

Integrating nature-based solutions into the urban planning in Russia



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PLATFORM
BSR WATER



EUROPEAN UNION
EUROPEAN
REGIONAL
DEVELOPMENT
FUND

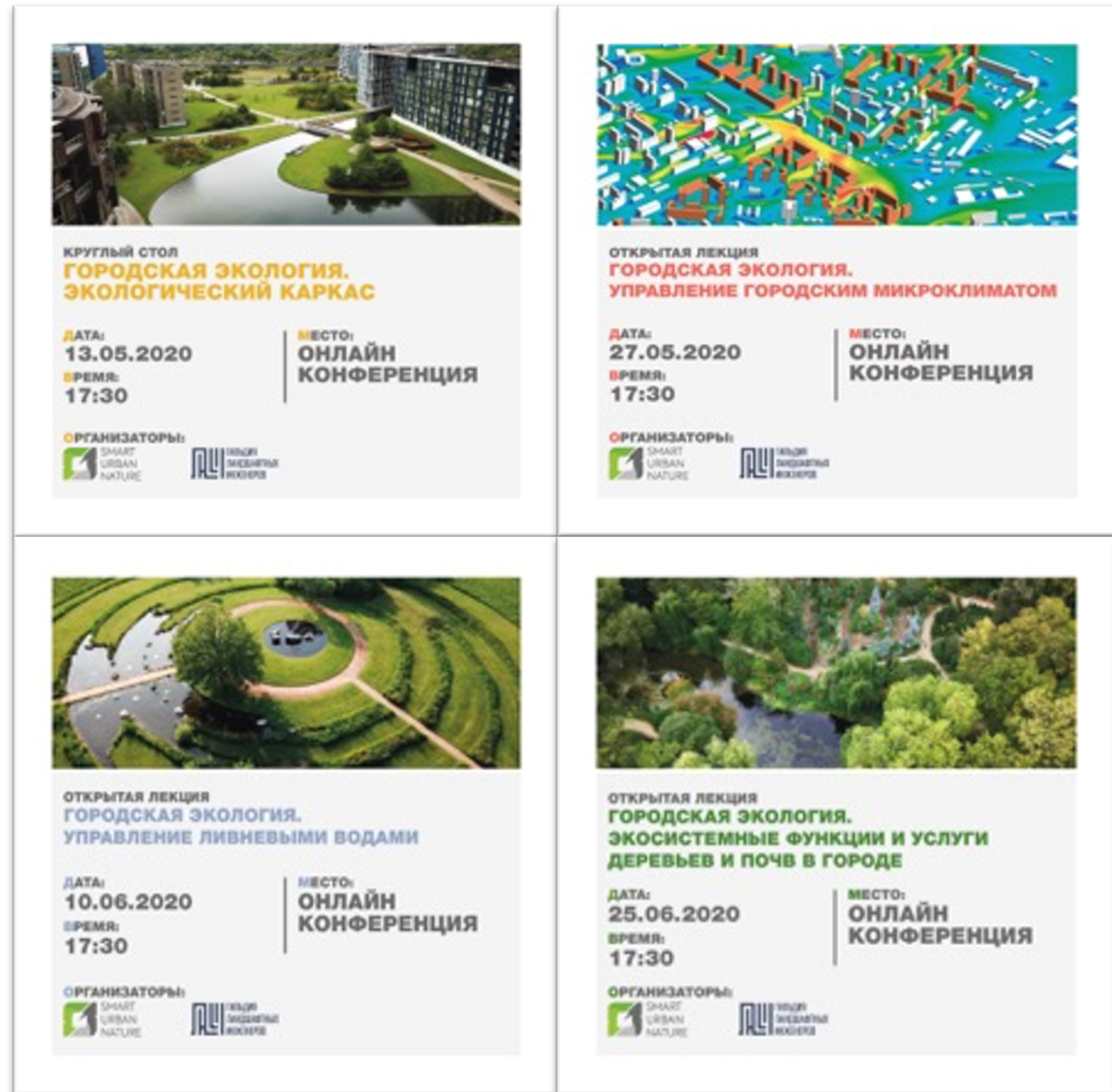


WITH FINANCIAL
SUPPORT OF THE
RUSSIAN
FEDERATION

Landscape Engineers Guild Association

Since 2019, the Association brings together specialists like-minded people in order to create a comfortable and a sustainable environment. Guild members are experts in the field of landscape design and planning, ecologists, engineers, architects and urban planners.

- Social activity
- Education
- Research and Science
- Design
- Expertise of landscape objects

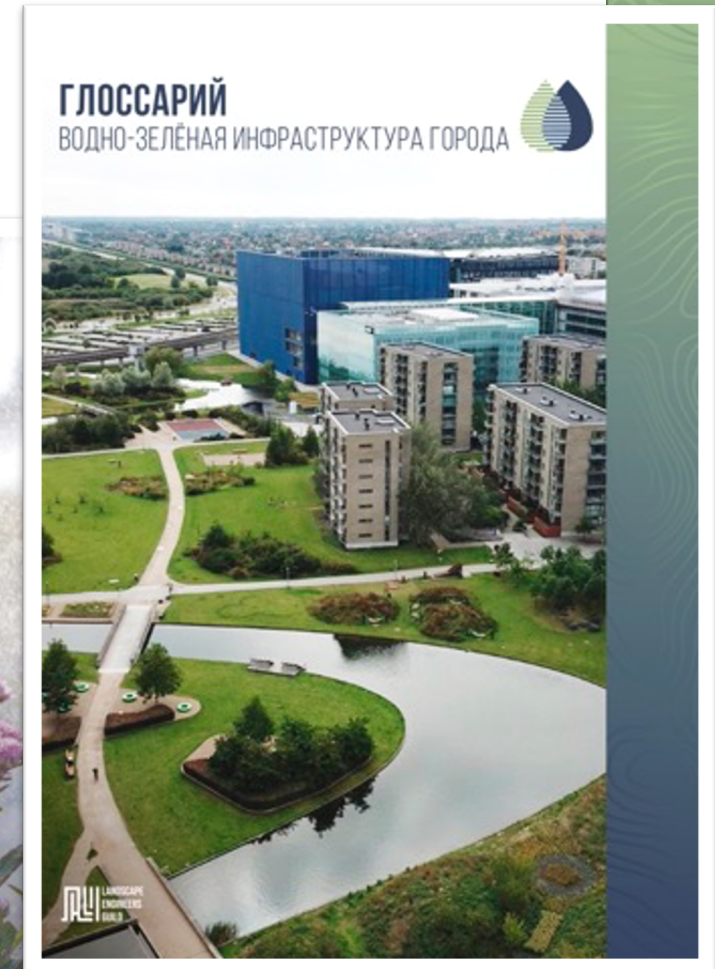
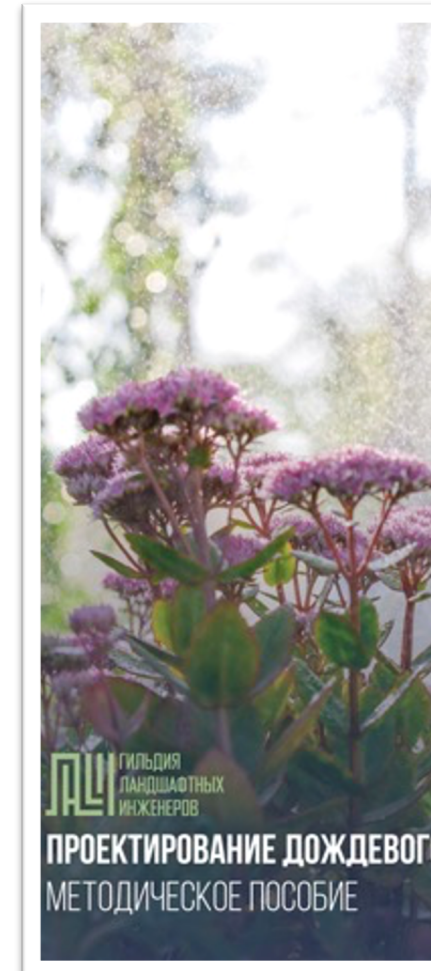


- Manual "Design rain garden "

The brochure is devoted to the description of the methodology rain garden design with detailed illustrations and instructions on how to choose place for a rain garden, how to determine the filter soil ability, calculate effective area drain, etc.

- Glossary "Water-green infrastructure of the city"

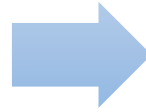
The Glossary of Green Water Infrastructure will be be an explanatory dictionary, which will given terms in Russian and English and an explanation their meanings. More than 200 terms will be collected in the Glossary, used in professional international environment.



