



# F-WATER TUNNELS

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# F-WATER TUNNELS MANUALS

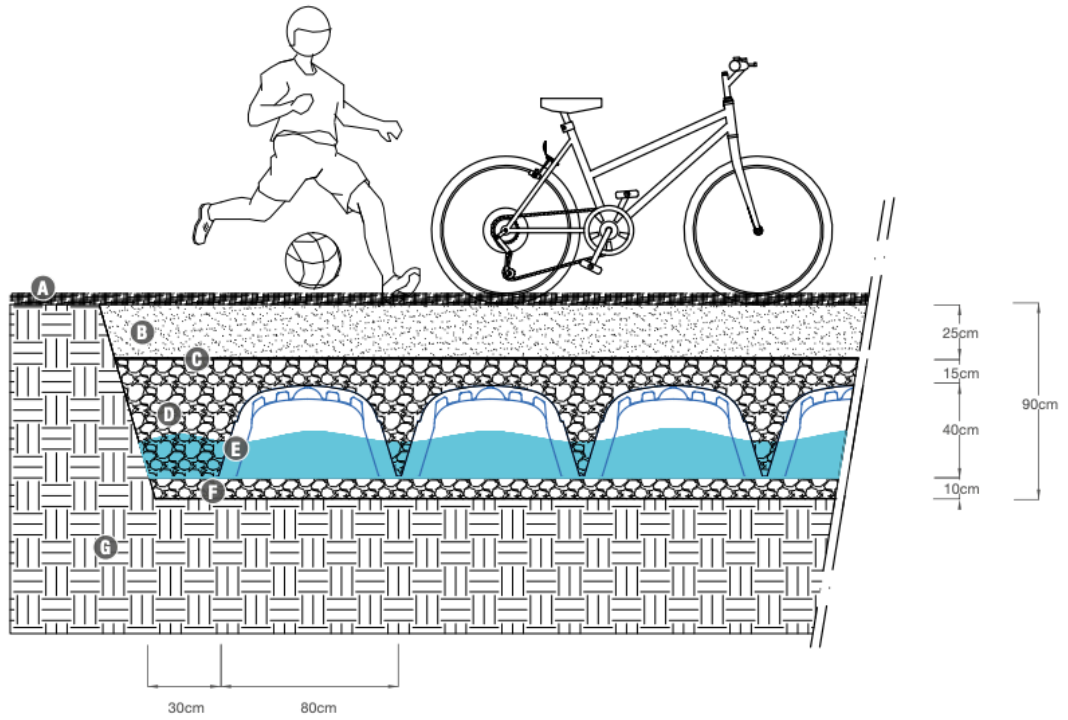
## GREEN AREAS - CONSIDERED PARAMETERS

Specific ground weight	kN/m <sup>3</sup>	20
Material safety factor	-	2

## VERTICAL LOADS APPLIED\*

Coating thickness (m)	Installation depth (m)	Soil load (kN/m <sup>2</sup> )
0,4	0,8	8
0,8	1,2	16
1,2	1,6	24
1,6	2,0	32
2,0	2,4	40
2,4	2,8	48
2,8	3,2	56
3,2	3,6	64
3,5	3,9	70

\*Loads applied on the extrados of the Drening chambers



- Ⓐ Vegetation
- Ⓑ Carry-over land
- Ⓒ Non-woven fabric
- Ⓓ Covering in washed gravel 20/40 mm
- Ⓔ DRENING
- Ⓕ 20/40 mm washed gravel background ayer
- Ⓖ Existing land

