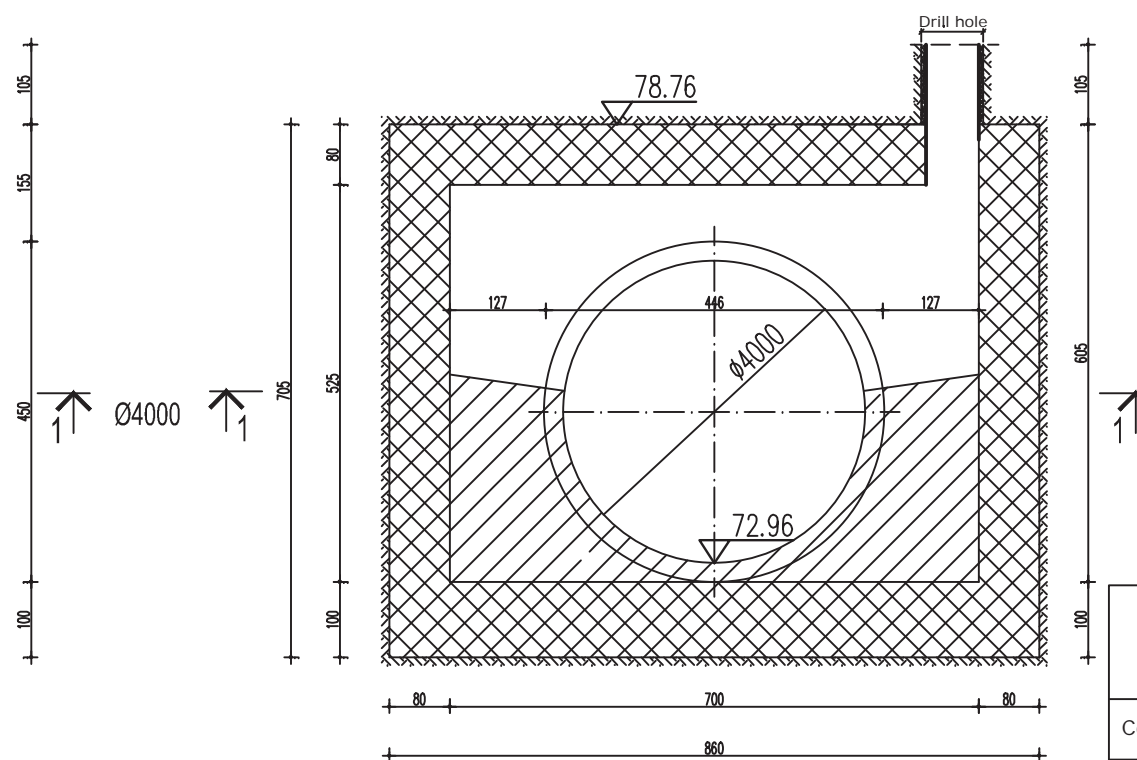
## Plan 1-1



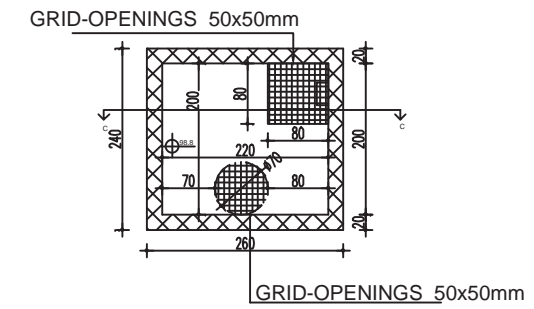
## Section A-A



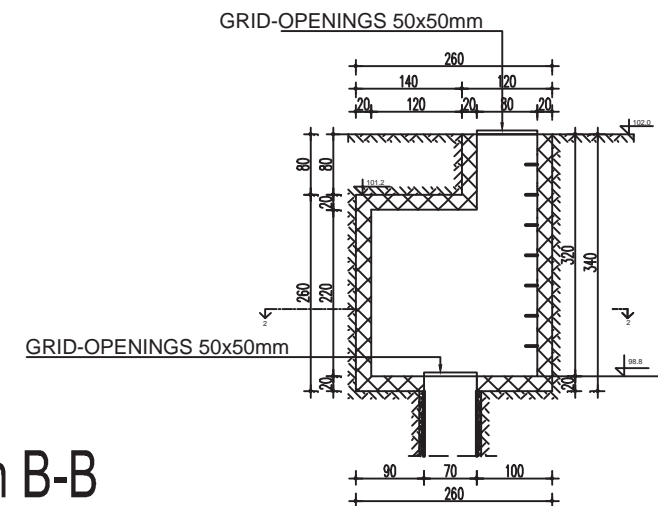
## Section B-B



## Plan 2 - 2



## Section C - C



PREPARATORY SURVEY ON THE  
SEWERAGE SYSTEM IMPROVEMENT  
PROJECT FOR THE CITY OF BELGRADE

Components: Sewer

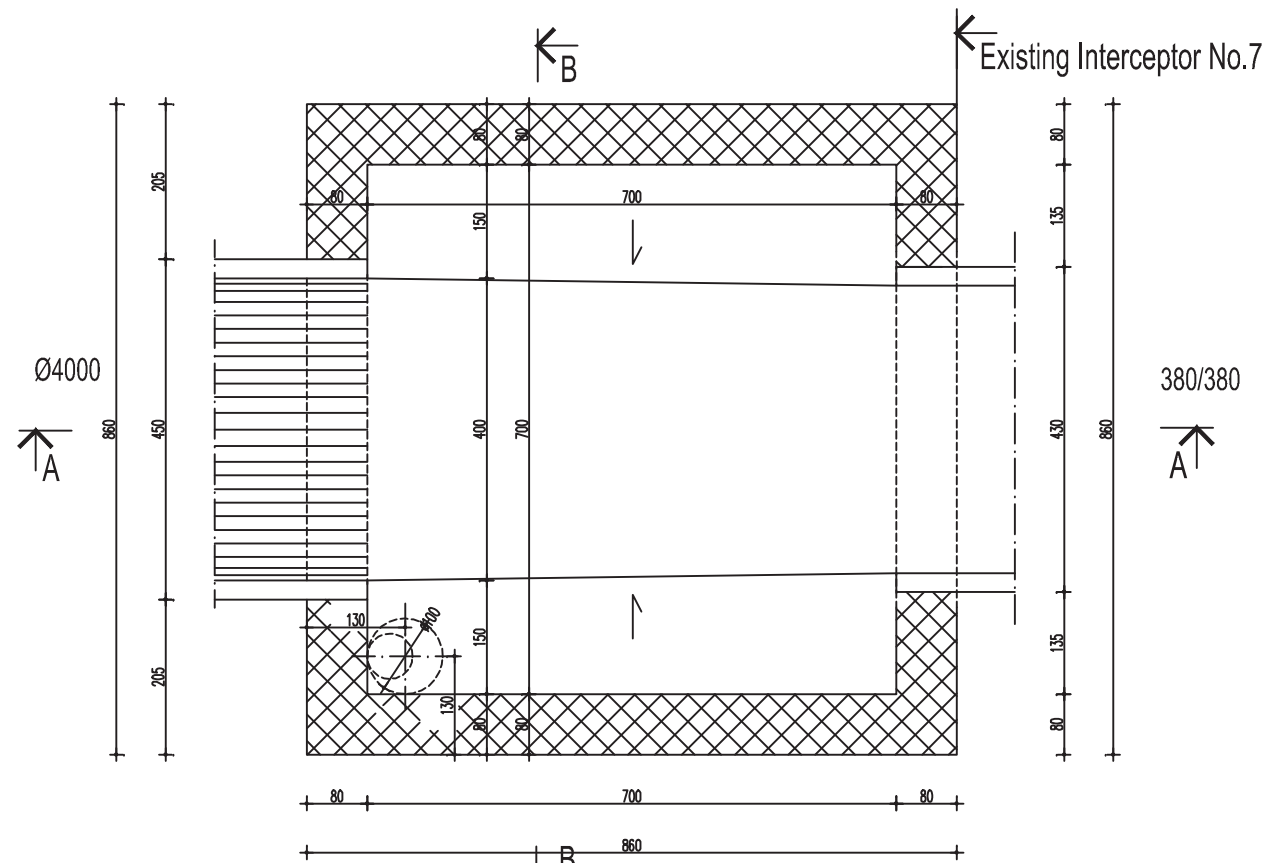
Drw no.:  
SEW-45-1

Title: Shaft No.3

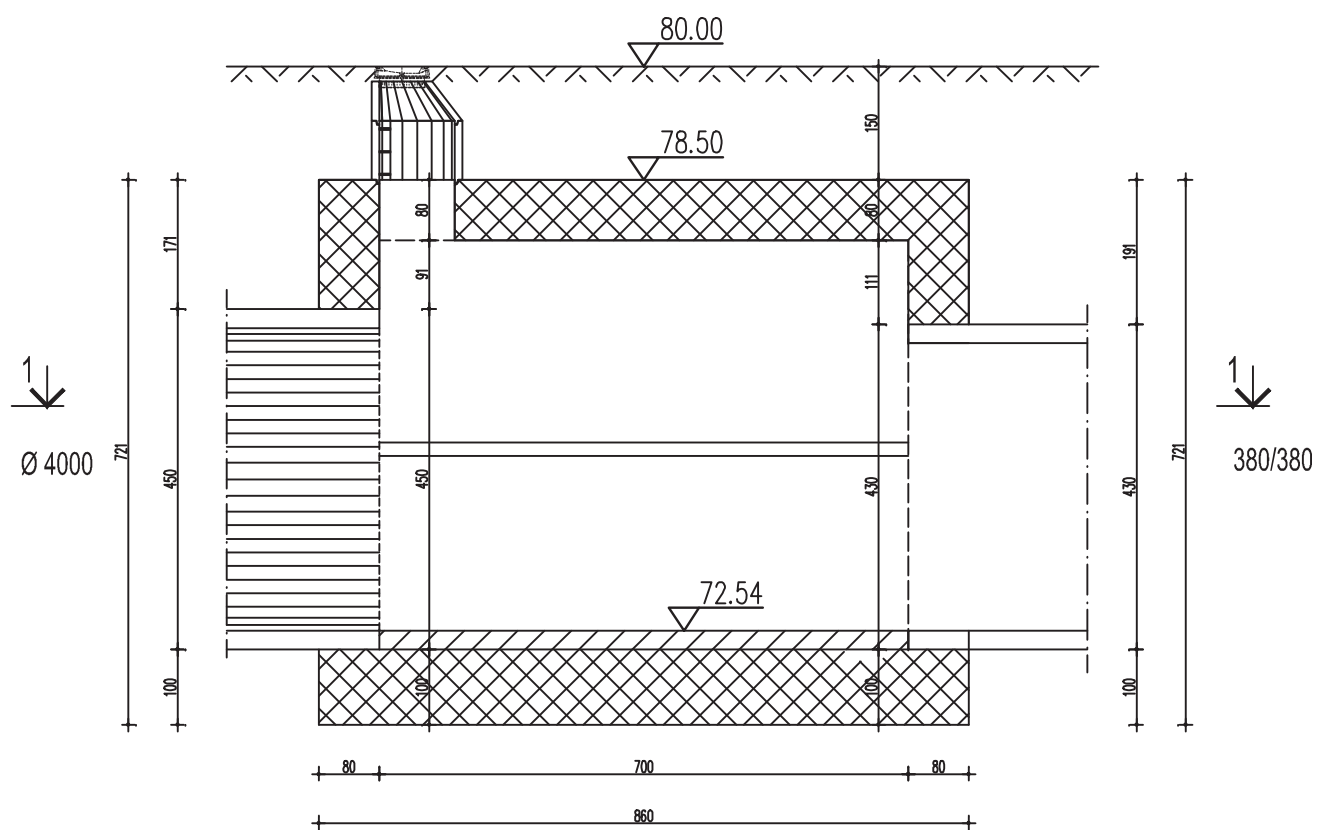
Scale:  
1:100

# Shaft No.4 ( Chainage 5+090 )

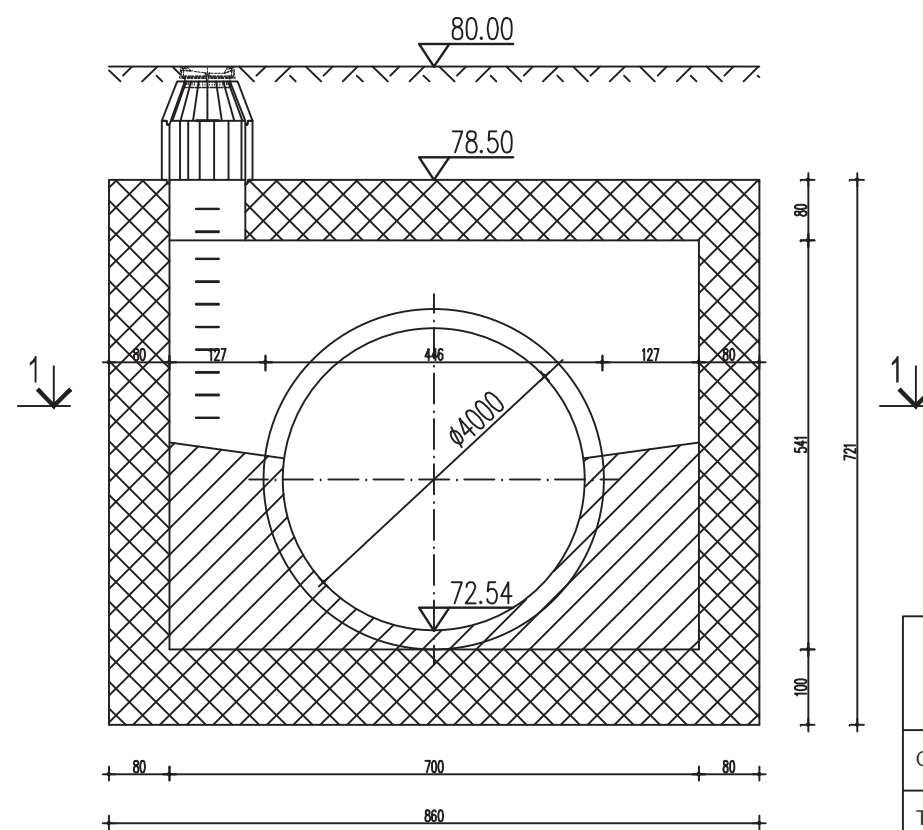
## Plan 1-1



## Section A - A



## Section B - B



PREPARATORY SURVEY ON THE  
SEWERAGE SYSTEM IMPROVEMENT  
PROJECT FOR THE CITY OF BELGRADE

Components: Sewer

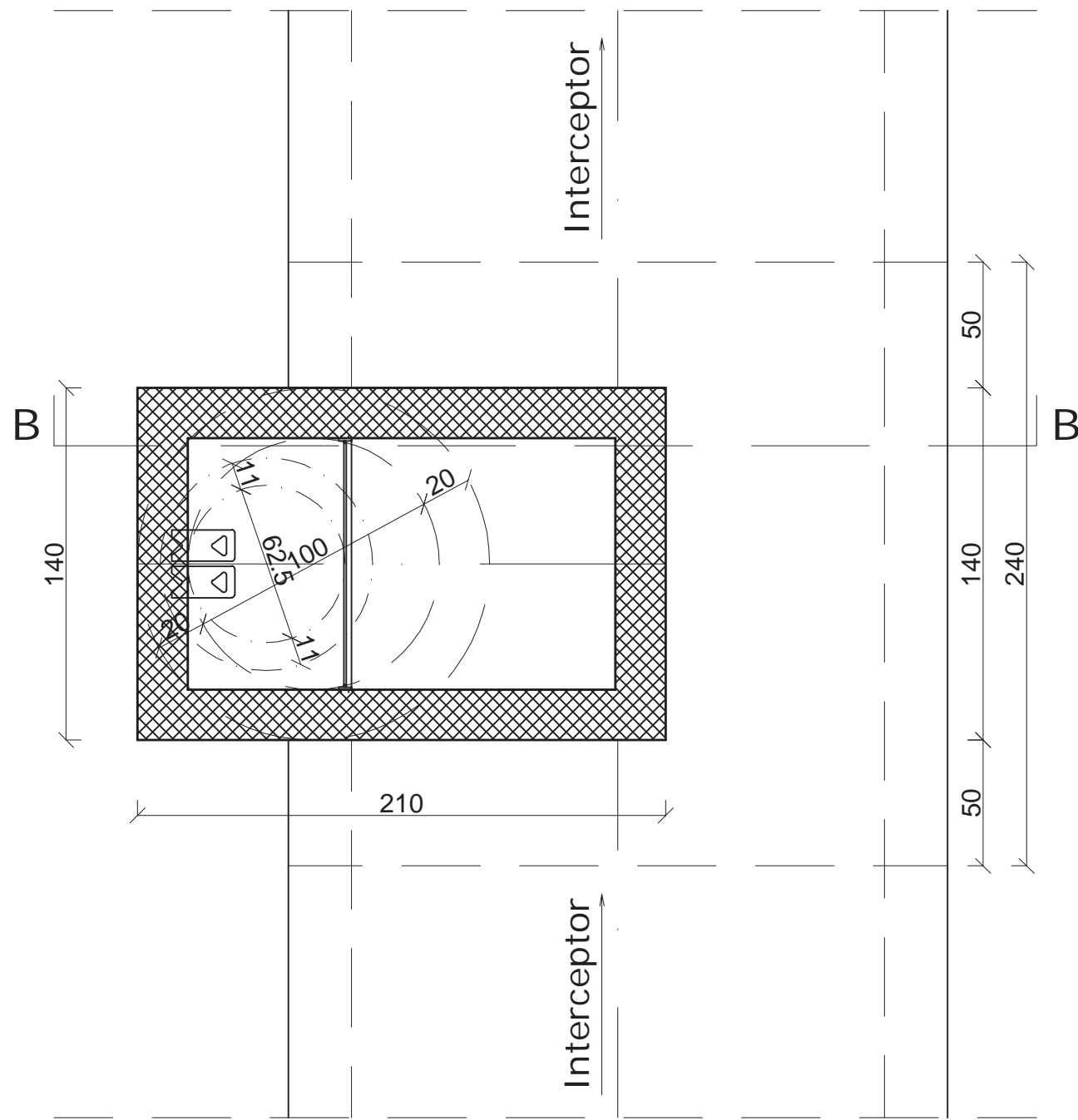
Drw no.:  
SEW-45-2

Title: Shaft No.4

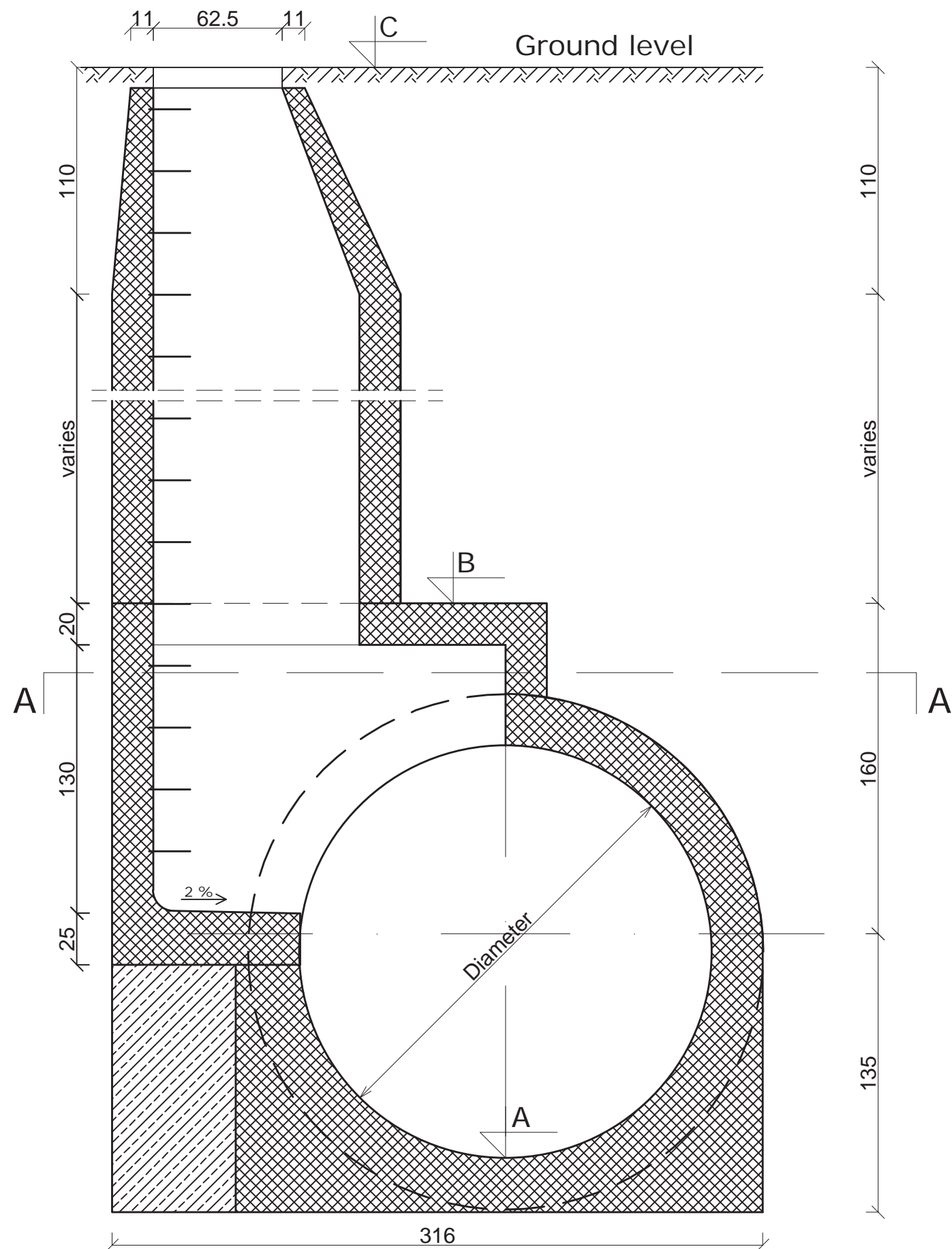
Scale:  
1:100

# TYPICAL INSPECTION MANHOLE

## Plan A - A



## Section B - B



PREPARATORY SURVEY ON THE  
SEWERAGE SYSTEM IMPROVEMENT  
PROJECT FOR THE CITY OF BELGRADE

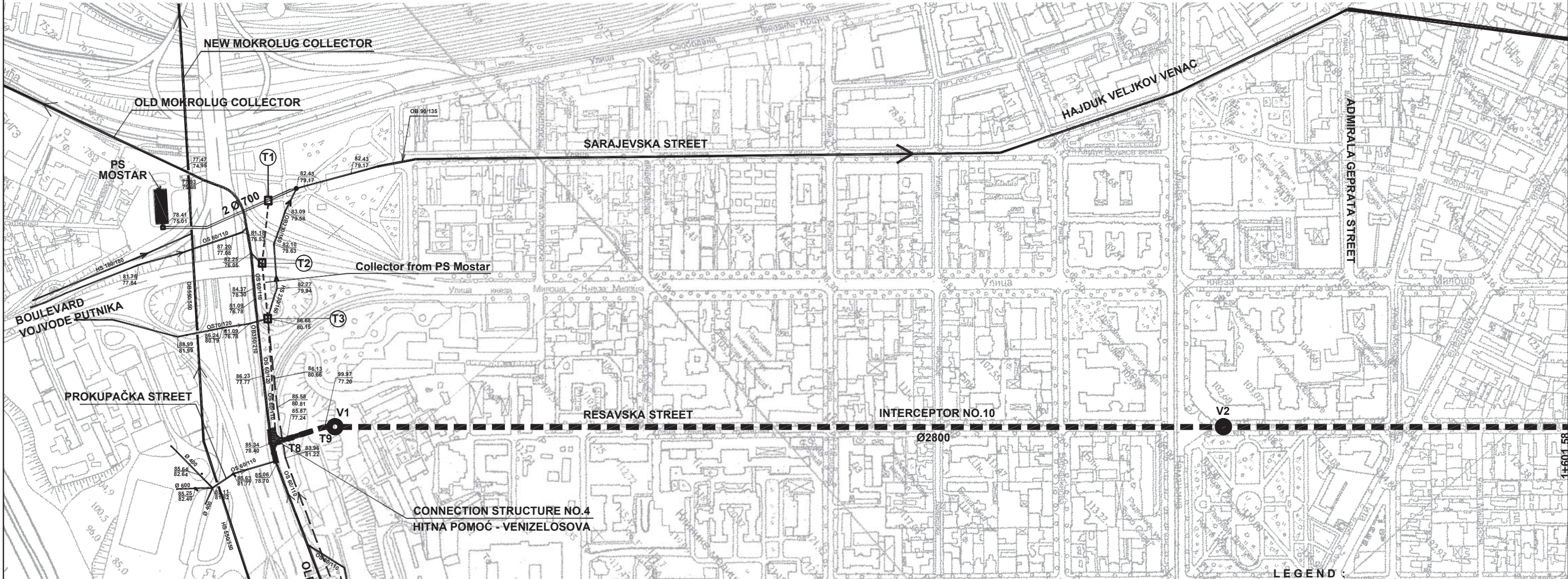
Components: Sewer

Drw no.:  
SEW-46

Title: Typical inspection manhole

Scale:  
1:25

# General layout of Interceptor No.10 (Hitna Pomoć - Venizelosova)

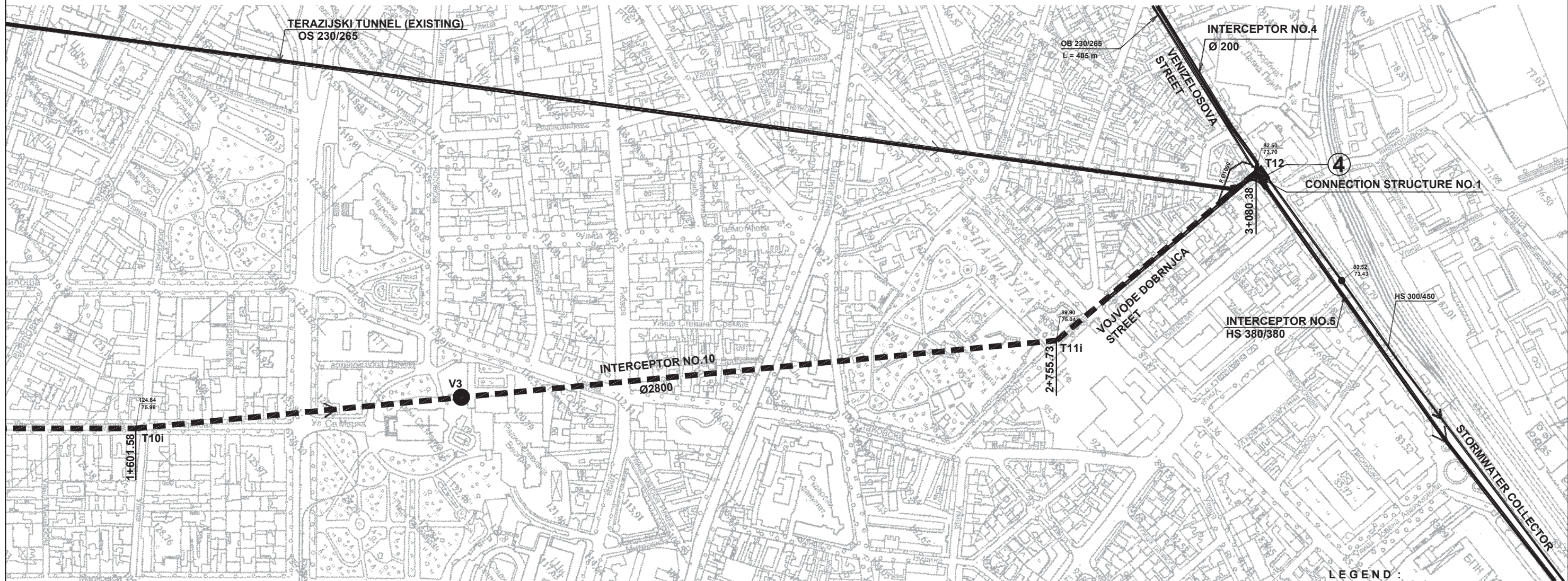


**LEGEND**

- EXISTING COLLECTOR
- - - PLANED COLLECTOR
- - - COLLECTOR - to be removed
- ■ ■ INTERCEPTOR
- OS - Oval Shape
- HS - Horseshoe Shape
- V - VENTHOLE

PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Sewer	Drw no.: SEW-47
Title: Interceptor, General layout - 15	Scale: 1:50

## General layout of Interceptor No.10 ( Hitna Pomoć - Venizelosova )



- LEGEND :**
- EXISTING COLLECTOR
  - - - PLANED COLLECTOR
  - - - COLLECTOR - to be removed
  - ■ ■ INTERCEPTOR
  - OS - Oval Shape
  - HS - Horseshoe Shape
  - V - VENTHOLE

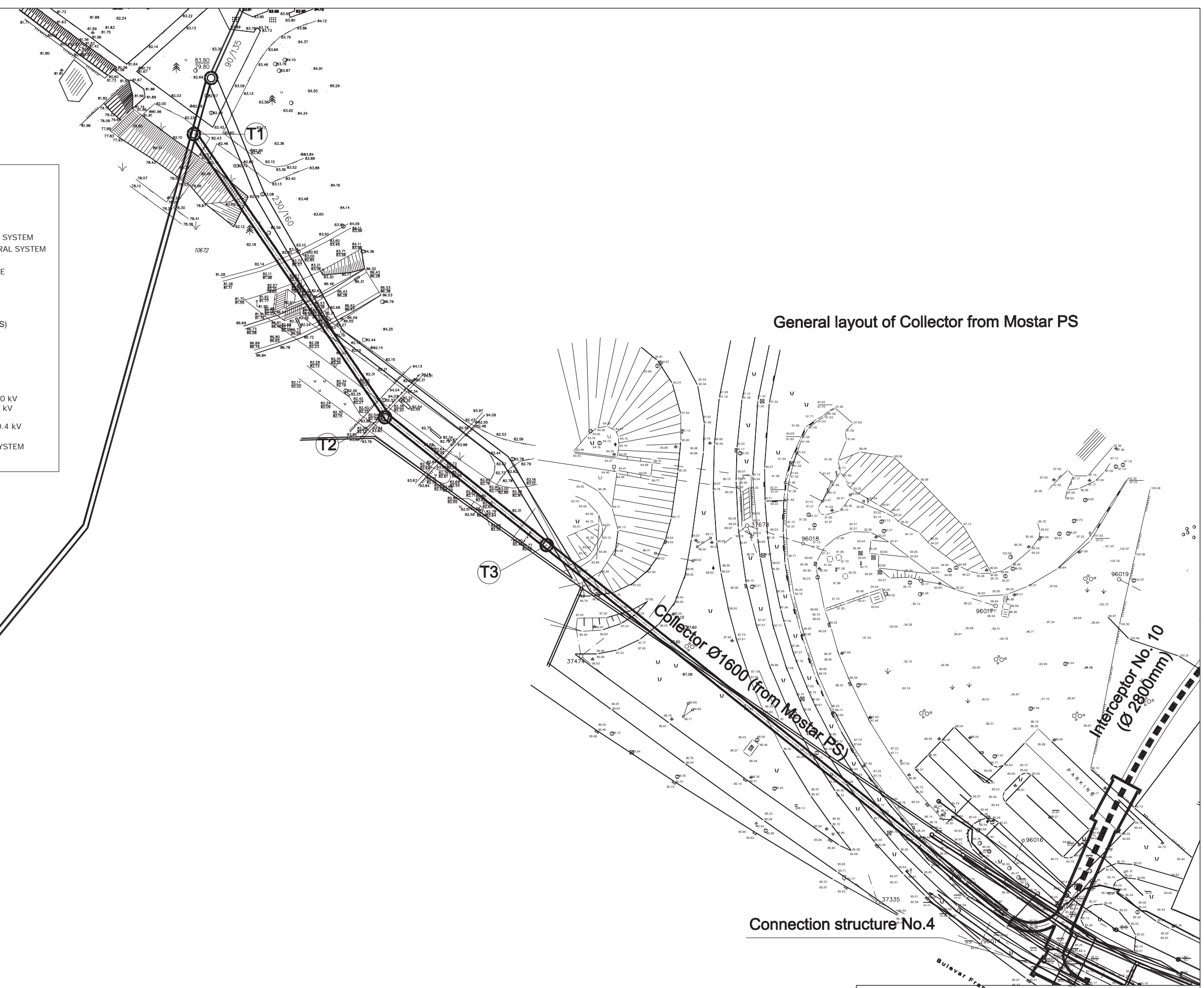
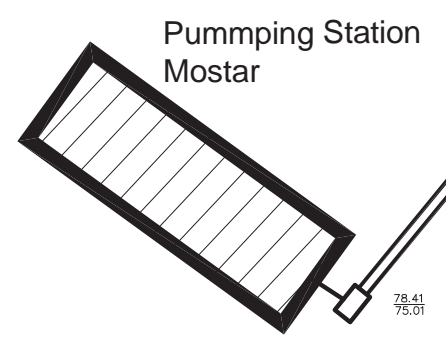
oved

PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Sewer	Drw no.: SEW-48
Title: Interceptor, General layout - 16	Scale: 1:50



# LEGEND

WATER SUPPLY AND SEWERAGE SUPPLY	
	EXISTING WATER SUPPLY
	PLANNED WATER SUPPLY
	EXISTING SEWAGE OF GENERAL SYSTEM
	EXISTING COLLECTOR OF GENERAL SYSTEM
	PLANNED SEWAGE
	EXISTING SEWAGE THAT WILL BE REMOVED
	INTERCEPTOR
	COLLECTOR Ø1600 (from Mostar PS)
	MANHOLE / SHAFT
	OVERFLOW STRUCTURE
ELECTRICAL AND TELEPHONE NETWORK	
	EXISTING ELECTRICAL LINE 10 kV
	PLANNED ELECTRICAL LINE 10 kV
	EXISTING ELECTRICAL LINE 1 kV
	PLANNED ELECTRICAL LINE 1 kV
	EXISTING SUBSTATION 10 / 0.4 kV
	PLANNED SUBSTATION 10 / 0.4 kV
	EXISTING CABLE CONDUCT SYSTEM
	PLANNED CABLE CONDUCT SYSTEM
	EXISTING TELECOM CABLE
	PLANNED TELECOM CABLE

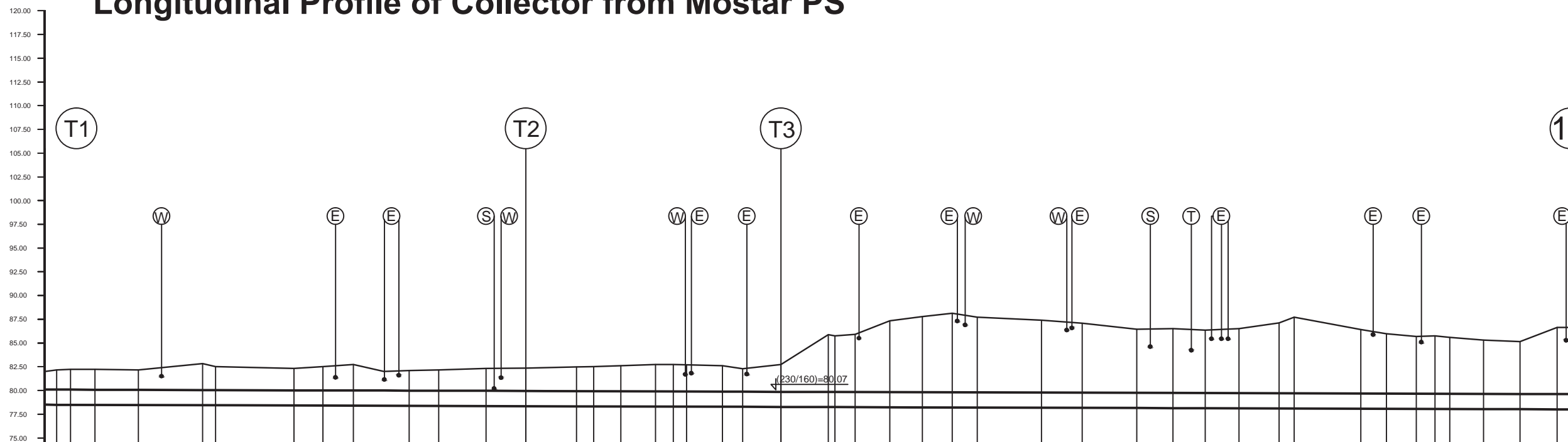


General layout of Collector from Mostar PS

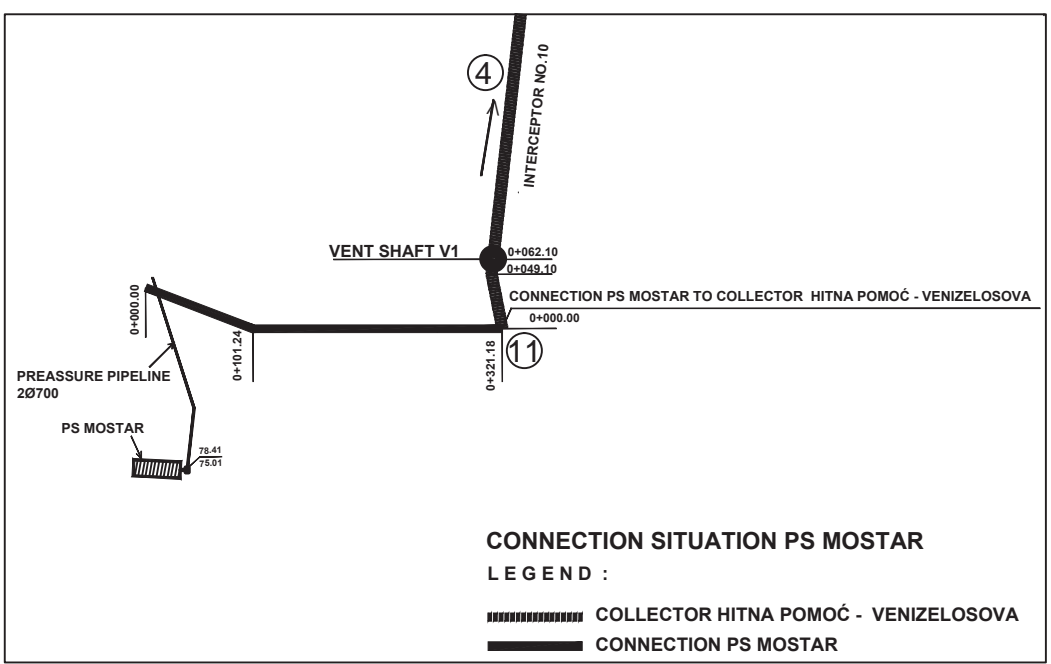
Connection structure No.4

PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Sewer	Drw no.: SEW-50
Title: Collector from Mostar PS, General layout	Scale: 1:1000

