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CENTRAL EUROPE



European Union
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SALUTE4CE

TAKING
COOPERATION
FORWARD

12. - 14. 9. 2022

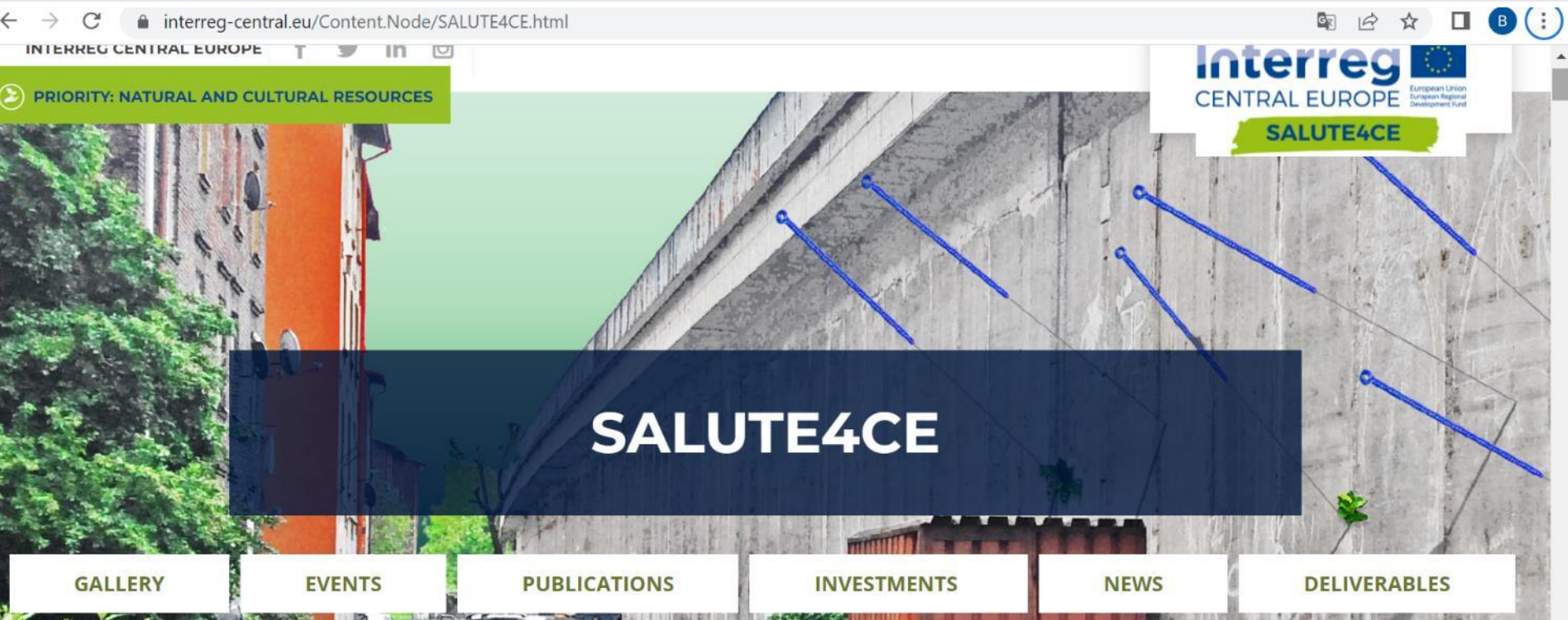


Příklady úspěšné aplikace prvků městské enviromentální akupunktury



SALUTE4CE | Barbara Vojvodíková

PROJEKT SALUTE4CE



SALUTE4CE -Integrated environmental management of SmALL Green Spots in FUnctional Urban ArEas following the idea of acupuncture

**4 WP a investice
4/2019 - 4/2022**



TAKING COOPERATION FORWARD

T1 - Metodika, školení a nástroje pro integrovaný environmentální management malých zelených oblastí

T2 - Akční plány pro městskou environmentální akupunkturu (UEA)