LANDSCAPE-ECOLOGICAL APPROACH IN SUSTAINABLE DESIGN

- Study of the landscape structure of the territory
- Analysis of the cultural landscape
- Modeling the microclimate of the territory
- Sustainable storm drainage system
- Assessment of ecosystem services of soil, vegetation, water bodies
- Landscape engineering recommendations and design solutions
- Monitoring system (including public) of landscape changes

**Analysis and assessment of
physical
geographic conditions**



**Modeling
microclimate of the territory**



**Landscape engineering
solutions and
recommendations
on landscape design**



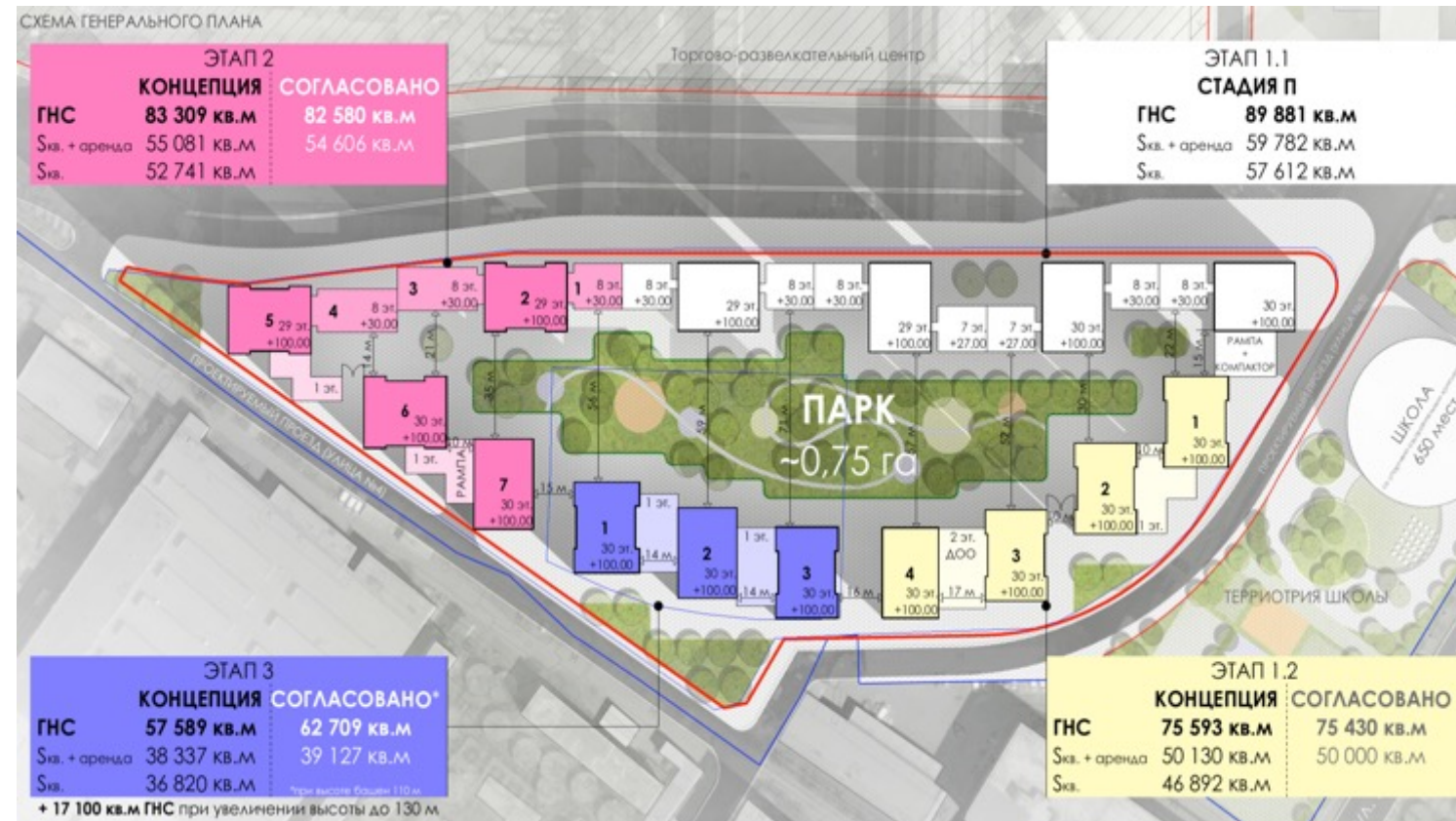
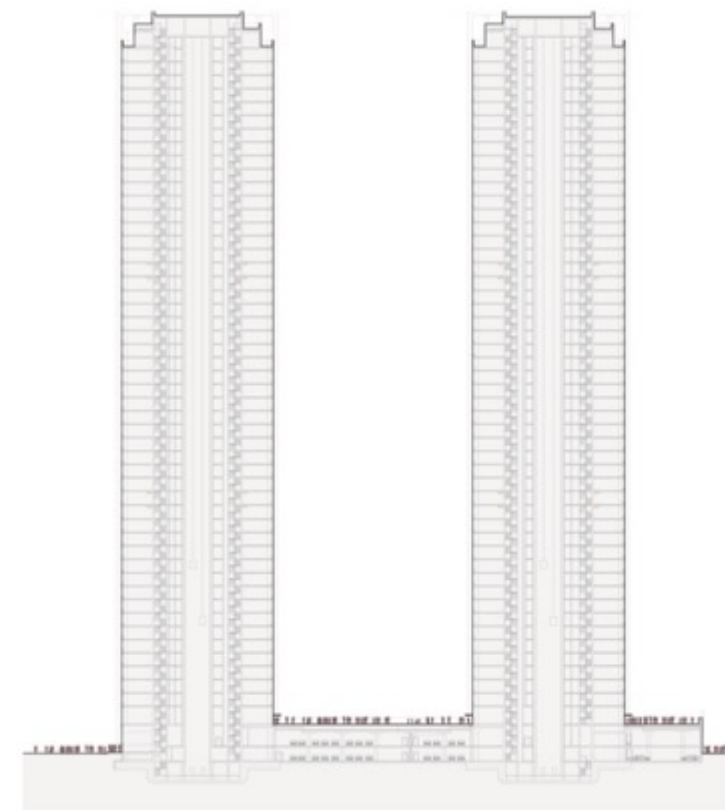
**Sustainable storm water
strategy**

CASE 1. METROPOLIA-2, MOSCOW

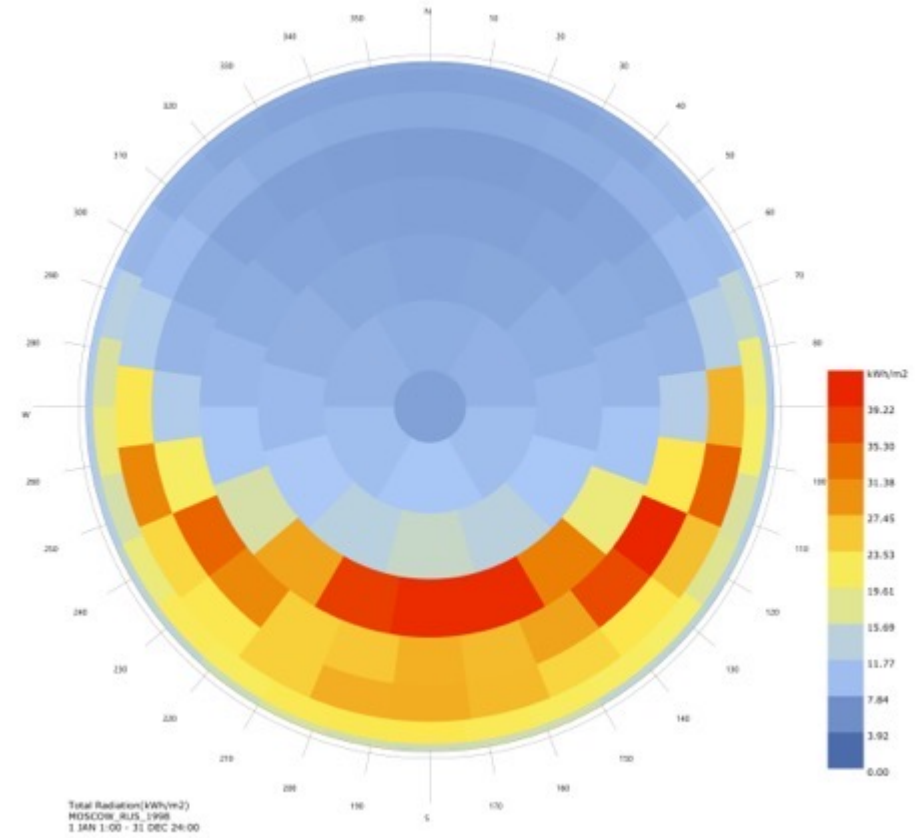
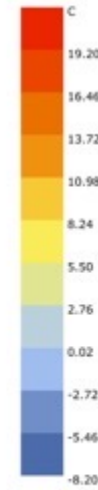
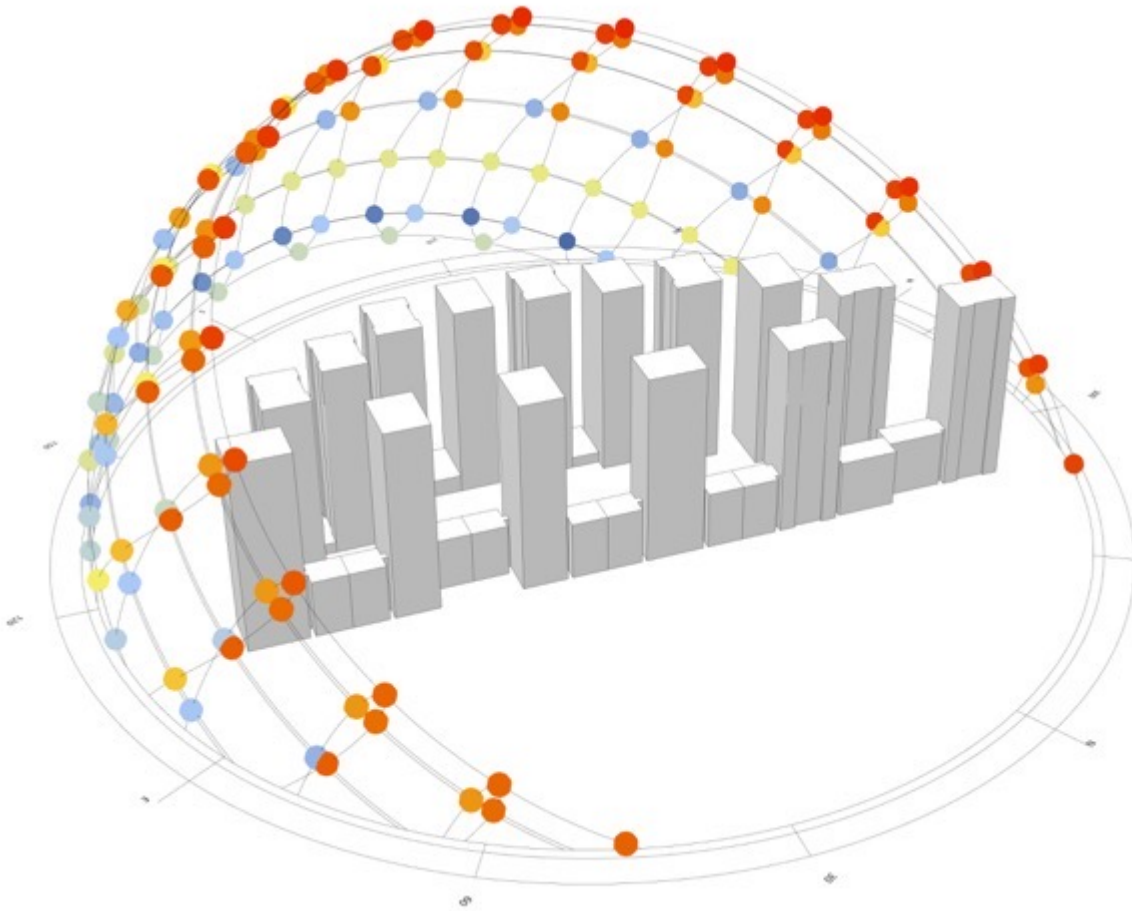
LANDSCAPE-ENVIRONMENTAL PRE-PROJECT ANALYSIS OF THE TERRITORY "METROPOLIA-2"



