Green University of Bangladesh

Department of Computer Science and Engineering (CSE)
Semester: (Spring, Year: 2023), B.Sc. in CSE (Day)

3D Bridge Modeling(Padma Bridge)

Course Title: Engineering Drawing
Course Code: CSE-208
Section: DC

Students Details

Name	ID
Md. Sohanur Rahman	213902106

Submission Date: 6 May 2023
Course Teacher's Name: Rusmita Halim Chaity

[For teachers use only: Don't write anything inside this box]

Lab Project Status	
Marks:	**Signature:**
Comments:	**Date:**

Contents

Chapter 1

Introduction

1.1 Overview

The goal of this methodology is to provide the AutoCAD user with practical guidance and a how-to in modelling a structure, such as a bridge, which has complex 3D geometry. Often the design of highways complicates bridge geometry when a road alignment has both horizontal and vertical curves. This is accentuated when trying to model a box girder for example, in 3D, with a road alignment containing both horizontal and vertical curves.

1.2 Motivation

A 3D bridge modeling project is a computer-generated visualization of a location or object, created by using advanced 3D modeling. The motivation behind a 3D bridge modeling project can vary depending on the specific application, but some common reasons for undertaking such a project include:

1. Marketing and Advertising: It can be used to showcase a property, development, or location to potential customers or investors. This can be particularly useful in the real estate and tourism industries, where customers may be looking for a visual representation of a property or destination.

2. Urban Planning and Architecture: It is very important for urban planning and architecture.It can be used to visualize the impact of proposed development projects on the surrounding environment. This can be useful for urban planning, as it allows planners to see the potential impact of new buildings an infrastructure before construction begins.

3.Economic Benefit: Bridges are used for shipping raw materials and goods. You can move them to different factories, warehouses, suppliers, distributors, stores and many more. Bridges can be used for travel purposes too. Purchasing goods and services are another economical impact of bridges.Bridges connect communities of distant places.

4. Entertainment and Gaming: It can be used to create immersive environments for

video games, movies, and other forms of entertainment. This can be particularly useful for creating realistic and enganeering virtual worlds. In summary, the motivation behind a 3D bridge modeling project can vary widely depending on the specific application

1.3 Problem Definition

1.3.1 Problem Statement

Design a 3D bridge project to showcase a new real state property to potential buyers and investors in a visually engaging and informative manner. The project will be accurately depict the property's features, including its location, layout, animations, and surrounding environment like river, and provide a realistic and immersive experience to viewers. The main goal is to design the 3D bridge project to generate interest and excitement about the property, ultimately leading to increased sales and investment opportunities etc.

1.3.2 Complex Engineering Problem

According to our discussion let's fill the below table:

Table 1.1: Summary of the attributes touched by the mentioned projects

Name of the P Attributess	Explain how to address
P1: Depth of knowledge required	For design a perfect bridge modeling we need to know about the basic 2D and 3D feature of autoCad like how to draw line, circle, move objects, trim etc.
P2: Range of conflicting requirements	It is important to establish clear project goals and objectives from the outset. This will help to ensure that all stock holders have a shared understanding of the project's purpose and scope. Additionally, it may be necessary to prioritize requirements based on their importance to the project's overall success.
P3: Depth of analysis required	For a perfect work we first need to analysis the problem deeply. Perfect analysis can be gives us perfect works. So, Depth analysis is very important for 3D modeling.
P4: Familiarity of issues	It may be necessary to conduct extensive research and analysis to gain a deeper understanding of the specific issues involved. This may include studying relevant codes, regulations, and standards, as well as consulting with subject matter experts to ensure that the 3D model accurately reflects the relevant issues and considerations.
P5: Extent of applicable codes	Applicable codes can be extended by the proper analysis and proper knowledge.
P6: Extent of stakeholder involvement and conflicting requirements	It is important to establish clear communication channels and protocols for engaging with stakeholders as well as creating clear documentation and reporting mechanisms to ensure that all stakeholders have a clear understanding of the project's progress and goals.
P7: Interdependence	Interdependence is also the idea that everything in nature is connected to and depends on every other thing. So, we can say interdependence is very important for 3D object modeling

1.4 Design Goals/Objectives

The objective of the Bridge modeling Project is ultimately to develop structural engineering skills and an understanding of the processes required of accelerated bridge construction. We involved in this project will obtain these skills through the completion of the various tasks described in the sub-sub-sections below:

1. The task of designing is to include the selection of the type of bridge structure, determination of connections that will be used, selection of member sizes and shapes, as well as grades of steel that will be used in the bridge.

2. Shop drawing: The Bridge modeling Team will also prepare shop drawings that may be used to direct the fabrication and construction of the bridge. These shop drawings will include all dimensions and details needed to direct the fabrication and construction of the bridge. The Team will use AutoCAD to prepare all shop drawings for the bridge.

3. Construction: The Bridge modeling Team will decide the amount of construction workers to be used, the tools to be used, and the order in which the construction workers will assemble the various components of the bridge.

1.5 Application

Integrated design and construction of bridge structures can be accomplished by several principles such as parametric modeling, layered model architecture,interoperable schema for information. each component of a bridge is modeled with basic parameters and connected with other components by layered architecture of geometry models Many engineers can cooperate in the design of a bridge and share the essential information.

A well-organized bridge information model can dramatically enhance the design revision process and communication with workers on the construction site. By building 3D models for a bridge, engineers can check constructability by DMU and produce accurate shop drawings. In Korea, remarkable number of cable supported bridges used 3D models. Even though the client does not require 3D models for the design, general contractors found the effectiveness of BIM technologies to reduce construction cost and risk. 4D simulations with detailed activities in 3D models enhanced engineer's knowledge of a bridge and resulted in effective usage of resources for the construction.

Overall, the 3D bridge modeling project has a wide range of applications and can be used in many different industries to enhance understanding, engagement, and visualization of the environment