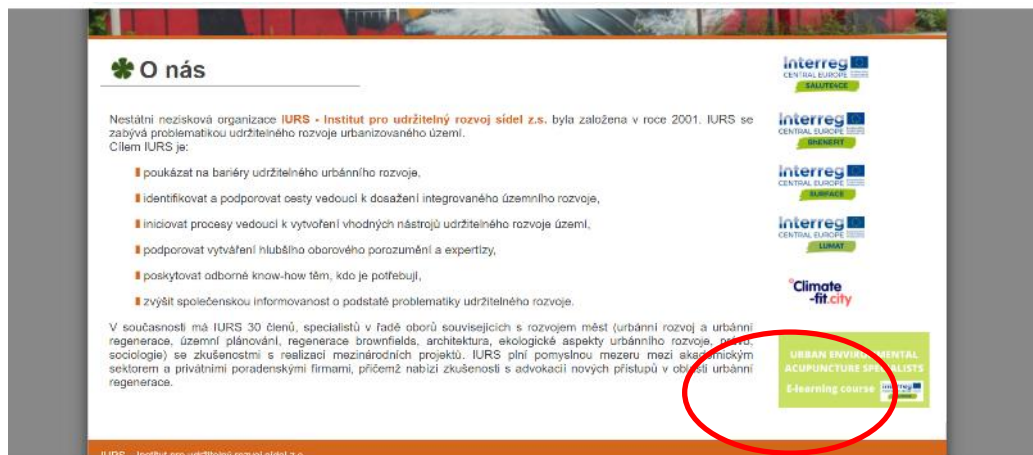
T3 - Aplikace městské environmentální akupunktury ve funkčních městských oblastech - **propojeno s investicemi**

T4 - E-learningový manuál a handbook



WP4 - VZDĚLÁVÁNÍ - E-LEARNINGOVÝ KURZ

<https://www.iurs.cz/>



https://www.iurs.cz/www/files/upload/file/D.T.%204.1.1.e_learning%20maual__entrance_11.pdf

URBAN ENVIRONMENTAL ACUPUNCTURE SPECIALISTS

E-LEARNING - COURSE

Module 1 - Introduction
Module 2 - Challenges that
need to be overcome
Module 3 Connecting UEA
with urban planning
Module 4 Special section -
Nature Based Solutions.





MODULE 2 - Challenges that need to be overcome

Chapter 2 Soil Sealing and Soil Degradation Reduction by application of Urban Environmental Acupuncture solution

Authors: Anna Starzewska-Sikorska, Justyna Gorgoń, IETU - The Institute for Ecology of Industrial Areas

[Self evaluation test](#)

Chapter 3 Urban Environmental Acupuncture as One of the Solutions for Reduction of Heat Stress in Urban Space

Authors: Juliane Mathey, Jessica Hemingway, Peter Wirth, IOER The Leibniz Institute of Ecological Urban and Regional Development

[Self evaluation test](#)

Chapter 4 Possibilities of application of Urban Environmental Acupuncture in Reducing Problems with Rainwater in the Urban Space

Authors: Barbara Vojvodikova, Božena Schejbalova, IURS - Institute for sustainable development

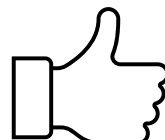
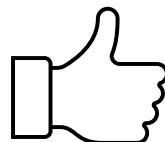
[Self evaluation test](#)

Chapter 5 Urban Environmental Acupuncture for Increasing Air Quality

Authors: Matteo Tabacco, Elena Masala, LINKS Foundation

[Self evaluation test](#)

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Chapter 3 Urban Environmental Acupuncture as One of the Solutions for Reduction of Heat Stress in Urban Space

Authors: Juliane Mathey, Jessica Hemingway, Leibniz Institute of Ecological Urban and Regional Development (IOER), Dresden

Learning targets

By studying this chapter, you will get a basic understanding of the potentials of urban green spaces to reduce urban heat stress. You will also learn about the cooling effects of different green space types in the course of the day. Additionally, information will be provided on points to be considered when preparing an action plan for heat stress reduction by urban environmental acupuncture.

