CE5390 & CE4377 BUILDING INFORMATION MODELING
Spring 2025

HW 2 – 4D SIMULATION

DUE DATE: Friday, April 4th, 11:59 PM

Instructor:
Jaeyoon (Jason) Kim

Office Hours: MW 8:00 – 9:00 am
Office: Engineering Building A-215; ***E-mail: jkim13@utep.edu***

Lecture: MW, 4:30 PM – 5:50 PM

Location: Classroom Building C204

Notes:
1. **DO NOT copy any sources**

2. If you have any questions after reading the assignment, please contact the instructor.

Assignment 2 – 4D Simulation

1. Introduction

The purpose of this assignment is to explore how to create 4D simulation to support construction planning, perform quality control on the project schedule, and assess the impact of various design and construction features on the construction schedule and site workflow. The feedback from 4D simulation enables project teams to evaluate and assess the impact of various plan and construction alternatives on the overall performance of the project.

In hands-on sessions, you learned how to combine models created with the Autodesk Revit with the Autodesk Navisworks Manage to create 4D simulations of planned construction processes. In this assignment, you will explore modeling strategies to more accurately conduct simulations.

2. Maximizing the Effectiveness and Value of 4D Simulations

To create more accurate and truly useful 4D simulations, it is critical that building elements be modeled in a way that mirrors the actual construction process planned. Strategies for doing this include:

- **Splitting Larger Elements to Model Location-Based Scheduling**
  Large, continuous building elements that will be installed in smaller pieces (e.g., long wall sections that span the entire face of the building) should be split into segments that match the actual construction process. Creating overly lengthy tasks to match the building elements builds delays into the simulation and diminishes its value as a planning tool. It is better practice to "subdivide the elements into realistic chunks that match actual construction activities". This approach is commonly used to support location-based scheduling — a strategy that attempts to create smooth, parallel workflows of sequential construction tasks through project locations by adapting the work crews and planned activities to minimize conflicts and delays created by location unavailability.
- 3 sections (A, B, C) are divided into grid lines D and E
- Elements on gird lines D and E are included in Section B

