



ORDINE DEGLI INGEGNERI DELLA PROVINCIA DI MILANO
THE MILAN ORDER OF ENGINEERS



Seminario

CITTÀ SPUGNA E NATURE BASED SOLUTIONS. INNOVAZIONE E SOSTENIBILITÀ URBANA.



27 maggio 2025

Partner media



Con il patrocinio di



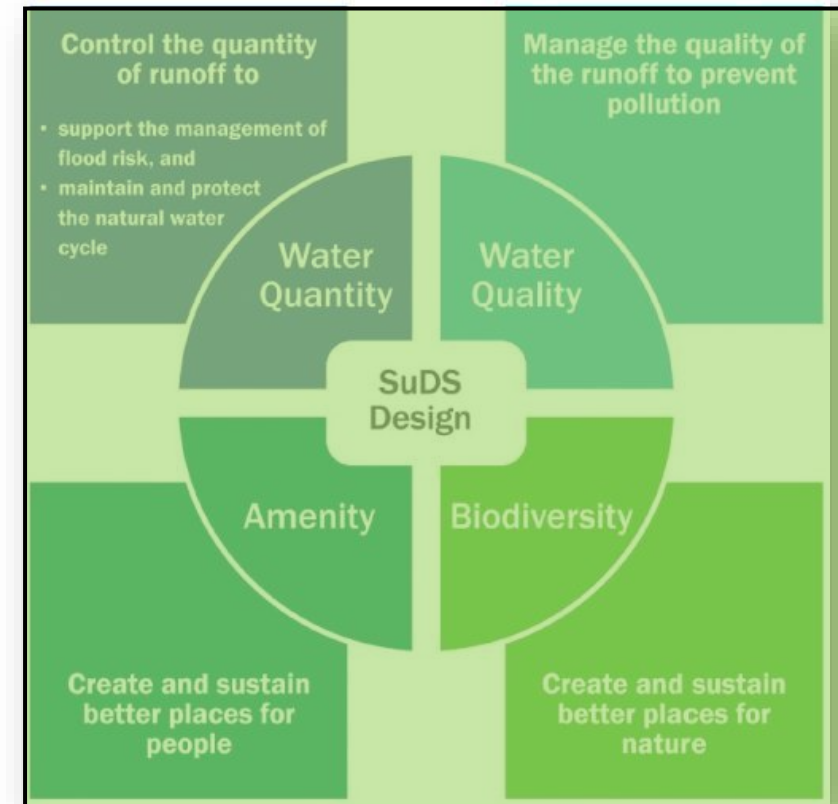
Città
metropolitana
di Milano



► Nature-based Solutions per SuDS: multiobiettivo

TABLE 7.1 SuDS component delivery of design criteria

Component type	Description	Collection mechanism	Design criteria					
			Water quantity (Chapter 3)			Water quality (Chapter 4)	Amenity (Chapter 5)	Biodiversity (Chapter 6)
			Peak runoff rate	Runoff volumes				
				Small events (Interceptions)	Large events			
Rainwater harvesting systems	Systems that collect runoff from the roof of a building or other paved surface for use	P		●	●		●	
Green roofs	Planted soil layers on the roof of buildings that slow and store runoff	S	○	●		●	●	●
Infiltration systems	Systems that collect and store runoff, allowing it to infiltrate into the ground	P	●	●	●	●	●	●
Proprietary treatment systems	Subsurface structures designed to provide treatment of runoff	P				●		
Filter strips	Grass strips that promote sedimentation and filtration as runoff is conveyed over the surface	L		●		●	○	○
Filter drains	Shallow stone-filled trenches that provide attenuation, conveyance and treatment of runoff	L	●	○		●	○	○
Swales	Vegetated channels (sometimes planted) used to convey and treat runoff	L	●	●	●	●	●	●
Bioretention systems	Shallow landscaped depressions that allow runoff to pond temporarily on the surface, before filtering through vegetation and underlying soils	P	●	●	●	●	●	●
Trees	Trees within soil-filled tree pits, tree planters or structural soils used to collect, store and treat runoff	P	●	●		●	●	●
Pervious pavements	Structural paving through which runoff can soak and subsequently be stored in the sub-base beneath, and/or allowed to infiltrate into the ground	S	●	●	●	●	○	○
Attenuation storage tanks	Large, below-ground voided spaces used to temporarily store runoff before infiltration, controlled release or use	P	●					
Detention basins	Vegetated depressions that store and treat runoff	P	●	●		●	●	●
Ponds and wetlands	Permanent pools of water used to facilitate treatment of runoff – runoff can also be stored in an attenuation zone above the pool	P	●			●	●	●



Fonte: Woods Ballard et al. 2015. "The SuDS Manual"



IRIDRA: un team multidisciplinare



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▸ NbS e SuDS: scale di applicazione



Regione Lombardia in collaborazione con **ERSAF** lancia una *call for ideas* per la selezione di interventi di adattamento e mitigazione ai cambiamenti climatici basati sull'impiego di *SuDS – Sustainable Drainage System* al fine di rendere più permeabili le aree urbane per favorire l'infiltrazione delle acque meteoriche, riducendo il rischio di allagamenti e la formazione di isole di calore, anche grazie ad interventi di piantumazione.

