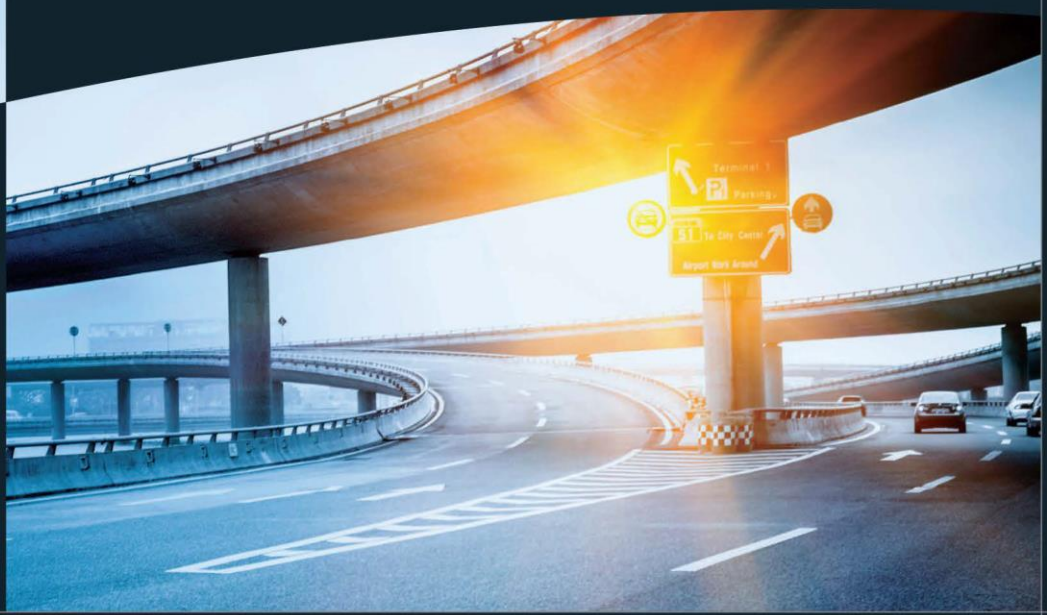
ROAD INFRASTRUCTURE

Precast concrete elements



ADN PREFABRICATE

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CONTENT

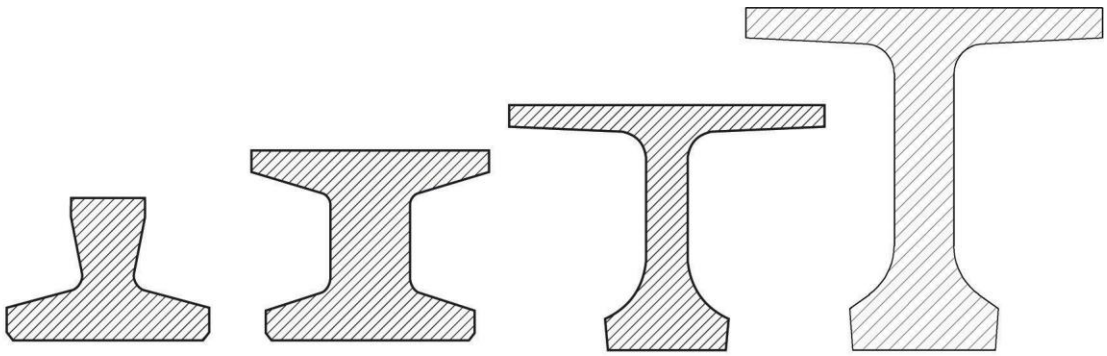
I. PRECAST CONCRETE ELEMENTS FOR BRIDGES, VIADUCTS, AND PASSAGEWAYS

I.1. Prestressed beams with adherent wires for bridges

Prestressed beams are usually used for executing works such as: bridges, overpasses, underpasses, viaducts and platforms.

TYPES OF PRESTRESSED BEAMS (PB)

PB BEAMS	INVERTED T TYPE	TYPE I	TYPE T



L (m) \ H(m)	0,42	0,52	0,72	0,80	0,93	0,95	1,05	1,15
6-10								
10-12								
12-14								
14-16								
16-18								
18-24								
24-30								

All precast beams are executed in line with **SR EN 15050+A1:2012–SYSTEM 2+**Elements for bridges

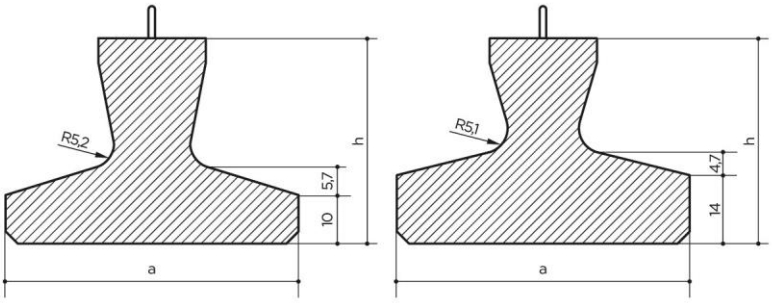
CE

I. PRECAST CONCRETE ELEMENTS FOR BRIDGES, VIADUCTS, AND PASSAGEWAYS

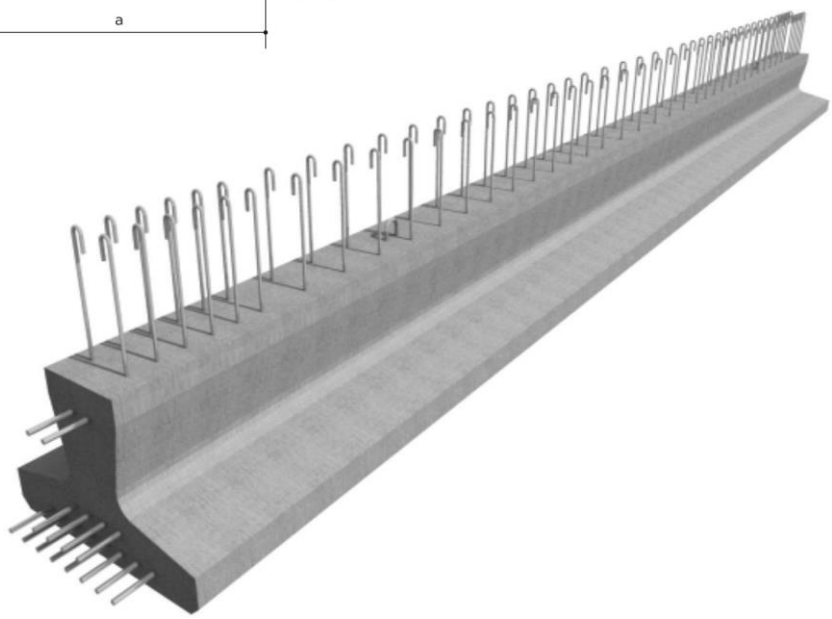
I.1.A. Prestressed beams - inverted T type