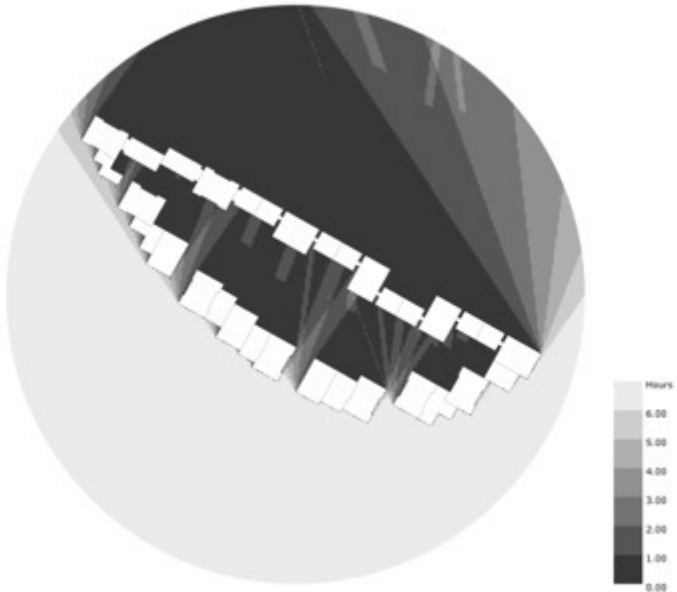
SITE



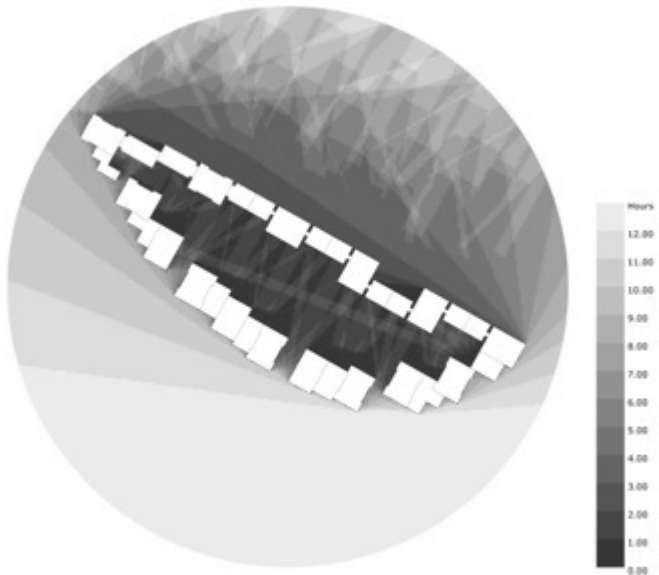
Insolation



Shading and insolation

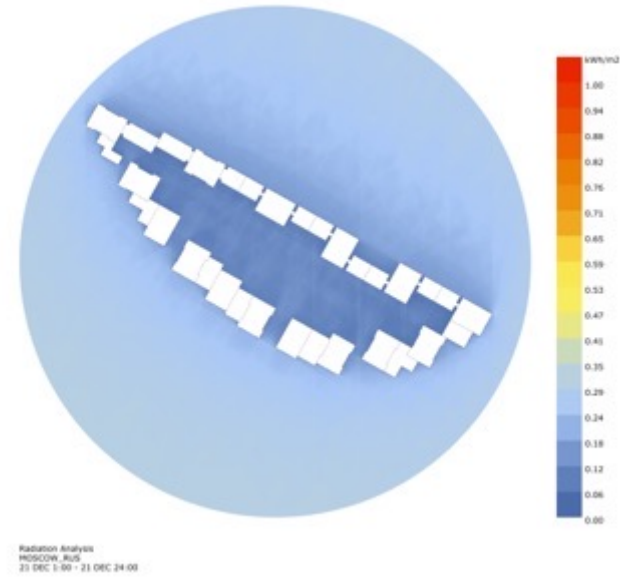


winter

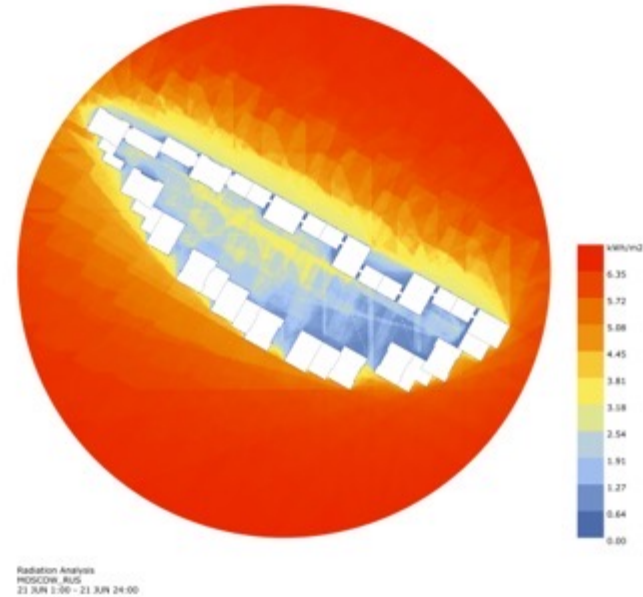


summer

SunlightHours Analysis



winter

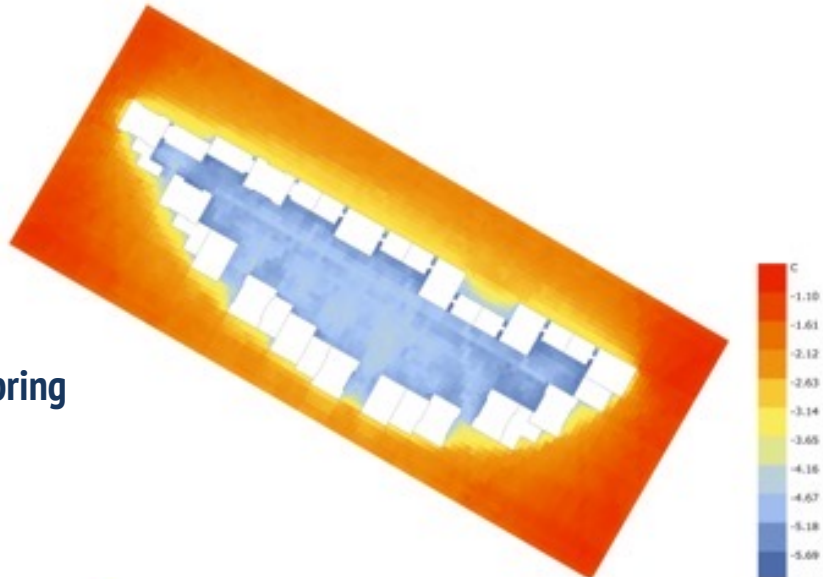


summer

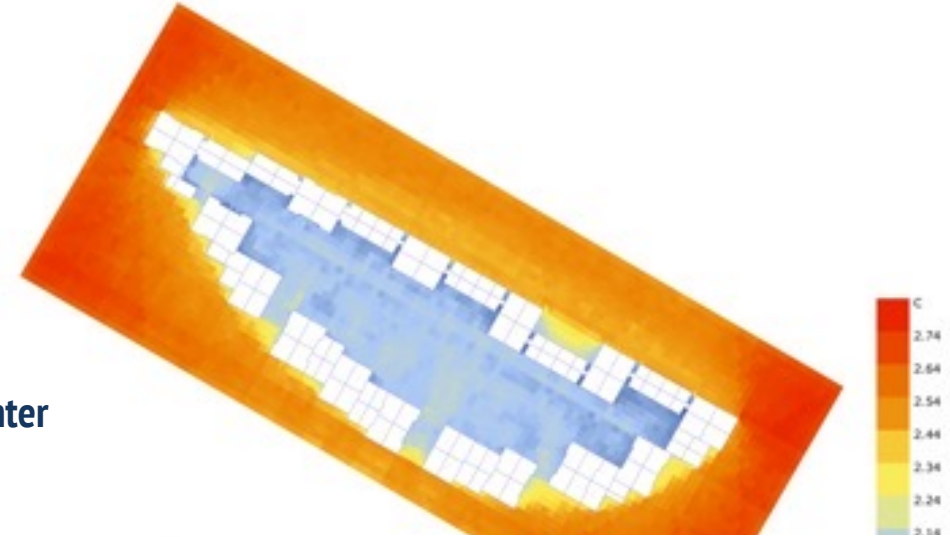
Radiation Analysis
HONGKONG, AUS
21 JUN 1:00 - 21 JUN 24:00

