

URBAN FURNITURE, DESIGN, AND COST PRODUCTION PRINCIPLES USING CAD DEVELOPMENT TOOLS

MOBILIERUL URBAN, PRINCIPII DE PROIECTARE ȘI ESTIMARE A COSTURILOR DE PRODUCȚIE FOLOSIND TEHNICI C.A.D.

SINGUREANU V.¹, DUMITRAȘ Adelina¹, POP Păunița¹, MOLDOVAN G.¹

e-mail: singvalentin@yahoo.com

Abstract. *Urban furniture viewed as landscape design constitutive element occupies nowadays an increasing prevalent position in systematization and designing principles of urban areas. Used materials and its multifunctionality become pronounced with the advent of economic crisis, when cheap and sustainable solutions represent key factors. The proposed materials for the construction of the urban furniture consisted in imprinted concrete with wood inserts. Urban design models were made with the assistance of SketchUp software. 2D and 2.5D projections were obtained using CorelDraw software. Estimating technical materials, surface and volume calculation was performed using SketchUp. Additional lighting to conceived furniture was done by ArtlantisStudio 3 renderings.*

Key words: trellises, bench, trash can, modularity, C.A.D.

Rezumat. *Mobilierul urban privit ca și element constitutiv al peisajului urban, ocupă în zilele noastre o poziție din ce în ce mai predominantă în activitatea de sistematizare și amenajare a mediului ambiant. Materialele folosite în construcția acestuia și multifuncționalitatea sa devin mai pregnante odată cu apariția crizei economice, când soluțiile ieftine și durabile reprezintă cheia succesului. Materialele folosite în construcția mobilierului propus au la bază tehnica betonului amprentat cu inserții de lemn. Proiectarea pieselor de mobilier urban a fost executată cu ajutorul programului SketchUP, proiectile 2D și 2,5D au fost executate cu ajutorul programului CorelDraw. Devizul tehnic al materialelor folosite, calculul de suprafață și volum a fost realizat cu ajutorul programului Sketchup. Iluminatul suplimentar al mobilierului creat s-a realizat prin randări în programul ArtlantisStudio 3.*

Cuvinte cheie: jardinieră, bancă, coș de gunoi, modularitate, C.A.D.

INTRODUCTION

The proposed urban furniture was created with the guidance of SketchUp software in direct compatibility with CorelDraw and ArtlantisStudio 3 through dwg extension files. 3D projection of the urban furniture was made using push/pull 3D modeling tool in SketchUp. The proposed urban furniture was improved by the author inserting led spot lights oriented downwards. The ornamental value of the urban furniture will be extended through nighttime assuring functionality and esthetic value 24h/day.

MATERIAL AND METHOD

The proposed urban furniture was imported from the general knowned 3D library 3D Warehouse. The general principles in choosing this kind of urban furniture

¹ University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania

consisted in reaching multifunctionality aspects (rest place and plant trellis) considering their implementation in possible pedestrian areas or squares (fig. 1 - a).

The second stage of design development consisted in verifying that all faces of the object are correct represented using monochrome visualization (fig. 1 - b). As showed in figure 1 all faces of the proposed urban furniture must be colored white facing the user point of view. Blue faces must be reversed because they represent the backside of the 3D object (Rogers et. al., 1988). After this stage, all faces are in correct order and further more improvements can be made. As seen in figure 2, the final projection of the urban furniture is improved with led spotlight oriented downwards, assuring the so called „butterfly effect” during nighttime (Bernatzky, 1975). For assuring the light diffusion properly, we applied translucent properties to some materials as seen in figure 2. After these procedures, the glazing effect will be pregnant and realistic in final render projections.

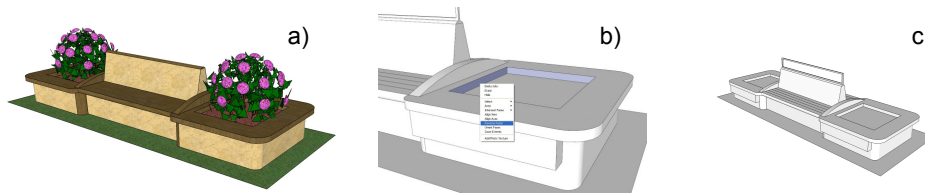


Fig. 1 - Original imported bench from 3D Warehouse (a), it's reverse face order (b) and final monochrome view (c)

Because its suggestive implementation to different pedestrian roads or squares, in the middle of the bench we propose the construction of a frame for different adverts exhibition.

Area and distance measurements where made using SketchUP dimensioning tools (Tape measure - Entity info - Dimension).

