REPRODUCTION SHEET

T3 Minneapolis

Seven-storey nail-laminated timber office and retail building, North Loop

Location	Minneapolis, Minnesota, United States
Completed	September 2016
Use	Office and retail
Gross floor area	20,440 m²
Storeys	7
Owner / developer	Hines (developer)
Architect	Michael Green Architecture (design); DLR Group (architect of record)
Structural engineer	Magnusson Klemencic Associates
LCA practitioner	No EN 15978 LCA published. Carbon figures derive from the WoodWorks / Canadian Wood Council
LCA standard applied	No whole-building LCA standard applied to disclosed figures.
Certification	LEED Gold
Wood supplier	StructureCraft Builders Inc. (design assist + build)
Wood origin / forest type	British Columbia interior, mountain pine beetle-killed salvage

§ 1 — PUBLIC SOURCES

Disclosure source documents

• **MGA T3 project page**
https://mg-architecture.ca/project/t3-minneapolis/

• **Architizer T3 profile**
https://architizer.com/projects/minneapolis-t3/

• **Dezeen 2016 article**
https://www.dezeen.com/2016/12/02/michael-green-architecture-t3-largest-mass-timber-building-usa-minneapolis-minnesota/

• **WoodWorks award gallery**
https://www.woodworks.org/award-gallery/t3-minneapolis/

§ 2 — DISCLOSED FIGURES

What was published

Item	Value	Unit
Timber volume (CLT + glulam + NLT)	3,600	m³

Carbon stored in wood (biogenic)	3,646	tCO■e
Substitution credit (avoided emissions)	1,411	tCO■e
Total disclosed wood 'carbon benefit'	5,057	tCO■e

§ 3 — BOUNDARY STATEMENT

What is excluded, in the disclosure's own words

On the source of the disclosed figures.

> *"T3 stores 3,646 metric tons of carbon dioxide. According to the WoodWorks Wood Calculator tool's Carbon Summary: using wood to construct T3 generates environmental benefits that are equivalent to taking 966 cars off the road for a year. By using wood, T3 avoided 1,411 metric tons of carbon dioxide emissions."*
>
> — Michael Green Architecture project page; Architizer profile

§ 4 — DRL RECOMPUTATION INPUTS

Every input used in the corrected calculation

Input	Value	Source / band
Timber volume	3,600 m³	Building's own disclosure
A1–A3 manufacturing factor	0.18 tCO■e/m³	Athena/FPInnovations mid-range
Biogenic storage factor	0.917 tCO■e/m³	EN 15978 convention
SOC efflux factor	0.12 tCO■e/m³	Band: mid
EOL methane fraction	12% biogenic C as CH■	Band: ximenes
Foregone seq. factor	0.45 tCO■e/m³	Band: yr50

§ 5 — ARITHMETIC, LINE BY LINE

Every step of the recomputation, showing the calculation

Line	Calculation	Result
A1–A3	3,600 × 0.18	+648 tCO■e
Biogenic storage (industry credit)	3,600 × 0.917	−3,646 tCO■e
Disclosed net (A1–A3 − biogenic)	**Sum of lines above**	**−4,409 tCO■e**
+ SOC efflux	3,600 × 0.12	+432 tCO■e
+ EOL methane	3,646 × 0.12 × (16/44) × 27.9	+4,439 tCO■e
+ Foregone sequestration	3,600 × 0.45	+1,620 tCO■e
Full-boundary total	**A1–A3 + SOC + EOL + Foregone**	**+7,139 tCO■e**

Delta vs. disclosed	**Full-boundary − disclosed_net**	**+11,548 tCO■e**

§ 6 — EMISSION FACTOR LIBRARY

Every factor used here, with its source

The factors below are the same library used by the live mini-calculator on the building's web page. Default factor values are mid-range and sourced; low and high alternatives are also available. Anyone challenging this recomputation can do so by naming a specific factor and substituting an alternative value with a citation; the math will recompute.