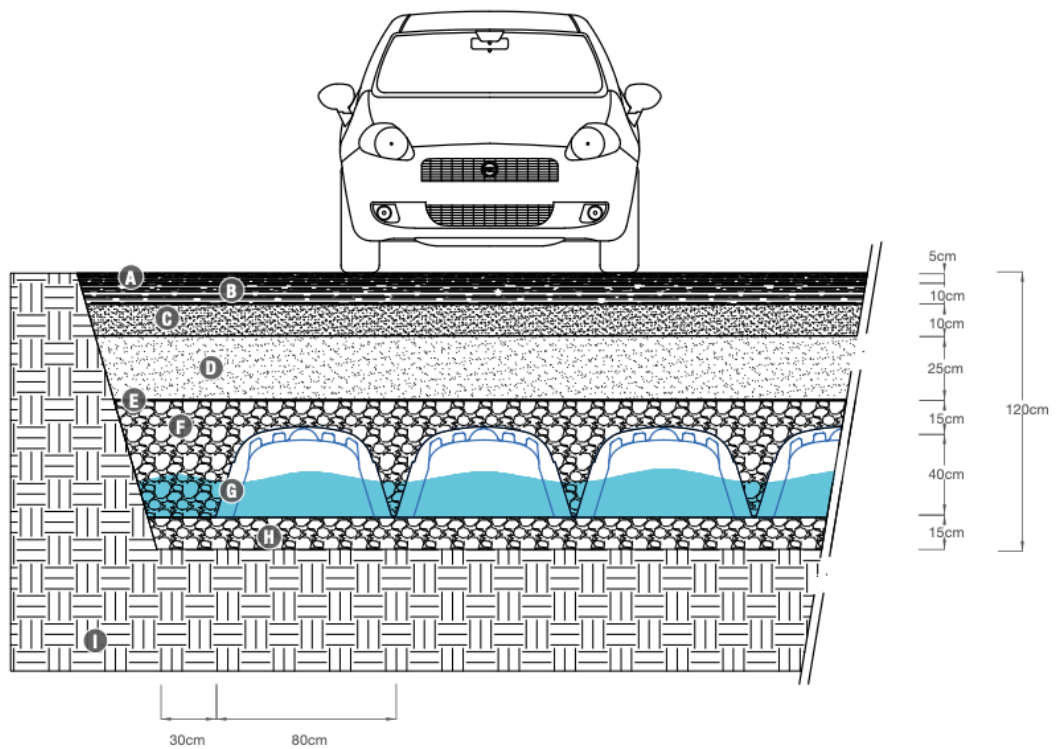
## LIGHT VEHICLES - CONSIDERED PARAMETERS

Equivalent distributed load	kN/m <sup>2</sup>	5
Specific ground weight	kN/m <sup>3</sup>	20
Fattore di sicurezza del materiale	-	2

## VERTICAL LOADS APPLIED\*

Coating thickness (m)	Installation depth (m)	Soil load (kN/m <sup>2</sup> )	Total load (kN/m <sup>2</sup> )
0,65	1,05	13	18
0,75	1,15	15	20
1,0	1,4	20	25
1,25	1,65	25	30
1,5	1,9	30	35
1,75	2,15	35	40
2,0	2,4	40	45
2,5	2,9	50	55
3,0	3,4	60	65