Call for Ideas SuDS



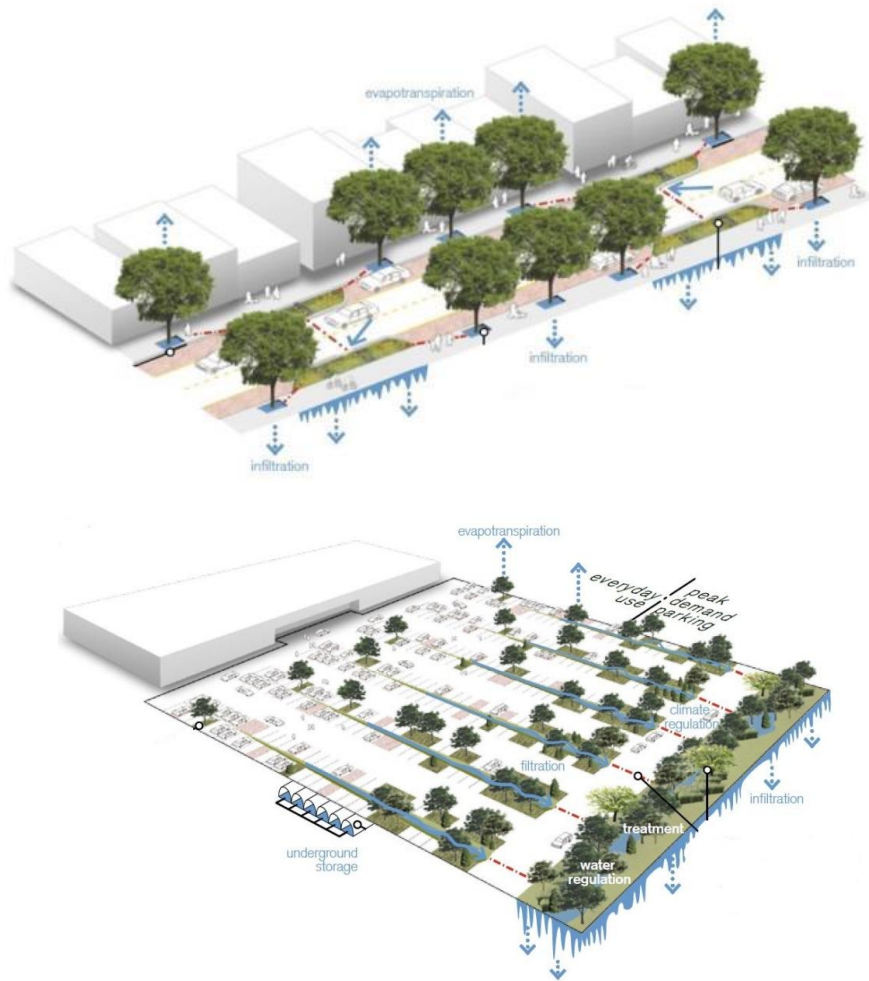
**Regione
Lombardia**

ERSAF
ENTE REGIONALE PER I SERVIZI
ALL'AGRICOLTURA E ALLE FORESTE

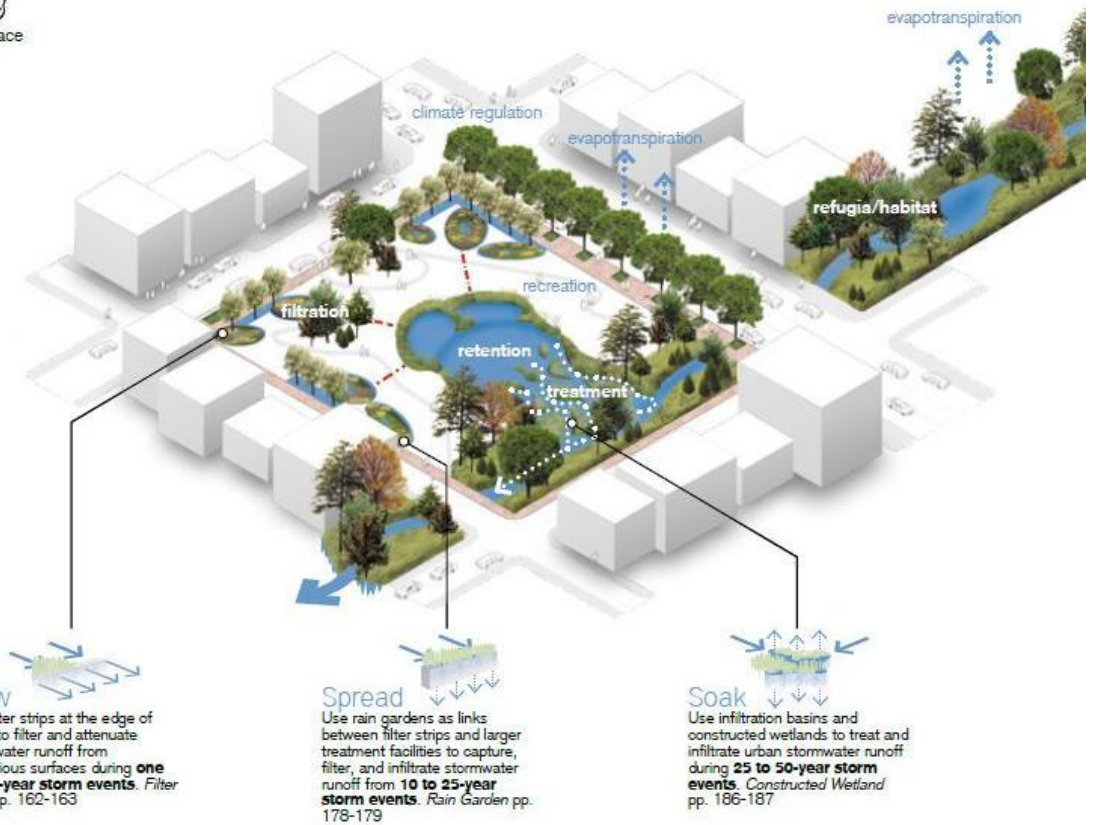
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► NbS e SuDS: scale di applicazione