Factor	Value	Source
Biogenic storage	0.917 tCO2e per m3	EN 15978 convention: ~0.25 tC/m3 softwood timber x 44/12 to CO2e.
A1-A3 manufacturing	0.13 to 0.25 tCO2e per m3, default 0.18	Athena Sustainable Materials Institute EPDs; FPInnovations data.
SOC efflux — Low	0.06 tCO2e per m3	Achat et al. 2015, Forest Ecology and Management.
SOC efflux — Mid	0.12 tCO2e per m3	James & Harrison 2016, Forests (meta-analysis: 11% SOC loss).
SOC efflux — High	0.20 tCO2e per m3	Mayer et al. 2020, Forest Ecology and Management.
EOL methane — IPCC default	3% of biogenic C as CH4	EN 15978 default; very low landfill diversion.
EOL methane — Ximenes	12% of biogenic C as CH4	Ximenes et al. 2008, Carbon Balance and Management.
EOL methane — Wang	18% of biogenic C as CH4	Wang et al. 2013, Waste Management (long-term decay).
CH4 conversion to CO2e	x 16/44 (mass) x 27.9 (GWP100)	IPCC AR6 WG1 Ch.7 Table 7.15.
Foregone seq — 50 yr	0.45 tCO2e per m3	Stephenson 2014; reduced for beetle-kill salvage.
Foregone seq — 100 yr	0.95 tCO2e per m3	Stephenson 2014, Nature; Luyssaert 2008.
Foregone seq — 200 yr	2.00 tCO2e per m3	Long-rotation full-cycle estimate.

§ 7 — METHODOLOGICAL NOTES

Calibrations and assumptions specific to this building

• This building does not have a published EN 15978 or ISO 14040/44 whole-building life cycle assessment. The disclosed figures derive from the Canadian Wood Council / WoodWorks Wood Calculator, which is a vendor screening tool, not an EN 15978 LCA. The Reproduction Sheet treats the calculator output as the disclosed value and recomputes against it.

• Foregone-sequestration window is set to 50 years (low band) rather than 100 to reflect that the harvested trees were mountain pine beetle-killed and would, absent salvage, have decomposed and released their carbon. This is a calibration that lowers the foregone-sequestration line; for live-harvest timber it would be set higher.

• End-of-life methane line uses 12% of biogenic carbon released as CH4 in landfill (Ximenes 2008), times 16/44 (CH4:C mass), times 27.9 (IPCC AR6 GWP100). Applied to the disclosed biogenic-store value of 3,646 tCO2e converted to carbon mass.

• Substitution credit of 1,411 tCO2e is preserved as disclosed for the disclosed-net line. It is not separately deducted from the recomputed full-boundary total because the recomputed total addresses wood-attributable lines only and is then compared to the same scope.

§ 8 — CITATIONS

Peer-reviewed and primary-source references

Bowick, M. (2018). Brock Commons Tallwood House — An Environmental Building Declaration According to EN 15978. Athena Sustainable Materials Institute.

EN 15978:2011. Sustainability of construction works — Assessment of environmental performance of buildings — Calculation method. European Committee for Standardization.

Stephenson, N. L., et al. (2014). Rate of tree carbon accumulation increases continuously with tree size. Nature, 507(7490), 90–93.

Luyssaert, S., et al. (2008). Old-growth forests as global carbon sinks. Nature, 455(7210), 213–215.

James, J. & Harrison, R. (2016). The effect of harvest on forest soil carbon: a meta-analysis. Forests, 7(12), 308.

Achat, D. L., et al. (2015). Forest Ecology and Management, 348, 124–141.

Mayer, M., et al. (2020). Tamm Review: Influence of forest management activities on soil organic carbon stocks. Forest Ecology and Management, 466, 118127.

Ximenes, F. A., et al. (2008). Greenhouse gas balance of native forests in NSW, Australia. Carbon Balance and Management, 3(1), 1–13.

Wang, X., et al. (2013). Methane emissions from landfills. Waste Management.

IPCC (2021). Sixth Assessment Report, WG1, Ch. 7, Table 7.15 — methane GWP■■■ = 27.9.

Searchinger, T. D., Peng, L., et al. (2023). Re-evaluating the climate effects of biofuels and bioenergy. Nature, 619, 64–73. doi:10.1038/s41586-023-06187-1

§ 9 — AUDITOR'S NOTE

This Reproduction Sheet is audit working papers. It is intended to be checked, disputed, and corrected.

If any input on this page is wrong — the timber volume, the boundary statement, the emission factor band — please write. The feedback channel logs every submission with timestamp. A correction will be published on the building's page and a revised version of this sheet will be issued. The purpose of this document is not to be unchallengeable. It is to be challengeable line by line.

Auditor: Murphy O'Neal **Version:** 1.0 **Reference framework:** Divergent Resource Logic (DRL), full-boundary accounting framework.
Status: Pre-publication draft. To be reviewed by counsel before public release.