

AUGUST 22-25, 2017

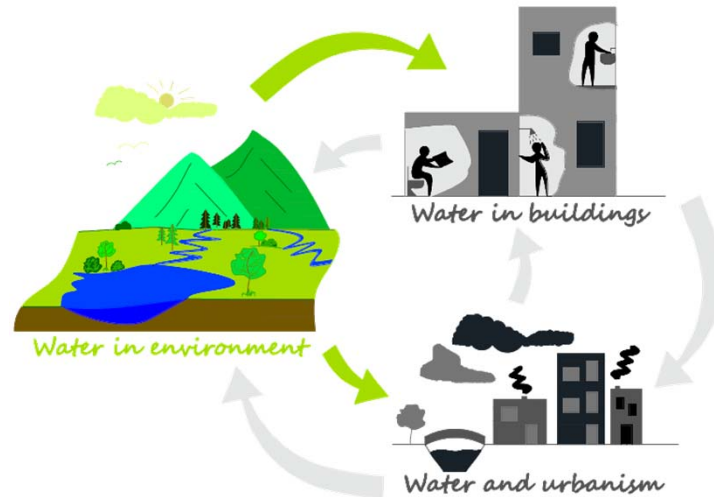
VEGETATED WALL MANAGING GREY WATER - WALL FEATURES

by Martina RYSULOVA

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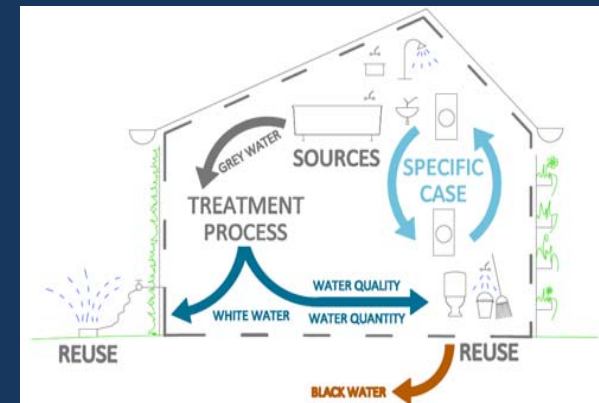
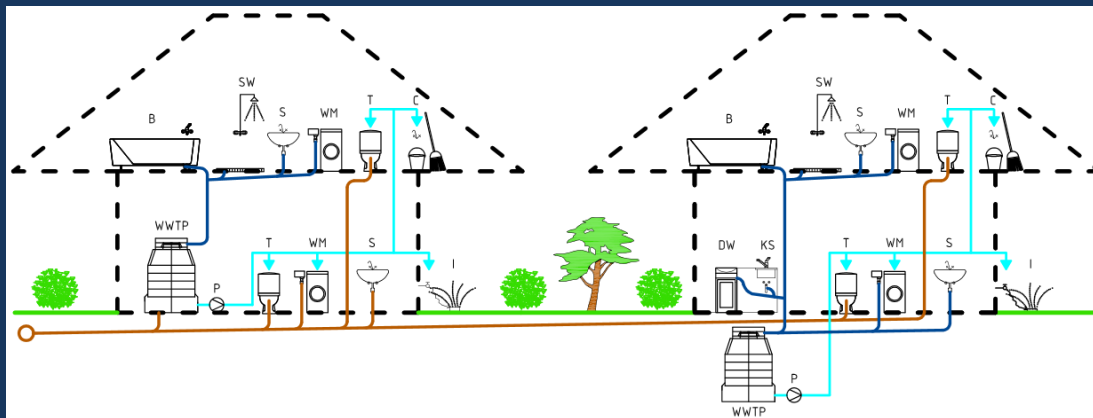
SUSTAINABLE WATER MANAGEMENT?