# Longitudinal Profile of Collector from Mostar PS



GROUND LEVEL	82.02	82.16	82.22	82.23	82.16	82.33	82.50	82.72	82.10	82.18	82.31	82.37	82.47	82.52	82.81	82.73	82.74	82.70	82.29	82.74	85.32	87.34	87.77	88.13	87.73	84.40	87.09	86.45	86.50	86.37	86.52	87.13	87.73	86.41	85.97	85.89	85.76	85.59	85.31	85.15	86.64	86.64						
PIPE BOTTOM ELEVATION	78.50	78.39	78.49	78.48	78.37	78.42	78.35	78.40	78.38	78.37	78.36	78.34	78.33	78.32	78.31	78.30	78.30	78.29	78.28	78.28	78.26	78.24	78.23	78.22	78.21	78.20	78.18	78.17	78.15	78.14	78.13	78.12	78.11	78.10	78.08	78.07	78.06	78.05	78.05	78.04	78.02	78.01						
TRENCH DEPTH	3.62	3.77	3.83	3.85	3.79	4.01	4.17	4.42	3.92	3.91	4.05	4.13	4.24	4.30	4.40	4.53	4.54	4.51	4.44	4.58	7.08	9.21	9.65	10.02	9.63	6.32	9.02	8.40	8.46	8.34	8.50	9.12	9.73	8.43	8.00	7.73	7.80	7.64	7.37	7.22	8.73	8.64						
LENGTH AND FALL																									321.24 I=1.5‰ Ø1600																							
HORIZONTAL ROUTE ANGLES	20°17'10"																																															
METHOD	Open Cut																								Micro-Tunneling																							
CHAINAGE	0+000.00	0+002.24	0+005.33	0+010.36	0+019.81	0+034.15	0+035.89	0+052.36	0+058.50	0+064.94	0+071.35	0+076.68	0+082.97	0+090.92	0+101.25	0+111.97	0+115.53	0+121.25	0+128.51	0+132.27	0+135.05	0+142.64	0+146.92	0+154.98	0+168.34	0+170.56	0+177.90	0+184.75	0+191.03	0+196.30	0+209.90	0+218.41	0+229.87	0+237.51	0+244.31	0+251.44	0+259.85	0+263.03	0+277.04	0+282.47	0+288.76	0+292.67	0+295.80	0+302.90	0+310.59	0+318.39	0+324.24	



- Legend
- (S) Existing sewage
  - (W) Water supply
  - (E) Electrical lines
  - (T) Telephone lines

PREPARATORY SURVEY ON THE  
SEWERAGE SYSTEM IMPROVEMENT  
PROJECT FOR THE CITY OF BELGRADE

Components: Sewer	Drw no.: SEW-51
Title: Collector, Longitudinal Profile	Scale: H 1:100 V 1:20

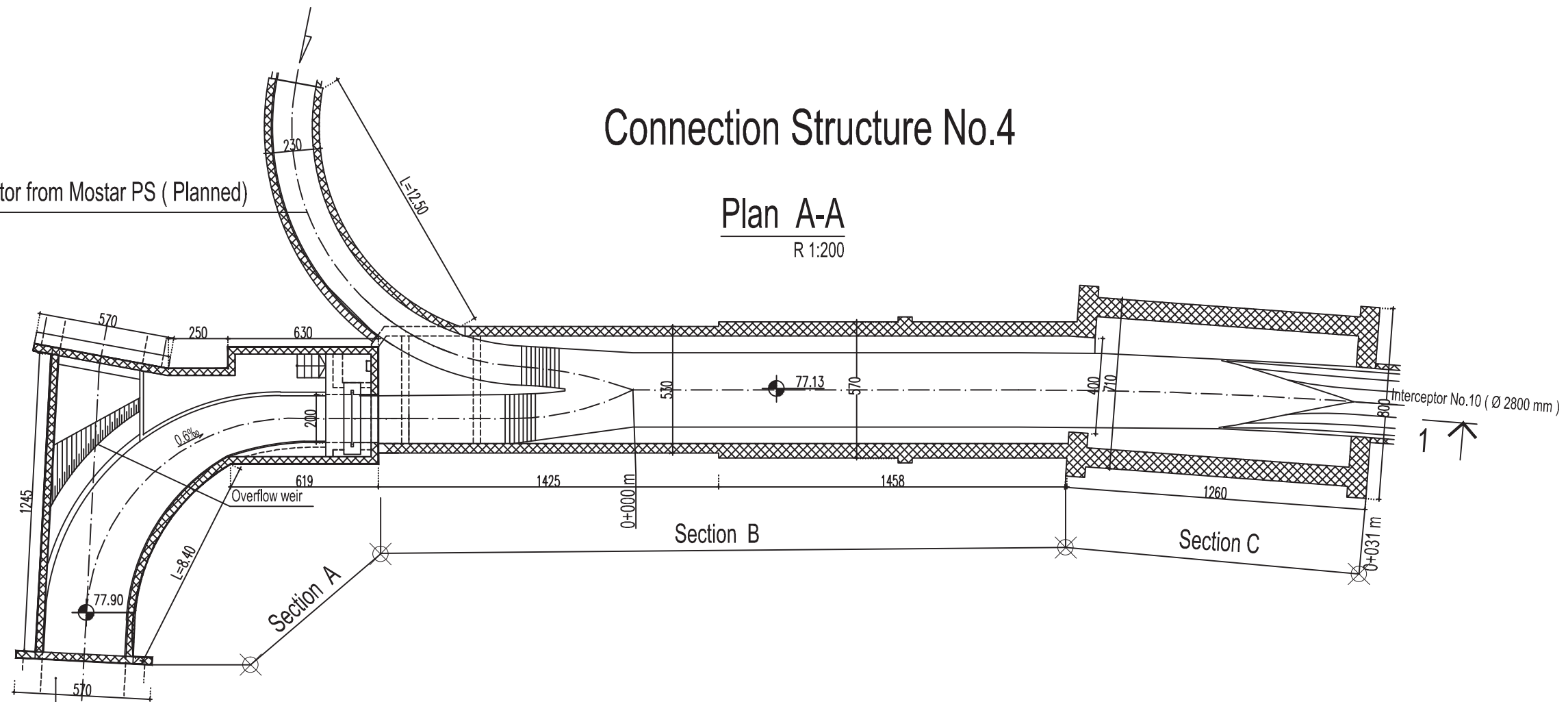


# Connection Structure No.4

## Plan A-A

R 1:200

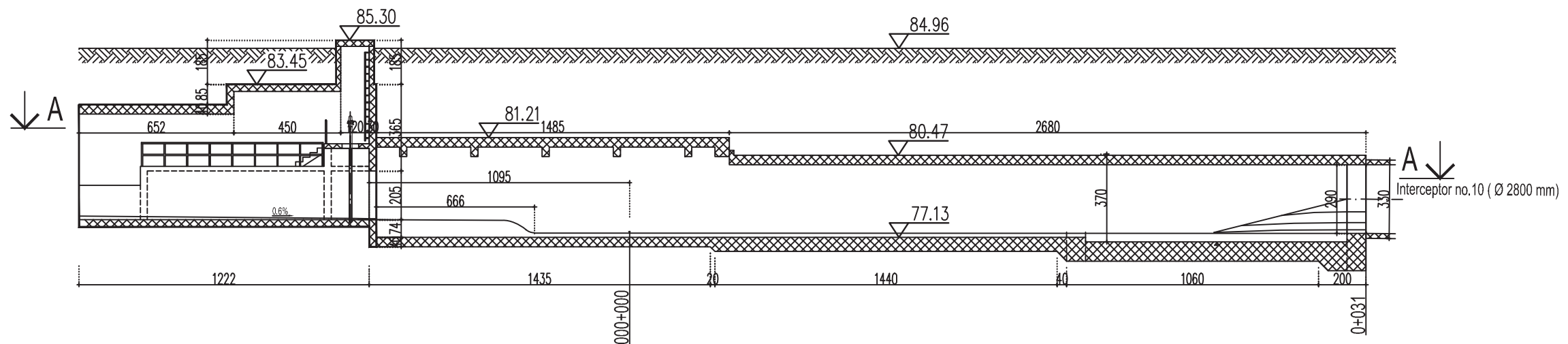
Collector from Mostar PS (Planned)



## Section 1 - 1

R 1:200

Old Mokrolug Collector (Existing)



PREPARATORY SURVEY ON THE SEWERAGE  
SYSTEM IMPROVEMENT PROJECT FOR THE CITY  
OF BELGRADE

Components: Sewer

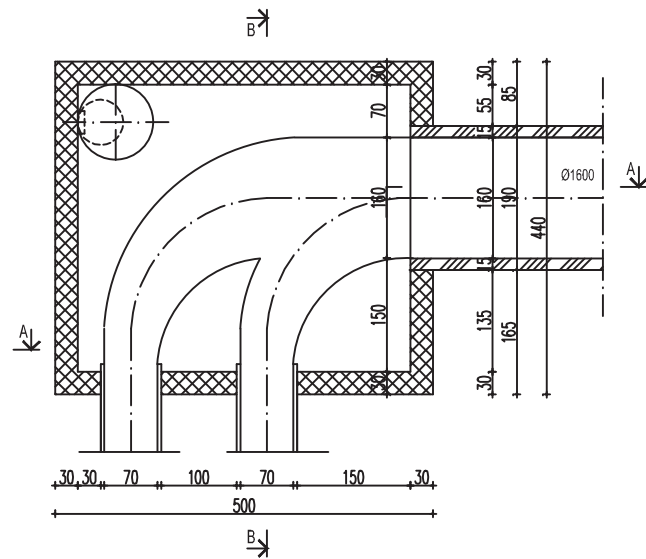
Drw no:  
SEW-52

Title: Connection Structure No.4

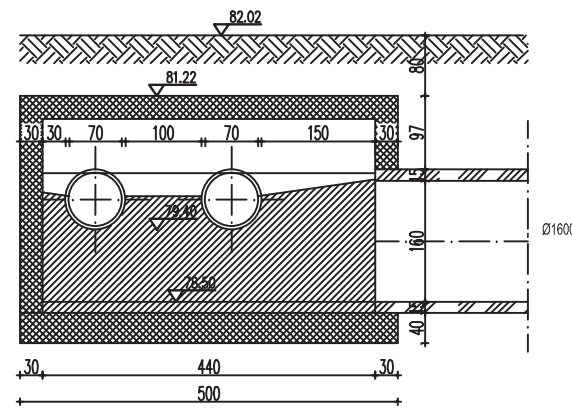
Scale:  
1:200

# Manhole T1

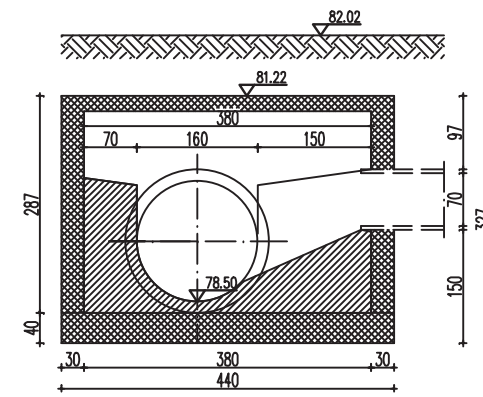
Plan



Section A-A

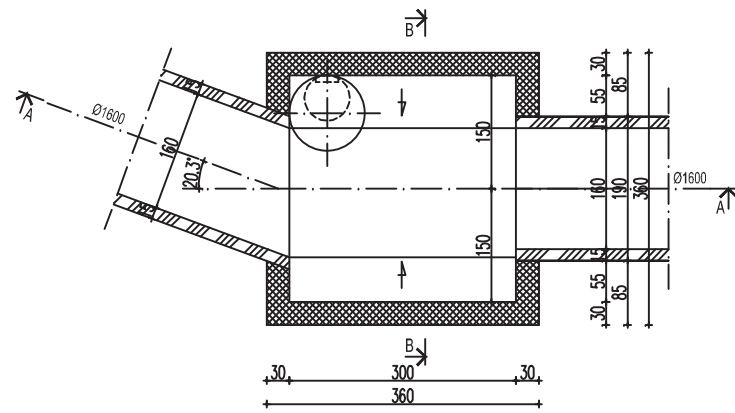


Section B-B

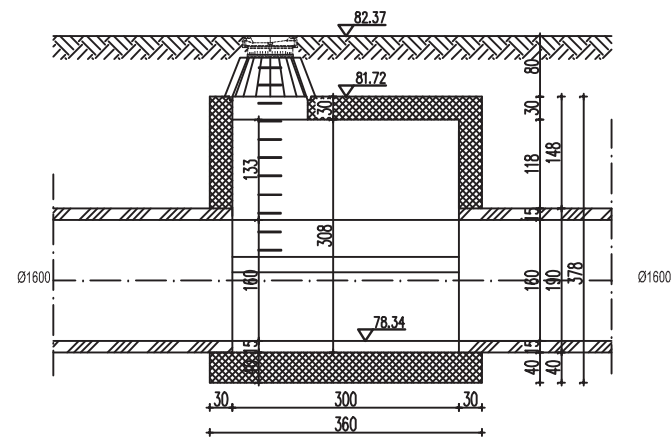


# Manhole T2

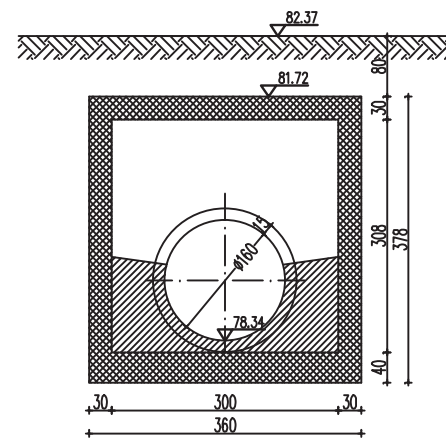
Plan



Section A-A

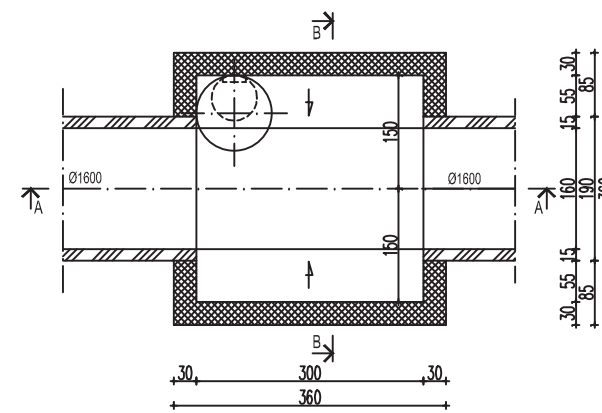


Section B-B

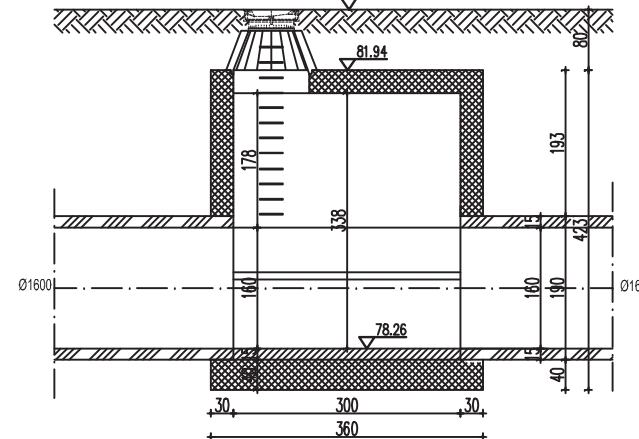


# Manhole T3

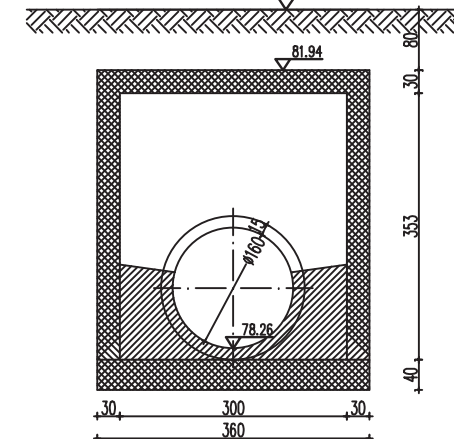
Plan



Section A-A



Section B-B



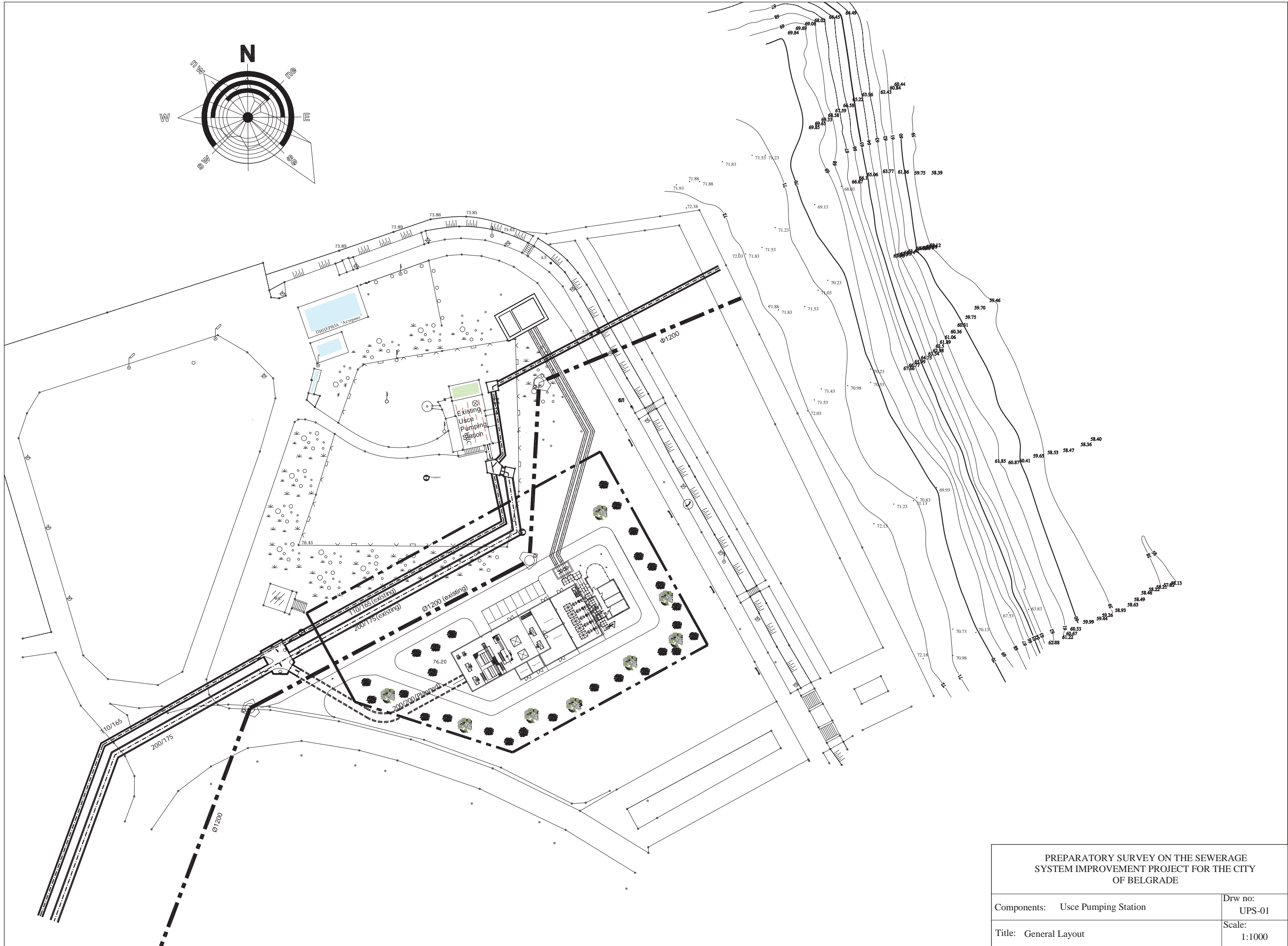
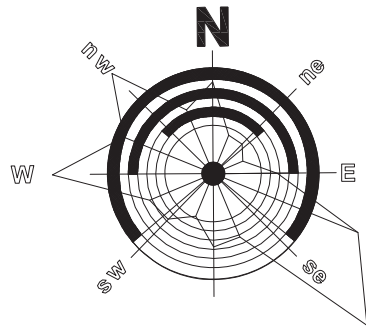
PREPARATORY SURVEY ON THE  
SEWERAGE SYSTEM IMPROVEMENT  
PROJECT FOR THE CITY OF BELGRADE

Components: Sewer

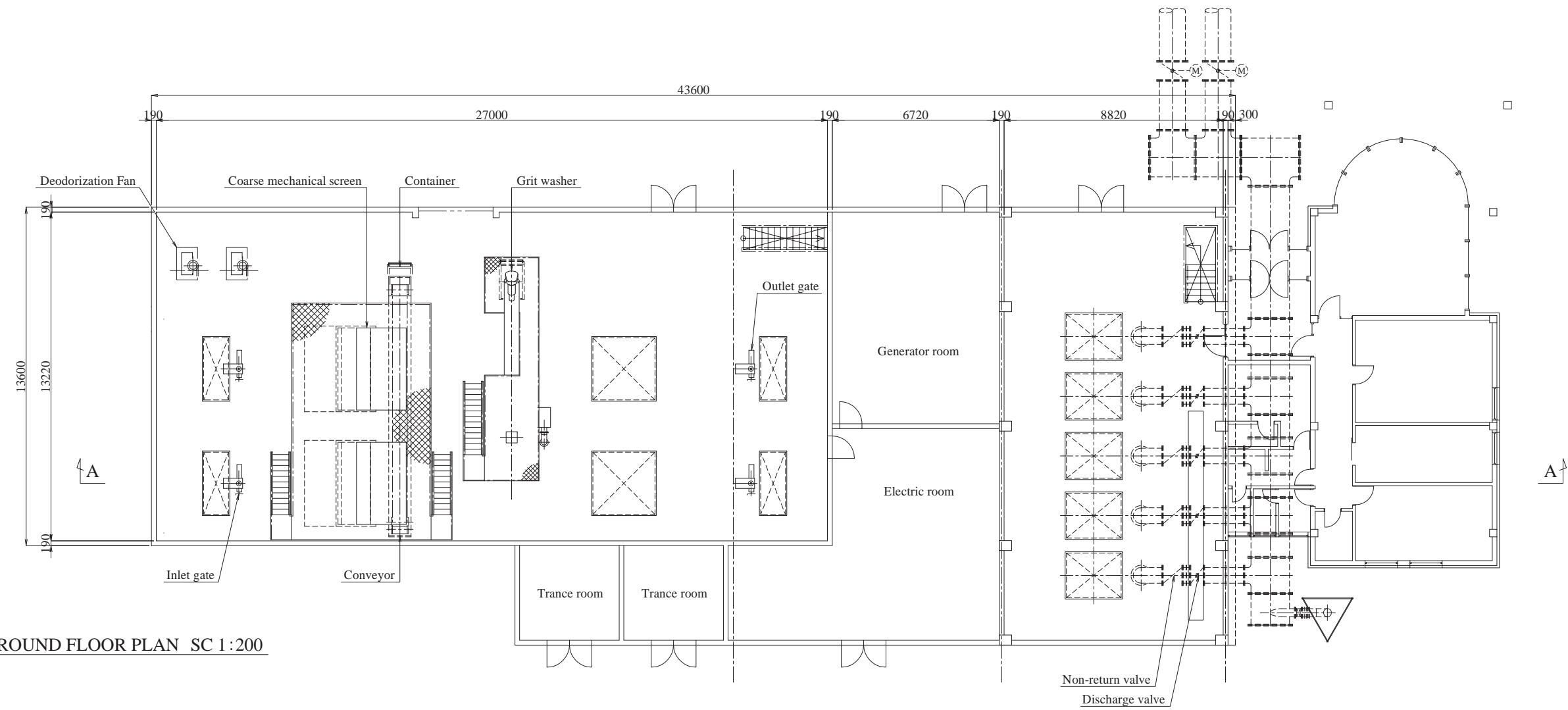
Drw no.:  
SEW-53

Title: Manhole No.T1 , No.T2 and No.T3

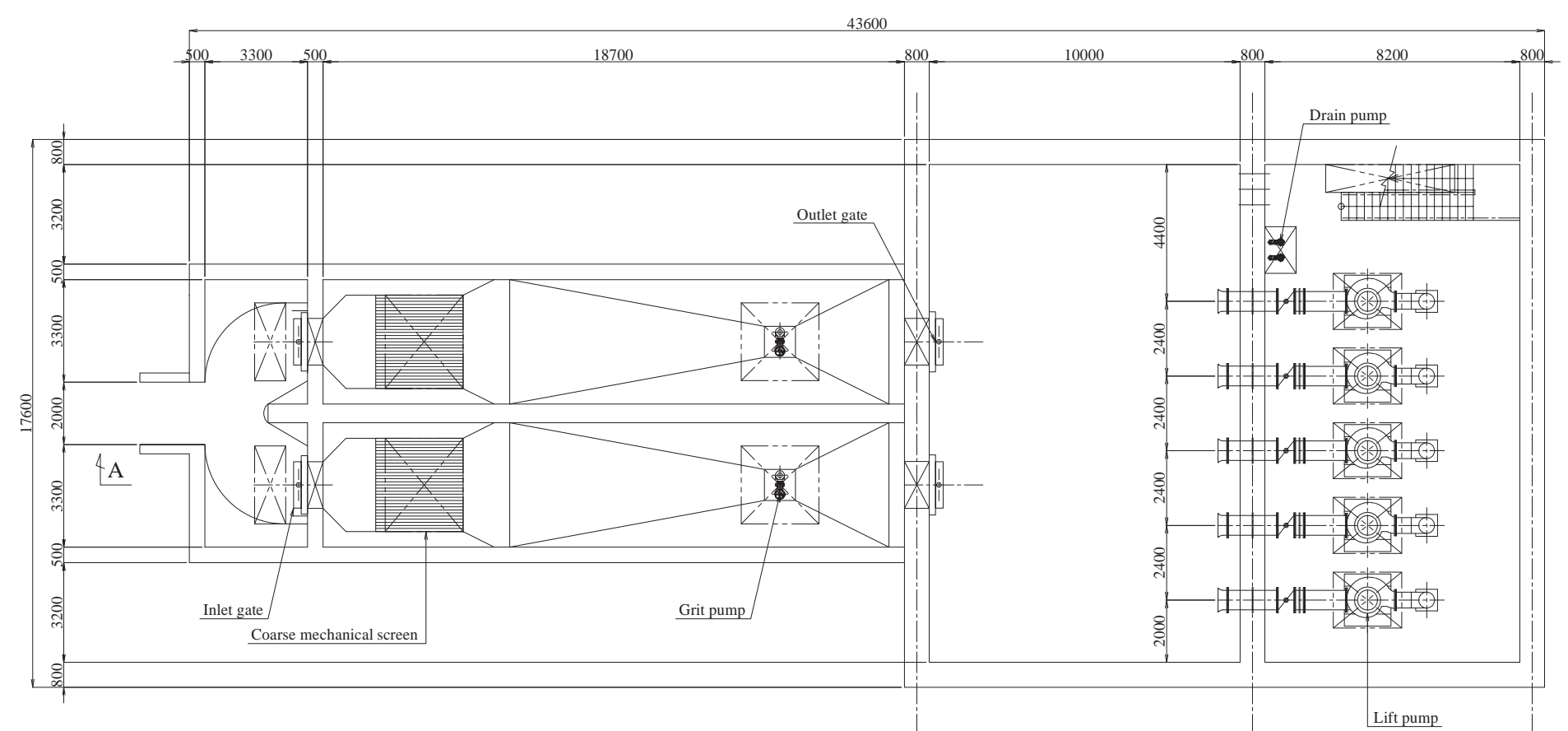
Scale:  
1: 100



PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Usce Pumping Station	Drw no: UPS-01
Title: General Layout	Scale: 1:1000

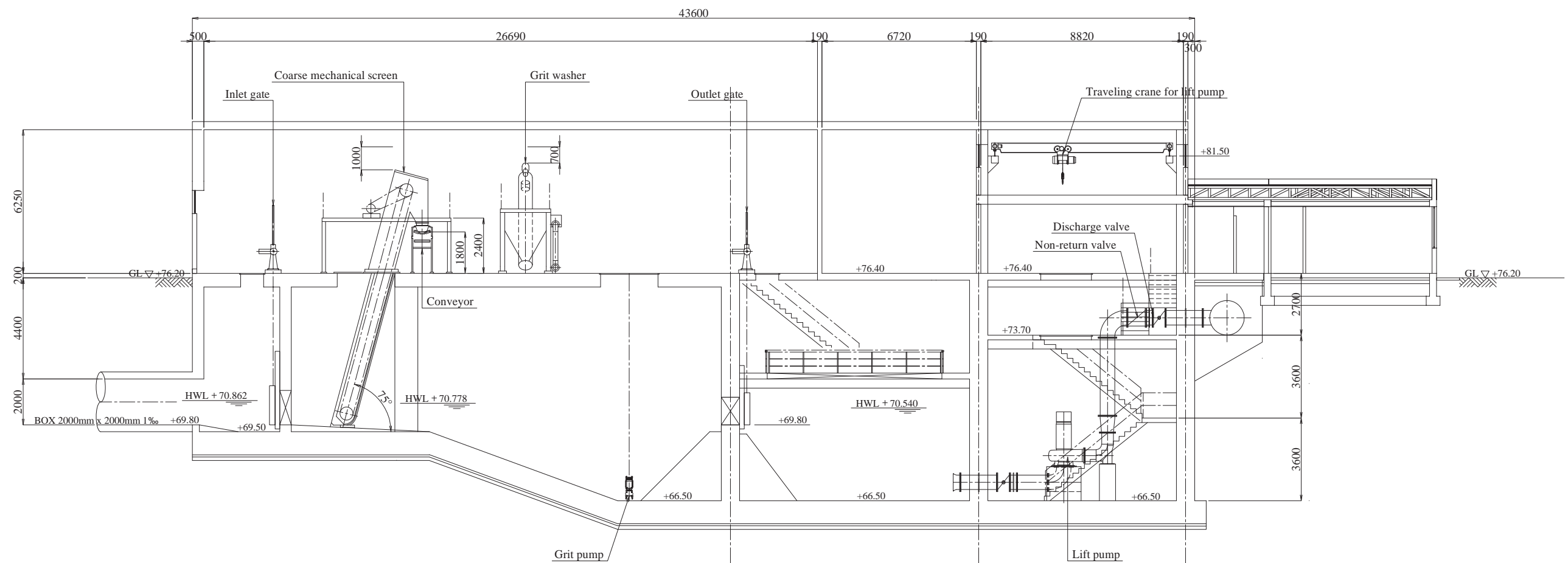


GROUND FLOOR PLAN SC 1:200



CHANNEL PLAN SC 1:200

PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Usece Pumping Station	Drw no: UPS-02
Title: Pumping Station	Scale: 1:200



A-A SECTION SC 1:200

PREPARATORY SURVEY ON THE SEWERAGE  
SYSTEM IMPROVEMENT PROJECT FOR THE CITY  
OF BELGRADE

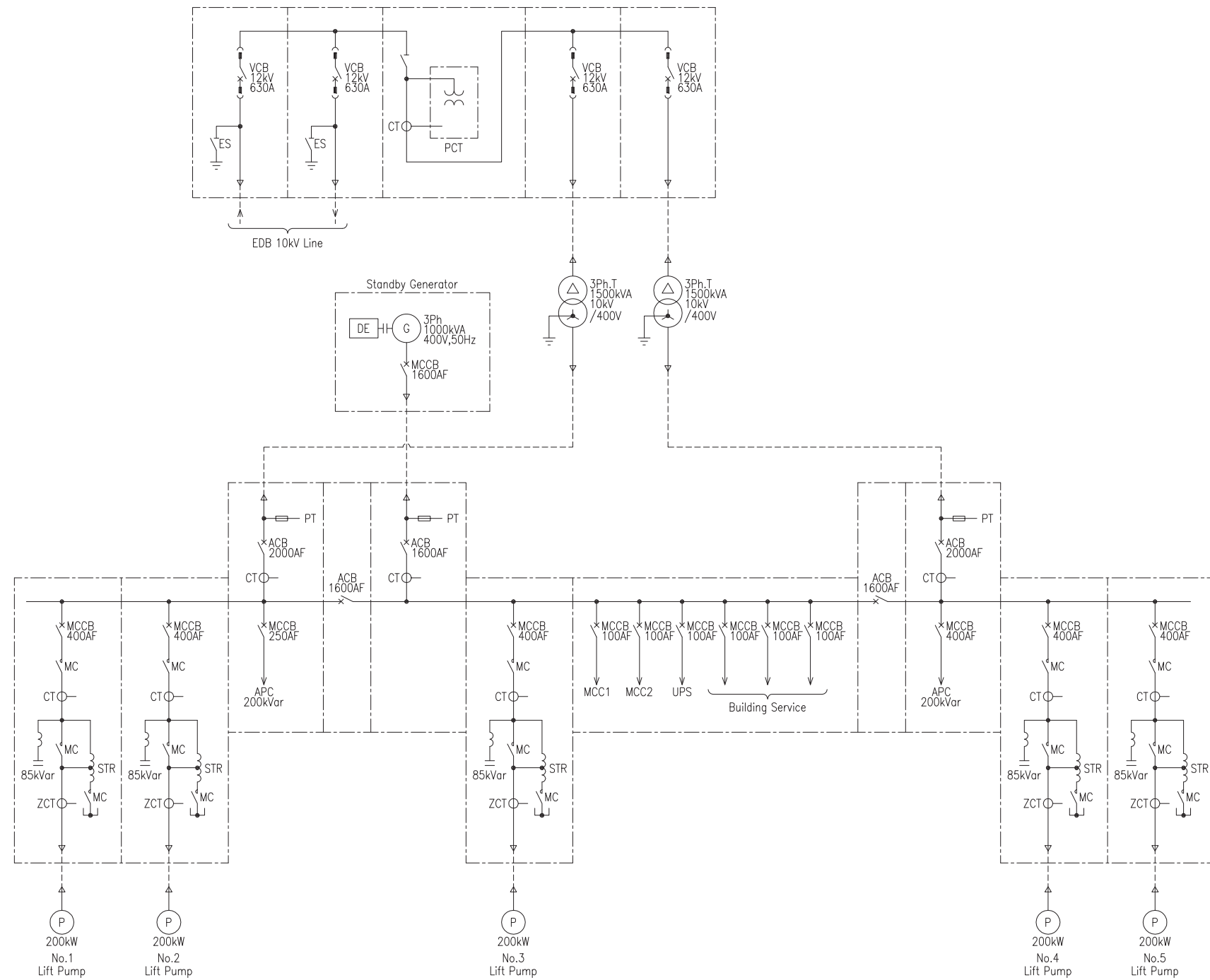
Components: Usec Pumping Station

Drw no:  
UPS-03

Title: Pumping Station

Scale:  
1:200

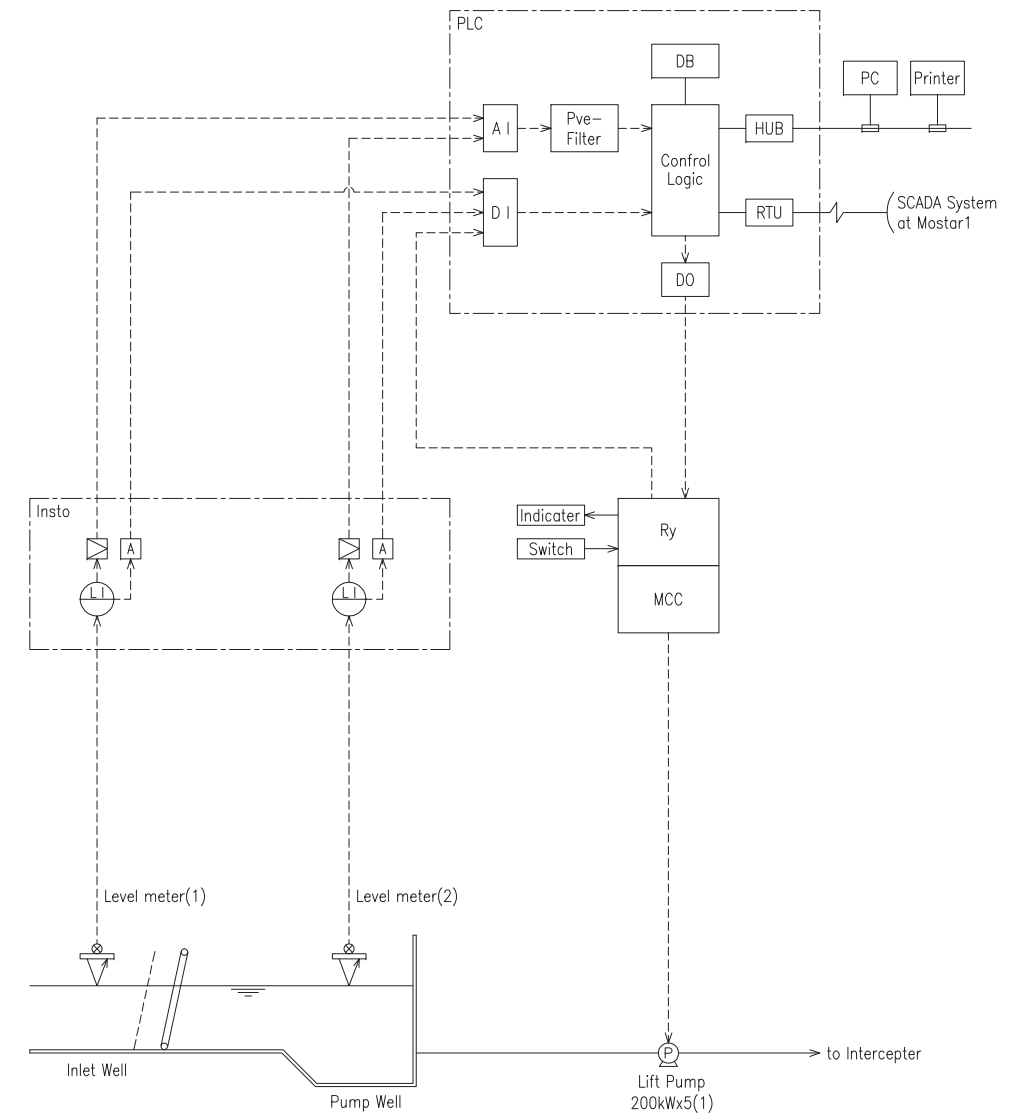
### Single Line Diagram



Panels	
101	No.1 10kV Receiving
102	No.2 10kV Receiving
103	Power Measuring
104	No.1 Transformer Primary VCB
105	No.2 Transformer Primary VCB
201	No.1 Lift pump
202	No.2 Lift pump
203	No.1 Transformer Secondary ACB
204	No.1 Bus-tie ACB
205	Standby Generator
206	No.3 Lift pump
207	Utility Feeder
208	No.2 Bus-tie ACB
209	No.2 Transformer Secondary ACB
210	No.4 Lift pump
211	No.5 Lift pump

Legend	
EDB	Electrical distribution company
VCB	Vacuum circuit breaker
ES	Earthing switch
PCT	Power measuring unit
3Ph.T	3 phase transformer
DE	Diesel engine
ACB	Air circuit breaker
MCCB	Molded case circuit breaker
MC	Magnetic contactor
CT	Current transformer
ZCT	Zero-phase current transformer
PT	Potential transformer
STR	Starting transformer
SC	Static capacitor
APC	Automatic power factor compensator