BEAM TYPE	LENGTH (m)	HEIGHT h (cm)	MASS (to)	VOLUME OF CONCRETE (m3)	MASS (to)	VOLUME OF CONCRETE (m3)
			Standard type		Eurocode type	
GP42-6	6	42	2.00	0.80	2.25	0.90
GP42-8	8	42	2.62	1.05	3.00	1.20
GP42-10	10	42	3.25	1.30	3.75	1.50
GP52-10	10	52	3.75	1.50	4.25	1.70
GP52-12	12	52	4.50	1.80	5.10	2.04

*the section base (a) for GP42 and GP52 beams is 60 cm



The presented element is provided as an example. Based on demand, beams can be executed to intermediate lengths and per the desired obliqueness. The type of reinforcement, number of strands, and concrete class will be indicated in the execution project submitted by the beneficiary.

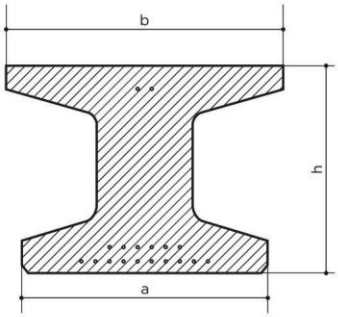


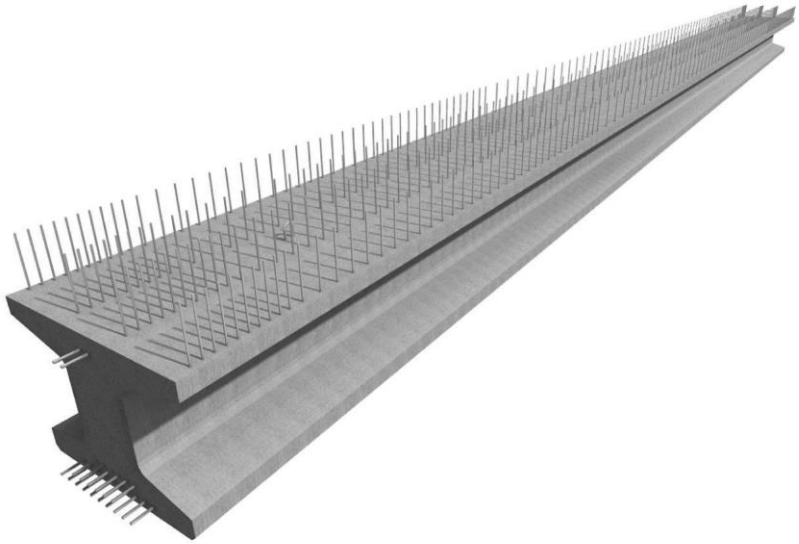
I. PRECAST CONCRETE ELEMENTS FOR BRIDGES, VIADUCTS, AND PASSAGEWAYS

I.1.B. Prestressed beams – type I

BEAM TYPE	LENGTH (m)	HEIGHT h (cm)	MASS (to)	VOLUME OF CONCRETE (m3)
GP72-14	14	72	13.50	5.40
GP72-16	16	72	15.425	6.17
GP80-16	16	80	16.275	6.51
GP80-18	18	80	18.325	7.43

*the section base (a) for GP72 and GP80 beams is 0.90 m, and the upper side (b) is 1.02 m





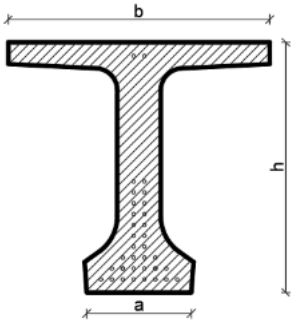
The presented element is provided as an example. Based on demand, beams can be executed to intermediate lengths and per the desired obliqueness. The type of reinforcement, number of strands, and concrete class will be indicated in the execution project submitted by the beneficiary.

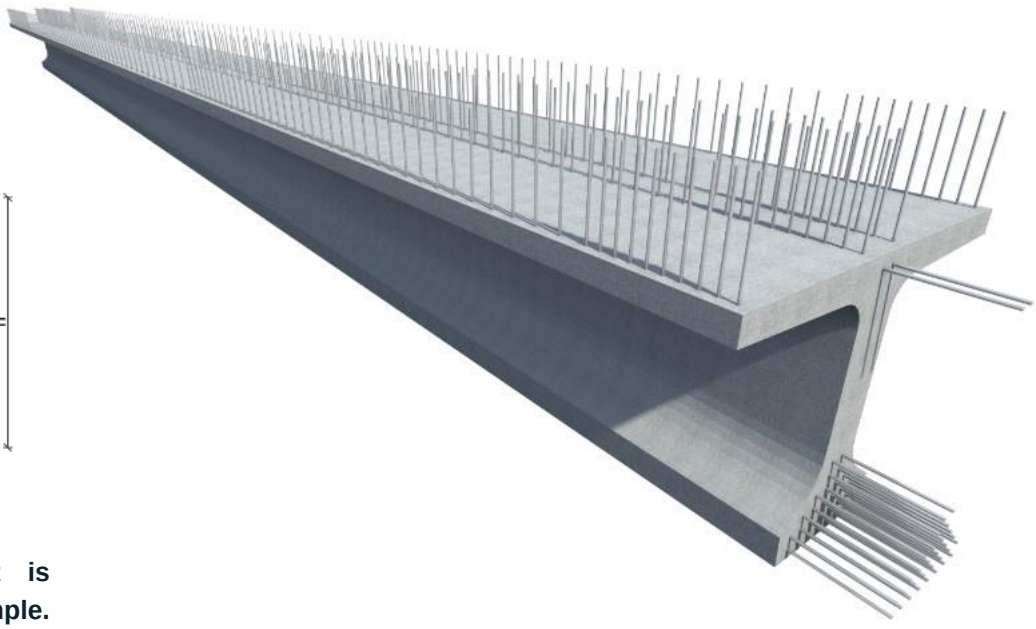
I. PRECAST CONCRETE ELEMENTS FOR BRIDGES, VIADUCTS, AND PASSAGEWAYS

I.1.C. Prestressed beams - type T, GP93/GP95

BEAM TYPE	LENGTH (m)	HEIGHT h (cm)	MASS (to)	VOLUME OF CONCRETE (m3)
GP93-21	21	93	16.00	6.40
GP93-24	24	93	18.30	7.32
GP95-21	21	95	18.60	7.44
GP95-24	24	95	21.30	8.51

*the section base (a) of GP93/GP95 beams is 0.45m/0.48m, and the upper side (b) is 1.20 m





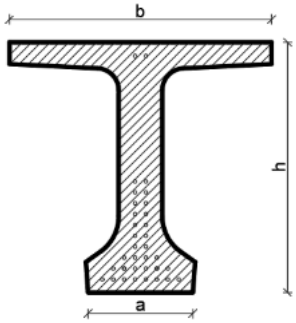
The presented element is provided as an example. Based on demand, beams can be executed to intermediate lengths and per the desired obliqueness. The type of reinforcement, number of strands, and concrete class will be indicated in the execution project submitted by the beneficiary.

