

Indicative calculation note

Scaffold: loads, load takedown, ties and wind

INDICATIVE: does not replace a structural calculation signed by an engineer.

Specified loads, unfactored unless stated otherwise. When neither the regulation nor the standard gives a value, the note uses the user's answer and says so.

Project	Three-storey sixplex, street façade
Client	-
Site	Montréal (Québec) (Quebec)
Company	Entreprise Démo TektonAI
Related plan	ECH-261023-F506, revision A (preliminary)
Date	2026-10-23
System	Frame scaffold (tubular)
Provenance	© 2026 TektonAI · tektonai.app · Ref. TK-2026-5E0D25237C4F4263 · Check 1337-A76D
Verification	https://mcp.tektonai.app/scaffold/verifier/TK-2026-5E0D25237C4F4263



Verify this document

1. Purpose and method

This note sets out the calculations of plan ECH-261023-F506 so that an engineer can check them. It gives the assumptions, the loads, the force at the foot of each standard (screw jack reaction and pressure under the sole plate) and the force in each tie. Vertical loads are shared between standards by tributary area (CSA S269.2-16, clause 7.8.2). Loads are specified and unfactored. The standard applies a factor of 4 to the unfactored load or to the ultimate capacity of the components (clauses 7.1, 7.3 b) and 7.5). The “× 4” column of the load takedown is therefore compared with the ultimate capacity. The unfactored force is compared with the manufacturer's allowable rated capacity.

Load cases (CSA S269.2-16, clause 6.2.2): LC1, unclad scaffold (self-weight, workers, construction loads, horizontal loads).

Summary

Element	Height (m)	Most loaded standard (kN)	Max. sole plate pressure (kPa)	Tie, indicative wind (kN)	Tie, design load (kN)
Façade	9.9	6.3	23	-	1.4



2. Façade

2.1 Assumptions

Parameter	Value	Source
System	Frame scaffold (tubular)	plan ECH-261023-F506
Length × width	16.76 m × 1.52 m	plan ECH-261023-F506
Bays	5 × 3.048 m, 1 × 1.524 m	plan ECH-261023-F506
Scaffold height	9.92 m to the top, highest platform at 8.85 m	plan ECH-261023-F506
Platforms (levels)	1: 8.85 m	plan ECH-261023-F506
Platforms loaded at the same time	1	given by the user
Duty class	Light: 1.2 kPa (25 psf)	CSA S269.2-16, clause 6.2.3
Soil bearing capacity	75 kPa, assumed: bearing required without a soil analysis	CSA S269.2-16, clause 7.7.8.6 a)
Tarp or net	none	given by the user
Location	Montréal (City Hall), QC, q ₁ /50 = 0.44 kPa	NBC 2020, Table C-2
Province or territory	Quebec	CSTC (Safety Code for the construction industry, CQLR, c. S-2.1, r. 4)
Tie pattern	6.10 m max. horizontally × 3.86 m max. vertically, 12 ties	plan ECH-261023-F506
Component masses	Entreprise Démo TektonAI catalogue (source of each mass in the bill of materials)	plan ECH-261023-F506

2.2 Loads

Self-weight

Category	Pieces	Mass (kg)	Weight (kN)
Supports	21	150.5	1.48
Structure	91	695.1	6.82
Bracing	60	361.0	3.54
Platforms	25	402.5	3.95
Access	10	233.5	2.29
Guardrails and toeboards	85	429.5	4.21
Ties	12	42.0	0.41
TOTAL	304	2,314.1	22.70

Weight = mass × 9.81 / 1,000. Each component is assigned to the nearest standard in plan.

Generic catalogue masses: average values, indicative. A plan made with the company's parts library uses the masses from its records.

Working load

Light duty class: 1.2 kPa (25 psf) over the whole platform area, 1 platform loaded at the same time (the most loaded one for each standard). Source: CSA S269.2-16, clause 6.2.3.

Horizontal loads

Platforms: at least 225 N/m of platform length, without sliding (CSA S269.2-16, clause 6.2.4 a)).

Members (CSA S269.2-16, clause 6.2.6 a) ii): 2% of the vertical loads, i.e. 0.98 kN (2% of 49.2 kN), or 150 N/m at a platform level, i.e. 2.51 kN over 16.76 m. The greater of the two, 2.51 kN, is compared with wind (clause 6.2.6 a) i)).

Wind (indicative calculation)

Wind not calculated: site relief and importance category not given (NBC 2020, Article 4.1.7.4 and Table 4.1.7.3). The calculation will be added to the revision that takes the user's answer.



2.3 Load takedown

Force at the foot of each standard, equal to its screw jack reaction: self-weight + working load, with working load = 1.2 kPa × tributary area × loaded platforms. Sole plate pressure = sum of the forces of the standards on the sole plate / 0.430 m².

