URBAN GreenUP

D4.7: Final report about implementation and commissioning of NBS in Izmir

WP 4 , T 4.8

Date of document

December, 2020 (M43)

Authors: IZM, DEM

URBAN GreenUP

SCC-02-2016-2017

Innovation Action – GRANT AGREEMENT No. 730426

Technical References

Project Acronym	**URBAN GreenUP**
Project Title	New Strategy for Re-Naturing Cities through Nature-Based Solutions – URBAN GreenUP
Project Coordinator	Raúl Sánchez Fundación Cartif rausan@cartif.es
Project Duration	1 June 2017 – 31 May 2022 (60 Months)

Deliverable No.	D4.6
Dissemination Level	PU[1]
Work Package	WP 4 – Izmir demonstration
Task	T 4.8 – Supervision of NBS implantation and civil works
Lead beneficiary	DEM
Contributing beneficiary(ies)	11 (DEM), 10 (IZM), 12 (EGE), 13 (IZT), 14 (BIT)
Due date of deliverable	31 May 2020
Actual submission date	24 December 2020
Estimated person-month for deliverable	

[1] PU = Public

PP = Restricted to other programme participants (including the Commission Services)

RE = Restricted to a group specified by the consortium (including the Commission Services)

CO = Confidential, only for members of the consortium (including the Commission Services)

Versions

Table 0-1: Table of versions

Version	Person	Partner	Date
v1	Berna Ataman Oflas, Ayşe Didem Yaygel, Ertan Dikmen, Sinan Alper, Sibel Kozan Alper	IZM	07 May 2019
v2	Kaan Emir, Oya Tabanoğlu, Gonca Akgül	DEM	13 May 2019
v3	Koray Velibeyoğlu, Gülden Gökçen Akkurt, Yusuf Kurucu, Mustafa Tolga Esetlili, Şerif Hepcan, Çiğdem Coşkun Hepcan, Merve Özeren Alkan, Gülşah Adıgüzel Kaçmaz	IZT, EGE	16 May 2019
v4	Berna Ataman Oflas, Ayşe Didem Yaygel, Ertan Dikmen, Sinan Alper, Sibel Kozan Alper	IZM	24 May 2019
v5	Kaan Emir, Baha Kuban	DEM	28 May 2019
v6	Berna Ataman Oflas, Ayşe Didem Yaygel, Ertan Dikmen, Sinan Alper, Sibel Kozan Alper	IZM	29 May 2019
v7	Kaan Emir	DEM	30 May 2019
v8	Berna Ataman Oflas, Ayşe Didem Yaygel, Ertan Dikmen, Sinan Alper, Sibel Kozan Alper	IZM	27 Aug 2019
v9	Kaan Emir	DEM	29 Aug 2019
v10	Berna Ataman Oflas, Ayşe Didem Yaygel, Ertan Dikmen, Sinan Alper, Sibel Kozan Alper	IZM	25 Nov 2019
v11	Sinan Alper, Ayşe Didem Yaygel, Ertan Dikmen, Berna Ataman Oflas, Sibel Kozan Alper	IZM	27 Nov 2019
v12	Kaan Emir	DEM	29 Nov 2019
v13	Kaan Emir, Esra Demir, Baha Kuban	DEM	25 May 2020
v14	Sinan Alper, Ayşe Didem Yaygel, Ertan Dikmen, Berna Ataman Oflas, Sibel Kozan Alper	IZM	27 May 2020
v15	Kaan Emir, Esra Demir	DEM	29 May 2020
v16	Sinan Alper, Ayşe Didem Yaygel, Ertan Dikmen, Berna Ataman Oflas, Sibel Kozan Alper	IZM	03 Dec 2020
v17	Kaan Emir	DEM	04 Dec 2020
V18	Kaan Emir	DEM	20 Dec 2020

Table of Content

List of Tables

List of Figures

0 Executive summary

As a final report related with implementations within sub demo areas in Izmir, this report contains implementation and commissioning details of all completed actions. However, this deliverable does not reflect the final progress for all previously defined NBSs. Under normal circumstances it was planned to finish implementation and commissioning processes of all NBSs in Izmir at the end of May 2020. Implementation of some of the 19 technical action in Izmir delayed due to the COVID-19. The effects of COVID-19 are explained in detail in chapter 8.

This document contains information about overall progress on NBSs, implementation steps for completed interventions, (All sub demo A and sub demo C interventions), implementation progress of on-going interventions (on sub demo B) and updated timetables including implementation phase of the interventions.

After the introduction chapter, in second, third and fourth chapter the information mentioned in previous paragraph investigated for each sub demo respectively. In the subsections of these chapters there is a further investigation for each NBS in terms of their current status.

In chapter 5, non-technical NBSs are explained with similar tables representing the current status. Chapter 6 is summarizing the timetables and gives the opportunity to follow the planned important dates in terms of implementation of each NBS together.

Taking into consideration the updated information given in Chapter 6, this final report about implementation and commissioning of NBS in Izmir will be revised after whole implementation progress on all Sub Demo areas completed.

In chapter 7 the details of tendering process for all NBSs in Izmir are given.

In the content of this report checklists are shared in the annex chapter (chapter 10). Relation between checklists and interventions and also the content of the checklists is explained under each chapter related with sub demo areas.

1 Introduction

In this version of the final report, status of each intervention is updated by taking into consideration the following table used in previous deliverable (D4.6) which is related with implementation progress:

Table 1-1: Explanation of percentages on status tables

Percentage delivery	Technical interventions	Non-technical interventions
10%	NBS locations under review	Non-technical interventions described
20%	NBS location agreed	Locations/approach proposed
30%	Detailed design and specifications are agreed and underway	Preliminary site visits/assessments made
40%	Economical specifications are calculated	Engagement with stakeholders, partners, and wider community started
50%	Technical project finished	Interventions mapped in detail/ Regular engagement with stakeholders
60%	Procurement of proposed works is underway	Stakeholder partnership established
70%	Tenders have been let	Interventions about to commence
80%	Works have started on site	Intervention has begun/ Stakeholders actively involved
90%	Good progress with on-site delivery	Good progress with delivering the Intervention/Stakeholders benefitting
100%	Works fully completed	Intervention completed

Interventions are investigated in specified subsections for each intervention under sections described for each sub demo.

Timetables for each intervention given in those subsections with information on dates of start and finish of the interventions.

Besides the information given for the NBSs which do not have any progress in terms of implementation yet, the implementation steps for the interventions of Sub Demo C are given under chapter 4. Also, steps of implementation of Grassed swales and Water Retention Ponds around Bio-boulevard and Climate Smart Greenhouses are given under chapter 3.

The implementation steps for the Parklets are given in the final version of the report D4.6 Report of Implementation Progress in Izmir under the section 2.2 Installation of Parklets and for the green covering shelter, green permeable surface and green shady structures in the final version of the report D4.6 Report of Implementation Progress under the section 2.5 Green Covering Shelter for Car Parking Area.

1.1 Purpose and Target Group

The report is covering final studies of the task 4.8 Supervision of NBS implantation and civil works as well as providing the implementation progress and current status and timetable for the following studies of each NBSs in Izmir's sub demo areas,

The document brings the summarized information in terms of status of each NBS and the implementation steps for the completed and ongoing actions in the demo sites of Izmir:

- Cycle and pedestrian route in new Green Corridor
- Planting 4800 Cool & Shady Trees
- Urban carbon sink
- Culvert works for Peynircioğlu Stream
- Green pavements for Peynircioğlu Stream
- Green fences
- Fruit walls
- Grassed swales and Water Retention Ponds around Bio-boulevard
- Climate smart Greenhouses
- Industrial Heritage Route Along the Izmir Urban Green

Implementation steps for the actions completed before are given in the final version of the report D4.6 Report of Implementation Progress in Izmir

- IAc4, installation of parklets,
- IAc14 green covering shelter for car parking areas,
- IAc15 green permeable pavement around car parking area,
- IAc16 green shady structures for car parking area,
- IAc3 Arboreal areas around Car Park Areas (Planting 26 trees around car park and parklets),
- IAc10 Smart Soil (Biochar) into green shady structures.
- Progress of IAc5 Culvert works on Peynircioğlu stream is explained in detail with photographs from construction site.

1.2 Contribution of partners

During the preparation stage of this report the municipality team (IZM) and DEM had a collaborative study to reflect the status of the interventions on this deliverable. IZM also worked with EGE and IZT teams to add their necessary contributions related with final decisions of design and implementation timetables.

1.3 Relation to other activities in the project

WP1 - D1.1 - NBS Catalogue: During the preparation of this document the information given in D1.1 and outcomes of the D1.1 used as resource.

WP4 - D4.1 & D4.2 & D4.3- Diagnosis Report on Izmir & Baseline Definition of Izmir & Technical Specifications of Izmir Demo: Those deliverables provide information during the determination of status of each NBS. Also, information from those reports will be used as resource for evaluation of implementation progress and the timetables which will be followed during the implementation of those NBSs. Besides these, those deliverables give the possibility of comparison of the previous decisions with updated decisions.

WP4 - D4.6 Report of implementation progress in Izmir: The deliverable is the basis of this document. Implementation details of completed interventions given in deliverable 4.6. This final report follows the same structure with D4.6 to reflect the final status of interventions in a simple way.