Keywords

urban environmental acupuncture, urban heat stress, heat stress reduction, adaptation to climate change, urban adaptation strategies, green space planning, urban greening

Part 1: Introduction – Urban Heat Stress and Climate Change

Urban areas suffer from special climatic conditions: The phenomenon of the urban heat island (UHI) is characterized by dryness, heat, and lower wind strengths compared to the rural surroundings (Arnfield 2003). Densely built-up and sealed areas (Fig. 1) are heat stores emitting heat to their surroundings, which is especially notable at night with negative influences on human health (Lehmann et al. 2014).

In large cities, heat islands with "tropical nights" above 20°C make it difficult to have the necessary recovery from the heat stress of the day. The sleep can be affected negatively, which may pose health hazards (Höppe 1999). Vulnerable people such as elderly people, sick persons, and young infants (toddlers) are thus exposed to higher health hazards (Scherber et al. 2013). The urban heat island and extreme heat events can increase heat-related morbidity and mortality (Endlicher et al. 2016).



Have you ever thought about what this means for residents?

Perhaps you remember that the 2003 summer heat wave during August caused 35,000 heat-related deaths across Europe (Larsen 2006).

Self Test Q2

On the following pictures you see two urban situations. How you can bring them together concerning heat stress (Fig. 1 with Fig. 2)? *




Valid solution!

On the following pictures you see two urban situations. How you can bring them together concerning heat stress (Fig. 3 with Fig. 4)? *

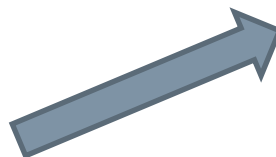



Valid solution!





1. Urban meadows	16. Herb spiral
2. Verges / flower beds with native perennials	17. Urban wilderness / succession area
3. Ground cover plants	18. Ground crops of vegetables / herbs
4. Lawn	19. Vegetated reinforced soil slopes with green fences
5. Green pavements	20. Green pergolas / green arbours
6. Street trees	21. Green facades with climbing plants
7. Park trees	22. Wall-mounted living walls
8. Fruit trees / shrubs /	23. Hydroponic mobile living walls / vertical gardens
9. Large shrubs	24. Vertical vegetable / herb gardens
10. Rain gardens (under-drained)	25. Hanging wall planters (as green street furniture)
11. Road-side swales for retention and infiltration	26. Compacted pollinators' module
12. Linear wetlands for stormwater filtration	27. Rain gardens in planter (self-contained)
13. Natural pollinators' modules	28. Street planters (as green street furniture)
14. Hedge/hedgerow	29. Green covering shelters



Green pergolas / green arbours	
Main impact on:	
Photo:	Linderhof Palace and Park, King Ludwig's castle (Germany) https://c8.alamy.com/comp/BWKJ6E/pergola-arbor-tunnel-green-plants-covered-shoots-bower-germany-europe-BWKJ6E.jpg
Main ecosystem services:	Regulation of air quality (mainly by urban trees, forests, shrubs), Noise mitigated by urban vegetation, Urban temperature regulation, Nature based recreation, Climate regulation by reduction of CO2, Water flow regulation and runoff mitigation, Habitat services – stopping loss of biodiversity, Insect pollination
Short description:	- Spatial characteristic: point - Scale of application: Neighbourhood, Parking area such as carport, Urban space - Labour intensity of maintenance: moderate - Expected efficacy: up to 5 years - Approximate lifespan: long (more than 30 years) - Investment costs: high
Possible locations:	Green town square (pedestrian zone); Green municipal recreational area; Community garden; Green pedestrian area in roadside zones; Green walkway & bicycle path; Green boulevards/promenades (pedestrian zone); Pocket park; Front garden (in housing area); Green backyard/courtyard; Green a. a. to retirement houses; Green a. a. to cultural/educational facilities; Educational garden (school or other educational facilities); Green a. a. to office-, industrial-, or business buildings; Green a. a. to low-rise building estate; Green a. a. to multi-story housing; Green a. a. to children facilities or youth recreational facilities; Green memorial site

[1] FassadenGrün (2020a): Greening of a Pergola.



E-LEARNINGOVÝ KURZ

Meanwhile, thanks to the inclusion of an additional list of references, every participant has the opportunity to improve their knowledge on specific issues. At the same time, the course also includes additional list of references to improve the knowledge of specific issues. For further self-study, the Salute4CE Handbook is also prepared which solves individual problem areas in greater detail, or expands the basic portfolio of knowledge.