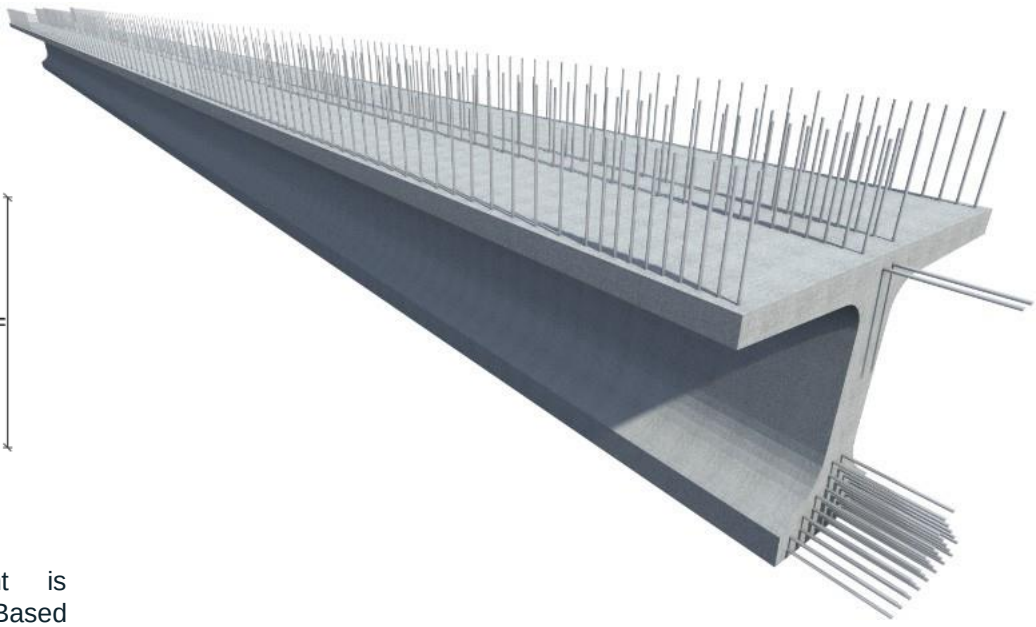
I. PRECAST CONCRETE ELEMENTS FOR BRIDGES, VIADUCTS, AND PASSAGEWAYS

I.1.D. Prestressed beams – type T, GP105 and GP115

BEAM TYPE	LENGTH (m)	HEIGHT h (cm)	MASS (to)	VOLUME OF CONCRETE (m3)
GP105-26	26	105	25.10	10.04
GP105-28	28	105	27.00	10.81
GP115-28	28	115	28.40	11.37
GP115-30	30	115	30.50	12.18

*the section base (a) of GP105/GP115 beams is 0.5m/0.5m, and the upper side (b) is 1.20 m





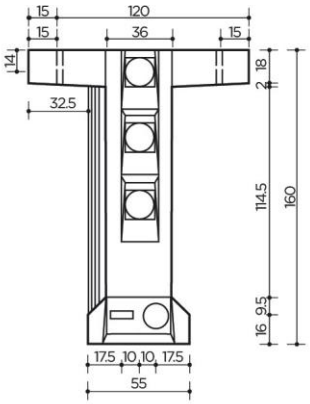
The presented element is provided as an example. Based on demand, beams can be executed to intermediate lengths and per the desired obliqueness. The type of reinforcement, number of strands, and concrete class will be indicated in the execution project submitted by the beneficiary.

I. PRECAST CONCRETE ELEMENTS FOR BRIDGES, VIADUCTS, AND PASSAGEWAYS

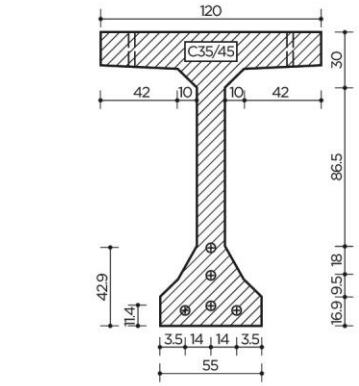
I.2. Post-stressed beams

Post-stressed beams serve to execute wide span bridges; they are comprised of three or more sections (transoms), which are manufactured in the factory and jointed on-site using the post-compression technology.

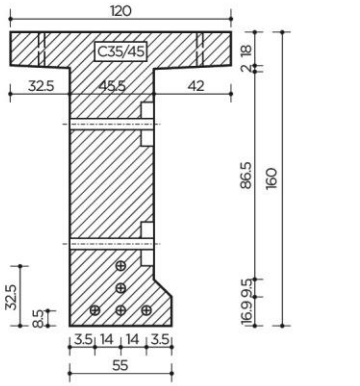
This covers a maximum span between 26 and 40 m, with a maximum height of 1.9 m. this solution avoids oversized transportation, which significantly reduces the cost of logistics.