\*Loads applied on the extrados of the Draining chambers



Ⓐ Asphalt - Wear Layer

Ⓑ Asphalt - Binder

Ⓒ Stabilized

Ⓓ Tout venant

Ⓔ Non-woven fabric

Ⓕ Covering in washed gravel 20/40 mm

Ⓖ 20/40 Washed gravel background layer

Ⓗ DRENING

Ⓘ Existing land

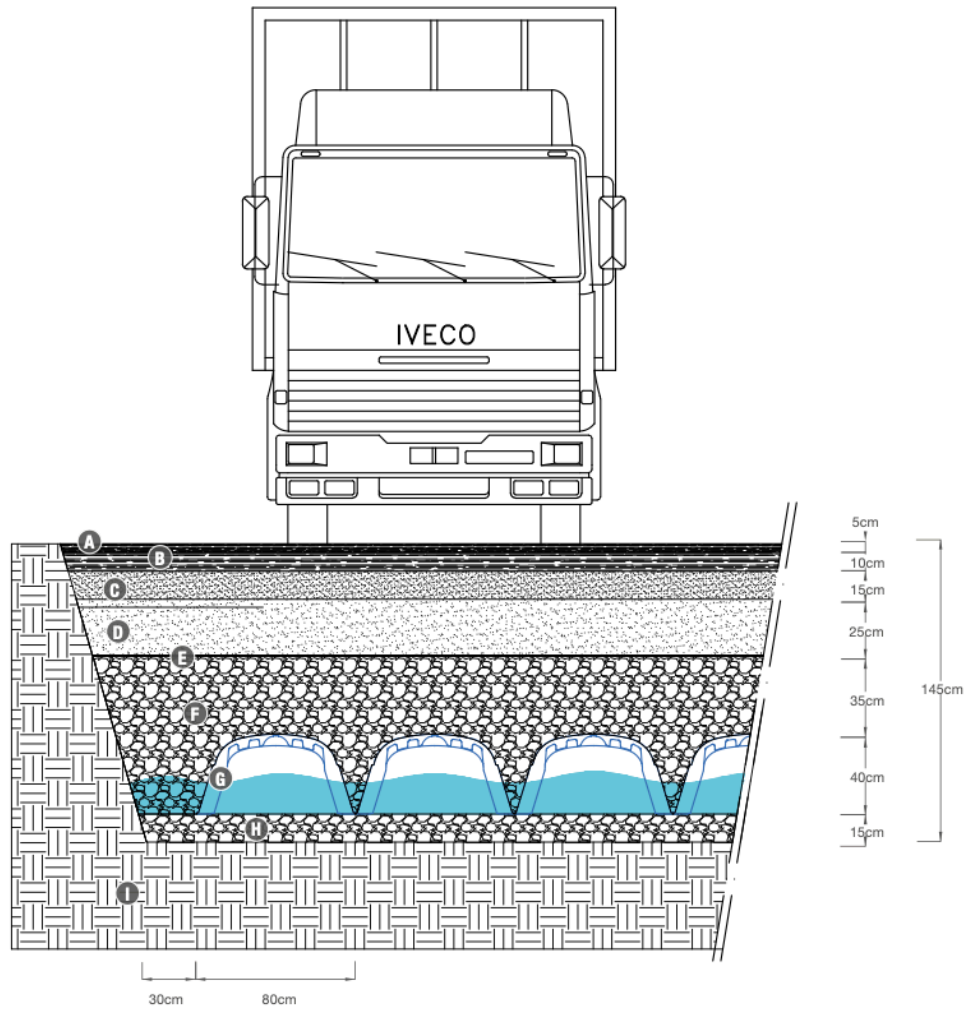
## TRUCKS - CONSIDERED PARAMETERS

Equivalent distributed load	kN/m <sup>2</sup>	7,2
Specific ground weight	kN/m <sup>3</sup>	20
Material safety factor	-	2

## VERTICAL LOADS APPLIED\*

Coating thickness (m)	Installation depth (m)	Ground load (kN/m <sup>2</sup> )	Total load (kN/m <sup>2</sup> )
0,9	1,3	18	25,2
1,0	1,4	20	27,2
1,5	1,9	30	37,2
2,0	2,4	40	47,2
2,5	2,9	50	57,2
3,0	3,4	60	67,2

