



Final technical designs for pilot sites

Deliverable D.6.1.3

Deliverable D. 6.1.3. – Final technical designs for pilot sites





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Revision History

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EXECUTIVE SUMMARY

SPIRE project will activate an urban regeneration at three main levels through the co-development of new adaptive and productive landscapes, integrated into a circular ecosystem of cascading material and energy value chains:

- Environmental regeneration (mitigate with the site's high levels of soil pollution with heavy metals through experimental phytoremediation);
- Social regeneration (involve the local community in a new and better environmental behavior through participative approach and co-creation process – iLEU represents a core element, being a citizen rewarding system);
- Economic regeneration (achieved mainly through SPIRE Start-ups, in which SPIRE project encourages and helps innovative business ideas to be implemented).

The first step in the SPIRE regeneration and related value chain of knowledge, energy, and innovation is the transformation of the pilot sites with the help of Remediation Toolkit, CASMA, leveraging on the co-design process results (Stage 1 and 2 – see deliverable D6.1.2). For the technical design of the pilot sites a set of two Stages of Workshops with the local community have been completed. The output of the two workshop stages represents the main guidelines for the planting design and overall zoning of the pilot sites. The *Technical Designs for Pilot sites* represents a design solution for the transformation of the pilot sites, including planting landscaping and location of thematic functions. In order to have a greater reach, the solutions were co-designed with the local communities through both participative workshops and through online questionnaires. Using these valuable information and site observations and analysis, a set of solutions were elaborated, that contains: (1) path and alley structure, (2) thematic areas location, (3) planting areas with indications regarding the planting distance (to be followed when possible). The last workshop, Workshop Stage 3 (to be completed end of April), is focusing on the design of public spaces, mainly on the urban furniture. The output of the last workshop will be encompassed within O6.1.1 - *Adaptive Phytoremediation and Landscaping Design projects for the Pilot Sites*. For more information regarding co-design process check D6.1.2 *Report of co-design workshops with the SPIRE Local Action Network*.

Technical design requirements and initial list of plants were elaborated before site cleaning and preparation work (in order to avoid delays in the acquisition procedures). The technical designs (embedded within this deliverable) guided the site works for levelling the terrain, cleaning the invasive vegetation, prepare the site for planting. The technical designs guide the initial planting stages. A thorough analysis of the situation will be deployed by end of 2021 in order to assess additional adaptation measures of the designs and to elaborate a comprehensive set of provisions. All of the previous mentioned work will be embedded within O.6.1.1 - *Adaptive Phytoremediation and Landscaping Design projects for the Pilot Sites*. It is expected that O.6.1.1 may provide new plant quantities. Elaboration of the final output can be achieved only after first stages of planting and site works are complete.

METHODOLOGY

For each site, a specific selection of plants was made, taking into consideration the native species found. The overall planting of the sites will be made accordingly to better phytoremediate the polluted soil and also to have a reasonable biomass harvest. The updated list of plants can be found in Annex 1 – Vegetation and quantities.

The final technical designs represent the output of the co-creation process, in which the local communities were involved into the decision-making process. The workshops gradually introduced topics and discussions related to the design of the sites. The discussions and related solutions were in direct relation with the site's terrain characteristics, the immediate proximities, the target users, and the local necessities. The co-creation process provided valuable input on the general ambiance of the public spaces.

The co-creation process was composed of various creative and collaborative activities, to deliver the most suitable options for site's transformation, given the available resources and the main objectives of the SPIRE project. The following principles were explained to the participants and represented the main topics for discussions:

Land-use principles regarding vegetation

- Densely and mixed vegetation. Even if 10-15% of each site will not have dense vegetation, the overall percentage of vegetation mass will exceed 100% because planting will be mixing natural pastures, with shrubs, trees, and other types of weeds. Is important to plant as densely as possible because, in this way, we speed up the phytoremediation process, resulting in a better production of biomass.
- Perviousness. The sites will use as much as possible pervious surfaces, in order to phytoremediate 100% of the area. In the case of impervious surfaces, there is a range within which the natural soil underneath will benefit from phytoremediative action via the roots of the plants.
- Protection. Is important that the vegetation will play a protective role for the users of the space, as in shade, wind, noise pollution, visual pollution. In this case, vegetation must be thought out in relation to the natural conditions (wind direction, sunlight)

Land-use principles regarding surroundings

- Ensuring psychological and physical protection from the roads and traffic. This can be realized through a specific plant zoning.
- Use of vegetation green screens and barriers in order to mitigate the visual relationship of the sites with unpleasant surroundings, such as industrial areas, undeveloped land, etc.....
- The proximity to residential areas must have dense vegetation and low activity (as in functions), in order to not disturb.
- Creating relations with the green infrastructure, natural environment, and with the water area.