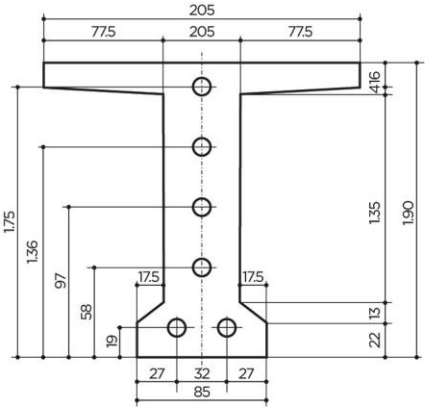
END-PIECE TRANSOM

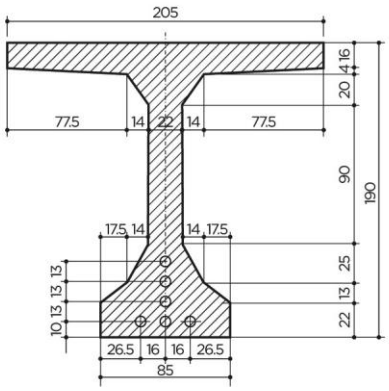


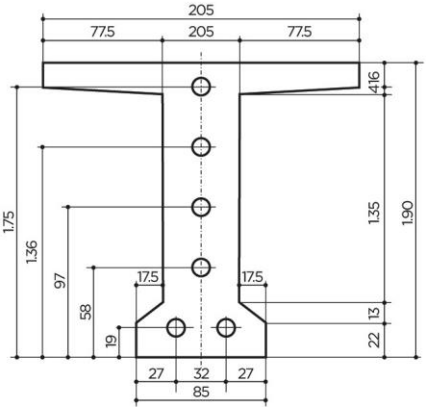
MIDDLE TRANSOM



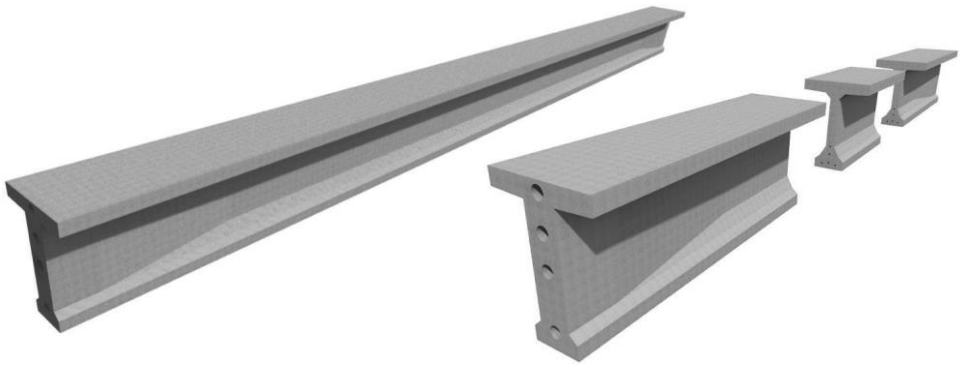
END-PIECE TRANSOM







The presented element is provided as an example. The exterior sizes, type of reinforcement, type/number of strands, and concrete class will be indicated in the execution project submitted by the beneficiary.



II. PRECAST ELEMENTS FOR CULVERTS

II.1. Useful data

Precast elements for culverts are used to execute culverts for:

- Rainwater/stormwater drainage road underpass;
- Overpass crossing water streams, channels, ditches, etc.

CHOOSING THE TYPE OF CULVERT FUNCTION OF THE NET LIGHT (ELEMENT WIDTH)

NET LIGHT (m)	CULVERT TYPE							
	P2	C2	C2'	C2"	C3	D3	D4	D5
<2.50	■	■	■	■				
>2.50 <3.50					■			
>3.50 <5.00						■		
>5.00 <6.00							■	

CHOOSING THE TYPE OF CULVERT/ELEVATION FUNCTION OF ELEMENT'S HEIGHT - H (EXTERIOR ELEVATION)

H (m)	CULVERT TYPE								
	P2	C2	C2'	C2"	C3	L0	L1	L2	L3
>1.50 <1.80	■			■					
>1.80 <2.50			■			■			
>2.50 <3.00		■						■	
≥3.00					■				■

ATTENTION! The presented tables are for information purposes. The type of culvert shall be determined under the technical project submitted by the beneficiary.

CORRESPONDENCE BETWEEN CULVERT ELEMENTS AND WING AND DIAPHRAGM TYPE END PIECES

PRECAST ELEMENT TYPE	WINGS				DIAPHRAGMS	
	A0	A1	A2	A3	T2	T3
Frame P2	■				■	
Frame C2			■		■	
Frame C2'		■			■	
Frame C2"	■				■	
Frame C3				■		■
Elevation L0	■					
Elevation L1		■				
Elevation L2			■			
Elevation L3				■		

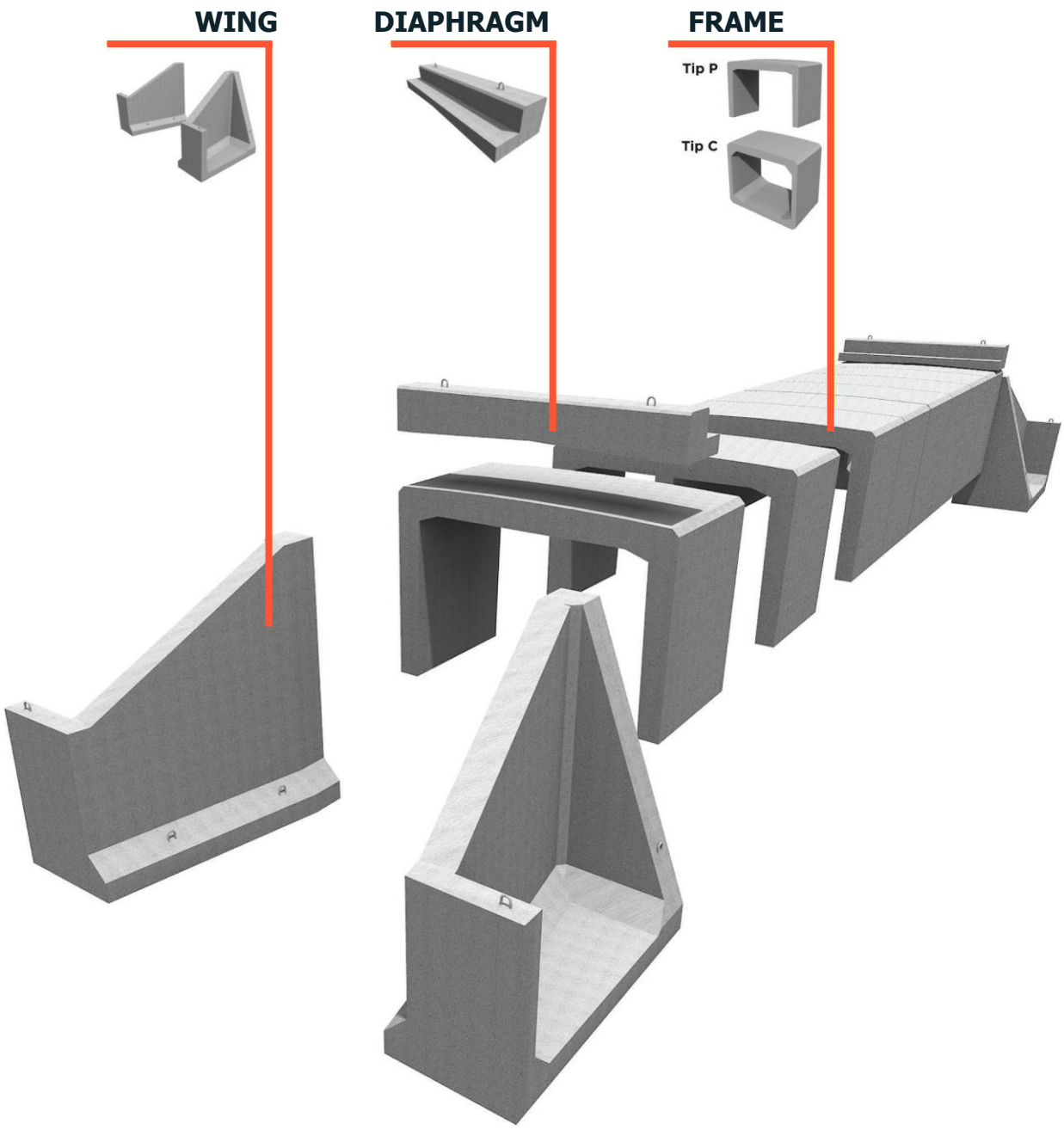
ATTENTION! The correspondence of the elements presented above is valid only for standard culverts. Function of the type of soil and/or the engineer's requirements, the combination between culverts and end pieces can differ from the one presented above.

