

## FLOOD PROTECTION OF NEW BELGRADE AND ZEMUN

Flood Defence line (FDL) on Danube right bank (Zemun area)  
with Flood Defence Mobile Equipment (FDME)  
for the protection of New Belgrade and Zemun

**Length of the FDL: 4470.29m**

**Length of the FDL with FDME: 2035.00m**

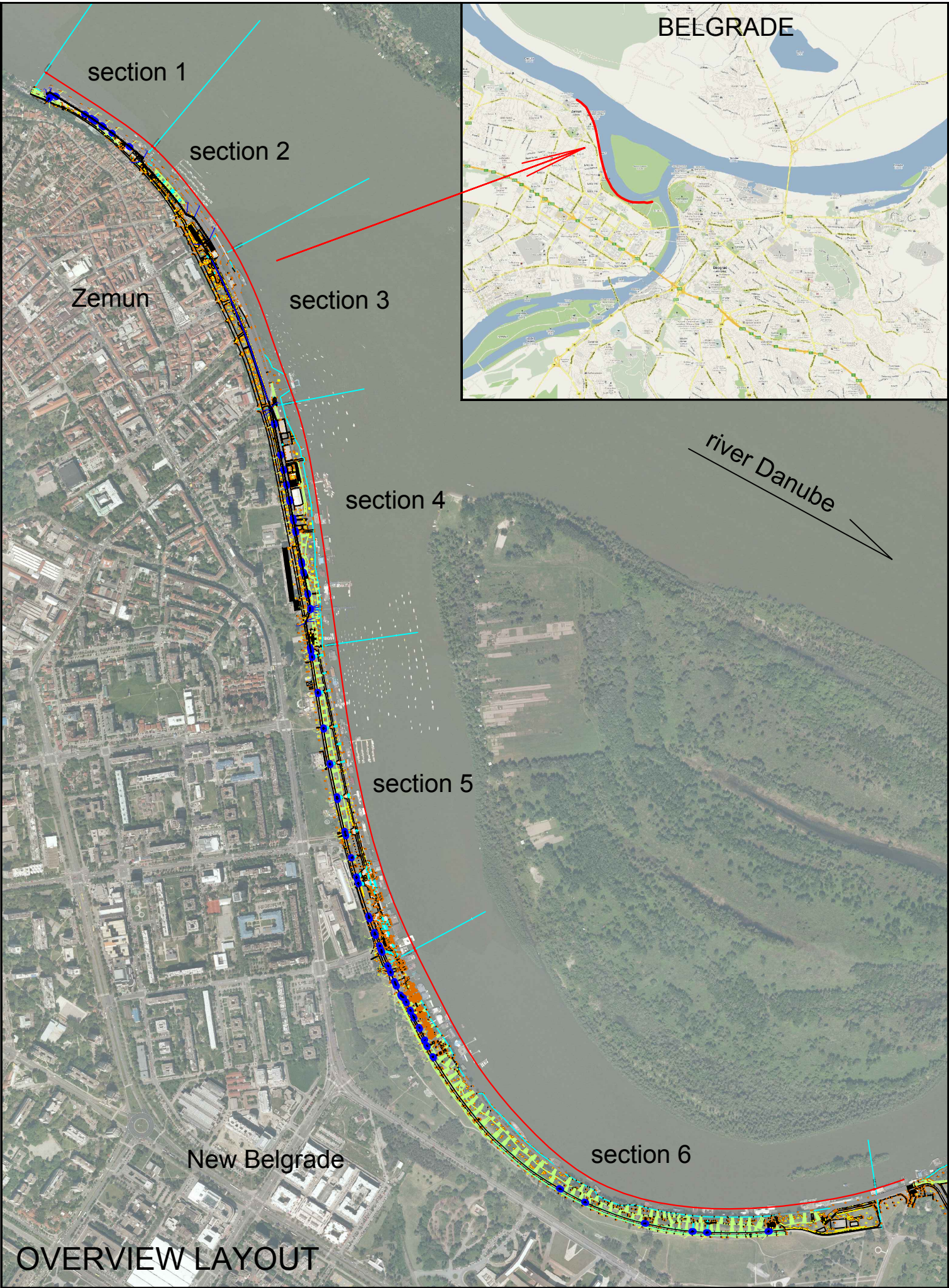
**Length of the FDME: 2035.00m**

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**Belgrade, 2017.**





# FLOOD PROTECTION OF NEW BELGRADE AND ZEMUN

Flood defence line (FDL) on Danube right bank (Zemun area) with Flood defence  
Mobile Equipment (FDME) for the protection of New Belgrade and Zemun

## SECTIONS 1 - 6

Length of the FDL : 4470.29m  
Length of the FDL with FDME: 2035.00m  
Length of the FDME: 2035.00m



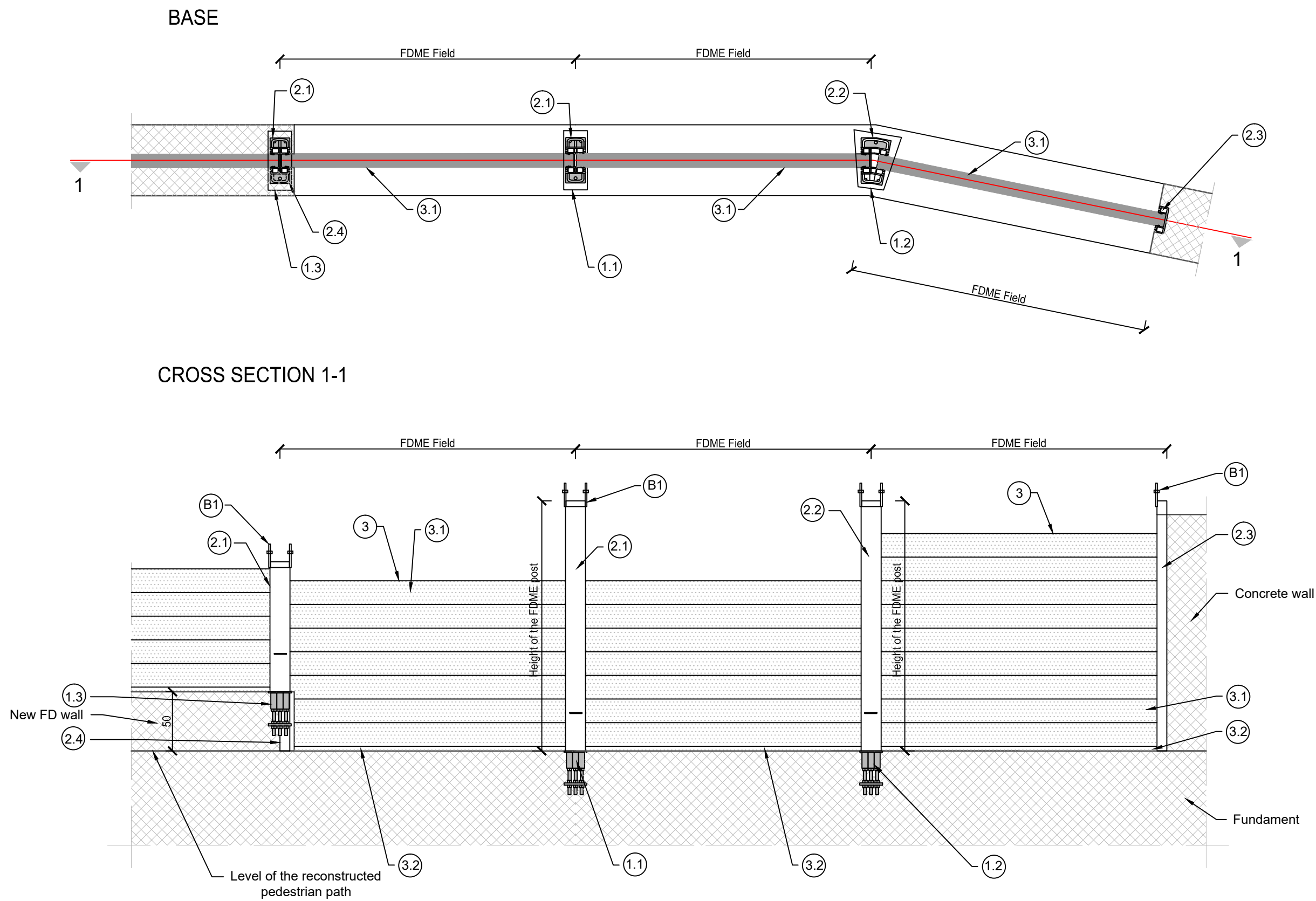
Section	Description		L FDL	L FDL with L FDME	L FDME
	from	to	m	m	m
1	club "Radecki"	restaurant "Šaran"	355	355	355
2	restaurant "Šaran"	restaurant "Venecija"	365	365	365
3	restaurant "Venecija"	"Hidrobaza"	440	440	440
4	"Hidrobaza"	quay in front of the hotel "Jugoslavija"	680	680	680
5	quay in front of the hotel "Jugoslavija"	hotel "Jugoslavija"	905.92	97.5	97.5
6	hotel "Jugoslavija"	the confluence of the Sava into the Danube	1724.37	97.5	97.5
Sum			4470.29	2035	2035



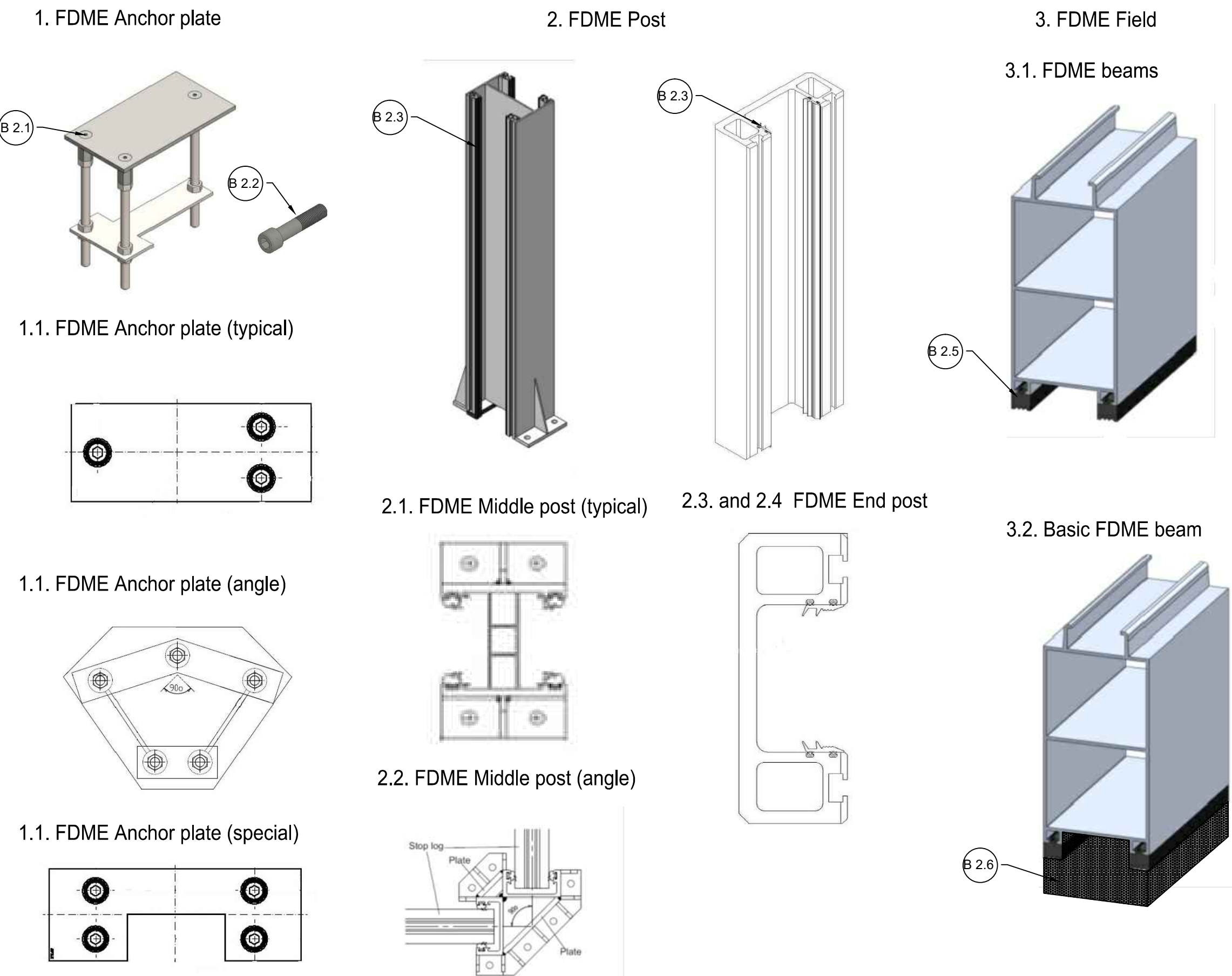
DESCRIPTION OF FDME PARTS  
(with tools, spare parts, consumables, accessories)

