

ESTIMATION

OFFICE BUILDING PROJECT PART 1

DESCRIPTION

Your team (up to 5 people) must produce an estimate for an office building and warehouse in Montreal. The estimate must progress from a Class D to a Class A estimate. This project will be completed throughout the remainder of the semester.

DESIGN REQUIREMENTS

- Office space + warehouse for a company. You decide the name of the company.
- Office space measures 20 000 square feet on 2 floors (10 000 per floor).
- Warehouse measures 30 000 square feet (one floor only).

EVALUATION

At different intervals throughout the semester, your team will be required to submit a portion of the project. Each submittal will be graded, and will form a part of your overall project grade.

FOR THIS SUBMITTAL (PART 1)

Prepare a Revit model of the proposed building. Focus solely on the exterior envelope of the building; don't draw ANY interior components (no partitions, columns, stairs, etc).

- Keep your building SIMPLE (no funky walls; no canopies; no overhangs; etc) as these things are more difficult to estimate.
- Assume steel construction.
- Top of slab, 2nd floor is 14'-0". Top of roof is 29'-0".
- Small (12" to 24") parapet at the top extending above the top of roof level. The warehouse roof level will line up with the office roof level, for one continuous roof across the whole building.
- Foundation walls: 12" thick x 64" deep concrete foundation with 12"x24" footing, all along the exterior of the building.
- Roof: 1'-0" thick generic roof. Same roof across the office and warehouse portions.
- Floors: 8" concrete slab-on-grade for ground floor; 4" concrete with metal deck at 2nd floor (concrete with metal deck).
- Exterior office walls: Use 3 wall types (curtain wall is a MUST, with either masonry, aluminum panel, and/or precast concrete as the other 2 types).
- Exterior warehouse walls: Precast concrete on the first 10' of walls, and metal panels for the remaining height of the walls.
- The exact wall type compositions aren't important. Copy the ones from Project 3 if you like. It doesn't matter if they're steel stud, or z-bar, or semi-rigid insul, or whatever. What matters is that you create wall types with different EXTERIOR FINISHES. The exterior finishes are important.
- The office portion must contain at least a few punch windows.
- The warehouse portion must contain 3 emergency exit doors and 3 garage doors, all standard sizes. No curtain wall or windows in the warehouse portion.

Don't kill yourself preparing a fancy building/elaborate renderings. Design is not graded.

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TO SUBMIT:

- One PDF document with a cover page, a description of your building, and images of the building (you can show 3D views if you like, as long as I can see ALL façades of the building).
- Include at least 1 elevation with levels, just so I can see if you followed my instructions.
- **Prepare a Class D estimate for the building, based on square footage and location factor from RS Means 2019 (not 2025).** Don't forget Cost Modifier/Project Size Modifier (but please ignore Historical Cost Index).
- **Prepare ANOTHER Class D estimate, based on Hanscomb "Gross Building Costs" tables.** Assume average construction quality for warehouse, and "low" quality for offices (using the 7-storey corporate office model costs). Remember: No location factor with this method.
- Show the math / calculations for both estimates.
- Compare your estimate with that of the Altus Group in a very short paragraph. Show your work!
- Package it all in a nice PDF. It can be sized 8.5x11 or 11x17.
- Do not submit the RVT file. I don't need it. I don't want it.

That's it!

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OFFICE BUILDING PROJECT PART 3

TO BE COMPLETED IN THE SAME TEAM AS THE REST OF YOUR PROJECT

Prepare a final estimate from both the RS Means assembly costs and the Hanscomb assembly and “current market prices” costs (attached). You will have to use your Revit model to calculate areas, distances, etc. You do NOT need to export the Revit schedule onto Excel, but I want to see at least a screenshot of the Revit schedule included in your report.

NOTES

1. I want to see how you got the values under the **cost** column of your spreadsheet (for example, the \$/SF or \$/LF costs). Please show calculations and sources for this.
2. All prices from **RS Means** must be multiplied by 1.06 for location factor, before inserting into your spreadsheet (excluding stuff like architect’s fees or anything else expressed as a %).
3. All prices from **Hanscomb** must be from the “Montreal” column.
4. **STRUCTURE**: Bay size 30’ x 30’ for office & warehouse, unless otherwise indicated below.

STRUCTURE

- **Footings**: Hanscomb. Section D. Use linear feet.
- **Foundation walls**: Hanscomb. Section D. Use linear feet.
- **Ground floor slab**: RS Means. Assume light industrial, reinforced.
- **Second floor slab & structure (for the 2nd floor offices)**: RS Means. Steel joists, beams and slab on columns. Superimposed load = 75 PSF. You also have to add the cost of the column (under “Column add”). Add these 2 numbers together for the total of the second floor structure.
- **Roof structure**: RS Means. I’ll let you figure this out. Assume superimposed load of 20 PSF. Don’t forget to add the extra price for the columns.