The elements for precast culverts are executed in line with **SR EN 15050+A1:2012–SYSTEM 2+** Elements for bridges/ **SR EN 14844+A2:2012–SYSTEM 2+** Underground coffers.

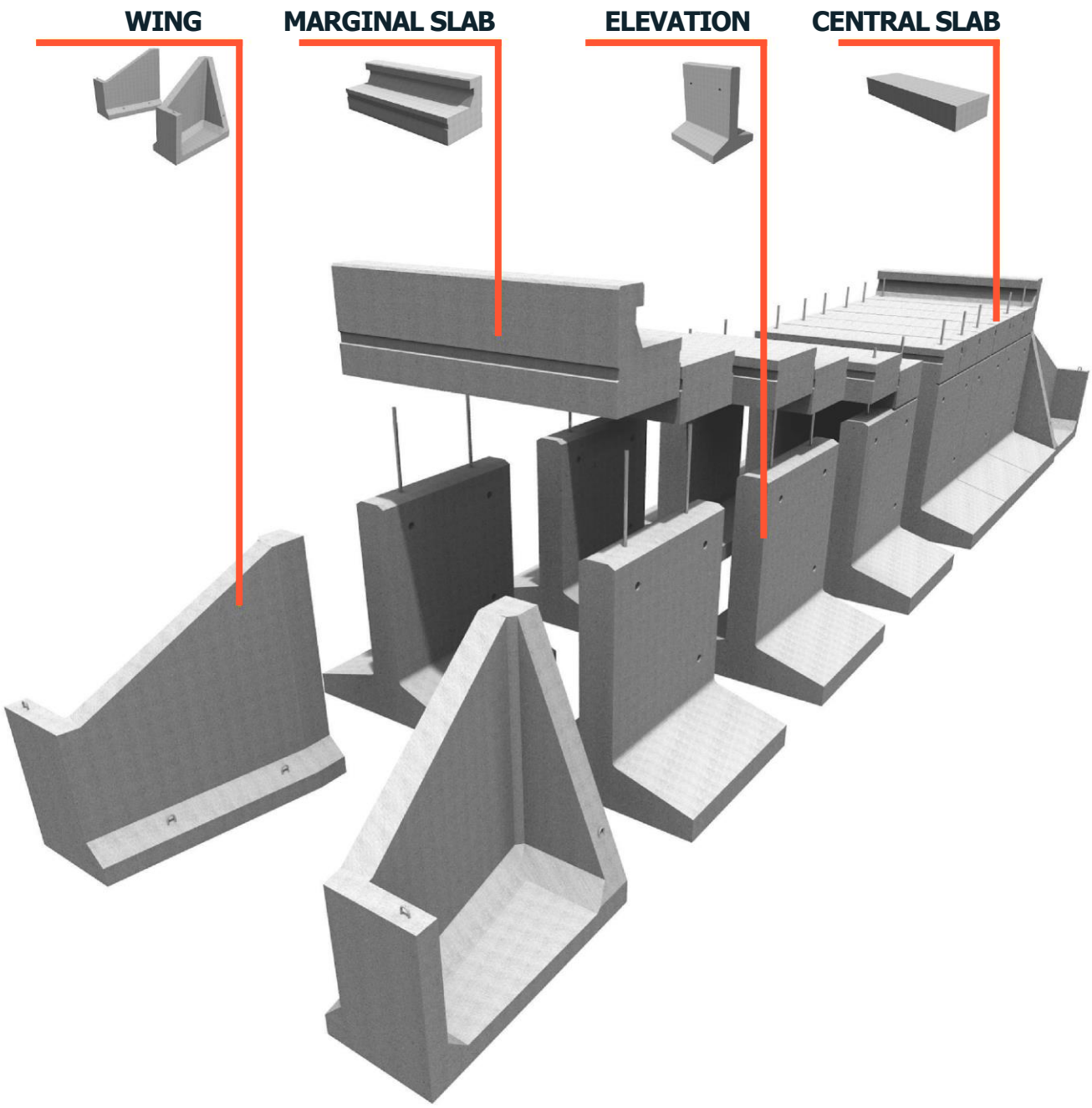
CE

II.2. Culvert types

A. BOX CULVERTS

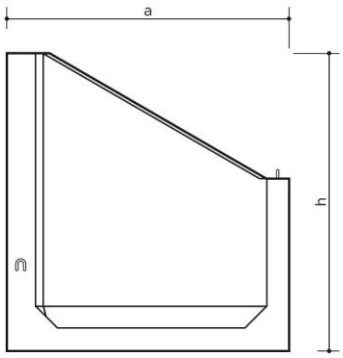


B. SLAB CULVERTS

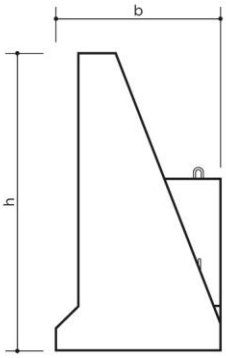


II.3. Precast wings in reinforced concrete

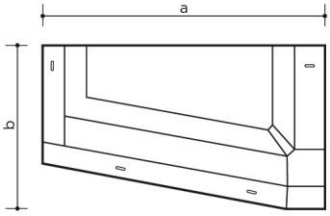
ELEMENT NAME	LENGTH b (m)	WIDTH a (m)	HEIGHT h (m)	MASS (to)	VOLUME OF CONCRETE (m3)
Wing A0	1.90	1.10	2.00	2.40	0.95
Wing A1	2.50	1.30	2.40	3.45	1.38
Wing A2	3.10	1.40	2.80	4.475	1.79
Wing A3	3.70	1.55	3.20	5.25	2.10
Wing A0 (E)	1.90	1.50	2.00	3.90	1.50
Wing A1 (E)	2.50	1.80	2.40	5.60	2.20
Wing A2 (E)	3.10	2.10	2.80	7.40	2.90
Wing A3 (E)	3.70	2.20	3.20	9.40	3.70