Drawing labels according to IS	FLOOD DEFENSE MOBILE EQUIPMENTS, SPARE PARTS, CONSUMABLES, TOOLS AND ACCESSORIES	DESCRIPTION
A.	FDME PARTS	Elements of Flood Defense Mobile Equipment:
A.1	FDME ANCHOR PLATE (with protection screws):	permanently support of the FDME (permanently installed in FD wall)
1.1.	Types of FDME Anchor plates:	FDME Anchor plate (typical): for installation of the typical FDME Middle Posts FDME Anchor plate (angle): for installation of the angular FDME posts FDME Anchor plate (special): for installation of the typical FDME posts on a FDME End Post 2
1.2.		
1.3.		
1.4.	Protection screws	: for anchor plates (anti-vandalism)
A.2	FDME POST (with installations screws):	parts of the FDME (for temporary installation during flood defense in anchor plates)
	Height of the FDME Post:	height of the posts (for installation of horizontal beams) including additional height for installation of the FDME beams fastening accessories
	FDME Middle posts:	for temporary installation during flood defense in anchor plates
2.1.	FDME Middle Post (typical):	in the FDL direction
2.2.	FDME Middle Post (angle):	on the angular points of the FDL route
	FDME End Post:	permanent post at the beginning and at the end of FDL with FDME
2.3.	FDME End Post 1 :	on the end of the section
2.4.	FDME End Post 2:	on the ends of the exit
2.5.	Installation screws	Screws for installation of posts in anchor plates (packed in aluminum boxes of the appropriate dimensions and suitable for carrying without deformation)
A.3	FDME FIELD (includes horizontal beams with fastened accessories)) Length of FDME Field:	part of the FDME between posts formed by horizontal beams (temporary installation during flood defense) optimal distance of axis (between posts): <b>BENEFICIARY REQUIREMENTS: uniform beam length 2,5m</b>
3.1.	FDME beams:	horizontal parts of FDME field (with integrated rubber sealing parts) for temporary installation during flood defense - <b>BENEFICIARY REQUIREMENTS: uniform beams high h=0,2 m.</b> The beams width (b) will be proposed by the producer depending on the static calculation of the FDME stability (in relevant flood conditions and impacts)
3.2.	Basic FDME beam	special beam on the bottom of FDME field with integrated longitudinal sealing rubber support
3.3.	FDME beams accessories	accessories for fastening the FDME beams
A.5	FDME INSTALLATION TOOLS	Tools for mounting/dismounting of the FDME parts: standard Chrom Vanadium tools with interchangeable parts (according screws dimensions)
A.5.2	Ratchet Torque Wrench with Hex Keys	For mounting/dismounting of the protection screws on the anchor plates
A.5.3	Ratchet Torque Wrench with deep socket	For mounting/dismounting of the installation screws on the anchor plates
A.8	ACCESSORIES FOR FDME	
A.8.1	Containers for FDME	Standard container (20 ft) side-opening of the entire site in full hole
A.8.2	Containers for consumables	Standard container (20 ft) front opening, with shelves on the walls
C.	SPARE PARTS OF FDME, CONSUMABLES	
C.1	SPARE PARTS OF FDME	<b>BENEFICIARY REQUIREMENTS:</b> for all types of FDME parts: Anchor plates; Posts; Beams
C.2	CONSUMABLES OF FDME	
2.1	Protection screws	Protection screws for anchor plates(anti-vandalism type)
2.2	Installation screws	Screws for installation of posts
2.3	Post rubber stripes	Vertical rubber profiled stripes for posts
2.4	FDME beams accessories	Accessories for fastening the FDME beams
2.5	Horizontal beams rubber	Horizontal beams rubber
2.6	Horizontal bottom beams rubber	Horizontal rubber seal on the bottom of the basic beam

CHARACTERISTIC DETAIL



PROSPECTS OF FDME PARTS



NOTE: This drawing detail of FDME parts are general not obligatory

SECTION 1 -SECTION 6		TOTAL RECAPITULATION						
Drawing labels according to TS	L FDL=4470.29m L FDL with FDME= 2035m L FDME=2035m	FDME Anchor plate	FDME post			FDME Field Distance of axis: 2.5m		BEAMS: Number of beams h/b: 20/b cm including basic beams with bottom rubber seal (as number of FDME fields)
			FDME post h=1.0m	FDME post h=2.0m	FDME post h=0.5m			
1	2	3	4	5	6	7		8
	description	pieces	pieces	pieces	pieces			pieces
A.	FDME PARTS	Elements of Flood Defense Mobile Equipment						
A.1	FDME Anchor plate (with protection screws):							
1.1	FDME Anchor plate for FDME Middle Post (typical)	730						
1.2	FDME Anchor plate for FDME Middle Post (angle)	19						
1.3	FDME Anchor plate for FDME End Post (special)	103						
1.4	Protection screws	According to manufacturer's design and instructions						
A.2	FDME post (with instalations screws):							
2.1	FDME Middle Post (typical)		440	390				
2.2	FDME Middle Post (angle)		14	5				
2.3	FDME End Post 1			1	2			
2.4	FDME End Post 2				101			
2.5	Installation screws	According to manufacturer's design and instructions						
A.3	FDME Field (includes horizontal beams with fastened accessories) Distance od axis: 2.5m							
3.1	FDME Field; h=1,0m 4 pieces of beams + 1 basic beam /field					368	fields	1835
	Surface area of field: 2.5m <sup>2</sup> /field					920	m <sup>2</sup>	
3.2	FDME Field; h=2,0m 9 pieces of beams + 1 basic beam /field					447	fields	4470
	Surface area of field: 5.0m <sup>2</sup> /field					2235	m <sup>2</sup>	
	SECTION 1-6 TOTAL PIECES	852	454	396	103	815		6305
3.3	FDME accessories for fastening the FDME beams (2 pieces/FDME field)					1630		
	TOTAL SURFACE OF FDME FIELDS					3155	m <sup>2</sup>	



SECTION 1 -SECTION 6		TOTAL RECAPITULATION					
Drawing labels according to TS	L FDL=4470.29m L FDL with FDME= 2035m L FDME=2035m	Detailed descriptions according TechSpec					
1	2	3					
	description	pieces					
A.5	FDME tools:	Tools for mounting/dismounting of the FDME parts: standard Chrom Vanadium tools with interchangeable parts (according screws dimensions)					
5.1	Ratchet Torque Wrench with Hex Keys		60				
5.2	Ratchet Torque Wrench with deep socket	60					
A.6.	FDME deployment machinery	Special machinery for deployment of the FDME and Equipment for works during flood defence (lighting, independent source of electricity supply)					
A.6.1	FDME deployment machinery	Special machinery for unloading, local transports and shipping of the FDME					
	Telehender (telescopic hender)		2				
A.7.	FDME Work equipment	Special equipments for works during flood defence activities (lighting, independent source of electricity)					
A.7.1	Power Generator	7kVA Three phase Power generator 7kVA with gasoline with four stroke engine with air cooling. Single phase and three phase supply. . kVA max.: 7 kVA					
			6				
A.7.2	Mobile light tower	Reflectors with mobile light tower minimum elevation of 5 m and min power 4x150 led with integrated					
			4				
A.8.	Storage containers						
A.8.1	Containers for FDME	Standard container(20 ft) Length: 5.90 m (19'4 " ), Width: 2.35 m (7'9"), Height: 2.39 m (7 "10"), side-opening of the entire site in full hole					
	Containers 20'	In accordance with the required number for transport and storage of equipment, selected by sections and pre-pared for machine loading and manipulation and with containers separately indicat-ed for spare parts.					
A.8.2	Containers	Standard container of (20 ft) Length: 5.90 m (19'4 " ), Width: 2.35 m (7'9"), Height: 2.39 m (7 "10"), front opening, with shelves on the walls (60 cm deep) lenght: 5m in 4 levels					
	Container 20'		1				



