

Course challenge exercise

Develop a coordinated time and cost control process

Create an integrated time-cost workflow for a construction project. Start by building a 4D simulation in Navisworks using an architectural model (use the provided course dataset). In Autodesk Build, represent the planned schedule in Schedule, assign budgets for each task in Cost Management, and create a main contract with the owner along with subcontracts for key scopes. Connect design, time, and cost data into one coordinated process.

Complete the required activities:

- Export the provided architectural Revit model as an NWC file to prepare it for use in Navisworks. Make sure the export settings maintain the correct coordinates and model organization so the geometry aligns properly.
- Append the exported model into a new NWF file in Navisworks and confirm that all model elements display correctly. Organize the file so it is ready for the simulation.
- Create search sets in Navisworks to group model elements by major building components such as foundations, structure, envelope, or other meaningful categories. Use property filters so the sets remain dynamic if the model changes.
- Build a construction schedule in TimeLiner that represents a logical sequence of work. Link the previously created search sets to the appropriate tasks so the 4D simulation will update when the schedule changes.
- Run a 4D simulation in Navisworks to visualize the planned construction sequence over time. Review the playback to confirm that the sequence appears logical and matches the schedule.
- Recreate the planned schedule in Autodesk Build (Schedule), either by importing or manually creating tasks. Organize tasks into a clear hierarchy that matches the construction logic used in your Navisworks simulation.
- Set up a budget in Autodesk Build (Cost Management) by creating line items that correspond to your scheduled tasks. Assign realistic cost values to each item so the budget accurately represents the planned work.
- Create a main contract with the project owner to represent the total project value. Link this contract to the appropriate budget items to establish the overall financial baseline.

Create subcontracts for at least three major scopes of work (for example, envelope, openings, and finishes). Connect each subcontract to the relevant budget line items so costs are properly distributed and controlled.

Success Criteria:

- **Accurate schedule integration:** The construction sequence is correctly represented in Navisworks as a 4D simulation, with tasks logically structured and model elements accurately linked.
- **Effective transfer to ACC:** The planned sequence from Navisworks is successfully recreated in Autodesk Build (Schedule), with tasks organized clearly and timelines reflecting the intended construction logic.
- **Well-structured cost control setup:** Budgets are correctly created for scheduled tasks, with a main contract established for the owner and subcontracts linked to the appropriate budget line items for each major scope of work.

What to Submit:

- The **Navisworks NWD file** containing the completed 4D simulation with linked tasks and model elements.
- A **schedule report** from Autodesk Build (Schedule) showing the recreated construction sequence.
- A **budget report** from Autodesk Build (Cost Management), including the budget line items created for each task.
- A **contracts report** from Autodesk Build (Cost Management), showing the main contract with the owner and the subcontracts for major scopes of work.
- *(Optional)* **Invite the instructor to your ACC project** to review the schedule, budget, and contracts directly within the platform.

Grading Rubric

	Advanced	Proficient	Basic	Emerging
Model export to Navisworks	Model is exported as NWC with correct coordinates and complete data; NWF is organized for scheduling.	Model exports successfully with minor issues that don't affect use.	Export is incomplete or missing elements affecting downstream work.	Export is incorrect or unusable for scheduling.
Search sets for model grouping	Search sets are well-structured, property-driven, and reliably capture all intended elements.	Most search sets function correctly with small gaps or overlap.	Search sets are partially complete or inconsistently defined.	Search sets are missing or ineffective for filtering.
TimeLiner schedule and linking	Schedule is logically sequenced and fully linked to the correct sets; dependencies and timing are appropriate.	Schedule is mostly logical and linked with minor sequencing or linkage issues.	Schedule or links are incomplete, with noticeable sequencing errors.	Little or no effective schedule–geometry linkage is established.
4D simulation and animation	Simulation clearly visualizes construction phases from multiple viewpoints with smooth playback.	Simulation runs and communicates sequence with minor clarity issues.	Simulation is basic or difficult to follow, limiting understanding.	Simulation is missing or fails to convey construction sequence.
Autodesk Build Schedule representation	Schedule accurately reflects the Navisworks plan with clear task structure, durations, and logic.	Schedule generally matches the plan with minor inconsistencies.	Schedule is incomplete or poorly organized relative to the plan.	Schedule is largely missing or not comparable to the plan.
Autodesk Cost Management budgets and contracts	Budget line items align to scheduled tasks; owner contract and multiple subcontracts are created and correctly linked to budget items.	Budget and contracts are created and mostly linked with minor errors.	Budget or contracts are partially created or misaligned with tasks.	Budgets/contracts are missing or not linked to the schedule.