BUILDING ENERGY-LOSS
COMPARISON
Tower / Terrace / Town House

Sprawl http://www.theyorkshirelad.ca/New.Nanaimo.Center/pudpn/Of%20the%20Stones.pdf is THE issue in addressing urban sustainability. We have allowed indiscriminate development to run rampant over the immediate urban surrounds for too long.

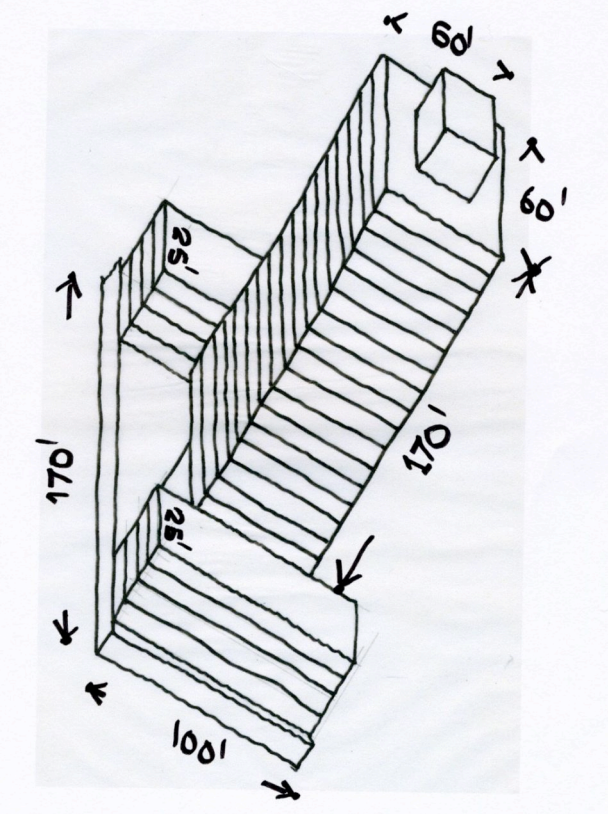
This essay attempts to make the case for densifying the inner city by means of a range of building typologies sited on one specific, typical, inner city parcel 170' x 100' - 17,000 sq. ft.

Technology can provide an array of other energy saving techniques; heat pumps, protracted public transit lines etc, but not as part of this comparison. And for obvious reasons neither is the singlefamily
dwelling.
Assumptions are inevitable. Inner-city downtown development is rife with conflicting opinions: high / medium densities, high-rise/low-rise, urban amenity, faux heritage, views and incremental diversity. However if we agree that a sustainable urban environment is the priority please proceed.

The debate will not be settled here but at least these comparisons shed light on an issue fraught with emotion and controversy.

COMPOSITE

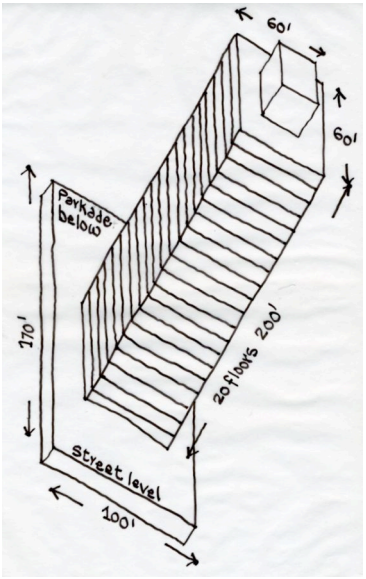
Site area: 17,000 sq. ft.
Site coverage: 51%
Foot print: 8,600 sq. ft.
Tower floors: 17
Town/terrace floors: 4
Tower gross floor area: 61,200 sq. ft.
Town/terrace gross floor area: 20,000 sq ft.
Total complex floor area: 81,200 sq. ft.
Total enclosed livable volume: 812,000 cu. ft.
Enclosing surfaces: 133,000 sq. ft.
Basement 100% parkade.



This design combines three of the following urban building typologies: tower, terrace and town house, and is the datum upon which the other typologies are compared. It addresses incremental streetscapes, urban ambience and shields an arboreal inner courtyard.

Town/terrace sides are assumed party walls.
Underside of the tower is exposed.
Heat loss depends upon rain screen design.

