DIGITECH 3D inc.

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Column's capacity report

Subject: Resistance results on Column's compressive capacity

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The present document confirms the buckling resistance of MCMEL's aluminum columns to the compression loads imposed by the 2010 and 2015 Canadian National Building Code, and 2012 Ontario Building Code. Official performance tests, have been performed by LES LABORATOIRES SHERMONT and under supervision of Mr. Paul Hébert, Professional engineer, on October 6th 2008. The design of each type of column did change since 2008. Square columns of 100mm have been tested on Septembre 12th, 2019, by ELEMENT's laboratory, Mississauga, Ontario. In addition, EXOVA performed similar tests on contemporary columns of 7 ¼ in. on October 2, 2018. Here is the summary of the capacity of each column model:

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Type of column	Height of column	Nominal Dimension	Maximal load test at break	Maximal load in projects SF=2
Round	3 048mm 120 in	180 mm 7 ¼ in	9913 kg 21 854 lb	4956 kg 10 927 lb
Round	3 048mm 120 in	130 mm 5 ¼ in	7913kg 17 445 lb	3957 kg 8 723 lb
Square close*	3 048mm 120 in	100 mm 3 ¾ in	8 632 kg 18 992 lb	4 316 kg 9 496 lb
Square fluted	3 048mm 120 in	180 mm 7 ¼ in	7534 kg 16 610 lb	3767 kg 8 305 lb
Square fluted	3 048mm 120 in	130 mm 5 ¼ in	5102 kg 11 248 lb	2551 kg 5 624 lb
Square fluted	3 048mm 120 in	100 mm 3 ¾ in	3967 kg 8 746 lb	1984 kg 4 373 lb
Square contemporary	3 048mm 120 in	130 mm 5 ¼ in	13258 kg 29169 lb	6629 kg 14584 lb
Square contemporary	3 048mm 120 in	180 mm 7 ¼ in	14218 kg 31280 lb	7109 kg 15640 lb
A safety factor of 2 should be applied to the maximal load test at break (21 854 lb in test = 10 927 lb for the project)				

NOTE: *The resistance to impact of the square close columns can be increased if a spruce 4x4 is inserted inside. This is the type of mounting that must be done on columns supporting more than one landing or balcony (load calculation to be validated by the project engineer).

Also, analytic calculations and digital simulations have been performed on June 2017 by Mr. Patrice Austin, on filed Ontario and Québec Engineer. Calculations, simulations and tests show that columns, properly selected, properly installed and properly loaded, support the loads imposed by the Canadian and Ontario Construction Codes and can be used safely in residential and commercial applications. Performance and safety are subject to the correct column selection, by the structural design engineer, and to a installation that complies with the manufacturer's instructions, MCMEL For each column model, critical loads and slenderness ratios are conform to the rules of art and ASTM and AISI Codes. The slenderness ration does exceed 81. The maximum value allowed by the Code is 200.

slenderness ration = height of column / gyration radius

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Digitech 3D assumes that information produced by MCMEL is truthful and calculations are executed with this information, test reports, manufacturing plans including aluminum grades and samples. Digitech 3D can't be responsible for false information. For more details, please contact us at 514-821-1787 or by e-mail at patrice.austin@digitech3d.ca.

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