### Micro-SCADA and Control System



Legend	
L I	Level indicator
A	Alarm setter
Insto	Instrument panel
RY	Auxiliary relay panel
MCC	Motor control center
PLC	Programable logical controller
AI	Analog input uuit
DI	Digital input uuit
DO	Digital output uuit
DB	Data base
RTU	Remote terminal unit

Usce Pump Station			
	Item	kW	nos
101	Inlet gate	5.5	2
102	Lift pump	200	5(1)
103	Mechanical screen	3.7	2
104	Screw conveyor		1
105	Sand pump	37	2
106	Sand dewatering	-	1
107	Outlet gate	-	2
108	Drainage pump	0.75	2

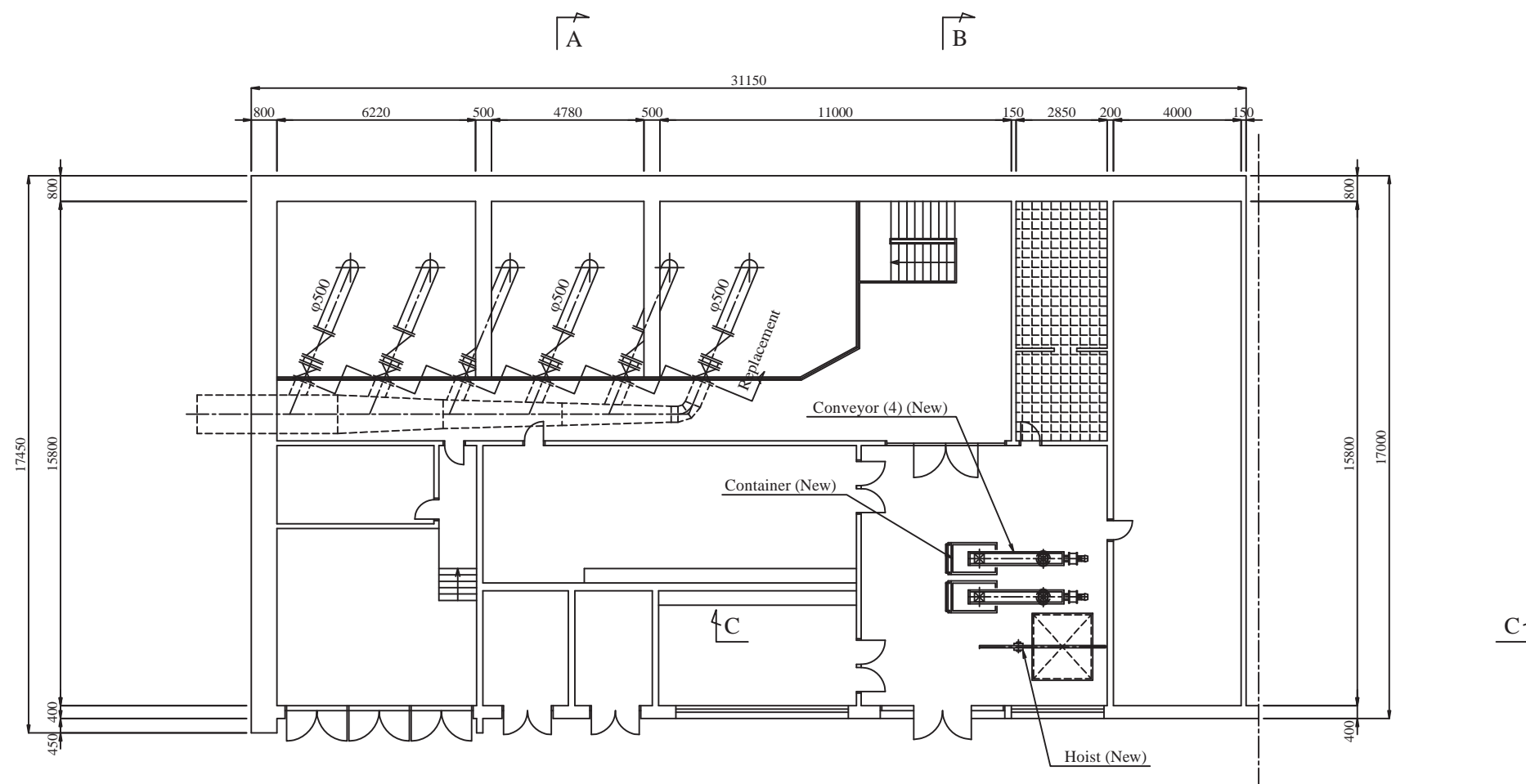
PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE

Components: Mostar Pumping Station

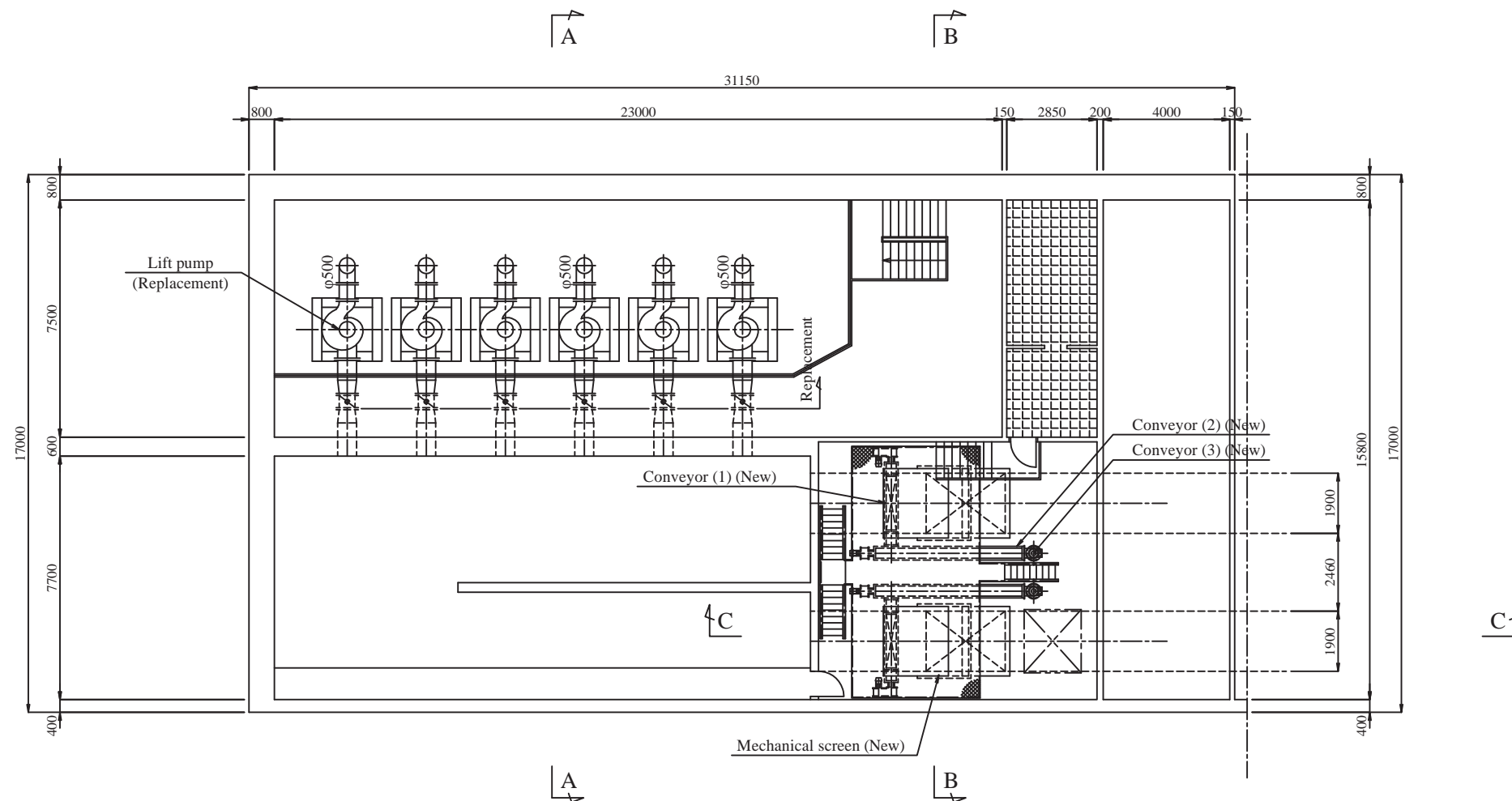
Title: Electrical System and MICRO-SCADA System

Drw no: UPS-04

Scale: NONE

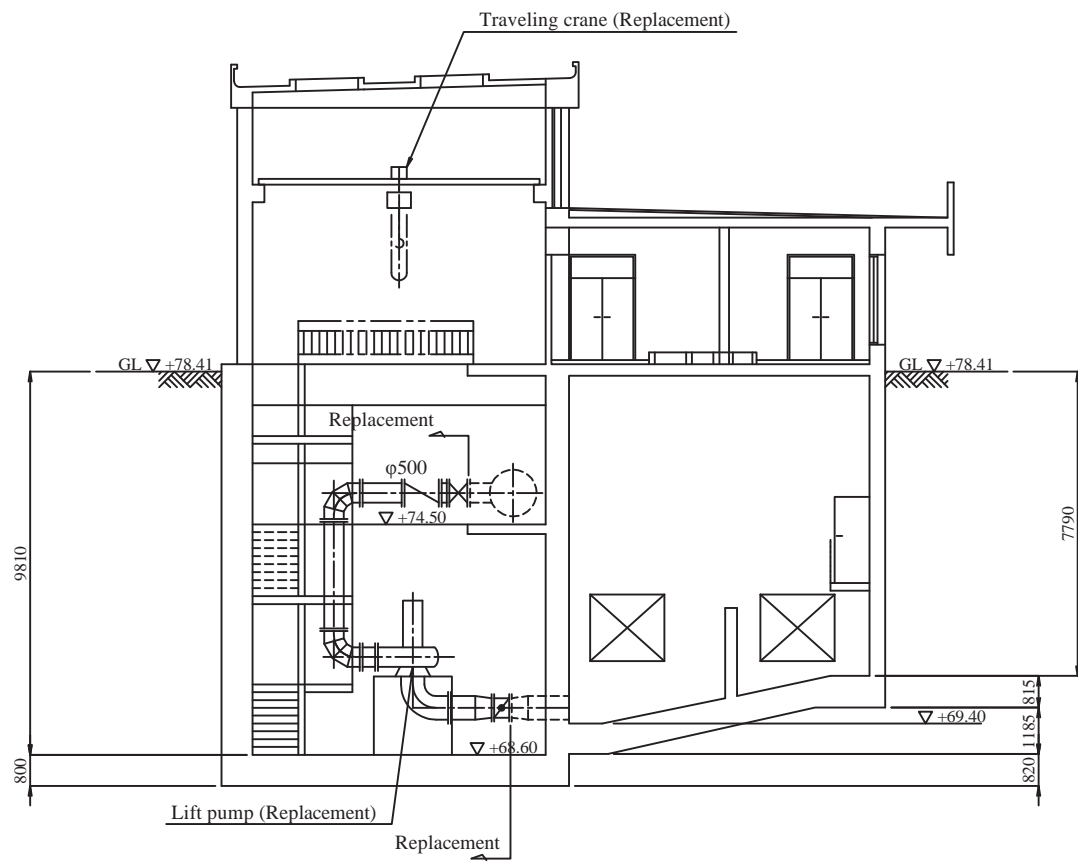


GROUND FLOOR PLAN SC 1: 200

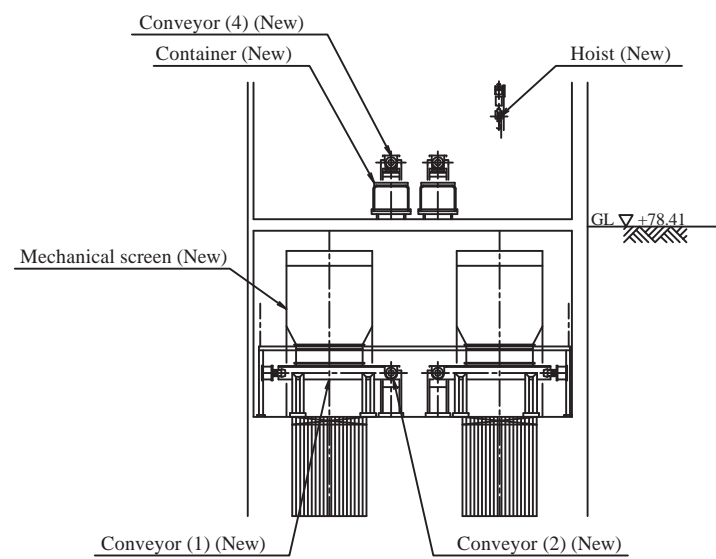


B1 FLOOR PLAN SC 1: 200

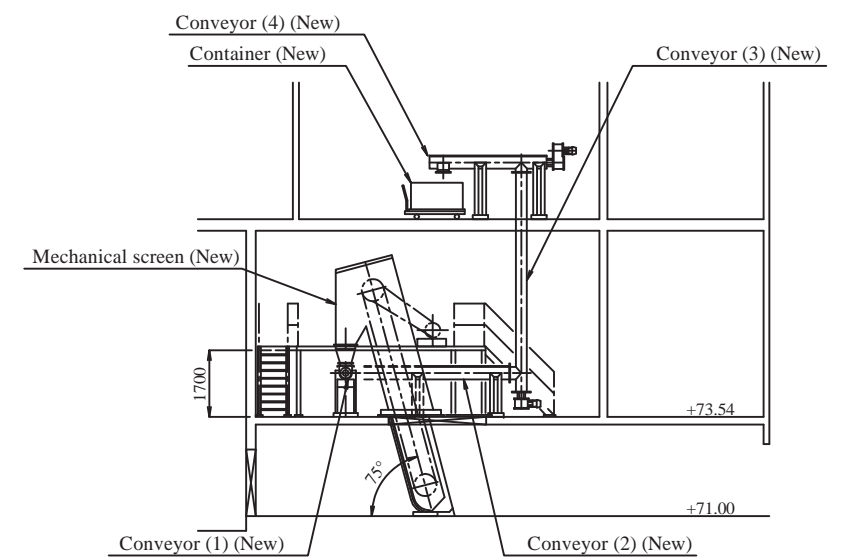
PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Mostar Pumping Station	Drw no: MPS-01
Title: Pumping Station	Scale: 1:200



A-A SECTION SC 1: 200



B-B SECTION SC 1: 200



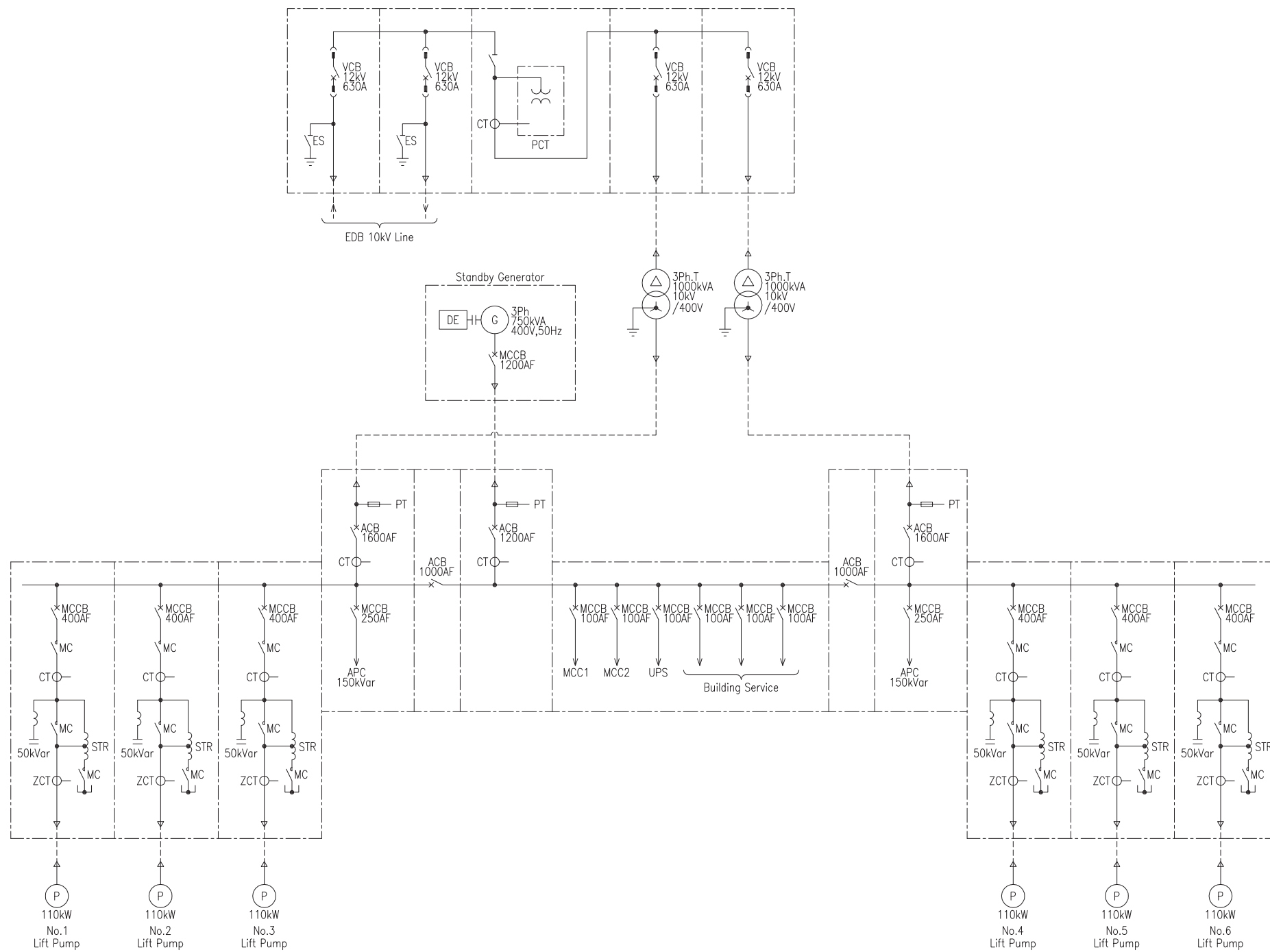
C-C SECTION SC 1: 200

PREPARATORY SURVEY ON THE SEWERAGE  
SYSTEM IMPROVEMENT PROJECT FOR THE CITY  
OF BELGRADE

Components: Mostar Pumping Station	Drw no: MPS-02
Title: Pumping Station	Scale: 1:200



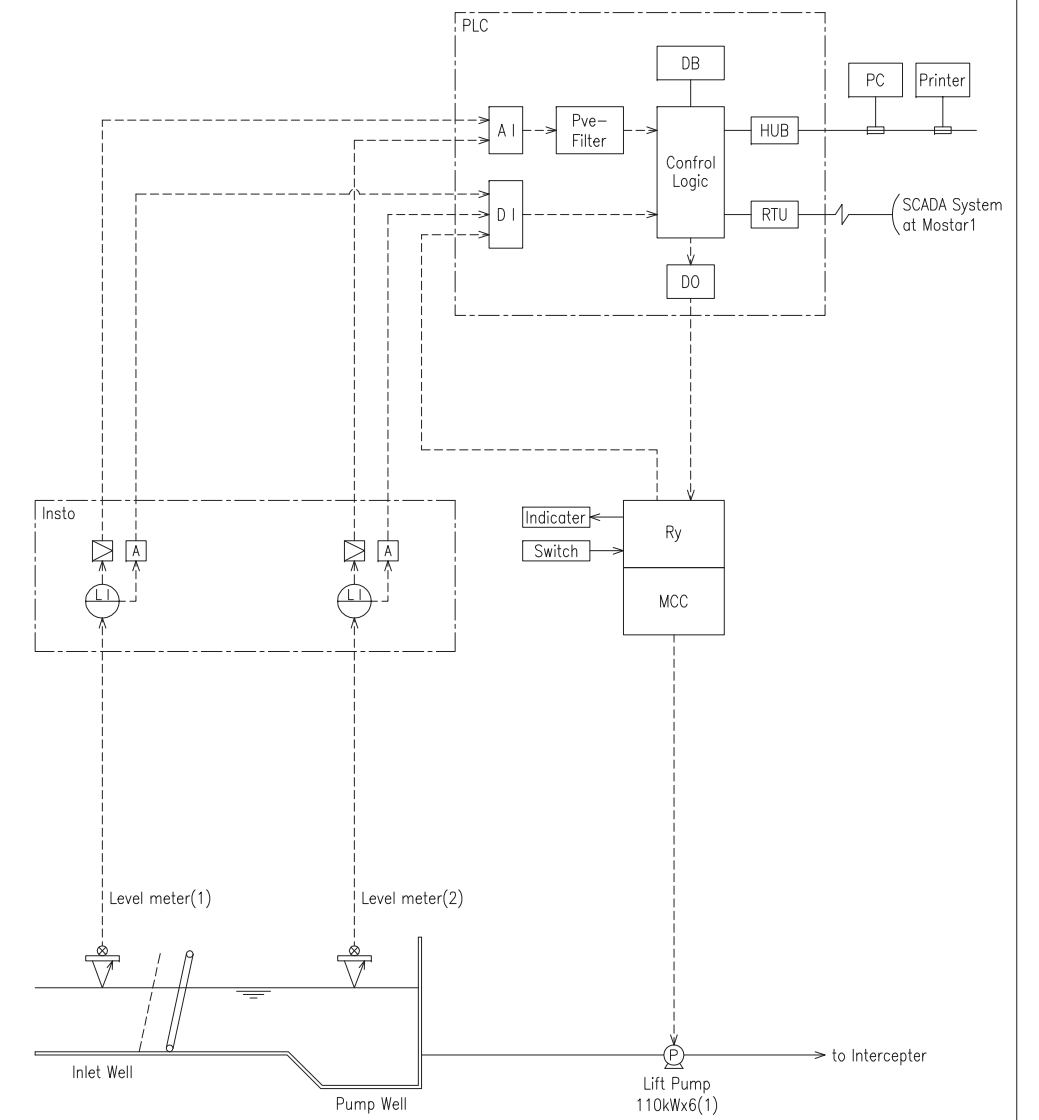
### Single Line Diagram



Panels	
101	No.1 10kV Receiving
102	No.2 10kV Receiving
103	Power Measuring
104	No.1 Transformer Primaly VCB
105	No.2 Transformer Primaly VCB
201	No.1 Lift pump
202	No.2 Lift pump
203	No.3 Lift pump
204	No.1 Transformer Secondary ACB
205	No.1 Bus-tie ACB
206	Standby Generator
207	Utility Feeder
208	No.2 Bus-tie ACB
209	No.2 Transformer Secondary ACB
210	No.4 Lift pump
211	No.5 Lift pump
212	No.6 Lift pump

Legend	
EDB	Electrical distribution company
VCB	Vacuum circuit breaker
ES	Earthing switch
PCT	Power measuring unit
3Ph.T	3 phase transformer
DE	Diesel engine
ACB	Air circuit breaker
MCCB	Molded case circuit breaker
MC	Magnetic contactor
CT	Current transformer
ZCT	Zero-phase current transformer
PT	Potential transformer
STR	Starting transformer
SC	Static capacitor
APC	Automatic power factor compensator

### Micro-SCADA and Control System



Legend	
L I	Level indicator
A	Alarm setter
Insto	Isolator
Inst.	Instrument panel
RY	Auxiliary relay panel
MCC	Motor control center
PLC	Programable logical controller
AI	Analog input uuit
DI	Digital input uuit
DO	Digital output uuit
DB	Data base
RTU	Remote terminal unit

Usce Pump Station			
	Item	kW	nos
101	Lift pump	110	6(1)
102	Mehcniacal screen	1.5	2
103	Screw conveyor (1)	1.5	2
104	Screw conveyor (2)	2.2	2
105	Screw conveyor (3)	3.7	2
106	Screw conveyor (4)	1.5	2
107	Traveling crane for pump	-	1
108	Hoist for container	3.0	1
109	Suction valve	-	6
110	Discharge valve	-	6
111	Check valve	-	6

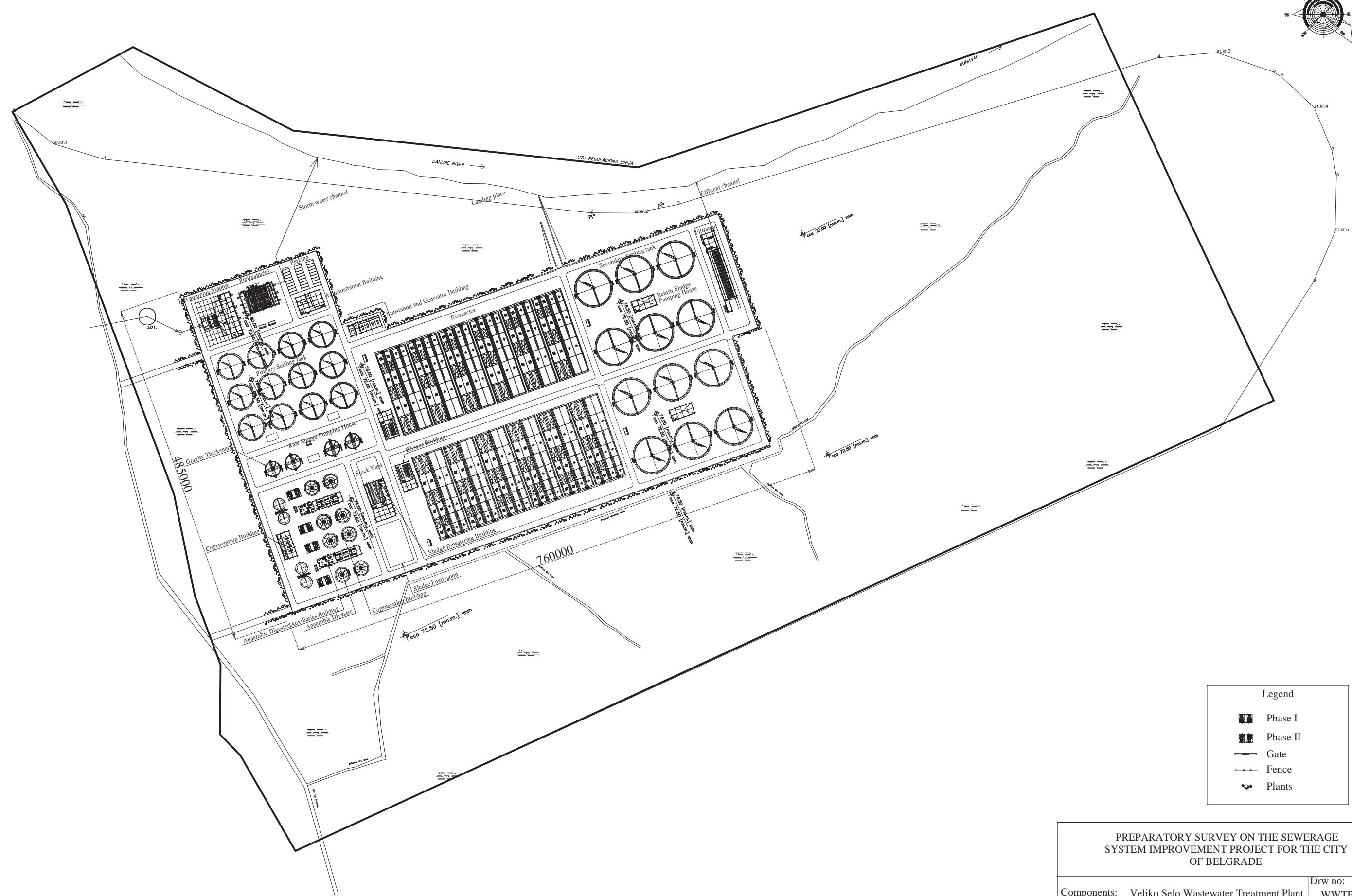
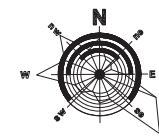
PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE

Components: Mostar Pumping Station

Title: Electrical System and MICRO-SCADA System

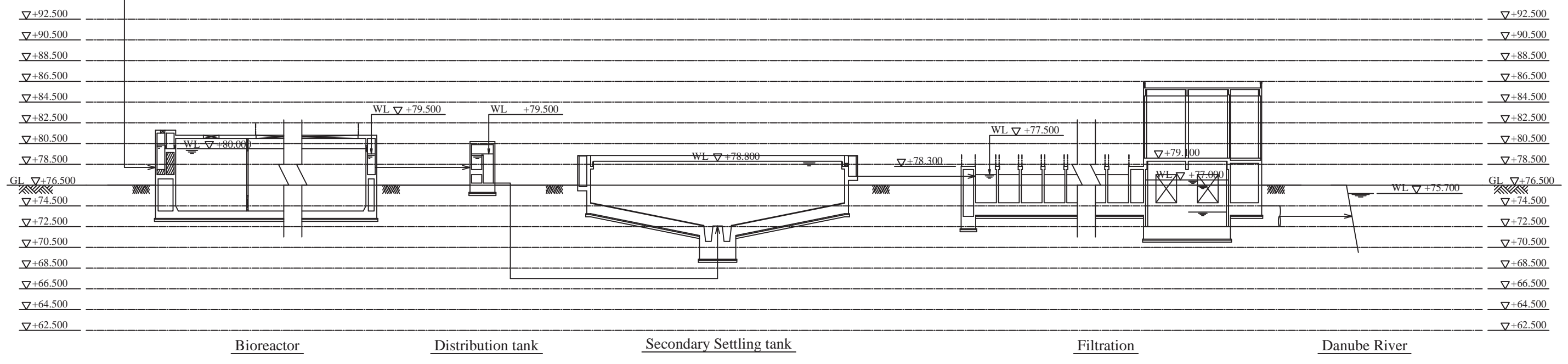
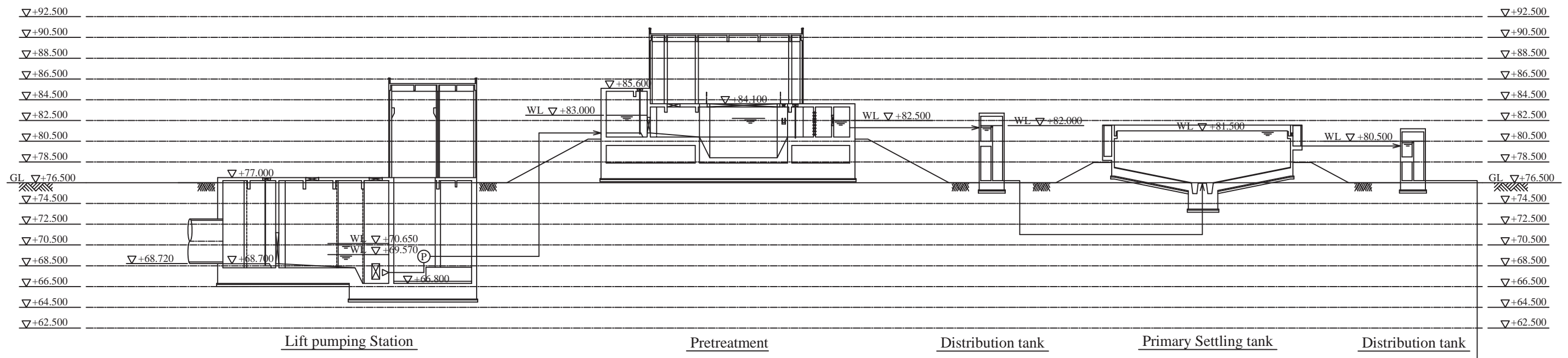
Drw no: MPS-03

Scale: NONE

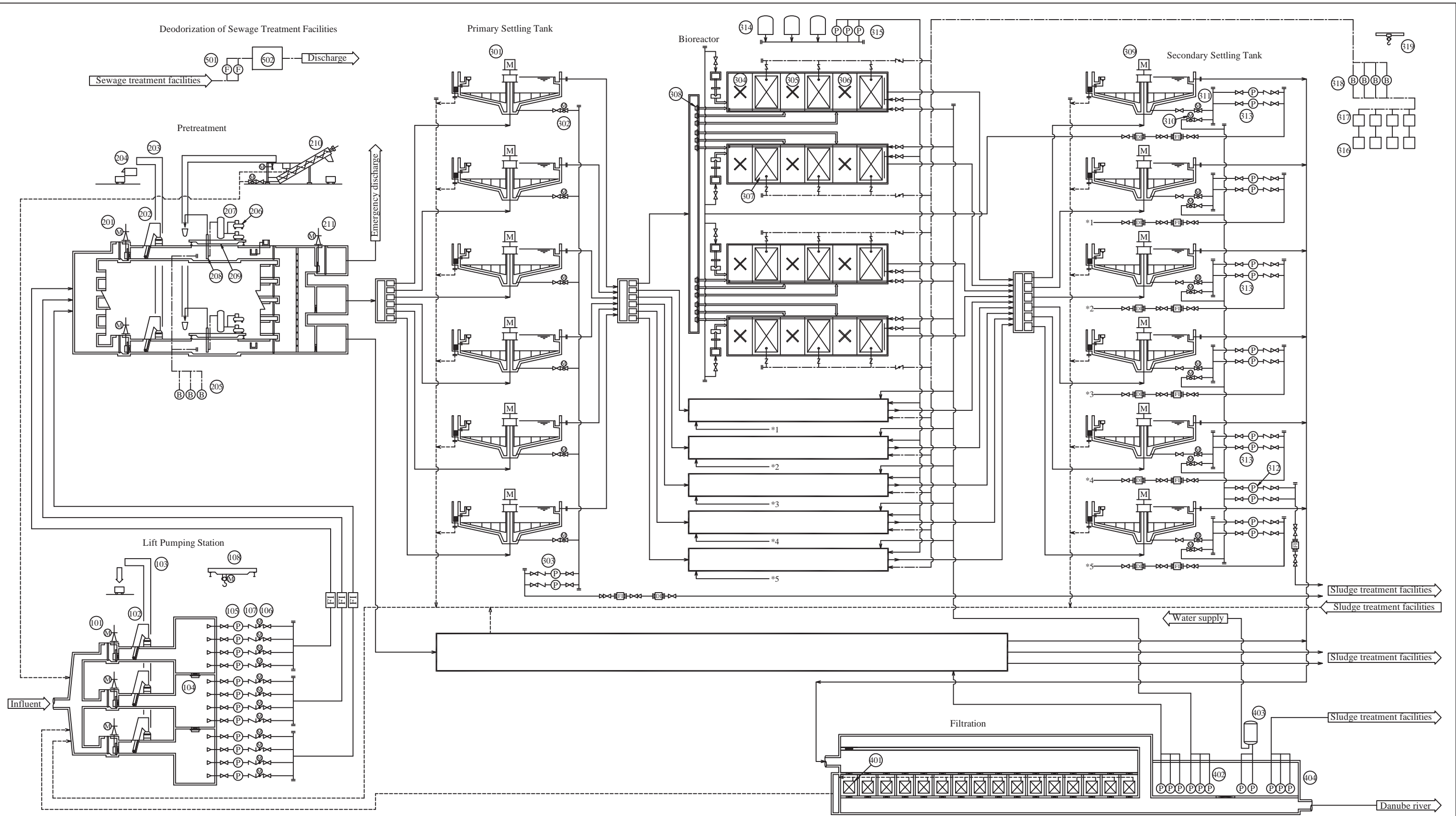


Legend	
	Phase I
	Phase II
	Gate
	Fence
	Plants

PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Veliko Selo Wastewater Treatment Plant	Drw no: WWTP-01
Title: General Layout	Scale: 1:5000



PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Veliko Selo Wastewater Treatment Plant	Drw no: WWTP-02
Title: Hydraulic Profile	Scale: 1:400,1:800



No	Item	kW	nos	No	Item	kW	nos	No	Item	kW	nos	No	Item	kW	nos
101	Inlet gate	11	3	201	Inlet gate	3.7	6	301	Sludge collector	0.75	12	316	Wet air filter	0.2	8
102	Coarse mechanical screen	5.5	3	202	Fine mechanical screen	3.7	6	302	Sludge withdrawal valve	0.2	12	317	Dry air filter	0.2	8
103	Conveyor	1.5	1	203	Conveyor	1.5	1	303	Raw sludge pump	11	4(2)	318	Blower	380	8(2)
104	Connecting gate	-	2	204	Screening dewaterer	5.5	1	304	Anoxic tank mixer (1)	2.2	48	319	Traveling crane for blower	-	2
105	Lift pump	320	12(2)	205	Grit chamber blower	5.5	3(1)	305	Anoxic tank mixer (2)	2.2	48				
106	Discharge valve	0.75	12(2)	206	Compressor	5.5	6(3)	306	Anoxic tank mixer (3)	3.0	48				
107	Non-return valve	-	12(2)	207	Air cylinder	-	3	307	Air diffuser	-	144				
108	Traveling crane for lift pump	3.7 0.75x2	1	208	Airlift pump	-	6	308	Step feeding weir	-	144				
				209	Movable stage of airlift pump	2.2	3	309	Sludge collector	1.5	12	401	Disc filter	1.5 30	16
				210	Grit washer	2.2x2 0.75	1	310	Excess sludge withdrawal valve	0.2	12	402	Antifoaming water pump	22	6(2)
				211	Bypass weir	0.75	2	311	Return sludge withdrawal valve	0.4	12	403	Water supply unit	7.5x2	1
								312	Excess sludge pump	11	4(2)	404	Filtrate transfer pump	15	3(1)
								313	Return sludge pump	37	24				
								314	Coagulant tank	-	6				
								315	Coagulant dosing pump	0.4	6(2)				