\*Loads applied on the extrados of the Drening chambers



Ⓐ Asphalt - Wear layer

Ⓕ Covering in washed gravel 20/40 mm

Ⓑ Asphalt - Binder

Ⓖ 20/40 Washed gravel bottom layer

Ⓒ Stabilized

Ⓗ DRENING

Ⓓ Tout venant

Ⓘ Existing land

Ⓔ Non-woven fabric

## HGVS - CONSIDERED PARAMETERS

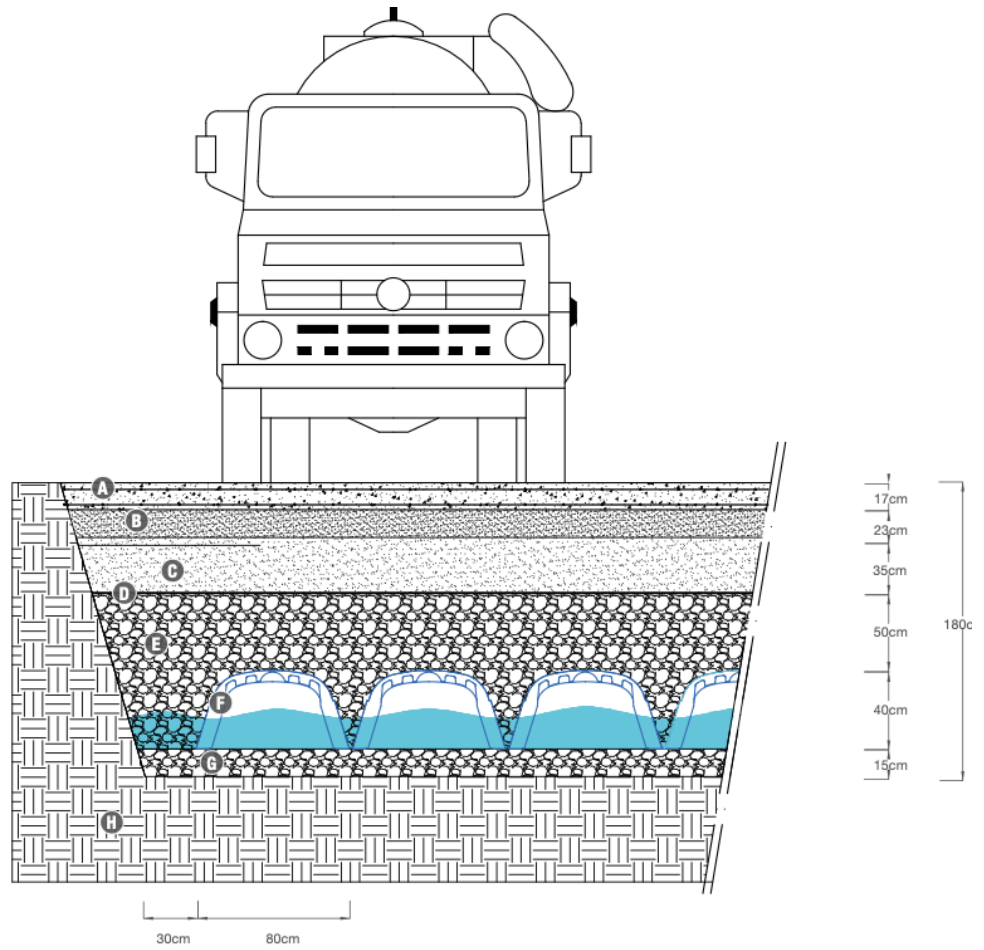
Equivalent distributed load	kN/m <sup>2</sup>	9
Specific ground weight	kN/m <sup>3</sup>	20
Material safety factor	-	2

## VERTICAL LOADS APPLIED\*

Coating thickness (m)	Installation depth (m)	Ground load (kN/m <sup>2</sup> )	Total load (kN/m <sup>2</sup> )
1,25	1,65	25	34
1,5	1,9	30	39
1,75	2,15	35	44
2,0	2,4	40	49
2,25	2,65	45	54
2,5	2,9	50	59