2 Implementation Progress and commissioning of NBS in Sub Demo A

Sub Demo A is deployed in the central area of Karşıyaka Metropolitan District characteristic of highly-urbanized areas (see Figure 2-1). The NBSs defined in this sub demo is related with re-naturing urbanization and singular green infrastructure interventions. The list of the interventions implemented and/or going to be implemented on sub demo A are given in the Table 2-1.

Figure 2-1: Sub Demo A: Karşıyaka Metropolitan District

Table 2-1: List of interventions in Sub-Demo A

Re-naturing urbanization	Water interventions	Singular Green Infrastructures
Arboreal areas around Car Park Areas		Smart Soil (Biochar) into Green Shady Structures
Installation of parklets		Green Covering Shelter for car parking area
		Green Permeable Pavement Around Car Parking Area
		Green Shady Structures for car parking area

2.1 Arboreal areas around Car Park Areas

Implementation of arboreal areas around car park areas is completed. Details can be found under the section 2.5 of D4.6 Report of implementation progress in Izmir.

The overall progress on this NBS is given in Table 2-2.

Table 2-2: Status for IAc3

IAc3	Arboreal areas around Car Park Areas (Planting 26 trees around car park and parklets)									
Implementation of this intervention is completed.										
10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	

The foreseen timetable can be seen in Table 2-3.

Table 2-3: Timetable for IAc3

Sub demo A		End of Design	Tender Process		Implementation	
			Start	End	Start	End
Renaturing Urbanization	Arboreal areas around Car Park Areas	Nov -18	Dec-18	May-19	Jun-19	Nov-19

2.2 Installation of Parklets

Implementation of Parklets is completed. Detailed progress and implementation steps are explained under section 2.2 of D4.6 Report of implementation progress in Izmir.

After the completion of the tender process of 4 Parklets in Girne Street, a control team consisting of 1 architect, 1 landscape architect, 1 construction technician and 1 machine technician has been commissioned for the construction audits of the work. The control team followed checklists to control progress during implementation and commissioning of the parklets. This checklist can be found in chapter 8 of this report (Figure 10-4). The checklist consists of 14 items and includes the list of materials and equipment to be controlled on site and implementation steps. All construction and excavation work, surface coating and filling operations, vegetation soil and plant species, irrigation system and piping details and properties of iron construction covered within those 14 items. The final view of one of the parklet units is given in the figure below:

Figure 2-2: Final view of a parklet unit

New pictures of parklets:

Figure 2-3: New pictures from parklets

2.3 Smart Soil (Biochar) into Green Shady Structures

Implementation of smart soil (biochar) into green shady structures has been completed. Details can be found under the section 2.5 of D4.6 Report of implementation progress in Izmir.

The overall progress on this NBS is given in Table 2-4.

Table 2-4: Status of IAc10

IAc10	Smart Soil (Biochar) into Green Shady Structures									
Implementation of this intervention is completed.										
10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	

The foreseen timetable can be seen in Table 2-5.

Table 2-5: Timetable for IAc10

Sub demo A		End of Design	Tender Process		Implementation	
			Start	End	Start	End
Singular Green Infrastructure	Smart Soil (Biochar) into Green Shady Structures	Nov -18	Dec-18	May-19	Jun-19	Nov-19

2.4 Green Permeable Pavement Around Car Parking Area

Implementation of green permeable pavement around car parking area is completed. Details can be found under the section 2.5 of D4.6 Report of implementation progress in Izmir.

The overall progress on this NBS is given in Table 2-6.

Table 2-6: Status of IAc15

IAc15	Green Permeable Pavement Around Car Parking Area									
Implementation of this intervention is completed.										
10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	

The foreseen timetable can be seen inTable 2-7.

Table 2-7: Timetable for IAc15

Sub demo A		End of Design	Tender Process		Implementation	
			Start	End	Start	End
Singular Green Infrastructure	Green Permeable Pavement Around Car Parking Area	Nov -18	Dec-18	May-19	Jun-19	Nov-19

2.5 Green Covering Shelter for Car Parking Areas

Implementation of green covering shelter for car parking areas is completed. Detailed progress explained in below paragraphs with photographs from implementation steps.

The overall progress on this NBS is given in Table 2-8.

Table 2-8: Status of IAc14

IAc14	Green Covering Shelter for car parking area (1450 m2 green covering shelter)									
Implementation of this intervention is completed.										
10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	

The foreseen timetable can be seen in the Table 2-9.

Table 2-9: Timetable for IAc14

Sub demo A		End of Design	Tender Process		Implementation	
			Start	End	Start	End
Singular Green Infrastructure	Green Covering Shelter for car parking area	Nov -18	Dec-18	May-19	Jun-19	Dec-19

After the tender was completed within the scope of the construction of the Green Covering Shelter, Green Permeable Pavement and Green Shady Structures; a control team consisting of 1 architect, 1 landscape architect, 1 civil engineer, 1 mechanical engineer and 1 map technician was commissioned for the construction control of the work. As a control organization, the project area was visited with the contractor and delivered to the contractor. During the implementation and commissioning of the actions IAc3 arboreal areas around car park areas, IAc10 smart soil (biochar) into green shady structures, IAc15 green permeable pavement around car parking area, IAc14 green covering shelter for car parking areas and IAc16 green shady structures for car parking area the control team has conducted the tests especially for

permeability and followed the previously determined checklists (Figure 10-5) of implementations.

Checklist consists of 24 items and all construction and excavation work, surface coating and filling operations, details of concrete, wood, steel and iron material, permeable concrete, geotextile filter and properties of iron construction covered within those 24 items.

Figure 2-4: Biochar (smart soil) implementation, ivy plants and tree planting

The construction of the green roofed parking lots project was completed on 22nd of November 2019.

Figure 2-5: Final view of green covering shelter, permeable surface and ivy plants on biochar added soil

2.6 Green Shady Structures for car parking area

Implementation of green shady structures for car parking area is completed. Details can be found under the section 2.5 of D4.6 Report of implementation progress in Izmir.

The overall progress on this NBS is given in Table 2-10.

Table 2-10: Status of IAc16

IAc16	Green Shady Structures for car parking area (Green shady structures with ivy plants)									
Implementation of this intervention is completed.										
10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	

The foreseen timetable can be seen in Table 2-11.

Table 2-11: Timetable for IAc16

Sub demo A	End of Design	Tender Process		Implementation	
		Start	End	Start	End

Singular Green Infrastructure	Green Shady Structures for car parking area	Nov -18	Dec-18	May-19	Jun-19	Nov-19

3 Implementation Progress and commissioning of NBS in Sub Demo B

In the heart of Sub Demo B there is 'Sasalı Natural Life Park' designed by Izmir Metropolitan Municipality and was recently considered to extend its area of influence through new ecologically-sensitive developments (Figure 3-1). The NBSs defined in this sub demo is related with water interventions and singular green infrastructure interventions. The list of the interventions implemented and/or going to be implemented on sub demo B are given in the Table 3-1.

Table 3-1: List of interventions in Sub-Demo B

Re-naturing urbanization	Water interventions	Singular Green Infrastructures
	Grassed swales and Water Retention Ponds around Bio-boulevard	Smart soil production in climate-smart urban farming precinct
		Natural pollinator's modules
		Climate-smart greenhouse in urban farming precinct
		Biofuel production unit
		Development of Smart soils from mud plant, to use in urban farming

Figure 3-1: Location of Sub Demo B

As in the other demo sites a group of architects, civil engineers, landscape architects, electrical and mechanical engineers were assigned for construction controls of the work in sub demo B. The control team is conducting tests by following the previously determined checklist (Figure 10-6) during the commissioning of the implementations on sub demo B.

Checklist of implementations of sub demo B consists of 54 items and details of all construction, excavation, plantation work, surface coating and filling operations, plant species, vegetation soil, properties of concrete, wood, steel and iron material, permeable concrete, layers of bioswale, properties of sludge from mud plant and smart soil covered within those 54 items.

3.1 Smart soil production in climate-smart urban farming precinct

First, the license application was made for this action. After obtaining the license, the implementation projects transferred to the tender unit. Implementation of smart soil production in climate-smart urban farming precinct started in September 2020 after the preliminary project phase of the intervention has been completed.

Tender process is completed at the end of June 2020. Implementation started in September 2020 and end in December 2020.

The overall progress on this NBS is given in Table 3-2.

Table 3-2: Status of IAc9

IAc9	Smart soil production in climate-smart urban farming precinct								
Selection of the location is completed and resulted with the decision of using an area owned by municipality within the boundaries of sub-demo B. Studies on technical project with external consultancy about the technical details of the production unit are completed. Tender process is completed at the end of June.									
10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

The foreseen timetable can be seen in Table 3-3.

Table 3-3: Timetable for IAc9

Sub demo B		End of Design	Tender Process		Implementation	
			Start	End	Start	End
Singular Green Infrastructure	Smart soil production in climate-smart urban farming precinct	May-19	Jun-19	Jun-20	Sep-20	Dec-20

3.2 Natural pollinator's modules

Implementation of natural pollinator's modules finished in September 2020.

The overall progress on this NBS is given in Table 3-4.