Index of thermal comfort UTCI

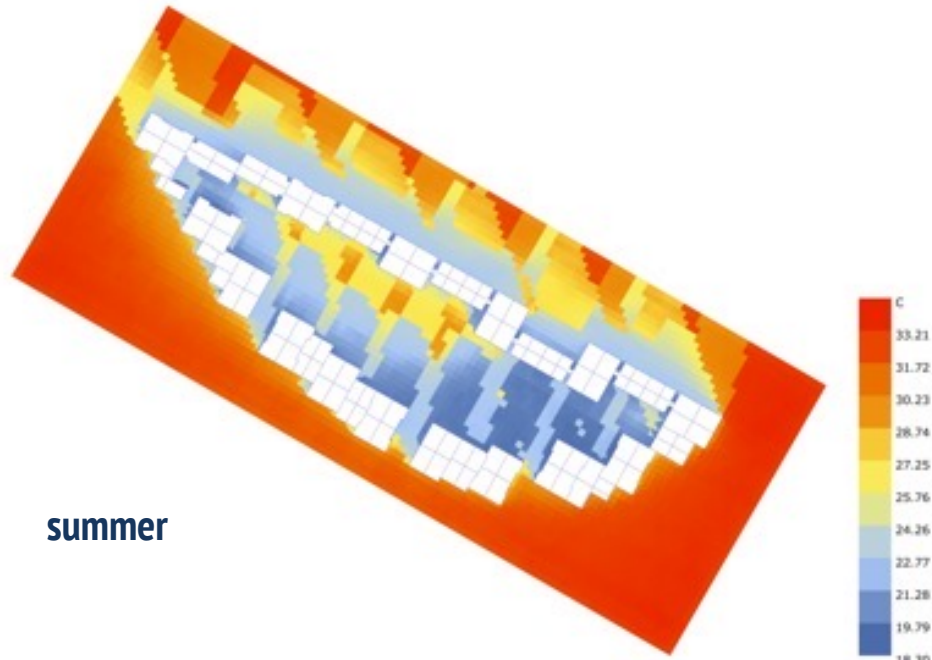
spring



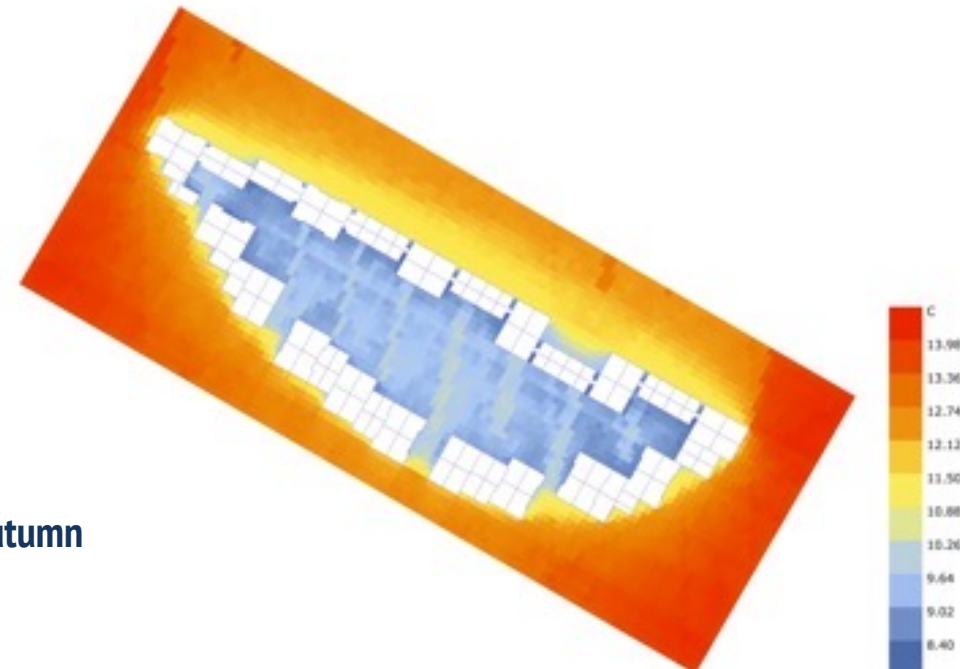
winter



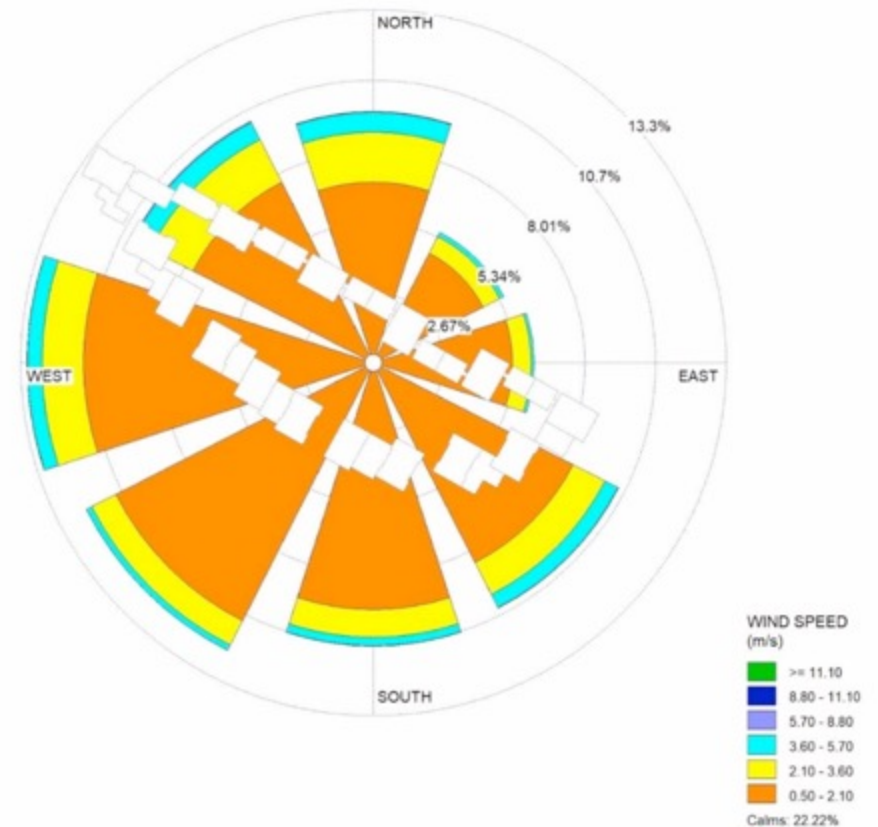
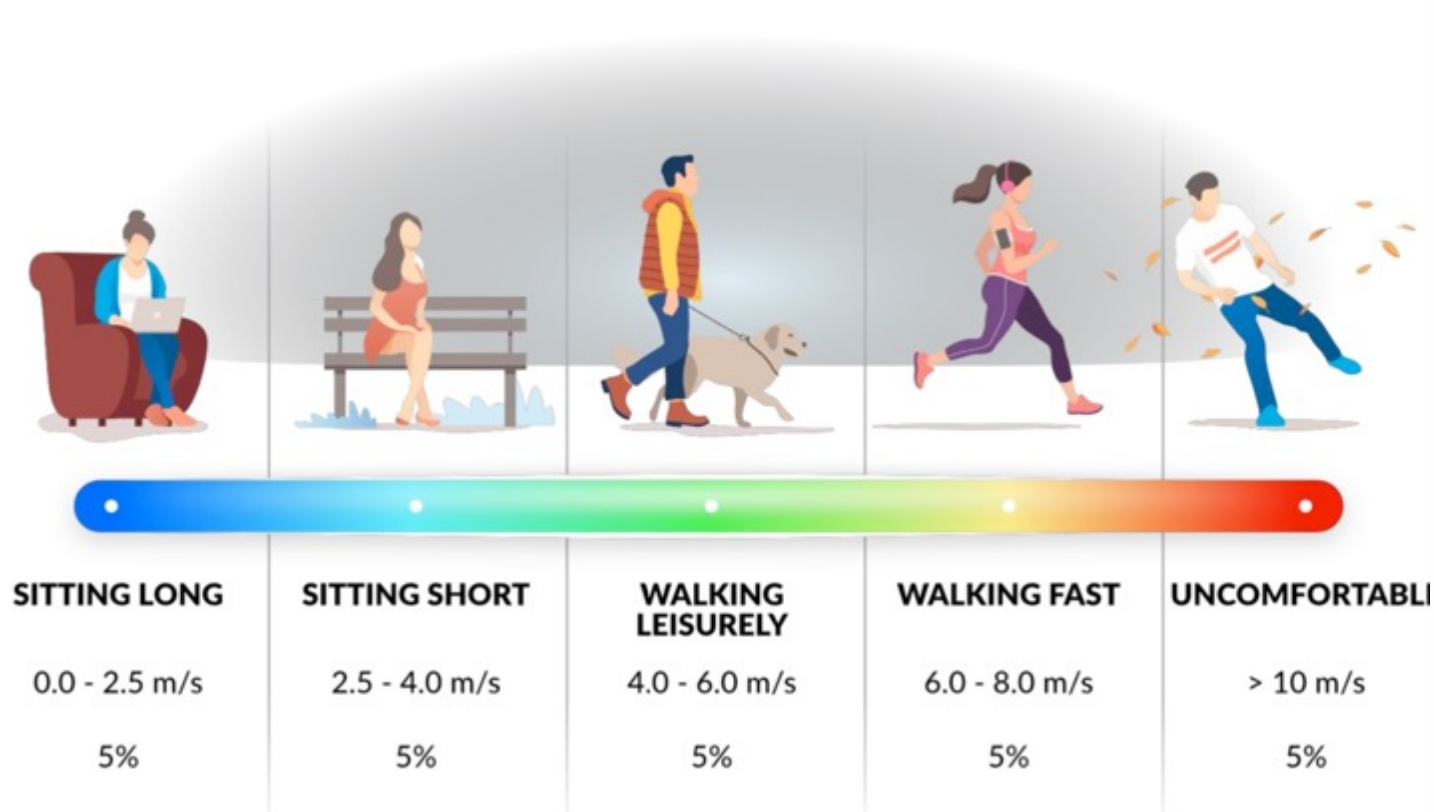
summer