\*Loads applied on the extrados of the Drening chambers



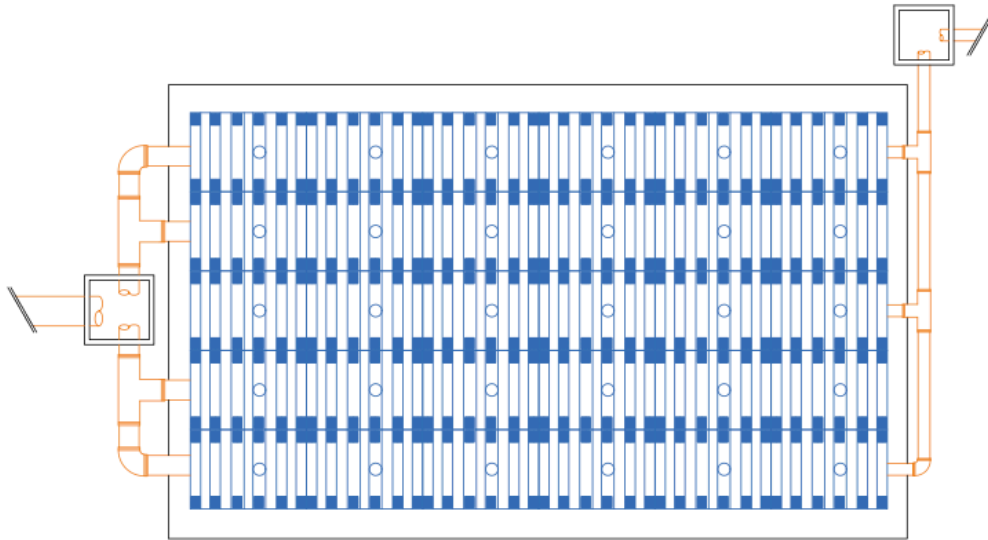


- (A) Reinforced concrete with double electro welded mesh Ø8/20x20
(B) Stabilized
(C) Tou t venant
(D) Non-woven fabric
(E) Covering in washed gravel 20/40 mm
- (F) DRENING
(G) 20/40 mm washed gravel bottom layer
(H) Existing land