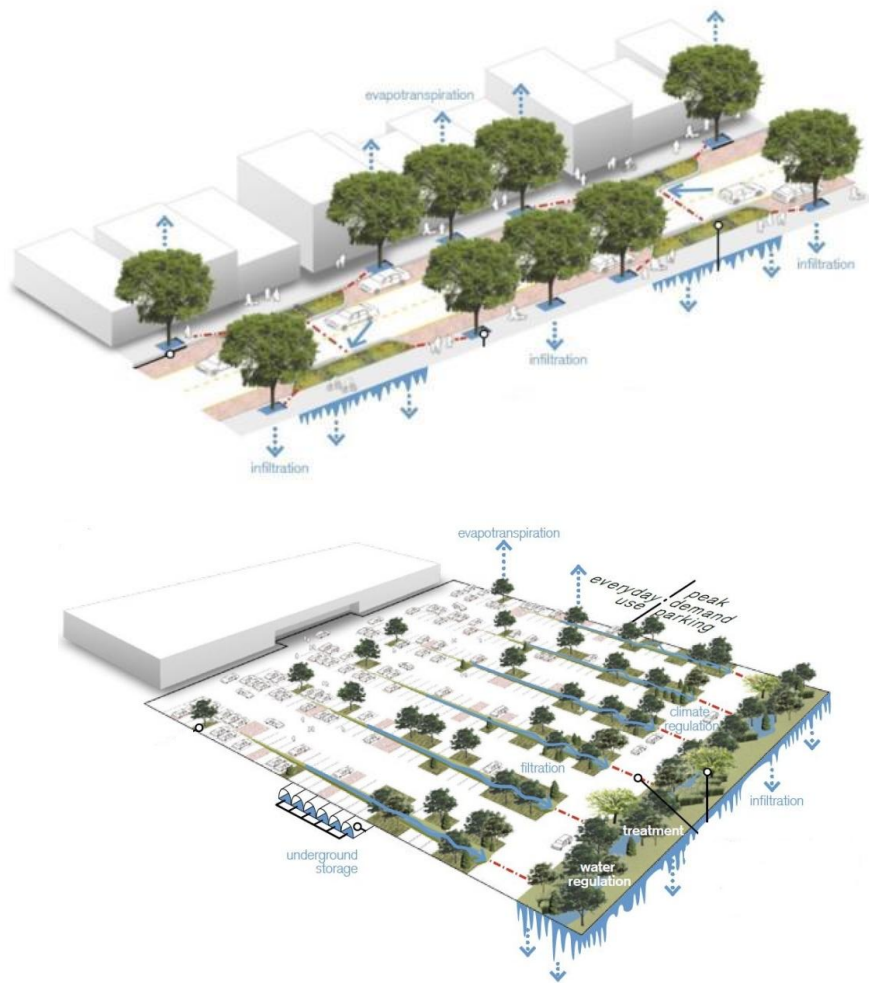
open space



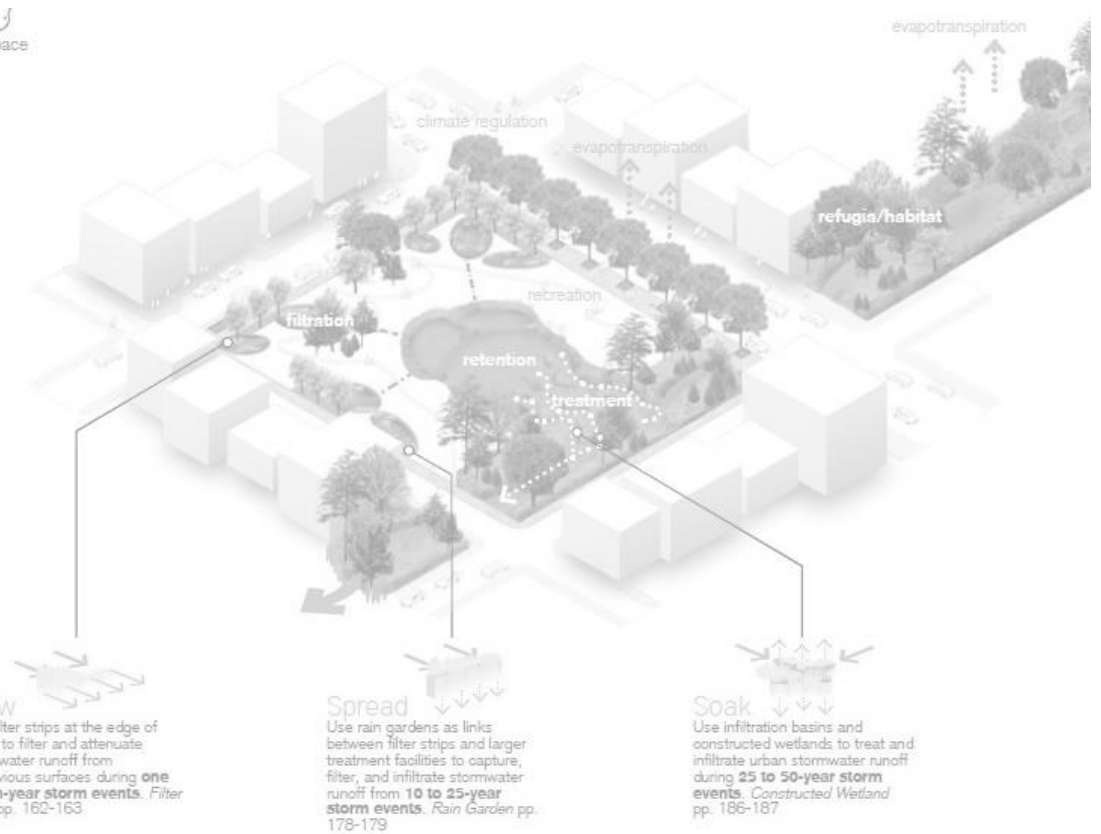
Fonte: Huber, J., 2010. *Low Impact Development: a Design Manual for Urban Areas*