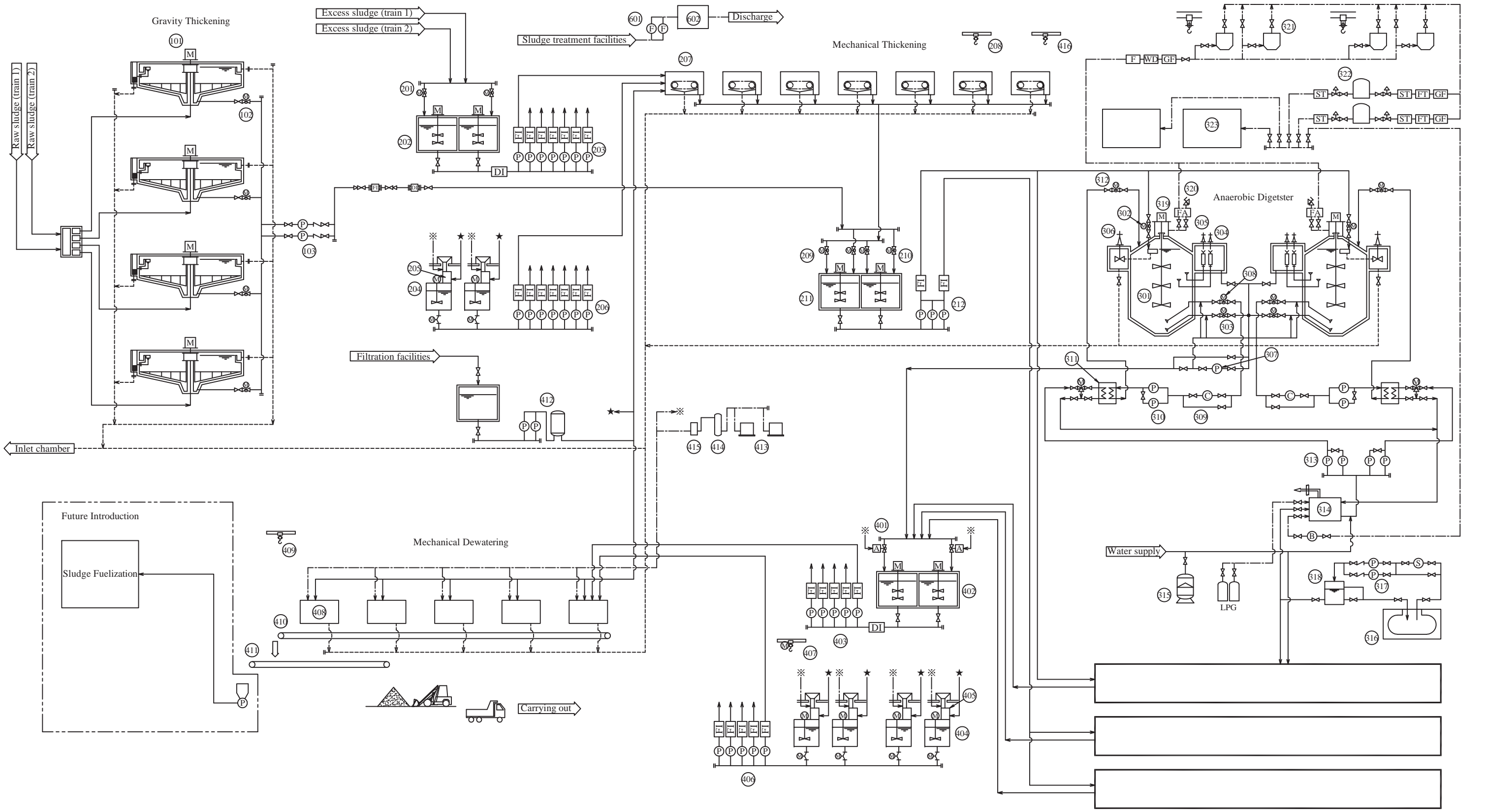
Legend		Legend	
∇	Check valve	—	Sewage
⊗	Sluice valve	—	Sludge
⊗	Eccentric valve	—	Treated water
⊗	Diaphragm valve	—	Chemicals
⊗	Butterfly valve	—	Air • Duct • Biogas
⊗	Motor	—	Drain
⊗	Concentration meter		
⊗	Flow meter		

**PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE**

Components: Veliko Selo Wastewater Treatment Plant      Drw no: WWTP-03

Title: Sewage Treatment Process      Scale: NONE

Deodorization of Sludge Treatment Facilities



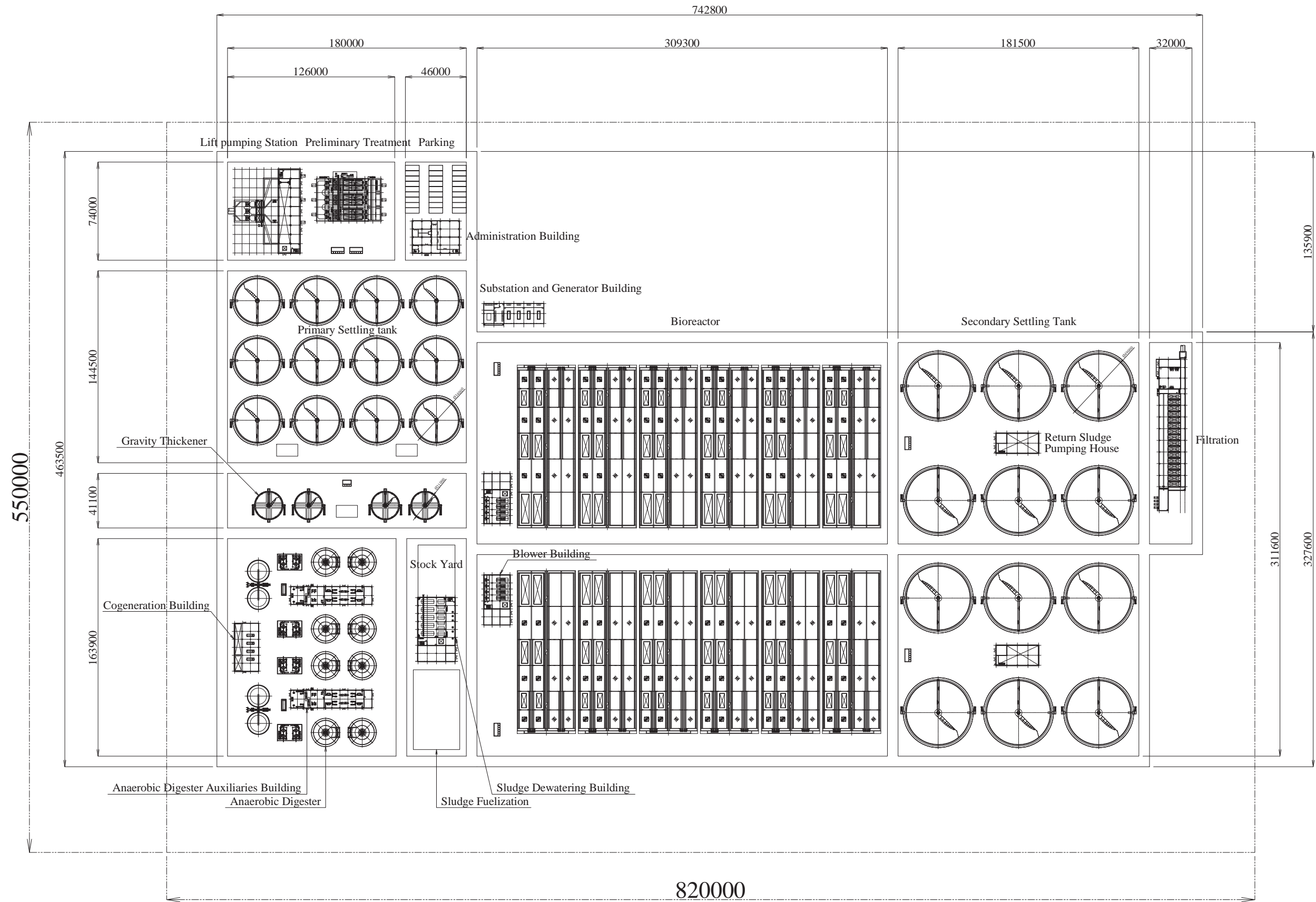
No	Item	kW	nos	No	Item	kW	nos	No	Item	kW	nos	No	Item	kW	nos
101	Sludge thickener	0.4	4	209	Thickened sludge inlet valve (1)	0.2	2	308	Circulation sludge withdrawal valve	0.4	8	321	Desulfurizer	-	8
102	Sludge withdrawal valve	0.4	4	210	Thickened sludge inlet valve (2)	0.2	2	309	Sludge shredding equipment	3.7	8	322	Biogas holder	-	4
103	Thickened sludge pump	5.5	2(1)	211	Thickened sludge tank mixer	2.2	2	310	Sludge circulation pump	30	16(8)	323	Cogeneration system	-	4
				212	Thickened sludge transfer pump	30	3(1)	311	Heat exchanger	-	8				
								312	Circulation sludge inlet valve	0.4	8				
								313	Hot water circulation pump	5.5	16(8)				
201	Excess sludge inlet valve	0.2	2					314	Water heater	3.7	4	401	Digested sludge inlet valve	-	2
202	Excess sludge tank mixer	2.2	2	301	Digester mixer	7.5	8			0.4	4	402	Digested sludge tank mixer	2.2	2
203	Excess sludge supply pump	15	7(1)	302	Thickened sludge inlet valve	0.2	8			2.0	8	403	Digested sludge supply pump	15	5(1)
204	Coagulant tank	3.7	2	303	Digested sludge withdrawal valve (1)	0.2	8	315	Water service tank	-	2	316	Fuel tank	-	2
205	Coagulant feeder	0.4	2	304	Digested sludge withdrawal valve (2)	-	8	317	Fuel transfer pump	0.2	4(2)	404	Coagulant tank	11	4
206	Coagulant dosing pump	0.75	7(1)	305	Digested sludge withdrawal valve (3)	-	8	318	Fuel service tank	-	2	405	Coagulant feeder	0.4	4
207	Belt thickener	5.4	7(1)	306	Scum withdrawal valve	-	8	319	Center dome	-	8	406	Coagulant dosing pump	2.2	5(1)
208	Hoist for belt thickener	-	1	307	Digested sludge transfer pump	11	4	320	Center dome safety device	-	8	407	Hoist for coagulant	0.2	1

Legend		Legend	
⌵	Check valve	⌵	Sewage
⌵	Sluice valve	⌵	Sludge
⌵	Eccentric valve	⌵	Treated water
⌵	Diaphragm valve	⌵	Chemicals
⌵	Butterfly valve	⌵	Air • Duct • Biogas
⌵	Motor	⌵	Drain
⌵	Concentration meter		
⌵	Flow meter		

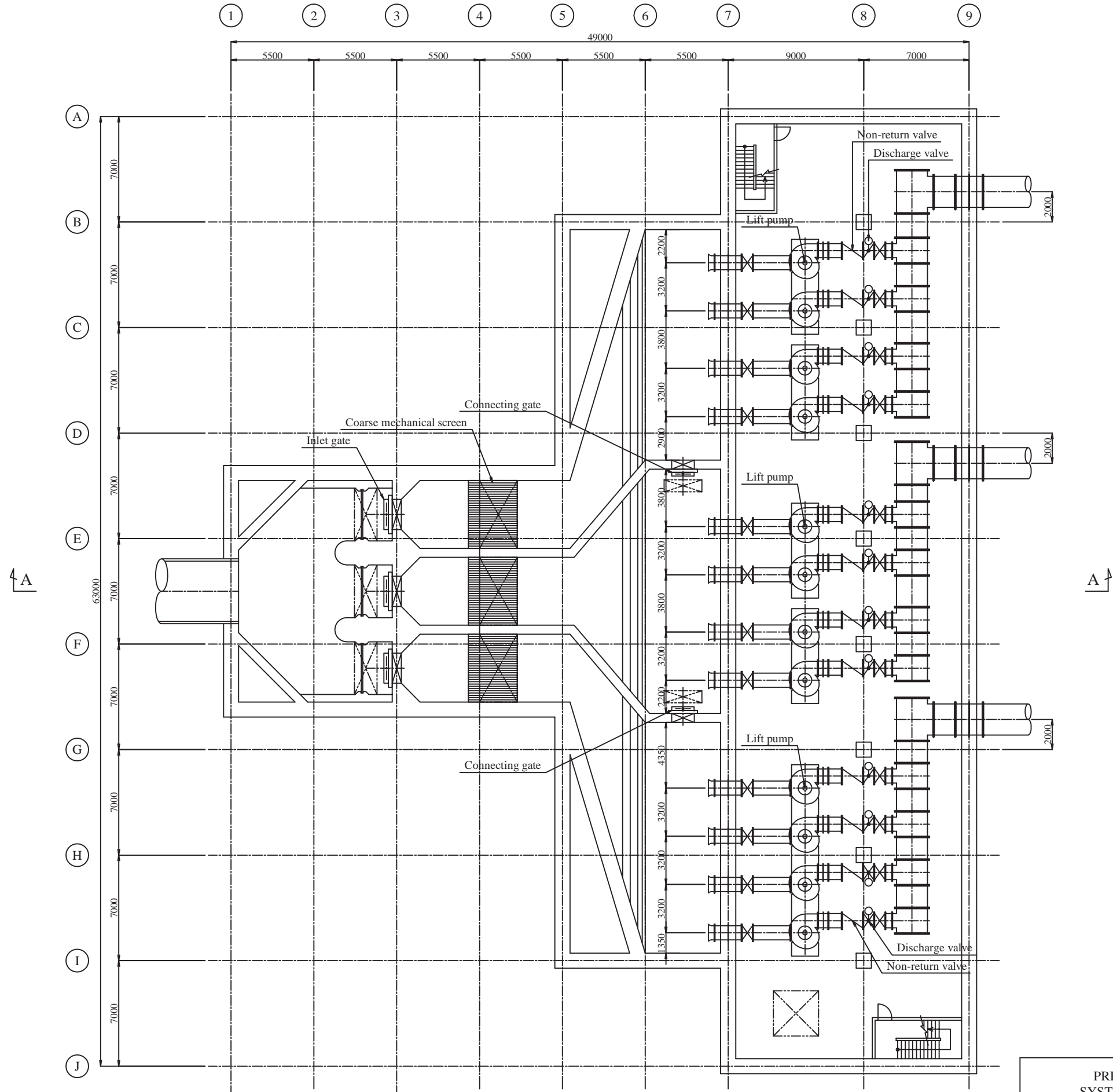
**PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE**

Components: Veliko Selo Wastewater Treatment Plant      Drw no: WWTP-04

Title: Sludge Treatment Process      Scale: NONE

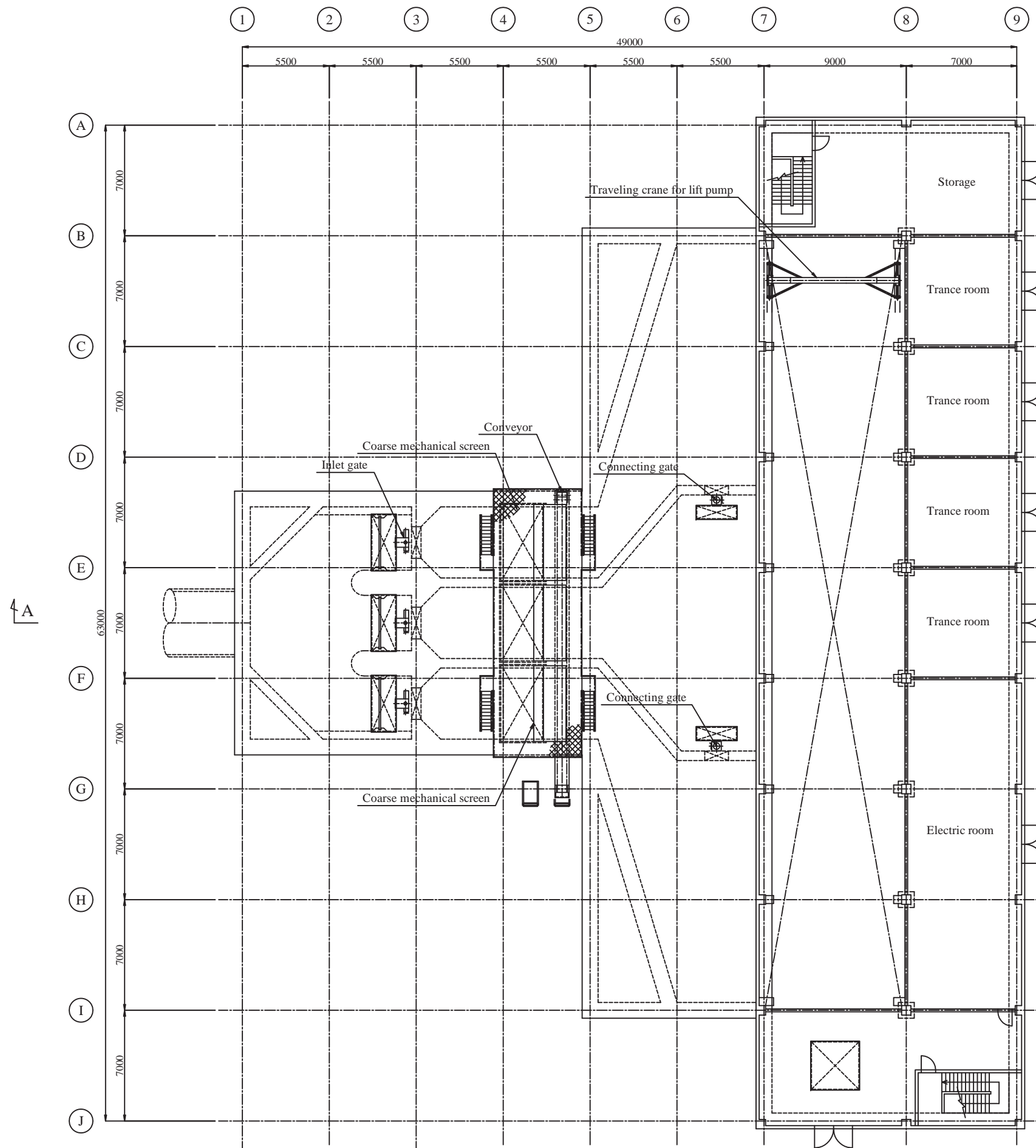


PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Veliko Selo Wastewater Treatment Plant	Drw no: WWTP-05
Title: General Layout	Scale: 1:3000



B1 FLOOR PLAN SC 1:300

PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Veliko Selo Wastewater Treatment Plant	Drw no: WWTP-06
Title: Lift Pumping Station	Scale: 1:300



GROUND FLOOR PLAN SC 1:300

PREPARATORY SURVEY ON THE SEWERAGE  
SYSTEM IMPROVEMENT PROJECT FOR THE CITY  
OF BELGRADE

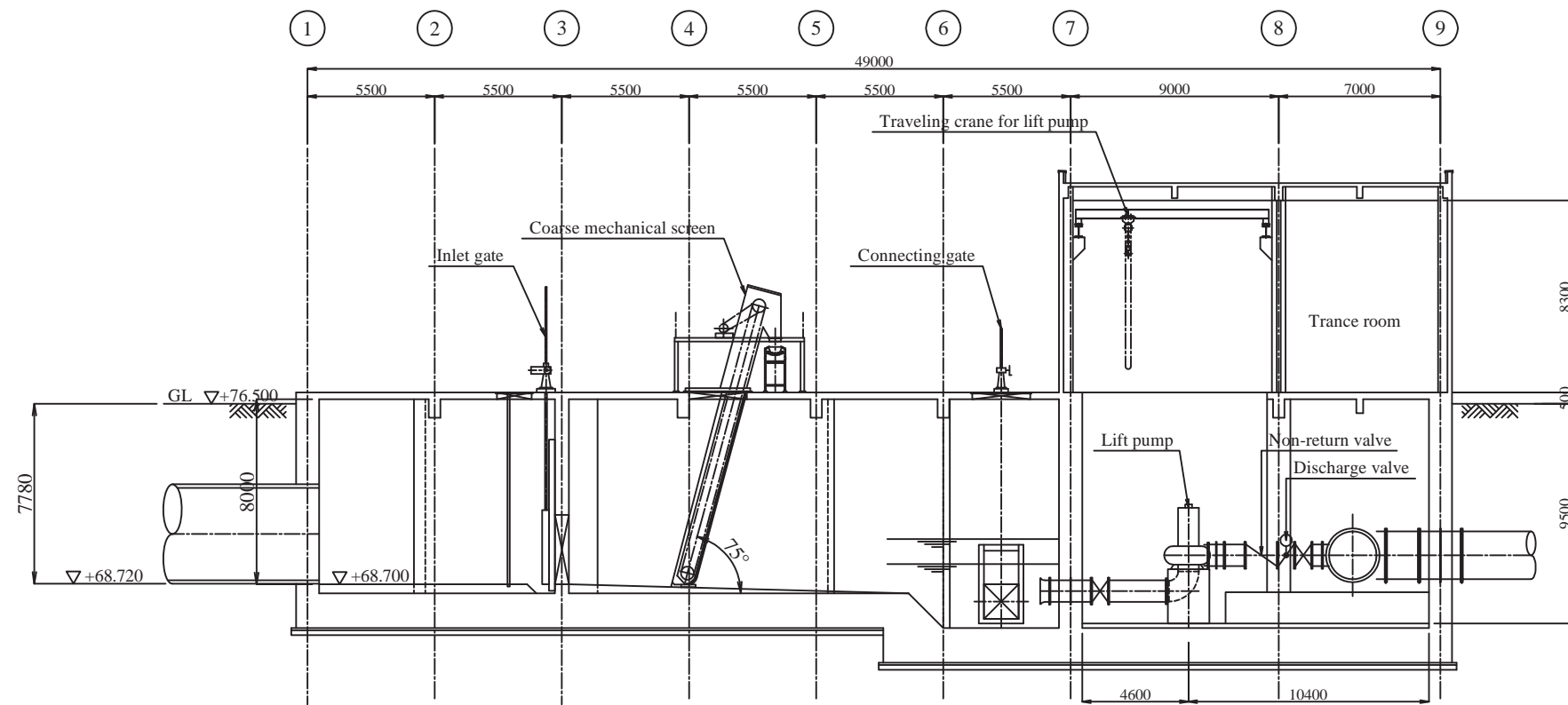
Components: Veliko Selo Wastewater Treatment Plant

Drw no:  
WWTP-07

Title: Lift Pumping Station

Scale:  
1:300

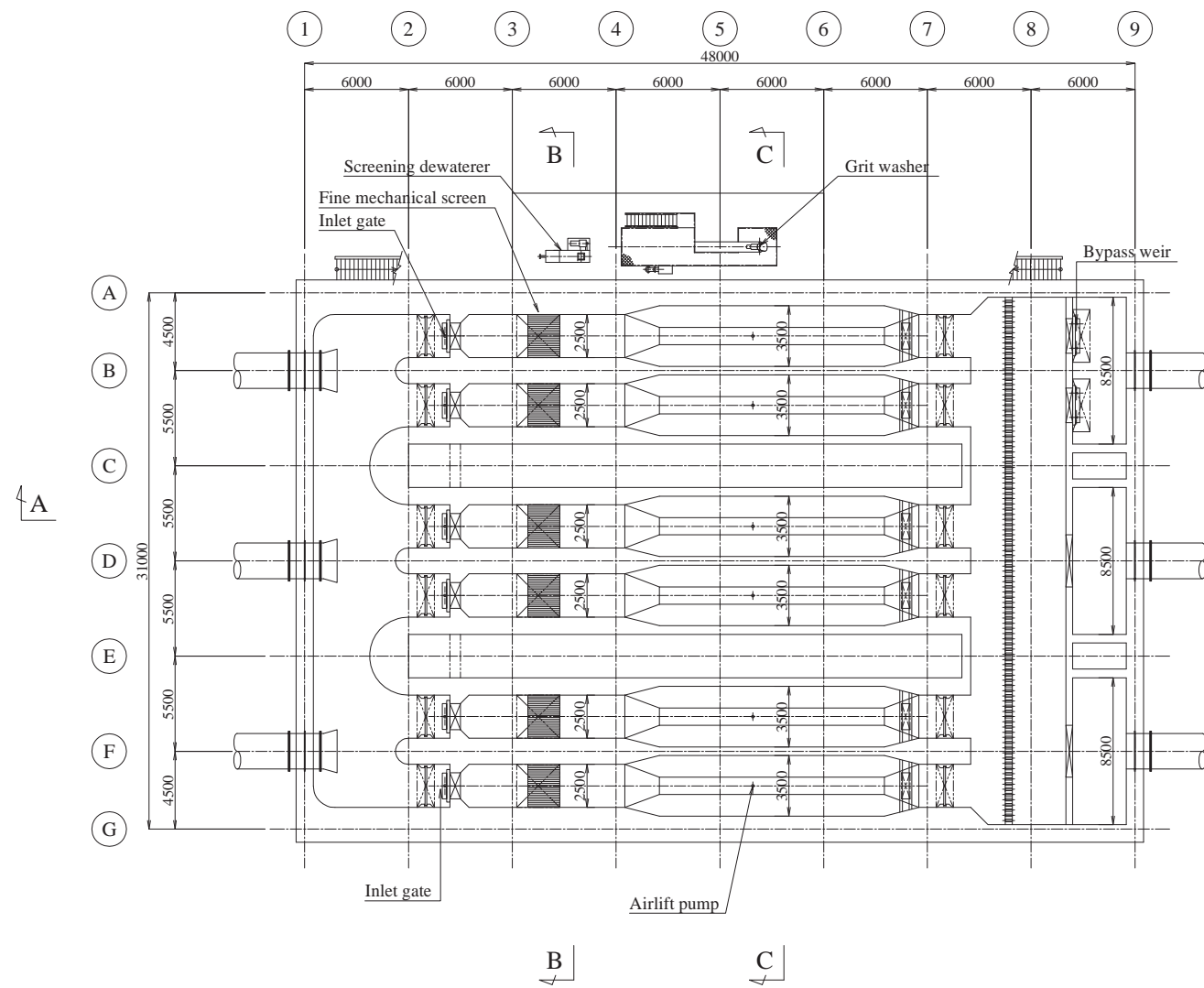




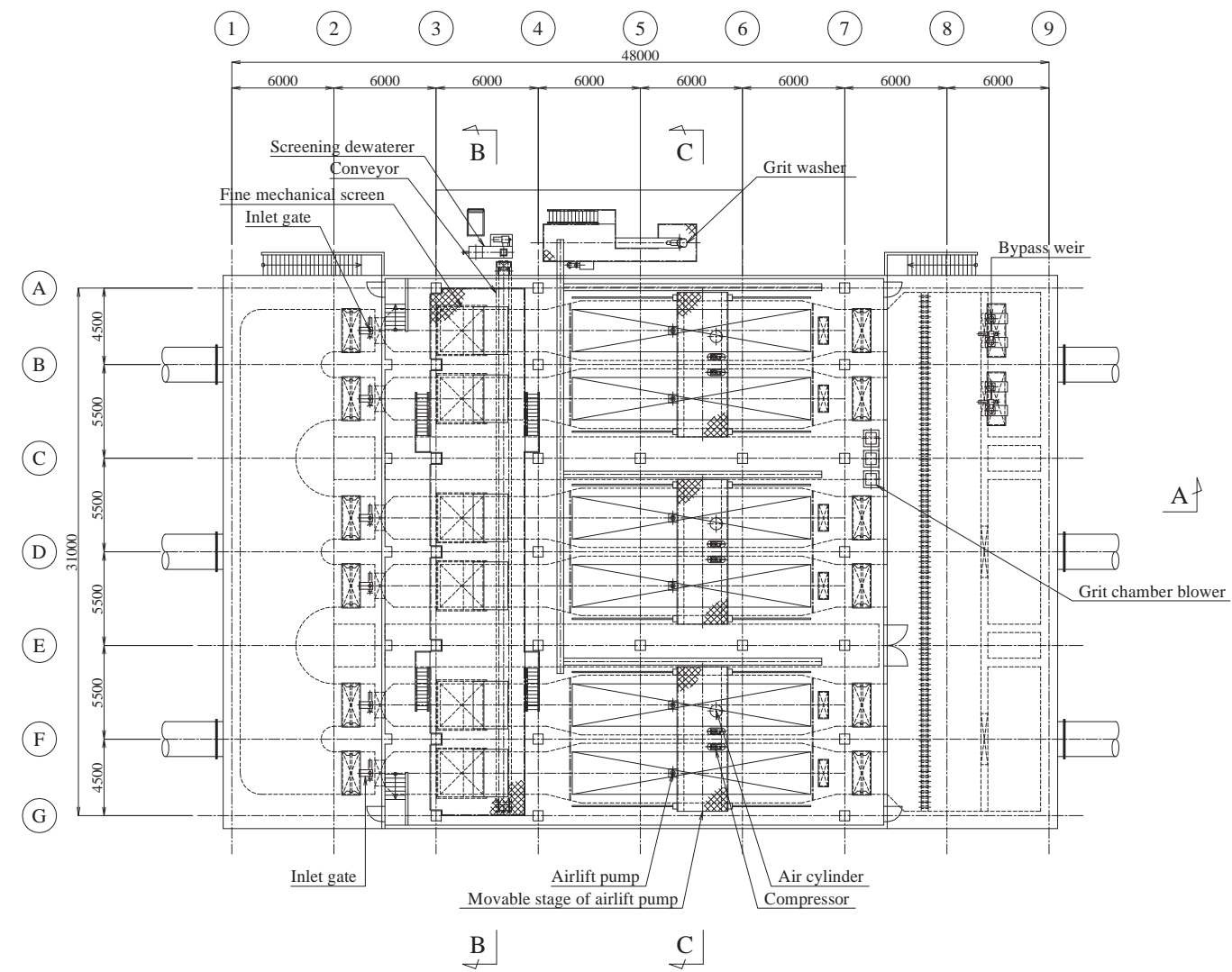
A-A SECTION SC 1:300

PREPARATORY SURVEY ON THE SEWERAGE  
SYSTEM IMPROVEMENT PROJECT FOR THE CITY  
OF BELGRADE

Components: Veliko Selo Wastewater Treatment Plant	Drw no: WWTP-08
Title: Lift Pumping Station	Scale: 1:300

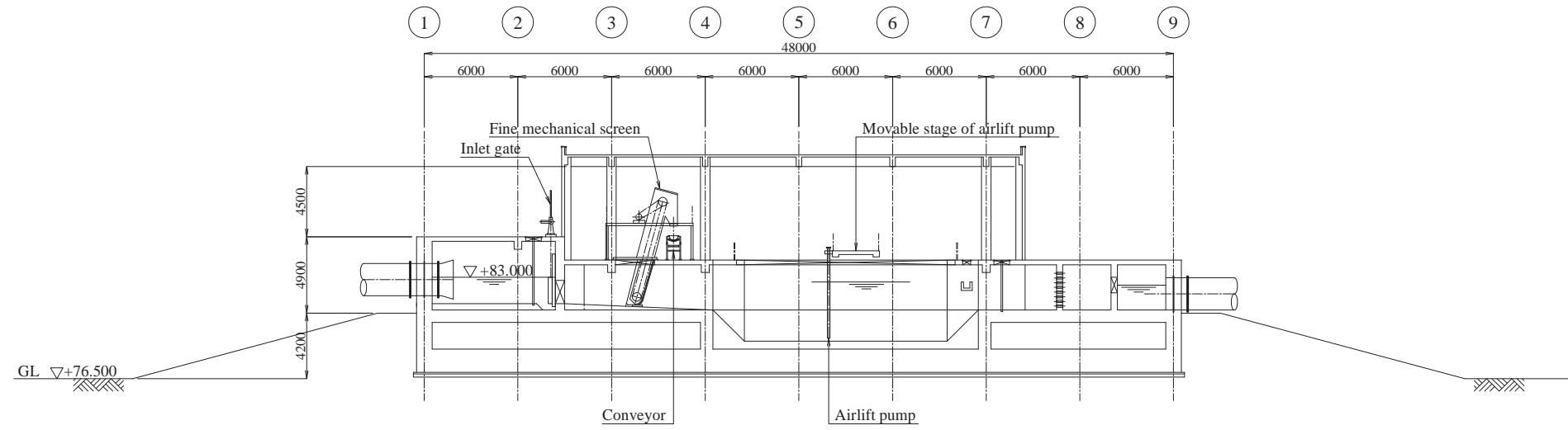


LOWER PLAN SC 1:400

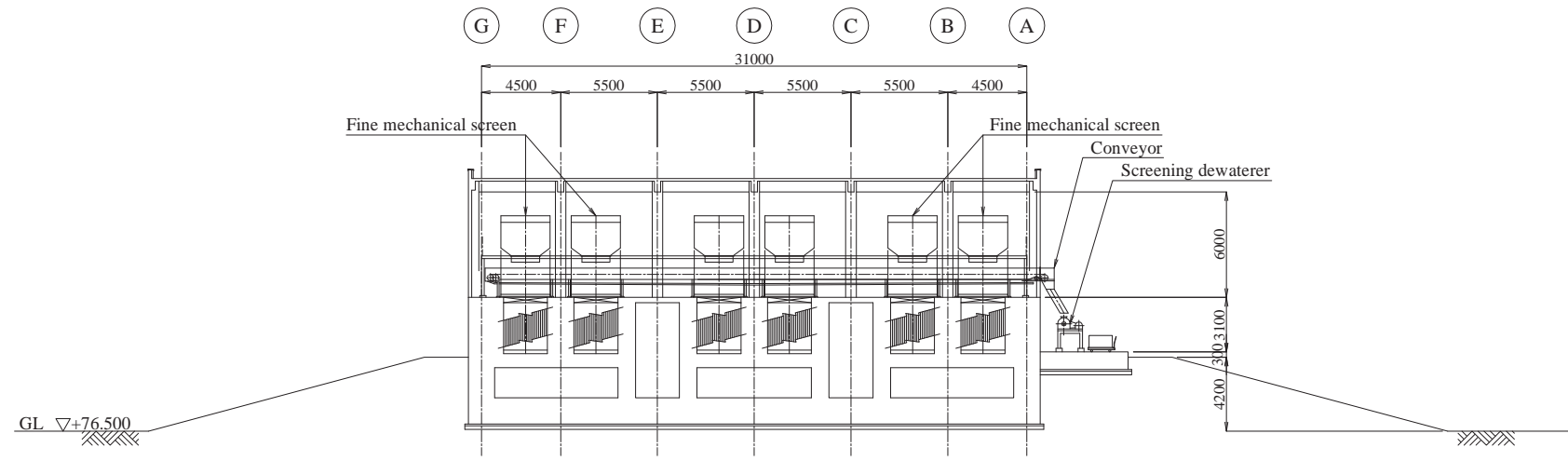


UPPER PLAN SC 1:400

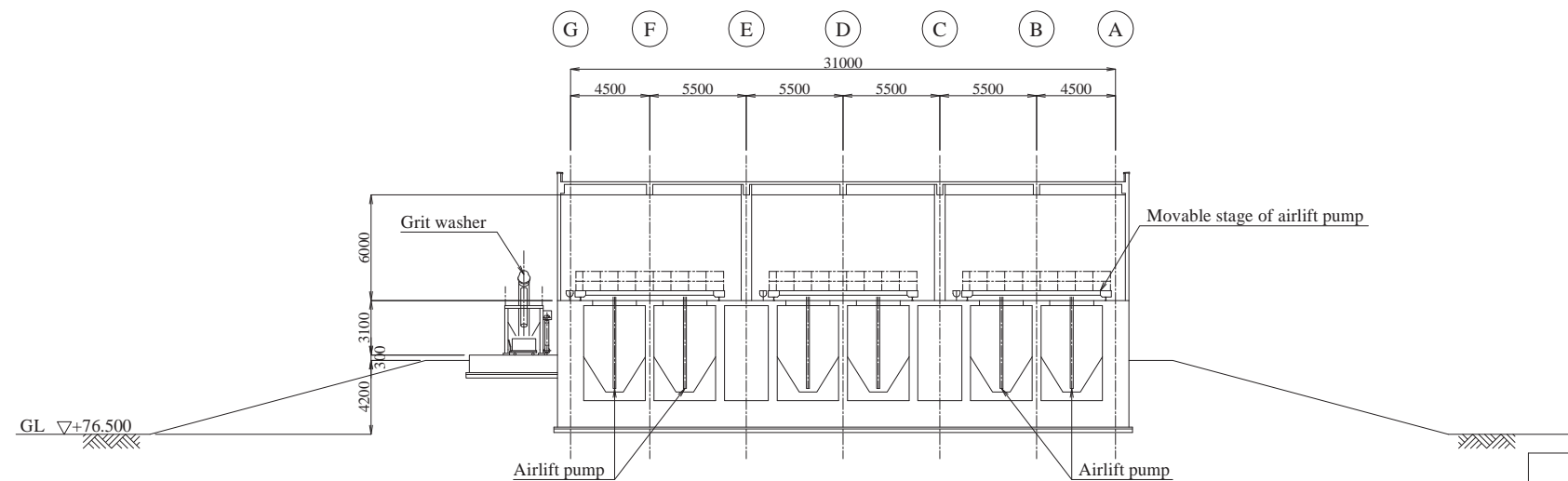
PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Veliko Selo Wastewater Treatment Plant	Drw no: WWTP-09
Title: Pretreatment	Scale: 1:400