*Notes. Community input provided information regarding which areas represent good proximity or bad proximity, which street is more or less transited, and which visual connection should be kept or mitigated.

Land-use principles regarding entrances

- Entrances must be well marked in relation to the main pedestrian nodes.
- The sites must have a maximum of two main entrances and several secondary entrances (no more than three).
- Entrances must be well illuminated and with proper urban furniture.

*Notes. The co-creation process delivered solutions to possible locations for entrances and their requirements. Creative solutions on how the entrances must be designed was also a topic, that will be further developed in the last Stage of Workshops.

Land-use principles regarding paths and alley's structure and design

- Each site should have one main alley and possibly one or two secondary alleys. The alleys should be a maximum of 1.5m for the main alley and a maximum of 1m for secondary alleys.
- The materials used and the overall design of the alleys must ensure a mainly pervious surface so that phytoremediation processes can happen.
- The alleys' structure must be correlated with the chosen entrance's points and with the major surrounding functions.

*Notes. During the co-creation process topics like the design of the alleys, the overall composition and ambiance was debated. In conclusion, green paths come-out to be the easiest to implement solutions, but in some areas, a more elaborated solutions can be implemented (the case of Colonia Topitorilor site).

Land-use principles regarding functions

- It is preferred for each site to accommodate three major categories of areas: (a) Engaging and dynamic activities area, (b) Social interaction activities are, (c) More intimate areas for relaxation, meditation, quiet time.
- The overall functions surface coverage must not exceed 15% of the entire site, and also the design of the subareas must include pervious surfaces.
- The share of each area can be negotiated during community consulting and workshops.

*Notes. The co-creation process proved that having all three types of functions in each site can be a challenge, due to the site's characteristics, level of accessibility, and critical mass of users. Nevertheless, two pilot sites have a powerful potential to cover all three categories: site Colonia Topitorilor and site Craica, with site Ferneziu being more oriented to activities related and directly addressed to the local school Nicolae Bălcescu.

TRANSFORMATION OF THE SITES

THE EXISTING SITUATION

Romplumb pilot site existing situation

- The northern part of the site present difficult conditions for planting, except for a small narrow area.
- Existing valuable vegetation that can be kept in the lower area towards the river, in order to have a better connection with blue-green corridor.
- In the southern part, there is a hill - that is perfect for mountain-biking activities and can also become the local landmark of the area.
- A dense alignment with *Acer Platanoides* is suitable for the area near the road – **an area of minimum 2 meters, alongside the road will not be planted, so that pedestrians can have refuge from the road traffic.**



Figure 1 – Romplumb site northern part



Figure 2 - Romplumb site slope areas and valuable vegetation



Figure 3 - Romplumb site slope areas and degraded terrain

Ferneziu pilot site existing situation

- The site has been cleaned, resulting valuable biomass (urișcă)- which is hard to process with the existing equipment.
- The site is difficult to access due to the irrigation channel, former rail line and the gas pipeline.
- Parthenocinus will be planted along the school wall.
- A small creek is crossing the site from east to west.
- Ferneziu site is valuable due to the flat area, but during planting, areas paved with concrete may be found.
- Educational activities can be accommodated with minimal furniture.



Figure 4 - Ferneziu site, the transversal creek



Figure 5 - Ferneziu site and former rail line



Figure 6 - Ferneziu site and the school fence

Colonia Topitorilor pilot site existing situation

- The site vocation will be strongly community-oriented, offering a wider range of thematic function areas.
- Site is cleaned - just valuable vegetation is kept.
- The site integrates very well within the local context.
- The site is generally flat and easily accessible, except from the southern part, where the slope towards the river has a strong slope.



Figure 7 - Colonia Topitorilor site flat terrain area



Figure 8 - Colonia topitorilor site slopes area

Urbis pilot site existing situation

- Urbis site has very difficult terrain, degraded and with steep slopes. The destination for a space open to the public all year around is not so feasible, but some activities can be held.
- Urbis has a very powerful natural ambiance, which unfortunately is very hard to capitalize on. Besides phytoremediation and biomass production. The site will have a green path and some organized activities related to the specific ambiance: (1) building birdhouses; (2) paint in nature activities - the target group and key users will be the students.
- The site has been cleaned from invasive vegetation, as much as the terrain allowed it.



Figure 9 - Urbis site steep slopes



Figure 10 - Urbis site flat terrain (cleaned from invasive vegetation)



Figure 11 - Urbis site hard to access area and the powerful natural ambiance

Craica pilot site existing situation

- The entrance is narrow – the entrance is marked by the railway lines. Creating a dense vegetation barrier is needed.
- The railway lines have wide embankment – 2/3 meters of a 45-degree slope.
- The overall terrain is flat, with a pit in the central area. The pit, by the way it is formed, has 2 main advantages: (1) very suitable to Salix (Salix thrives on wet soil - the water will drain according to the pit slopes); (2) the pit is very suitable to a mountain-bike path.
- The site has a powerful natural ambiance and very diverse terrain morphology. There are important flat areas, and mild slopes, together with valuable vegetation with tall trees.
- The site has a degraded terrain – concrete paved areas are being found through-out the space.