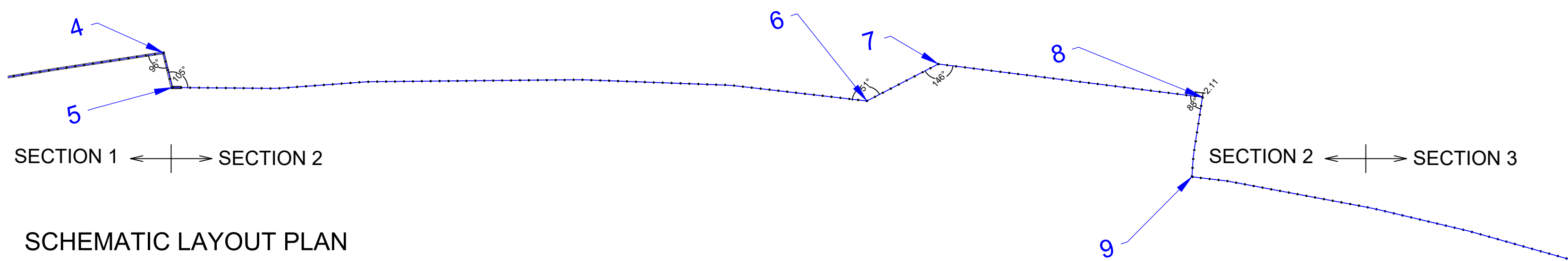
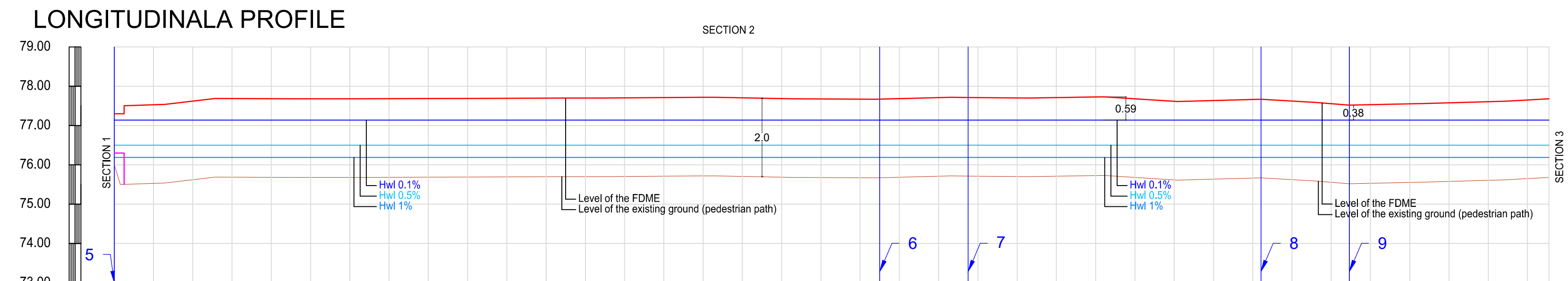
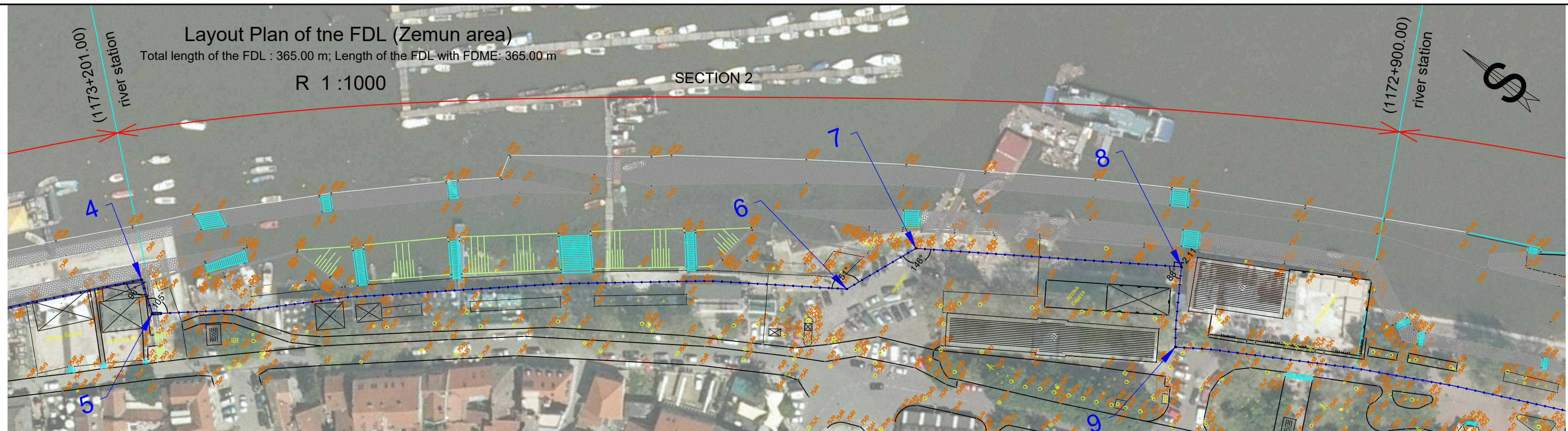
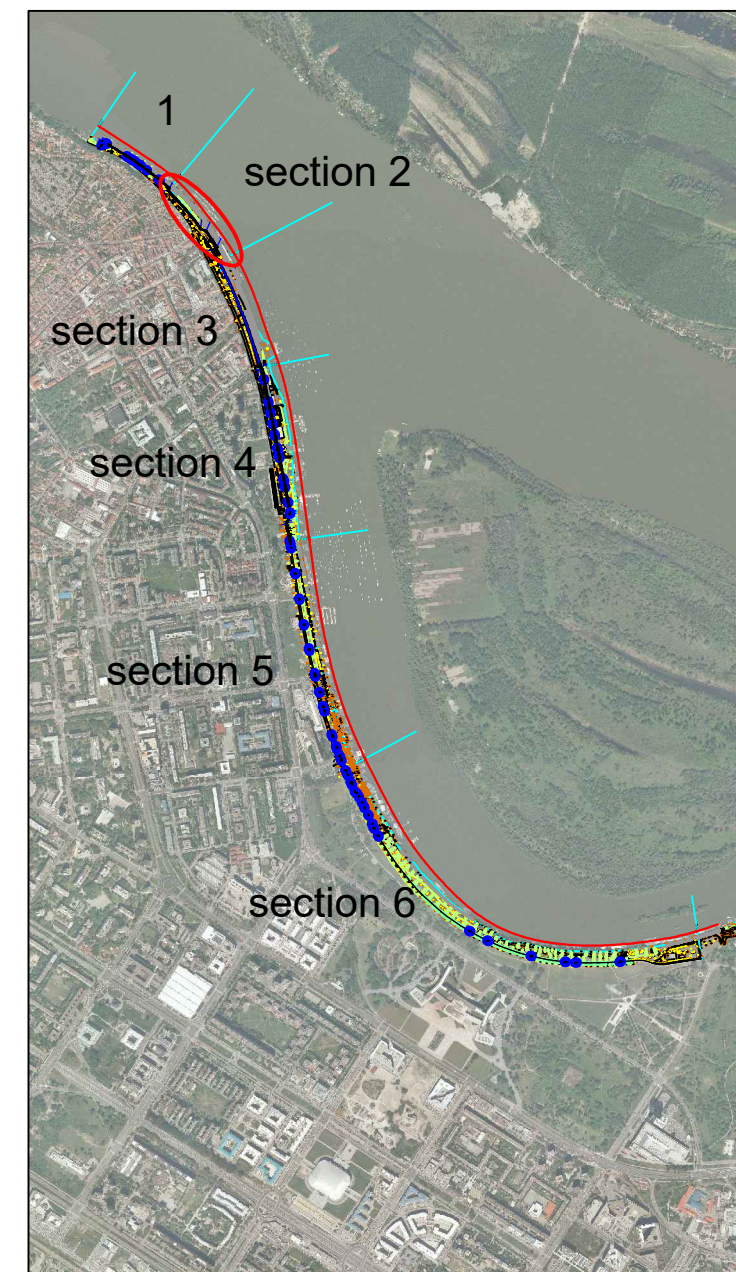
SECTION 1 -SECTION 6 TOTAL RECAPITULATION							
Drawing labels according to TS	L FDL=4470.29m L FDL with FDME= 2035m L FDME=2035m	FDME Anchor plates:	FDME post h=1.0m	FDME post h=2.0m	FDME post h=0.5m	FDME Field Distance of axis: 2.5m	BEAMS h/b: 20/b cm : 1) Number of beams 2) basic beams with bottom rubber seal
1	2	3	4	5	6	7	8
	description	pieces	pieces	pieces	pieces	pieces	pieces
<b>C</b>	<b>SPARE PARTS OF FDME, CONSUMABLES</b>						
<b>C.1</b>	<b>Spare parts of FDME</b>	BENEFICIARY REQUIREMENTS: for all types of FDME parts: Anchor plates; Posts; Beams					
<b>C.2</b>	<b>CONSUMABLES</b>						
2.1	Protection screws for anchor plates (anti-vandalism type)						
2.2	Screws for installation posts						
2.3	Vertical rubber profiled stripes for posts						
2.4	Accessories for fastening the FDME beams						
2.5	Horizontal beams rubber						
2.6	Horizontal rubber seal on the bottom of the basic beam						



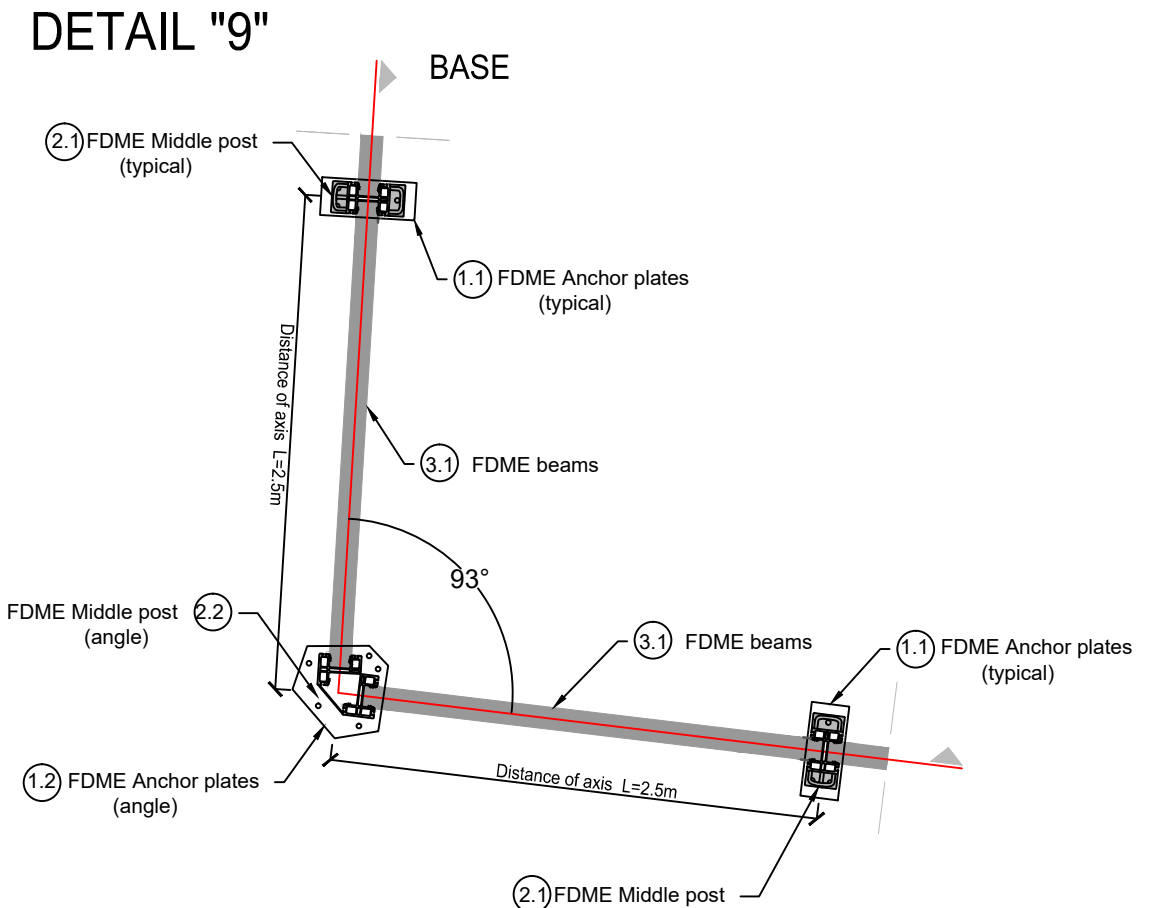
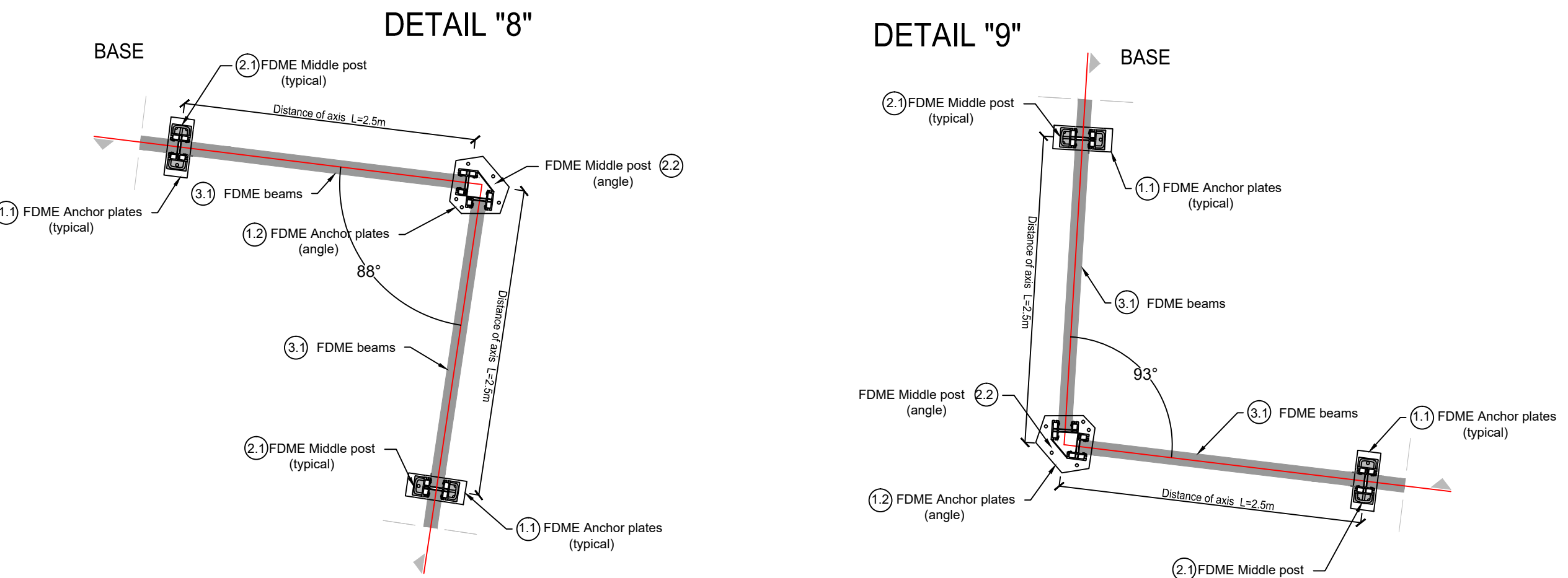
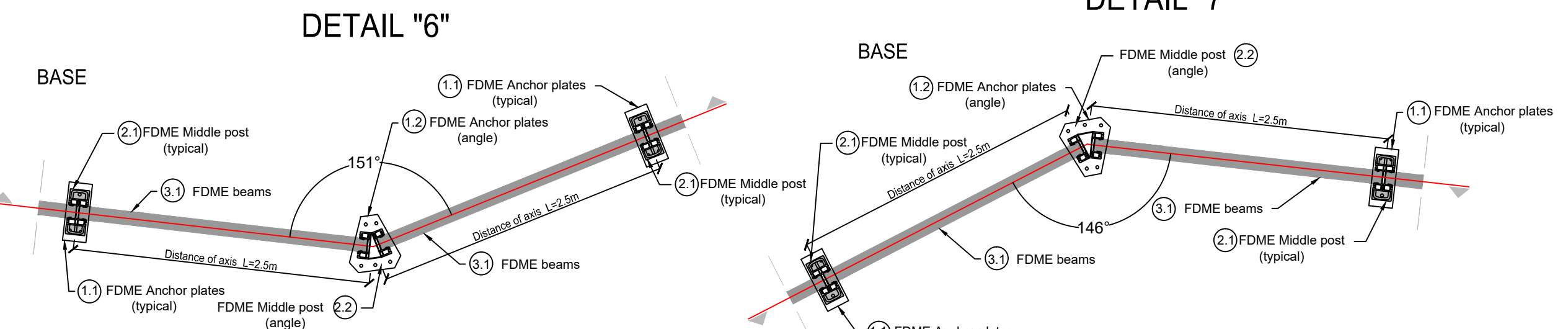