A-A SECTION SC 1:400

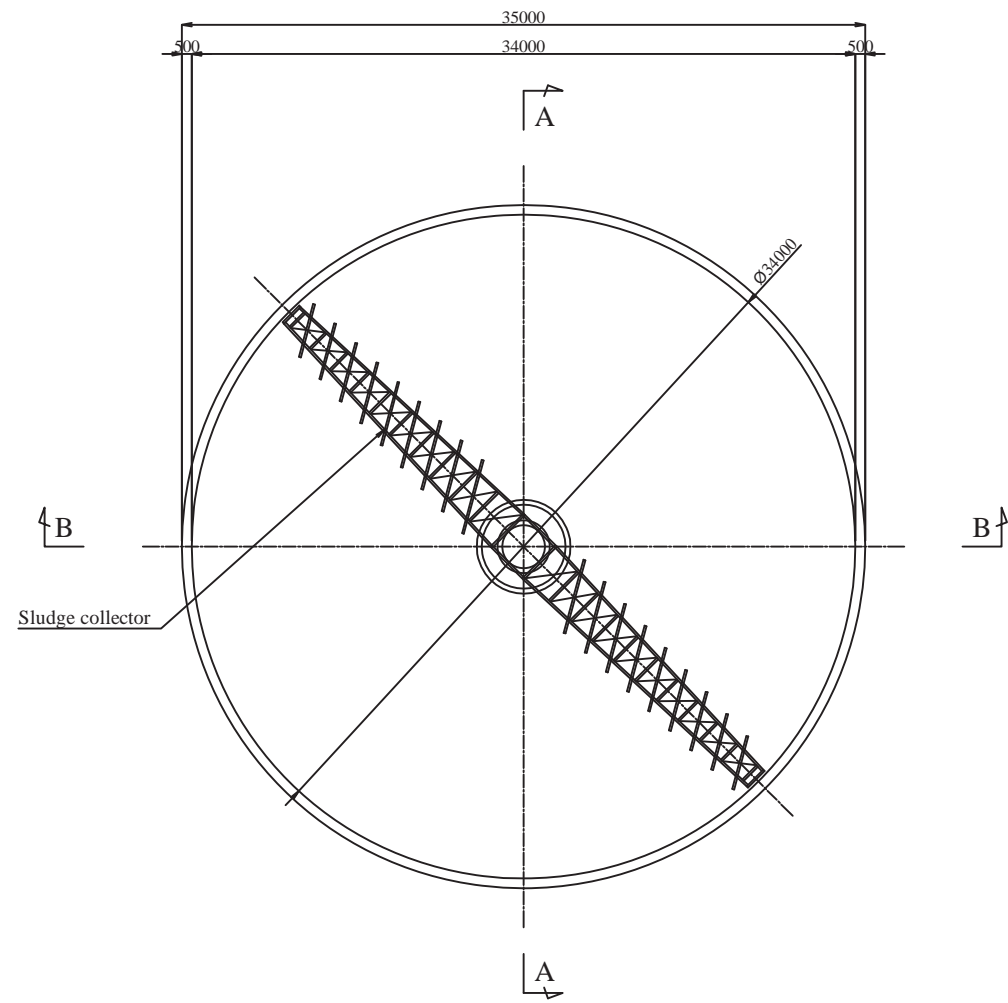


B-B SECTION SC 1:400

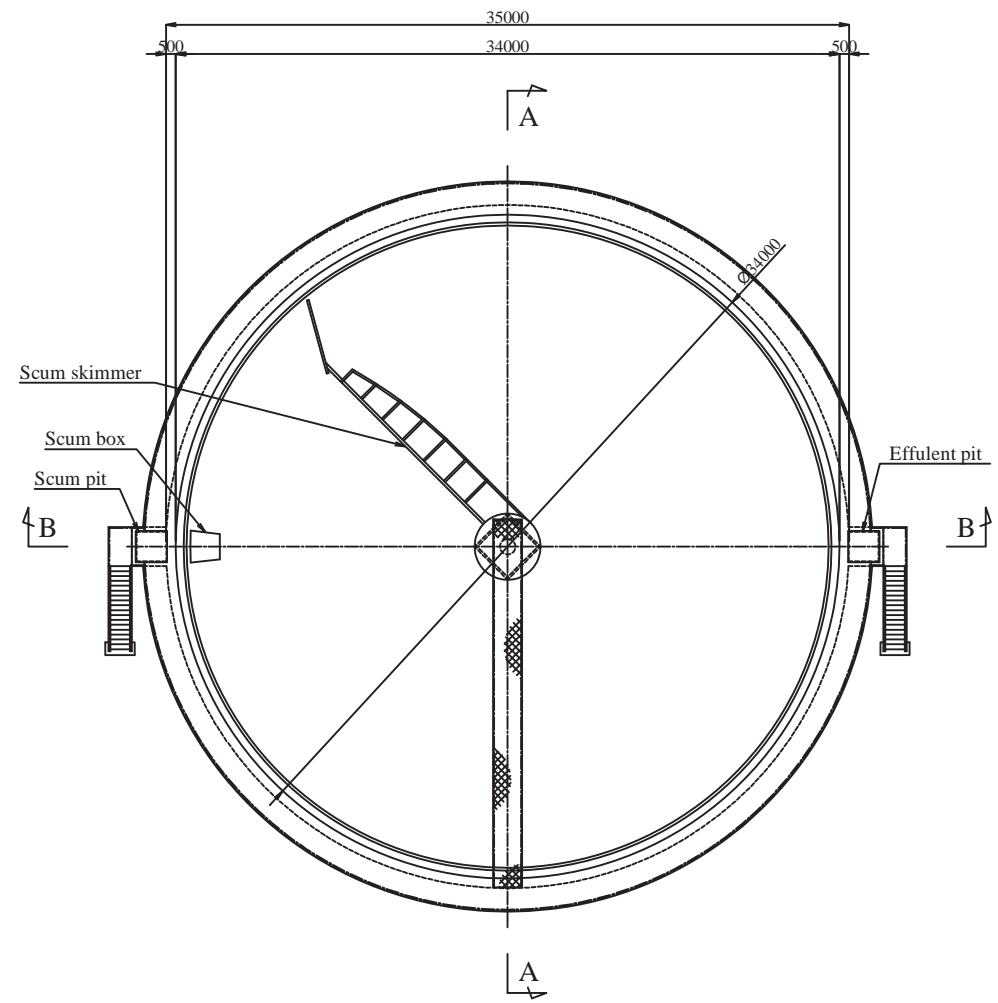


C-C SECTION SC 1:400

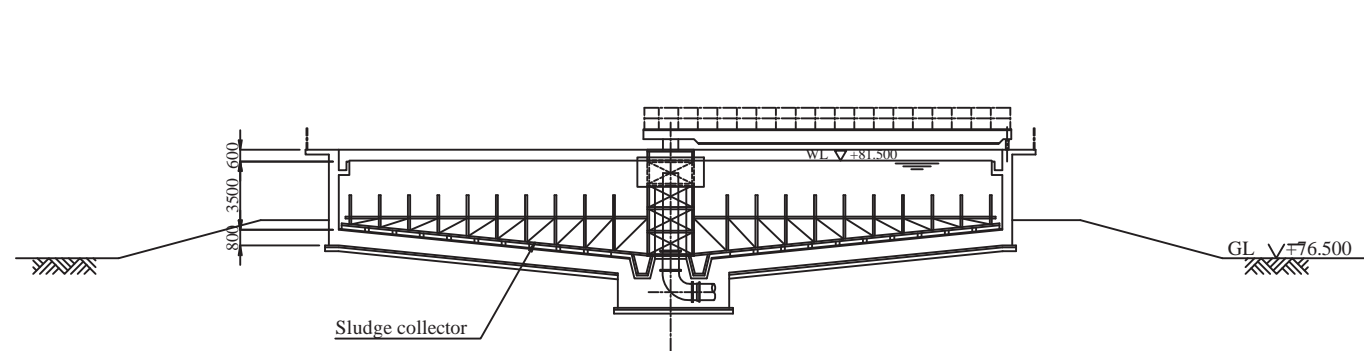
PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Veliko Selo Wastewater Treatment Plant	Drw no: WWTP-10
Title: Pretreatment	Scale: 1:400



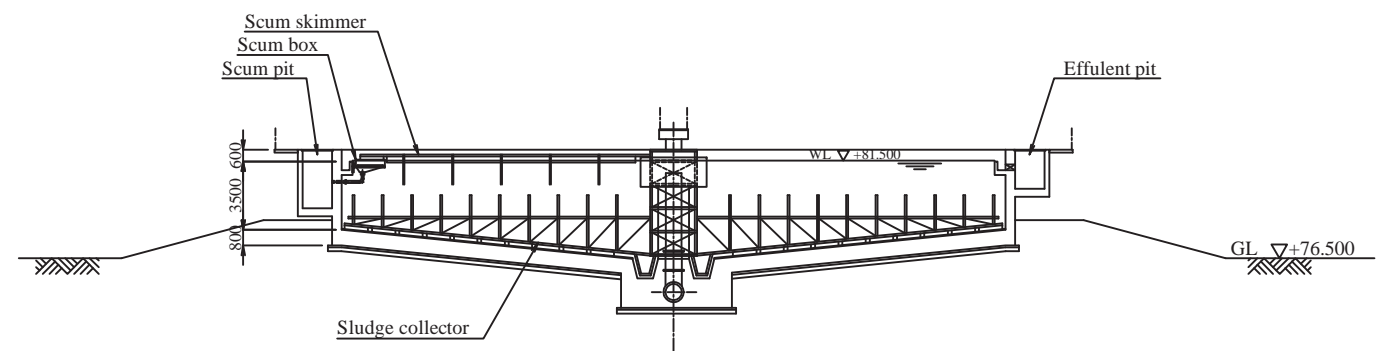
LOWER PLAN SC 1:400



UPPER PLAN SC 1:400

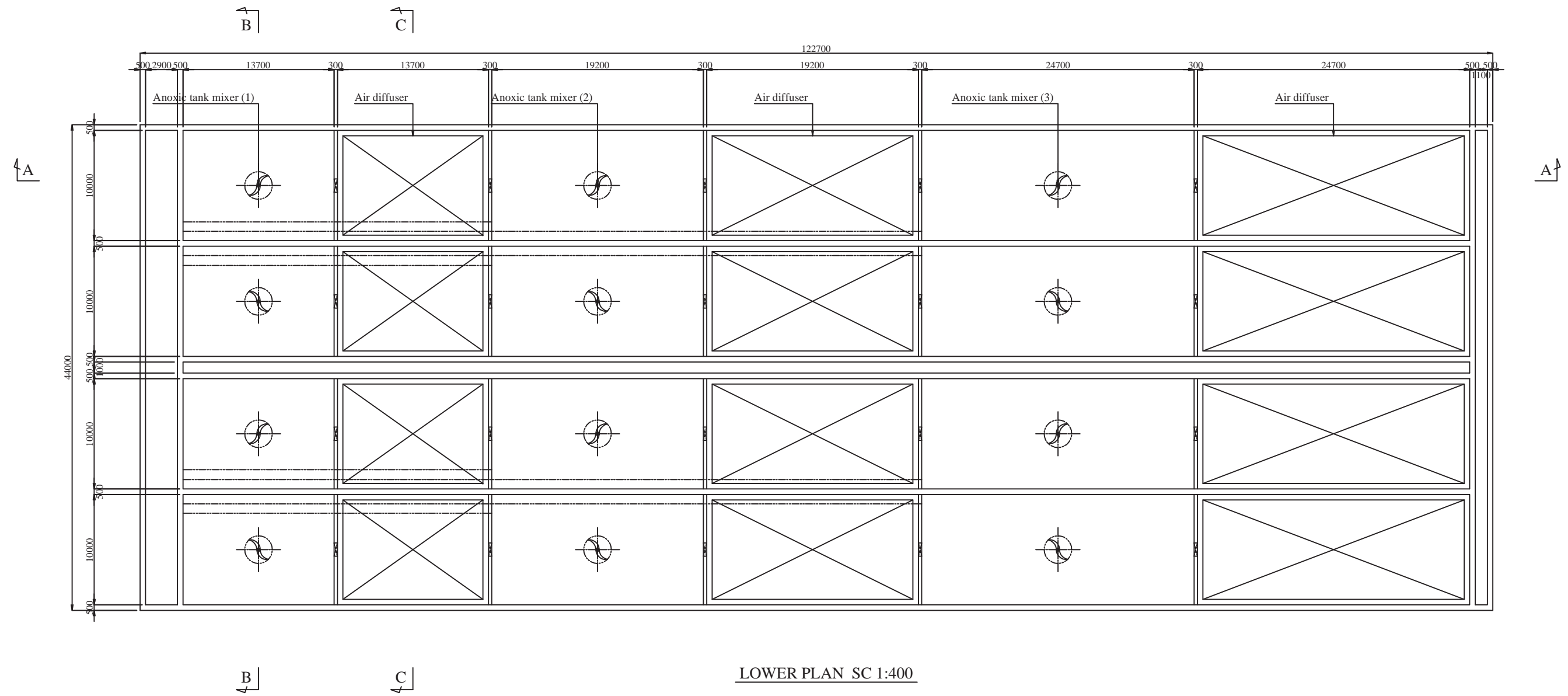


A-A SECTION SC 1:400



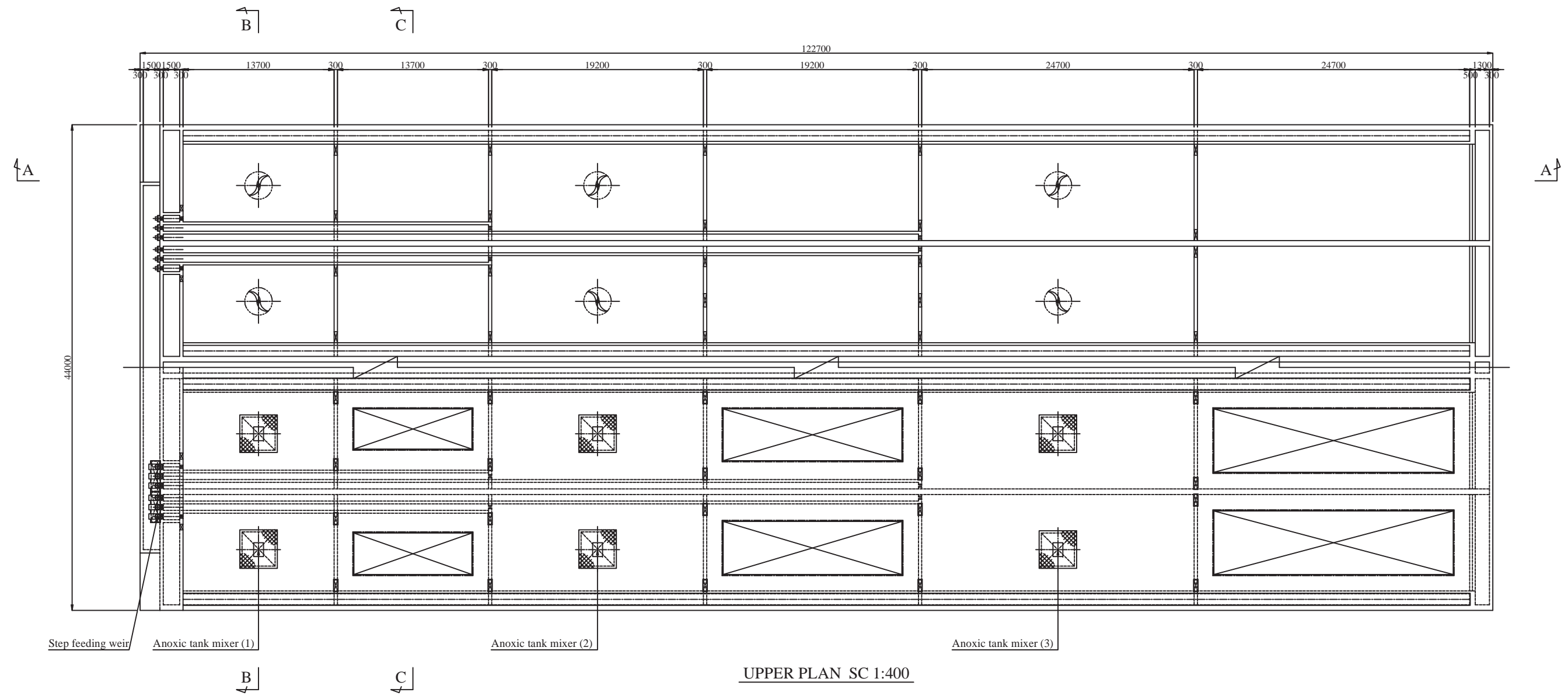
B-B SECTION SC 1:400

PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Veliko Selo Wastewater Treatment Plant	Drw no: WWTP-11
Title: Primary Settling tank	Scale: 1:400



LOWER PLAN SC 1:400

PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Veliko Selo Wastewater Treatment Plant	Drw no: WWTP-12
Title: Bioreactor	Scale: 1:400



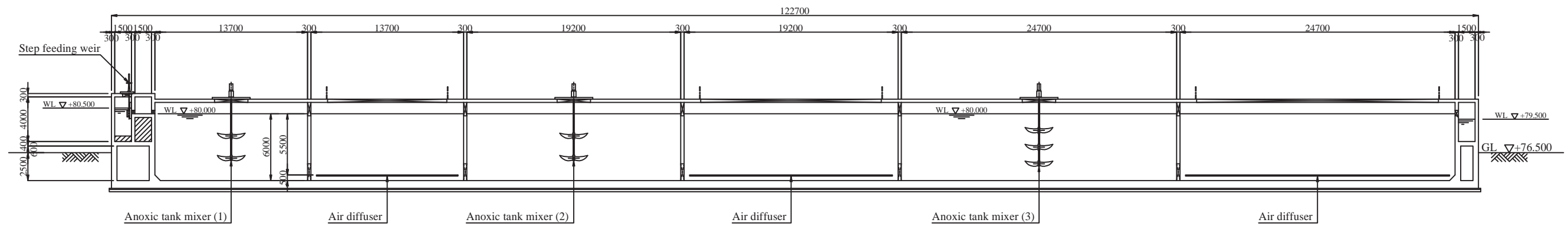
PREPARATORY SURVEY ON THE SEWERAGE  
SYSTEM IMPROVEMENT PROJECT FOR THE CITY  
OF BELGRADE

Components: Veliko Selo Wastewater Treatment Plant

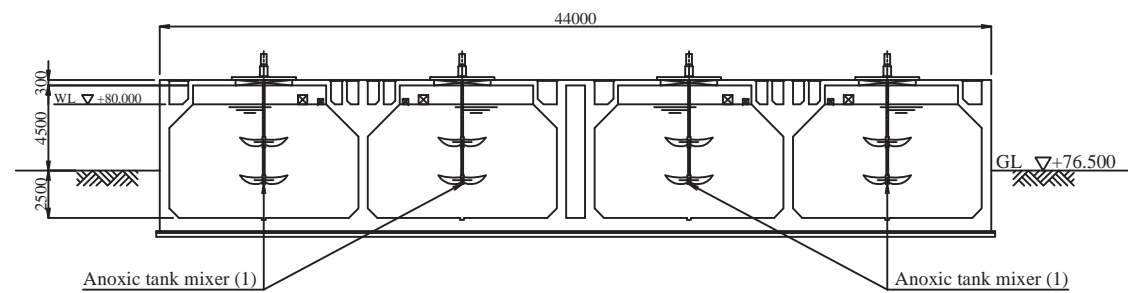
Drw no:  
WWTP-13

Title: Bioreactor

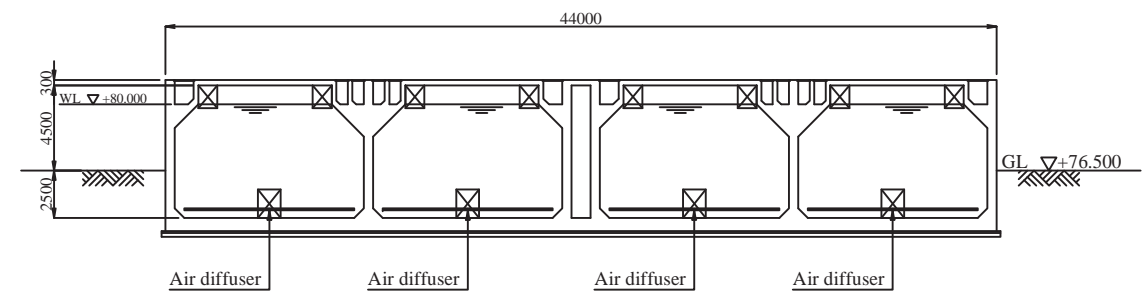
Scale:  
1:400



A-A SECTION SC 1:400



B-B SECTION SC 1:400



C-C SECTION SC 1:400

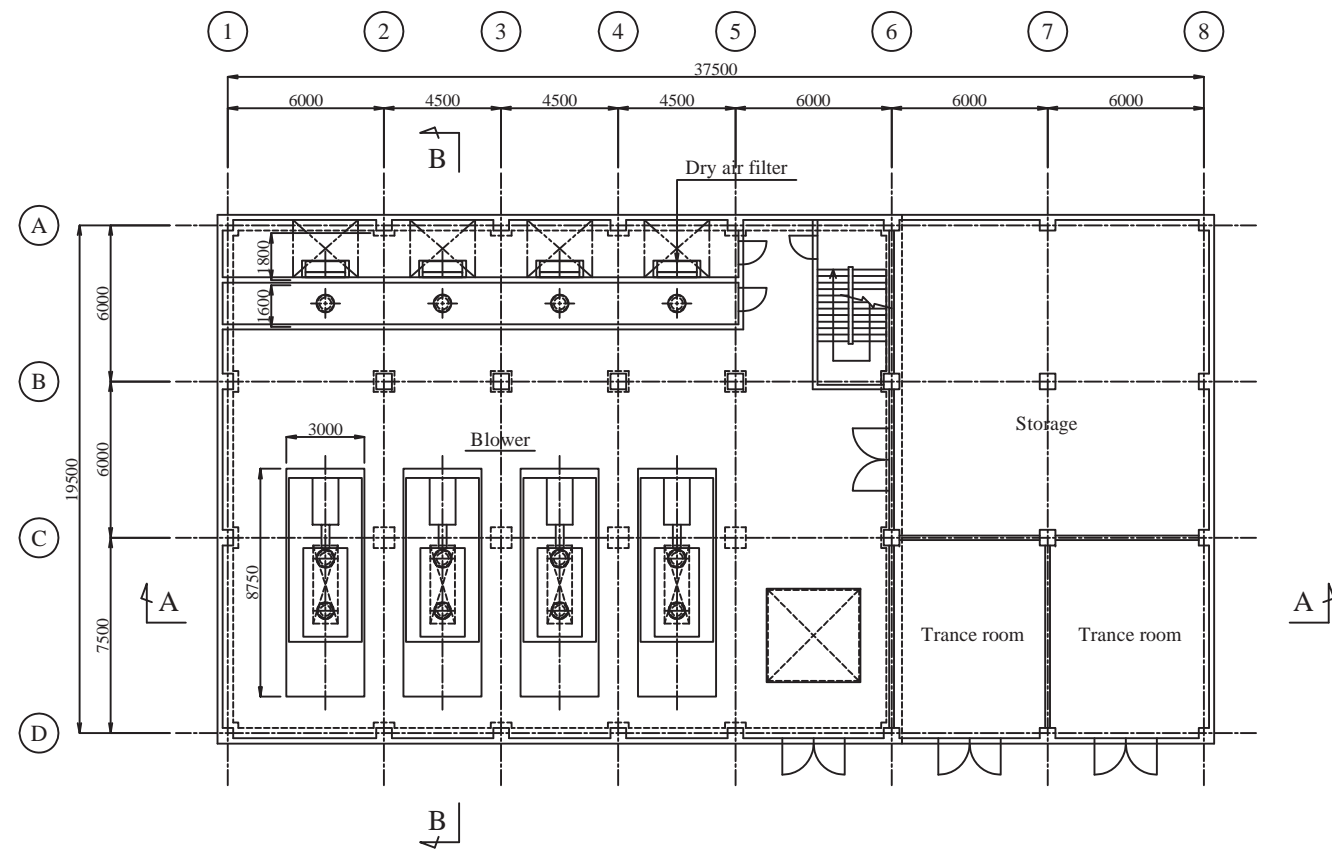
PREPARATORY SURVEY ON THE SEWERAGE  
SYSTEM IMPROVEMENT PROJECT FOR THE CITY  
OF BELGRADE

Components: Veliko Selo Wastewater Treatment Plant

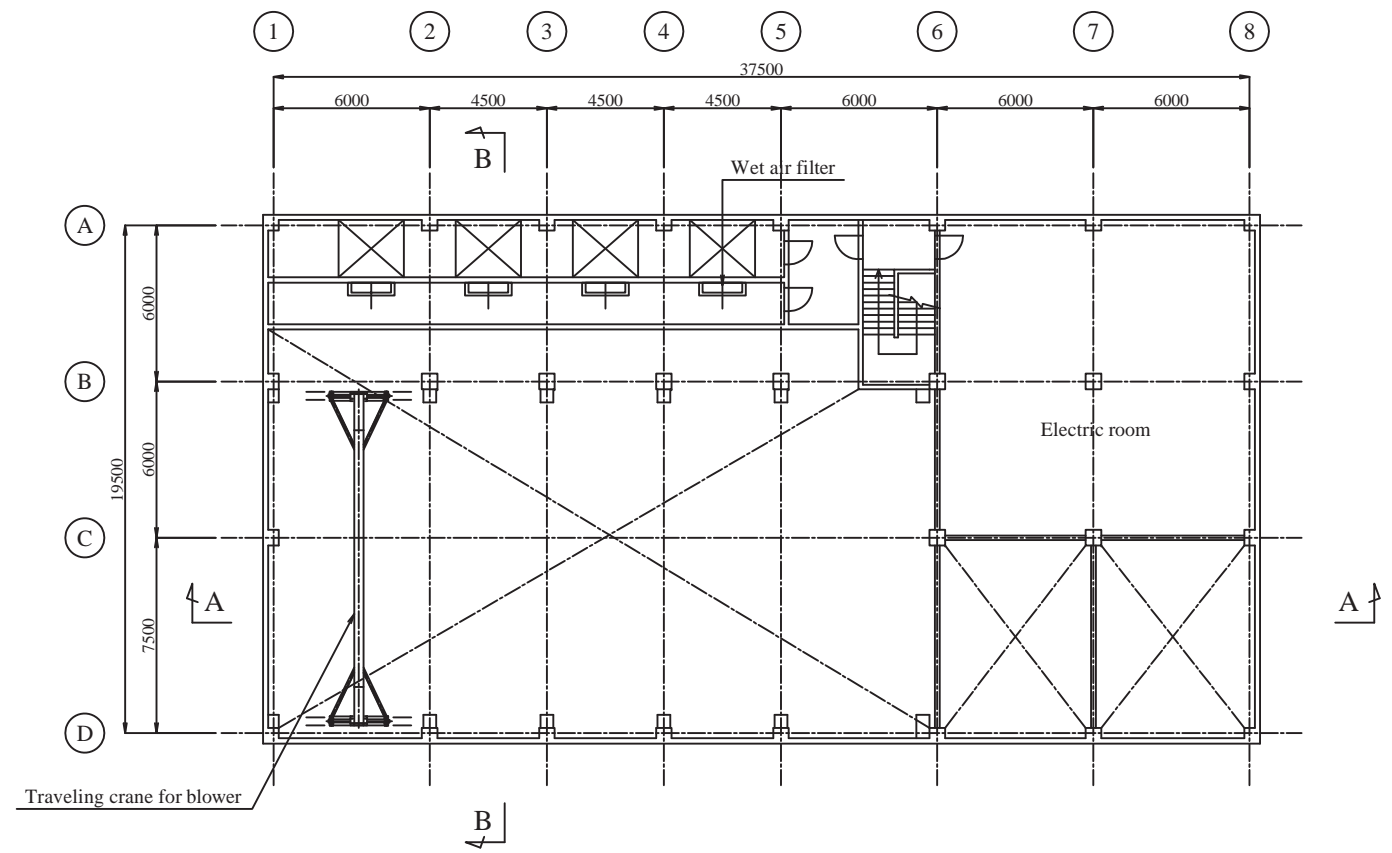
Drw no:  
WWTP-14

Title: Bioreactor

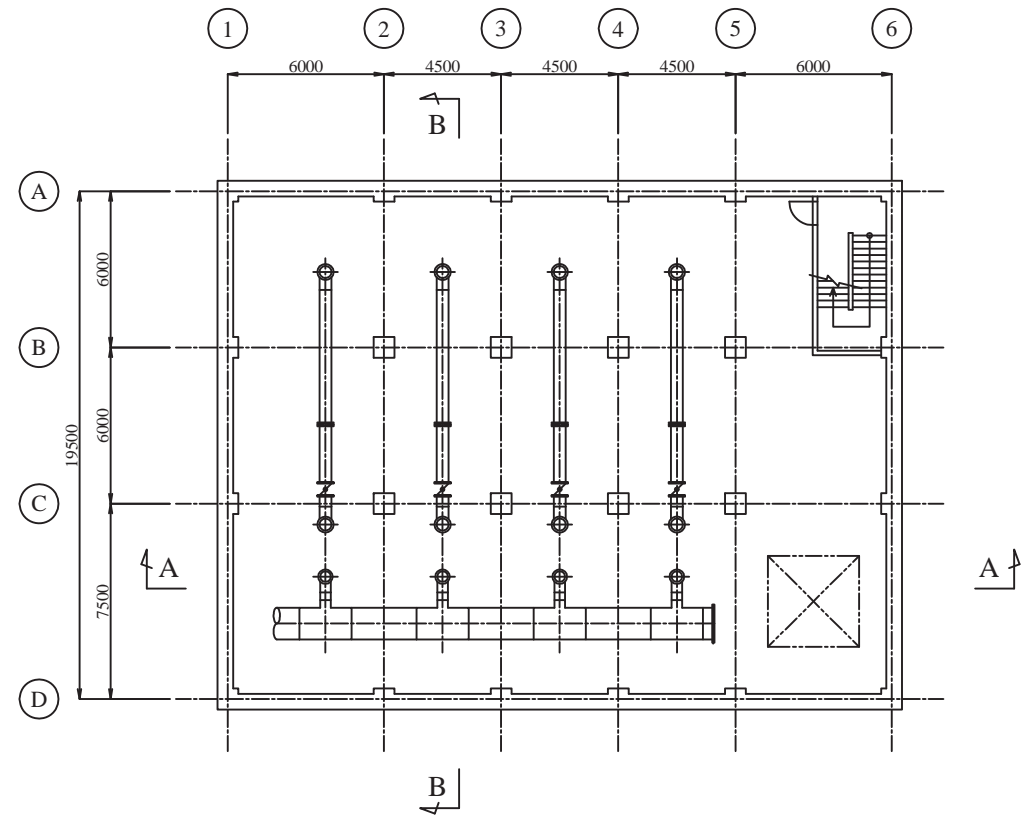
Scale:  
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GROUND FLOOR PLAN SC 1:300



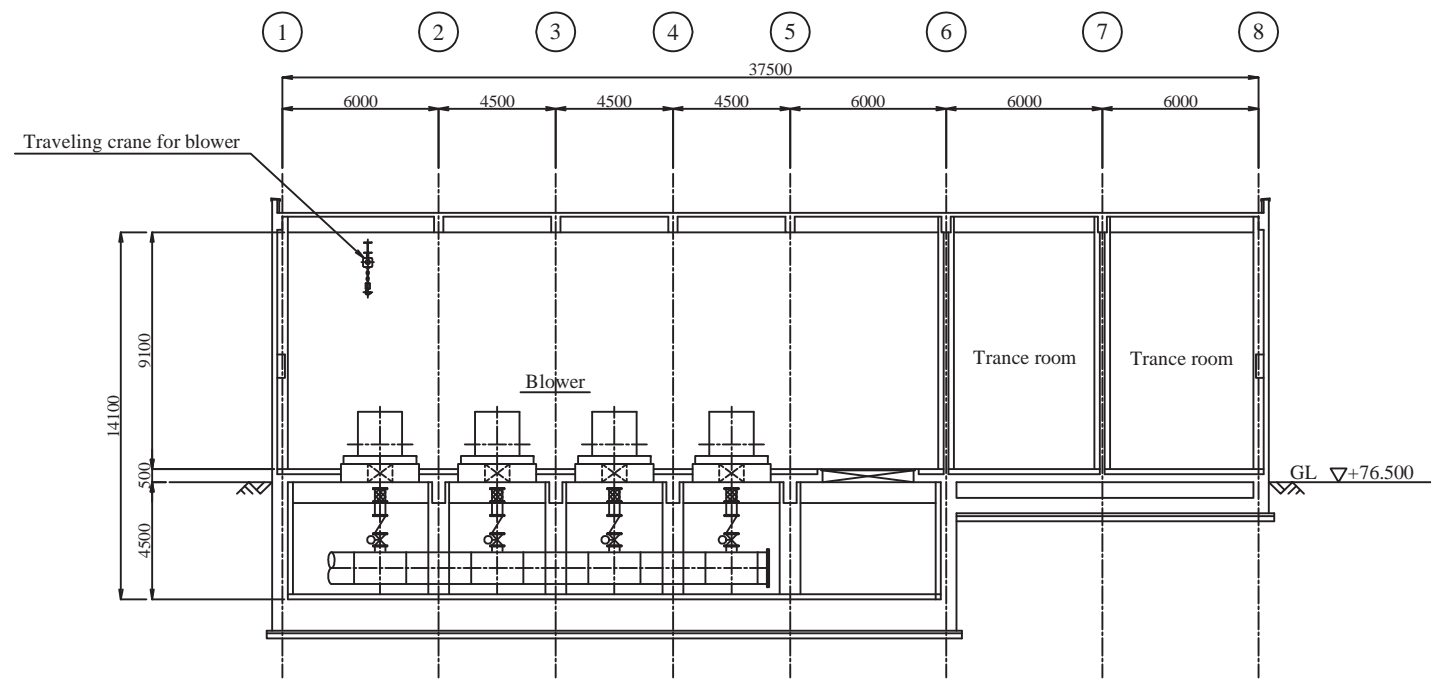
1 FLOOR PLAN SC 1:300



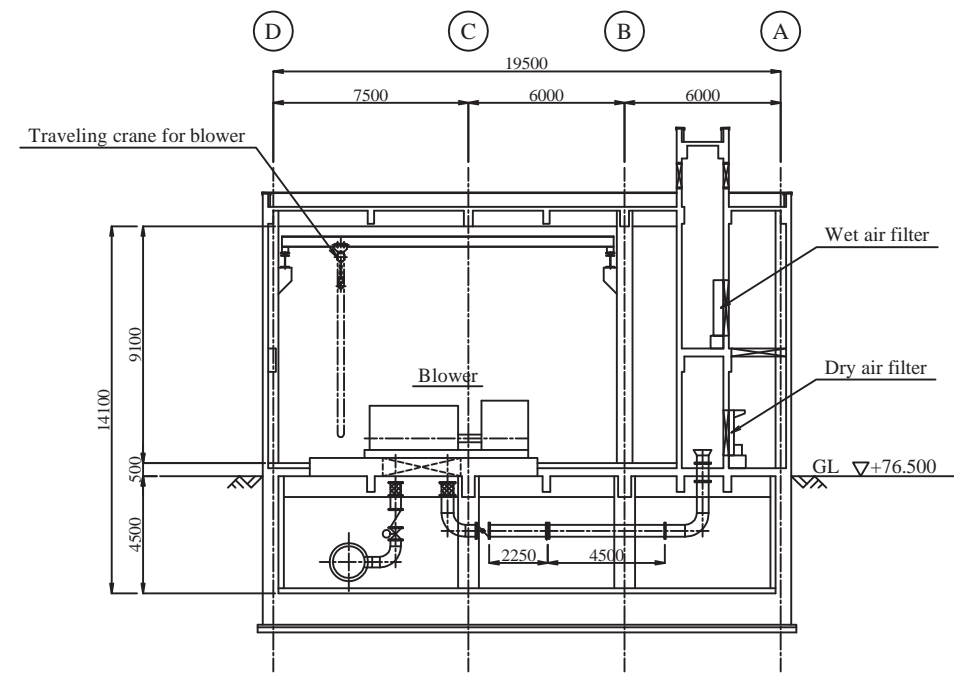
B1 FLOOR PLAN SC 1:300

PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Veliko Selo Wastewater Treatment Plant	Drw no: WWTP-15
Title: Blower Building	Scale: 1:300



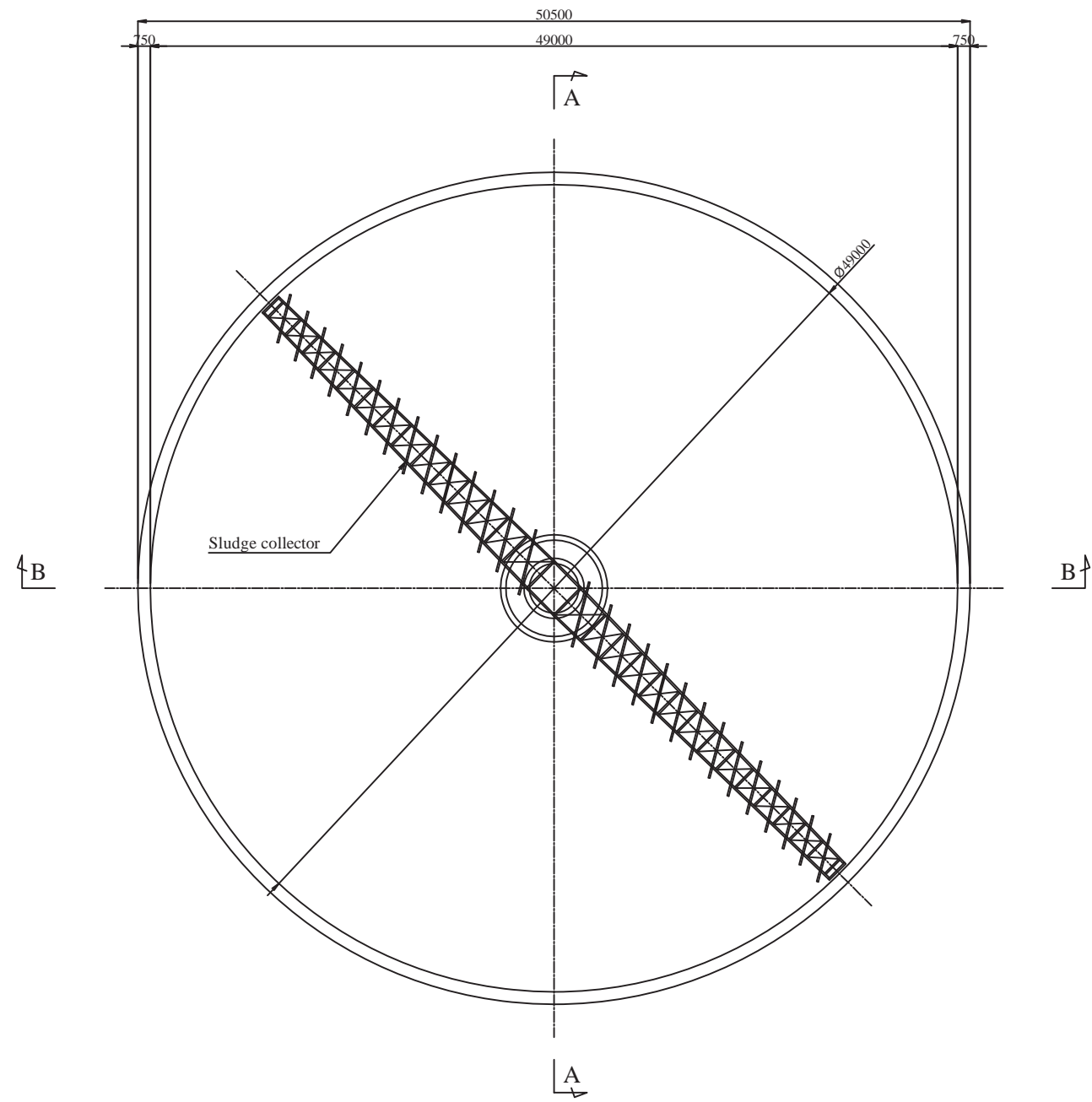


A-A SECTION SC 1:300

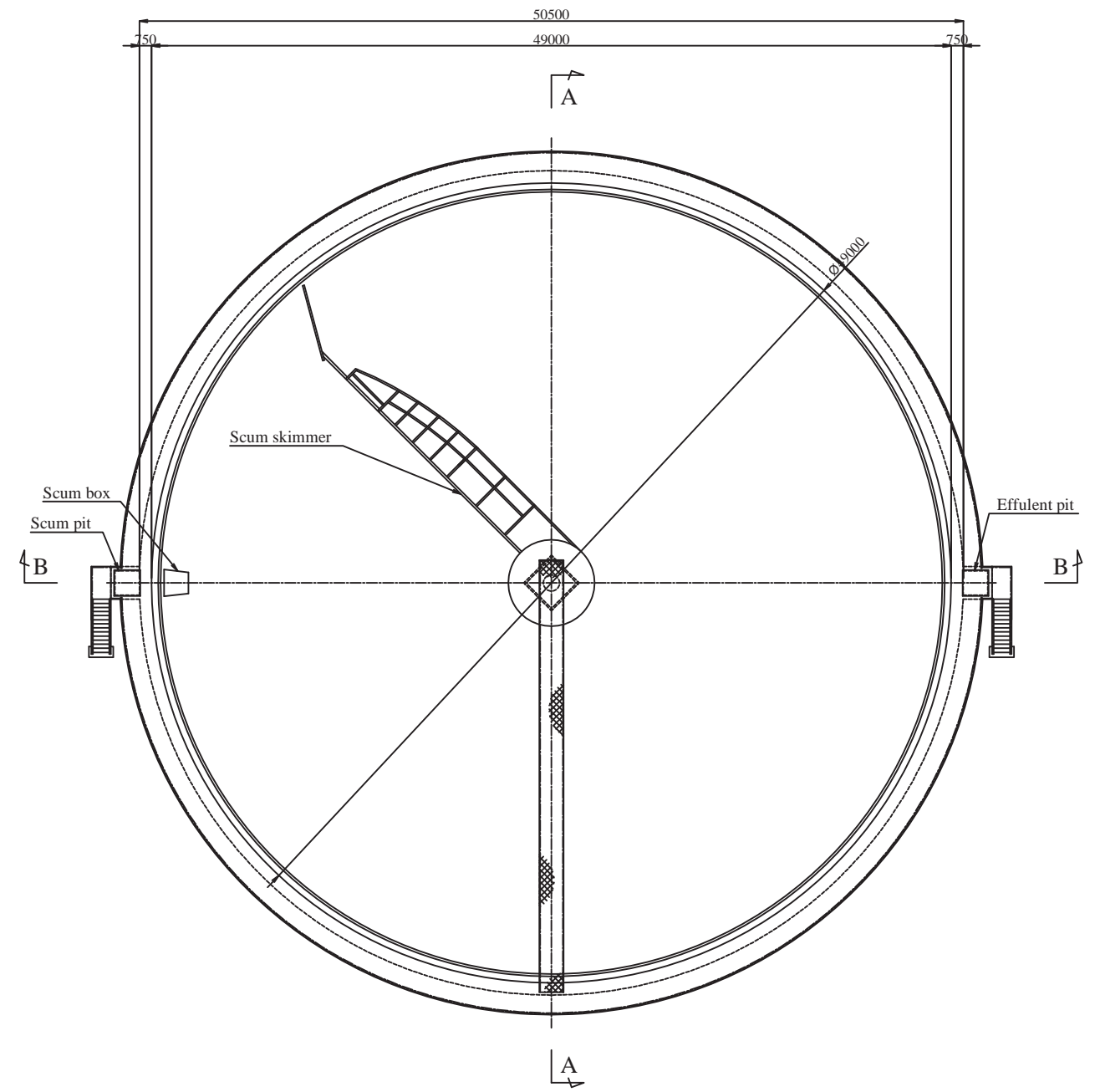


B-B SECTION SC 1:300

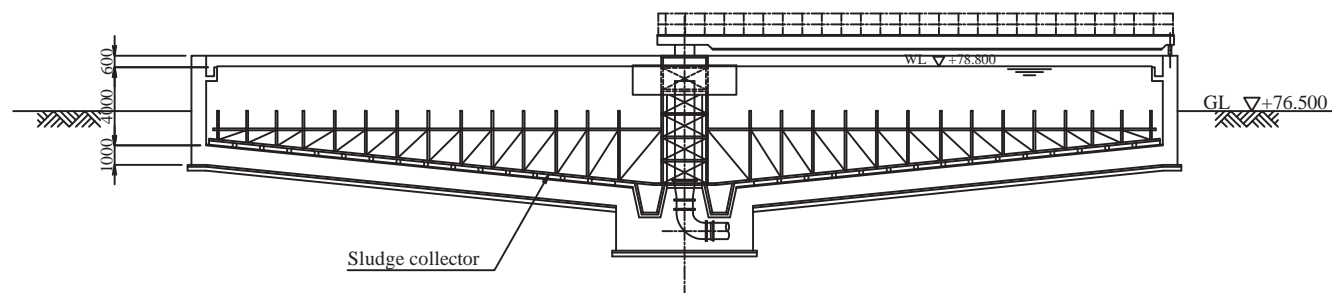
PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Veliko Selo Wastewater Treatment Plant	Drw no: WWTP-16
Title: Blower Building	Scale: 1:300