Table 3-4: Status of IAc11

IAc11	Natural pollinator's modules (20 pollinator houses along the bio-boulevard)								
The technical project for this intervention is completed. Procurement of proposed works is completed. Implementation completed.									
10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

The foreseen timetable can be seen in Table 3-5.

Table 3-5: Timetable for IAc11

Sub demo B	End of	Tender Process	Implementation

		Design	Start	End	Start	End
Singular Green Infrastructure	Natural pollinator's modules	Nov-18	Dec-18	Nov-19	Jun-20	Sep-20

3.3 Development of Smart soil from mud plant, to use in urban farming

Tender process of development of smart soil from mud plant is completed in September 2020. Implementation started in September 2020 and it will end in December 2020.

The overall progress on this NBS is given in Table 3-6.

Table 3-6: Status of IAc18

IAc18	Development of Smart soil from mud plant, to use in urban farming (Increase efficiency in agriculture with using the by-products from wastewater treatment)									
The technical project for this intervention is completed. Tender process started and completed in September.										
10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	

The foreseen timetable can be seen in Table 3-7.

Table 3-7: Timetable for IAc18

Sub demo B		End of Design	Tender Process		Implementation	
			Start	End	Start	End
Singular Green Infrastructure	Development of Smart soil from mud plant	May-19	Jun-19	Jun-20	Sep-20	Dec-20

3.4 Grassed swales and Water Retention Ponds around Bio-boulevard

Implementation of grassed swales and water retention ponds started on January 2020. First,

Figure 3-2: Excavation works and piping equipment implementation for grassed swales

excavation work was started. Then, piping equipment of the drainage system was installed.

Figure 3-3: Final view of grassed swales and water retention ponds

The overall progress on this NBS is given in Table 3-8.

Table 3-8: Status of IAc6

IAc6	Grassed swales and Water Retention Pounds around Bio-boulevard									
Implementation started on site.										
10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	

The foreseen timetable can be seen in Table 3-9.

Table 3-9: Timetable for IAc6

Sub demo B		End of Design	Tender Process		Implementation	
			Start	End	Start	End
Water Interventions	Grassed swales and Water Retention Ponds	Mar-19	Apr-19	Nov-19	Jan-20	Dec-20

3.5 Climate-smart Greenhouses

Implementation of climate-smart greenhouses started on January 2020. Reinforcement and

Figure 3-4: Reinforcement and ground preparations of climate-smart greenhouses

ground preparations for the foundation of greenhouses began.

Figure 3-5: Final view from climate-smart greenhouses

The overall progress on this NBS is given in Table 3-10.

Table 3-10: Status of IAc17

IAc17	Climate smart greenhouses								
Implementation started on site.									
10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

The foreseen timetable can be seen in Table 3-11.

Table 3-11: Timetable for IAc17

Sub demo B		End of Design	Tender Process		Implementation	
			Start	End	Start	End
Singular Green Infrastructure	Climate-smart Greenhouses	Mar-19	Apr-19	Nov-19	Jan-20	Dec-20

4 Implementation Progress and commissioning of NBS in Sub Demo C

Sub Demo C is formed by a 10 km long green corridor from the coastal areas, river beds to highly sensitive nature protection areas (see Figure 4-1). The proposed green corridor includes sustainable transportation options (cycling &walking) and special sections like the Bio-Boulevard that will provide important ecosystem services for urban biodiversity. Sub Demo C also includes non-technical interventions aiming bio-diversity increasing education activities. The NBSs defined in this sub demo is related with re-naturing urbanization, water interventions, singular green infrastructure and non-technical interventions. The list of the interventions implemented and/or going to be implemented on sub demo C are given in the Table 4-1.

Figure 4-1: Sub Demo C: Peynircioğlu Stream and Urban Green Corridor

Table 4-1: List of interventions in Sub-Demo C

Re-naturing urbanization	Water interventions	Singular Green Infrastructures	Non-technical interventions
Cycle and pedestrian route in new Green Corridor	Culvert works for Peynircioğlu Stream	Green fences	Industrial Heritage Route along the Izmir Urban Green Corridor
Planting 4800 Cool & Shady Trees	Green pavements for Peynircioğlu Stream	Fruit walls	
Urban Carbon Sink			

In sub demo C the tender processes of all of the interventions listed above applications are proceeding simultaneously. The tender processes of the interventions have been completed. Constructions are started in October.

After the tender processes of Peynircioğlu Stream Landscaping Project was completed, a group of architects, civil engineers, landscape architects, electrical and mechanical engineers were assigned for construction controls of the work. The control team has conducted tests especially by following the previously determined checklist (Figure 10-4) during the commissioning of the implementations on sub demo C.

Checklist of implementations of Peynircioğlu stream consists of 101 items and details of all construction, excavation, plantation and in-stream culvert work, surface coating and filling operations, plant species, vegetation soil, properties of concrete, wood, steel and iron material, permeable concrete, geotextile filter and iron construction covered within those 101 items.

4.1 Cycle and pedestrian route in new Green Corridor

Tender process is completed in October 2019. Implementation started in December 2019. Implementation of cycle and pedestrian route in new green corridor has been completed in September 2020.

The overall progress on this NBS is given in Table 4-2.

Table 4-2: Status of IAc1

IAc1	Cycle and pedestrian route in new Green Corridor									
The technical project for this intervention is completed. Tender process is completed. Implementation completed.										
10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	

The foreseen timetable can be seen in Table 4-3.

Table 4-3: Timetable for IAc1

Sub demo C		End of Design	Tender Process		Implementation	
			Start	End	Start	End
Renaturing Urbanization	Cycle and pedestrian route in new Green Corridor	Apr-19	May-19	Oct-19	Dec-19	Sep-20

Concrete quality and permeability were checked by conducting a test by pouring the permeable concrete in front of the construction site office.

Figure 4-2: Permeability test of concrete

Geotextile felting is laid on the compacted floor, which is one of the layers specified in the project, by determining the place where permeable concrete pouring made within wooden chambers.

Figure 4-3: Geotextile layer laying

Cellular filling was made on geotextile felt. Filling is completed with granular filling on cellular filling.

Figure 4-4: Cellular and granular filling operations

Channeled bricks for disabled people put on cellular filling

Figure 4-5: Channeled brick on filling layers

Permeable concrete pouring was made by using a concrete mixer. The spread of concrete on the road was done by the concrete workers. The concrete spread on the road was leveled with a hand roller. The places that remained high in the concrete were leveled with a wooden leveler. After spreading process was completed, concrete was left to dry.

Figure 4-6: Pouring and levelling of permeable concrete

The drying process has been completed and the concrete has reached walkable hardness.

Figure 4-7: Drying process of concrete

Trial casting for tile dust manufacturing was made for running track. Compaction of the tile powder was done by leveling it with a roller.

Figure 4-8: Tile dust laying

After the trees were planted around the permeable concrete and the running track, the pedestrian and cycle road were finalized.

Figure 4-9: Final views from the road

4.2 Planting 4800 Cool & Shady Trees

Implementation of planting 4800 cool & shady trees is completed. Tender process is completed in October 2019. Implementation started in December 2019 and has been completed for 2200 trees in September 2020.

The overall progress on this NBS is given in Table 4-4.

Table 4-4: Status of IAc2

IAc2	Planting 4800 Cool & Shady Trees									
The technical project for this intervention is completed. Tender process is completed. Implementation started on site. Implementation will continue on different sites around new green corridor.										
10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	

The foreseen timetable can be seen in Table 4-5.

Table 4-5: Timetable for IAc2

Sub demo C		End of Design	Tender Process		Implementation	
			Start	End	Start	End
Renaturing Urbanization	Planting 4800 Cool & Shady Trees	Apr-19	May-19	Oct-19	Dec-19	Sep-20

Locations for planting trees are detected with measurements and soil is prepared for plantation. Then, plantation of new trees along new cycle and pedestrian route is started.

Figure 4-10: Plantation of trees around Peynircioğlu stream

Plantation of trees continued on this site and along new green corridor.

Figure 4-11: Planted new trees from different locations of demosite

Trees are selected at tree facility of municipality then those selected trees are planted along new green corridor. Watering infrastructure is completed to finish implementation of planting trees.

Figure 4-12: Plantation of trees around new green corridor

4.3 Urban carbon sink

Implementation of urban carbon sink is completed. Tender process is completed in October 2019. Implementation started in June 2020 and has been completed in September 2020.

The overall progress on this NBS is given in Table 4-6.

Table 4-6: Status of IAc5

IAc5	Urban Carbon Sink (Creation of new green areas with special species of plants for high-level carbon capture)								
The technical project for this intervention is completed. Tender process is completed. Implementation completed after the culvert works on Peynircioğlu stream completed.									
10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

The foreseen timetable can be seen in Table 4-7.

Table 4-7: Timetable for IAc5

Sub demo C		End of Design	Tender Process		Implementation	
			Start	End	Start	End
Renaturing Urbanization	Urban carbon sink	Apr-19	May-19	Oct-19	Jun-20	Sep-20

4.4 Culvert works for Peynircioğlu Stream

Implementation of culvert works for Peynircioğlu Stream started October 2019 and completed in September 2020.