► NbS e SuDS: strade e parcheggi



open space



Fonte: Huber, J., 2010. Low Impact Development: a Design Manual for Urban Areas

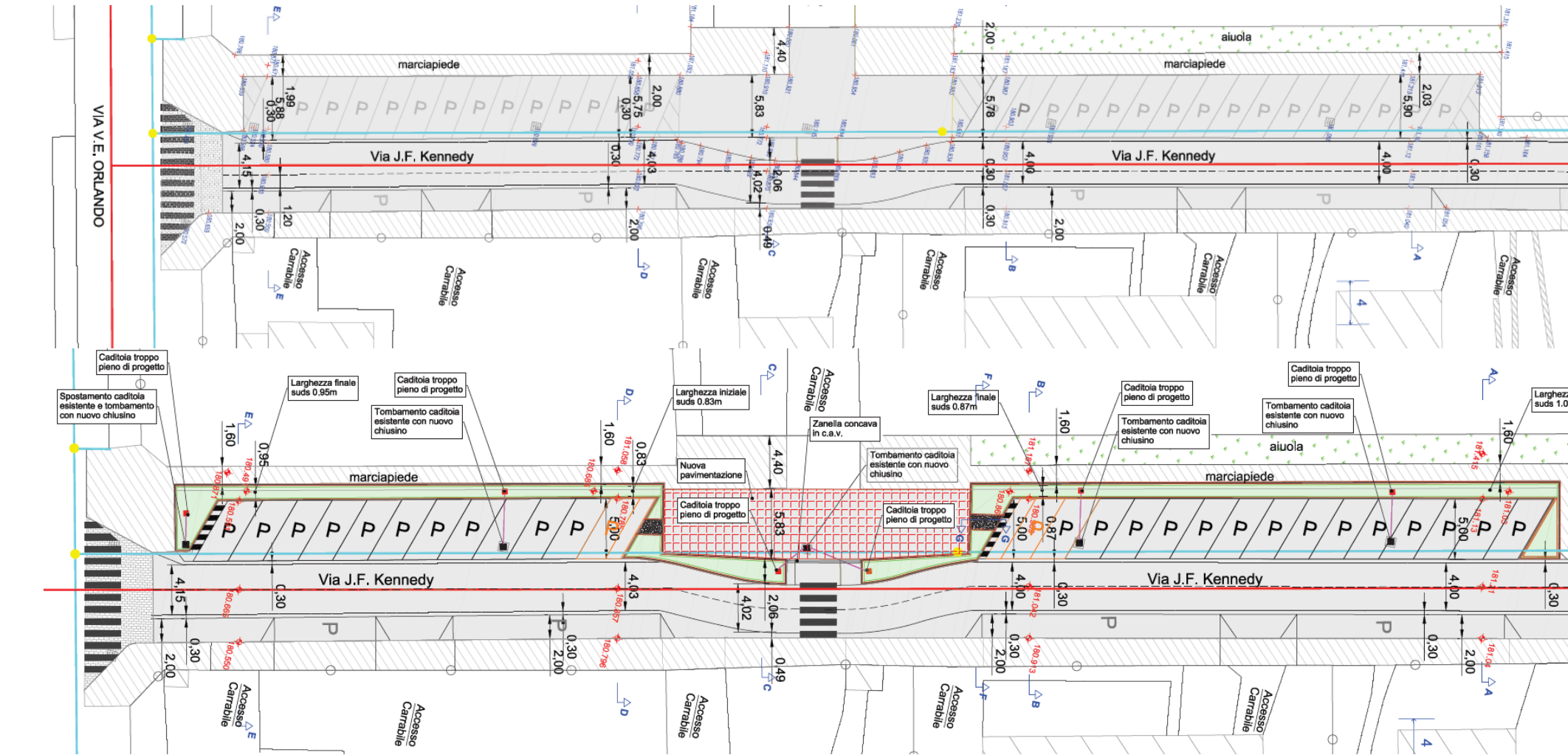
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▼ Viale Kennedy, Varedo (MB) – pre intervento