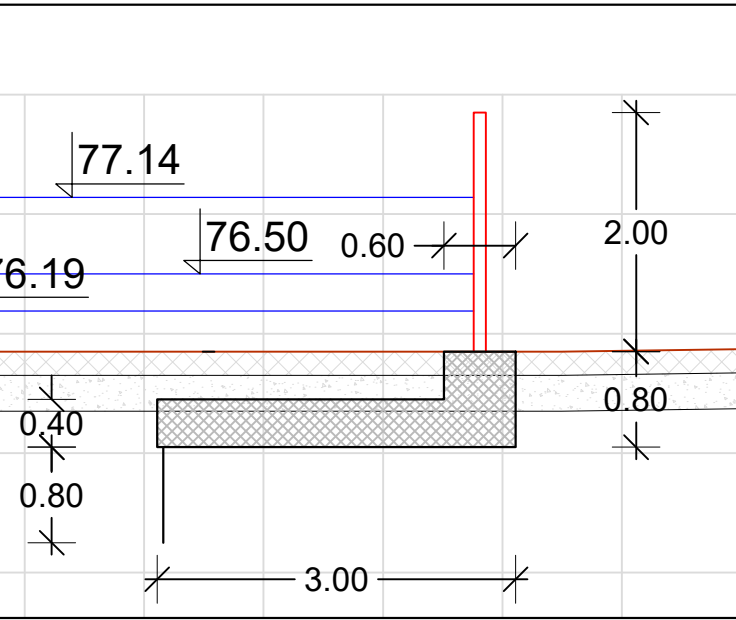
## LAYOUT PLAN OF THE FDL



## SCHEMATIC LAYOUT PLAN



## FOUNDATION OF FDME



## SPECIFICATION

RECAPITULATION SECTION 2							
Drawing labels	L FDL=365m L FDL with FDME= 365m L FDME=365m	FDME Anchor plate	FDME post			FDME Field Distance of axis: 2.5m	BEAMS: Number of beams h/b: 20b cm including basic beams with bottom rubber seal (as number of FDME fields)
1	2	3	4	5	6	7	8
	description	pieces	pieces	pieces	pieces		pieces
Elements of Flood Defense Mobile Equipment							
A.1 FDME Anchor plate (with protection screws):							
1.1	FDME Anchor plate for FDME Middle Post (typical)	141					
1.2	FDME Anchor plate for FDME Middle Post (angle)	4					
1.3	FDME Anchor plate for FDME End Post (special)	1					
A.2 FDME post (with installations screws):							
2.1	FDME Middle Post (typical)		1	141			
2.2	FDME Middle Post (angle)			4			
2.3	FDME End Post 1				1		
2.4	FDME End Post 2						
A.3 FDME Field (includes horizontal beams with fastened accessories):							
3.1	FDME Field; h=1,0m Surface area of field: 2.5m²/field						
3.2	FDME Field; h=2,0m Surface area of field: 5.0m²/field					146 fields	1460
						730 m²	
SECTION 2 TOTAL PIECES							
		146	1	145	1	146	1460
3.3	FDME accessories for fastening the FDME beams					292	
TOTAL SURFACE OF FDME FIELD							
						730 m²	

## FLOOD PROTECTION OF NEW BELGRADE AND ZEMUN

Flood defence line (FDL) on Danube right bank (Zemun area) with Flood defence Mobile Equipment (FDME) for the protection of New Belgrade and Zemun

## SECTION 2

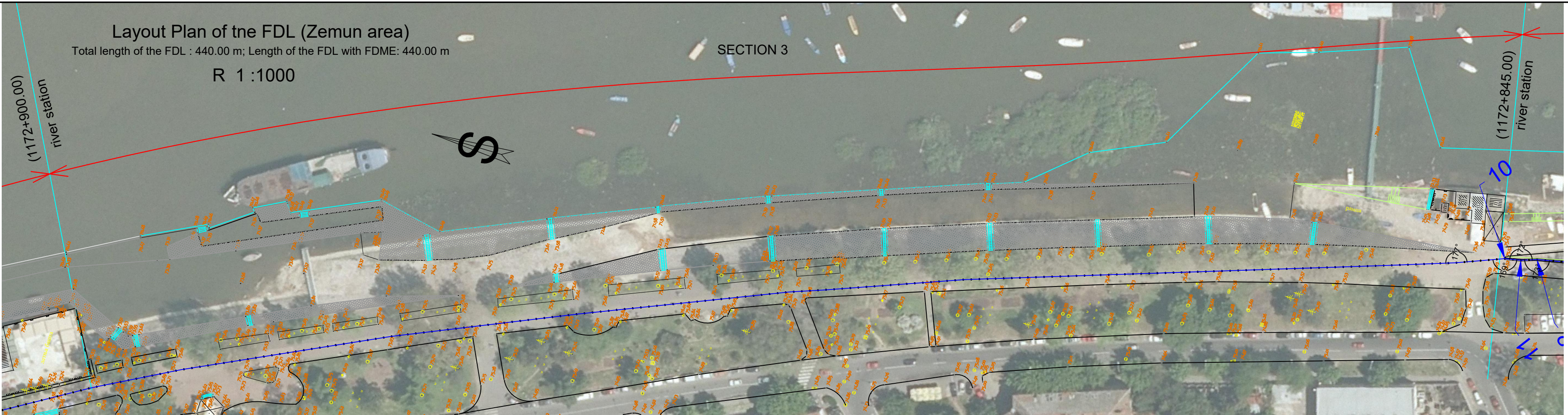
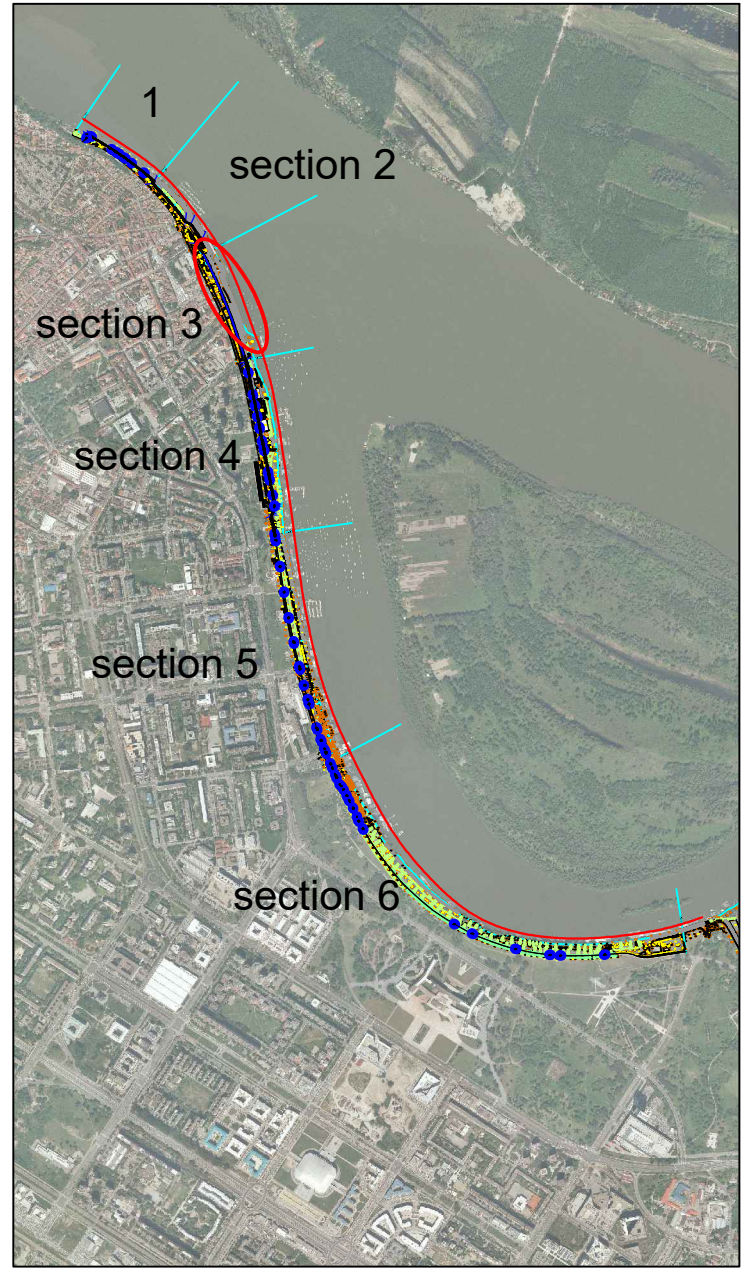
Length of the FDL with FDME: 365.00m

### LEGEND:

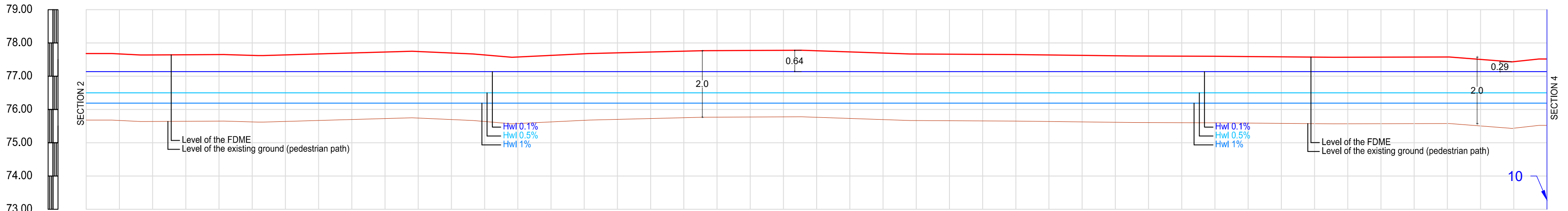
- Existing ground
- New FD wall
- Reconstructed pedestrian path
- Hwl 1%
- Hwl 0.5%
- Hwl 0.1%
- Level of the FDME
- Exit
- FDME post (angle)



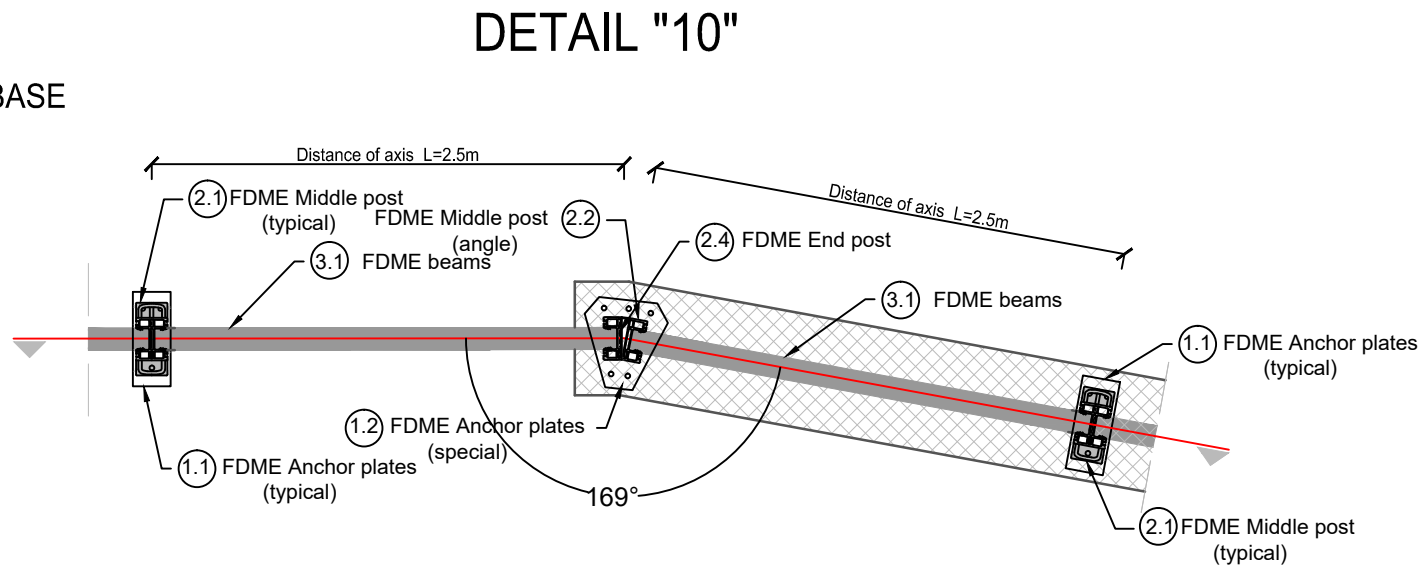
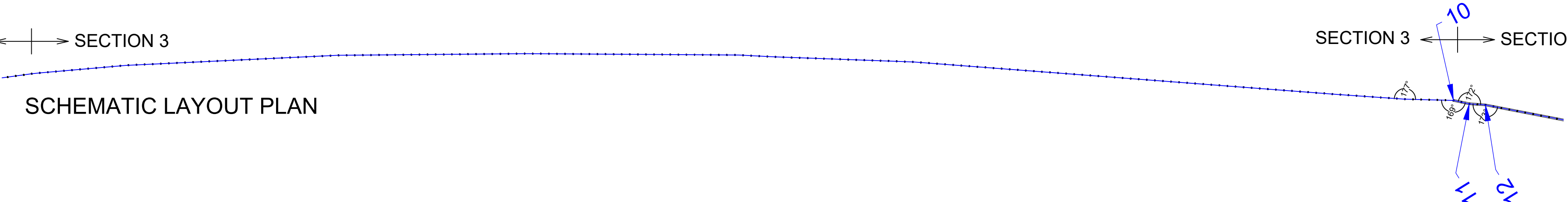
LAYOUT PLAN OF THE FDL