After the tender processes of Peynircioğlu Stream Landscaping Project was completed, a group of architects, civil engineers, landscape architects, electrical and mechanical engineers were assigned for construction controls of the work. The project area was delivered to the contractor company on 18th of October 2019. Implementations within the scope of this project are; green pedestrian and bicycle path, planting 1000 trees, applications to reduce carbon emissions, green culvert works on stream, green pavement application, green fence application, 10 pollinator house and fruit wall application.

Details of first construction steps for Peynircioğlu Stream can be found under the section 4.42.5 of D4.6 Report of implementation progress in Izmir. After those steps, implementation continued with the steps explained below.

Necessary equipment and materials to implement terramesh system are brought to demo site

Figure 4-13: Terramesh materials on site

Excavation work is completed on the area for terramesh system application.

Figure 4-14: Area of terramesh application after excavation

Terramesh material laid on the excavated surface to prevent erosion.

Figure 4-15: Terramesh material on excavated surface

Vegetation soil is poured on the terramesh system.

Figure 4-16: The area after pouring vegetation soil

Terramesh layers which are explained in D4.3 Technical Specifications of Izmir Demo are implemented on vegetation soil layer.

Figure 4-17: Implementation of terramesh layers

Irrigation system manufacturing started for plants in the terramesh system. Installation of pipes for the drip irrigation system to the terramesh system has been completed.

Figure 4-18: Implementation of drip irrigation system

Terramesh system manufacturing was finalized and preparations were made for the fabrications behind the system.

Figure 4-19: Completed implementation of terramesh system

Manufacturing of the works behind the terramesh system (permeable road, vegetative soil) was completed.

Figure 4-20: Implementation behind the terramesh area

The plants in the terramesh system started to grow green.

Figure 4-21: Terramesh area with plants

Crowbar plants brought to the demosite and plantation of terramesh system is started.

Figure 4-22: Plantation of crowbar plants

Plantation is completed and in-stream culvert works are completed.

Figure 4-23: Final view from in-strream culvert works

Figure 4-24: Final views from Peynricioğlu stream

4.5 Green pavements for Peynircioğlu Stream

Implementation of green pavements for Peynircioğlu Stream is completed. Tender process is completed in October 2019. Implementation started on January 2020 and completed on September 2020.

The overall progress on this NBS is given in Table 4-8.

Table 4-8: Status of IAc8

IAc8	Green pavement along Peynircioğlu stream								
The technical project for this intervention is completed. Tender process is completed. Implementation completed on demo site.									
10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

The foreseen timetable can be seen in Table 4-9.

Table 4-9: Timetable for IAc8

Sub demo C		End of Design	Tender Process		Implementation	
			Start	End	Start	End
Water Interventions	Green pavements for Peynircioğlu Stream	Apr-19	May-19	Oct-19	Jan-20	Sep-20

A base was created for plants to be planted on green pavement by laying vegetative soil.

Figure 4-25: First steps of implementation of green pavements

Figure 4-26: Final view of green pavements

4.6 Green fences

Implementation of green fences has completed. Tender process is completed in October 2019. Implementation started on December 2019 and completed on September 2020.

The overall progress on this NBS is given in Table 4-10.

Table 4-10: Status of IAc12

IAc12	Green fences (1600 m^2 green fence)								
The technical project for this intervention is completed. Tender process is completed. Implementation completed on site.									
10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

The foreseen timetable can be seen in Table 4-11.

Table 4-11: Timetable for IAc12

Sub demo C		End of Design	Tender Process		Implementation	
			Start	End	Start	End
Singular Green Infrastructure	Green fences	Apr-19	May-19	Oct-19	Dec-19	Sep-20

Reinforced concrete foundation production which required for green fence application started.

Figure 4-27: Concrete foundation of green fences

Foundation production was completed and vegetative soil was laid on it. Trial production was made for the railing that would form a green fence base and the appropriate model was chosen.

Figure 4-28: Trial implementation of green fences

Installation of the fence brought to the area completed and preparations for plantation of ivy structures started.

Figure 4-29: View of fences before plantation

Figure 4-30: Final view from green fences

4.7 Establishment of fruit walls

Implementation of establishment of fruit walls started on December 2019 and completed in September 2020.

In the area where fruit walls manufactured, the production of resting units has been completed and the units are installed on the site.

Figure 4-31: Resting units of fruit walls implementation

Figure 4-32: Final views from fruit walls

The overall progress on this NBS is given in Table 4-12.

Table 4-12: Status of IAc13

IAc13	Establishment of Fruit walls (96 m^2 Fruit walls)									
The technical project for this intervention is completed. Tender process is completed. Implementation completed on site.										
10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	

The foreseen timetable can be seen in Table 4-13.

Table 4-13: Timetable for IAc13

Sub demo C	End of	Tender Process	Implementation

		Design	Start	End	Start	End
Singular Green Infrastructure	Fruit walls	Apr-19	May-19	Oct-19	Dec-19	Sep-20

4.8 Industrial Heritage Route Along the Izmir Urban Green

Implementation of Industrial Heritage Route along the Izmir urban green started on February 2020 and completed in September 2020. Information boards with resting units are implemented.

Figure 4-33: Implementation stage of information boards

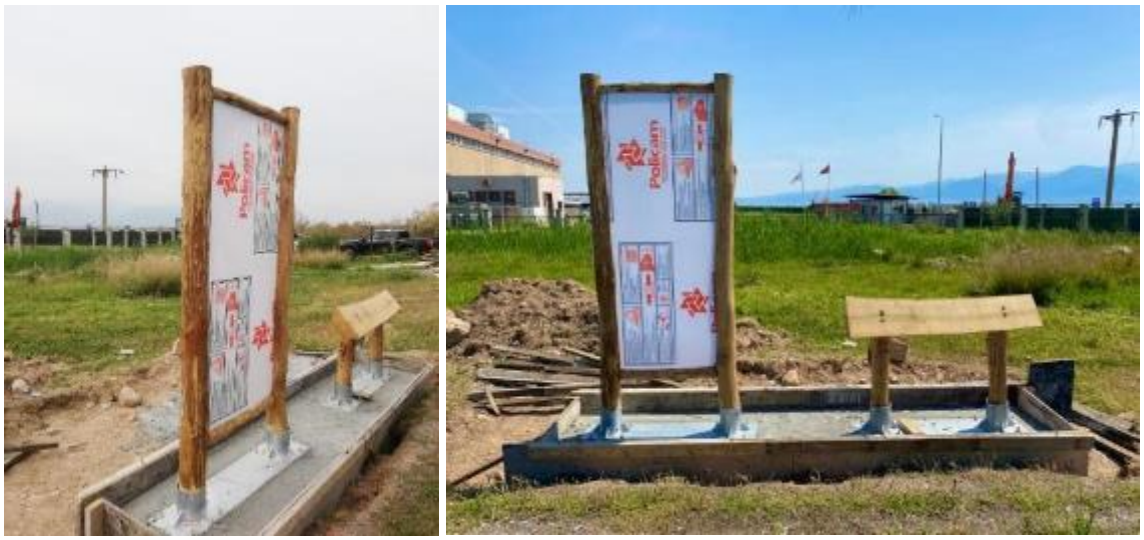

Figure 4-34: Final view of an information board with resting unit

Figure 4-35: Final view from industrial heritage route

The overall progress on this NBS is given in Table 4-14.

Table 4-14: Status of IAc19

IAc19	Industrial Heritage Route Along the Izmir Urban Green								
Implementation started on site. Implementations completed in some spots and will continue along the route.									
10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

The foreseen timetable can be seen in Table 4-15.

Table 4-15: Timetable for IAc19

Sub demo C		End of Design	Tender Process		Implementation	
			Start	End	Start	End
Non-Technical Interventions	Industrial Heritage Route Along the Izmir Urban Green	Apr-19	May-19	Nov-19	Feb-20	Sep-20

5 Implementation Progress for Non-technical Interventions

Planning, organisation and implementation details of following non-technical interventions are given in the report D4.3 Technical Specifications of Izmir Demo under chapter 5.

5.1 Educational Path/Bio-boulevard

The status of the intervention is given in Table 5-1.

Table 5-1: Status of IAc20

IAc20	Educational Path/Bio-boulevard								
Preparation of different education scenarios and activities for the NBSs on sub demo B is on-going. Implementation of the studies related with that action going to be started after the interventions in sub demo B completed.									
10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

5.2 Supporting Activities for the Food-smart Future of Izmir

The status of the intervention is given in Table 5-2.

Table 5-2: Status of IAc21

IAc21	Supporting Activities for the Food-smart Future of Izmir								
Implementation of the studies related with that action going to be started after the interventions in sub demo B completed.									
10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

5.3 Education for the Food-smart Future of Izmir

The status of the intervention is given in Table 5-3.

Table 5-3: Status of IAc22

IAc22	Education for the Food-smart Future of Izmir								
There are on-going studies on planning the different scenarios/activities. Implementation of the studies related with that action going to be started after the interventions in sub demo B completed.									
10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

5.4 Engagement Portal

The status of the intervention is given in Table 5-4.