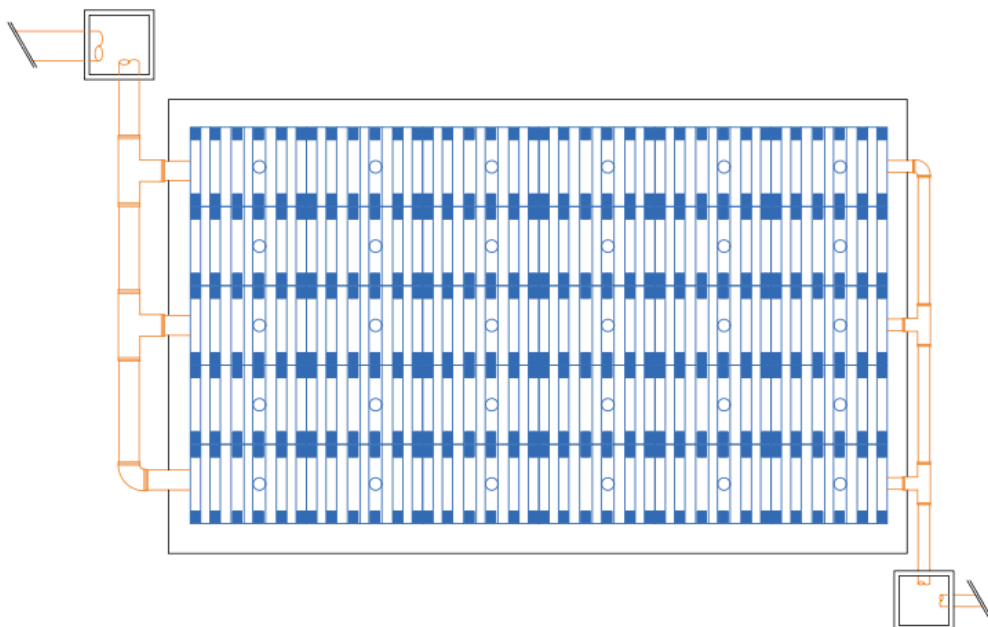
# APPENDIX C1

## HYDRAULIC SCHEMES

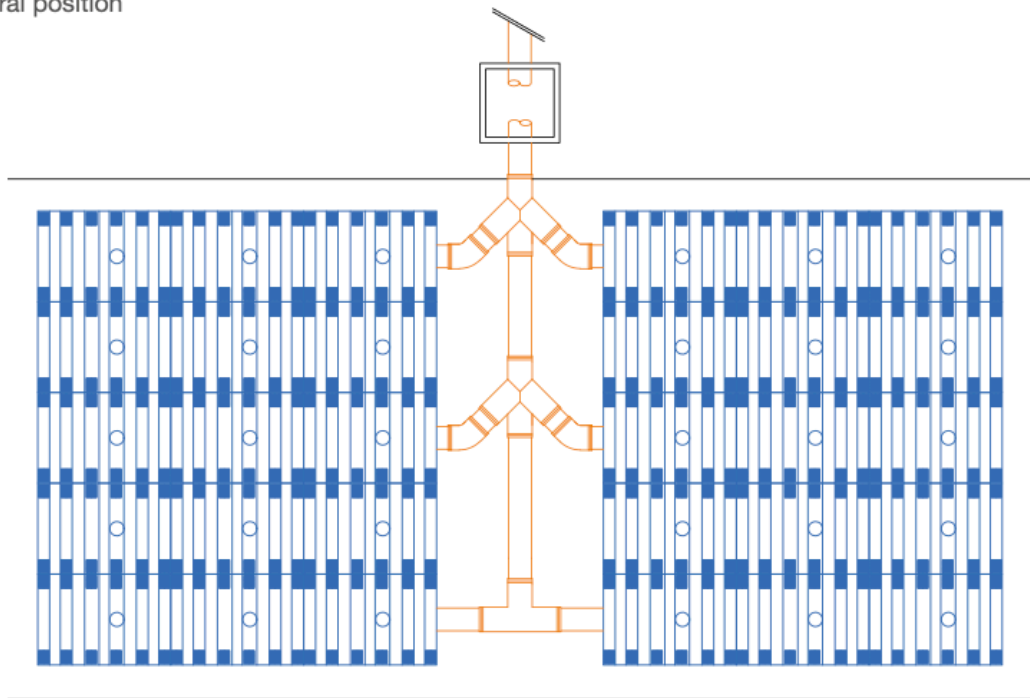
“Front “ supply and “comb” discharge.



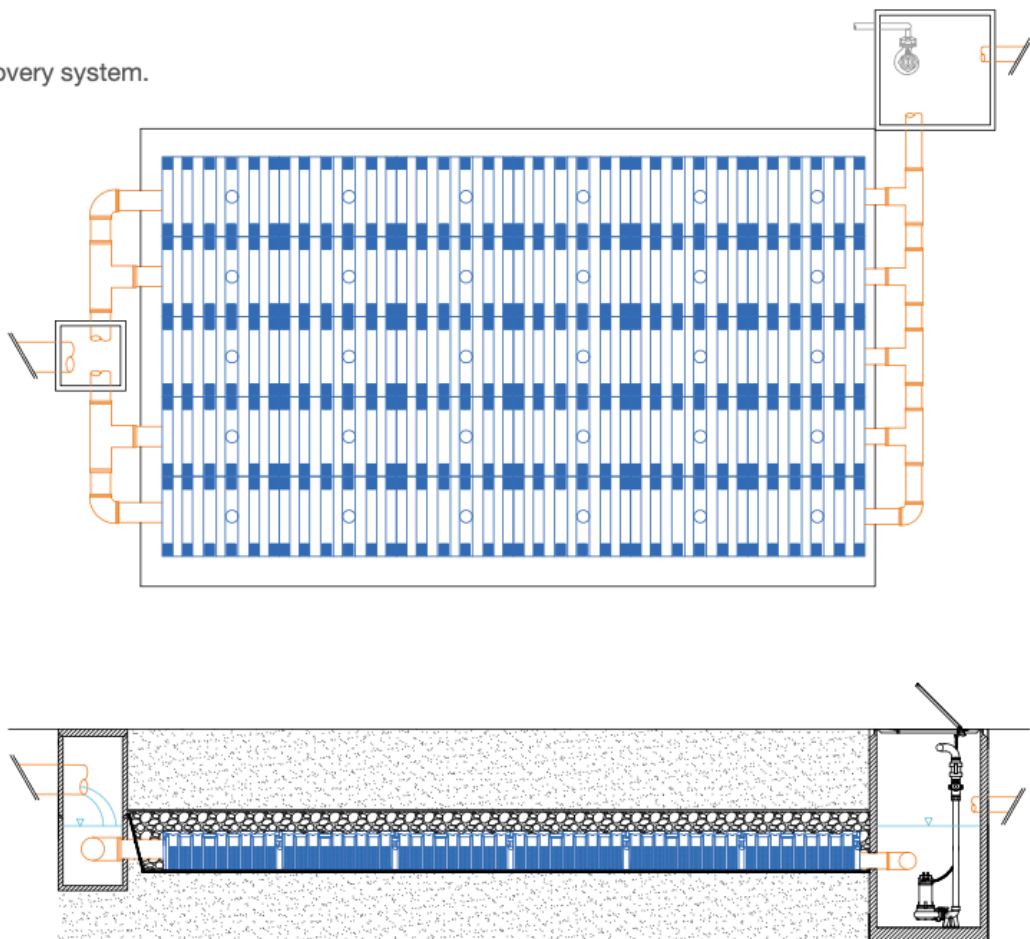
“Comb” supply and discharge.