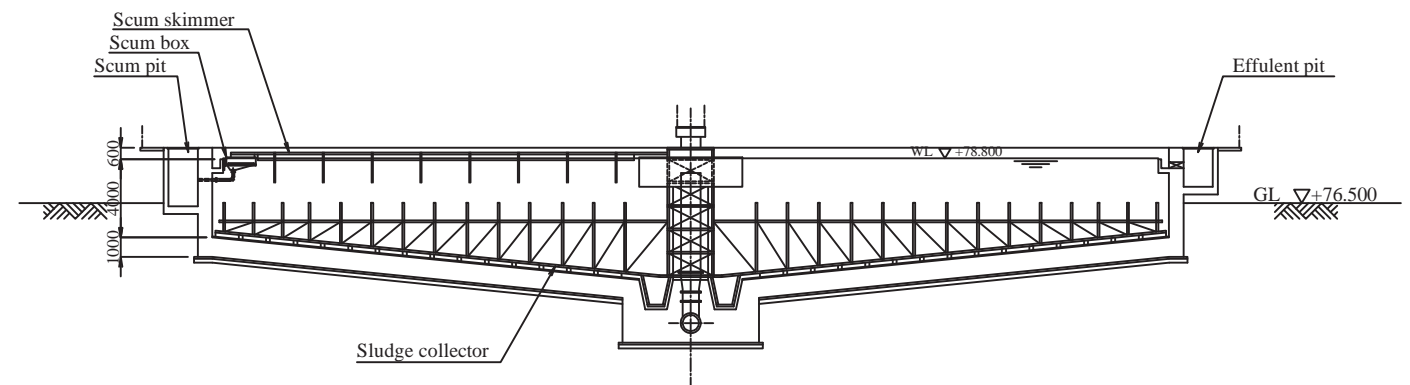
LOWER PLAN SC 1:400



UPPER PLAN SC 1:400

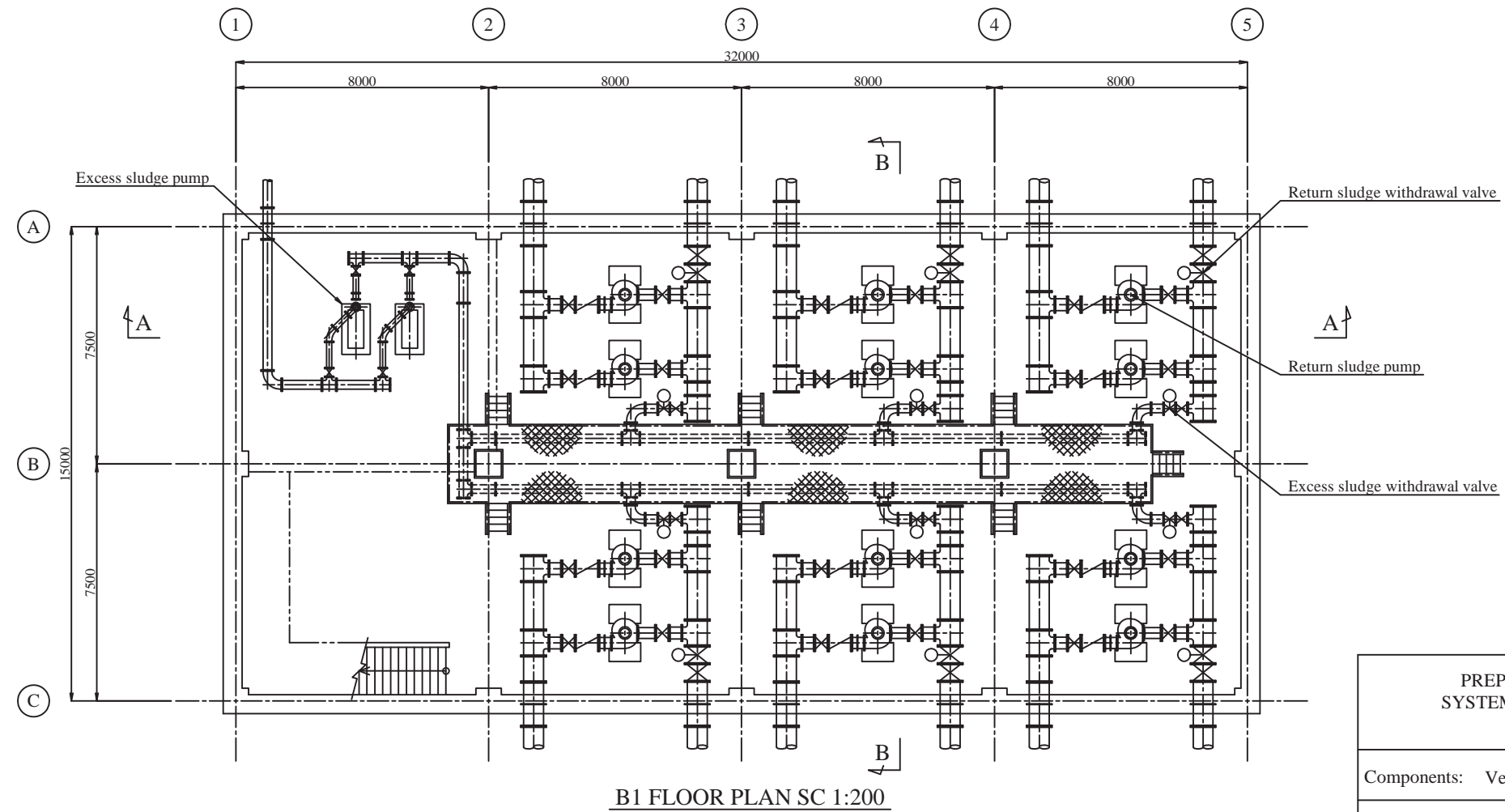
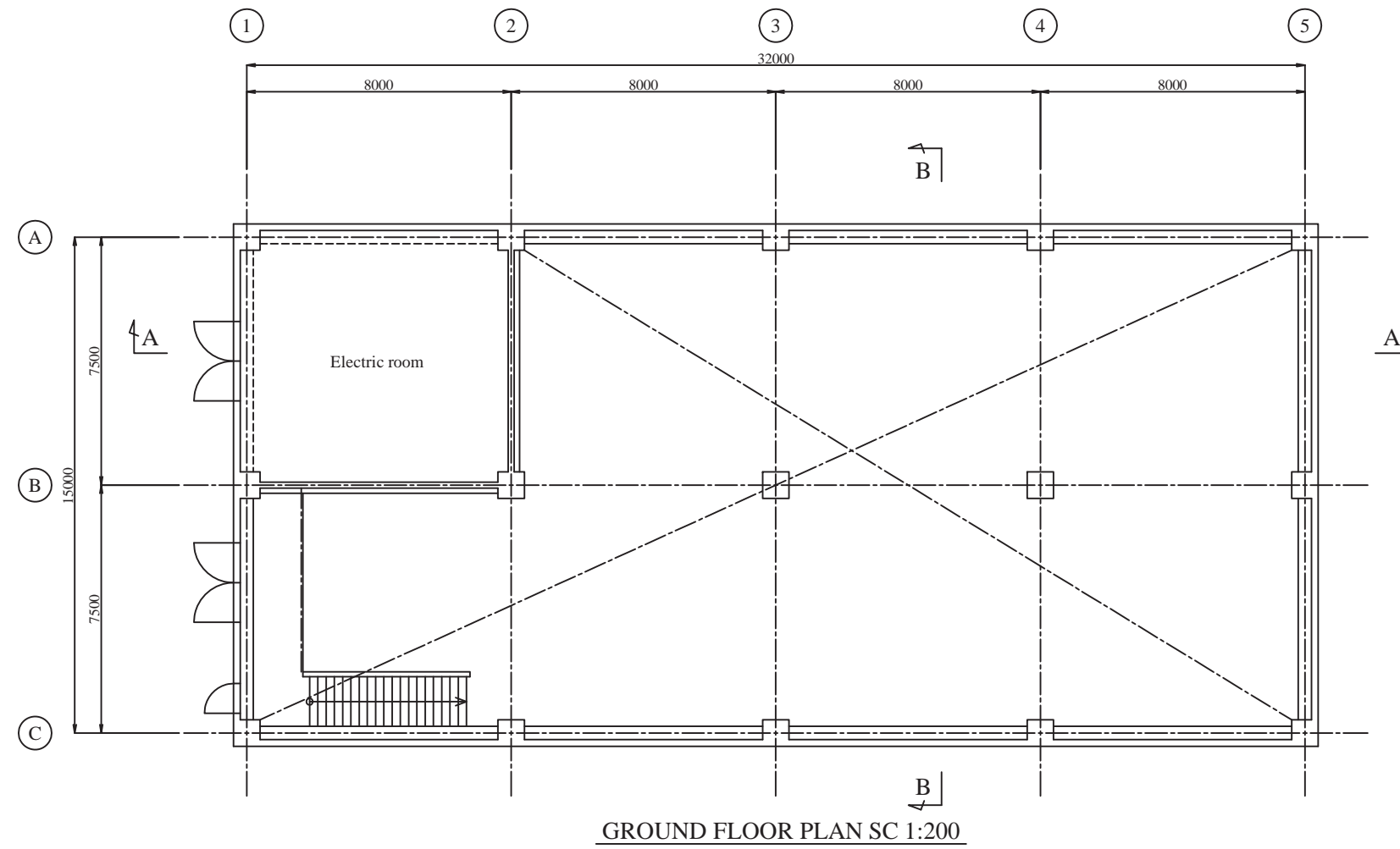


A-A SECTION SC 1:400

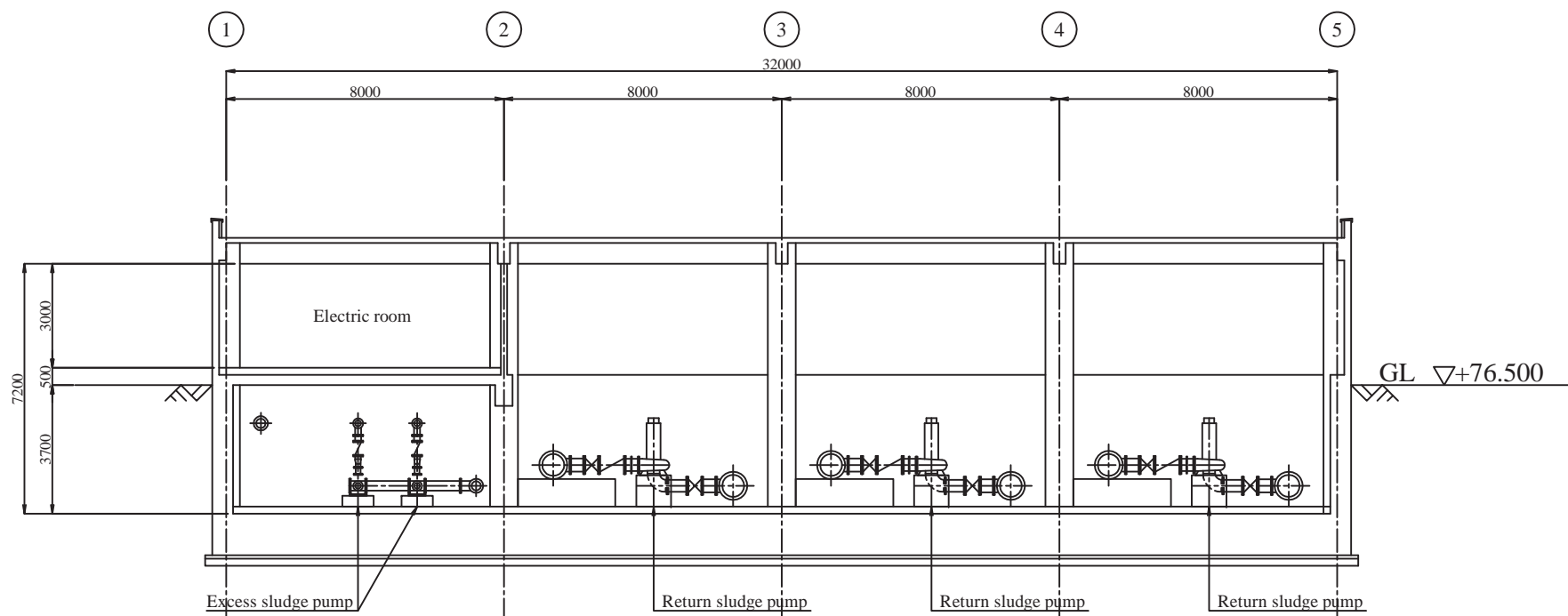


B-B SECTION SC 1:400

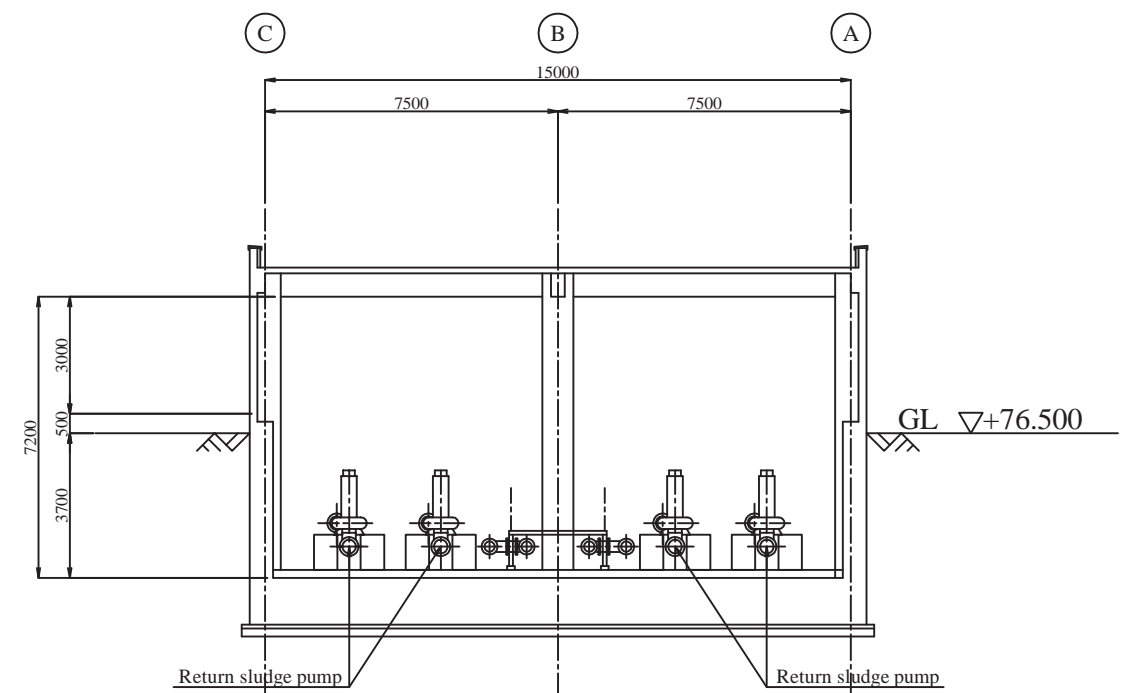
PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Veliko Selo Wastewater Treatment Plant	Drw no: WWTP-17
Title: Secondary Settling tank	Scale: 1:400



PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Veliko Selo Wastewater Treatment Plant	Drw no: WWTP-18
Title: Return Sludge Pumping House	Scale: 1:200



A-A SECTION SC 1:200



B-B SECTION SC 1:200

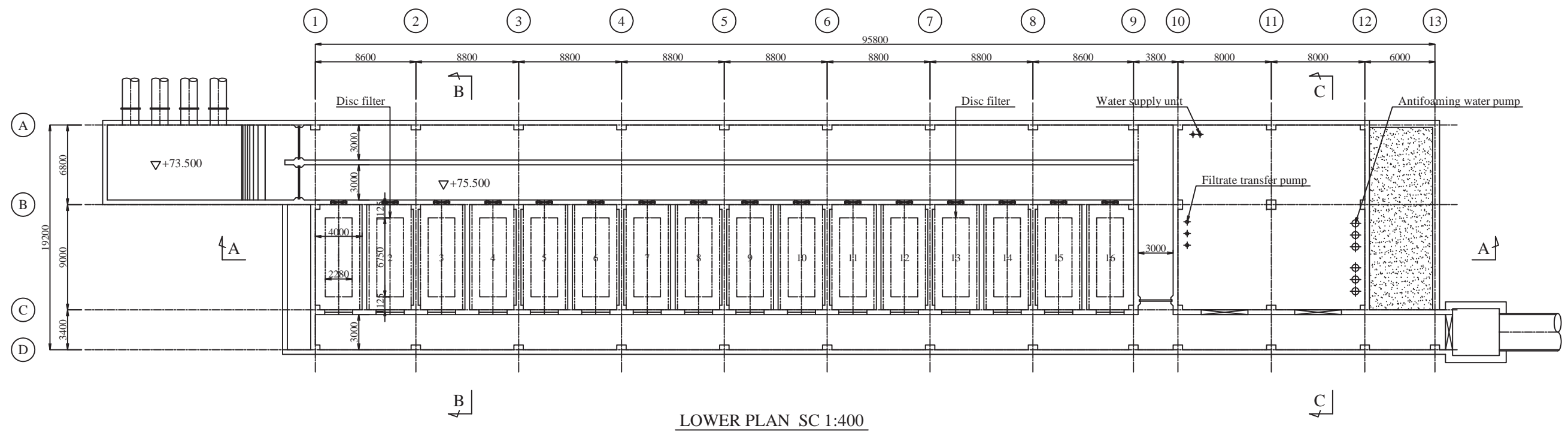
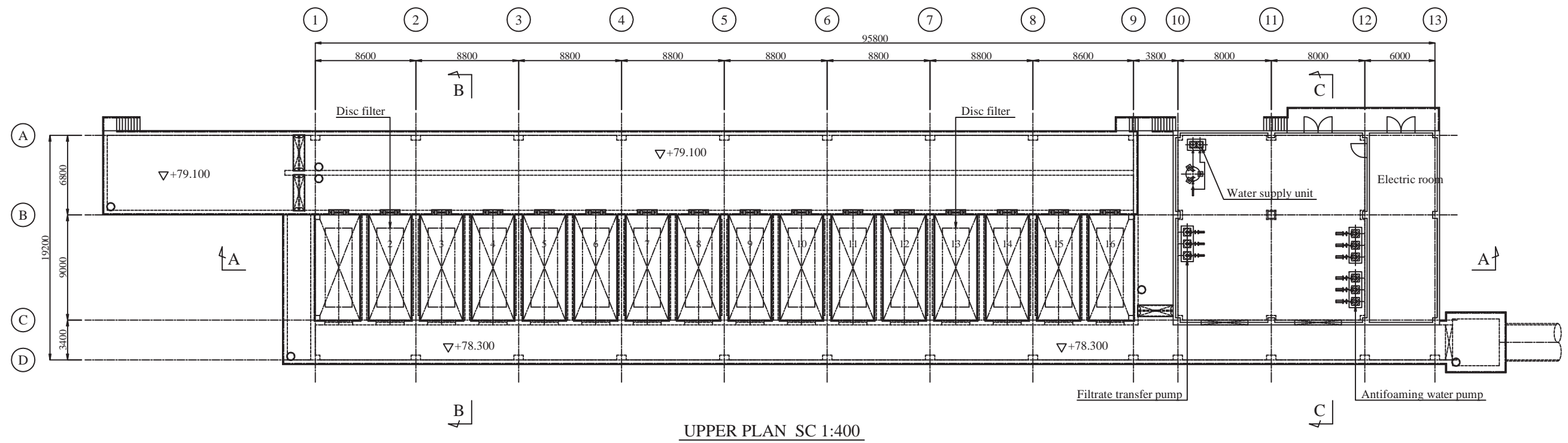
PREPARATORY SURVEY ON THE SEWERAGE  
SYSTEM IMPROVEMENT PROJECT FOR THE CITY  
OF BELGRADE

Components: Veliko Selo Wastewater Treatment Plant

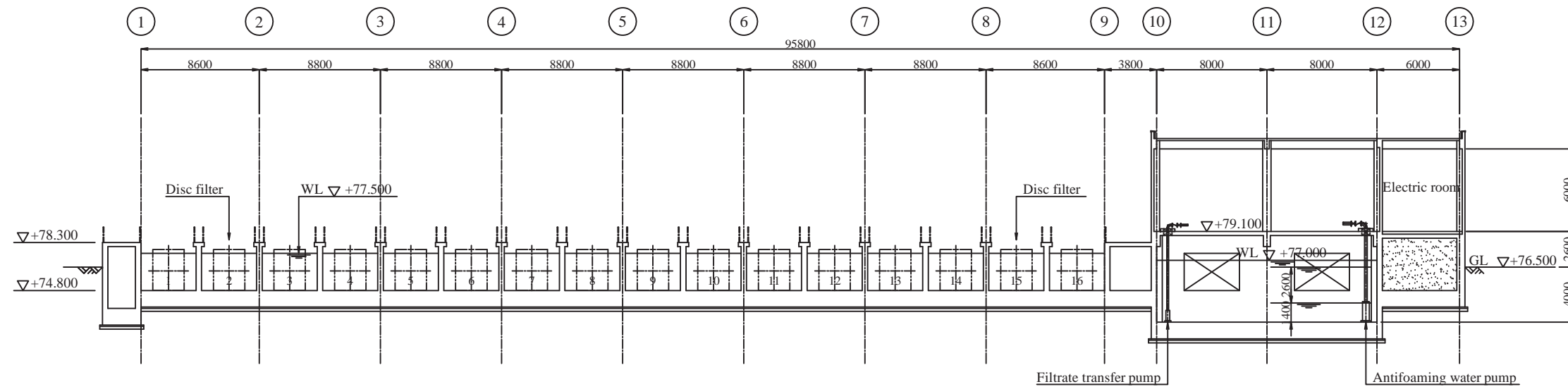
Drw no:  
WWTP-19

Title: Return Sludge Pumping House

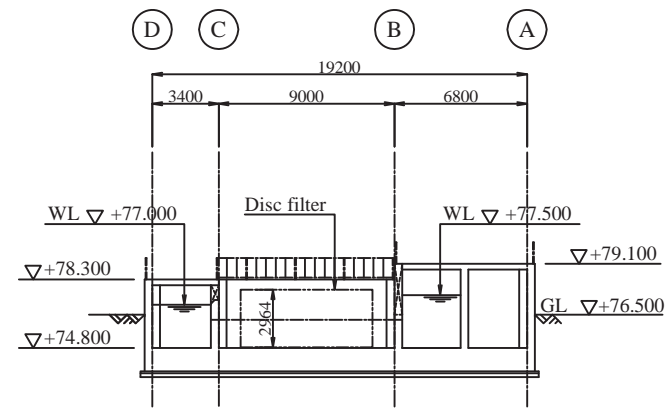
Scale:  
1:200



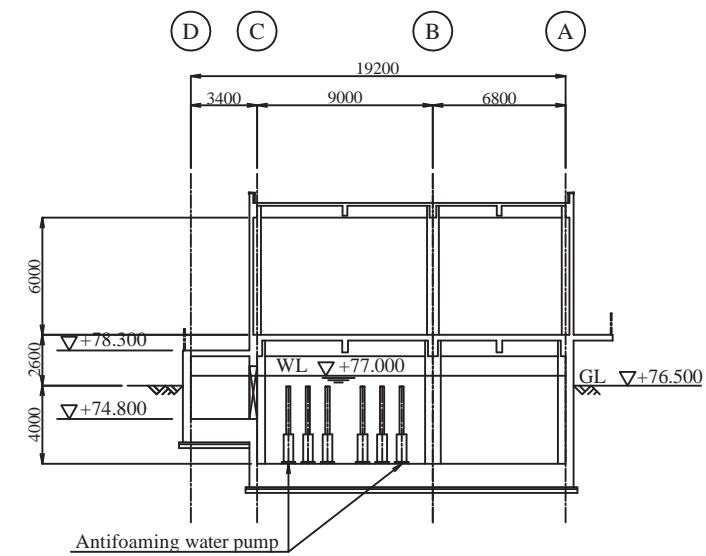
PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Veliko Selo Wastewater Treatment Plant	Drw no: WWTP-20
Title: Filtration	Scale: 1:400



A-A SECTION SC 1:400

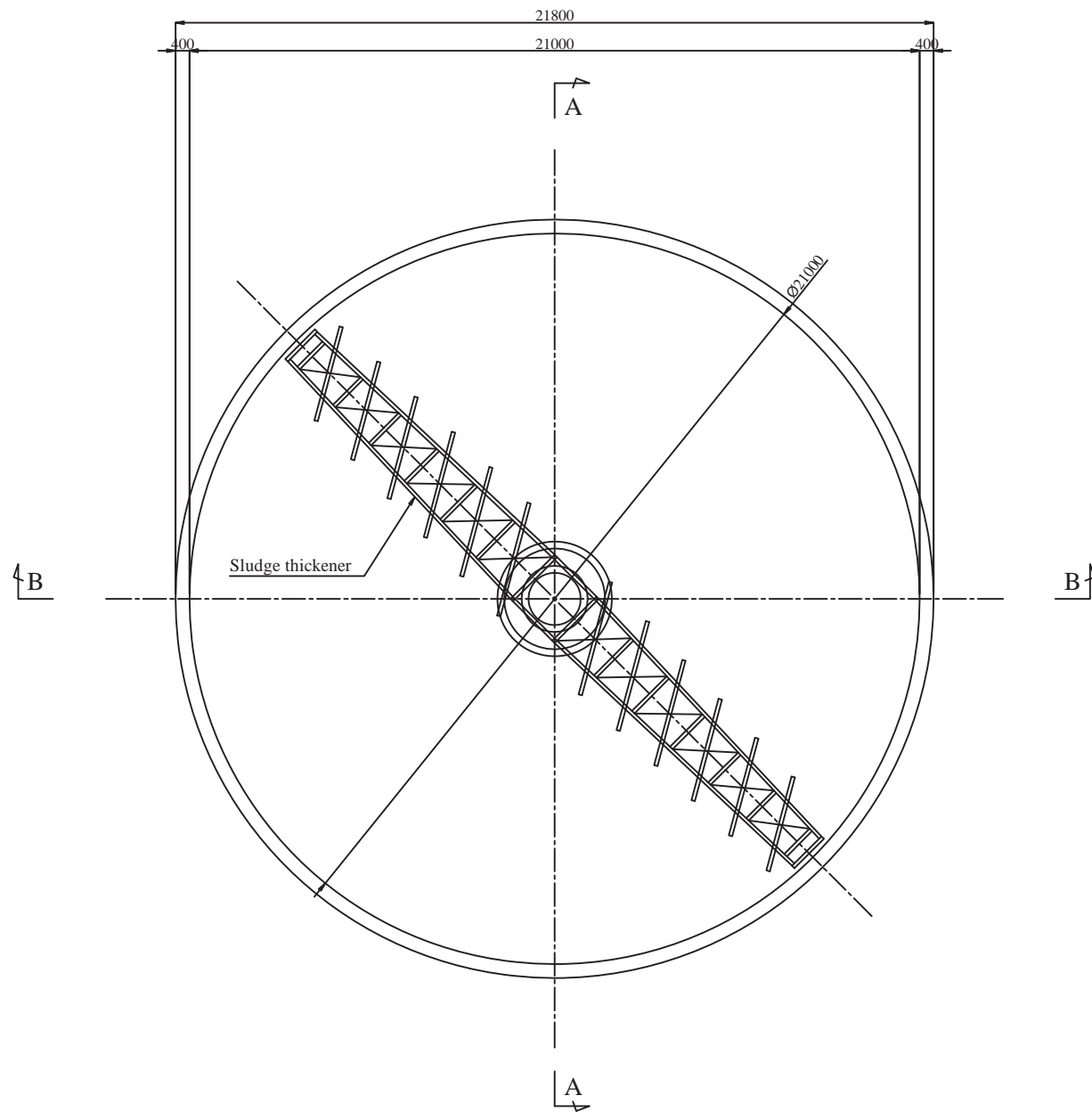


B-B SECTION SC 1:400

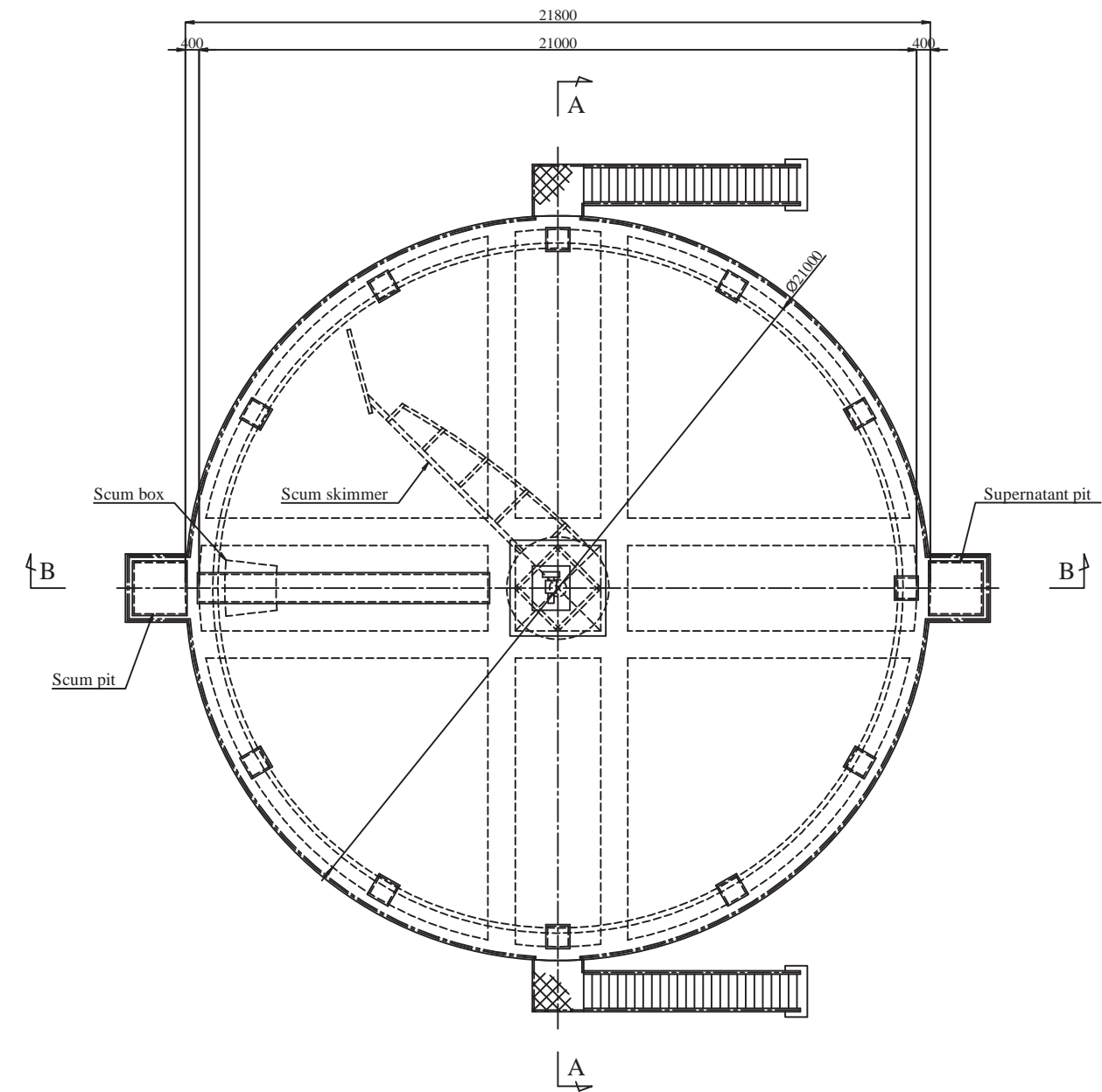


C-C SECTION SC 1:400

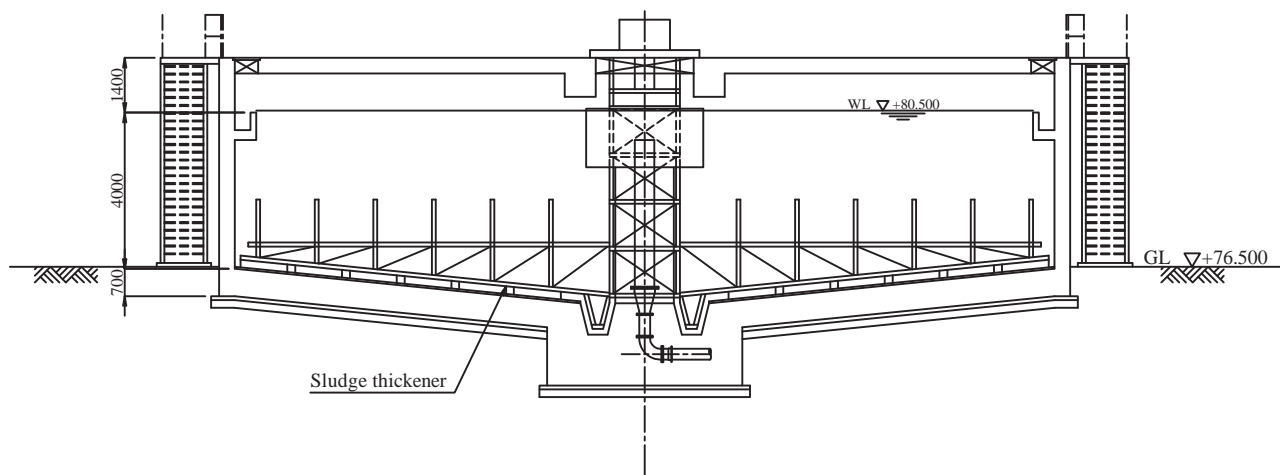
PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Veliko Selo Wastewater Treatment Plant	Drw no: WWTP-21
Title: Filtration	Scale: 1:400