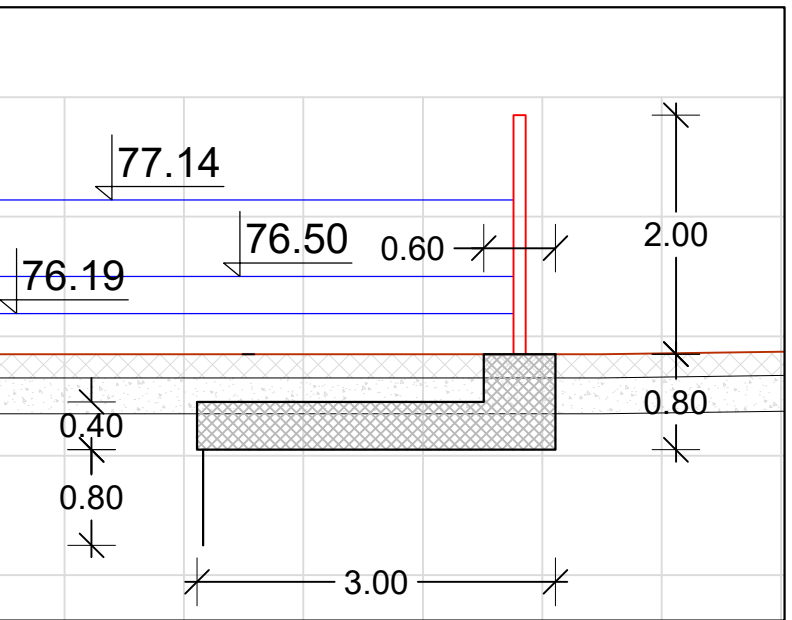
LONGITUDINALA PROFILE



SCHEMATIC LAYOUT PLAN



FOUNDATION OF FDME



SPECIFICATION

RECAPITULATION SECTION 3							
Drawing labels	L FDL=440m L FDL with FDME= 440m L FDME=440m	FDME Anchor plate	FDME post			FDME Field Distance of axis: 2.5m	BEAMS: Number of beams h/b. 20/b cm including basic beams with bottom rubber seal (as number of FDME fields)
1	2	3	4	5	6	7	8
	description	pieces	pieces	pieces	pieces		pieces
A. FDME parts							
Elements of Flood Defence Mobile Equipment							
A.1	FDME Anchor plate (with protection screws):						
1.1	FDME Anchor plate for FDME Middle Post (typical)	174					
1.2	FDME Anchor plate for FDME Middle Post (angle)	1					
1.3	FDME Anchor plate for FDME End Post (special)	1					
A.2	FDME post (with installations screws):						
2.1	FDME Middle Post (typical)			175			
2.2	FDME Middle Post (angle)		1				
2.3	FDME End Post 1				1		
2.4	FDME End Post 2						
A.3	FDME Field (includes horizontal beams with fastened accessories) Distance of axis: 2.5m						
3.1	FDME Field: h=1,0m Surface area of field: 2.5m²/field						
3.2	FDME Field: h=2,0m Surface area of field: 5.0m²/field					176	fields 1760
						880	m²
SECTION 3							
TOTAL PIECES							
3.3	FDME accessories for fastening the FDME beams	176	1	175	1	176	
						352	
TOTAL SURFACE OF FDME FIELD							
						880	m²

## FLOOD PROTECTION OF NEW BELGRADE AND ZEMUN

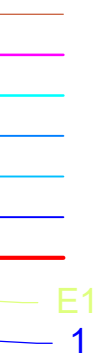
Flood defence line (FDL) on Danube right bank (Zemun area) with Flood defence Mobile Equipment (FDME) for the protection of New Belgrade and Zemun