Figure 12 - Colonia Topitorilor site rail line



Figure 13 - Colonia Topitorilor site diverse terrain morphology

THE TECHNICAL PLANS

The following technical plans are the main guidelines for the transformation of the pilot sites. The planting and landscaping process will probably encounter changes during and potentially after the first stages of the building process. The changes that may occur will be in the case of:

- 1) Planting areas – being heavily degraded areas, the planting points can not have a regular pattern. In most areas the planting will happen in nests, or clusters, in order to minimize effort of soil preparation and maximize the phytoremediation process. Vegetation clusters have higher changes of resilience against the environmental conditions.
- 2) Paths/alleys fidelity to the original design – the main connections and directions will be kept, but the design and directions of the paths may encounter a series of changes, due to the highly degraded state of the terrain.
- 3) Morphology of the thematic public spaces can change according to site's conditions.

All modifications to the technical design plans embedded within this deliverable will be included and detailed in the final output of Activity 6.1 – O.6.1.1 Adaptive Phytoremediation and Landscaping Design projects for the Pilot Sites. Consideration for scoring chart for the final planting project, according to CASMA tool, will be deployed in O.6.1.1. Given the different conditions of the sites, not all of sites can fulfill all SPIRE pilot sites objectives at the same level (phytoremediation, biomass production, community public space). It is important to highlight the fact that, **as a WHOLE (as an integrated system) all sites will together accomplish all SPIRE pilot sites goals with high standards:**

- 1) Phytoremediation - has the same level of importance and will be completed as much as the terrain conditions allow.
- 2) Biomass production - Salix is the main species that will be planted, but some sites allow for a better percentage of Salix planted.
- 3) Community public space - except for Urbis site (which is hard to access), all sites will be open to the public all year around. Craica and Colonia Topitorilor especially will have the most attractive ambiance, functions, and design.

All changes that may occur in the building phase will be encompassed in the O6.1 – Adaptive Phytoremediation and Landscaping Design projects for the Pilot Sites. The document will also include a set of actions/steps for the future transformation of the sites, and recommendations for the management of the site, in order to ensure sustainability of the intervention.

The following drawings contain planting areas together with surface area of for each species, access points, alley structure and dimensions, location of ecologic community public spaces/interaction areas/activities, and provisions for planting for areas with difficult conditions.

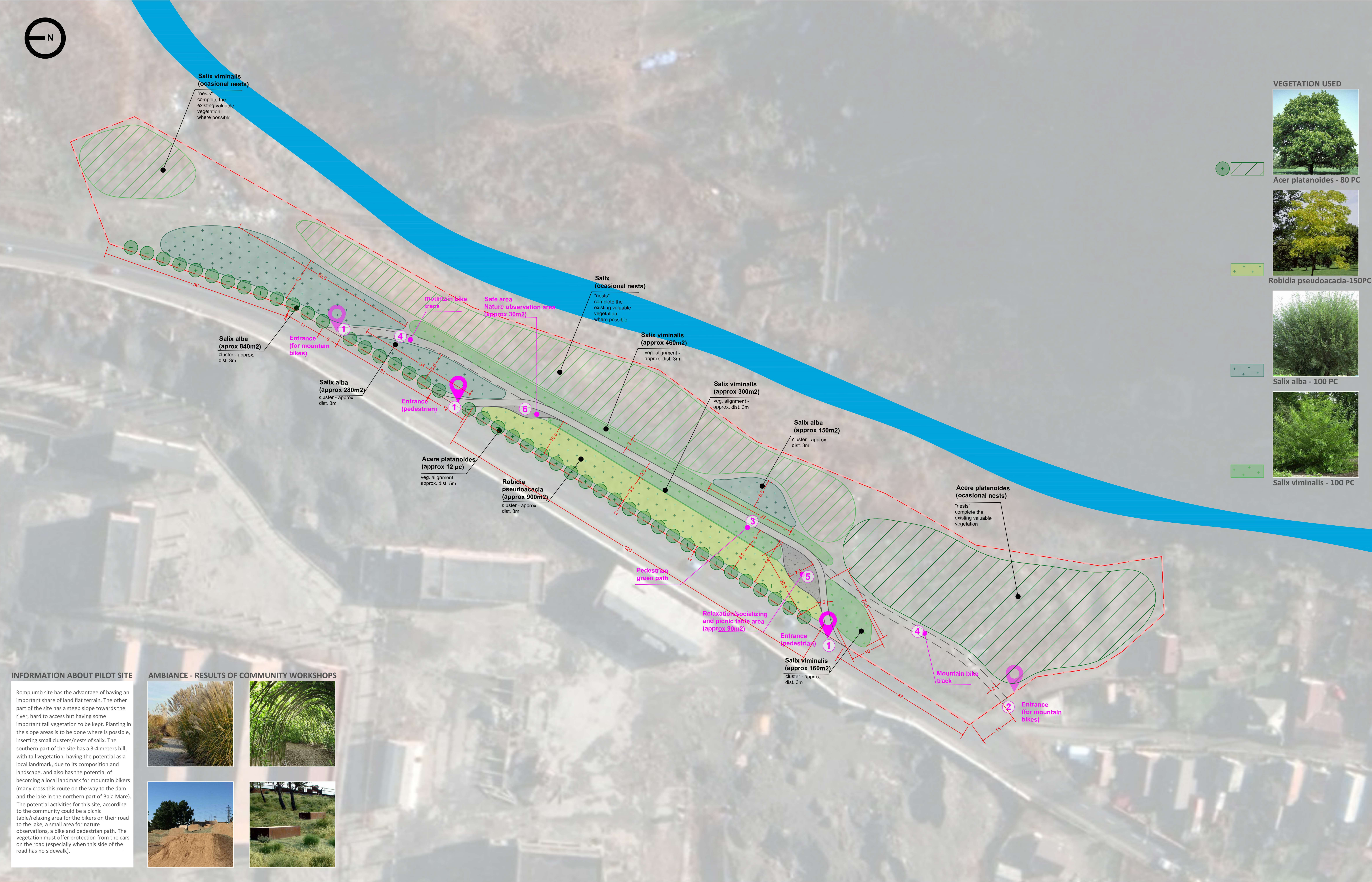
Annex 1 – Vegetation table represent the quantities provided for first stages of plating. Additional vegetation may be provided, when elaborating O.6.1.1.