LATERAL VIEW



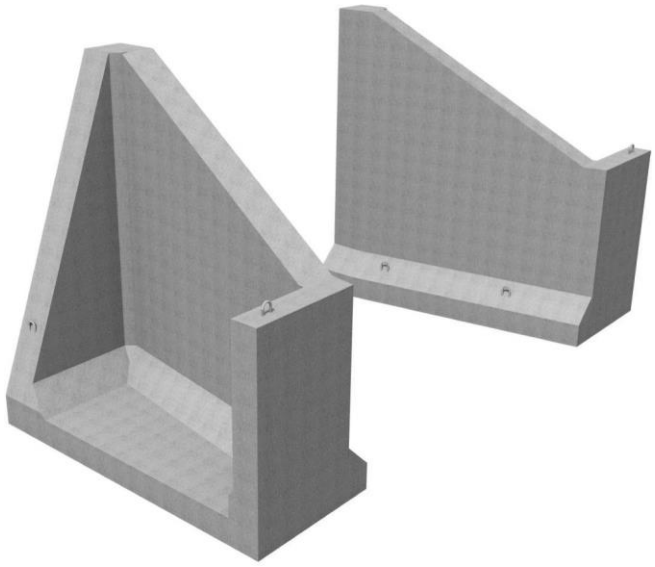
FRONTAL VIEW



PLAN VIEW

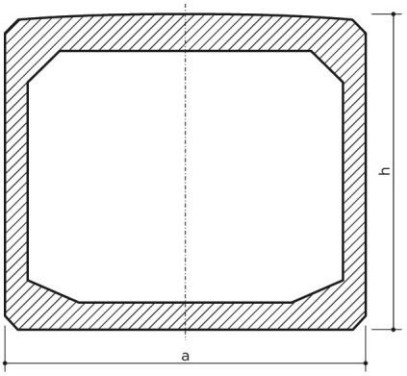
Bridge wings are end pieces used for executing slab and box culverts. Function of their position, the wings can be either right or left.

ATTENTION! Check the recommended type of wings for each type of culvert element!

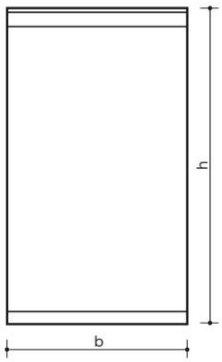


II.4. Precast frames type C in reinforced concrete

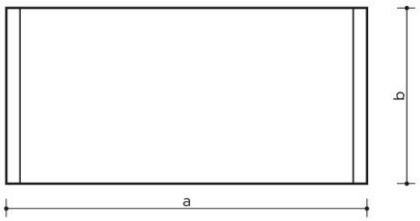
ELEMENT NAME	LENGTH	WIDTH	HEIGHT	MASS	VOLUME OF CONCRETE
	b (m)	a (m)	h (m)	(to)	(m3)
Frame C2	1,60	2,40	2,79	8,10	3.24
Frame C2’	1,60	2,40	2,29	7,30	2.92
Frame C2”	1,60	2,40	1,75	6,75	2.70
Frame C3	1,60	3,44	3,00	13.30	5.32
Frame C2 (E)	1,60	2,50	2,89	10.70	4.30
Frame C2’ (E)	1,60	2,50	2,39	9.80	3.90



CROSS SECTION



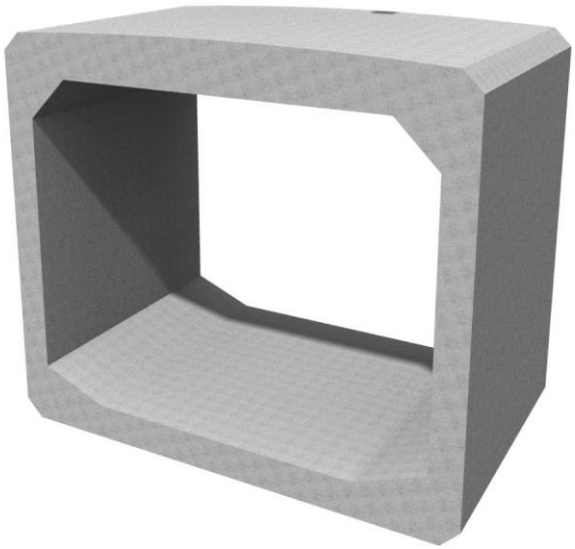
LATERAL VIEW



PLAN VIEW

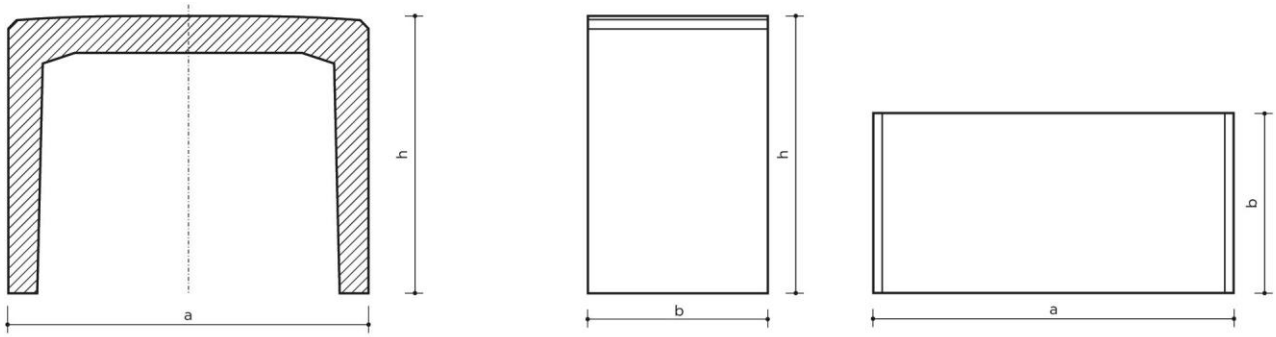
Precast frames type C are used for culverts and rainwater drainage road underpasses. Frame size is selected function of the type of soil and the water discharge it is expected to manage. The total length of the culvert is a multiple of 1.60 m.