### SECTION 3

Length of the FDL with FDME: 440.00m

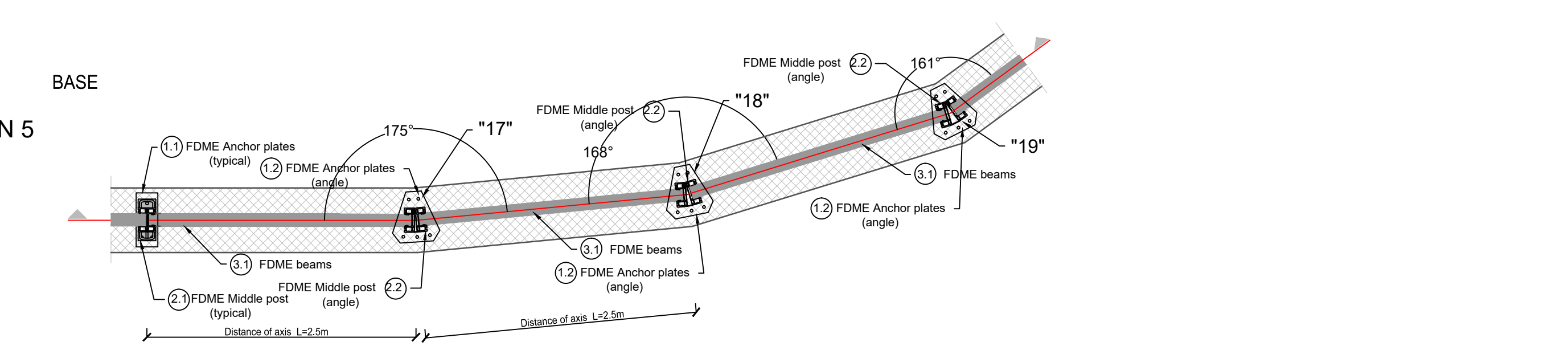
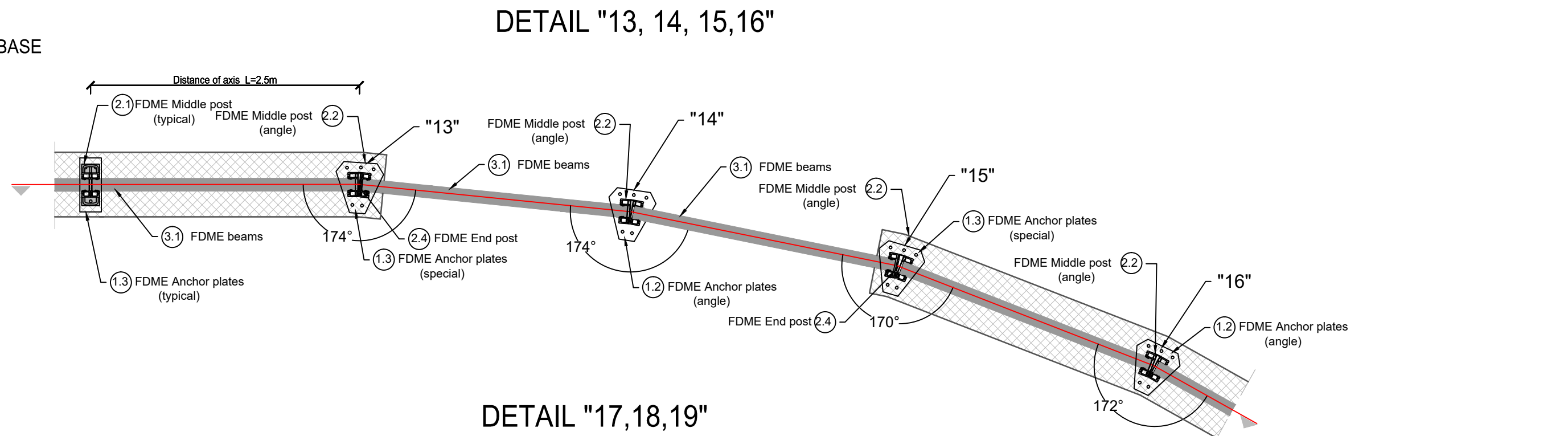
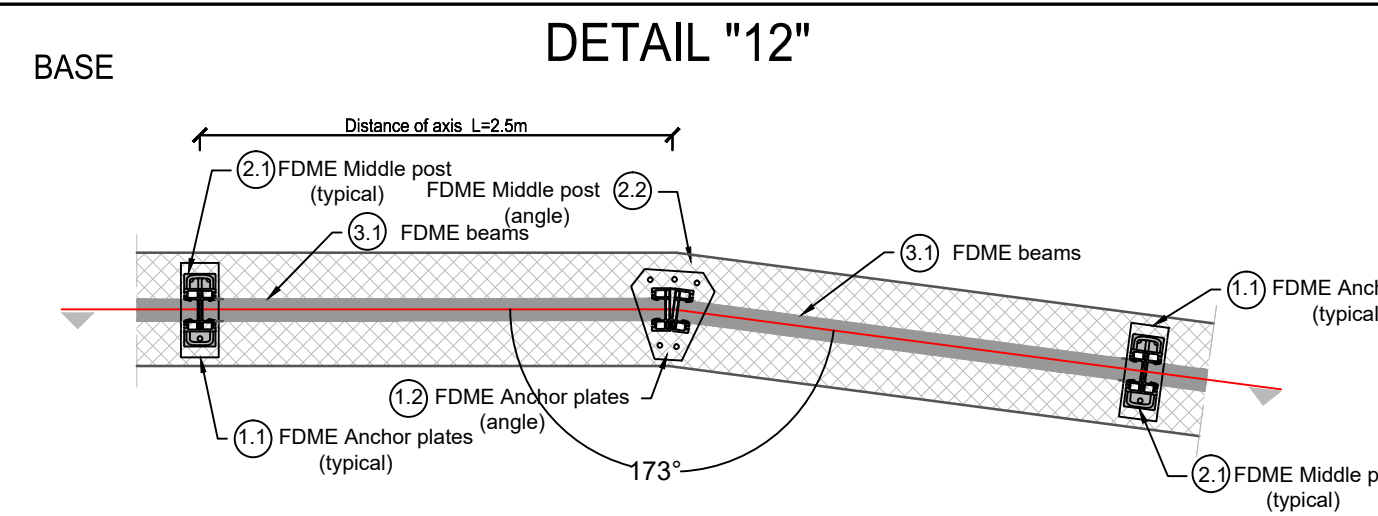
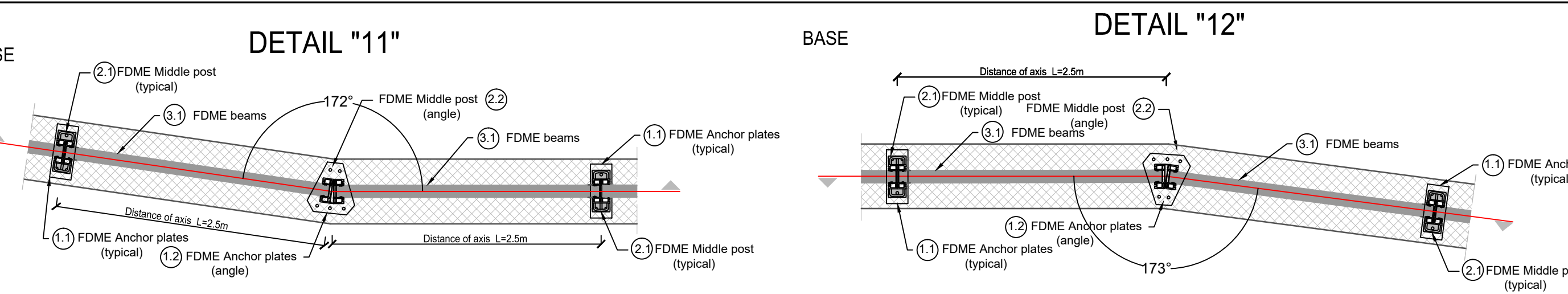
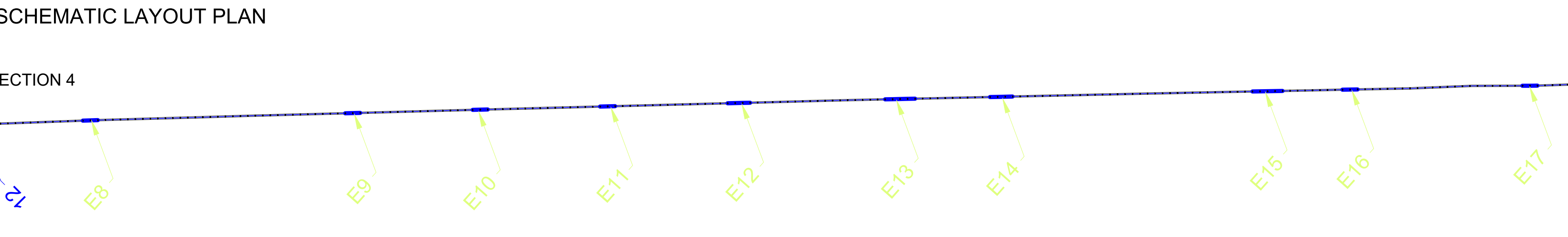
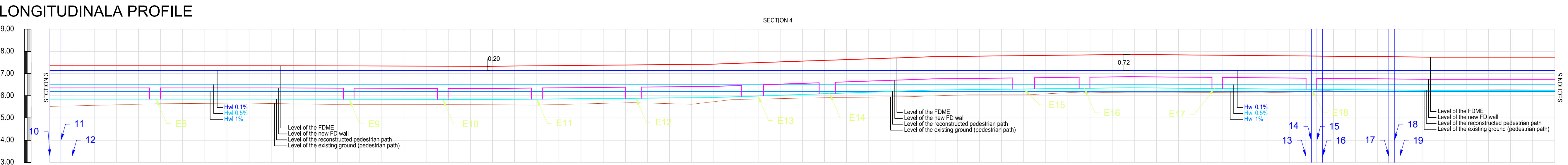
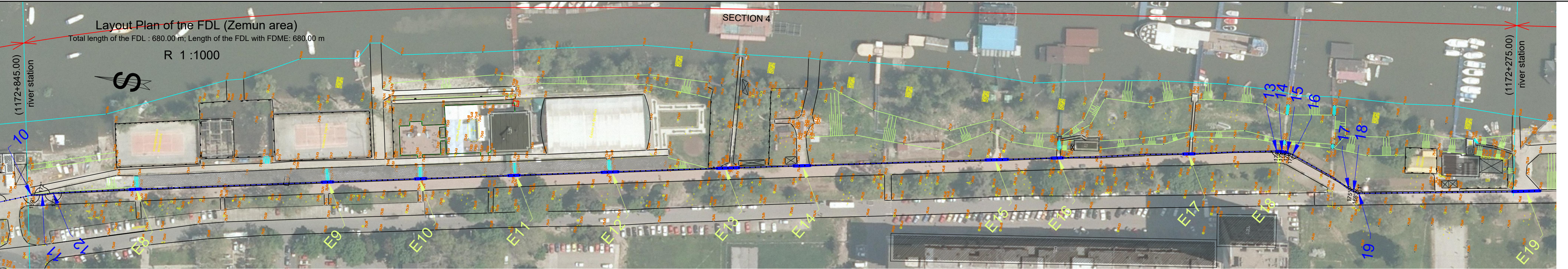
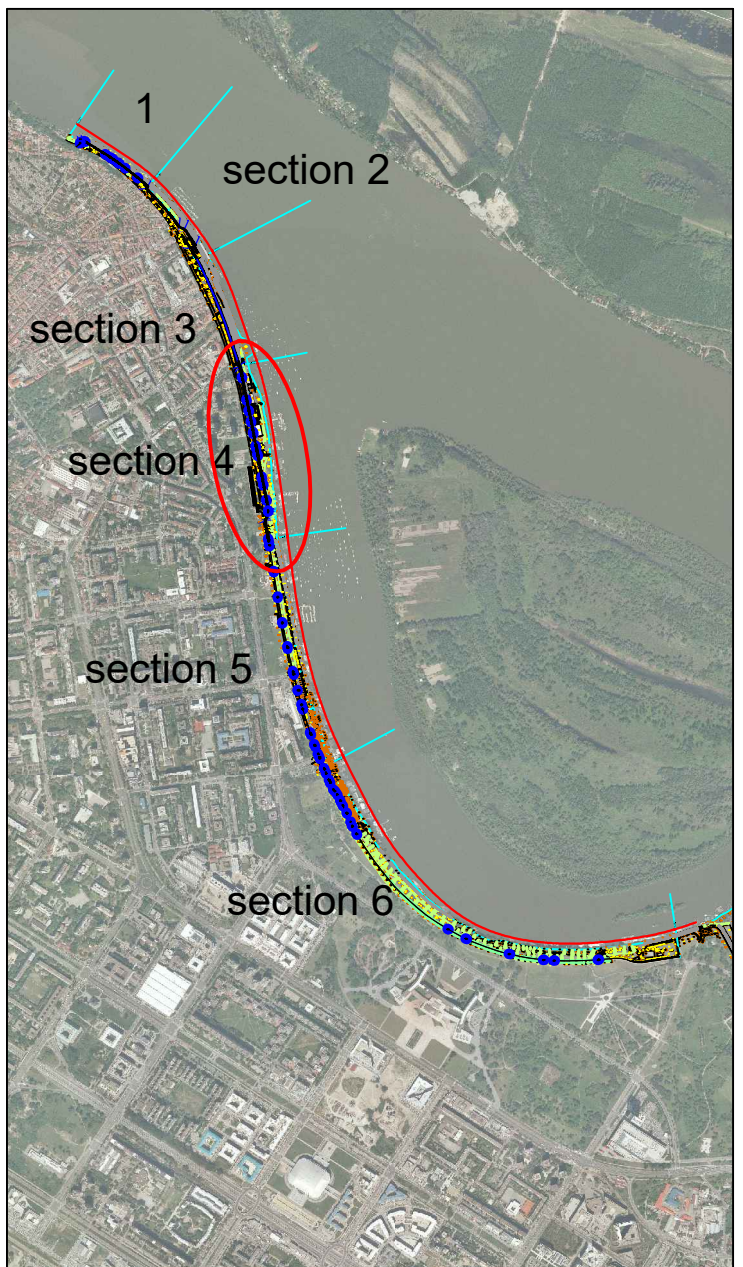
#### LEGEND:

- Existing ground
- New FD wall
- Reconstructed pedestrian path
- Hwl 1%
- Hwl 0.5%
- Hwl 0.1%
- Level of the FDME
- Exit
- FDME post (angle)

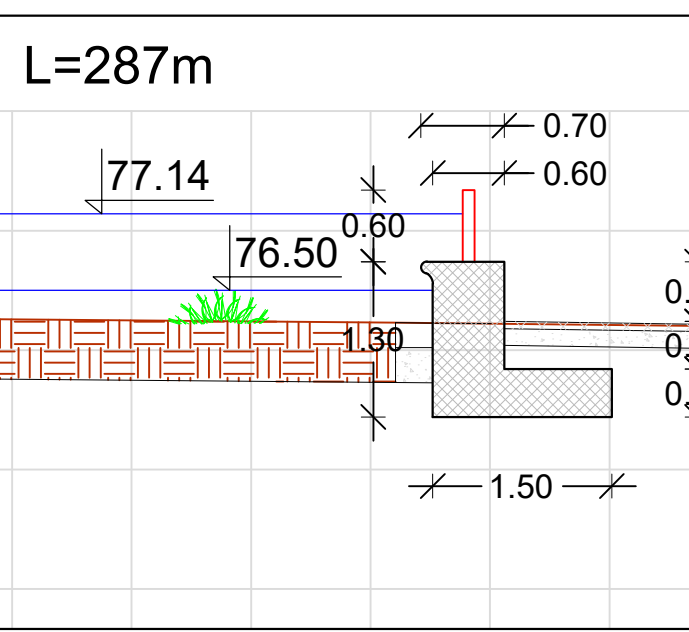
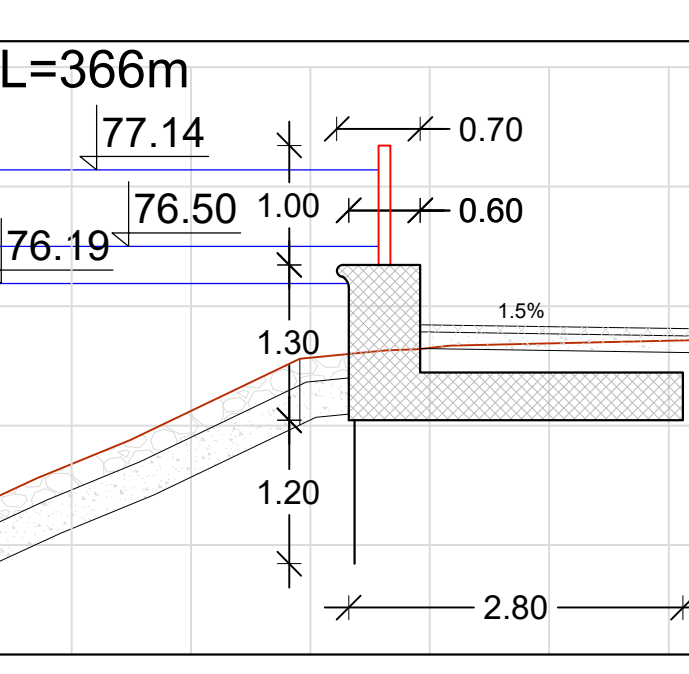




### LAYOUT PLAN OF THE FDL



### FOUNDATION OF FDME



### SPECIFICATION

RECAPITULATION SECTION 4		FDME post						BEAMS:	
Drawing labels	L FDL=680m L FDL with FDME= 680m L FDME=680m	FDME Anchor plate	FDME post h=1.0m	FDME post h=2.0m	FDME post h=0.5m	FDME Field Distance of axis: 2.5m		Number of beams h=200 cm including basic beams with bottom rubber seal (as number of FDME fields)	
1	2	3	4	5	6	7	8		
description		pieces	pieces	pieces	pieces				
Elements of Flood Defence Mobile Equipment									
FDME parts									
FDME Anchor plate (with protection screws):									
1.1	FDME Anchor plate for FDME Middle Post (typical)	240							
1.2	FDME Anchor plate for FDME Middle Post (angle)	9							
1.3	FDME Anchor plate for FDME End Post (special)	23							
FDME post (with installations screws):									
2.1	FDME Middle Post (typical)		247	16					
2.2	FDME Middle Post (angle)		8	1					
2.3	FDME End Post 1								
2.4	FDME End Post 2				23				
FDME Field (includes horizontal beams with fastened accessories):									
FDME Field: h=1.0m						244	fields	1220	
3.1	Surface area of field: 2.5m <sup>2</sup> /field					610	m <sup>2</sup>		
FDME Field: h=2.0m						28	fields	280	
3.2	Surface area of field: 5.0m <sup>2</sup> /field					140	m <sup>2</sup>		
SECTION 4									
TOTAL PIECES		272	255	17	23	272		1500	
3.3	FDME accessories for fastening the FDME beams					544			
TOTAL SURFACE OF FDME FIELD						750	m <sup>2</sup>		

## FLOOD PROTECTION OF NEW BELGRADE AND ZEMUN

Flood defence line (FDL) on Danube right bank (Zemun area) with Flood defence Mobile Equipment (FDME) for the protection of New Belgrade and Zemun