Annex 2 – Illustrations for pilot sites, represent graphical drawings used for disseminating the results of workshops, with the aim of making the technical design easier to understand. Illustrations were elaborated only for Ferneziu, Colonia Topitorilor and Craica (sites planned for Plantathlon activities).

SPIRE BAIA MARE - TECHNICAL PLAN - PILOT SITE ROMPLUMB

ZONING AND PLANTING PLAN - AS A RESULT OF CO-CREATION PROCESS

DATE



SPIRE BAIA MARE - TECHNICAL PLAN - PILOT SITE FERNEZIU

ZONING AND PLANTING PLAN - AS A RESULT OF CO-CREATION PROCESS

DATE



DATE _____

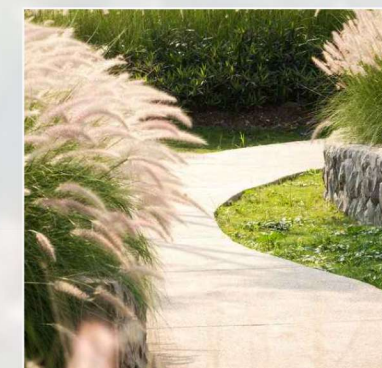


The site vocation will be strongly community-oriented, offering a wider range of thematic function areas.

Site is cleaned – just valuable vegetation is kept.

The site integrates very well within the local context.

The site is generally flat and easily accessible, except from the southern part, where the slope towards the river has a strong slope.