autumn



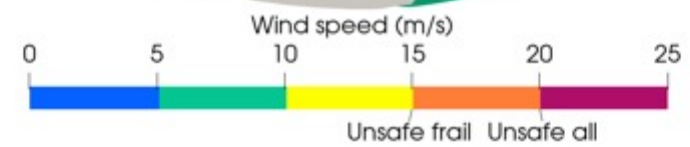
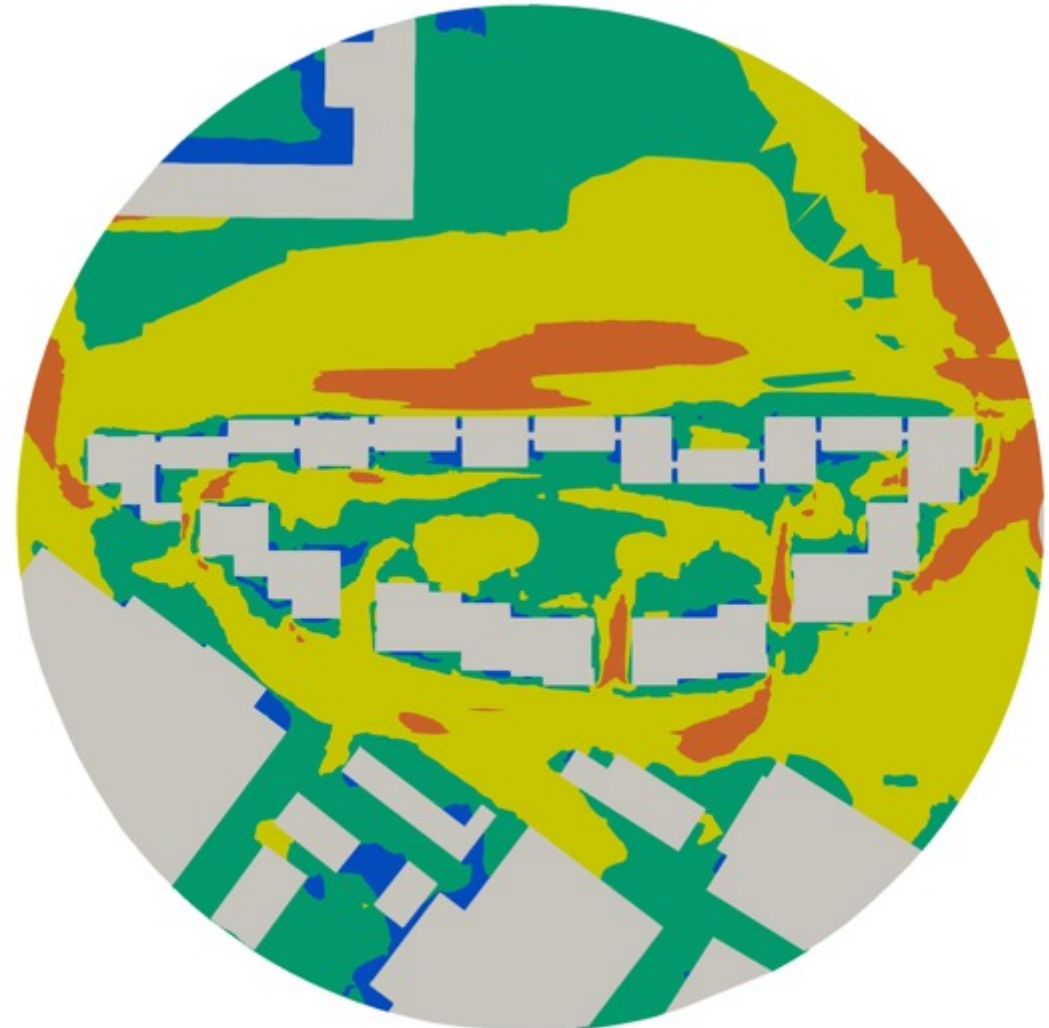
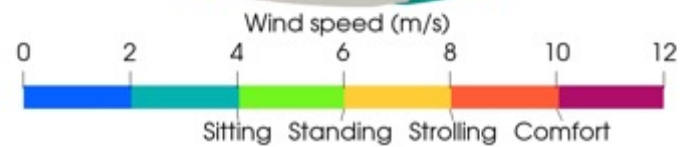
LAWSON CRITERIA. ROSE OF WIND



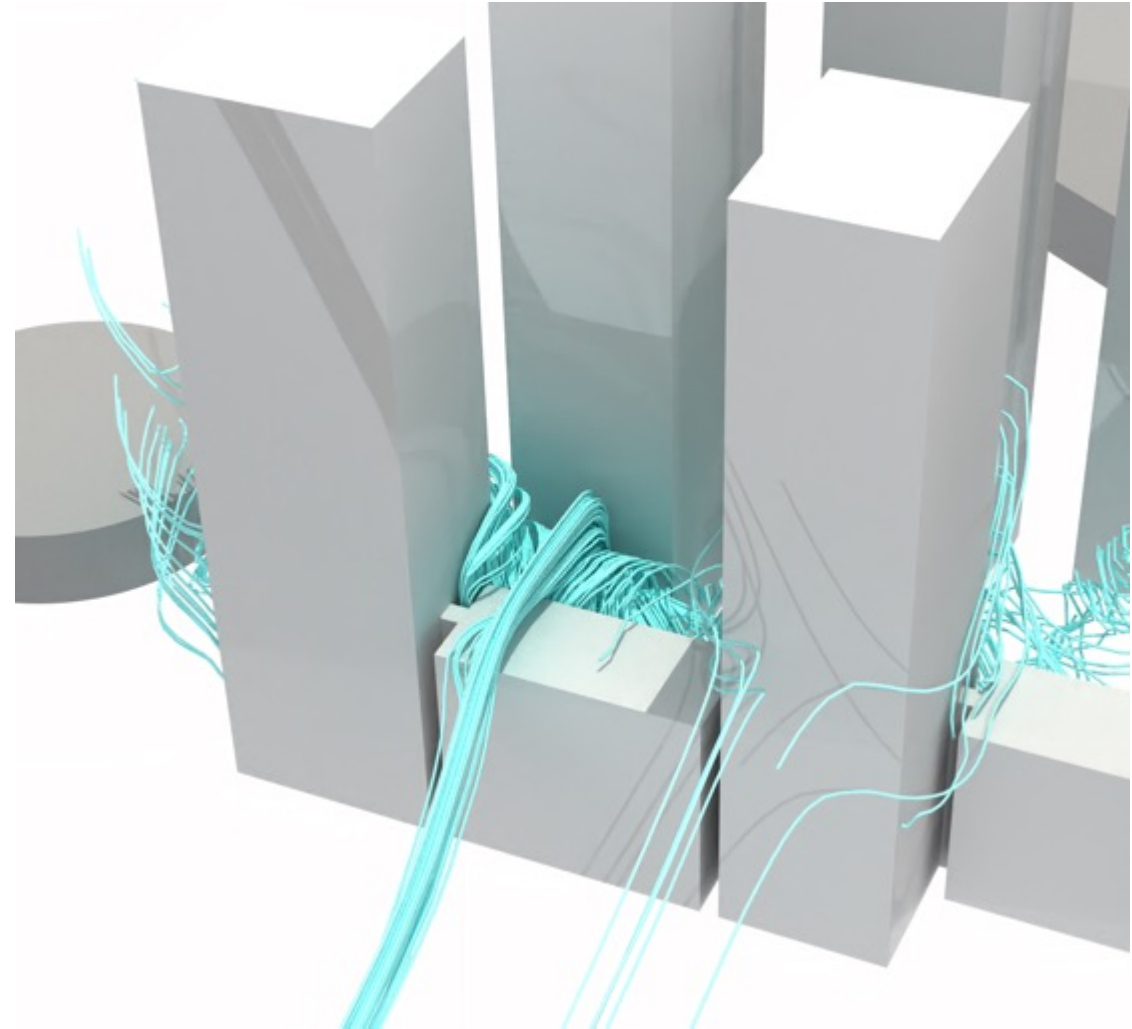
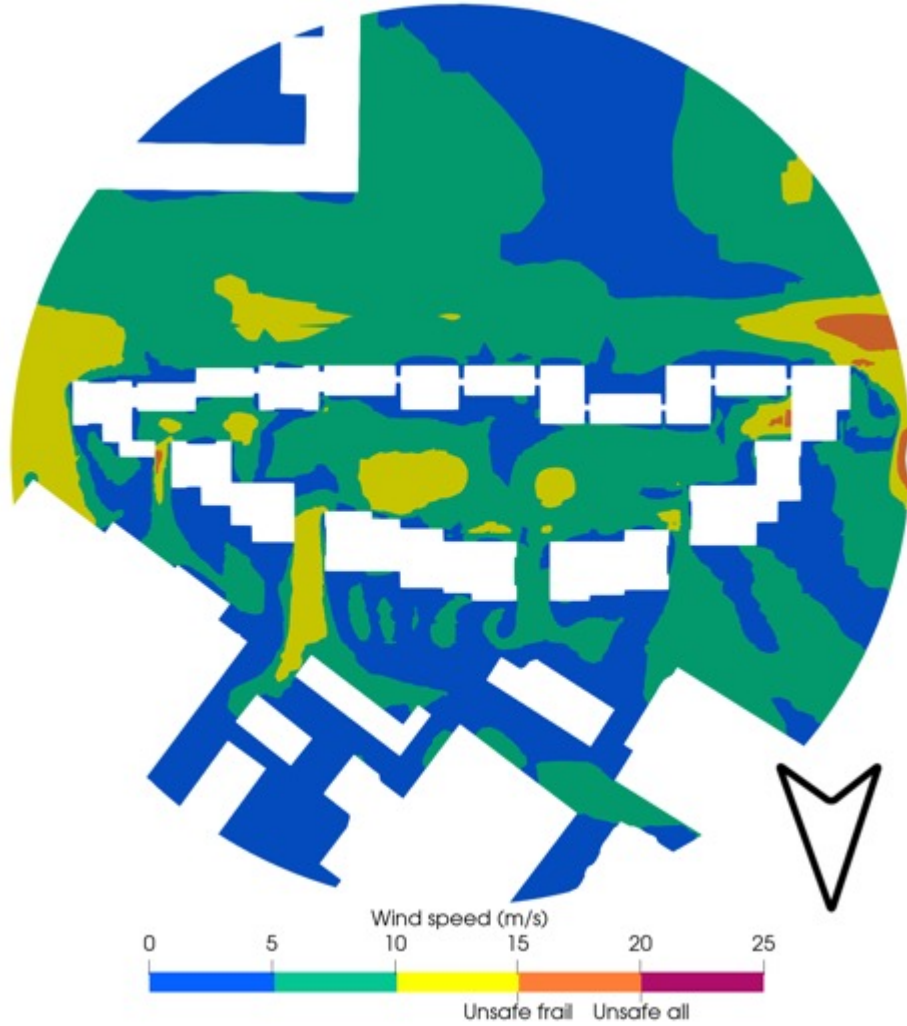
London Docklands Development Corporation (LDDC)
— for assessment comfort and safety