Support X; Y (m)	Trib. area (m²)	Self-weight (kN)	Working (kN)	Total (kN)	× 4 (kN)	Sole plate (kPa)
0.00 ; 0.00	1.178	4.88	1.41	6.29	25.2	22.5
3.05 ; 0.00	2.282	2.62	2.74	5.36	21.4	17.9
6.10 ; 0.00	2.282	2.00	2.74	4.73	18.9	18.1
9.14 ; 0.00	2.282	2.00	2.74	4.73	18.9	17.9
12.19 ; 0.00	2.282	2.00	2.74	4.73	18.9	18.1
15.24 ; 0.00	1.707	1.64	2.05	3.69	14.8	13.6
16.76 ; 0.00	0.527	1.25	0.63	1.89	7.5	6.2
0.00 ; 1.52	0.294	3.03	0.35	3.38	13.5	22.5
3.05 ; 1.52	1.307	0.76	1.57	2.32	9.3	17.9
6.10 ; 1.52	1.997	0.67	2.40	3.07	12.3	18.1
9.14 ; 1.52	1.997	0.57	2.40	2.96	11.9	17.9
12.19 ; 1.52	1.997	0.67	2.40	3.07	12.3	18.1
15.24 ; 1.52	1.493	0.38	1.79	2.17	8.7	13.6
16.76 ; 1.52	0.461	0.24	0.55	0.79	3.2	6.2
TOTAL (14 supports)		22.70	26.50	49.21	196.8	

Soil capacity not given: assumed 75 kPa, the bearing required without a soil analysis (CSA S269.2-16, clause 7.7.8.6 a)), compared with unfactored pressures: met under every sole plate.

2.4 Ties

Each tie takes the façade up to half-way to its neighbours. Design load: CSTC (Quebec Construction Safety Code), s. 3.9.10, para. 2 a), 225 N/m of platform and at least 1,000 N (same 225 N/m as CSA S269.2-16, clause 7.7.3.3 a)). Wind force not calculated (see the wind section).

Ties	Tributary width (m)	Tributary height (m)	Area (m²)	Indicative wind (kN)	Regulatory (kN)
1	6.10	4.79	29.20	-	1.37
1	5.33	4.79	25.55	-	1.20
1	6.10	2.90	17.65	-	1.37
1	5.33	2.90	15.44	-	1.20
1	3.05	4.79	14.60	-	1.00
1	6.10	2.23	13.61	-	1.37
1	5.33	2.23	11.90	-	1.20
1	2.29	4.79	10.95	-	1.00
1	3.05	2.90	8.83	-	1.00
1	3.05	2.23	6.80	-	1.00
1	2.29	2.90	6.62	-	1.00
1	2.29	2.23	5.10	-	1.00

2.5 Checks

Criterion	Source	Value	Limit	Result
Height / least width	CSA S269.2-16, 7.7.2	6.51	≤ 3	exceeded: lateral supports required (cl. 7.7.3), ties provided
Vertical tie spacing	CSA S269.2-16, 7.7.3.1	3.86 m	≤ 3 × width = 4.57 m	met
Horizontal tie spacing	CSA S269.2-16, 7.7.3.1	6.10 m	≤ 3 bays (9.14 m)	met
Sole plate pressure	CSA S269.2-16, 7.7.8.6 a)	22.5 kPa	≤ 75 kPa	met
Safety factor against overturning	CSA S269.2-16, 7.7.1	-	≥ 2	not calculated by the tool



2.6 Points to note printed on the plan

- 13 parts without an equivalent in the Entreprise Démo TektonAI catalogue: the generic parts stay on the drawing (ANC-T, ECH-CAD, GOU-AC, LGC-10', LGC-5', LGC-5'B, PGC-42, PLI-10', PLI-5', PLI-5'B, PTR-10', SEM-2x10, VER-24).

Calculations this note does not make

- Façade: wind not calculated; site relief and importance category not given (NBC 2020, Article 4.1.7.4 and Table 4.1.7.3). The calculation will be added to the revision that takes the user's answer.
- Façade, working platforms at intermediate levels not provided: extent of the work not given; working platform at the top level only.
- Façade, soil bearing capacity not checked: soil report not provided.
- Façade, capacity of standards, screw jacks or casters and ties not checked: manufacturer data sheet not provided.
- Overturning (factor of 2, CSA S269.2-16, clause 7.7.1) and bracing (2% of loads, clause 7.7.4.3) of each element.
- Capacity of couplers and bracing (CSA S269.2-16, clause 7.3).

Sources (clauses)

- CSA S269.2-16, Access scaffolding for construction purposes: clauses 6.2.2, 6.2.3, 6.2.4, 6.2.6, 6.3, 6.4, 7.1, 7.3, 7.5, 7.7.1, 7.7.2, 7.7.3, 7.7.4.3, 7.7.8.6 and 7.8.2.
- NBC 2020 (National Building Code of Canada, Volume 1, Division B): Article 4.1.7.3 (Table 4.1.7.3, Sentences 5) and 8)), Article 4.1.7.4, Appendix C, Table C-2; Structural Commentaries, Commentary I, Fig. I-17 to I-19.
- Quebec: CSTC (Safety Code for the construction industry, CQLR, c. S-2.1, r. 4), subdivision 3.9 (ss. 3.9.1 to 3.9.26) and s. 2.4.1, para. 2 (engineered drawings); CSA S269.2-16 (design) and CSA Z797:23 (erection and use).

Engineer's review

I, the undersigned, have checked the assumptions and calculations of this note for plan ECH-261023-F506, revision A.

Name	
Professional order and licence no.	
Date	
Opinion	☐ Compliant ☐ Compliant with reservations ☐ Not compliant
Signature and seal	
Remarks	