Who can participate?

The course is open to all who are interested in sustainable urban development. It is primarily intended for urban planners, architects, students, citizens, local and regional authorities ect.

Why attend the course?

Thanks to the chosen form, the participant has the opportunity to gain an intensive overview of the entire UEA issue. Thanks to the self-evaluation system, the participant has the opportunity to find out if he / she has understood the given issue correctly.

How the e-learning course is divided?

The course is divided into two parts. Educational part and certificated part.

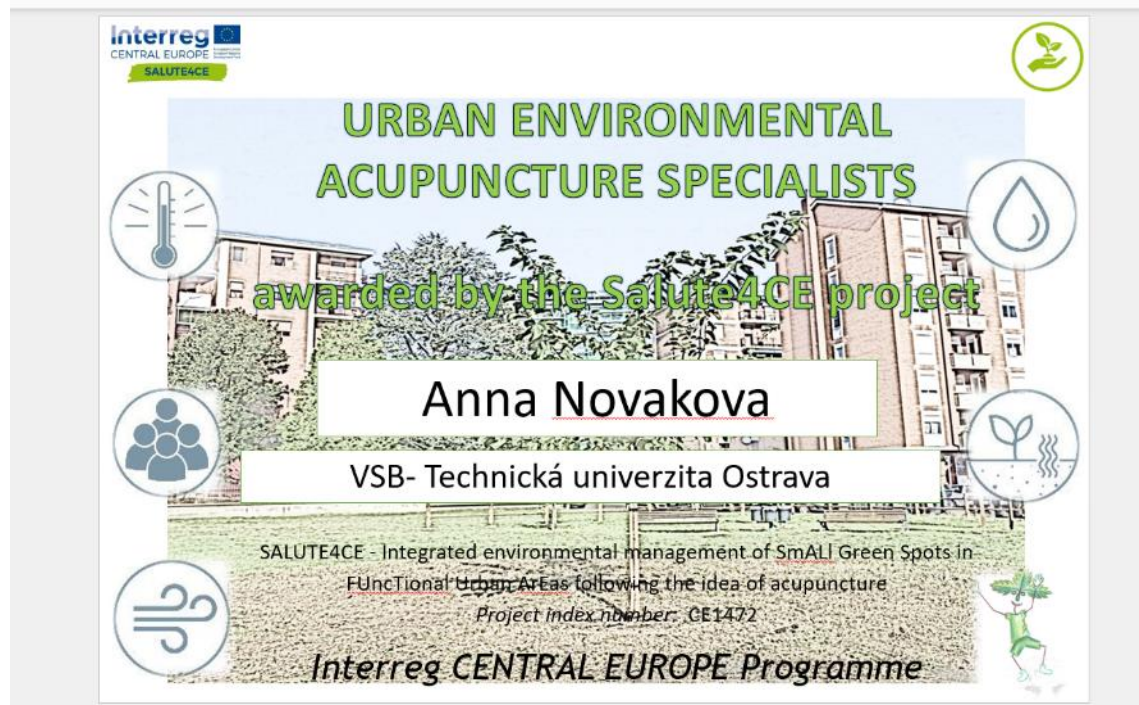
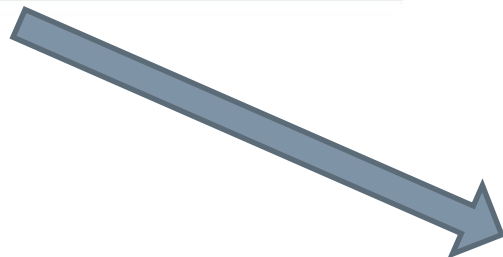
The educational part is accessible to everyone without registration. This part includes all educational modules, including the possibility of self-evaluation.

The certificated part is intended for those e-learning participants who want to obtain a certificate URBAN ENVIRONMENTAL ACUPUNCTURE SPECIALISTS, awarded by the Salute4CE project.

How to proceed in the e-learning course to get a certificate?