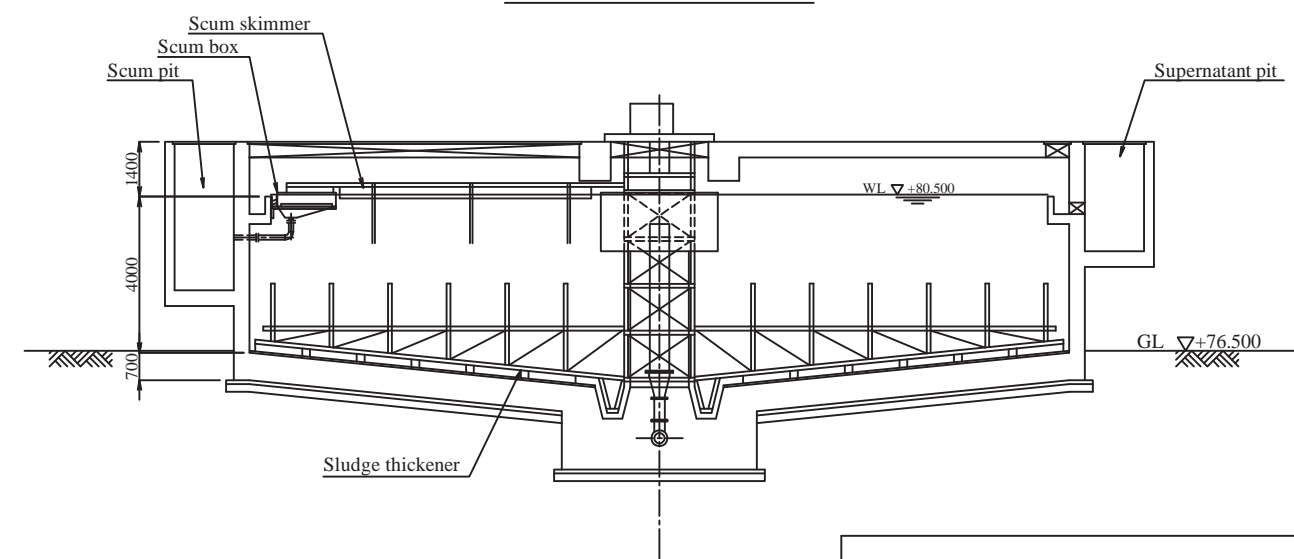
LOWER PLAN SC 1:200



UPPER PLAN SC 1:200

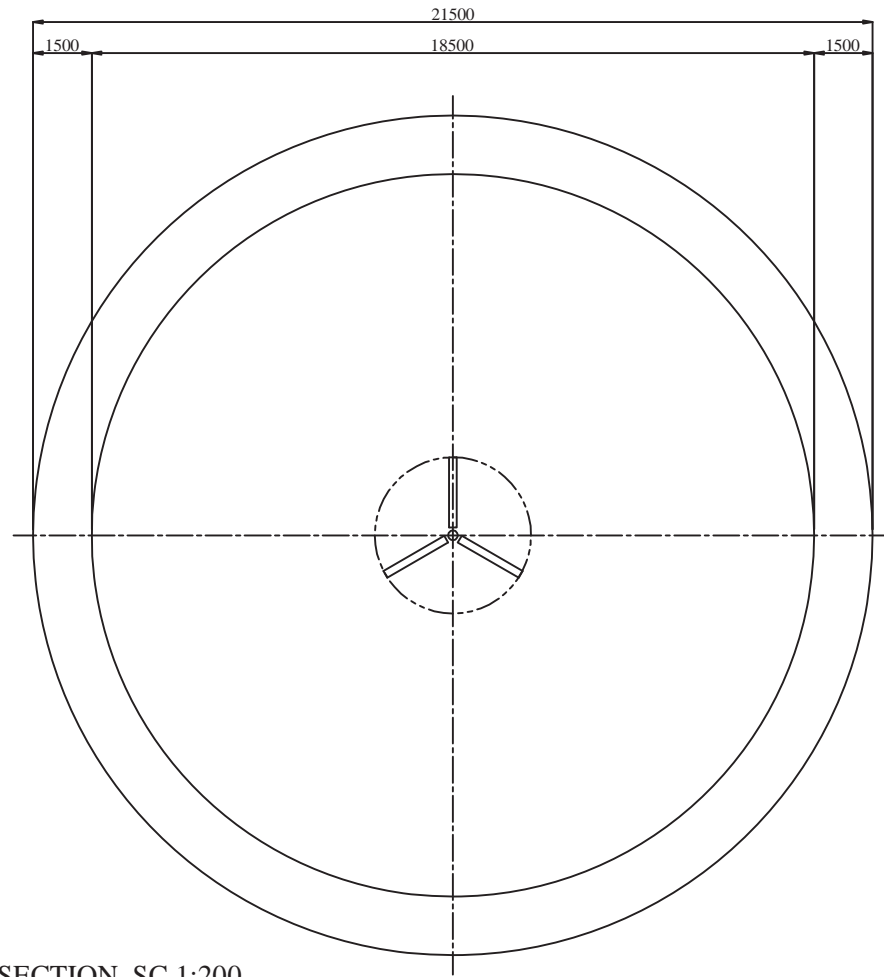


A-A SECTION SC 1:200

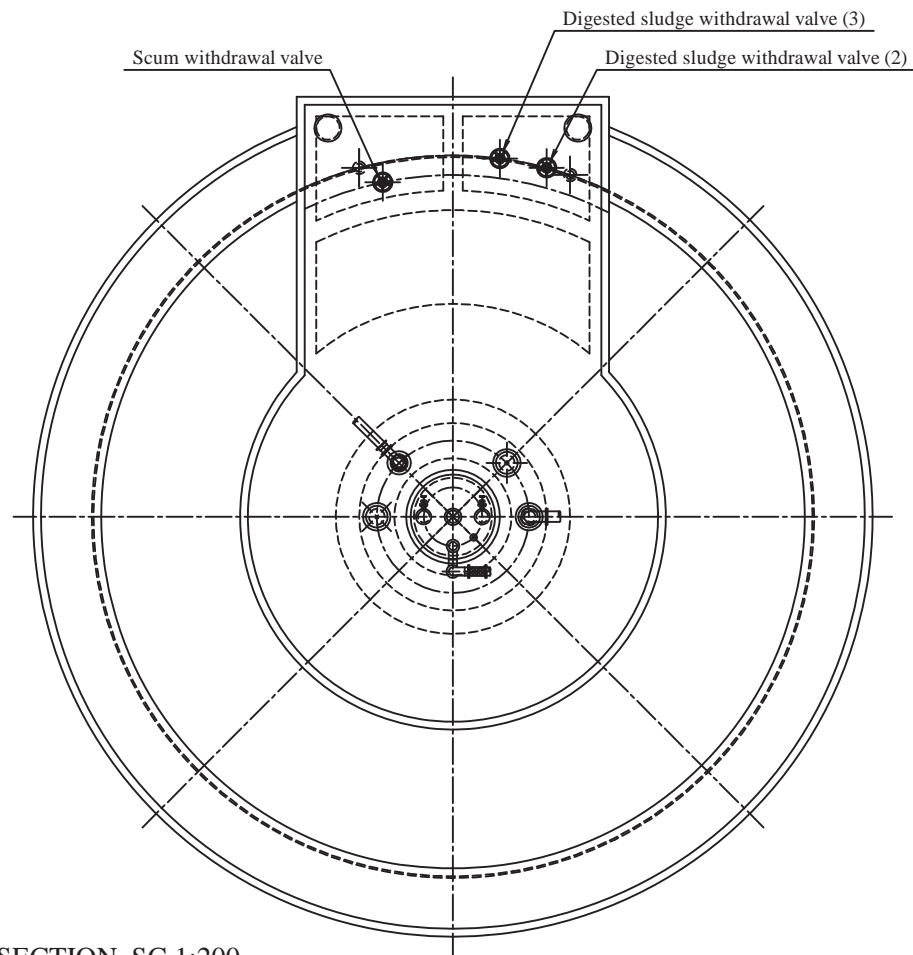


B-B SECTION SC 1:200

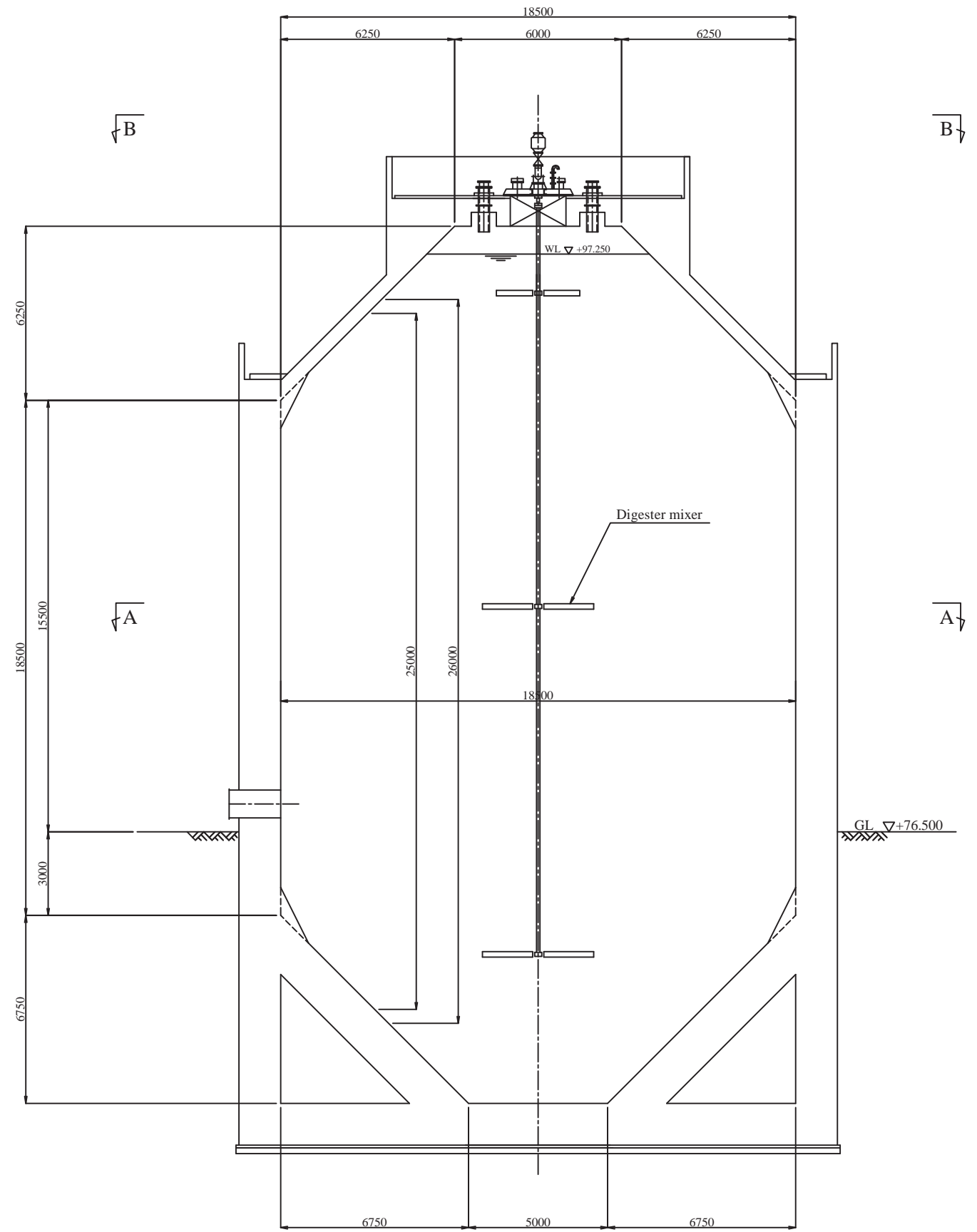
PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Veliko Selo Wastewater Treatment Plant	Drw no: WWTP-22
Title: Gravity Thickener	Scale: 1:200



A-A SECTION SC 1:200



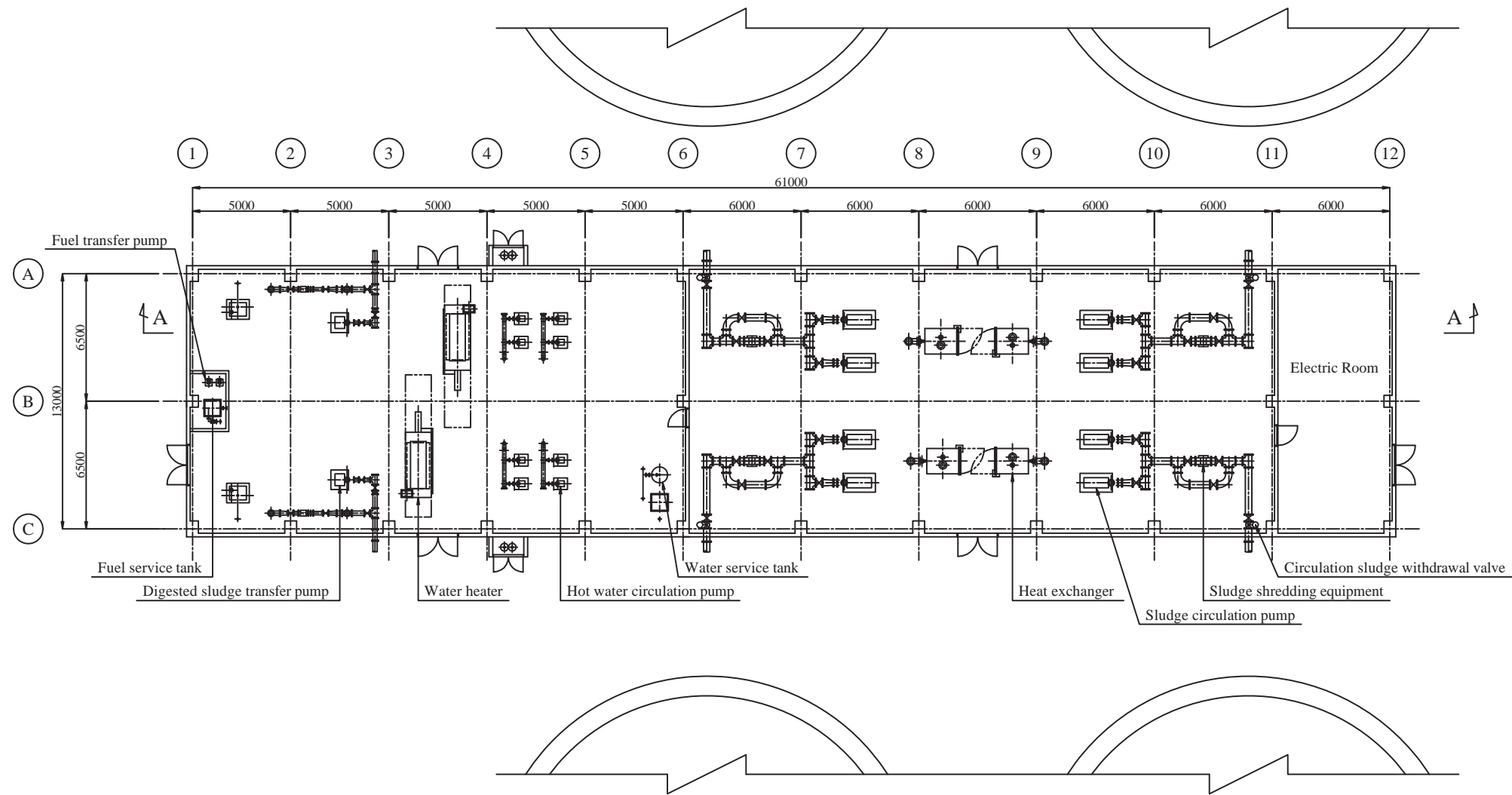
B-B SECTION SC 1:200



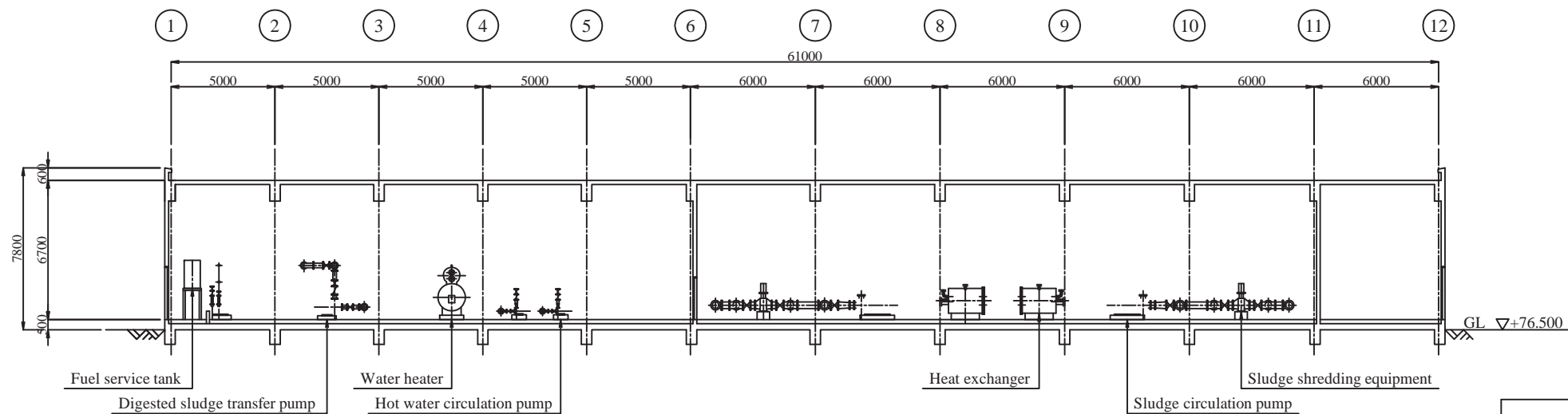
SECTION SC 1:200

PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Veliko Selo Wastewater Treatment Plant	Drw no: WWTP-23
Title: Anaerobic Digester	Scale: 1:200



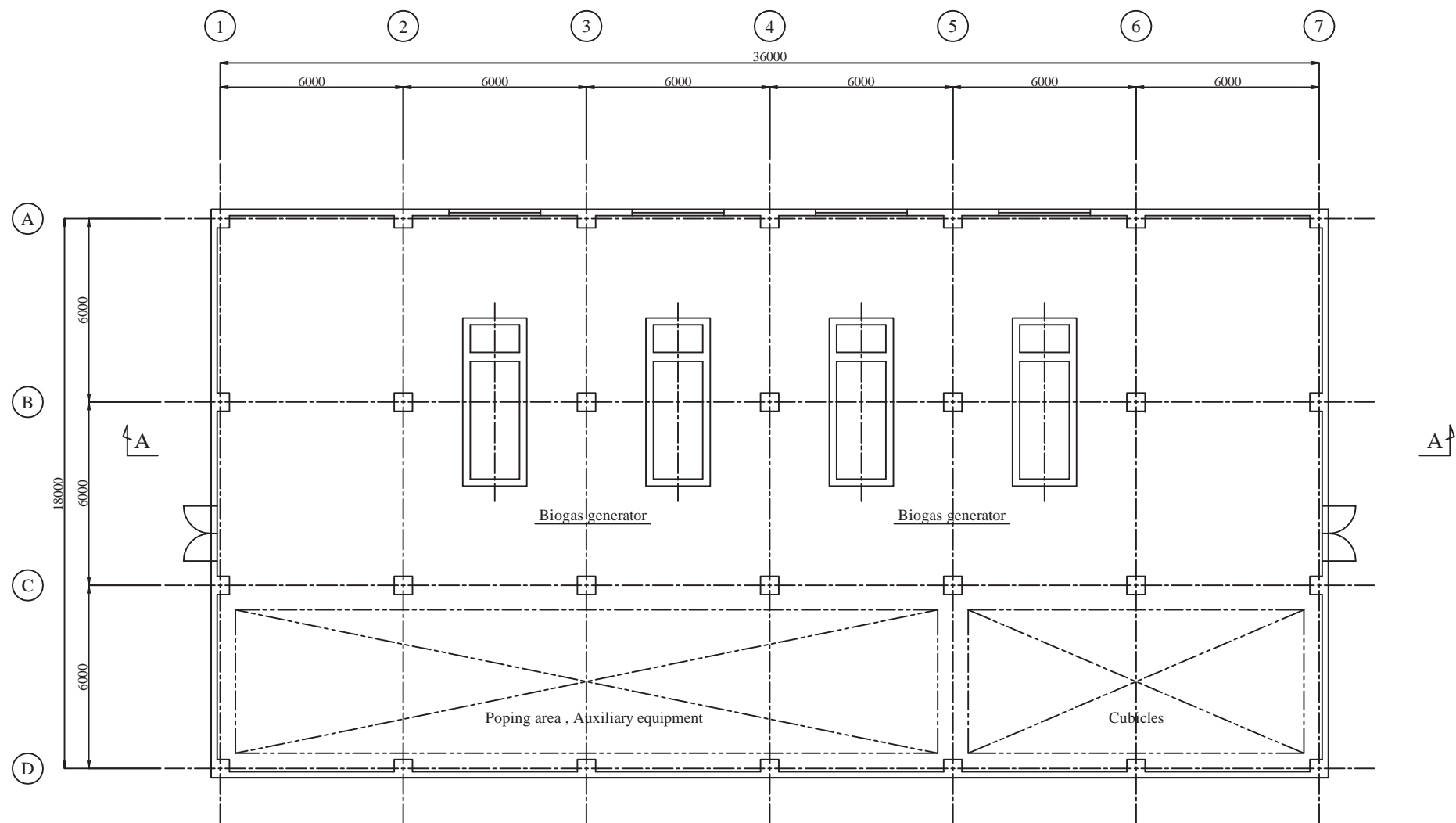


GROUND FLOOR PLAN SC 1:300

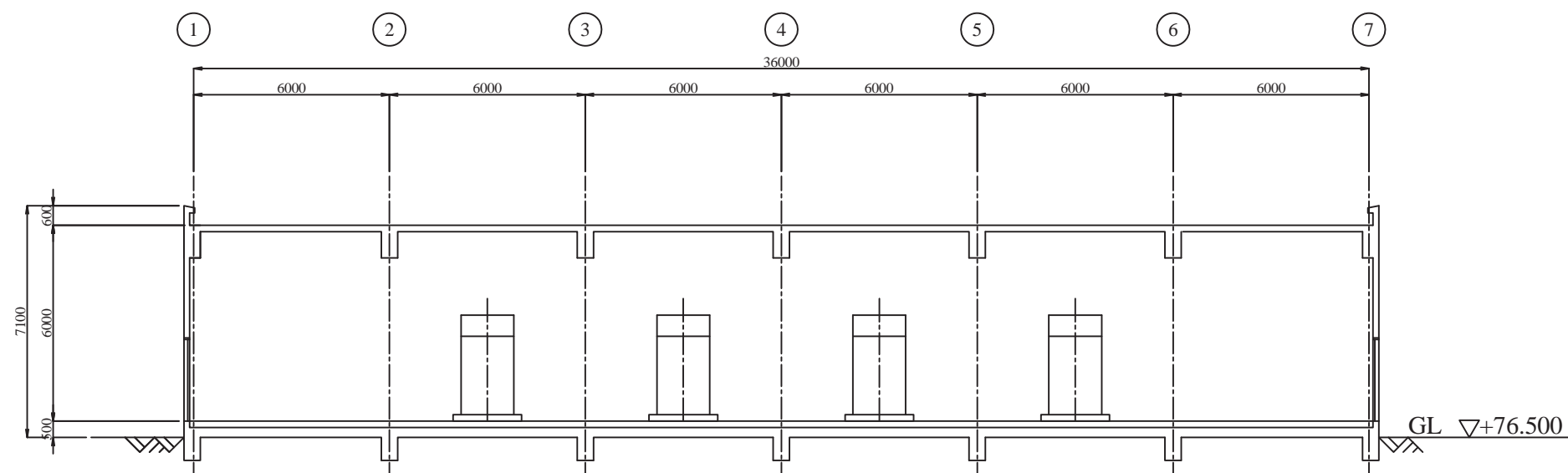


A-A SECTION SC 1:300

PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Veliko Selo Wastewater Treatment Plant	Drw no: WWTP-24
Title: Anaerobic Digester Auxiliaries Building	Scale: 1:300

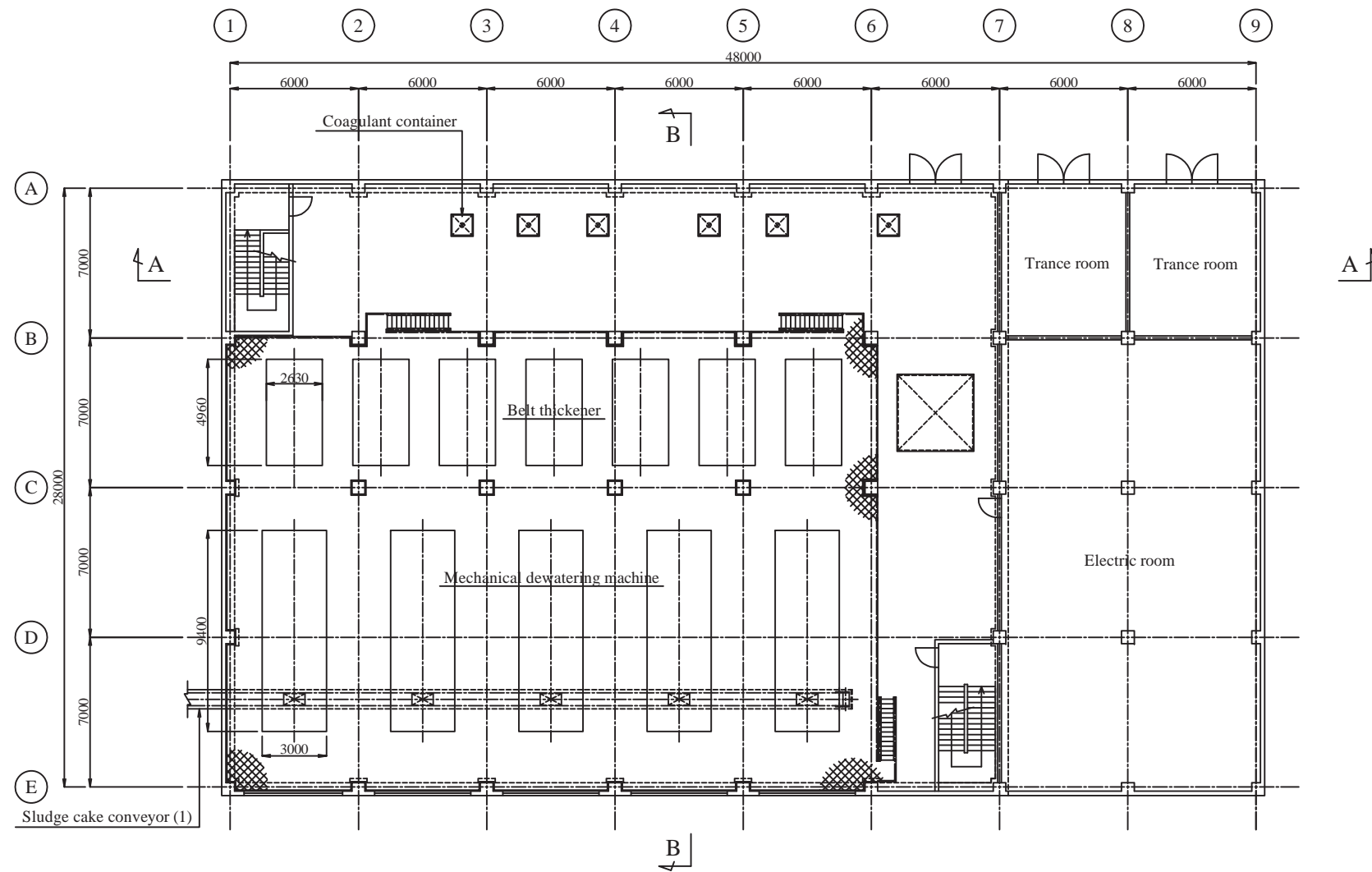


GROUND FLOOR PLAN SC 1:200

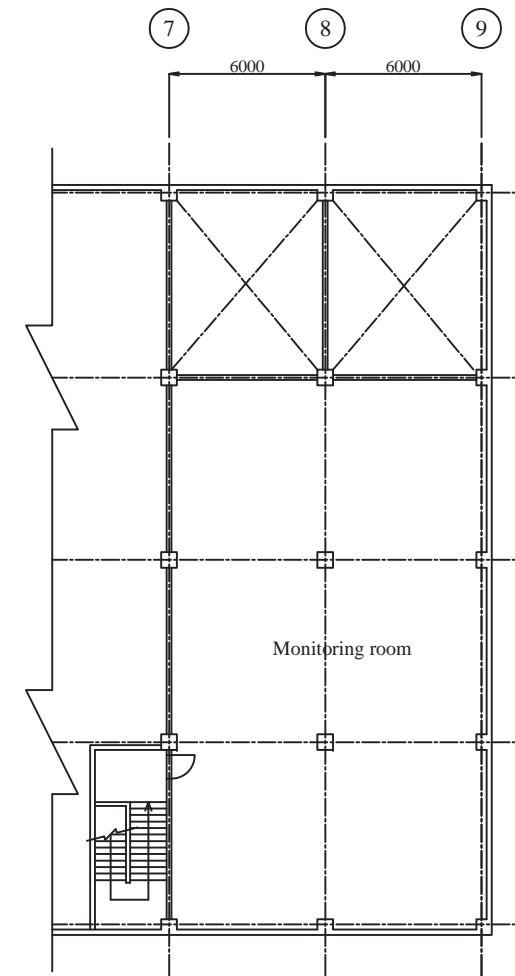


A-A SECTION SC 1:200

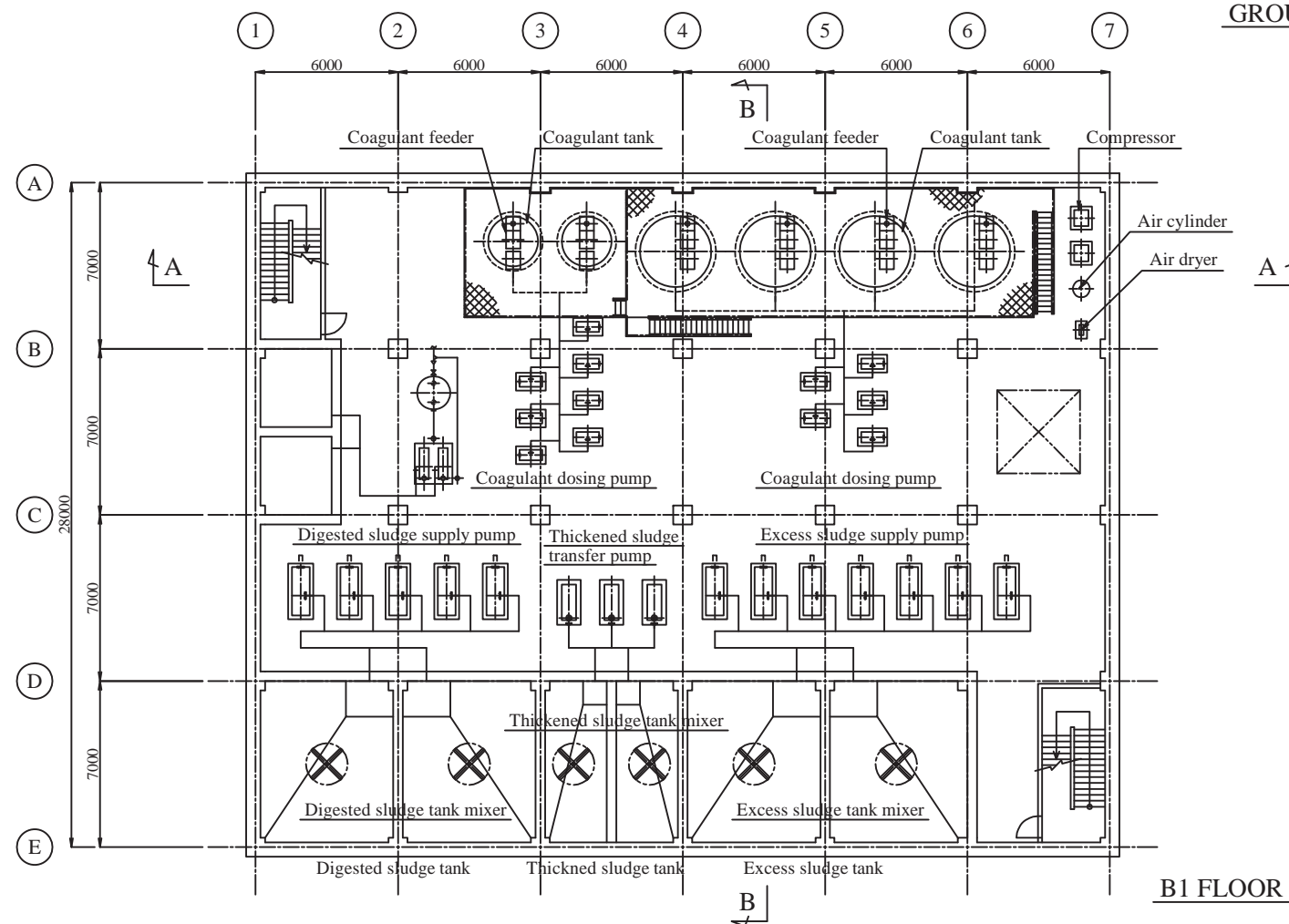
PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Veliko Selo Wastewater Treatment Plant	Drw no: WWTP-25
Title: Cogeneration Building	Scale: 1:200



GROUND FLOOR PLAN SC 1:300

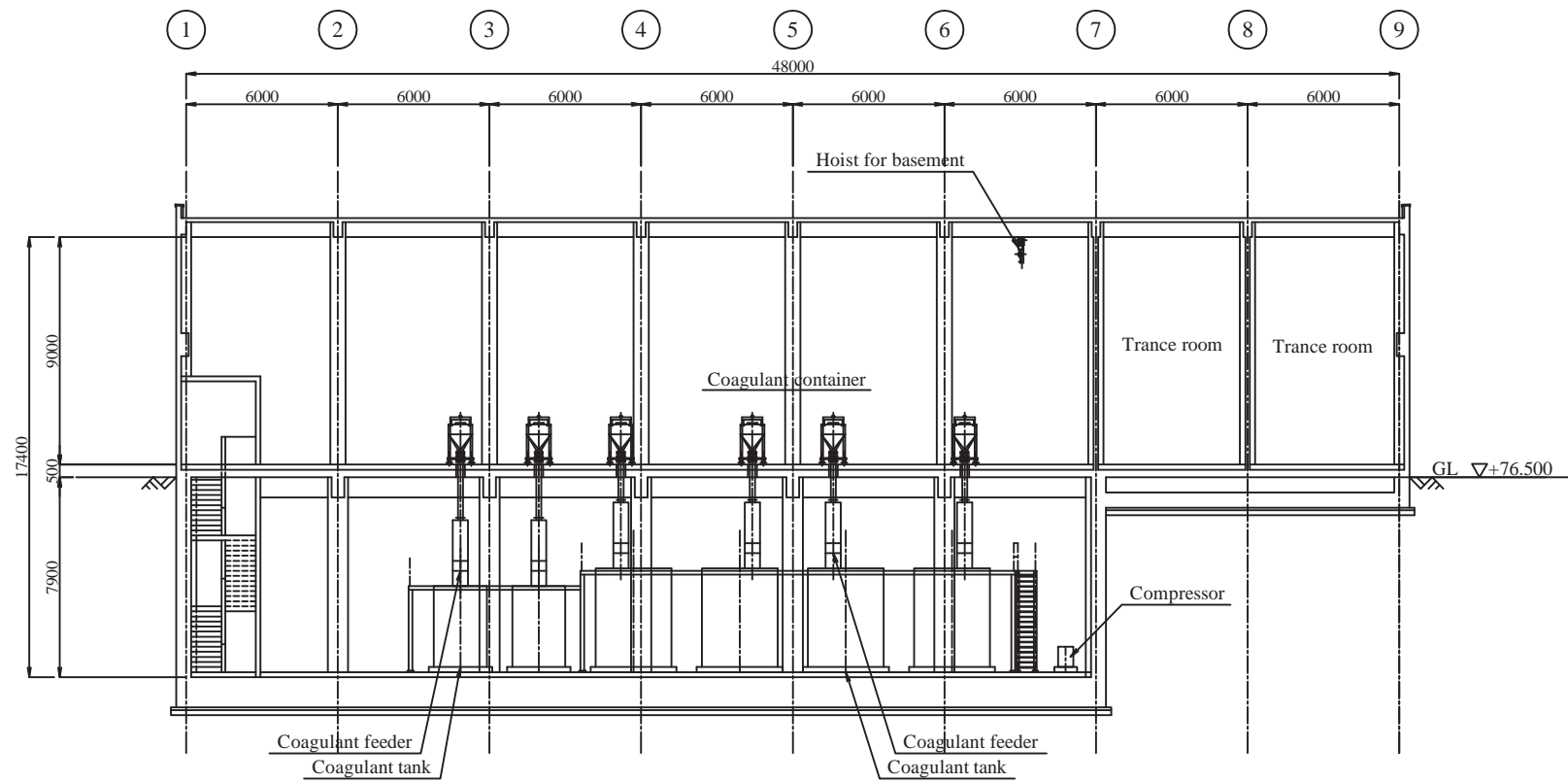


1 FLOOR PLAN SC 1:300

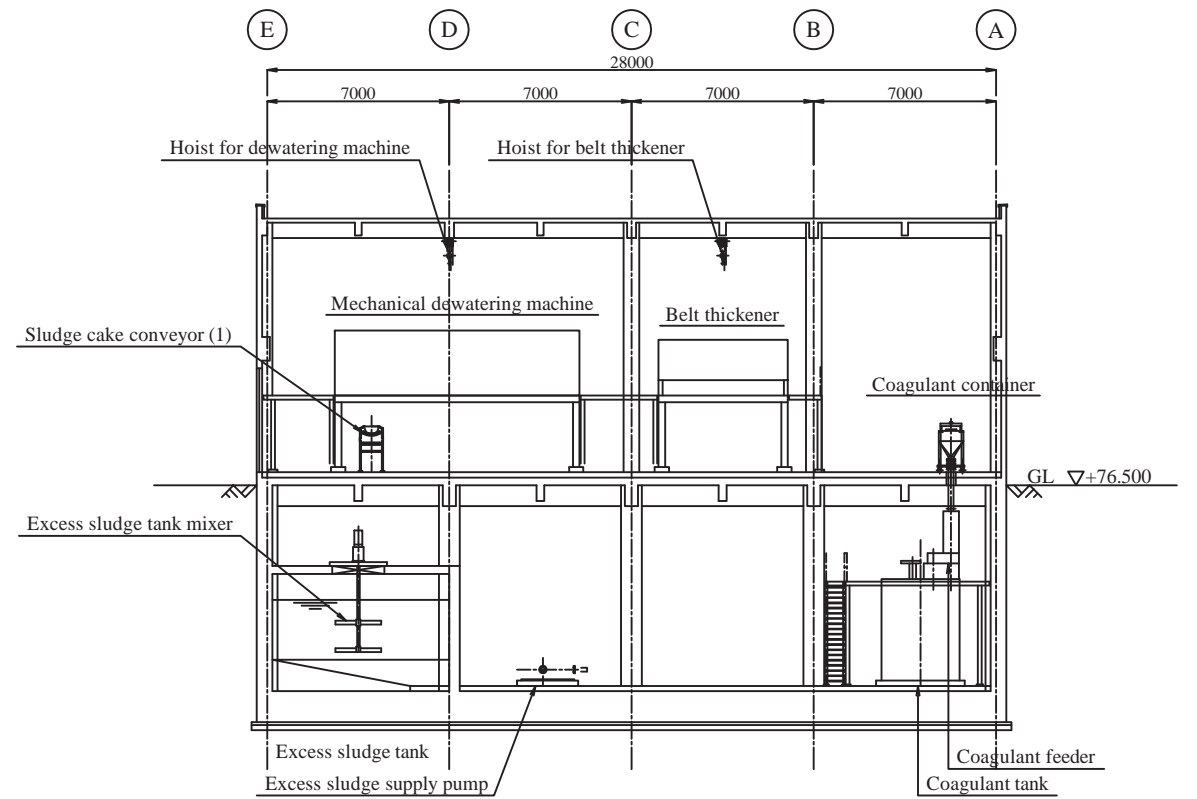


B1 FLOOR PLAN SC 1:300

PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Veliko Selo Wastewater Treatment Plant	Drw no: WWTP-26
Title: Sludge Dewatering Building	Scale: 1:300