Calculations for 4 wind directions –
NW , SW, SE, NE

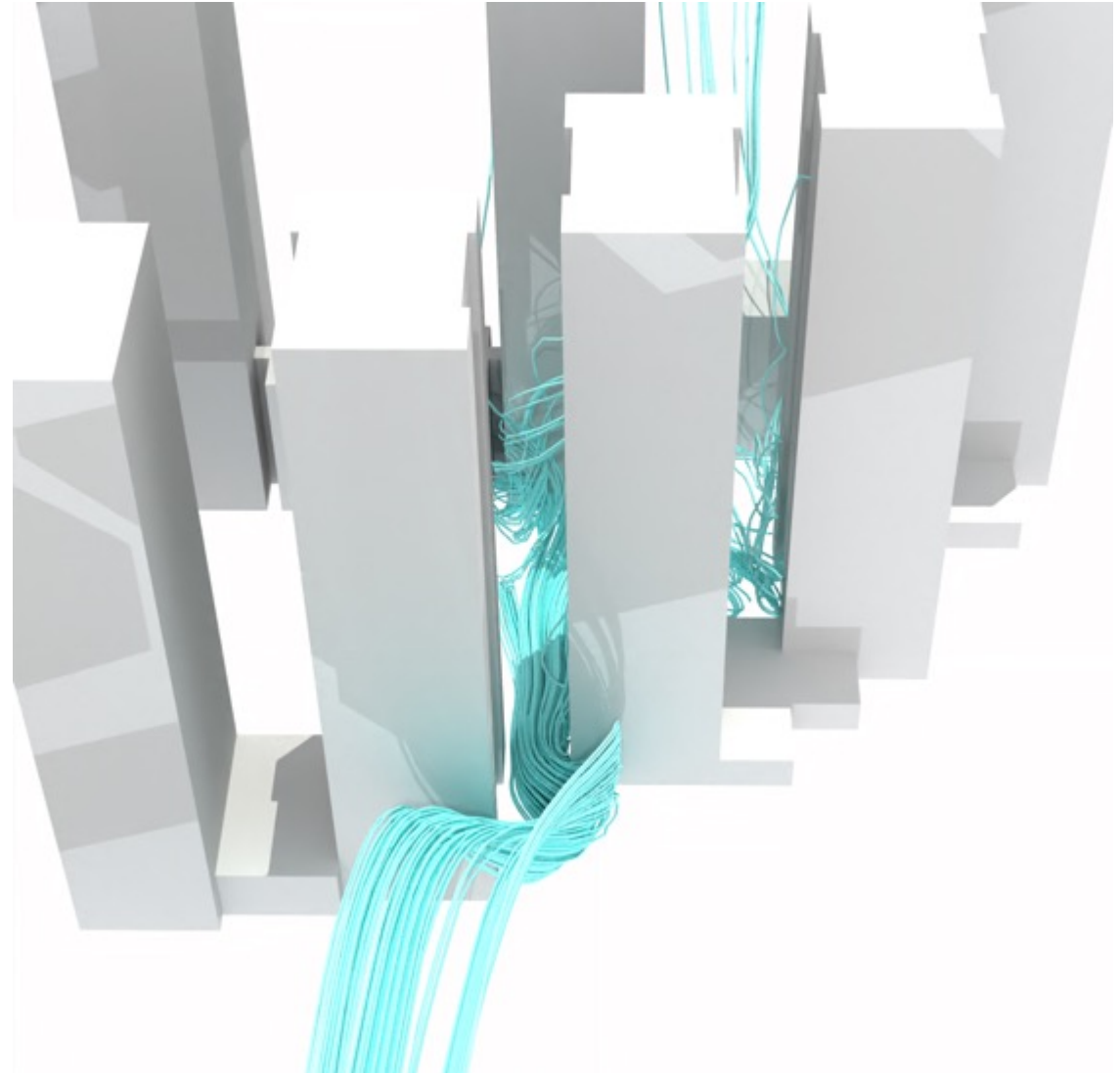
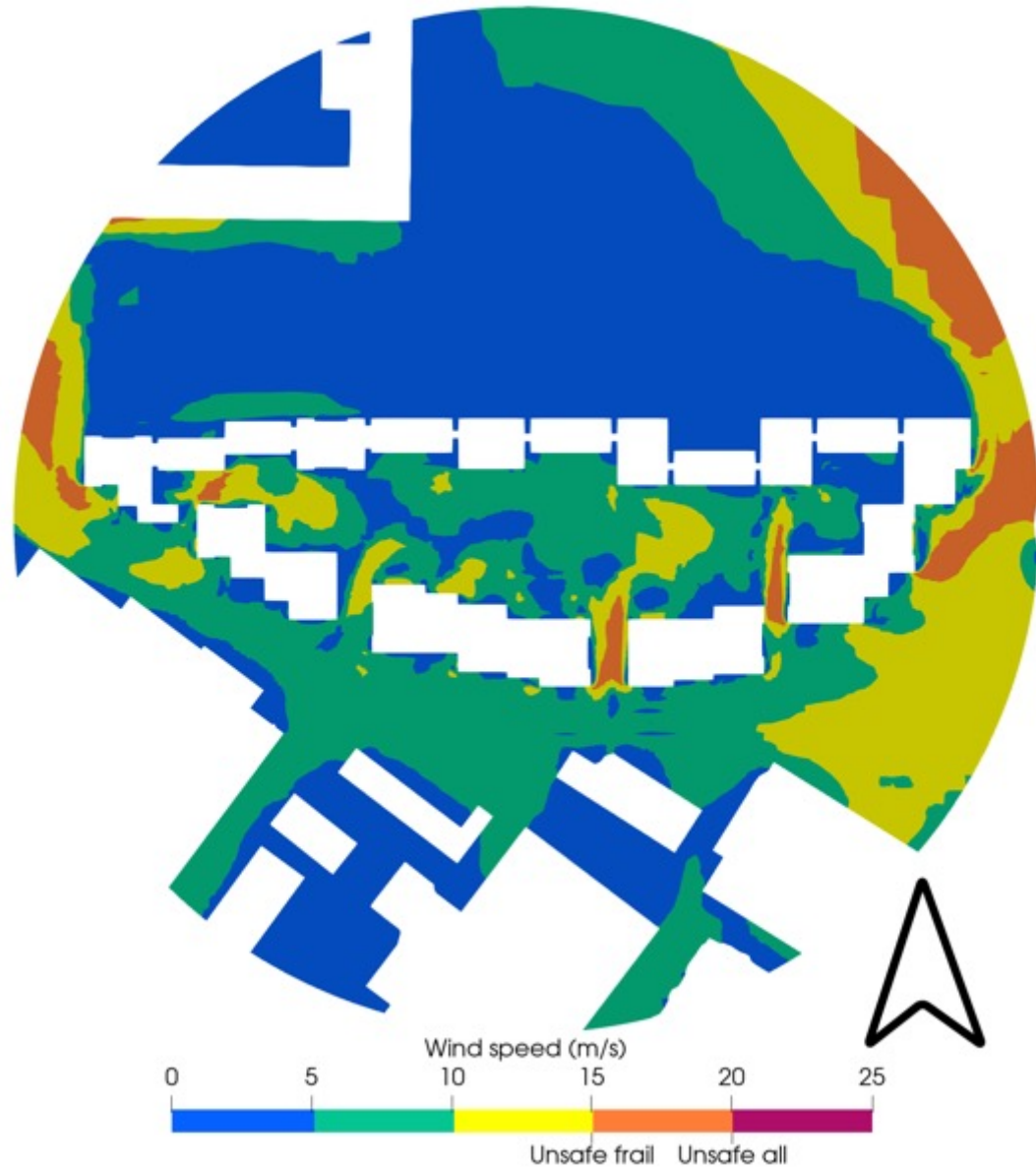
THE LEVEL OF WIND COMFORT AND SAFETY IN THE TERRITORY FOR ALL WIND DIRECTIONS