In the beginning is necessary to study the information in materials from the educational part. After you feel that you are familiar with UEA, then it is necessary to register. After [registration](#) project representatives will open a special on-line test. Before you start with registration please read [Private Policy - GDPR information](#). By registering, you agree to the terms of the GDPR.

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**URBAN ENVIRONMENTAL
ACUPUNCTURE SPECIALISTS**

awarded by the Salute4CE project

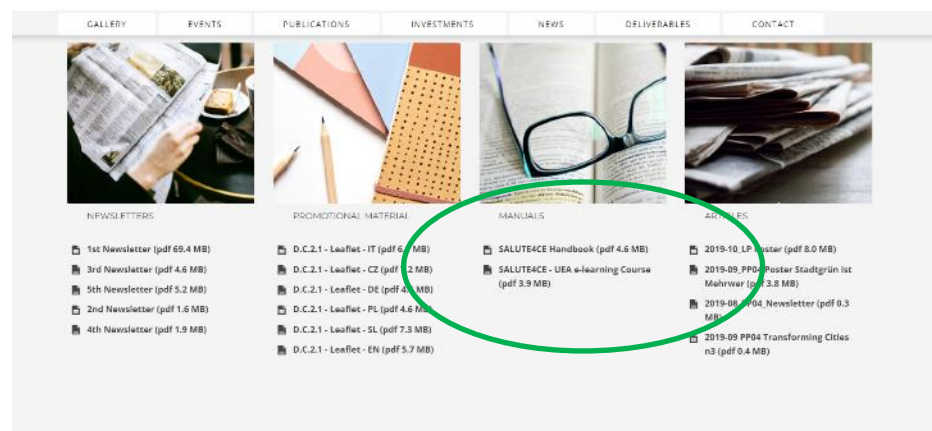
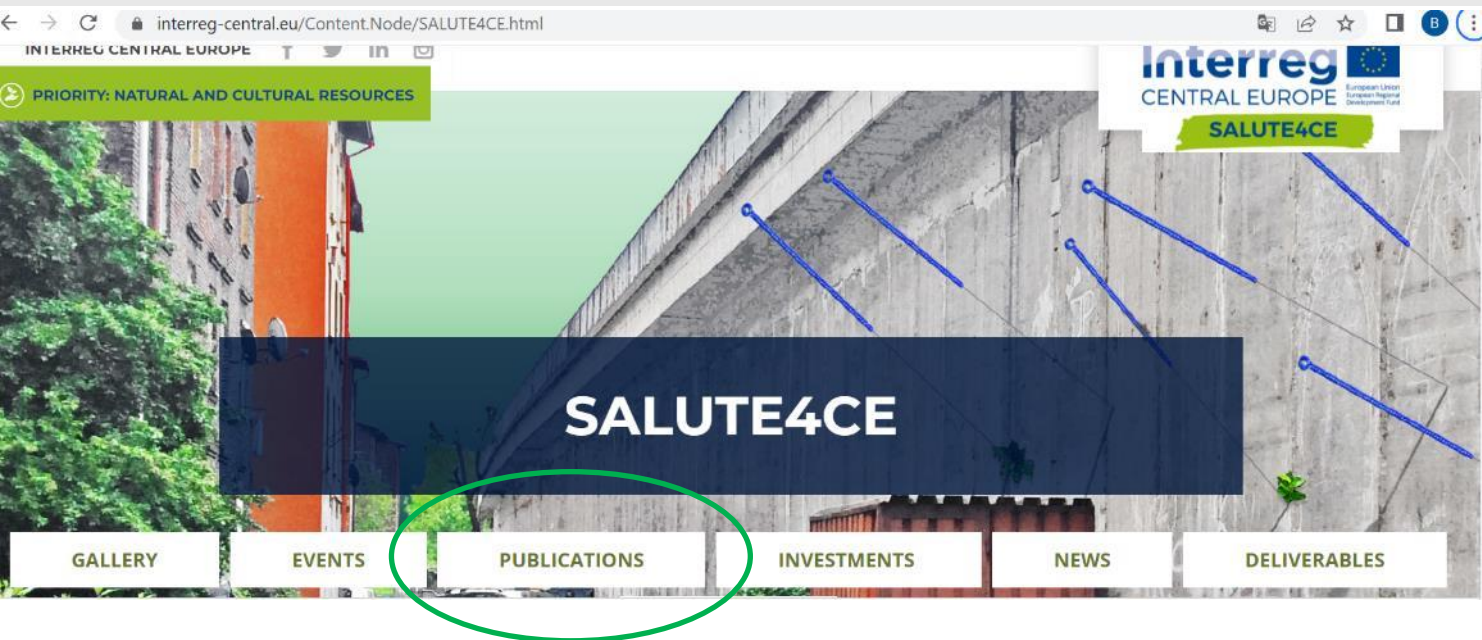
Anna Novakova