WALLS

- **Precast concrete**: RS Means. Flat precast concrete 6” thick with insulation.
- **Brick veneer**: RS Means. Your choice. Choose any type of brick veneer on METAL STUD backup.
- **Metal panel**: RS Means. Your choice for the finish (B2010 146), but don’t choose 4100 to 5200. You then **add** the cost of the structure behind (under B2010 154, metal siding support). Assume wind load of 20 and column spacing of 35. **Add** the intermediate “wind columns” to your price. Add all of this together for your metal panels price.
- **Aluminum panels**: RS Means. Identical to metal panel, but for the finish, choose B2010 146 5100.
- **Curtain wall**: Hanscomb. This includes both spandrel panels and vision (transparent) panels. There is no distinction between the 2 with this price. Assume a double-glazed curtain wall (thermally broken). First, get the price of the ASSEMBLY, assume 5’ modules (finish is your choice). Then **add** the cost of the glazing (assume insulating glass, two panes of 1/4” thick glass); type of glass (clear, tinted or reflective) is your choice. Use the total as the cost of your curtain wall system.
- **Other**: If you have stucco or EIFS or any other type of wall finish, choose one from the RS Means book. It’s your choice from the lists presented in the book.

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OPENINGS

- **Front entrance:** If you have a glazed door in aluminum for the front entrance: RS Means, aluminum & glass door. If your front door is not glazed, choose a steel 18 gauge door, similar to below.
- **Other exterior doors:** RS Means. Steel 18 gauge, hollow metal, no rating or label. Choose the doors according to the size of your doors in Revit.
- **Garage doors:** RS Means. Steel, overhead, rolling, electric operation.
- **Windows:** RS Means. Aluminum windows; type is your choice (fixed windows are “picture unit”). Sizes will vary; just choose a size that is closest to the window (or windows) that are on your project.

ROOFING

- **Roof covering:** RS Means. Your choice, but the client doesn’t want you to use any asphalt or coal tar roofing. You then have to add the price of insulation (4” thick; either expanded polystyrene (R20 total) or Polyisocyanurate at 15 PSI). Add the extra for “tapered for drainage” (either 1800 or 2750). Add it all up for the price of your roofing.
- **Roof edges:** Add a sheet metal edge, 6” high, 20 gauge all around your roof. The length of the roof edge is the same as the length of your foundation walls (from your Revit model).
- **That’s it** for roofing. Nothing else needed.

OTHER

- **Interior design:** Add the cost that you calculated for Part 2 to your spreadsheet (pre-taxes, pre-general requirements, etc) EXCLUDING the electrical costs!!! Show a sub-total adding this to the base building sub-total.
- **Mechanical:** Use the \$/SF amounts shown in the Hanscomb table “Gross Building Costs.” (Warehouse area x \$/SF for warehouse) + (Office area x \$/SF for post office) = Total cost for mechanical. The Hanscomb “Gross Building Costs” was distributed with Part 1 of the project.
- **Electrical:** Similar as mechanical.
- **Taxes:** Same % as Part 2.
- **General requirements & fee:** Use the % value shown in the Hanscomb table “Gross Building Costs” for warehouse. (This will apply to your entire building; the office + warehouse portions.)
- **General contractor overhead and profit:** assume 7%.
- **NO LOCATION FACTOR** since you’ve already included it in the individual items in your spreadsheet.
- **Consultant fees:** RS Means, table for architectural fees. Use the value for warehouses. Use the % that is closest to your project cost. For example, if the project costs 6 million \$, use 5.3% as the value.
- **Contingency:** Hanscomb, section Z2, use the maximum % for construction contingency/allowance for our type of project. (Do NOT add a design allowance or escalation.)

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OFFICE BUILDING PROJECT **PART 3**

CONCLUSION

Summarize your findings in a quarter-page of text. Keep it light and fun. Do NOT use AI. Things that you might want to discuss (you don't have to discuss all of these):

- What can you conclude about the estimation process, from the earliest estimates to your most recent estimate?
- Are your estimates generally the same as you progressed from a very preliminary estimate to a very detailed estimate, or are they wildly different?
- Would you say that the estimation process is accurate, as you've learned it in this course? Or do you find the manuals (RS Means, Hanscomb) give you too much variation between the different estimates, and are therefore not as reliable as you'd expect?
- What did you think of the estimation process overall; does your team have any opinions?
- Were you surprised by your estimates, and/or the progress of the estimates?
- What did you like? What did you dislike?

TO SUBMIT

A professional-looking **PDF document** (letter sized?) with cover page showing an overall perspective of the building (doesn't have to be Lumion; just a simple 3D view straight from Revit).

Include the estimate spreadsheet in the PDF.

Conclusion somewhere at the end.

Also submit an Excel file separately from the PDF, so that I can open it up and look at your calculations in detail (if I have to).

Don't submit Revit files or anything else. Just a PDF and Excel file.