Table 5-4: Status of IAc23

IAc23	Engagement Portal								
Actions related with this non-technical intervention will be developed and took place on the website of "Izmir Doğa", (http://izmirdoga.izmir.bel.tr/tr/Anasayfa). A map of Izmir from the website; http://kentrehberi.izmir.bel.tr/izmirkentrehberi going to be adapted and social media modules going to be added on Izmir Doğa website.									
10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

5.5 Bio-blitz Event

The status of the intervention is given in Table 5-5.

Table 5-5: Status of IAc24

IAc24	Bio-blitz Event								
Two activities took place as pilot activities with the groups of 30 people in August and November 2018. One of the activities was in an archeologic site and the other one was in a botanic site.									
10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

5.6 Support to citizen project of NBS

The status of the intervention is given in Table 5-6.

Table 5-6: Status of IAc25

IAc25	Support to citizen project of NBS								
First activity has taken place as planned in section 5.6 of deliverable 4.3. Pollinator house installation has been tried as a part of this event.									
10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

5.7 City Mentoring Strategy

The status of the intervention is given in Table 5-7.

Table 5-7: Status of IAc26

IAc26	City Mentoring Strategy								
2 conference events for dissemination of URBAN GreenUP via healthy cities union which is the union of 70 local governments of Turkey have been organised. There are on-going studies to reach other local networks.									
10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

6 Timetable

This section includes timeline for each sub demo and intervention. Within the timeline the design stage, tender and implementation processes can be investigated.

Table 6-1: Timetable for sub demo A

Sub demo A		End of Design	Tender Process		Implementation	
			Start	End	Start	End
Renaturing Urbanization	Arboreal areas around Car Park Areas	Nov -18	Dec-18	May-19	Jun-19	Nov-19
	Installation of Parklets	Oct -18	Nov-18	Feb-19	Mar-19	May-19
Singular Green Infrastructure	Smart Soil (Biochar) into Green Shady Structures	Nov -18	Dec-18	May-19	Jun-19	Nov-19
	Green Permeable Pavement Around Car Parking Area	Nov -18	Dec-18	May-19	Jun-19	Nov-19
	Green Covering Shelter for car parking area	Nov -18	Dec-18	May-19	Jun-19	Nov-19
	Green Shady Structures for car parking area	Nov -18	Dec-18	May-19	Jun-19	Nov-19

Table 6-2: Timetable for sub demo B

Sub demo B		End of Design	Tender Process		Implementation	
			Start	End	Start	End
Singular Green Infrastructure	Smart soil production in climate-smart urban farming precinct	May- 19	Jun-19	Jun-20	Sep-20	Dec-20
	Natural pollinator's modules	Nov -18	Dec-18	Nov-19	Jun-20	Sep-20
	Development of Smart soil from mud plant	May- 19	Jun-19	Jun-20	Sep-20	Dec-20
	Climate-smart Greenhouses	Mar- 19	Apr-19	Nov-19	Jan-20	Dec-20
Water Interventions	Grassed swales and Water Retention Ponds	Mar- 19	Apr-19	Nov-19	Jan-20	Dec-20

Table 6-3: Timetable for sub demo C

Sub demo C		End of Design	Tender Process		Implementation	
			Start	End	Start	End
Renaturing Urbanization	Cycle and pedestrian route in new Green Corridor	Apr-19	May-19	Oct-19	Dec-19	Sep-20
	Planting 4800 Cool & Shady Trees	Apr-19	May-19	Oct-19	Dec-19	Sep-20
	Urban carbon sink	Apr-19	May-19	Oct-19	Jun-20	Sep-20
Water Interventions	Culvert works for Peynircioğlu Stream	Apr-19	May-19	Oct-19	Oct-19	Sep-20
	Green pavements for Peynircioğlu Stream	Apr-19	May-19	Oct-19	Jan-19	Sep-20
Singular Green Infrastructure	Green fences	Apr-19	May-19	Oct-19	Dec-19	Sep-20
	Fruit walls	Apr-19	May-19	Oct-19	Dec-19	Sep-20
Non-Technical Interventions	Industrial Heritage Route Along the Izmir Urban Green	Apr-19	May-19	Oct-19	Feb-20	Sep-20

7 Details of Tendering Process

Fundamental information about the tender processes of NBSs to be implemented in Izmir sub demos in the scope of Urban GreenUP project given in D4.5 Tender documents for Izmir Demonstration. The fundamental information includes the laws and regulations which applied on the preparation of the tender documents, the grouping of NBSs to be tendered, how the process proceed under these groups and the timeline of whole process.

Stakeholders in the execution of civil works in relation with the procurement procedure were: Government board, responsible for the approval of the tender process and the successful bidder, designer, architect/engineer responsible for the technical project signature, contractor, in charge of the contract implementation and municipal supervisor, responsible for the administrative supervision and technical advice. Within the municipality organizational chart of implementation process of NBSs are shown in the figure below:

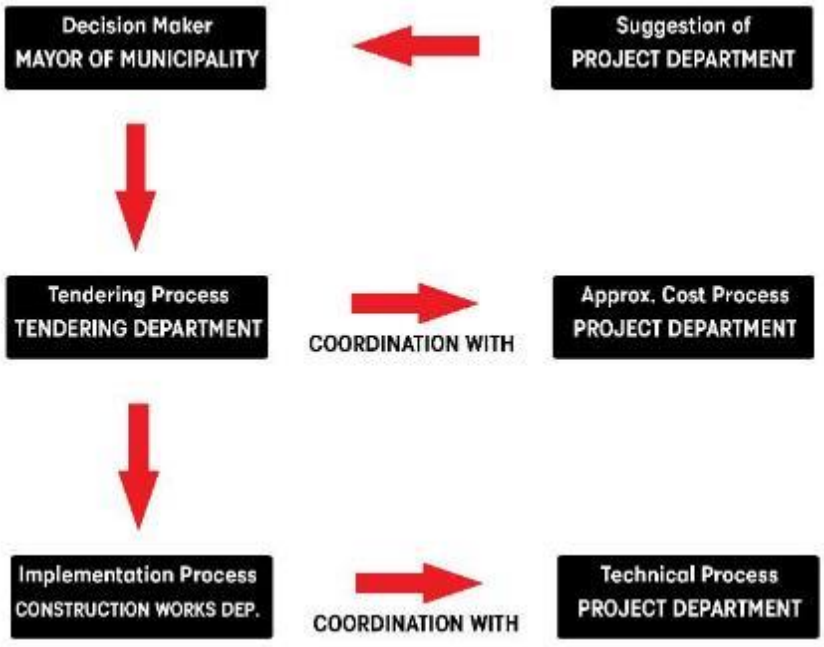

Figure 7-1: Organizational chart of implementation process of NBSs

There are no regional or local laws related with the legal framework of tendering process.

The procurement of all purchasing of goods and services, construction and civil works are carried out according to the provisions of Public Procurement Law No. 4734 and dated 04.01.2002 by Izmir Metropolitan Municipality[2].

Although, the municipalities in Turkey has the authority to independently conduct the tender for works, they are obliged to act in accordance with national procurement law. They cannot form a regulation, legislation etc. other than this law. The municipality shall act according to

[2] (Web access: http://www2.ihale.gov.tr/english/4734_English.pdf)

the results of its own feasibility studies on issues such as the grouping of the interventions to be tendered, the number of interventions per tender, the budget and the area of the interventions with following the tendering procedure, provided for by law.

To identify the characteristics of the public tendering processes it can be explained as all of the public contracts were works contract. Open procedure, restricted procedure, negotiated procedure and direct procurement were the types of public procurement processes.

The method of direct procurement may be applied in the following cases without advertising and without receiving any securities:

a) when it is established that the needs can be met from only one natural or legal person,

b) in case only one single natural or legal person has exclusive rights with regard to the need in question,

c) procurement of goods and services which are necessarily supplied from the real or legal person who is the initial supplier/ service provider, to ensure compatibility and standardization with existing goods, equipment, technology or services by means of contracts to be arranged based on the principal contract and not exceeding three-year period in total,

d) procurements not exceeding fifteen billion Turkish Liras for needs of contracting authorities within the boundaries of metropolitan municipalities and procurements not exceeding five billion Turkish Liras for needs of other contracting authorities, and purchases with regard to accommodation, trip and subsistence within the scope of representation expenses,

e) purchase or lease of immovable property according to need of the contracting authority,

f) procurement of medicine, vaccination, serum, antiserum, blood and blood products which are not economically stored due to their nature and necessity to use in a definite time interval or used in urgent cases, and medical consuming materials whose appliance can be decided during practice and peculiar to patient such as orthesis, prothesis, and procurement of consuming materials for test and analysis,

g) procurements of services from advocates having Turkish or foreign nationality or from advocacy partnerships in order to represent and defend the contracting authorities covered in the Law, in lawsuits with regard to disputes which proposed to be settled by international arbitration,

h) services procurements from Turkish or foreign nationality advocates pursuant to Articles 22 and 36 of Law No: 4353, dated 08.01.1943, and services procurements in order to register the intellectual and industrial properties by national and international institutions,

i) procurements of services by Turkish Labor Authority regarding its duties stated in the subparagraphs (b) and (c) of the third article of Law No: 4904, dated 25.06.2003; and also, its duties stated in the seventh subparagraph of article 48 of the Unemployment Insurance Law, numbered 4904, and dated 25.08.1999,

j) In cases where it is determined to renew the elections before the end of regular term, or to go to off year elections, or to hold a referendum on constitutional changes; procurement of watermarked voting paper and watermarked voting envelope paper and procurement of printing services by Supreme Election Board, and in case of local elections procurement of printing services of voting paper by the chairmanships of Provincial Election Boards.