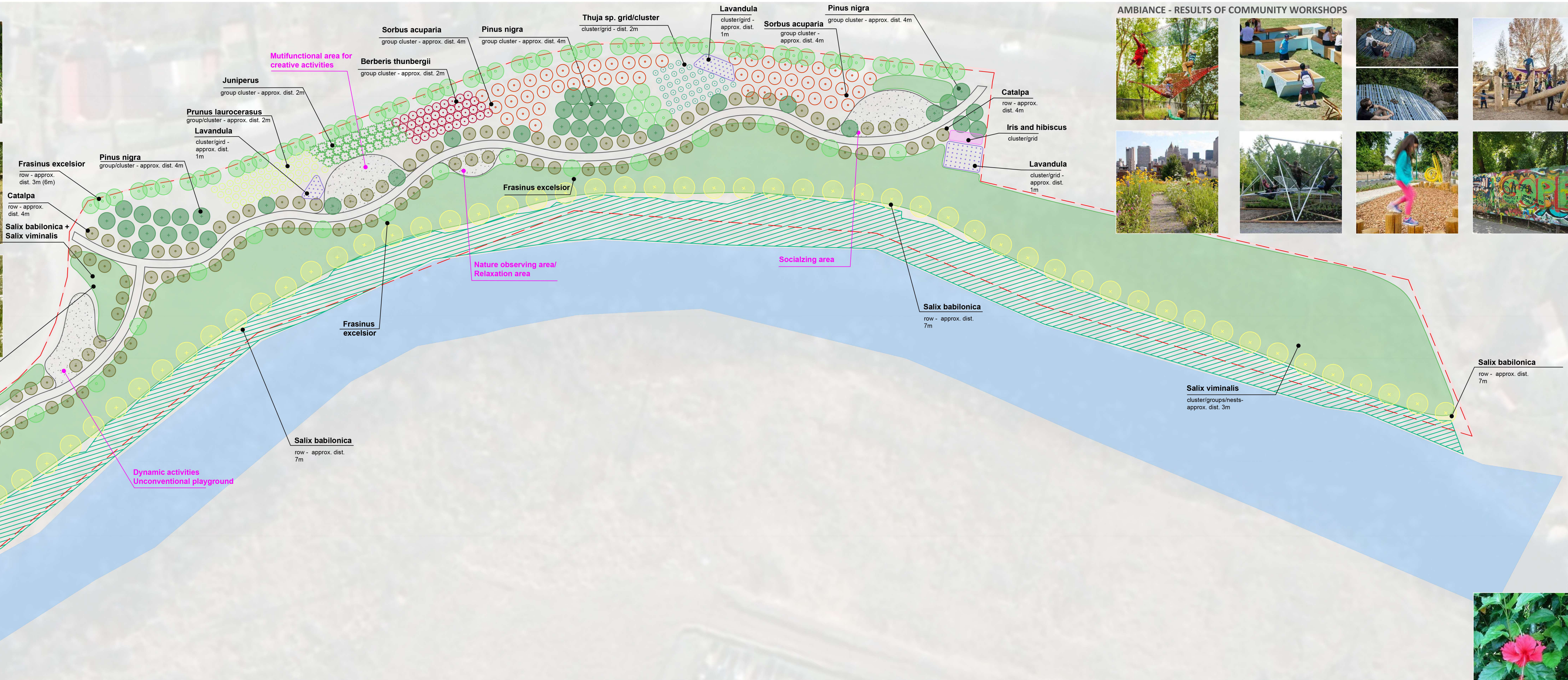


The diagram illustrates the spatial arrangement of three tree species in a coastal dune restoration project. A red dashed line represents the coastline, with a blue area below it indicating the sea. A green hatched area represents the dune zone. A white line indicates a path or boundary. The layout is as follows:

- Salix viminalis**: Cluster/groups/nests - approx. dist. 3m. Represented by green circles with a cross inside, located along the coastline and the white line.
- Fraxinus excelsior**: Represented by yellow circles with a cross inside, located in the central dune area.
- Catalpa**: row - approx. dist. 4m. Represented by a single green circle with a cross inside, located near the coastline.



format 420x1094mm
scale 1 500



A large, mature tree heavily laden with bright red, round fruits, likely cherry tomatoes, in a sunny outdoor setting. The tree's branches are thick and dark, spreading out to support a dense canopy of green leaves and numerous red fruits. The background shows a clear blue sky and a flat, open landscape under bright sunlight.