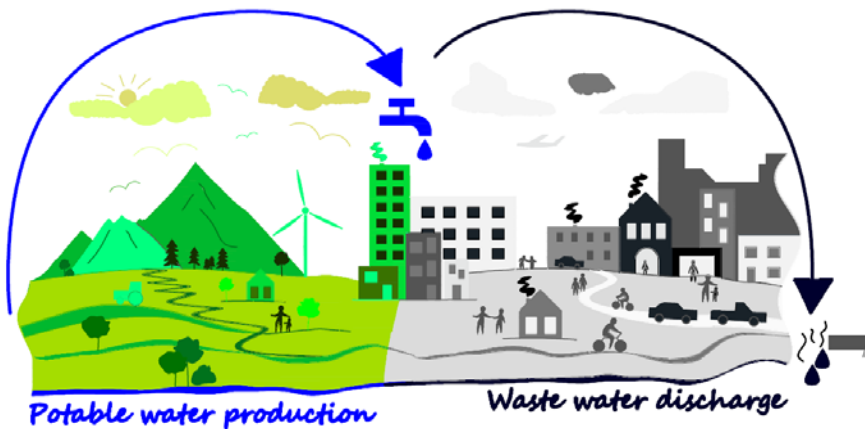
- Well water
- Rain water
- Grey water
- Hybrid system



GREY WATER?



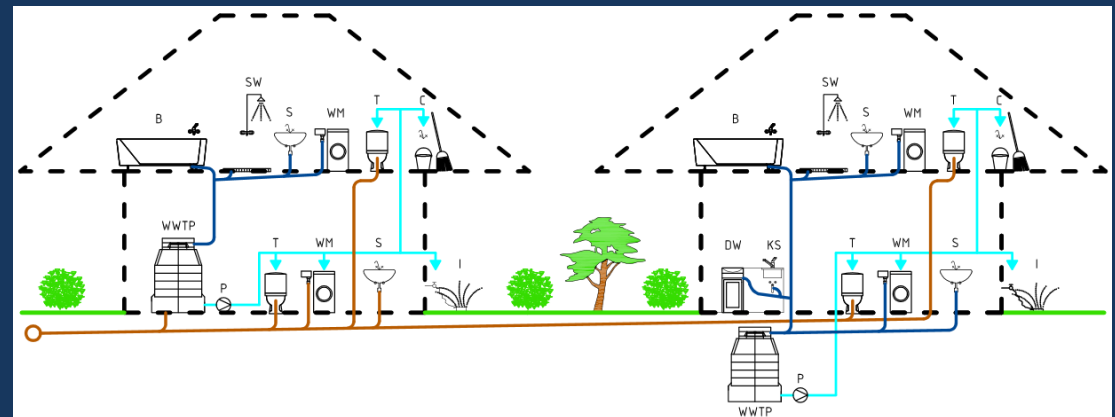
SUSTAINABLE WATER MANAGEMENT?