ATTENTION! Check the recommended type of wings foreach frame size!

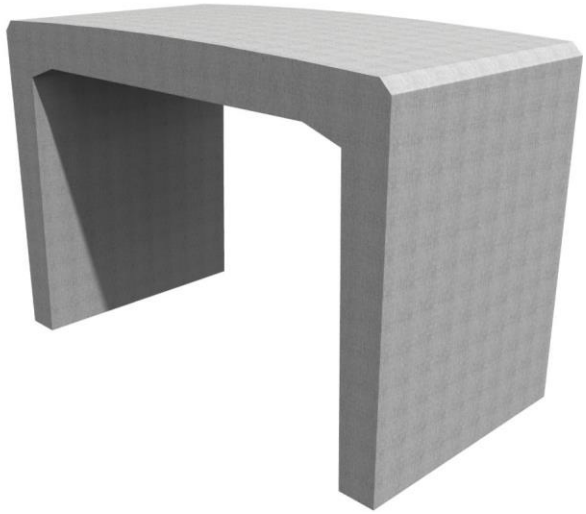


II.5. Precast frames type P2 in reinforced concrete

ELEMENT NAME	LENGTH	WIDTH	HEIGHT	MASS	VOLUME OF CONCRETE
	b (m)	a (m)	h (m)	(to)	(m3)
Reinforced frame P2	1.20	2.34	1.60	3.025	1.21



CROSS SECTION LATERAL VIEW PLAN VIEW

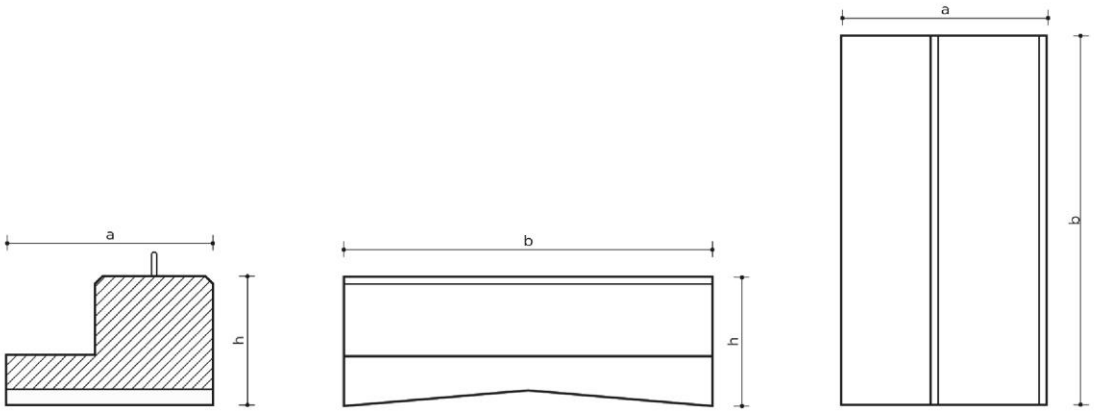


Precast frames type P2 are the most frequently used elements for executing rainwater drainage road underpasses. Their small overall dimensions allow for their efficient transportation (7 pieces/ shipment, 22 t) and easy handling on site (~3.1 t/piece). The total length of the culvert is a multiple of 1.20 m.

ATTENTION! A0 wings are recommended for this type of frame!

II.6. Precast diaphragms in reinforced concrete

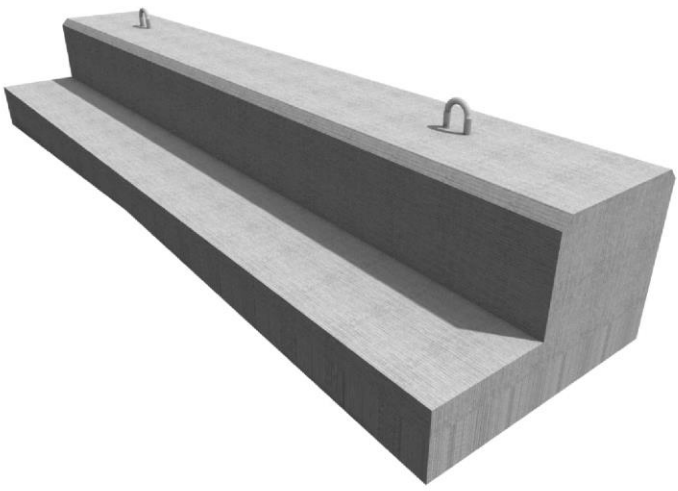
ELEMENT NAME	LENGTH	WIDTH	HEIGHT	MASS	VOLUME OF CONCRETE
	b (m)	a (m)	h (m)	(to)	(m3)
Diaphragm T2	2.40	0.53	0.33	0.725	0.29
Diaphragm T3	3.44	0.53	0.33	1.00	0.40
Diaphragm T2 (E)	2.50	0.53	0.50	1.20	0.47



CROSS SECTION **LATERAL VIEW** **PLAN VIEW**

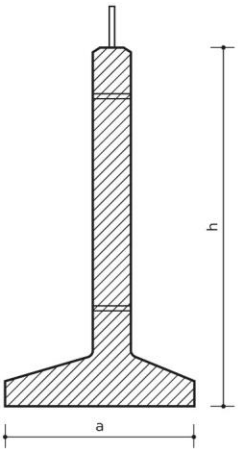
Precast diaphragms are end pieces used as superelevation for culverts types C and P. Their height can be adapted in line with the beneficiary's project.

ATTENTION! Check the recommended type of diaphragm for each of the frame types C and P!

