DESCRIPTION OF THE LARGE-SCALE URBAN DRAINAGE FACILITY

The large-scale urban drainage facility is located at the Hydraulics Laboratory of the Centre of Technological Innovation in Construction and Civil Engineering (CITEEC) of the University of A Coruña (Spain). The facility represents a T-intersection street of 100 m^2 linked to a sewer system, and it is equipped with a rainfall simulator able to generate spatially homogeneous rainfall intensities of 30, 50 and 80 mm/h. Rainfall intensity maps generated by the rainfall simulator are provided in the "03_Rain_intensity_maps" folder of the dataset. The street consists of two 2.5-m width roadways with a 30-cm width tile pavement located on both sides. The roadways and the pavements are separated by a 6-cm high curb and have 2% and 1% transversal and longitudinal slopes respectively. In addition, four building blocks with ceramic tile roofs and different slopes are located at both sides of the main street (Figure 1a). Additional information of roof characteristics is provided in Table 1 and in Sañudo et al. (2022) [DOI: https://doi.org/10.1002/hyp.14588].

Figure 1. Surface system (a) and sewer network (b) of the urban drainage facility.

The sewer network (Figure 1b) has a principal pipeline along the longitudinal dimension of the facility which consist of four manholes connected by pipes with inner diameter of 240 mm and a slope of 1%. Additionally, a transversal pipe with an inner diameter of 194 mm and a slope of 0.5% intersect the principal pipeline at manhole 3 (MH3). The XYZ coordinates, dimensions and topology of the pipes, inlets and nodes is presented in Table 3. The surface runoff enters the sewer system through four inlets of 0.5 x 0.2 m and a downstream transversal grid of 2.5 x 0.13 m that covers the roadway width (Table 2). Each inlet is directly connected to the nearest manhole. The water discharge generated by the roofs are conveyed through a semi-circular gutter and caught by four gully pots, one for each roof. The transversal grid and the roof gullies are connected to the manholes by 90 mm PVC conduits. Furthermore, the facility has a pumping system that allows the generation of surface runoff and inflow on the upstream boundary of the roads and pipes, respectively. At the drainage system outlet there is a channel equipped with a triangular weir and a water level sensor. A conceptual scheme of the facility is shown in Figure 2.

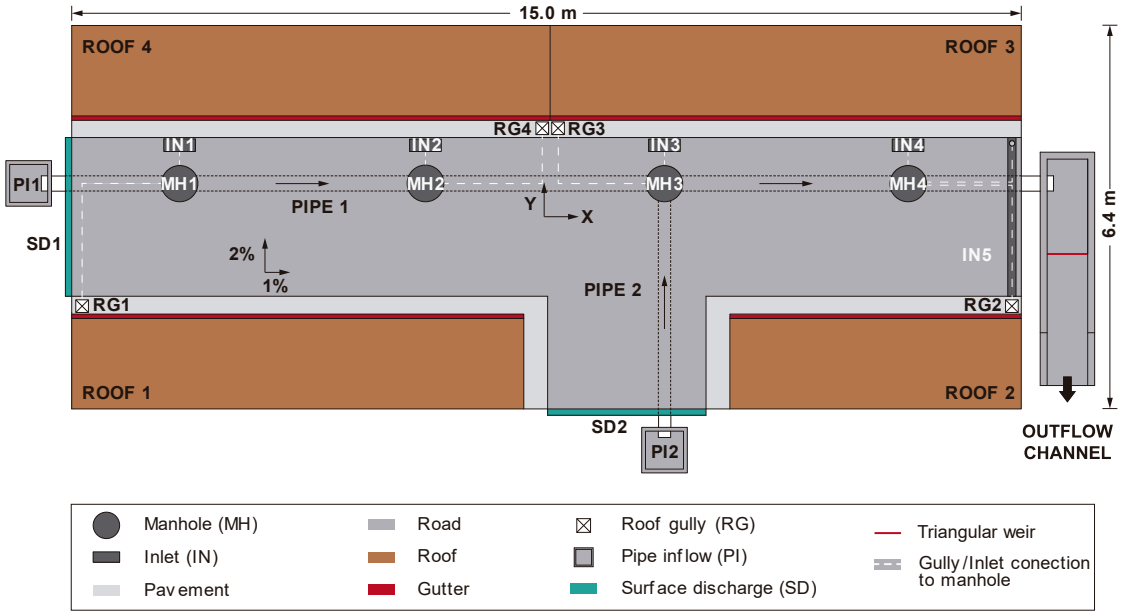

Figure 2. Scheme of the urban drainage facility

The geometry files of the surface and the drainage network are provided in SHP format in the “02_Geometries” folder of the dataset.

APPENDIX: TABLES

Table 1. Geometric characteristics of roofs and associated manholes.

Roof	Slope (%)	Length (m)	Width (m)	Manhole connection
Roof 1	16.0	7.03	1.55	MH1
Roof 2	26.0	4.59	1.55	MH4
Roof 3	37.0	7.42	1.55	MH3
Roof 4	51.0	7.54	1.55	MH2

Table 2. Geometric characteristics of inlets and associated manholes. The XY coordinates refer to the geometric centre of the element.

Inlet	Manhole connection	x Coord (m)	Y Coord (m)	Width (m)	Length (m)
Inlet 1	MH1	-5.76	1.14	0.2	0.5
Inlet 2	MH2	-1.88	1.14	0.2	0.5
Inlet 3	MH3	1.88	1.14	0.2	0.5
Inlet 4	MH4	5.74	1.14	0.2	0.5
Grate	MH4	7.37	0.005	0.13	2.5

Table 3. XYZ coordinates, dimensions, and topology of the urban drainage system. All the coordinates are referenced to the local reference system. The XY coordinates refer to the geometric centre of the element.

Pipe	Length (m)	Slope (%)	Inlet Node	Outlet Node	In Offset (m)	Out Offset (m)
1.1	2.217	0.76	PI 1	MH 1	0.000	0.000
1.2	3.882	0.77	MH 1	MH 2	0.000	0.000
1.3	3.773	0.54	MH 2	MH 3	0.000	0.000
1.4	3.845	0.23	MH 3	MH 4	0.000	0.000
1.5	2.411	0.73	MH 4	OUT	0.000	-
2	3.919	0.28	PI 2	MH 3	0.000	0.082

Node	x Coord (m)	Y Coord (m)	Z invert (m)	Max Depth (m)
PI 1	-7.982	0.477	1.612	-
MH 1	-5.766	0.546	1.596	1.213
MH 2	-1.885	0.522	1.566	1.195
MH 3	1.888	0.534	1.545	1.185
MH 4	5.732	0.522	1.536	1.162
OUT	8.143	0.506	1.519	-
PI 2	1.879	-3.383	1.638	-