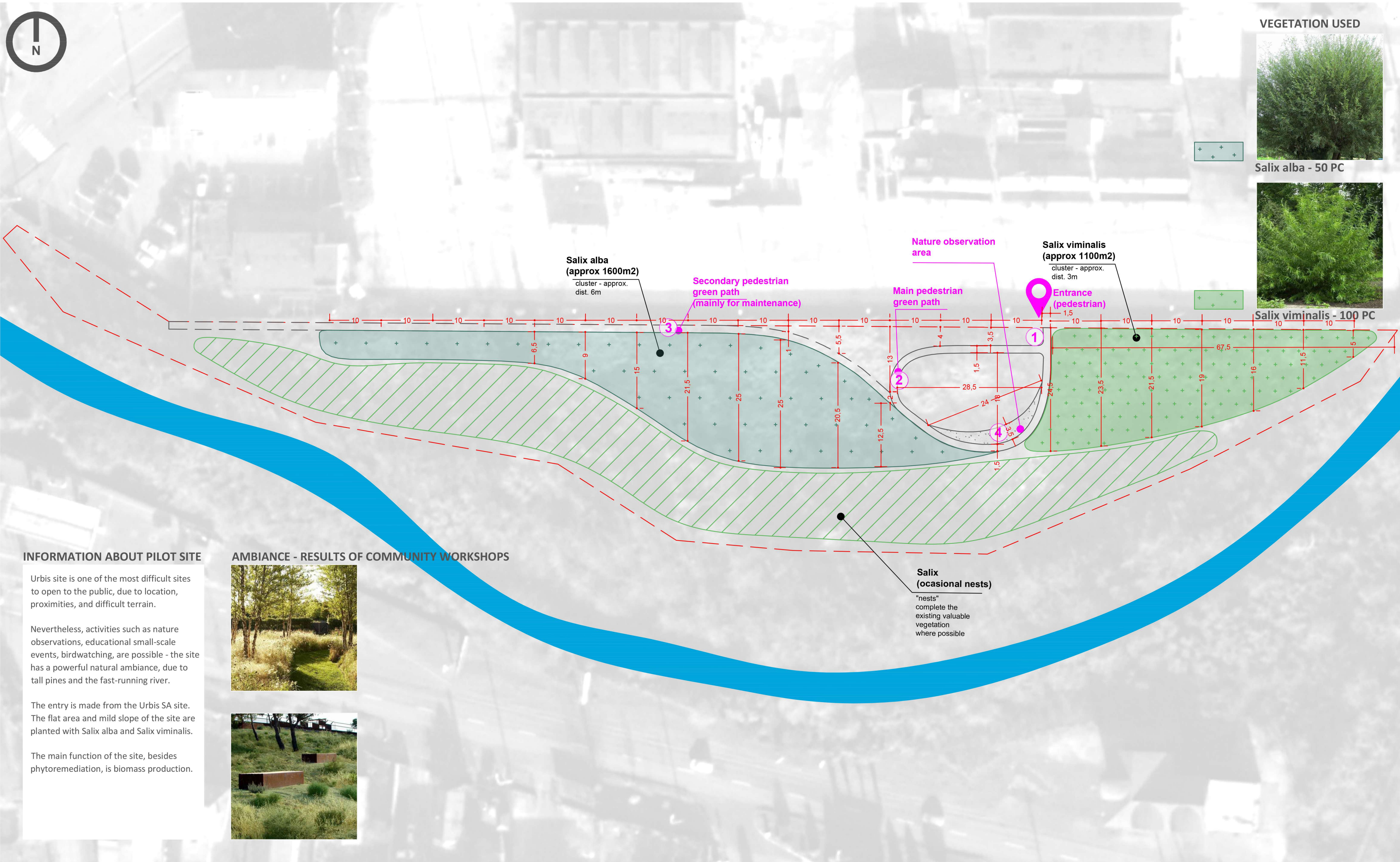
 Lavandula - 100 PC

 Iris - 50 PC

SPIRE BAIA MARE - TECHNICAL PLAN - PILOT SITE URBIS

ZONING AND PLANTING PLAN - AS A RESULT OF CO-CREATION PROCESS

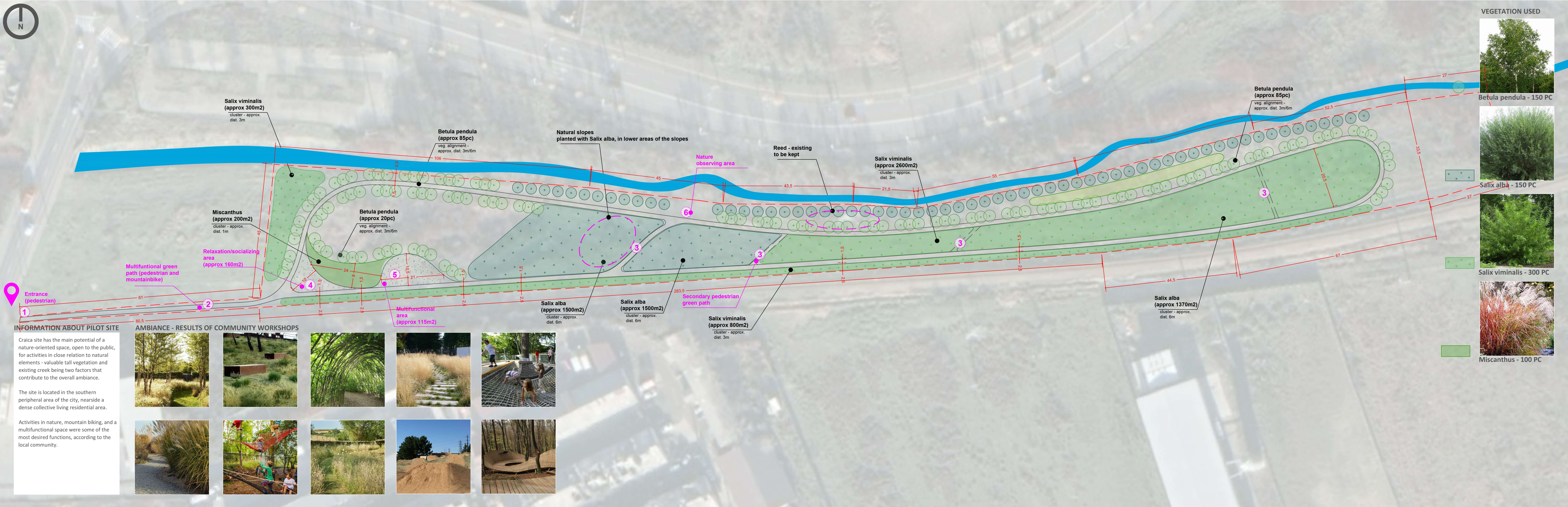
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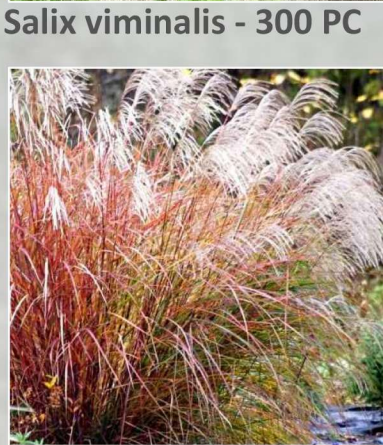
SPIRE BAIA MARE - TECHNICAL PLAN - PILOT SITE CRAICA