► Viale Kennedy, Varedo (MB) – planimetria



Stato di fatto

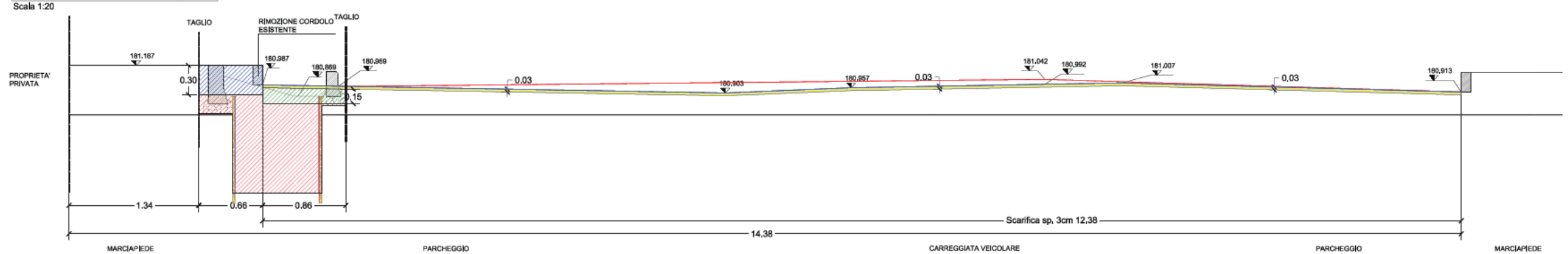
Stato di progetto

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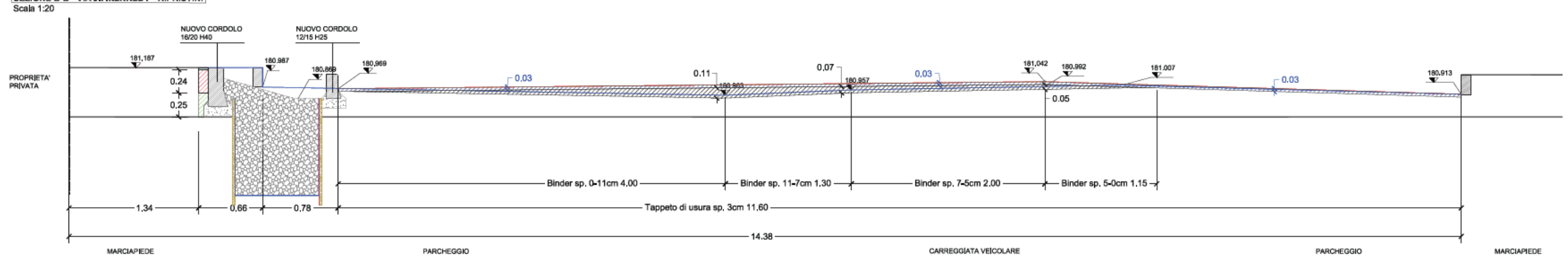


► Viale Kennedy, Varedo (MB) – Sezioni

SEZIONE B-B - VIA J.F. KENNEDY - DEMOLIZIONI



SEZIONE B-B - VIA J.F. KENNEDY - RIPRISTINI





**Aree di bioritenzione
recuperando lo spazio con
restringimento lunghezza
posto auto**

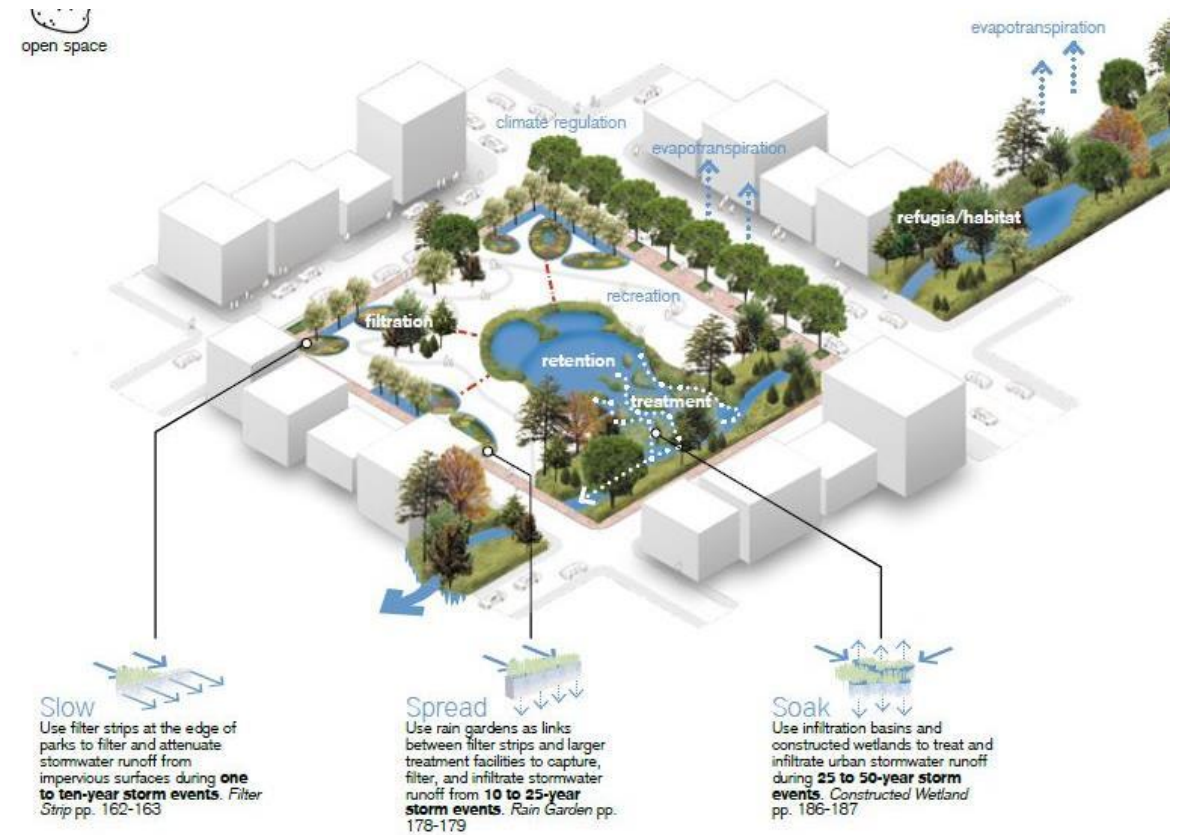
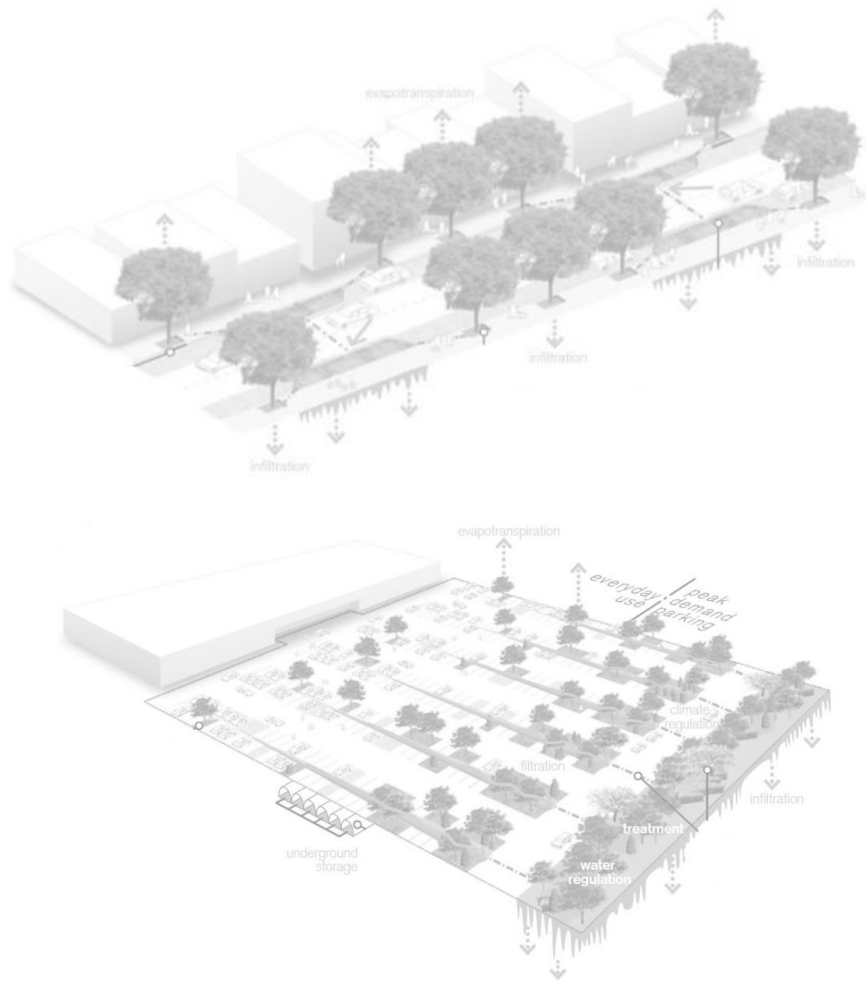
Foto Luglio 2024