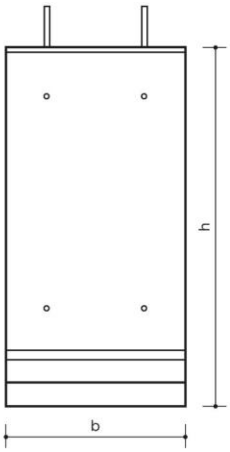


II.7. Precast elevations in reinforced concrete

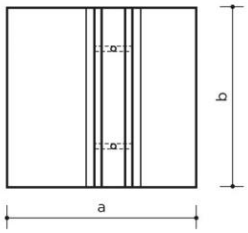
ELEMENT NAME	LENGTH	WIDTH	HEIGHT	MASS	VOLUME OF CONCRETE
	b (m)	a (m)	h (m)	(to)	(m3)
Elevation L0	1.60	1.50	2.00	3.85	1.54
Elevation L1	1.60	1.50	2.40	4.325	1.73
Elevation L2	1.60	1.50	2.80	4.825	1.93
Elevation L3	1.60	1.50	3.20	5.325	2.13



CROSS SECTION



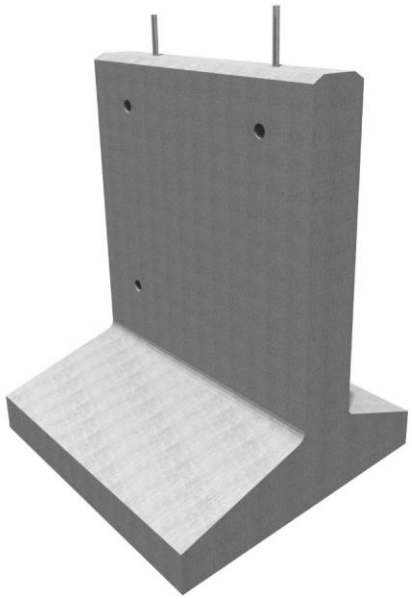
LATERAL VIEW



PLAN VIEW

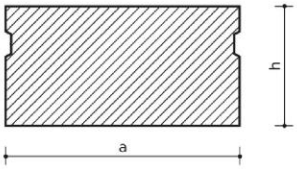
Precast elevations are used for executing culverts together with central and marginal prestressed slabs. Usually, when executing a culvert, the number of elevations will be equal to the number of slabs and vice-versa. The total length of the culvert is a multiple of 1.60 m.

ATTENTION! Usually, when executing a culvert, the number of slabs will be equal to the number of elevations!

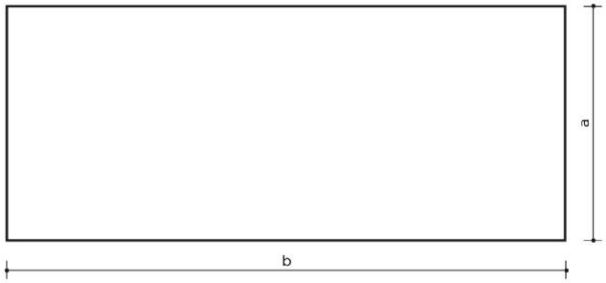


II.8. Prestressed precast central slabs

ELEMENT NAME	LENGTH	WIDTH	HEIGHT	MASS	VOLUME OF CONCRETE
	b (m)	a (m)	h (m)	(to)	(m3)
Central slab D3C	3.90	0.79	0.40	3.05	1.22
Central slab D4C	4.90	0.79	0.40	3.825	1.53
Central slab D5C	5.90	0.79	0.40	4.625	1.85

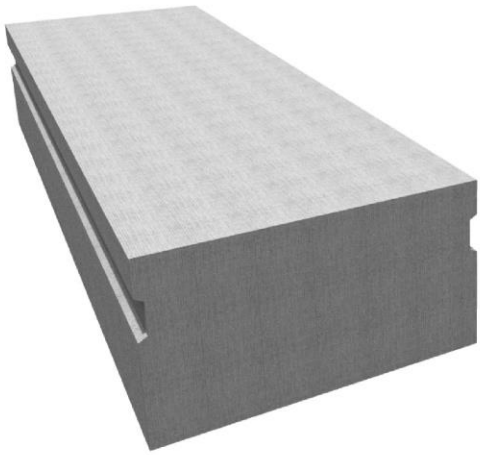


CROSS SECTION



PLAN VIEW

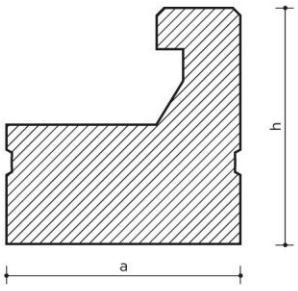
Prestressed precast central slabs are used for executing culverts together with reinforced elevations. Slanted (oblique) central slabs can also be executed upon the beneficiary's request.



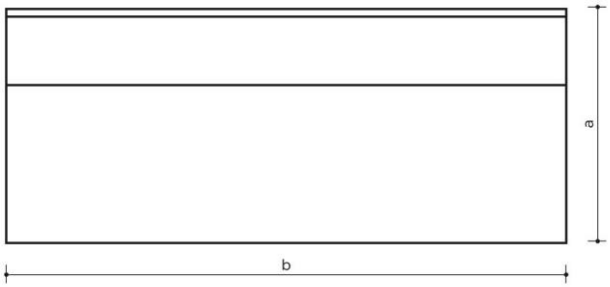
ATTENTION! Usually, when executing a culvert, the number of slabs will be equal to the number of elevations!

II.9. Prestressed precast marginal slabs

ELEMENT NAME	LENGTH	WIDTH	HEIGHT	MASS	VOLUME OF CONCRETE
	b (m)	a (m)	h (m)	(to)	(m3)
Central slab D3M	3.90	0.79	0.80	3.90	1.56
Central slab D4M	4.90	0.79	0.80	4.90	1.96
Central slab D5M	5.90	0.79	0.80	5.925	2.37



CROSS SECTION



PLAN VIEW

Prestressed precast marginal slabs are used for executing culverts together with reinforced elevations. Upon the beneficiary's request, marginal slabs with armatures can also be executed, so that the superelevation can be poured on site, at the desired height.

ATTENTION! Usually, when executing a culvert, the number of slabs will be equal to the number of elevations!

III. CERTIFICATIONS

System certifications

CERTIFICATE	STANDARD
Quality management system	SR EN ISO 9001:2015
Environmental management system	SR EN 14001:2015
Occupational safety and health management system	SR EN ISO 45001:2023

Product certificates

CERTIFICATE	STANDARD
Precast concrete goods – elements for retaining walls	SR EN 15258:2009
Precast concrete goods – elements for bridges	SR EN 15050 +A1:2012
Precast concrete goods – underground coffers	SR EN 14844+A2:2012
Precast concrete goods – elements for culverts in reinforced and/or prestressed concrete	SR EN 13369:2023
Pre-assembled steel products – cages for piles, slurry walls, beams, pillars. Shaped and trimmed steel products – frames, cross-ties, fasteners, anchors, curved bars	ST 009-2011 NE 012/2-2022

Building is in your DNA

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