

REGENERATING THE HISTORIC CEBUANO'S STREET: COUNTERING URBAN HEAT ISLAND (UHI) EFFECT IN COLON STREET, CEBU CITY THROUGH GREEN INFRASTRUCTURE APPROACH



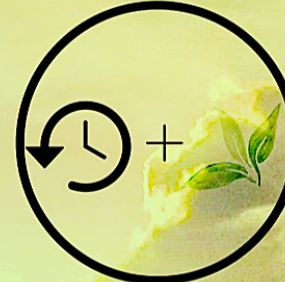
ABSTRACT

An urban heat island (UHI) is a human-caused urban or metropolitan area that is significantly warmer than its surrounding rural area. There are numerous causes for this phenomenon. For example, when houses, shops, and industrial buildings are built close together, they can contribute to the urban heat island effect due to building materials that are good at insulating or holding in heat, making the areas around the buildings warmer. Waste heat contributes to UHI as well, such as cars and factories that are constantly consuming energy daily. Furthermore, if a city has a dense population, their activities contribute significantly to a lot of heat. This study focuses on "Regenerating the Historic Cebuano's Street: Countering Urban Heat Island (UHI) Effect in Colon Street, Cebu City through Green Infrastructure Approach". Here we show the assumption that this greening of city streetscapes, specifically through the integration of green infrastructure design in Colon Street, must necessarily lead to positive environmental effects. With the landscape design intervention such as curbside gardens, green walls, green canopy, reflective pavement, and urban tree species along Colon Street it will further help on the urban heat island effect that is experienced in the street. Through this type of solution, the health and well-being of the Cebuano will be taken care of and significantly it will counter the UHI effect that is present in Colon Street. Because of the research outcome it helps to understand that green infrastructure can help in reducing day and nighttime temperature, also helping in cleansing the accumulating air pollution.

DESIGN CONCEPT



FORM COMPOSITION



MODERN ARCHITECTURE



THEORETICAL FRAMEWORK



SITE ANALYSIS

SITE LOCATION AND BACKGROUND

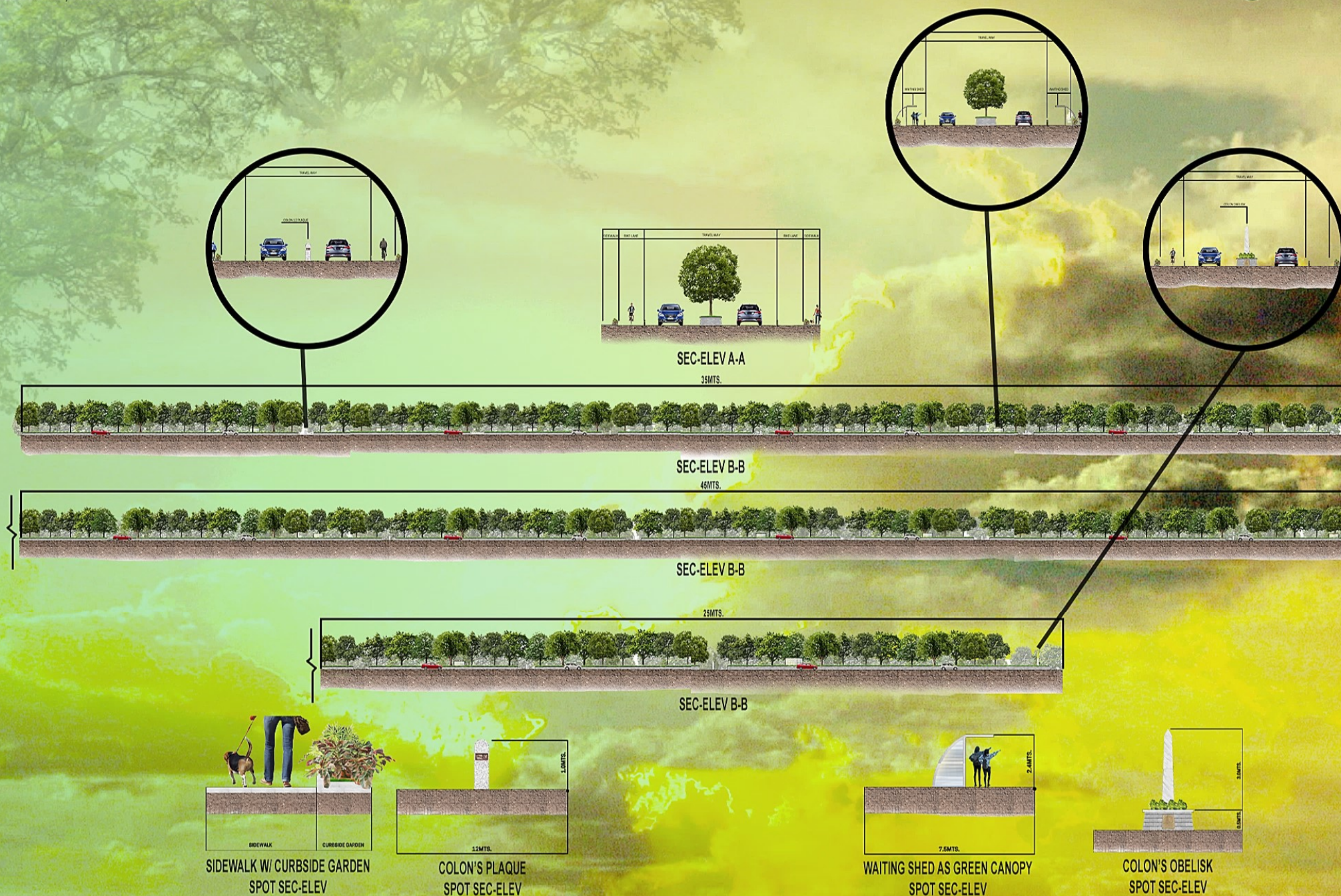
Colon street is an historical street in downtown Cebu City that is often called the oldest and the shortest national road in the Philippines. It can be located in Brgy. Kalubihan and from its humble beginnings, at present, it is now established