CITTÀ SPUGNA E NATURE BASED SOLUTIONS. INNOVAZIONE E SOSTENIBILITÀ URBANA.



► NbS e SuDS: spazi pubblici



Fonte: Huber, J., 2010. *Low Impact Development: a Design Manual for Urban Areas*



► Via e Chiesa S. Martino, Carvico (BG) – pre intervento



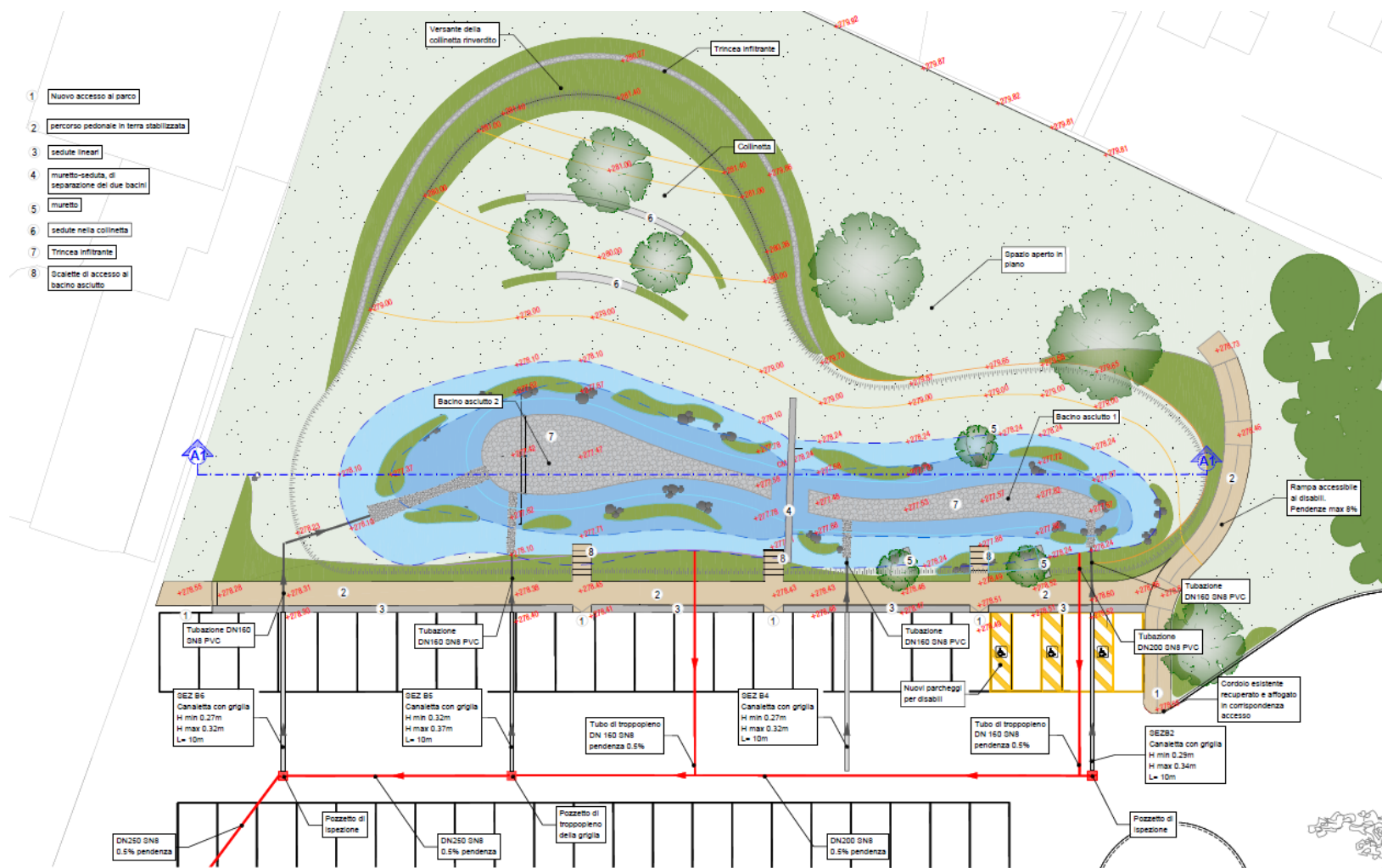
▼ Via e Chiesa S. Martino, Carvico (BG) – planimetria