Stages of public procurement processes can be summarized as in the following figure:

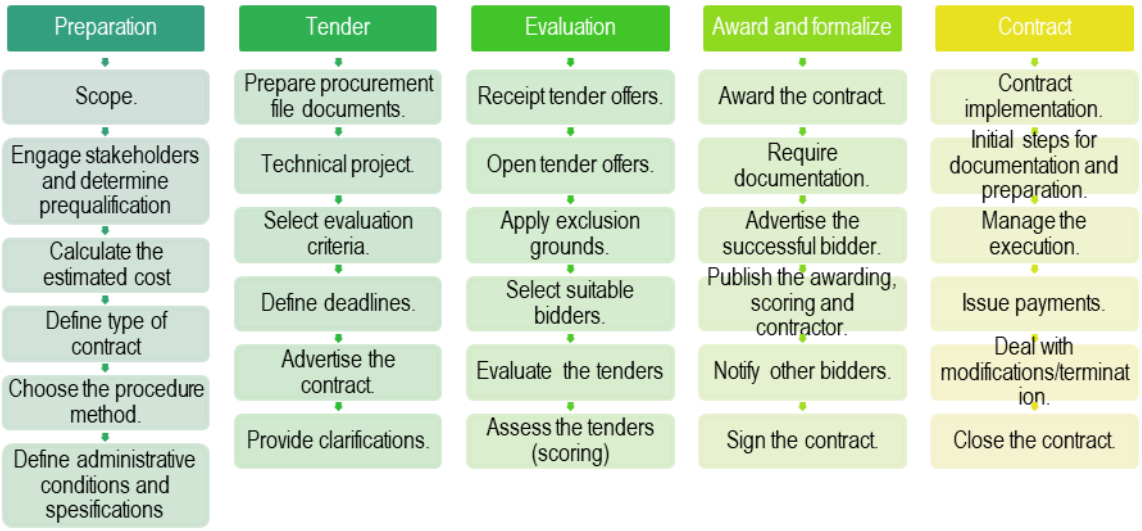

Figure 7-2: Stages of public procurement processes

This figure and its details will also be explained in D1.9 which will be delivered on December 2020.

The main procurement documents are technical project and administrative conditions. Technical project includes the technical implementation project and technical specification depending on the subject of the tender. The technical criteria for the goods, services and works to be procured shall be specified in the technical specifications, which constitute an integral part of the tender documents.

Preparation of administrative specifications, specifying all characteristics of the goods, services and works that constitute the subject matter of the procurement belongs to the administrations.

In the case of the grouping of NBSs to be tendered the criteria for division in lots can be summarized as in the following paragraph: The most important criteria in tender processes is not to divide procurement contracts in lots if not necessary. Although there are no criteria in the laws, it is the priority choice for the administration to complete the applications with minimum divisions. Because the division creates extra work and wasting time for the administration not only in tendering process but also in implementation process. However, seasonal conditions, the implementation and financial capacity of the contractors and the tender schedule are an important factor in dividing the procurement contract in lots.

Electronic Public Procurement Platform (ekap.kik.gov.tr) is the contracting platform where the bidding processes are published.

Description of the evaluation process is listed below:

- All documents required under the rules of participation in the procurement including the tender letter and the tender security shall be placed in an envelope.

- The tender letter shall be submitted in writing and signed. It is mandatory to indicate in the tender letter that the tender documents are fully read and accepted; the offered price is written clearly

- The tenders shall be submitted to the contracting authority no later than the date and hour specified in the tender documents

- The tenders shall be submitted to the contracting authority until the time stated for submission of tenders in the tender documents.

- Upon the request of tender commission, the contracting authority may ask the tenderers to clarify their tenders in writing on the unclear aspects of the tender

- The tender commission shall evaluate the tenders and shall determine those that are abnormally low compared to the other tenders or the estimated cost determined by the contracting authority.

- The tender commission shall evaluate the abnormally low tenders taking into consideration the written explanations documented on the following aspects:

a) economic nature of the manufacturing process, the services provided and the method of works,

b) selected technical solutions and advantageous conditions to be utilized by the tenderer in supply of the goods and services or fulfilment of the works,

c) the originality of the goods, services or civil works proposed.

In Izmir case the summary of the breakdown of the tender budget is as follows:

- Implementation budget (no VAT) – 90%

- Project design and drawing (include 18% VAT) – 5%

- Construction management (include 18% VAT) - 5%

- All additional expenses included in implementation budget. Such as general expenses, industrial benefit, quality control, health and safety coordination.

The challenges and barriers experienced during the tendering and implementation processes are listed below:

- Managing the project budget with variable exchange rate differences

- Difficulty in supplying imported products, especially during the pandemic process

- Working with different units within the municipality for different applications

- Contractor companies not having sufficient qualified technical staff and machinery

- Increase in manufacturing and inability to manage time due to unpredictable problems in the field

- Budget management is difficult due to extra manufacturing

- Budget management becomes difficult as both the municipal budget and the grant budget are spent on manufacturing

- Lack of expert technical personnel within the municipality for specific works

- The victimization experienced by the local people during the manufacturing process and their opposition to some practices, their complaints

The lessons learnt during the tendering and implementation processes are listed below:

- Learning the budget management along with the manufacturing process

- Coordination with different units within the municipality

- Ensuring project management by including the people living around the implementations in the project process

- Following the implementation of the drawn technical project in the field, determining the difficulties experienced

- The project, tender and construction process are processes that are not independent from each other, but must be considered together.

- Learning vegetative manufacturing and maintenance processes especially in vegetative landscape projects.

8 Effects of COVID-19

In case of implementations on sub demo B, during the peak times of COVID pandemic implementation progress has stopped for 4 months. For development of smart soil, procurement of proposed works is delayed. Tender units of public institutions were not in operation during the peak times of COVID pandemic (spring-2020).

The situation on sub demo B is summarized in following table.

Table 8-1: Effects of COVID-19 on sub demo B

PPP2 - Subdemo B		Implementation Status	Comments
Singular Green Infrastructure	Smart soil production in climate-smart urban farming precinct	not finished	Procurement of proposed works is underway. Tender units of public institutions were not in operation during the peak times of COVID epidemic.
	Development of Smart soil from mud plant	not finished	One equipment that needed to be import is not delivered to demo site due to Covid-19. Implementation will be completed with this equipment.
	Climate-smart Greenhouses	not finished	On-going implementation. Because of quarantine during covid-19 implementation stopped for 4 months.
Water Interventions	Grassed swales and Water Retention Ponds	not finished	On-going implementation. Because of quarantine during covid-19 implementation stopped for 4 months.

For Smart soil production in climate-smart urban farming precinct and Development of Smart soil from mud plant the purchase of the two devices and laboratory equipment required for the planned measurements in the project was delayed due to the production processes that slowed down due to the pandemic period. For this reason, field experiment for both Smart soil production in climate-smart urban farming precinct and Development of Smart soil from mud plant have not been initiated. Namely, the experiment could not be started due to the inability to provide the necessary analytical devices for the measurements to be planned on the soil surface and the chemicals and other laboratory equipment required for the analysis to be planned in the soil samples to be taken from the experimental area with the start of the experimental period.

Although we could not start the field experiments with the corn plant as a planned test plant, we made our preparations by changing the test plant to wheat due to climate conditions. In negotiations with importer companies, it is predicted that the supply of devices and laboratory equipment will reach the seed planting time of the wheat plant in Ege region. After this first

vegetation experiment, we will make preparations for a second vegetation according to the project completion deadline.

On Sub Demo C, deviations have occurred in case of IAc5, IAc8 and IAc12 because, plant species materials and equipment needed for implementation could not delivered on site due to COVID pandemic. This problem is solved and implementation will be finished in August 2020. Still, the monitoring studies could not start on time during spring and summer 2020. Monitoring started in September and 2 seasons will be enough for sub demo C.

In sub demo A there are no deviations caused by COVID-19 in implementations but the monitoring studies have been delayed due to quarantines. Assuming there are no quarantines we will take more portable measurements during winter and spring. 6 more months may be needed to cover 2 years of monitoring since the summer period is critical to monitor development in demo site.

9 Conclusion

This report includes the information of current status of each NBS. IAc4, installation of parklets, IAc14 green covering shelter for car parking areas, IAc15 green permeable pavement around car parking area, IAc16 green shady structures for car parking area, IAc3 Arboreal areas around Car Park Areas (Planting 26 trees around car park and parklets), IAc10 Smart Soil (Biochar) into green shady structures are the actions which has been completed in the demo sites of Izmir. Those completed actions has explained in detail in the report D4.6 Report on implementation progress in Izmir and within this report D4.6 is referred in related sections.

Implementation process of all actions on sub demo C has completed in September 2020. Implementation progress of these actions is explained under chapter 4. For the other NBSs the timetables showing the implementation plan in terms of dates can be found under subsections.