ZONING AND PLANTING PLAN - AS A RESULT OF CO-CREATION PROCESS

DATE



VEGETATION USED



Betula pendula - 150 PC

Salix alba - 150 PC

Salix viminalis - 300 PC

Miscanthus - 100 PC

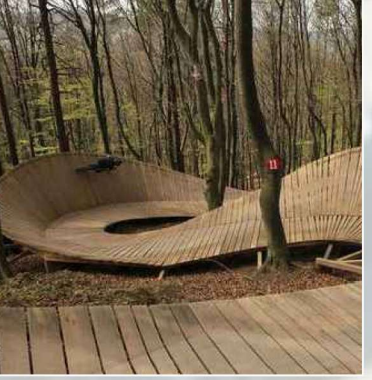
INFORMATION ABOUT PILOT SITE

Craica site has the main potential of a nature-oriented space, open to the public, for activities in close relation to natural elements - valuable tall vegetation and existing creek being two factors that contribute to the overall ambience.

The site is located in the southern peripheral area of the city, nearside a dense collective living residential area.

Activities in nature, mountain biking, and a multifunctional space were some of the most desired functions, according to the local community.

AMBIANCE - RESULTS OF COMMUNITY WORKSHOPS



ANNEX 1 – VEGETATION AND QUANTITIES.

Nr. Crt.	Species	Romplumb	Ferneziu	Colonia Topitorilor	Urbis	Craica
1	Acer platanoides	80	-	-	-	-
2	Robinia pseudoacacia	90	-	-	-	-
3	Salix alba	100	-	-	50	150
4	Salix babilonica	-	-	60	-	-
5	Betula pendula	-	30	-	-	150
6	Fraxinus excelsior	-	-	80	-	-
7	Catalpa Bin.	-	-	120	-	-
8	Sorbus acuparia	-	-	50	-	-
9	Pinus nigra	-	-	40	-	-
10	Thuja	-	-	40	-	-
11	Juniperus	-	-	30	-	-
12	Salix viminalis	100	250	400	100	300
13	Parthenocissus quinquefolia	-	360	-	-	-
14	Miscanthus	-	350	-	-	100
15	Prunus laurocerasus	-	-	40	-	-
16	Berberis thunbergi	-	-	40	-	-
17	Hibiscus	-	-	40	-	-
18	Lavandula	-	-	100	-	-
19	Iris	-	-	50	-	-

SPIRE BAIA MARE

SMART POST INDUSTRIAL
REGENERATIVE ECOSYSTEM



FERNEZIU



Accesează pagina de forum comunitar pentru situl Ferneziu

Terenul Ferneziu este localizat în proximitatea școlii Nicolae Bălcescu și în proximitatea unor zone de locuire individuală. Aspectul de teren degradat și vegetația spontană sunt câteva din problemele terenului. Terenul este considerat a fi contaminat cu metale grele (regăsite în sol). Speciele de plante alese vor decontamina solul pe termen mediu-lung. Totodată prin procesul de plantare, imaginea urbană la nivel local se va îmbunătăți.

Terenul Ferneziu are principalul rol de element de peisaj pozitiv, estetic, la nivelul cartierului, dar și un rol funcțional pentru elevii școlii alăturate și pentru membrii comunității locale.

Soluția generală de amenajare este rezultatul unui proces de consultare a publicului (prin chestionare online) și al unui proces de lucru colaborativ, prin ateliere de creație, cu tinerii din Baia Mare. Astfel, se dorește un traseu pietonal longitudinal, făcând terenul accesibil pentru plimbări și explorări în natură. Comunitatea consideră necesară amenajarea unui spațiu de dimensiuni reduse pentru socializare și activități educaționale comunitare. Latura aferentă străzii Areei se dorește a fi plantată cu alinaмент de mesteacăn pentru a crea o perdea de vegetație.

Terenul se va transforma treptat, declarând un proces de ecologizare, transformându-se conform nevoilor comunității locale.