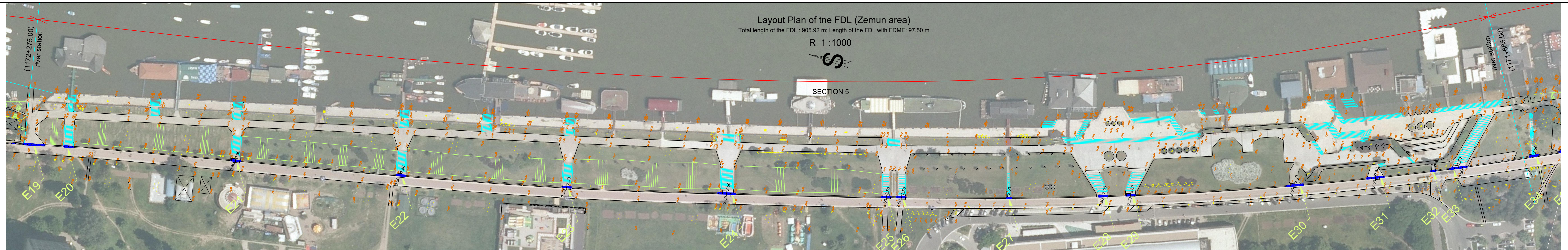
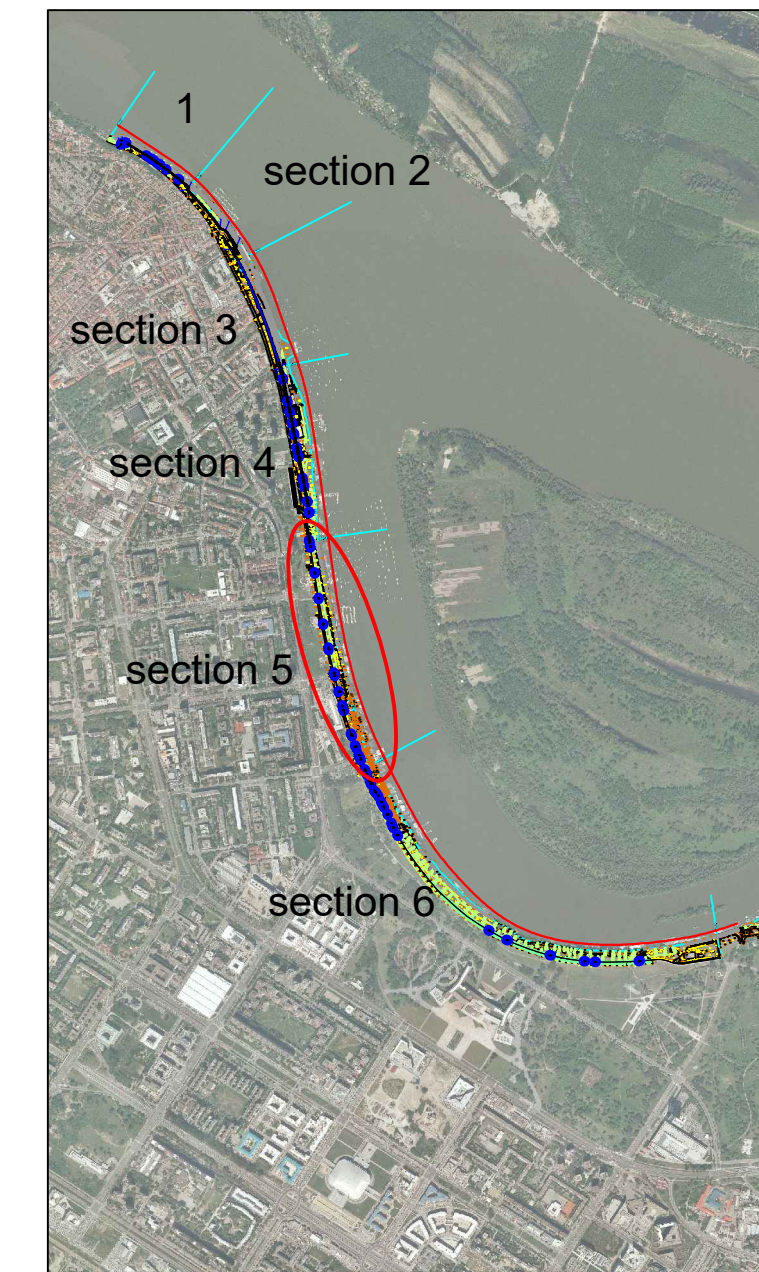
### SECTION 4

Length of the FDL with FDME: 680.00m

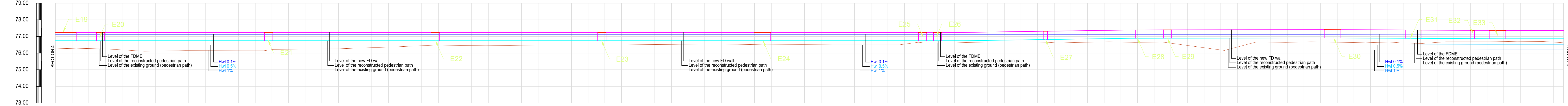
- LEGEND:**
- Existing ground
  - New FD wall
  - Reconstructed pedestrian path
  - Hwl 1%
  - Hwl 0.5%
  - Hwl 0.1%
  - Level of the FDME
  - Exit
  - FDME post (angle)



## LAYOUT PLAN OF THE FDL

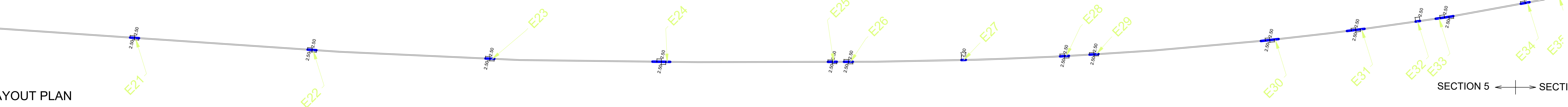


## LONGITUDINALA PROFILE



→ SEC

## SECTION 5

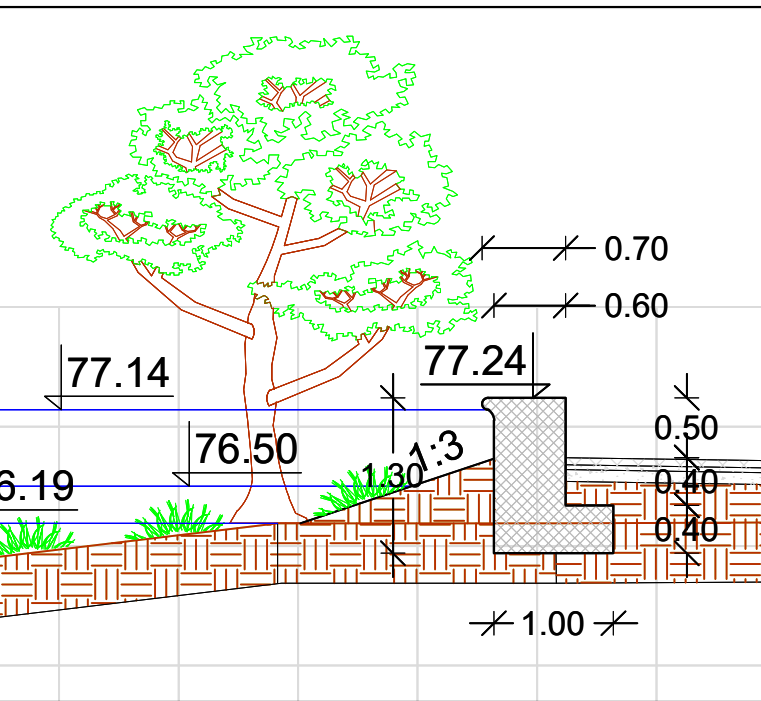


## SCHEMATIC LAYOUT PLAN

## SPECIFICATION

RECAPITULATION SECTION 5								
Drawing labels	L FDL=905.92m L FDL with FDME= 97.5m L FDME=97.5m	FDME Anchor plate	FDME post			FDME Field Distance of axis: 2.5m	BEAMS: Number of beams h/b: 20b cm including basic beams with bottom rubber seal (as number of FDME fields)	
			FDME post h=1.0m	FDME post h=2.0m	FDME post h=0.5m			
1	2	3	4	5	6	7	8	
	description	pieces	pieces	pieces	pieces			pieces
<b>A.</b>	<b>FDME parts</b>	<b>Elements of Flood Defense Mobile Equipment</b>						
<b>A.1</b>	<b>FDME Anchor plate (with protection screws):</b>							
1.1	FDME Anchor plate for FDME Middle Post (typical)	24						
1.2	FDME Anchor plate for FDME Middle Post (angle)	0						
1.3	FDME Anchor plate for FDME End Post (special)	29						
<b>A.2</b>	<b>FDME post (with instalations screws):</b>							
2.1	FDME Middle Post (typical)		29	24				
2.2	FDME Middle Post (angle)							
2.3	FDME End Post 1							
2.4	FDME End Post 2				29			
<b>A.3</b>	<b>FDME Field (includes horizontal beams with fastened accessories) Distance od axis: 2.5m</b>							
3.1	FDME Field; h=1,0m Surface area of field: 2.5m²/field							
3.2	FDME Field; h=2,0m Surface area of field: 5.0m²/field					39	fields	390
						195	m²	
	<b>SECTION 5</b>							
	<b>TOTAL PIECES</b>	53	29	24	29	39		390
3.3	FDME accessories for fastening the FDME beams					78		
	<b>TOTAL SURFACE OF FDME FIELD</b>					195	m²	

## FOUNDATION OF FDME



# FLOOD PROTECTION OF NEW BELGRADE AND ZEMUN

Mobile Equipment (FDME) for the protection of New Belgrade and Zemun

## SECTION 5

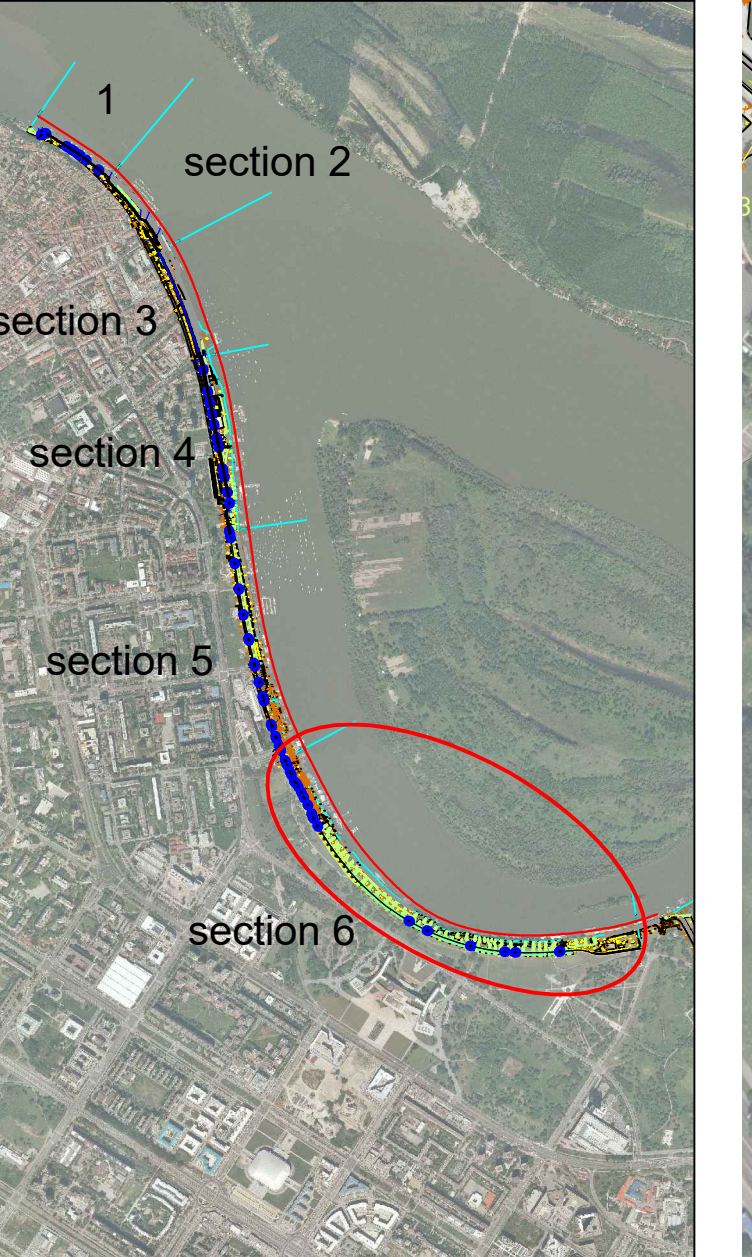
Length of the FDL with FDME: 97.50m

LEGEND:

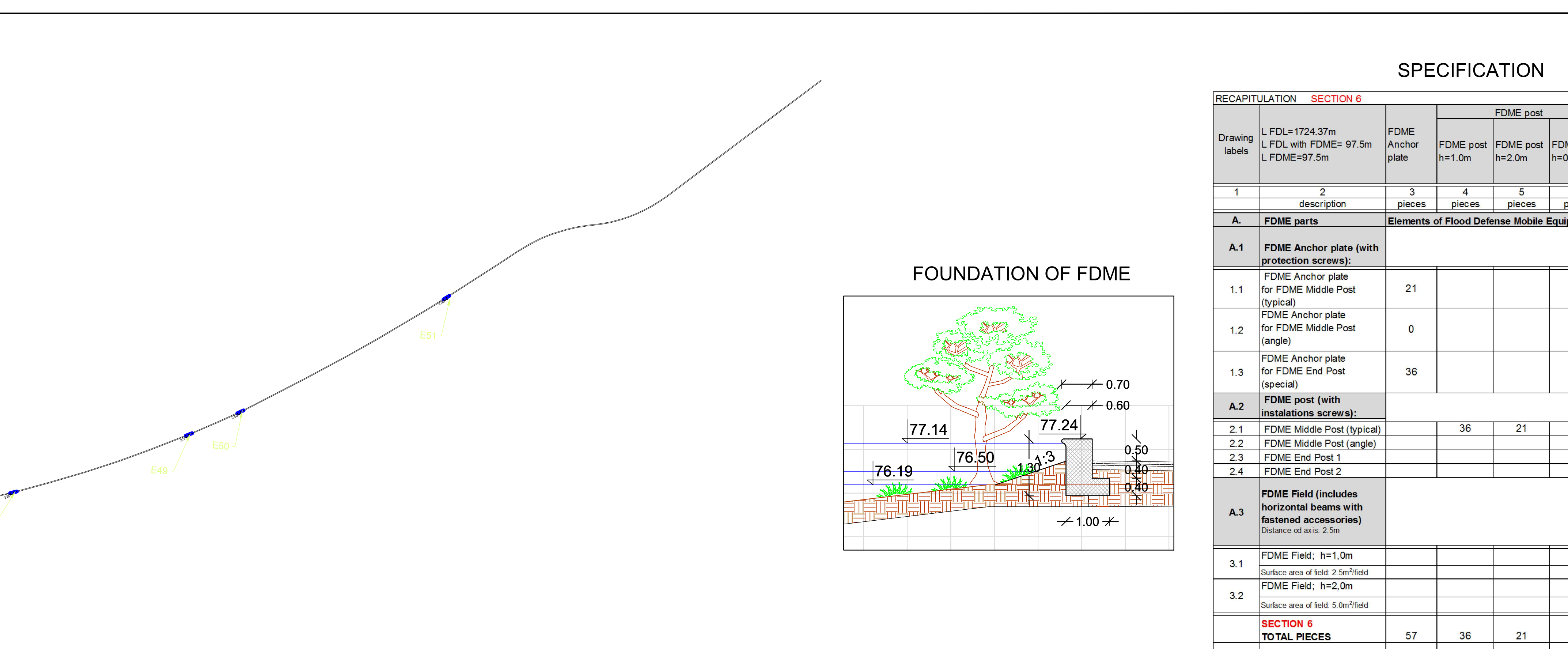
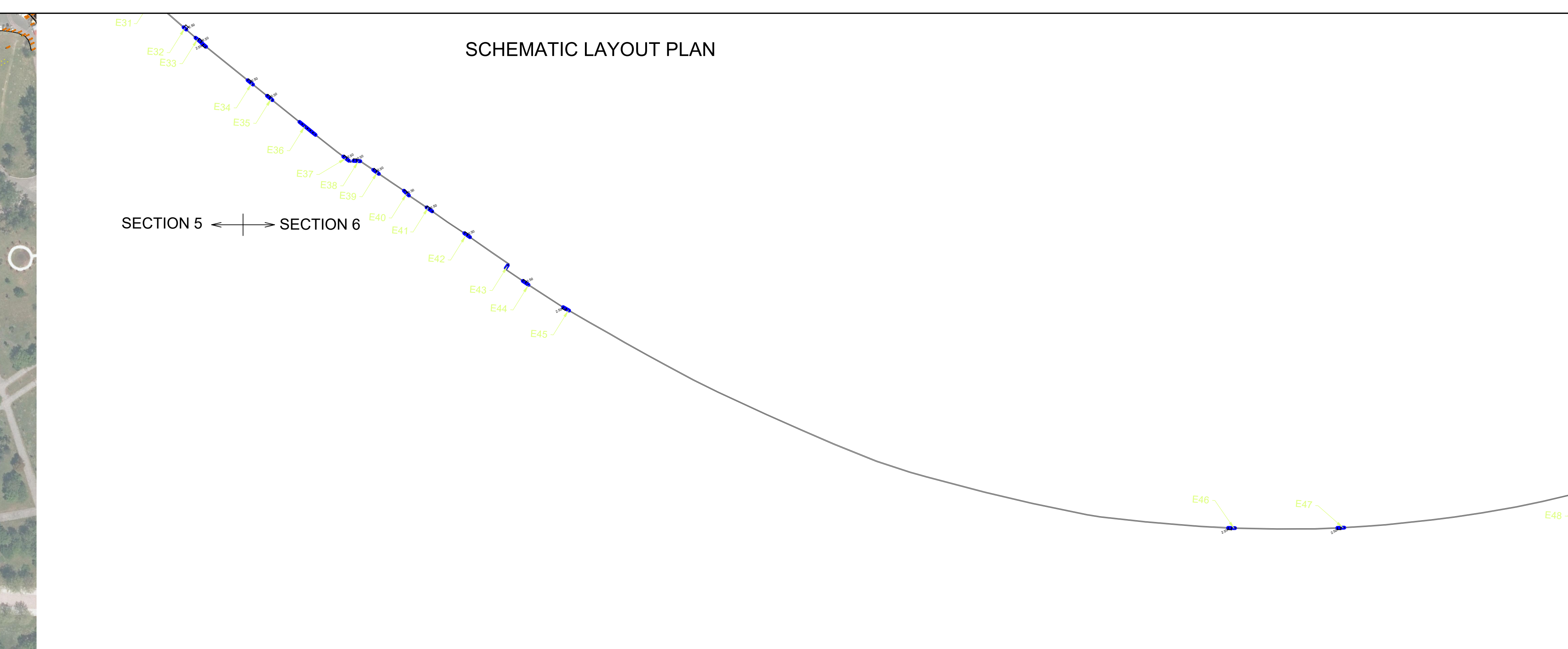
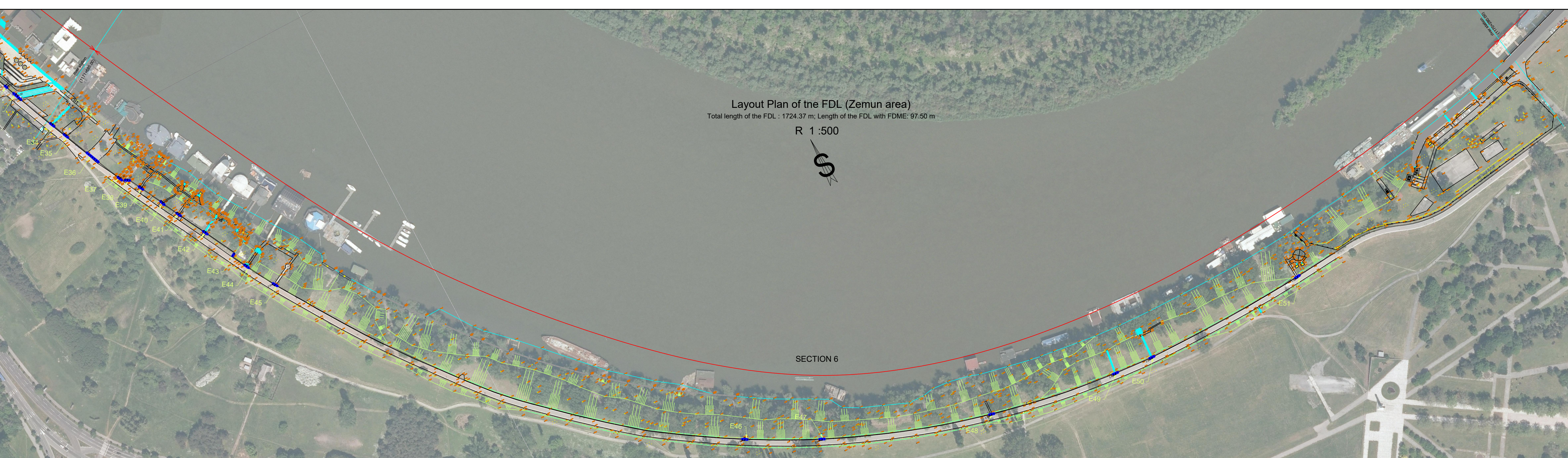
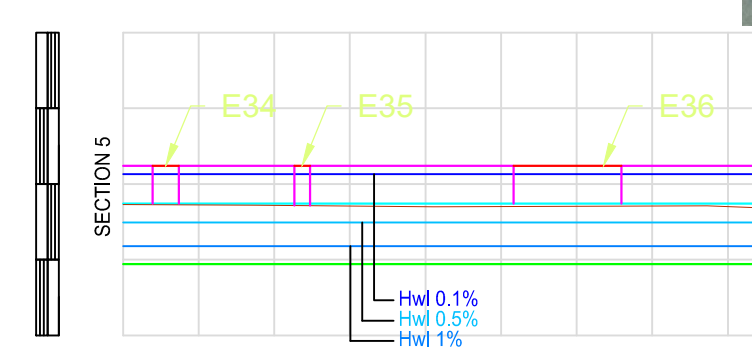
- Existing ground  
New FD wall  
Reconstructed pedestrian path  
Hwl 1%  
Hwl 0.5%  
Hwl 0.1%  
Level of the FDME  
Exit  
FDME post (angle)



LAYOUT PLAN OF THE FDL



LONGITUDINAL PROFILE



SPECIFICATION							
RECAPITULATION SECTION 6							
Drawing labels	L FDL=1724.37m L FDL with FDME= 97.5m L FDME=97.5m	FDME Anchor plate	FDME post h=1.0m	FDME post h=2.0m	FDME post h=0.5m	FDME Field Distance of axis: 2.5m	BEAMS: Number of beams h/b: 20b cm including basic beams with bottom rubber seal (as number of FDME fields)
1	2	3	4	5	6	7	8
description		pieces	pieces	pieces	pieces	pieces	pieces
A. FDME parts		Elements of Flood Defence Mobile Equipment					
A.1 FDME Anchor plate (with protection screws):							
1.1	FDME Anchor plate for FDME Middle Post (typical)	21					
1.2	FDME Anchor plate for FDME Middle Post (angle)	0					
1.3	FDME Anchor plate for FDME End Post (special)	36					
A.2 FDME post (with installations screws):							
2.1	FDME Middle Post (typical)		36	21			
2.2	FDME Middle Post (angle)						
2.3	FDME End Post 1						
2.4	FDME End Post 2				36		
A.3 FDME Field (includes horizontal beams with fastened accessories) Distance of axis: 2.5m							
3.1	FDME Field; h=1.0m Surface area of field: 2.5m <sup>2</sup> /field						
3.2	FDME Field; h=2.0m Surface area of field: 5.0m <sup>2</sup> /field					39 195	fields m <sup>2</sup>
SECTION 6 TOTAL PIECES		57	36	21	36	39	390
3.3	FDME accessories for fastening the FDME beams					78	
TOTAL SURFACE OF FDME FIELD						195	m <sup>2</sup>

FLOOD PROTECTION OF NEW BELGRADE AND ZEMUN

Flood defence line (FDL) on Danube right bank (Zemun area) with Flood defence Mobile Equipment (FDME) for the protection of New Belgrade and Zemun

SECTION 6

Length of the FDL with FDME: 97.50m

- LEGEND:
- Existing ground
  - New FD wall
  - Reconstructed pedestrian path
  - Hwl 1%
  - Hwl 0.5%
  - Hwl 0.1%
  - Level of the FDME
  - Exit
  - FDME post (angle)