<Floor plan>

<Ceiling plan>
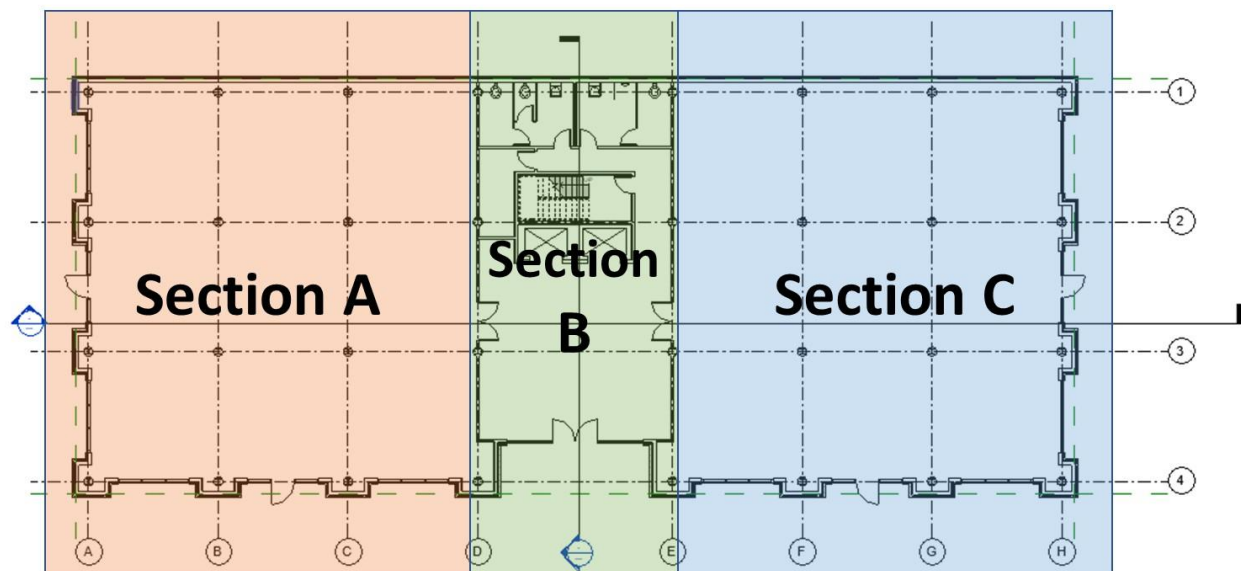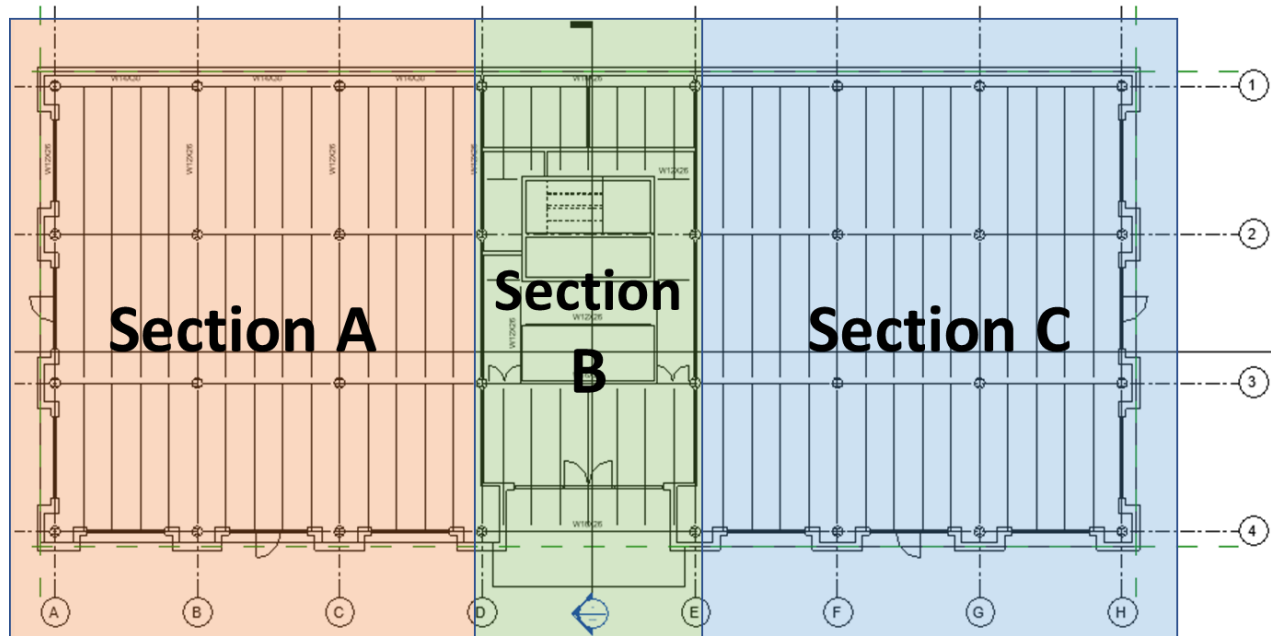
3. Learning Objectives of This Homework
After completing this assignment, you will be able to:
- Understand how to create 4D simulations for construction planning.
- Appreciate the importance of accurately modeling building elements to improve construction simulations.
- Identify and explore opportunities to reduce delays and improve construction plans using location-based scheduling strategies.

4. Deliveries
- Create a 4D animation of the construction process of the given building by using **'Timeline2' csv file** and put it on YouTube.
- Prepare **a report (PDF document)** including screenshots from your 4D animation and the aspects that need further improvement to accurately model the sequence of construction operations (open-ended).
- Submit the below **through jkim13@utep.edu by 11:59 pm on 04/04.**
  1) a report (*FirstName_LastName_A2.pdf*)
  2) revit file *(FirstName_LastName_A2.rvt)*
  3) nwd file *(FirstName_LastName_A2.nwd)*
  4) the web address for the 4D animation that you have put on YouTube

If you have any questions, please send an email to Instructor (jkim13@utep.edu)