WIND SAFETY. NW WIND

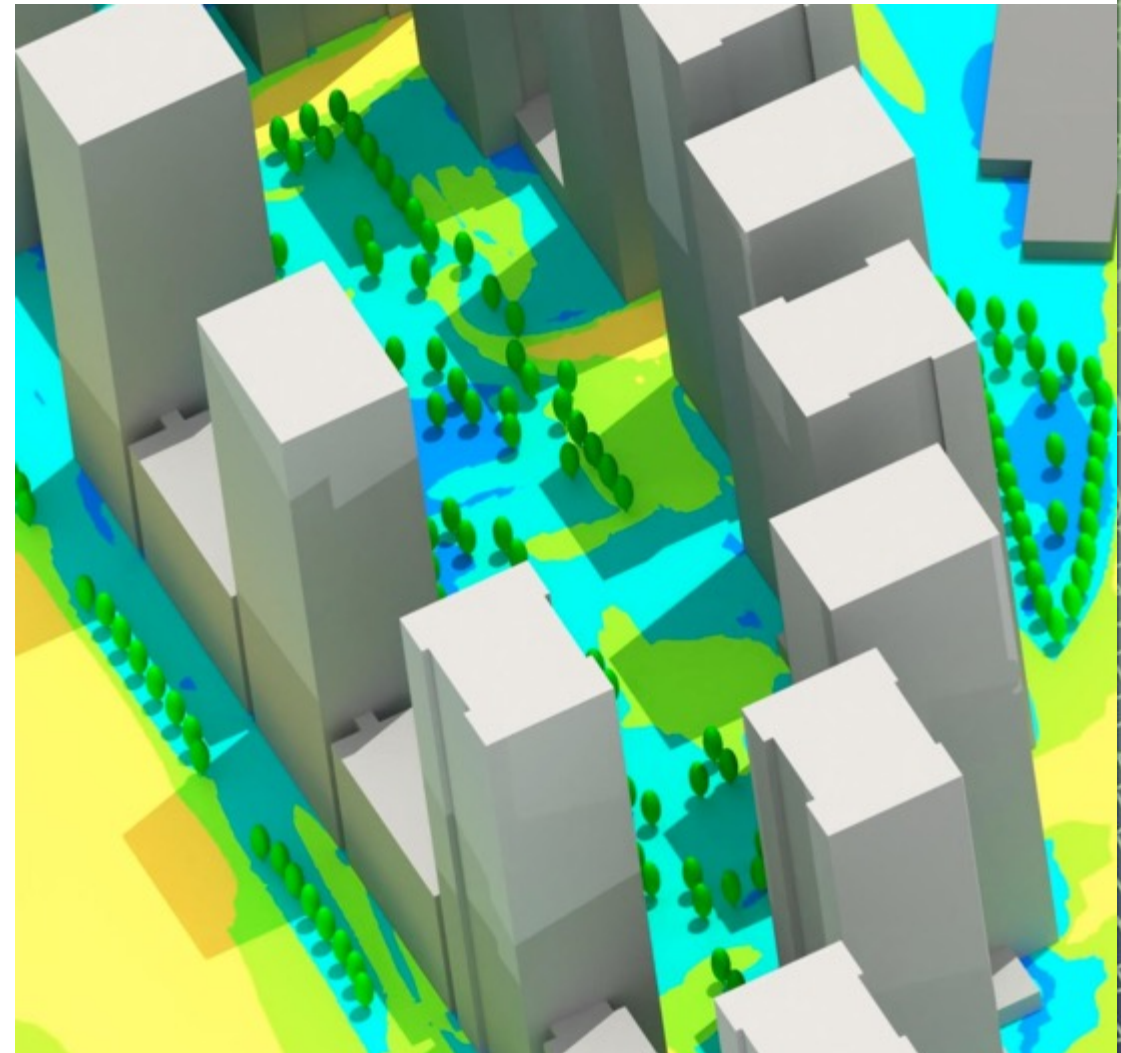


WIND SAFETY. SOUTH WIND

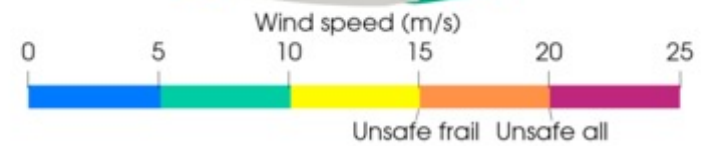
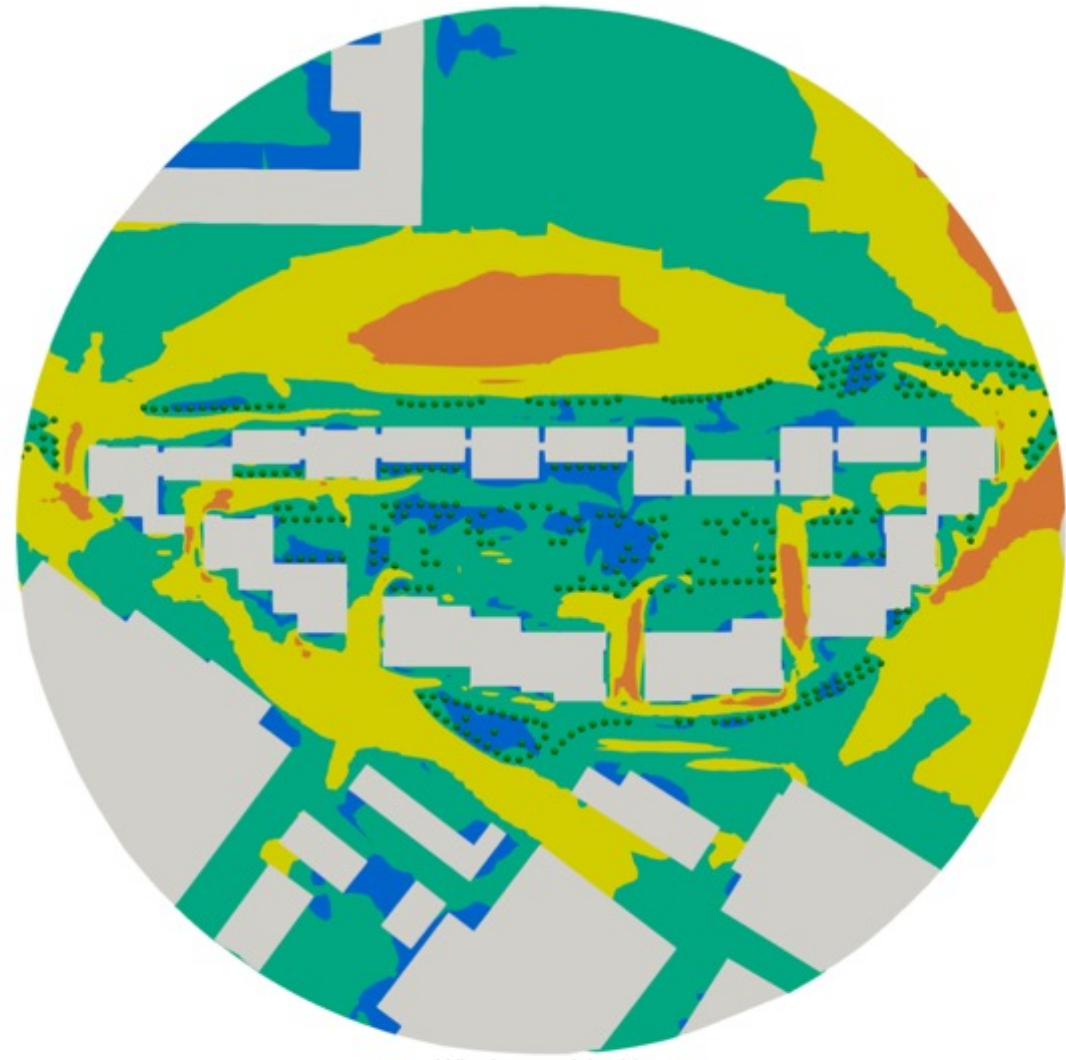
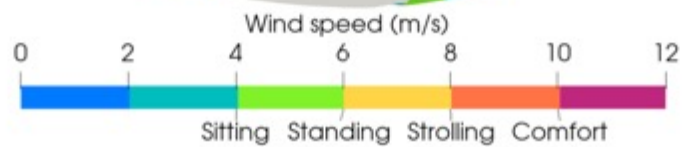