Stato di fatto



► Via e Chiesa S. Martino, Carvico (BG) – planimetria

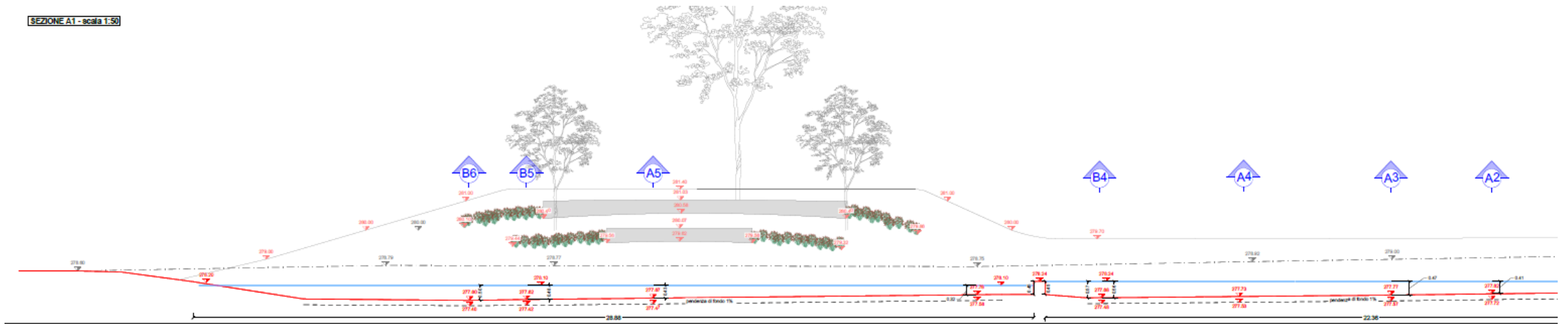


**Stato di
progetto**

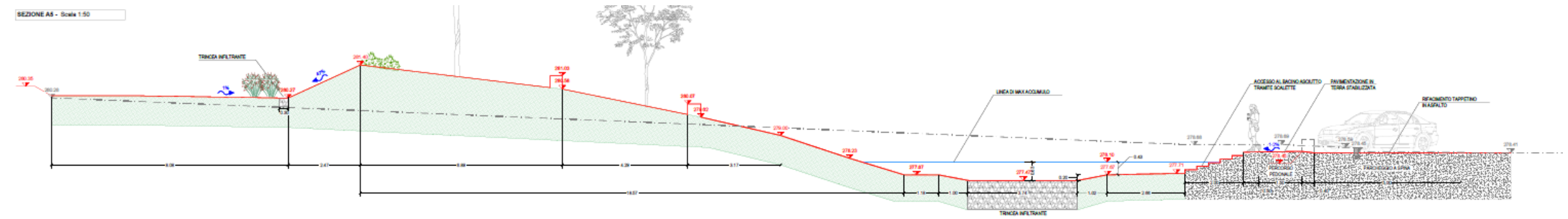


► Via e Chiesa S. Martino, Carvico (BG) – sezioni

SEZIONE A1 - scala 1:50



SEZIONE A5 - scala 1:50



CITTÀ SPUGNA E NATURE BASED SOLUTIONS. INNOVAZIONE E SOSTENIBILITÀ URBANA.



Bacini di detenzione asciutti e fruibili in area parco

Novembre 2024



Bacini di detenzione asciutti e fruibili in area parco

Novembre 2024



▼ Parco via Milano, Besozzo (VA)