Proposal of vegetated wall managing grey water

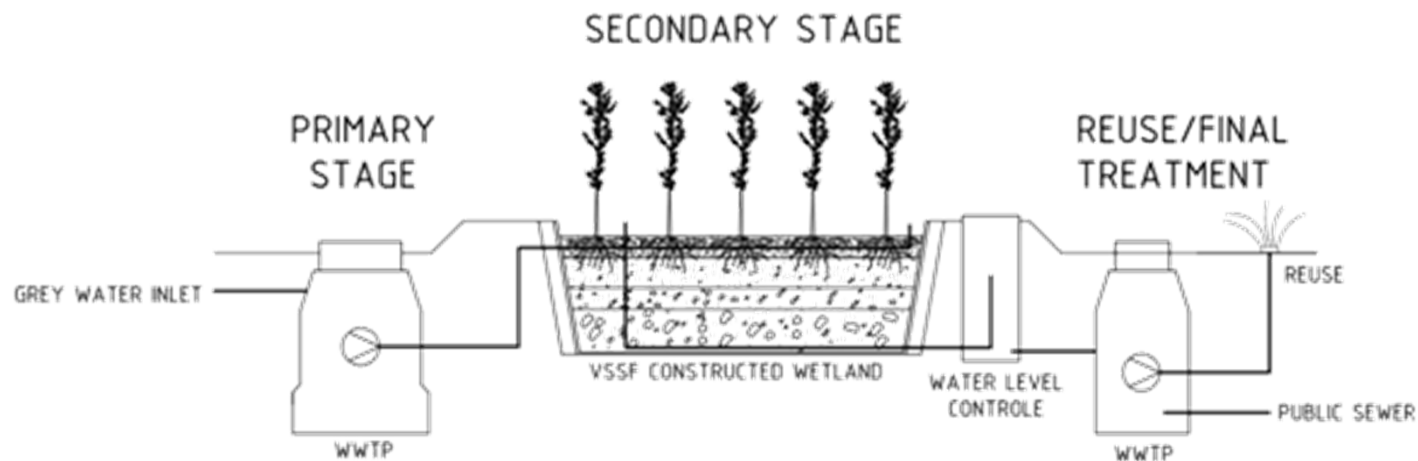
- ✓ Wall basics
- ✓ Substrate - filter media
- ✓ Plants
- ✓ Pollutant concentration

GREY WATER?





„GREEN“ TREATMENT

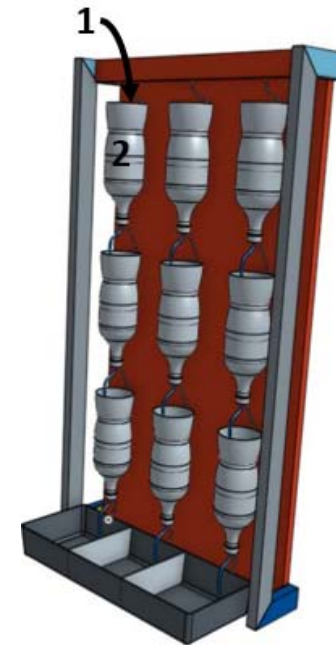
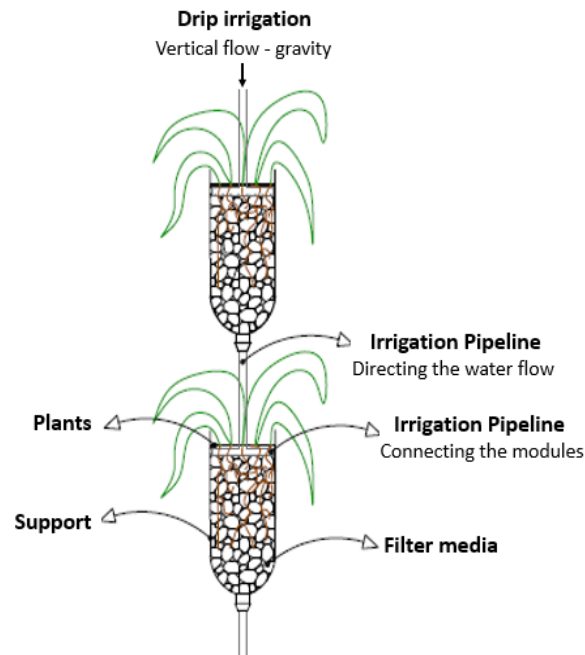