VSB- Technická univerzita Ostrava

SALUTE4CE - Integrated environmental management of Small Green Spots in
Functional Urban Areas following the idea of acupuncture
Project Index number: CE1472

Interreg CENTRAL EUROPE Programme





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SALUTE4CE – HANDBOOK ON URBAN ENVIRONMENTAL ACUPUNCTURE



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(South African) *Smear 2005, 8, 1000000*

Figure 4.2: Low-magnification electron micrograph showing intercalation.



Figure 4. An example of a comparison with an *Escherichia coli* gene (see also Figure 8, *Escherichia coli*).

Agente di C'Erroty non si è mai visto con il Padre B. Zofreghiliani.

7.1.16. HERB SPIRAL



rocks and stones, it is necessary to know the space of different plants, which are then covered by the ground. It is necessary to provide good drainage because most plants suitable for rock gardens require a well-drained soil.

Many ecosystem services provided by nature are habitat services. Maintaining loss of biodiversity and insect populations. Possible challenges are loss of biodiversity, potential of increased agricultural loss and green lands, and social justice and social cohesion.

Figure 2. (a) Northern shore, (b) Golden Gate.



Figure 2. (a) Lockers from K. Golek-Dziak.



Electricity Distribution cabins

drainage system at the entrances to the underground car parks and the cellars is filled. As rainfall continues, water often penetrates entrances to underground garages and basements. Low-lying areas such as underpasses under railroads begin to fill with water as they become impassable, and property damage soars.

Fig. 4.3 shows an example of the stormwater model for the city of Antwerp, which was developed by Emergency Planning. Some problem areas are marked in the model. The model documents which important elements in the city may be at risk and therefore need to be given special attention and connected with other hazard data.

- The first group is the measures to improve the microclimate and prevent the occurrence of rainfall runoff.
- The second group consists of infiltration and retention facilities.



Figure 6-4 Two-pointing at an element of uLA - given parameter Phase 1, Trial 1

Figure 4.5 Two planing on an element of UFA – curls, Phase 1. Fold



Figure 2.4.16. (a) ^{13}C NMR spectra of 1,4-dioxane, 1,4-dioxane- d_6 , and 1,4-dioxane- d_8 .

PARTNEŘI PROJEKTU A INVESTICE



ROZDĚLENÍ INVESTIC PODLE TYPŮ

- zelené stěny
- veřejné zahrady
- malé parky a parková úprava
- zeleň na veřejných prostranstvích



ZELENÁ STĚNA - ŽIVÁ - CHORZOW



- Velikost plochy je 50 m² - Kulturní centrum
- Výběrové řízení na veřejnou zakázku bylo firmám otevřeno v květnu 2021.
- Zhotovitel byl vybrán v prvním kole a zelenou stěnu dokončil v září 2021.
- Náklady přibližně 27 500 EUR



ZELENÁ STĚNA- ŽIVÁ- LIPTOVSKÝ MIKULÁŠ



- Plocha zelené stěny je 51 m².
- První a druhé neúspěšné výběrové řízení na zhotovitele se konaly od května do června 2021. Třetí proběhla v červenci a srpnu.
- Práce byly zahájeny dne 22.9.2021 a dokončeny 30. 11. 2021.
- Náklady přibližně 29 070 EUR.



ZELENÁ STĚNA - TRELÁŽ- POPÍNAVÉ ROSTLINY - APOLDA



- Velikost lokality je 0,157 ha (zelená stěna 40 m²).
- V minulosti sloužil objekt jako pošta
- Výběrové řízení bylo zahájeno 7/2021 ukončeno v 12/2021.
- Dokončení 3/2022.
- Náklady přibližně 17 350 EUR.