Tender processes of all of the interventions are completed. The details of tender process for all actions are given in chapter 7 of this report. It is possible to extend the content of the report with implementation details of whole actions after December 2020.

In the content of this report checklists are shared in the annex chapter (chapter 9). Control teams consist of a group of architects, civil engineers, landscape architects, electrical and mechanical engineers are following those checklists during the commissioning of interventions. Relation between checklists and interventions and also the content of the checklists is explained under each chapter related with sub demo areas.

10 Annex

PEYNİRCİOĞLU DERESİ VE ÇEVRE DÜZENLEMESİ YAPILMASI
İNŞAAT İŞ KALEMLERİ
(HİBE KAPSAMINDA OLAN İŞ KALEMLERİ)

SIRA NO	İŞ KALEMİNİN ADI	ÖLÇÜ BİRİM
I.094	DERE BETONUNUN KESİLMESİ VE KALDIRILMASI	M
I.095	EĞİMLİ YEŞİLLENEBİLİR TOPRAK DESTEK ÜNİTESİ TEMİNİ VE KURULUMU	M2
I.096	BİTKİSEL TOPRAK TEMİNİ VE SERİLMESİ	M3
I.097	HYDROSEEDING YAPILMASI	M2
I.098	DİKİM HARCI TEMİNİ, TAŞINMASI VE SERİLMESİ	M3
I.099	KORKULUK YAPILMASI	M
I.100	GEÇİRİMLİ SAHA BETONU YAPILMASI	M3
I.101	KLİNKER IRMIK DÖŞEME TEMİNİ VE SERİLMESİ	M2
I.102	POLİNATÖR EVİ TEMİNİ VE MONTAJI	AD
I.103	HAZIR RULO ÇİM TEMİNİ	M2
I.104	HAZIR RULO ÇİMİN SERİLMESİ, SILINDIR ÇEKİLMESİ VE CAN SUYU VERİLMESİ	M2
I.105	HEREK TEMİNİ VE UYGULANMASI	AD
I.106	AĞAÇ DİKİMİ İÇİN ÇUKUR AÇILMASI, BİTKİNİN TAŞINMASI, DİKİLMESİ, CANSUYU VERİLMESİ	AD
I.107	ÇALI DİKİMİ İÇİN ÇUKUR AÇILMASI, BİTKİNİN TAŞINMASI, DİKİLMESİ, CANSUYU VERİLMESİ	AD
I.108	YER ÖRTÜCÜ VE SARILICI DİKİMİ İÇİN ÇUKUR AÇILMASI, BİTKİNİN TAŞINMASI, DİKİLMESİ, CANSUYU VERİLMESİ	AD
I.109	GÜMÜŞİ AKASYA TEMİNİ	AD
I.110	YABANİ BADEM TEMİNİ	AD
I.111	KOCA YEMİŞ TEMİNİ	AD
I.112	ÇİTLENBİK TEMİNİ	AD
I.113	ERGUVAN TEMİNİ	AD
I.114	KEÇİBOYNUZU TEMİNİ	AD
I.115	TURUNÇ TEMİNİ	AD
I.116	PORTAKAL TEMİNİ	AD
I.117	AT DİKENİ TEMİNİ	AD
I.118	ARİZONA SELVİSİ TEMİNİ	AD
I.119	PİRAMİT SELVİ TEMİNİ	AD
I.120	IĞDE TEMİNİ	AD
I.121	OYA AĞACI TEMİNİ	AD
I.122	ANADOLU SIĞLASI TEMİNİ	AD
I.123	TERS BEYAZ DUT TEMİNİ	AD
I.124	KARA DUT TEMİNİ	AD
I.125	ZEYTİN TEMİNİ	AD
I.126	FISTIK ÇAMI TEMİNİ	AD
I.127	SAKIZ AĞACI TEMİNİ	AD
I.128	DOĞU ÇINARI TEMİNİ	AD
I.129	AKKAVAK TEMİNİ	AD

Figure 10-1: Checklist of implementations and supplied materials followed during commissioning of interventions around Peynircioğlu stream

L130	TITREK KAVAK TEMINI	AD
L131	MEŞE TEMINI	AD
L132	MANTAR MEŞESI TEMINI	AD
L133	AK SÖĞÜT TEMINI	AD
L134	KEÇI SÖĞÜDÜ TEMINI	AD
L135	ILGIN (TETRANDA) TEMINI	AD
L136	ILGIN (SMYRINENSIS) TEMINI	AD
L137	GÜMÜşI IHLAMUR TEMINI	AD
L138	ABELYA TEMINI	AD
L139	NIL ZAMBAĞI TEMINI	AD
L140	HOROZ IBIĞI TEMINI	AD
L141	ATRIPLEX TEMINI	AD
L142	MELEK BORUSU TEMINI	AD
L143	KELEBEK ÇALISI TEMINI	AD
L144	FIRÇA ÇALISI TEMINI	AD
L145	KANA ÇIÇEĞI TEMINI	AD
L146	LADEN TEMINI	AD
L147	KISMET AĞACI TEMINI	AD
L148	KIZILCIK TEMINI	AD
L149	DODENYA TEMINI	AD
L150	FUNDA TEMINI	AD
L151	ALTIN ÇANAK TEMINI	AD
L152	GAURA TEMINI	AD
L153	GREVILYA ÇALISI TEMINI	AD
L154	SARI KANTARION TEMINI	AD
L155	KINDIRA TEMINI	AD
L156	GERÇEK YASEMIN TEMINI	AD
L157	HASIR OTU TEMINI	AD
L158	LAVANTA (ANGUSTIFOLIA) TEMINI	AD
L159	LAVANTA (STOECHAS) TEMINI	AD
L160	LAVANTA (DENTATA) TEMINI	AD
L161	LONISERA TEMINI	AD
L162	PEMBE SAZ TEMINI	AD
L163	MERSIN TEMINI	AD
L164	ZAKKUM TEMINI	AD
L165	PENNISETUM TEMINI	AD
L166	KIRMIZI PENNISETUM TEMINI	AD
L167	FILBAHRI TEMINI	AD
L168	PITOS TEMINI	AD
L169	MAVI YASEMIN TEMINI	AD
L170	KUşDILI TEMINI	AD
L171	YAYILICI KUşDILI TEMINI	AD
L172	DERICI SUMAĞI TEMINI	AD
L173	ADAÇAYI TEMINI	AD
L174	LAVANTIN TEMINI	AD

Figure 10-2: Continuation of Figure 8.1

L175	KEÇİ SAKALI TEMİNİ	AD
L176	LEYLAK TEMİNİ	AD
L177	ZEYTİN ÇALISI TEMİNİ	AD
L178	KARTOPU TEMİNİ	AD
L179	HAYIT TEMİNİ	AD
L180	BUZ ÇİÇEĞİ TEMİNİ	AD
L181	FELİSYA TEMİNİ	AD
L182	GAZANYA TEMİNİ	AD
L183	MEZEM TEMİNİ	AD
L184	OSMANLI ÇİMİ TEMİNİ	AD
L185	RUSCHIA TEMİNİ	AD
L186	SEDUM (ACRE) TEMİNİ	AD
L187	SEDUM (PALLIDUM VAR. BITHYNICUM) TEMİNİ	AD
L188	SEDUM (REFLEXUM) TEMİNİ	AD
L189	THYMUS SP TEMİNİ	AD
L190	MENEKŞE TEMİNİ	AD
L191	BEGONVİL TEMİNİ	AD
L192	ORMAN SARMAŞIĞI TEMİNİ	AD
L193	MUM YASEMİN TEMİNİ	AD
L194	BÖĞÜRTLEN TEMİNİ	AD
L195	ASMA TEMİNİ	AD

Figure 10-3: Continuation of Figure 8.1 and Figure 8.2

İŞ KALEMLERİ

İşin Adı: KARŞIYAKA GİRNE CADDESİ PARKLET YAPILMASI

İnşaat

Sıra No	Poz No	Tanımı	Birim
1	İ.001	HAFRİYAT YAPILMASI	M3
2	İ.002	IROKO AHŞAP PERGOLE YAPILMASI	M3
3	İ.003	TUVENAN DOLGU YAPILMASI	M3
4	İ.004	AKRİLİK KATI YÜZEY KAPLAMA YAPILMASI	M2
5	İ.005	BİTKİLERİN TEMİNİ VE DİKİLMESİ	TK
6	İ.006	BİTKİSEL TOPRAK TEMİNİ VE SERİLMESİ	M3
7	İ.007	PEYZAJ ÇURUFU TEMİNİ VE SERİLMESİ	M3
8	İ.008	DEMİR İMALATIN SICAK DALDIRMA GALVANİZ YAPILMASI	KG
9	İ.009	KUM TEMİN EDİLEREK, EL İLE SERME, SULAMA VE SIKIŞTIRMA YAPILMASI	M3
10	İ.010	BETON SANTRALİNDE ÜRETİLEN VEYA SATIN ALINAN VE BETON POMPASIYLA BASILAN, C 20/25 BASINÇ DAYANIM SINIFINDA BETON DÖKÜLMESİ (BETON NAKLİ DAHİL)	M3
11	İ.011	250 GR/M² AĞIRLIKTA GEOTEKSTİL KEÇE SERİLMESİ	M2
12	İ.012	HDPE ESASLI DRENAJ VE KORUMA LEVHASI TEMİNİ VE YERİNE DÖŞENMESİ	M2
13	İ.013	IROKO AHŞAP CEPHE VE ZEMİN KAPLAMA YAPILMASI	M2
14	İ.014	LAMA VE PROFİL DEMİRLERDEN ÇEŞİTLİ DEMİR İŞLERİ YAPILMASI VE YERİNE KONULMASI	KG