VEGETATED WALL TREATMENT

VEGETATED WALL FOR HYDROPONIC AND GREY WASTE WATER



1ST IDEA – DO IT YOURSELF APPROACH



VEGETATED WALL TREATMENT

VEGETATED WALL FOR HYDROPONIC AND GREY WASTE WATER

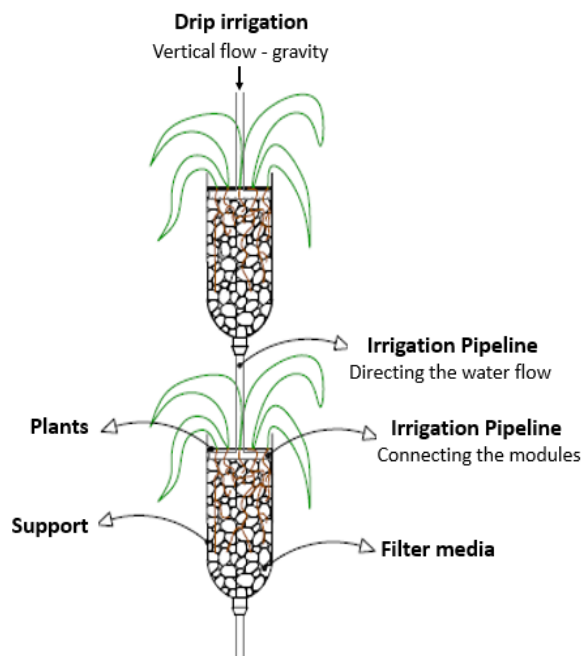


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Filter media compound was selected from 3 layers:

- gravel at the bottom
- coarse sand and
- washed sand mixed with sawdust assuming the role of carbon source

➤ Important issue is to determine **the hydraulic retention time** of selected plants and **filter media**, therefore can be established the approximate time necessary for grey water to pass through all layers.




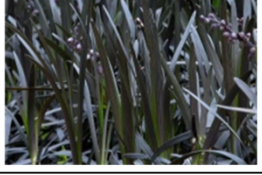
➤ The hydraulic retention time will be determined according to purposed experiment in laboratory conditions

VEGETATED WALL TREATMENT

VEGETATED WALL FOR HYDROPONIC AND GREY WASTE WATER

Selection of the plants



| Figure | Name | Basics |
|---|------------------------|--|
|  | Cotoneaster dammeri | <ul style="list-style-type: none"> • fast growing evergreen low shrub • height 40-50 cm • average, dry or moist soil |
|  | Blechnum spicant | <ul style="list-style-type: none"> • deer fern/ hard fern and evergreen • height 50 cm • average or moist soil |
|  | Carex oshimensis | <ul style="list-style-type: none"> • evergreen arching grassy foliage • height 15-20 cm • average or moist soil |
|  | Ophiopogon planiscapus | <ul style="list-style-type: none"> • evergreen perennials forming clumps • height 20-30 cm • permeable and moist soil |

PLANTS



TUKE - LABORATORIES AT FACULTY OF CIVIL ENGINEERING



- Vegetated wall will be tested in laboratories conditions, where real samples of grey water will be used

GREY WATER SYSTEM – MODIFICATION OF THE LABORATORY



EXPERIMENT – MBR TREATMENT

MEMBRANE BIOREACTOR FOR GREY WATER



MODUL PICTURE

ACTUAL



PROPOSED



EXPERIMENT–VEGETATED WALL TREATMENT
MODUL (600x800) – LABORATORIES; WALL – UNIVERSITY LIBRARY

NEW (04 2017)

ACTUAL (08 2017)



MODUL
PICTURE



EXPERIMENT—VEGETATED WALL TREATMENT

MODUL (1600x2850) — WALL — CENTER OF EXCELLENT RESEARCH



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MBR TREATMENT

- Contaminants removal INLET, OUTLET
- Amount of contaminants after storage
- System function – potential risks/ control measures

COMPARISON

FACTORS:

- + HEALTH PROTECTION
- + ENVIRONMENTAL ASPECTS
- + ECONOMY
- + POLICY

VEGETATED WALL

- Contaminants removal PRE-TREATMENT, INLET, OUTLET
- I Modul tests – 800x600 (different plants)
- System function – Wall system - Potential risks/ control measures

GREY WATER SYSTEM EFFICIENCY



ACKNOWLEDGEMENTS

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ZA VAŠU POZORNOST!

THANK YOU FOR YOUR
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