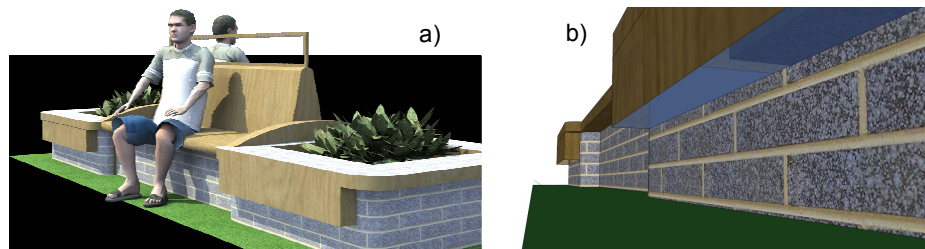


Fig. 2 - Final rendering of the proposed urban furniture (a), spot light translucent option for better glazing effect and light diffusion (b)

The standard edition of SketchUP software assures free of charge plug-ins such as sandbox or estimating cost tool. Considered in development stages, the estimating cost tool assures expenses defalcation by type of material used in projecting the model.

In most of the cases this tool is accurate, but where we confound with complex poly objects the final solutions stays in adding all the surfaces in a excel work sheet using entity info tool (Paquet et. al., 2010).

For comprehensive understanding, we propose the rendering projection of the skp file in ArtlantisStudio 3 where we can observe the proposed light effect (fig. 4).

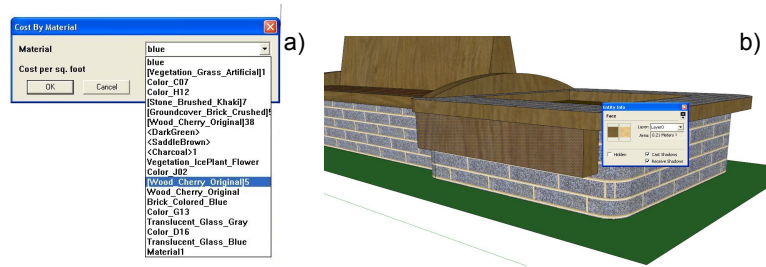


Fig. 3 - Cost estimation tool by type of used material (a) entity info tool for manual cost estimation (b)



Fig. 4 - Final rendering and implementation of the proposed urban furniture during nighttime in ArtlantisStudio 3

RESULTS AND DISCUSSIONS

After its render in ArtlantisStudio 3, the bench can be saved in the library of the software as individual entity (aof extension file) used for decorative purposes in different designs as showed in figure 4. The same 3D projection can be exported as dwg extension file and imported in different software's (for example CorelDraw) where are automatically projected to 2D and 2.5D (fig. 5).

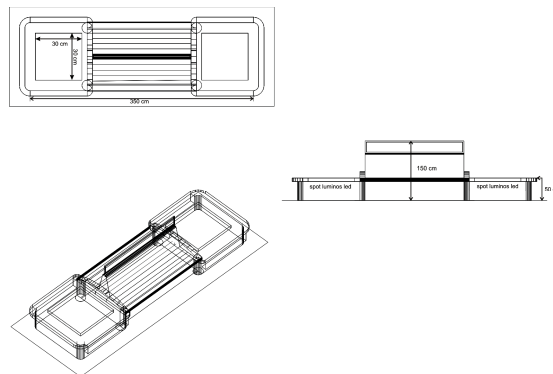


Fig. 5 - 2D and 2.5D projection of the proposed urban furniture in CorelDraw X3

The light insertion spots where induced in ArtlantisStudio 3 (fig. 6). In this software, we can establish the exact amount of needed spot lights their used power in watts and light diffusion cone.

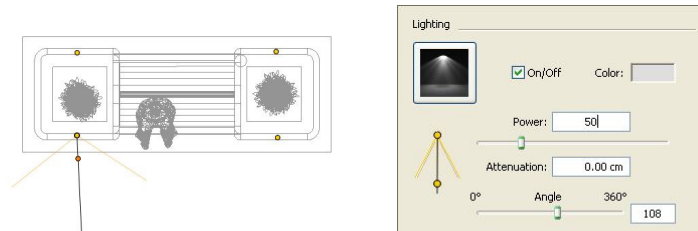


Fig. 6 - Spot light characteristics in ArtlantisStudio 3 and their parameters

CONCLUSIONS

1. Improvement of 3D models from the general knowned library 3D Warehouse consisted one of the key aspects treated in the present paper. Regarding the aspect the urban furniture was improved with led spotlights and frames for different announces and exhibition works.

2. Cost calculation tool are presented from their efficiency point of view, insisting upon the fact that entity info tool and excel work sheet represent technical solutions for manually calculating these aspects where cost efficiency plug-in does not do this job.

3. The final render of the proposed 3D object in ArtlantisStudio 3 will show how the lights spots are projected and how will work during nighttime. For assuring this light transition target materials must be translucent for optimum light distribution.

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