FUNCTIONAL DIAGRAM

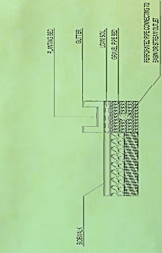
The site has different design elements and the diagram provided shows the relationship of these spaces. There are seven elements in the site and the one with black circle shows the primary adjacency or the accessibility



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CURBSIDE GARDEN

It is one of the design strategies proposed to address the UHI effect of the site and it is placed along with the sidewalk. It acts as a rain garden where it is planted with different vegetation that helps in heat absorption, also it contributes, if any to the stormwater runoff experience in the site. Most of the studies indicated that applying shrubs results in moderate temperature reduction.

GREEN WALL

A vertical garden that is placed on the walls that can be located along the streets. It contributes to lessen the heat temperature felt in the site by giving a cooling effect in the street, create a cooler microclimate, improve local air quality, and allow plants to grow in places that would not normally support vegetation.

GREEN CANOPY

This kind of design intervention is proposed along with the waiting shed that is added in Colon Street because at present it does not provide its users proper shading and unloading area. It gives new design and adds in mitigating UHI effect experienced in Colon Street by the shade in the site. Lowering the temperature, which reduces the cooling demand of buildings in the summer, contributing to improved air quality, and lowering storm water runoff.

REFLECTIVE PAVEMENT

This is a design intervention that is focused on the travel way of Colon Street. It is accomplished using resurfacing techniques or the application of white pavement or to traditional road materials. Furthermore, global case studies have shown that a cool pavement strategy can reduce micro-level UHI while increasing thermal comfort. Materials can save cooling energy use by directly reducing the heat gained through a building's envelope (direct effect) and also by lowering the urban air temperature in the neighborhood of the building (indirect effect).

URBAN TREE SPECIES

These are tree species that have a significant effect on the cooling of the site. According to study, the canopy composition and vertical structure have a significant relationship with lowering the surface temperature of daytime and nighttime. Through evapotranspiration, trees release vapor to the atmosphere and thus increase relative humidity, decreasing temperature and eventually improve the thermal comfort condition. It was found that large crown and dense canopy trees can effectively reduce the mean radiant temperature (MRT), which will eventually improve thermal comfort condition.

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SPOT PERSPECTIVE



AERIAL PERSPECTIVE