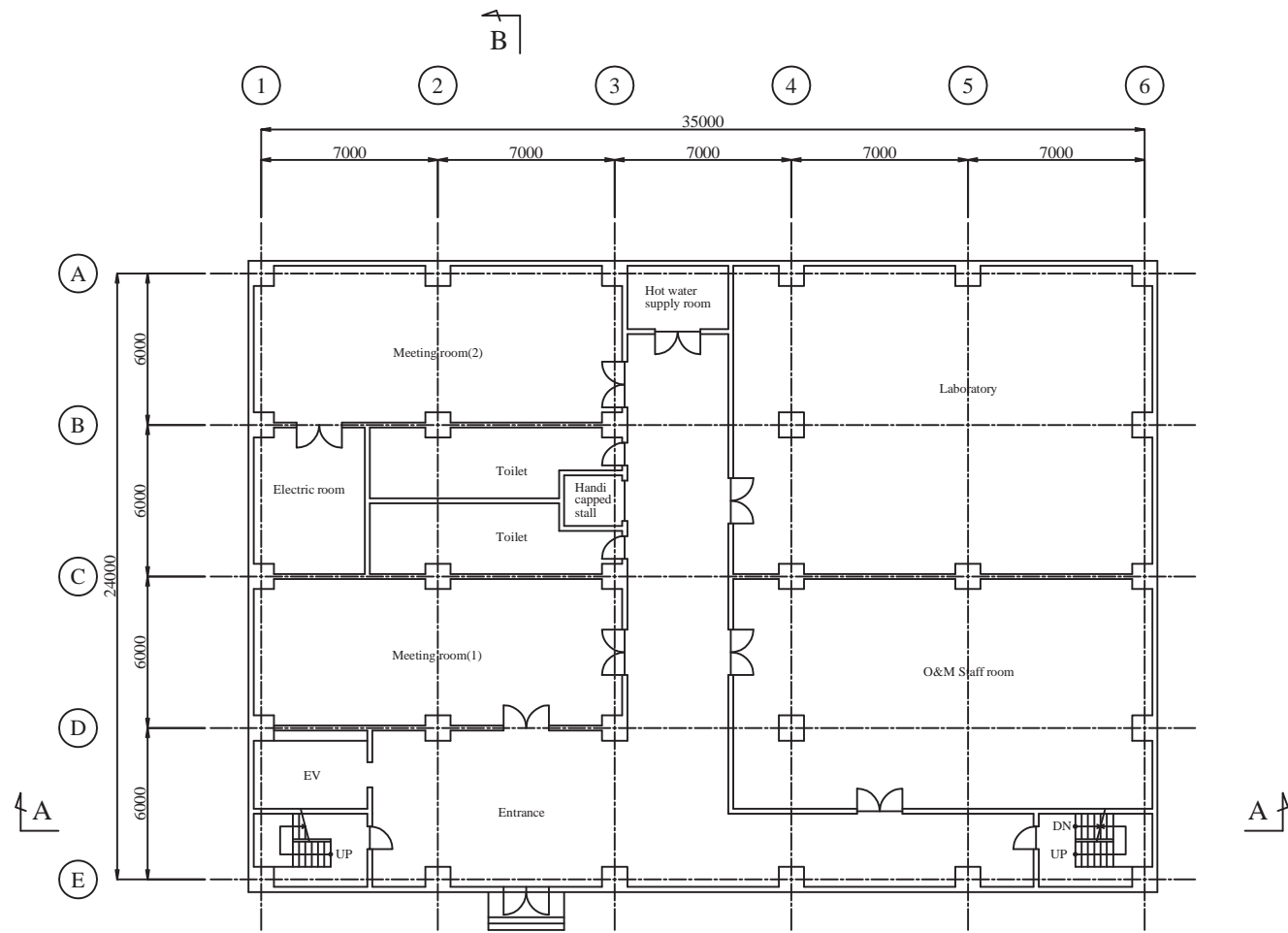


A-A SECTION SC 1:300

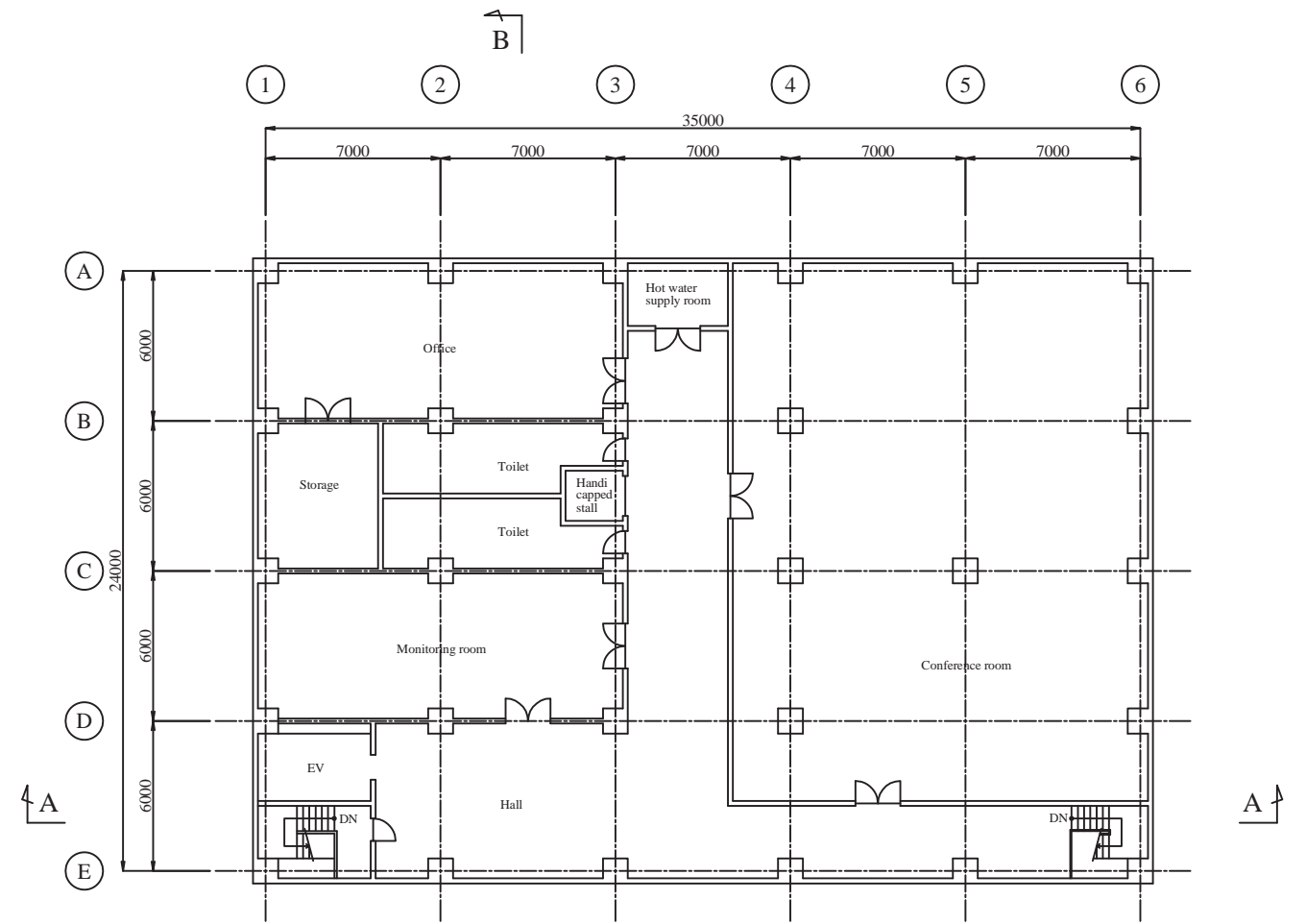


B-B SECTION SC 1:300

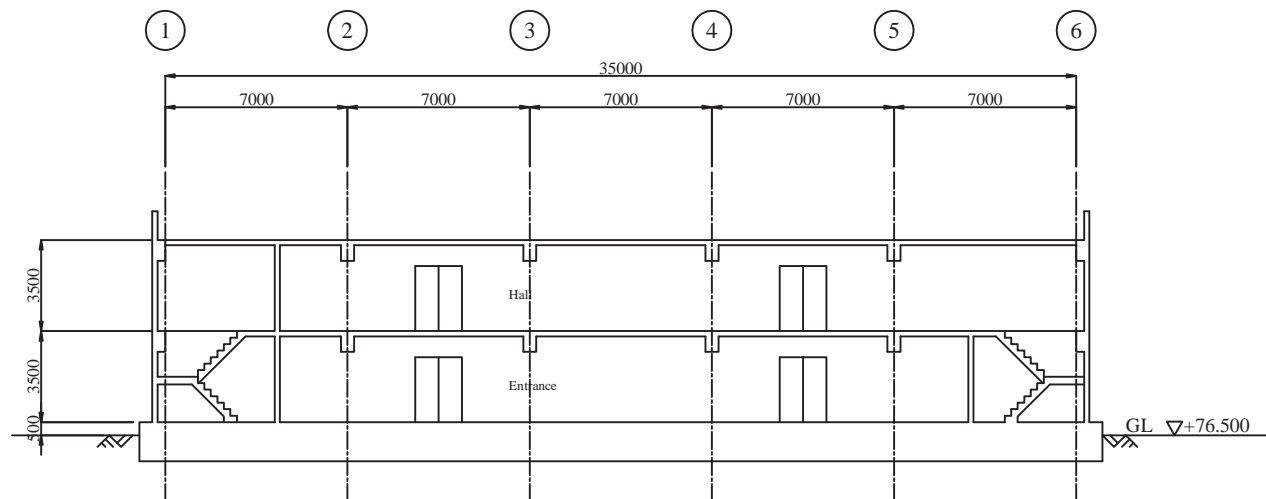
PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Veliko Selo Wastewater Treatment Plant	Drw no: WWTP-27
Title: Sludge Dewatering Building	Scale: 1:300



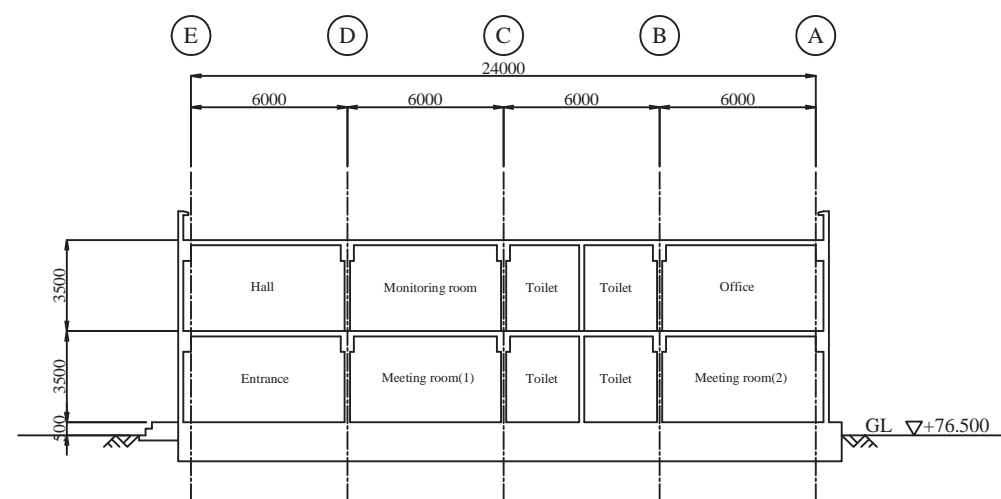
GROUND FLOOR PLAN SC 1:300



1 FLOOR PLAN SC 1:300



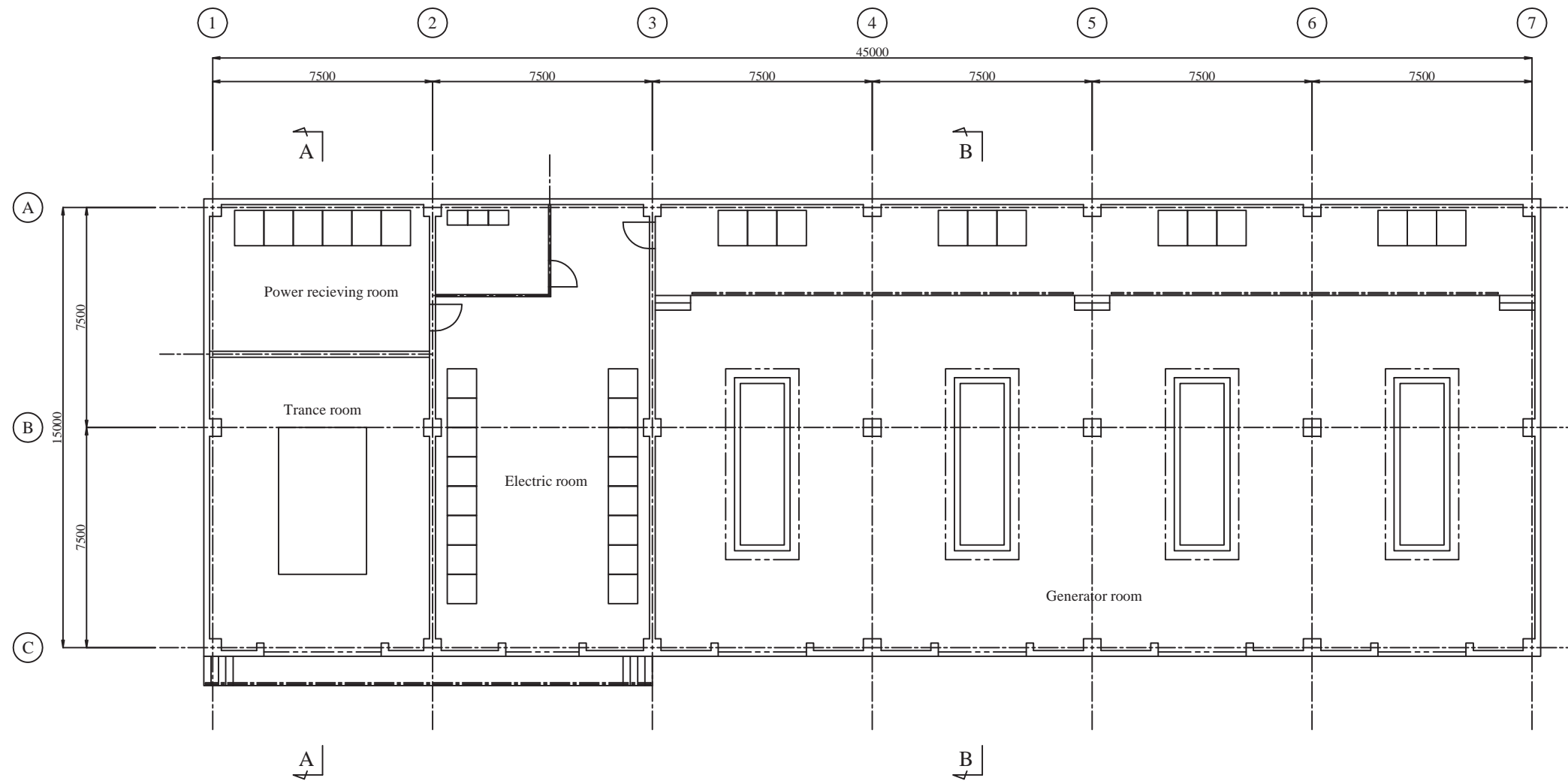
A-A SECTION SC 1:300



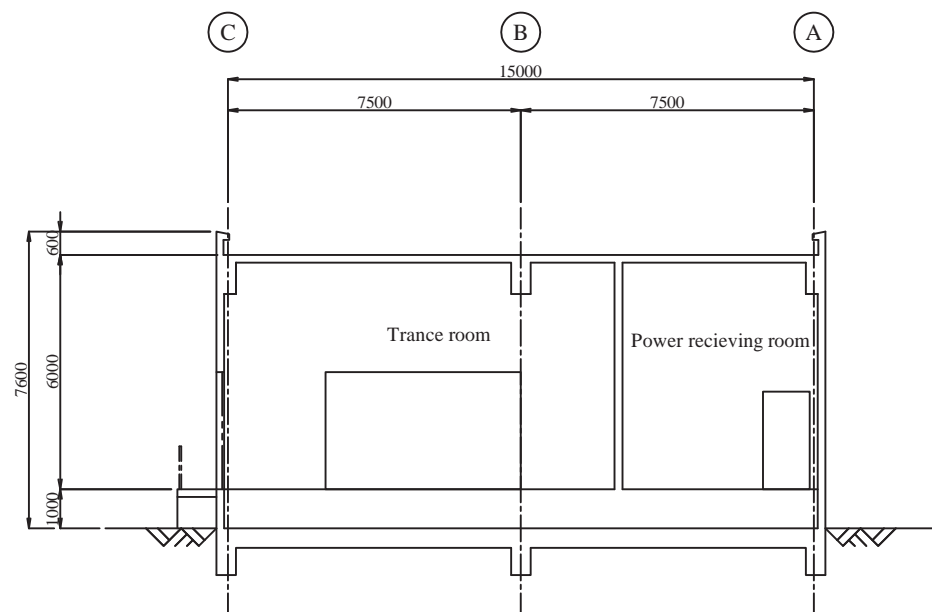
B-B SECTION SC 1:300

\*GF +77.00 m  
\*GL +76.50m

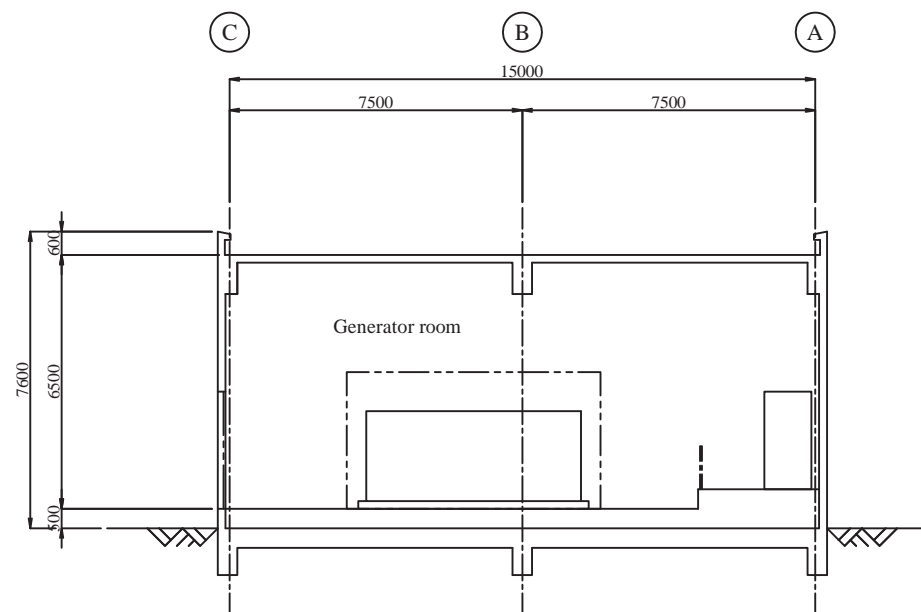
PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Veliko Selo Wastewater Treatment Plant	Drw no: WWTP-28
Title: Administration Building	Scale: 1:300



GROUND FLOOR PLAN SC 1:200



A-A SECTION SC 1:200



B-B SECTION SC 1:200

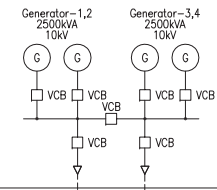
PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Veliko Selo Wastewater Treatment Plant	Drw no: WWTP-29
Title: Substation and Generator Building	Scale: 1:200

Electric power Distribution Company

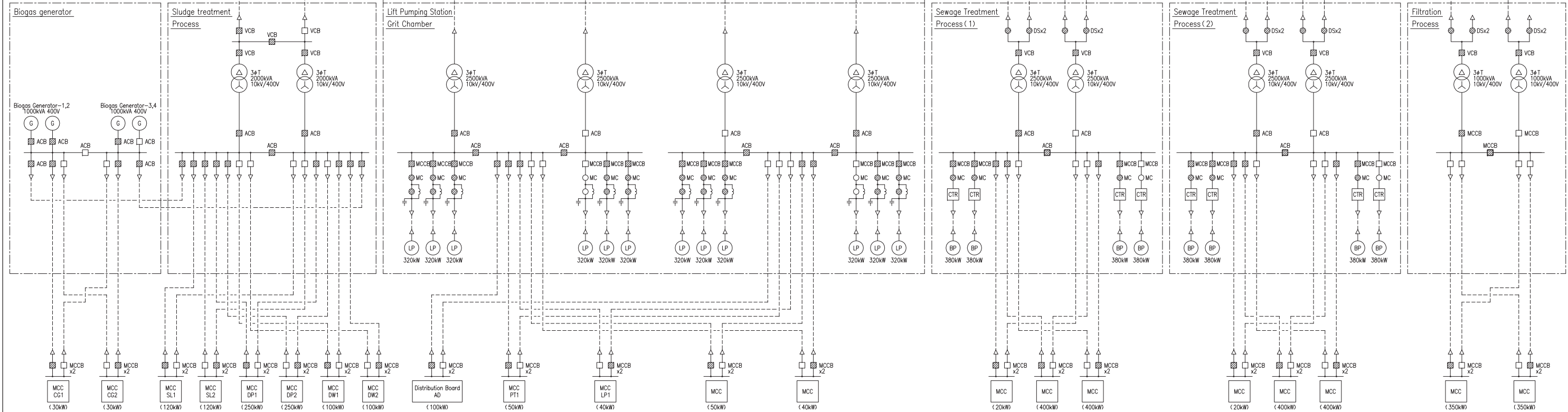
WWTP "VELIKO SELO"  
(Peak Demand = 9000kW)

Main Substation  
Generator

No.1,2  
35kV 3#3W



	Nos.	Total Capacity (MVA)
Transformer (35kV/10kV at primary voltage)	(1) +12=13	(12.5) +26=38.5
Generator (Standby/Biogas)	2+4=6	10+4=14
Circuit Breaker (35kV/10kV/0.4kV)	(1) +33+20=54	—



Code	Description	Power (kW)
CG1	Auxiliary Equipment for Generator 1,2	30kW
CG2	Auxiliary Equipment for Generator 3,4	30kW
SL1	Sludge Treatment (Thickener) Train 1	120kW
SL2	Sludge Treatment (Thickener) Train 2	120kW
DP1	Sludge Digestion Process Train 1	250kW
DP2	Sludge Digestion Process Train 2	250kW
DW1	Sludge Dewatering Process Train 1	100kW
DW2	Sludge Dewatering Process Train 2	100kW
Total IM Capacity		1000kW

Code	Description	Power (kW)
AD	Administration Building	100kW
LP	Lift Pump 1 - 12 (2 for standby)	3200kW
PT1	Pre Treatment Train 1	50kW
LP1	Auxiliary Equipment for Pump Group 1	40kW
PT2	Pre Treatment Train 2	50kW
LP2	Auxiliary Equipment for Pump Group 2	40kW
Total IM Capacity		3480kW

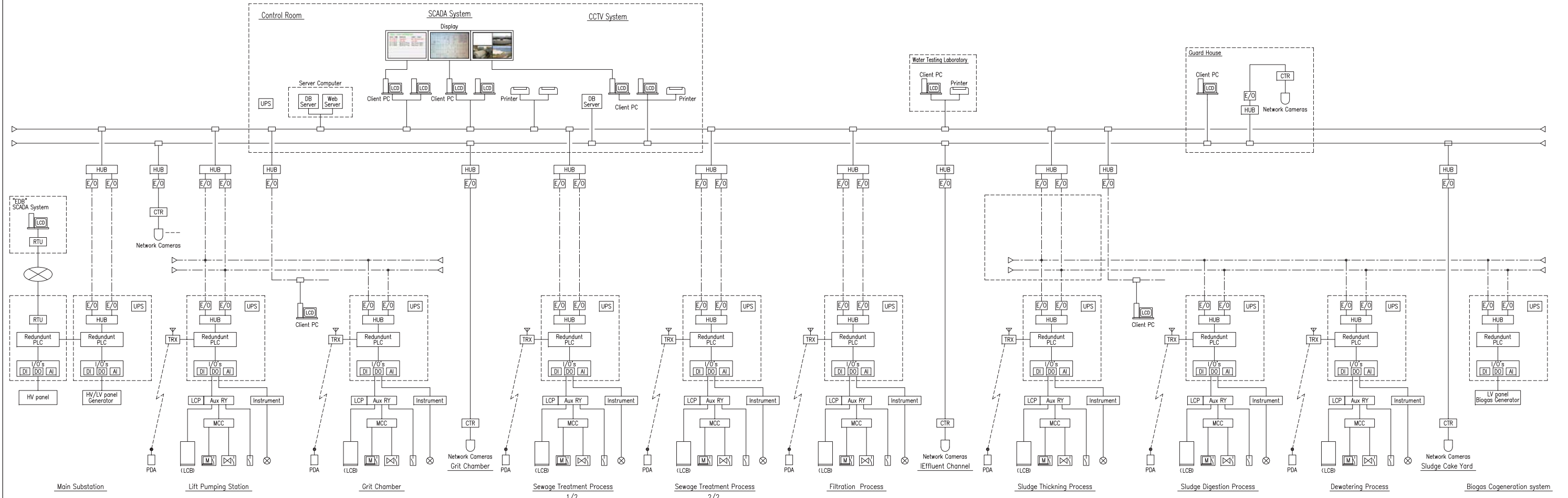
Code	Description	Power (kW)
BL	Blower 1 - 8 (2 for standby)	2280kW
BL1	Auxiliary Equipment for Blower Group 1	20kW
STP1-1	Sewage Treatment Process Train 1-1	400kW
STP1-2	Sewage Treatment Process Train 1-2	400kW
BL2	Auxiliary Equipment for Blower Group 2	20kW
STP2-1	Sewage Treatment Process Train 2-1	400kW
STP2-2	Sewage Treatment Process Train 2-2	400kW
Total IM Capacity		3920kW

Code	Description	Power (kW)
FP1	Filtration Process Train 1	350kW
FP2	Filtration Process Train 2	350kW
Total IM Capacity		700kW

PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE

Components: Mostar Pumping Station	Draw no: WWTP-30
Title: Electrical System(Singl Line Diagram)	Scale: NONE

# SCADA System configuration



SCADA System	
DB	Data Base Server
Web	Web Server
HUB	Network Hub Unit
PLC	Programable Logic Controller
I/O's	Input Output Units
AI	Analog Input Unit (DC4-20mA,1-5V,etc.)
DI	Digital input Unit (On/Off,etc.)
AO	Analog Output Unit
RTU	Remoto Terminal Unit
E/O	Electrical-to-Optical Converter
TRX	Tranciever for Wireless Cumunication
CTR	Control Unit for IP Camera

Control System	
HV/LV	High Voltage/Low Voltage Switch gear
MCC	Motor Control Center
Aux RY	Auxiliary Relay Cubicle
Instrument	Instrument Cubicicle
LCP	Local Control Panel
LCB	Local Control Box
PDA	Personal Digital Assistant

**SCADA System (bold line)**

Purpose of SCADA

- Efficient operation.
- Modernization of operation.
- Automatic control.
- Sharing of information.
- Energy saving.
- Good Use of Man power.
- Active Implementation of IT.

**Advanced Control System**

- Online Self-tuning PID control
- Feedforward Control
- Database Mining
- Forecasting Future Trend
- Knowledge Base DB Serching

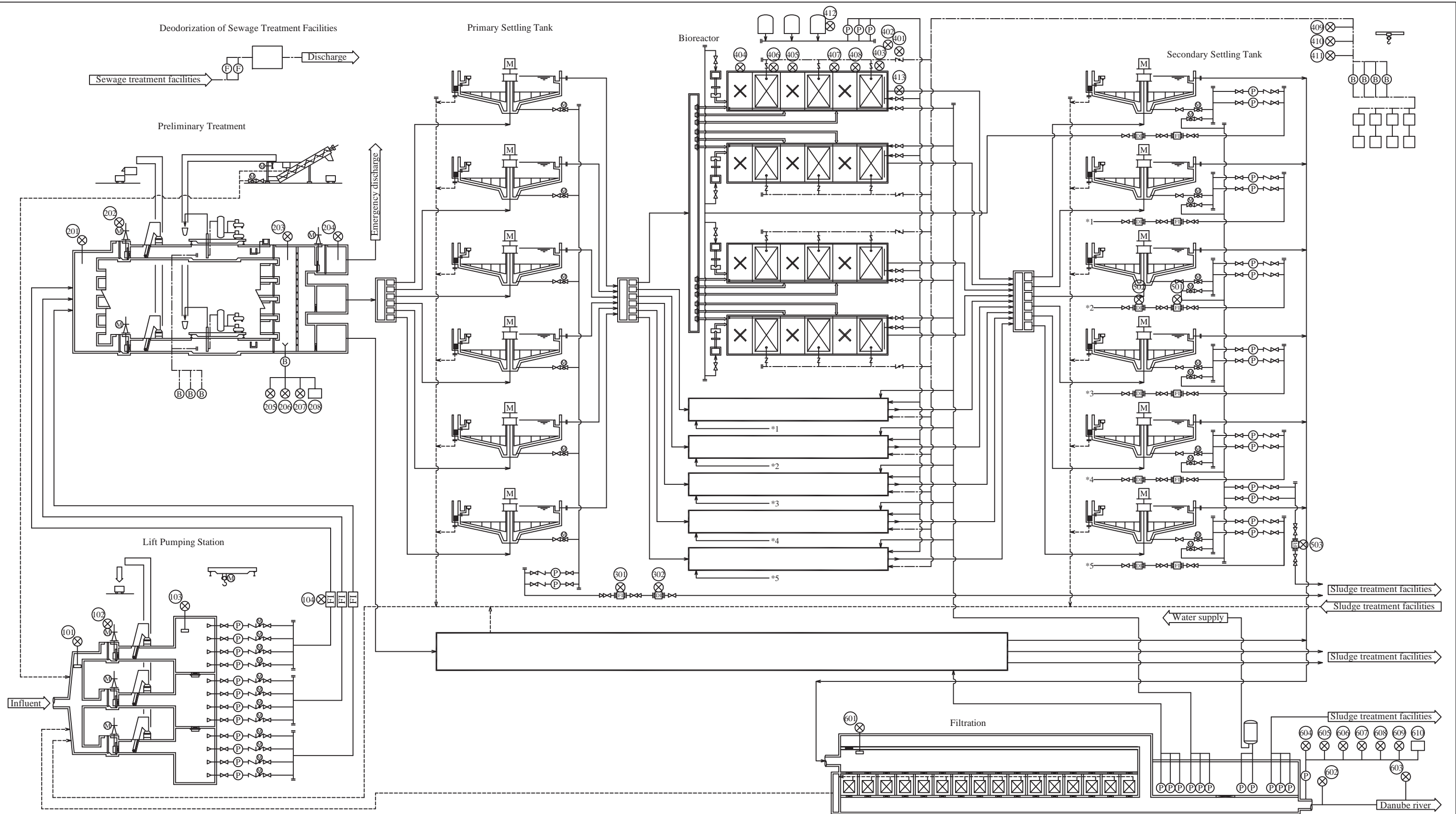
**CCTV System (fine line)**

The purpose of the video monitoring system is for STP's security system and visual monitoring for operation and control. Each network camera has the control function of pan/zoom/focus/lighting and selecting the recording mode. The following view points are suitable for each purpose.

- Influent chamber / Effluent river
- Sludge dewatering machine / drying yard
- Biogas generator
- Main entrance, gateway and road

PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE	
Components: Mostar Pumping Station	Drw no: WWTP-31
Title: SCADA System Configuration	Scale: 1:200





No	Item	Type of Sensor	nos
101	Influent well level	Microwave level meter	1
102	Inlet gate opening position	Potentiometer	3
103	Pump well level	Microwave level meter	3
104	Lifting sewage flow	Ultrasonic flowmeter	3
201	Inlet well level	Microwave level meter	1
202	Inlet gate opening position	Potentiometer	-
203	Effluent well level	Microwave level meter	1
204	Emergency discharge channel level	Microwave level meter	1
205	Influent sewage Temperature	RTD (resistance temperature detector)	1
206	Influent sewage pH	Electrode type sensor	1
207	Influent sewage Turbidity	Optical (infrared) backscatter method	1
208	Composite sampler	50 samples or more	1

No	Item	Type of Sensor	nos
301	Raw sludge flow	Electro-magnetic flowmeter	2
302	Raw sludge turbidity	Laser beam type sludge density meter	2
401	Aerobic bioreactor air flow	Orifice type flowmeter	48
402	Temperatur	RTD	2
403	DO	Fluorescent DO electrode sensor	48
404	pH	Electrode type sensor	48
405	ORP	Electrode type sensor	48
406	MLSS	Optical (infrared) backscatter method	48
407	Alkalinity meter		2
408	ammonium meter		1+1
409	Blower outlet air flow	Orifice type flowmeter	2
410	Blower outlet pressure	Semiconductor strain guage type	2
411	Blower outlet air temperature	RTD	2

No	Item	Type of Sensor	nos
412	Coagulant tank level	Ultrasonic level meter	6
413	Coagulant dosing flow	Electro-magnetic flowmeter	48
501	Return sludge flow	Electro-magnetic flowmeter	12
502	Return sludge turbidity	Laser beam type sludge density meter	12
503	Excess sludge flow	Electro-magnetic flowmeter	2

No	Item	Type of Sensor	nos
601	Inlet channel level	Ultrasonic level meter	1
602	Effluent channel flow	Parshall flume (Ultrasonic level meter)	1
603	Danube river level	Ultrasonic level meter	1
604	Effluent Temperature	RTD (resistance temperature detector)	1
605	Effluent pH	Electrode type sensor	1
606	Effluent Turbidity	Optical (infrared) backscatter method	1
607	Effluent COD		1
608	Effluent TN		1
609	Effluent TP		1
610	Composite sampler	50 samples or more	1

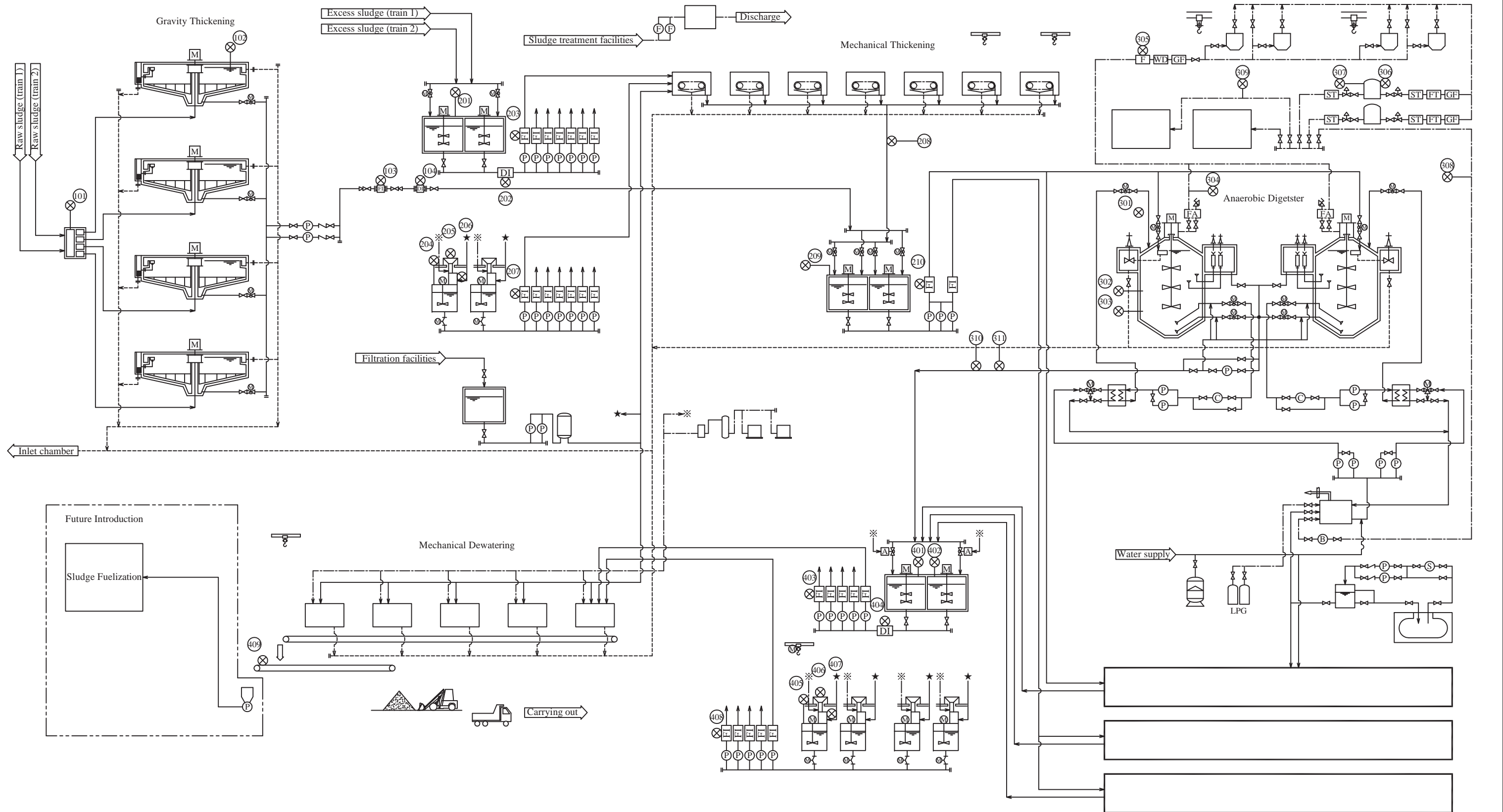
Legend		Legend	
L	Level meter	MLSS	Mixed liquor suspended solids
F	Flow meter	Tub	Turbidity
D	Densiy meter	COD	Chemical oxygen demand
Z	Position	TN	Total nitrogen
W	Weight	TP	Total phosphorus
T	Temperature	SP	Sampling system
pH	Potential hydrogen		
ORP	Oxidation reduction potential		
DO	Dissolved oxygen		

**PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE**

Components: Veliko Selo Wastewater Treatment Plant      Drw no: WWTP 32

Title: Instrumentation List(WWTP)      Scale: NONE

Deodorization of Sludge Treatment Facilities



No	Item	Type of Sensor	nos	No	Item	Type of Sensor	nos	No	Item	Type of Sensor	nos	No	Item	Type of Sensor	nos
101	Distribution well level	Microwave level meter	1	201	Excess sludge tank level	Microwave level meter	2	301	Digester inlet flow	(Calculated by PLC)	-	401	Digester sludge level	Microwave level meter	2
102	Thickener sludge level	Ultrasonic sludge level indicator	4	202	Excess sludge density	Laser beam type sludge density meter	1	302	Digester Temperature 1	RTD (resistance temperature detector)	8	402	Digested sludge pH	Electrode type sensor	1
103	Thickened sludge flow	Electro-magnetic flowmeter	1	203	Excess sludge supply flow	Electro-magnetic flowmeter	7	303	Digester Temperature 2	RTD (resistance temperature detector)	8	403	Digested sludge supplying flow	Electro-magnetic flowmeter	5
104	Thickened sludge density	Laser beam type sludge density meter	1	204	Coagulant tank level	Ultrasonic level meter	2	304	Generated biogas flow	Oloffice type gas flowmeter	8	404	Digested sludge supplying density	Laser beam type sludge density meter	1
				205	Coagulant hopper weight	Load cell type weight sensor	2	305	Generated biogas total flow	Oloffice type gas flowmeter	1	405	Coagulant tank level	Ultrasonic level meter	2
				206	Coagulant feeder flow	(Calculated by PLC)	2	306	Biogas holder level	Potentiometer	2	406	Coagulant hopper weight	Load cell type weight sensor	2
				207	Coagulant dosing flow	Electro-magnetic flowmeter	7	307	CH4 meter		1	407	Coagulant feeder flow	(Calculated by PLC)	2
				208	Thickened sludge flow	Electro-magnetic flowmeter	1	308	Biogas flow for water heater	Oloffice type gas flowmeter	4	408	Coagulant dosing flow	Electro-magnetic flowmeter	2
				209	Thickened sludge tank level	Microwave level meter	2	309	Biogas flow for biogas generator	Oloffice type gas flowmeter	2	409	Sludge cake weight	Load cell type weight sensor	1
				210	Thickened sludge transfer flow	Electro-magnetic flowmeter	2	310	Digested sludge flow	Electro-magnetic flowmeter	4				
								311	Digested sludge density	Laser beam type sludge density meter	4				

Legend		Legend	
L	Level meter	MLSS	Mixed liquor suspended solids
F	Flow meter	Tub	Turbidity
D	Density meter	COD	Chemical oxygen demand
Z	Position	TN	Total nitrogen
W	Weight	TP	Total phosphorus
T	Temperature	SP	Sampling system
pH	Potential hydrogen		
ORP	Oxidation reduction potential		
DO	Dissolved oxygen		

PREPARATORY SURVEY ON THE SEWERAGE SYSTEM IMPROVEMENT PROJECT FOR THE CITY OF BELGRADE

Components: Veliko Selo Wastewater Treatment Plant  
 Title: Instrumentation List(STP)  
 Drw no: WWTP 33  
 Scale: NONE