Figure 10-4: Checklist of implementation and supplied materials followed during commissioning of Parklets

SASALI DOĞAL YAŞAM PARKI VE İZMİR VİLAYETLER EVİNDE YEŞİL ÇATILI OTOPARK YAPILMASI

İNŞAAT İŞ KALEMLERİ

POZ NO	YAPILAN İŞİN CİNSİ
1	İNŞAAT İŞLERİ
1.1	Bordür sökülmesi
1.2	Her türlü asfalt veya beton yol kesilmesi
1.3	Kırmataş şose ve asfalt sökülmesi
1.4	Hafriyat yapılması
1.5	Tuvenan dolgu yapılması
1.6	Ahşaptan düz yüzeyli beton ve betonarme kalıbı yapılması
1.7	Ø 8- Ø 12 mm nervürlü beton çelik çubuğu, çubukların kesilmesi, bükülmesi ve yerine konulması
1.8	Ø 14- Ø 28 mm nervürlü beton çelik çubuğu, çubukların kesilmesi, bükülmesi veyerine konulması
1.9	Beton santralinde üretilen veya satın alınan ve beton pompasıyla basılan, C 16/20basınç dayanım sınıfında beton dökülmesi (beton nakli dahil)
1.10	Beton santralinde üretilen veya satın alınan ve beton pompasıyla basılan, C 25/30basınç dayanım sınıfında beton dökülmesi (beton nakli dahil
1.11	Beton santralinde üretilen veya satın alınan ve beton pompasıyla basılan, C 30/37basınç dayanım sınıfında beton dökülmesi (beton nakli dahil)
1.12	Elenmiş çakıllı malzeme ile altlemel yapılması
1.13	Her kategorde granülometrik kum-çakıllı titreşimli silindirle sıkıştırılarak hendek vetemel taban ıslatı ve boru tabanı yataklanması yapılması
1.14	Şilte malzemesi hazırlanması
1.15	Elenmiş çakıldan konkasörle kırılmış ve elenmiş 19 mm (3/4") ve 12.5 (1'2") mm likagrega hazırlanması
1.16	El ile serme
1.17	Geçirimli beton yapılması
1.18	Hücresel dolgu sistemi yapılması
1.19	Geotekstil filtre uygulaması yapılması
1.20	Doğal granitparke taşı (10*10 cm) ile döşeme kaplaması yapılması
1.21	ÇEŞİTLİ DEMİR İŞLERİ YAPILMASI VE YERİNE KONULMASI
1.22	Demir borudan bariyer yapılması
1.23	Her çeşit profil, çelik çubuk ve çelik saçlara karkas, (çerçeve) inşaat yapılması, yerinetespiti
1.24	Demir yüzeylere iki kat antipas, iki kat sentetik boya yapılması
	İnşaat İşleri Toplamı

Figure 10-5: Checklist of implementations and supplied materials followed during commissioning of interventions on Sub Demo A except Parklets

SASALI İKLİM DUYARLI TARIM EĞİTİM VE ARAŞTIRMA ENSTİTÜSÜ YAPILMASI İŞİ
BİTKİSEL PEYZAJ İŞLERİ İŞ KALEMLERİ
(HİBE KAPSAMINDA)

SIRA NO	İŞ KALEMİNİN ADI	ÖLÇÜ BİRİMİ
B.001	Ceratonia siliqua (H: 250-300/ Tige min 150; Ø14-18 cm) Temini	ad
B.002	Elaeagnus angustifolia (H:500-600 cm Tige min 200; Ø14-18 cm) Temini	ad
B.003	Olea europaea (H: 150 cm) Temini	ad
B.004	Cupressus sempervirens (H: 500-600 cm ; Ø18-26 cm) Temini	ad
B.005	Salix babylonica (H: 500-600 cm ; Ø18-26 cm) Temini	ad
B.006	Tilia argentea (H: 450-500/ Tige min 250 ; Ø18-26 cm) Temini	ad
B.007	Abelia x grandiflora (H: 40-50 cm ; CLT 10) Temini	ad
B.008	Berberis thunbergii (H: 50-60 cm ; CLT 10) Temini	ad
B.009	Buddleja davidii (H: 60-80 cm ; CLT 20) Temini	ad
B.010	Callistemon leavis (H: 40-60 cm ; CLT 10) Temini	ad
B.011	Forsythia x intermedia (H: 100-120cm ; CLT 3) Temini	ad
B.012	Juniperus sabina (H: 40-60 ; CLT 5) Temini	ad
B.013	Myrtus communis (H: 40-60 ; CLT 10) Temini	ad
B.014	Nerium oleander (H: 40-60 ; CLT 10) Temini	ad
B.015	Pittosporum tobira Nana (H: 30-40 ; CLT 10) Temini	ad
B.016	Rosmarinus officinalis (H: 20-30 ; CLT 3) Temini	ad
B.017	Vitex agnus-castus (H: 60-80 ; CLT 10) Temini	ad
B.018	Festuca rubra (H: 15-20 ; CLT 3) Temini	ad
B.019	Gazania rigens 'Sun gold' (H: 15-20 ; CLT 3) Temini	ad
B.020	Lavandula angustifolia (H: 20-30 ; CLT 3) Temini	ad
B.021	Lavandula stoechas (H: 20-30 ; CLT 3) Temini	ad
B.022	Pennisetum setaceum Rubrum (H: 40-60 ; CLT 10) Temini	ad
B.023	Stipa tenuissima (H: 20-30 ; CLT 3) Temini	ad
B.024	Jasminum officinale (H: 120-150 ; CLT 4) Temini	ad
B.025	Lonicera etrusca (H: 120-150 ; CLT 4) Temini	ad
B.026	Cydonia vulgaris (H: 150-175 cm) Temini	ad
B.027	Punica granatum (H: 175-200 cm) Temini	ad
B.028	Zea mays L. (10-15 kg) Temini	paket
B.029	Lagerstroemia indica (H: 350-400/Tige min 200 cm ; Ø14-18 cm) Temini	ad
B.030	Arbutus unedo 'Compacta' (H: 60-80 cm ; CLT 10) Temini	ad
B.031	Spiraea x vanhouttei (H: 80-100 cm ; CLT 10) Temini	ad
B.032	Salix caprea (H: 80-100 cm ; CLT 10) Temini	ad
B.033	Acorus calamus (H: 20-30 cm ; CLT 3) Temini	ad
B.034	Leymus arenarius L. (H: 40-60 cm ; CLT 7) Temini	ad
B.035	Juncus effusus 'Spiralis' (H: 15-20 cm ; CLT 5) Temini	ad
B.036	Perovskia atriplicifolia (H: 20-30 cm ; CLT 3) Temini	ad
B.037	Çayır I Karışımı Püskürtme Yöntemi İle Tohum Temini Ve Ekimi (Hydroseeding)	ad
B.038	Çayır II Karışımı Püskürtme Yöntemi İle Tohum Temini Ve Ekimi (Hydroseeding)	m2
B.039	Dikim Harcı Temini	m2
B.040	Nebati Toprak Temini Ve Serilmesi (30 cm)	m3
B.041	Özel Toprak Karışımı Temini Ve Serilmesi (10 cm)	m3
B.042	Biochar Toprak Temini Ve Serilmesi	m3
B.043	Çam Kabuğu Temini Ve Serilmesi (5 cm)	kg
B.044	Cüruf Temini Ve Serilmesi (5 cm)	m3
B.045	Bitkilere Herekleme Yapılması	m3
B.046	Yüksek Sıra Dikim Tarım Alanı Oluşturulması (150X1500X70 cm)	ad
B.047	Bioswale Zemin Üzeri (5 cm) Malç Serilmesi	ad
B.048	Bioswale Toprak Temini Ve Serilmesi	m3
B.049	Her cins toprağın sulanması ve sıkıştırılması	m3
B.050	Yumuşak topraklarda 30 cm çapında 30 cm derinliğinde el ile fidan çukurunun açılması	m3 ad

SIRA NO	İŞ KALEMİNİN ADI	ÖLÇÜ BİRİMİ
B.051	Yumuşak topraklarda 60 cm.çapında 80 cm derinliğinde el ile fidan çukuru açılması	ad
B.052	60 cm çap ve 80 cm derinlikteki çukurlara ibreli ve yapraklı fidanların kaplı dikimi	ad
B.053	30 cm çap ve 30 cm derinlikteki çukurlara sarılıcı ve örtücü fidanların dikimi	ad
B.054	32mm'ye kadar kırmataş temin edilerek, makine ile serme, sulama ve sıkıştırma yapılması	m3

Figure 10-6: Checklist of implementations and supplied materials followed during commissioning of interventions on Sub Demo B