RECONSTRUCTION OF KING TOMISLAV SQUARE, PULA, CROATIA

Region	**Europe and Central Asia**
Award Scheme	**Dubai International Award**
Start Year	**2017**
Sustainable Development Goals	**Goal 11 - Make cities and human settlements inclusive, safe, resilient and sustainable**

Summary

Reconstruction of King Tomislav Square in Pula Croatia was awarded competition project for the reconstruction of the the neglected square fom 2013. After the public tender was conducted and the contract was awarded to designers from STUDIO BF (Zagreb) and from STARUM (Pula) Relevant area was a derelict dusty surface used as an unregulated parking lot whose entire surface would be flooded during short-duration heavy rainfall.

Background and Objective

Relevant area was a derelict dusty surface used as an unregulated parking lot whose entire surface would be flooded during short-duration heavy rainfall. A combined sewage collection system of 80/1200 mm in diameter passes through the square and represents the main sewage system of a catch basin area for a large part of the town. Part of the surface was inaccessible and neglected for the last 50 years.

Actions and Implementation

The project commenced with a public tender for refurbishment of the square, construction of a new building for the market and the community centre, and large infrastructural interventions required to solve the problem of rainfall drainage for that part of the town of Pula. After the public tender was conducted and the contract was awarded to designers from STUDIO BF (Zagreb) and from STARUM (Pula), the square and the buildings were designed. However, after the town's financial reprogramming, construction of buildings was abandoned during this phase, while the designs for the square and its complete infrastructure were elaborated and modified. Upon agreeing on design requirements with all the town's municipal companies, designs were drawn up for all the installations, the final plane of the square, urban equipment and horticulture. A mathematical model of the system was drawn up, the manner in which the rainfall would be kept in retentions (underground or above-ground) was determined, as well as the critical rainfall for the designed system. Surfaces intended for retention were selected and additional retentions were constructed underground. Through architectural and landscape designs, the retentions were implemented into the area, forming a uniform and integral unit. Surface retention was dealt with by constructing rain gardens in which indigenous plants and over 70 new trees were planted, and additional retentions were constructed underground. The largest retention – the rain garden, is part of the square designed as a park with a children's playground. The system functions in such a manner that one part of the purified water is infiltrated into the subsoil and one part is discharged into the existing collection system, but only after the precipitation stops and for a period lasting a maximum of 24 hours. Additional safety is provided through the volume planned for water retention in case of rainfall lasting longer than 24 hours and the whole system has to be drained in the period of 48 hours. Connecting secondary sanitary collection systems of the neighbouring buildings was carried out through the existing shafts of the collection system, and the connection was executed by means of tangential shafts in order to avoid the occurrence of unpleasant odours and to prevent them from spreading by means of additional aeration. Project was realised from September 2016 to 15 July 2017.

Outcomes and Impacts

Architectural solutions and the selection of construction materials from local sources resulted in savings that made this project financially viable and decreased the negative impact of dust pollution from undeveloped surfaces. Except for improving drainage, rain gardens provide for a greater percentage of green surfaces and shade, which will, after a certain period of time, provide better conditions during summer months. The solution for lighting on the square is one with minimal lighting pollution. Through the application of WSUD (water sensitive urban design) principles, we eliminated flooding of the square and saved a significant amount of money compared to the cost of the usual sewage system for which it would have been necessary to sectionalize the entire combined system and reconstruct the existing collection system. We also decreased CO2 emission by planting more than 70 new trees. Temperature differences, which are constantly increasing in the town of Pula due to climate changes, were also reduced and the entire system functions

per the principle of sustainable drainage “slow the flow” as opposed to the former principle of “as soon as possible into the sea”. The system also takes into consideration the infiltration that the existing soil can endure and the flow that does not interfere with the hydraulics of the existing collection system.

Gender and Social Inclusivity

Problem areas with undeveloped parts, which are socially atomized and, therefore, passively transformed into slums, form a part of every city in the world. Prior to implementing these types of projects, it is necessary to consider all the elements that define the problem (local conditions, environmental and climate studies) and, along with the planned investments, choose a concept that is sustainable for the local environment. The system can be applied in all types of climates by reducing the number of required pipelines that do not function in the dry season and are overloaded in the rainy season. It can also be applied in any place where a constructed combined sewage collection system already exists and where it is not cost-effective to carry out system sectionalisation for economic reasons

Innovative Initiative

All parts of urban city area need to be included in strategic consideration that does not represent only shallow refurbishment which just ensures improved urban standard. Capacities of such large surfaces in relatively small towns represent risky projects that require strong social integration in planning, designing and implementation. With that in place, along with patient cooperation with the city’s administration and the citizens and the use of realistic technologies, working on a project and satisfaction stemming from its results become truly meaningful. Limitations of city life are compounded by aging infrastructure, combined sewer overflows and concerns for climate change, but by using WSUD principles we achieved a representative place for all the citizens. Citizens showed unbelievable interest in all the technical aspects of new modern drainage methods. For a project of refurbishment of urban areas, such as this one, planning stage requires extra time. It is necessary to include the management in the process of defining the terms of reference, so that they can, at any time, evaluate the investment value and manage the project itself. City municipal services do not have enough man-power for these types of projects and they, as well as the designers, should be given the role of communicators with the citizens.

Resources devoted to delivery

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Conclusion

Basis for design was Stormwater drainage – Conceptual design – Town of Pula, and it has been created by applying multi-criteria analysis with integral approach and by superimposing all the results. King Tomislav Square is part of Vidikovac-Stoja watershed. In the conceptual design of the town of Pula, the drainage system with potential green surfaces with the purpose of drainage and purification through the main and secondary drainage net of stormwater, each watershed of the precipitation sewage has been marked with different priorities and problem areas. One of such problem areas was King Tomislav Square. Switch case study – Managing the water for the City of the future, UNESCO – 2011. General urban plan of the town of Pula. All valid acts that regulate construction and physical planning in the Republic of Croatia.