OZELENĚNÍ DOPRAVNÍ INFRASTRUKTURY POPÍNAVÉ ROSTLINY - CHORZOW



- Velikost lokality je 300 m².
- Veřejná zakázka byla ukončena podpisem smlouvy v únoru 2021. Dne 03.03.2021 bylo předáno staveniště.
- Regenerace byla dokončena v září 2021
- Náklady přibližně 14 400 EUR



ZELENÝ DVOREK - CHORZOW



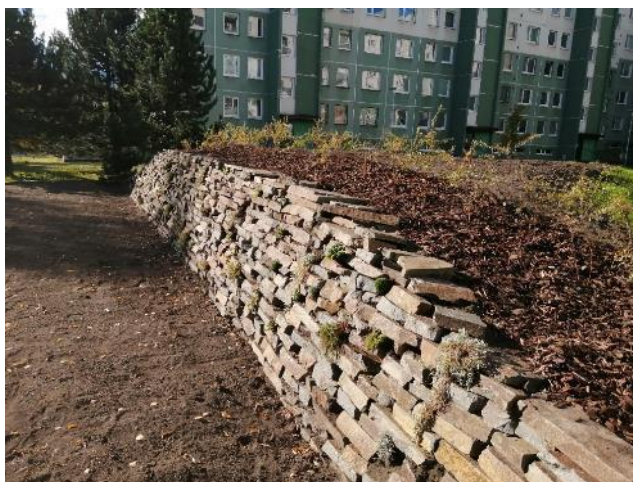
- Velikost lokality je 511 m2.
- V říjnu 2020 provedla firma (po veřejné zakázce) úklidové práce.
- Stavba byla dokončena 20. 6. 2021.
- Náklady přibližně 5 500 EUR.



VNITROBLOK - VEŘEJNÁ ZELEŇ - LIPTOVSKÝ MIKULÁŠ



- Rozloha činí asi 0,2 ha.
- Příprava revitalizace byla zahájena v roce 2019 přípravou návrhu a projednáním se návrhů s občany na veřejném setkání.
- Dne 21.5.2021 město vyzvalo k podání nabídek stavební firmy.
- Dne 17.6.2021 byla podepsána smlouva.
- Stavba byla zahájena dne 6. 9. 2021 - dokončena 22.10.2021.
- Náklady přibližně 63 845 EUR .



VEŘEJNÉ PROSTRANSTVÍ - ZAHRADA PRO ŠKOLÁKY - ALESSANDRIA



- Pozemek o rozloze 1 600 m²
- V září 2019 bylo uspořádáno neoficiální setkání s obyvateli . Zapojení školáků.
- Dne 15. 12. 2020 město vyzvalo k podání nabídek stavební firmy. Dne 30. 12. 2020 byla ukončena a byla vyhlášena veřejná zakázka na stavební práce.
- Stavební práce byly zahájeny 13. 5. 2021 a ukončeny 30. 9. 2021.
- Náklady přibližně 25 300 EUR.



ŠKOLNÍ ZAHRADA - LIPTOVSKÝ MIKULÁŠ

ZAHRADA STAREJ MAMY

- Do procesu navrhování tohoto pozemku o rozloze přibližně 600 m² byli zapojeni žáci školy.
- Dne 28. 4. 2021 tedy požádali místní firmy, aby prošly projektovou dokumentací.
- Dne 17.6.2021 byla uzavřena smlouva o dílo.
- Stavba byla zahájena 5. 8. 2021 a ukončena 24. 10. 2021.
- Na výsadbě se podíleli žáci školy několika stromů a částí záhonů pod odborným vedením.
- Náklady přibližně 12 939 EUR.



- Městská environmentální akupunktura je vnímána jako účinná alternativa k velkým projektům.
- Zájem občanů je díky možnosti zapojení a představitelným rozměrům velký.
- Aplikované prvky přinášení nejen environmentální benefity, ale i benefity edukační a sociální.



DĚKUJI ZA POZORNOST



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