SELECTION OF PLANTS ASSORTMENT BY LAI INDEX

№	Name	LAI	Height max, m	Height, m
1	Берёза пушистая (Betula)	4,51	до 12	7
2	Дуб болотный (Quercus)	4,52	до 15	7
	Вяз шершавый (Ulmus)	4,3	до 20	7
3	Клён остролистный 'Debora' (Acer)	4,68	до 12	6
4	Клён пенсильванский (Acer)	3,4	до 6	6
	Клён красный 'Brandywine' (Acer)	3,4	до 9	6
5	Липа мелколистная 'Winter Orange' (Tilia)	6,1	до 15	7
6	Липа мелколистная 'Greenspire' (Tilia)	6,1	до 15	7
7	Липа крупнолистная (Tilia)	4,13	до 20	7
8	Ольха серая (Alnus)	3,81	до 15	7
9	Ольха серая 'Laciniata' (Alnus)	3,81	до 8	6
10	Пихта сибирская (Abies)	7,2	до 20	7
11	Сосна обыкновенная (Pinus)	2,41	до 20	7



WIND COMFORT AND SAFETY LEVEL ON THE TERRITORY FOR ALL WIND DIRECTIONS TAKING INTO ACCOUNT GREENING

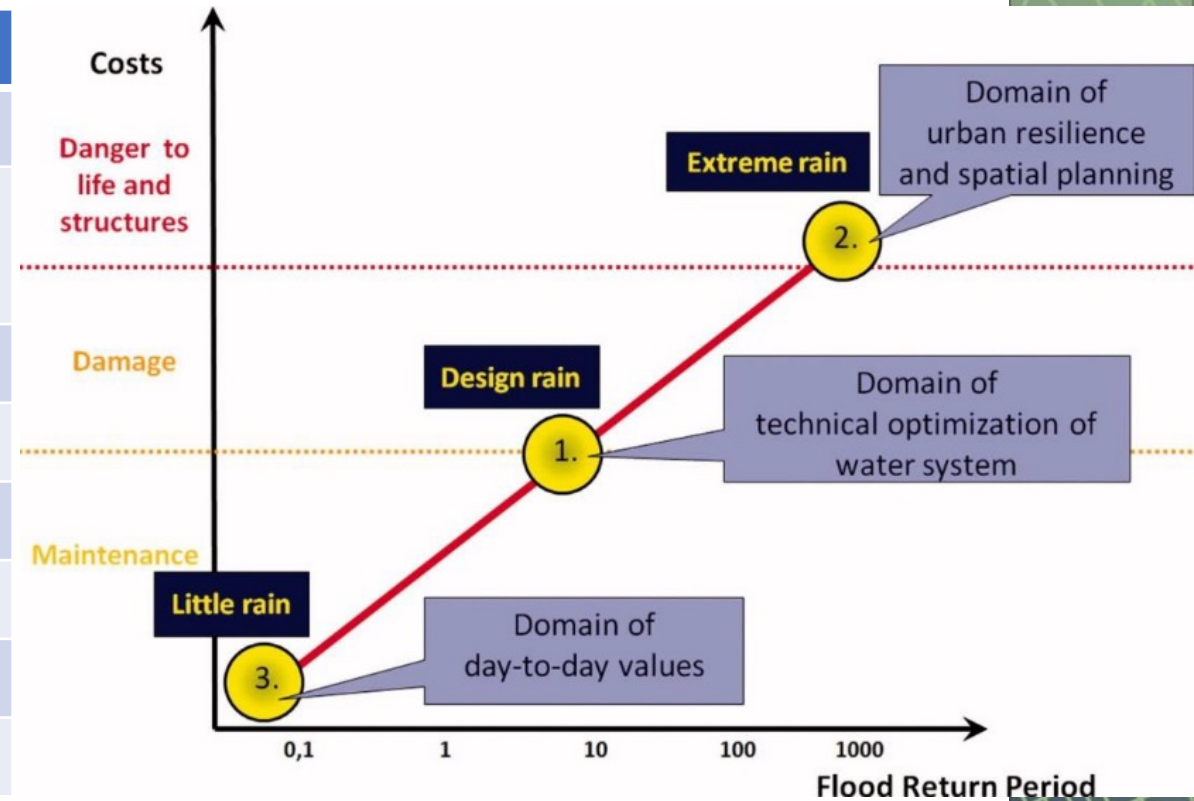


INITIAL DATA FOR CALCULATION OF STORM RUNOFF

IDF Moscow VDNH

	Period (P)					
	2020			2080		
	P=2	P=10	P=100	P=2	P=10	P=100
duration						
5 min	7.9	12.0	17.2	10.3	15.6	22.4
30 min	19.1	29.0	41.2	24.8	37.7	53.6
60 min	22.2	33.7	48.1	28.9	43.8	62.5
120 min	24.8	37.8	53.6	32.2	49.1	69.7
180 min	27.3	41.7	59.1	35.5	54.2	76.8
1 day	42.1	63.8	91.0	54.7	82.9	118.3

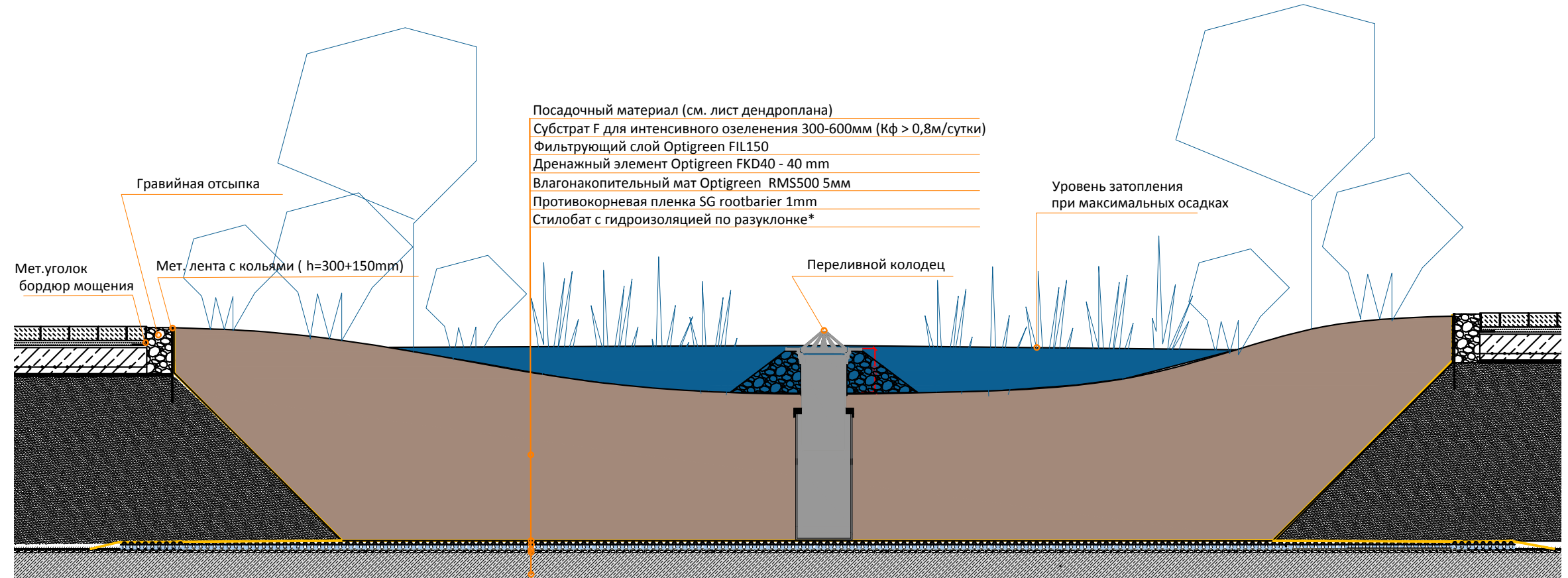
3 steps approach



CONCEPT OF WATER-GREEN INFRASTRUCTURE "METROPOLIA-2"



DIAGRAM OF THE FILTERING GREEN ZONE DEVICE ON STYLOBATE



FKD 12 (vehicular surfaces)



FKD 25 Plus (greened vehicular surfaces)



FKD 60 (greened vehicular surfaces)

GREEN-BLUE ELEMENT - Channel



GREEN-BLUE ELEMENT – Rain Garden



RESULTS

- The range of landscaping meets microclimatic conditions and the flooding regime.
- Improved thermal comfort indicators.
- Areas of increased wind load have been identified.
- Optimized storm water drainage and irrigation system.
- Calculation of storm loads and volume of tanks has been carried out water-green elements.

CASE 2. RAIN GARDEN PAVILION , MOSCOW



**Rain Garden
pavilion in
Moscow State
University's
Botanic
Garden (the
"Apothecary
Garden")**



Existing situation



Construction

autumn 2019 and
summer 2020



Open 22 September 2020

"A new educational, exhibition and research exposition on the concert and exhibition field of the role of rainwater in the city and a modern approach to stormwater management."



Biofiltration

Plants:

Thalictrum, Polygonum,
Filipendula, Eupatorium,
Carex, Iris, Lythrum
salicaria, Salix purpurea
'Nana' and other



Permeable paving



Sample of extensive green roof



Excursions for architects and engineers



Eco-education



CONCLUSIONS

- ✓ THIS IS THE FIRST PUBLIC RAIN GARDEN IN MOSCOW.
- ✓ DEMONSTRATION OF MAIN STORM WATER MANAGEMENT BEST PRACTICES.
- ✓ WE HOPE THAT IT WILL BRING NEW OPPORTUNITIES TO DEVELOP BLUE-GREEN INFRASTRUCTURE IN RUSSIA.





Thank you for
attention!