Supply in central position



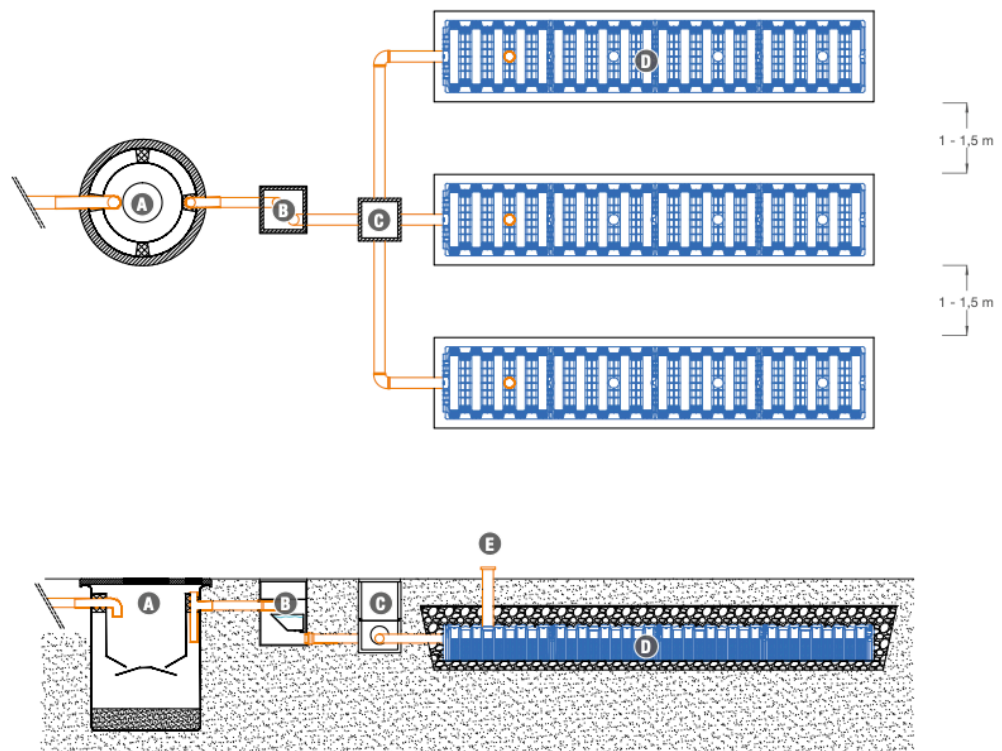
Rainwater recovery system.