CITTÀ SPUGNA E NATURE BASED SOLUTIONS. **INNOVAZIONE E SOSTENIBILITÀ URBANA.**



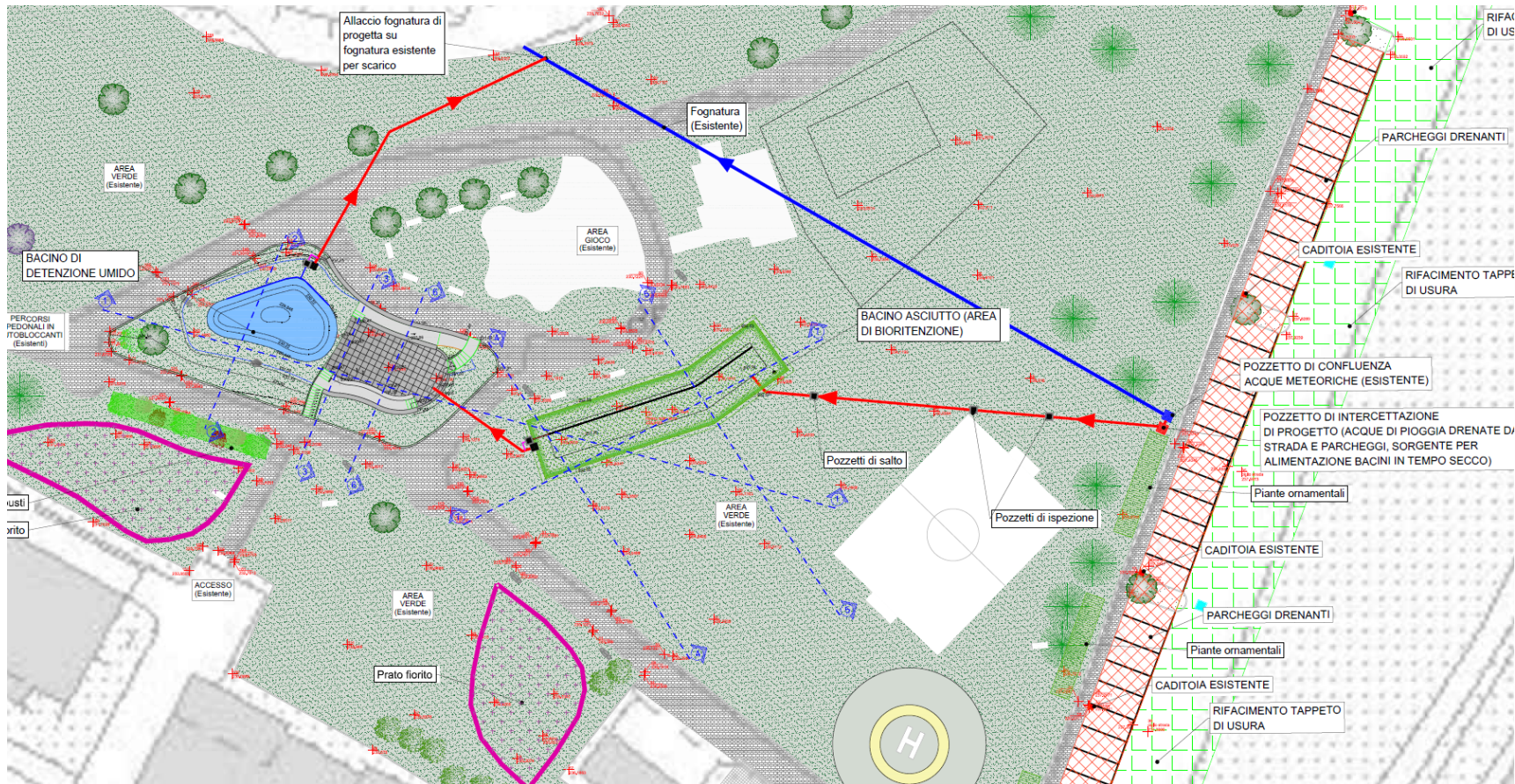
▼ Parco via Milano, Besozzo (VA) – planimetria



Stato di fatto



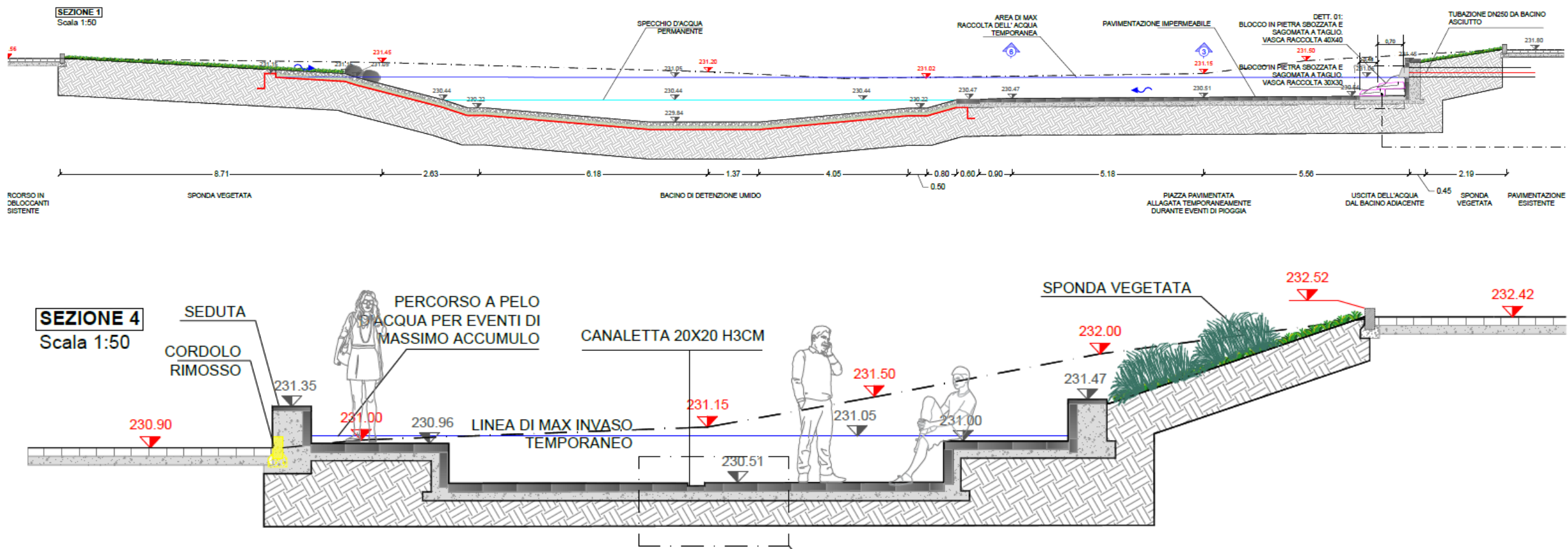
Parco via Milano, Besozzo (VA) – planimetria



**Stato di
progetto**



Parco via Milano, Besozzo (VA) – sezioni



**Bacini di detenzione asciutti
e bagnati fruibili in area
parco**

Novembre 2024



Bacini di detenzione asciutti e bagnati fruibili in area parco

Novembre 2024



Bacini di detenzione asciutti e bagnati fruibili in area parco

Novembre 2024



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