Procesul de lucru cu comunitatea a fost unul provocator dar distractiv:

Exercițiul colaborativ: ambianță și dotări

Exercițiul colaborativ: amenajarea terenului

Ne-am dorit să amenajăm terenul în funcție de nevoile și activitățile comunității locale.

Ne-am dorit să plantăm o specie care să decontamineze solul și să îmbunătățească imaginea urbană la nivel local.

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COLONIA TOPITORILOR



Accesează pagina de forum comunitar pentru situl Colonia Topitorilor

Terenul Craica prezintă vegetație valoroasă, ce este integrată în noua amenajare.

Terenul Craica are principala valoare de spațiu liber, orientat către natură. Prin intermediul proiectului SPIRE, deschidem acest teren către comunitate, cu activități în strânsă legătură cu peisajul natural. Vegetația înaltă valoroasă, cursul de apă și deschiderile vizuale ale terenului sunt câteva din factorii care contribuie la ambianța generală. Terenul este considerat a fi contaminat cu metale grele (regăsite în sol). Speciele de plante alese vor decontamina solul pe termen mediu-lung.

Soluția generală de amenajare este rezultatul unui proces de consultare a publicului (prin chestionare online) și al unui proces de lucru colaborativ, prin ateliere de creație, cu tinerii din Baia Mare. Activitățile în natură, plimbarea cu bicicleta și un spațiu multifuncțional au fost unele dintre cele mai dorite funcțiuni, conform comunității locale.

Terenul se va transforma treptat, declarând un proces de ecologizare, transformându-se conform nevoilor comunității locale.

Procesul de lucru cu comunitatea a fost unul provocator dar distractiv:

Exercițiul colaborativ: ambianță și dotări

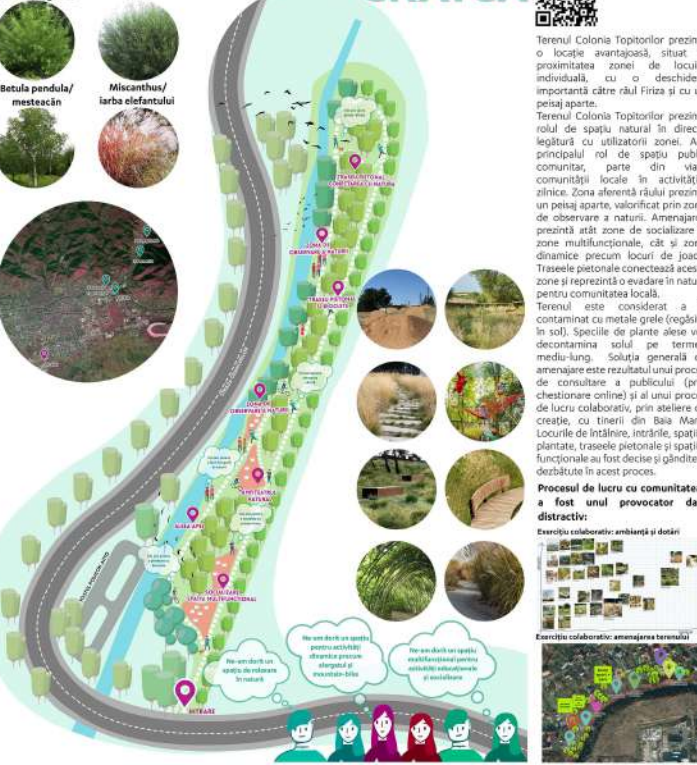
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CRAICA



Accesează pagina de forum comunitar pentru situl Craica

Terenul Colonia Topitorilor prezintă o locație avantajoasă, situată în proximitatea zonei de locuire individuală, cu o deschidere importantă către râul Fıriza și cu un peisaj aparte.

Terenul Colonia Topitorilor prezintă rolul de spațiu natural în directă legătură cu utilizatorii zonei. Are principalul rol de spațiu public comunitar, parte din viața comunității locale în activitățile zilnice. Zona aferentă râului prezintă un peisaj aparte, valorificat prin zone de observare a naturii. Amenajarea prezintă atât zone de socializare și zone multifuncționale, cât și zone dinamice precum locuri de joacă. Traseele pietonale conectează aceste zone și reprezintă o evadare în natură pentru comunitatea locală.

Terenul este considerat a fi contaminat cu metale grele (regăsite în sol). Speciele de plante alese vor decontamina solul pe termen mediu-lung. Soluția generală de amenajare este rezultatul unui proces de consultare a publicului (prin chestionare online) și al unui proces de lucru colaborativ, prin ateliere de creație, cu tinerii din Baia Mare. Locurile de întâlnire, intrările, spațiile plantate, traseele pietonale și spațiile funcționale au fost decise și gândite și dezvoltate în acest proces.

Procesul de lucru cu comunitatea a fost unul provocator dar distractiv:

Exercițiul colaborativ: ambianță și dotări

Exercițiul colaborativ: amenajarea terenului

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