# APPENDIX C2

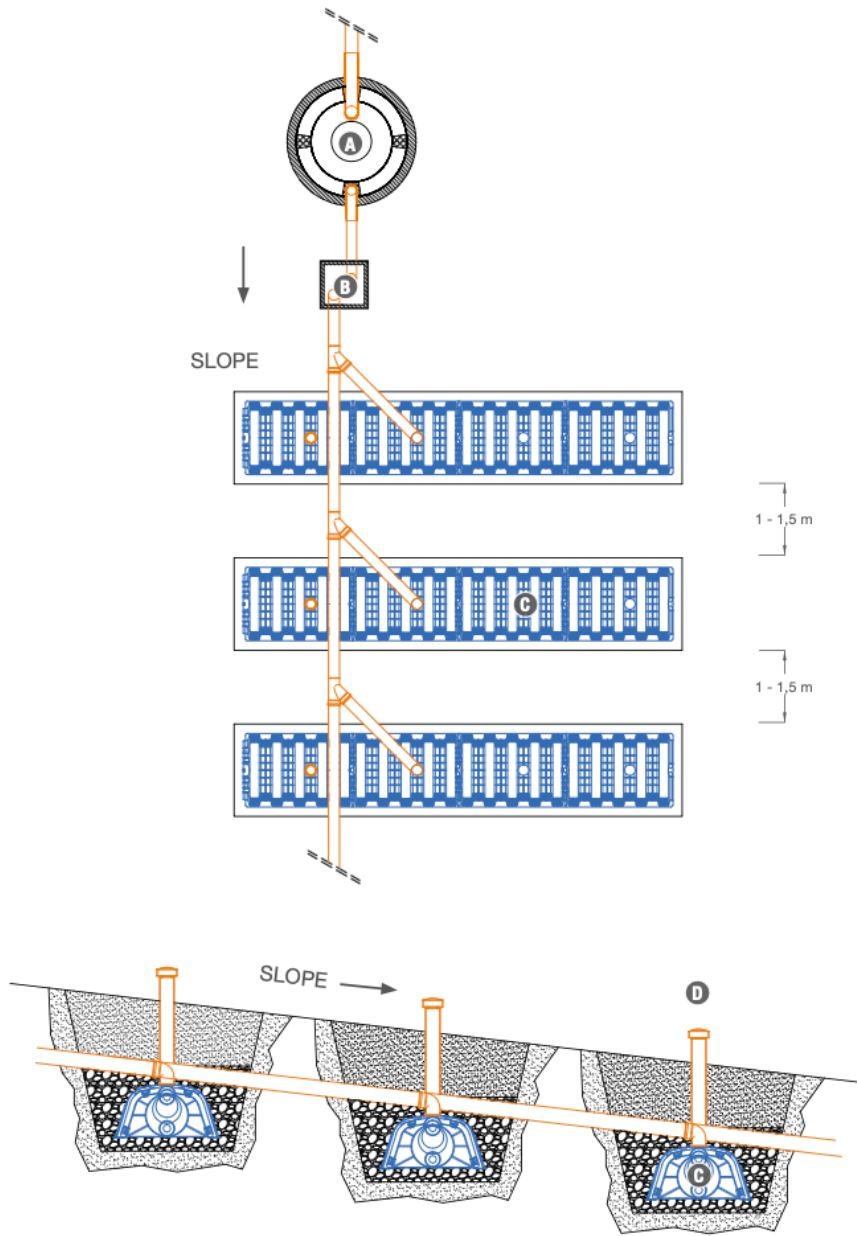
## HYDRAULIC WASTE DISPOSAL SCHEMES

Typical installation scheme for flat areas.



- (A) Imhoff pit (or clarification treatment)
- (B) Expulsion well
- (C) Divider well
- (D) Draining
- (E) Ventilation stack

Installation diagram for sloping areas with top supply.



- (A) Imhoff pit (or clarification treatment)
- (B) Expulsion well
- (C) Draining
- (D) Ventilation Stack