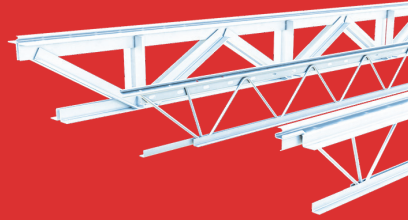




HAMBRO[®]
by Canam

CONCRETE vs **STEEL** CASE STUDY



September 2020

CASE STUDY

BUILDING BREAKDOWN

154,625 ft.²
Four stories
Ottawa, Ontario
Senior living facility
2019

Hambro by Canam was asked to convert the design of a building from concrete to load bearing steel structure with Hambro floor system. Below is a full take-off comparison between the two systems. Exterior walls and tower crane were added to the concrete building scope in order to compare the buildings on the same basis and scope.

CAST IN PLACE CONCRETE OPTION

	ITEM	DESCRIPTION	COST (CAN\$)
Ground, 2 nd , 3 rd , 4 th	Formwork	2,335 m ² x 4 floors	\$1,205,981
	Concrete	2,335 m ² x 250 mm x 4 floors	\$443,080
	Reinforcing	21 kg/m ² x 2,335 m ² x 4 floors	\$392,280
	Placing and finishing	2,335 m ² x 4 floors	\$150,748
Roof	Formwork	2,335 m ²	\$301,495
	Concrete	2,335 m ² x 325 AVG thick	\$144,020
	Reinforcing	25 kg/m ² x 2,335 m ²	\$116,750
	Placing and finishing	2,335 m ²	\$37,687
High roof	Formwork	170 m ²	\$21,950
	Concrete	170 m ² x 325 mm AVG thick	\$10,640
	Reinforcing	23 kg/m ² x 170 m ²	\$7,866
	Placing and finishing	170 m ²	\$2,744
Columns (300 mm x 1,300 mm x 54)	Formwork	3.2 m x 17 m x 54 columns	\$379,355
	Concrete	0.3 m x 1.3 m x 17 m x 54 columns	\$81,700
	Reinforcing	45 kg/m ² x 17 m x 54 columns	\$82,620
Shear walls	Formwork	109 m x 17 m	\$259,660
	Concrete	83 x 17 m x 250 mm	\$87,210
	Reinforcing	321 kg/m ² x 17 m x 83 m	\$117,396
			Total formwork: \$2,168,441
			Total concrete: \$766,650
			Total reinforcing: \$716,912
BUILDING MATERIALS SUBTOTALS:			Total placing and finishing: \$191,178

CONCRETE SUPERSTRUCTURE SUBTOTAL:	\$3,843,182
Basement (28,700 ft. ² @ \$45):	\$1,291,500
Exterior walls added for comparison (38,962 ft. ² @ \$10):	\$389,620
Tower crane, operator and concrete pad added for comparison:	\$225,000
TOTAL STRUCTURE:	\$5,749,302

Price per square foot:	\$37.18
Schedule cost (two-month differential, 5% interest, @ 231,250/2.5 months):	\$1.50
Heating, hoarding, additives (winter construction conditions):	\$2.00
Piling for building weight (D class soil):	\$3.60
REAL COST PER SQUARE FOOT:	\$44.28

CASE STUDY

BUILDING BREAKDOWN

154,625 ft.²
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HAMBRO BY CANAM - STEEL OPTION

ITEM		DESCRIPTION	COST (CAN\$)	
Complete steel superstructure	Structural system	Structural steel package		
	LBSS walls	With outside sheeting		
	Floor system	Hambro D500		
	Balconies	Precast concrete on SS column		
	Roof and parapets	OWSJ and SD		
	Engineering	EOR mandate		
			\$3,470,000	*Contract price
Ground, 2 nd , 3 rd , 4 th	Concrete	1,914 m ² x 89 mm thick x 4 floors	\$129,390	
	Reinforcing	Wire mesh only, incl. installation	\$50,249	
	Placing and finishing	2,335 m ² x 4 floors	\$100,498	
Shear walls	Formwork	109 m x 17 m	\$199,749	
	Concrete	83 x 17 m x 250 mm	\$67,070	
	Reinforcing	321 kg/m ² x 17 m x 83 m	\$90,304	
			Total steel structure:	\$3,470,000
			Total formwork:	\$199,749
			Total concrete:	\$196,460
			Total reinforcing:	\$140,553
BUILDING MATERIALS SUBTOTALS:			Total placing and finishing:	\$100,498

CONCRETE SUPERSTRUCTURE SUBTOTAL: **\$4,107,260**
Basement (28,700 ft.² @ **\$30**): **\$861,000**
TOTAL STRUCTURE: **\$4,968,260**

Price per square foot: **\$32.23**
Heating, hoarding, additives (winter construction conditions): \$0.00
Piling for building weight (D class soil): \$0.00
REAL COST PER SQUARE FOOT: **\$32.13**

FACTS

PROJECT CONCLUSION

The building was erected and enclosed ahead of schedule at 14 weeks. Hambro's floor system requires no shoring, allowing subsequent trades to work in the building the day after concrete placement, providing additional schedule savings. Unlike concrete structures, no extra costs for winter conditions had to be considered since the exterior walls were up as the building was erected.

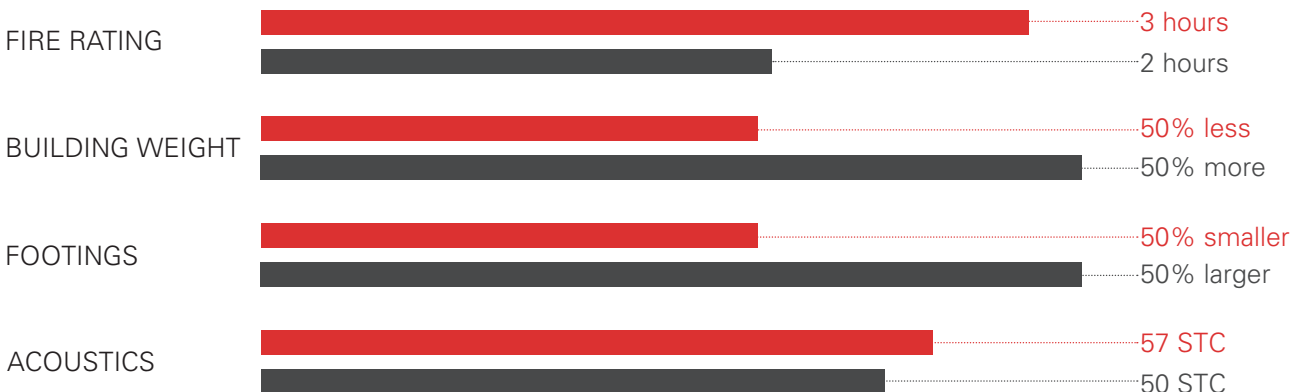


Wildpine Residence
Senior living facility, Ottawa, ON

HAMBRO BY CANAM SCHEDULE



PERFORMANCE STEEL vs CONCRETE







HAMBRO[®]
by Canam

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