TOWER

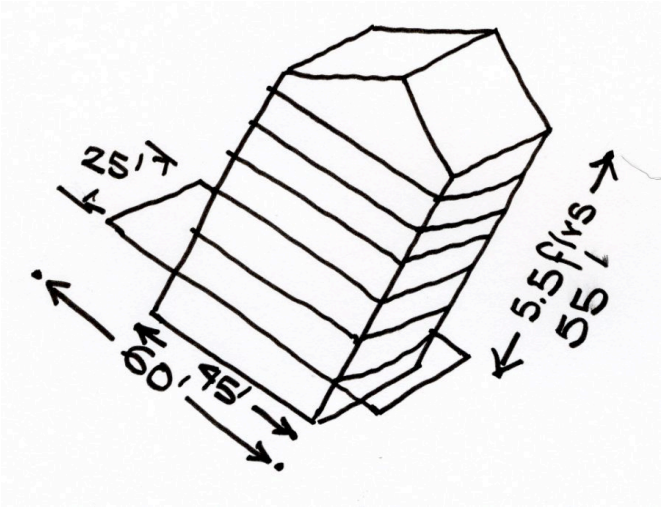


Site area: 17,000 sq. ft.
Site coverage: 21 %
Footprint: 3,600 sq. ft.
Tower floors: 20.
Gross floor area: 72,000 sq. ft.
Livable volume: 720,000 cu. ft.
Enclosing surfaces: 51,600 sq. ft.
Basement 100% parkade.
This tower configuration does nothing for surrounding street continuity, incremental texture or urban ambience. A creation of the 1960's the stand-alone tower is the object of much resistance. It is no longer an acceptable urban intervention.
Heat loss dependent upon rain screen design.

TERRACE

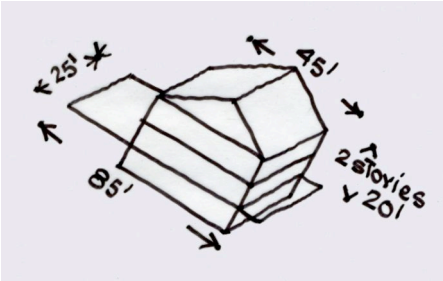
ONE UNIT.
Site area: 1,500 sq. ft.
Site coverage: 75%
Footprint: 1,125 sq. ft.
Gross floor area: 6,750 sq. ft.
Floors: 5.5
Livable volume: 61,875 cu. ft.
Enclosing surface: 8,950 sq. ft.
Basement 100% parkade.

8 UNITS.
Site area: 17,000 sq. ft.
Site coverage: 53%
Footprint: 9,000 sq. ft.
Gross floor area: 54,000 sq. ft.
Floors: 5.5
Livable volume: 495,000 cu. ft.
Enclosure surface: 32,800 sq. ft.
Basement 100 % parkade.



The 5.5 storey row terrace with basement, ubiquitous in the Bayswater area of London UK, does not have traction on the west coast of Canada. Perhaps its day has come.
Heat loss depends upon rain screen design.

TOWN HOUSE



ONE UNIT.
Site area: 2,125 sq. ft.
Site coverage: 53%
Footprint: 1,125 sq. ft.
Gross floor area: 2,250 sq. ft.
Floors: 2
Livable volume: 22,500 cu. ft.
Enclosure surfaces: 4,500 sq. ft.
Basement 100% parkade.

8 UNITS.
Site area: 17,000 sq. ft.
Site coverage: 53%
Footprint: 9,000 sq. ft.
Gross floor area: 18,000 sq. ft.
Livable volume: 180,000 cu. ft.
Enclosure surface: 18,500 sq. ft.
Basement 100 % parkade.
Town houses are always configured in rows.
Accordingly units are compared in multiples.
Town houses are very popular on the west coast of Canada.
Heat loss depends upon rain screen design.

This essay compares four building types on a small city lot using common criteria: density, urban ambience, incremental streetscape and scale. Recognizing that the site is unfavourable to terraces and townhouses, it is nevertheless typical of the traditional inner city. The point is if we wish to preserve incrementally scaled, diversified streetscapes, assembling large tracts on inner city land to accommodate rows would decimate the purpose and line the street with continuous faux facades. Therefore, allowing 6,000 cu. ft. per urban dweller, a considerable luxury in most of the world:

Composite yields: 81,200 sq. ft. floor area; 133,000 sq. ft. enclosure; 135 persons; 1 cu. ft. volume = 6.2 sq. ft. ext. surface.
Tower yields: 72,000 sq. ft. floor area; 51,600 sq. ft. enclosure; 120 persons; 1 cu. ft. volume = 14 sq. ft. ext. surface.
Terraces yield: 54,000 sq. ft. floor area; 32,800 sq. ft. enclosure; 83 persons; 1 cu. ft. volume = 16 sq. ft. ext. surface.
TH's yield: 18,000 sq. ft. floor area; 18,500 sq. ft. surface enclosure; 30 persons; 1 cu. ft. volume = 9.7 sq. ft. ext. surface.

The genre high-rise is received, justifiably, with opposition: usually on the basis of lost views and familiar streets. The question arises, however . . . what are our priorities in the early part of the 21st century? If our commitment is to sustainability then empty, nostalgic rhetoric is unacceptable: we must reconsider our life-styles, use of our cars, and redress out-dated urban land economics. I am surprised no one has made this comparison before! I am surprised I haven't!

http://www.alternet.org/envirohealth/47728/

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