

## RESULTS

**PROJECT #: TPLX1-U3-NORTH. 0 || CSA F280**



**These results have been generated by The TECA Heat Loss & Heat Gain Calculator (V5.08), which is CSA F280 Verified**

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*The heating and cooling loads calculated with this calculator tool are the sole responsibility of the user. This tool is to aid the user in applying to the CSA F280-12 calculation methods. The Thermal Environmental Comfort Association of BC accepts no responsibility for damages whatsoever, and offers no guarantee of equipment sizing or configuration.*

## BUILDING INFORMATION

**CALCULATIONS PERFORMED FOR:** BC MINISTRY OF HOUSING

### CALCULATIONS PERFORMED BY

|             |                            |
|-------------|----------------------------|
| NAME        | TODD BACKUS                |
| COMPANY     | TECA                       |
| ADDRESS     | PO BOX 73105, EVERGREEN RO |
| CITY        | SURREY                     |
| PROVINCE    | BC                         |
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### SOFTWARE LICENSING

|         |
|---------|
| COMPANY |
| NAME    |
| REG. #: |



|                 |                |
|-----------------|----------------|
| PROJECT #:      | TPLX1-U3-NORTH |
| ADDRESS:        |                |
| CITY:           | PRINCE RUPERT  |
| PROVINCE:       | BC             |
| POSTAL CODE:    |                |
| BUILDING MODEL: | TPLX-01-UNIT 3 |
| SITE:           | NORTH          |
| LOT:            |                |



|                                |                                                             |                    |   |                          |
|--------------------------------|-------------------------------------------------------------|--------------------|---|--------------------------|
| DESIGNER OF BUILDING DRAWINGS: | Leckie Studio Architecture + Design Inc.                    |                    |   |                          |
| DATE OF DRAWINGS:              | September 6, 2024                                           |                    |   |                          |
| BUILDING ATTACHMENT:           | Single Unit in Multi-Unit Building (stacked dwelling units) |                    |   |                          |
| NUMBER OF FLOOR LEVELS:        | 4                                                           | NUMBER OF STOREYS: | 3 | above grade floor levels |

|                                            |                                           |                        |         |
|--------------------------------------------|-------------------------------------------|------------------------|---------|
| <b>WEATHER DATA</b>                        | Prince Rupert                             |                        |         |
| <b>LATITUDE:</b>                           | 54.32                                     | <b>LONGITUDE:</b>      | -130.32 |
| <b>Summer Mean Daily Temperature Range</b> | 6 °C                                      | <b>WINDOW SHADING:</b> | NO      |
| <b>VENTILATION SYSTEM</b>                  | Non-dedicated HRV, 45CFM, ASE0.65, ATRE:0 |                        |         |
| <b>HEATING SYSTEM</b>                      | forced air (central system with ductwork) |                        |         |

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|                                         |     |
|-----------------------------------------|-----|
| <b>FRONT OF HOUSE FACING DIRECTION:</b> | S   |
| <i>is this value assumed?</i>           | yes |

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|                                            |                                                    |
|--------------------------------------------|----------------------------------------------------|
| <b>AIR TIGHTNESS / INFILTRATION</b>        | ACH50: 1.5, ELA: 138.4 cm <sup>2</sup> , ELA @10Pa |
| <i>is the air tightness value assumed?</i> | yes                                                |

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|                                 |                     |
|---------------------------------|---------------------|
| <b>BUILDING SITE SHIELDING:</b> | Low crops, x/H > 20 |
|---------------------------------|---------------------|

|                              |                       |
|------------------------------|-----------------------|
| <b>LOCAL WALL SHIELDING:</b> | Light local shielding |
|------------------------------|-----------------------|

|                              |                       |
|------------------------------|-----------------------|
| <b>LOCAL FLUE SHIELDING:</b> | Light local shielding |
|------------------------------|-----------------------|

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|                                    |                       |   |
|------------------------------------|-----------------------|---|
| <b>INDOOR DESIGN TEMPERATURES:</b> | <b># OF BEDROOMS:</b> | 2 |
|------------------------------------|-----------------------|---|

|                              |                     |   |
|------------------------------|---------------------|---|
| <b>HEATING:</b> 22°C, 71.6°F | <b># OF PEOPLE:</b> | 3 |
|------------------------------|---------------------|---|

|                              |  |  |
|------------------------------|--|--|
| <b>COOLING:</b> 24°C, 75.2°F |  |  |
|------------------------------|--|--|

|                                     |  |  |
|-------------------------------------|--|--|
| <b>OUTDOOR DESIGN TEMPERATURES:</b> |  |  |
|-------------------------------------|--|--|

|                              |  |  |
|------------------------------|--|--|
| <b>HEATING:</b> -13°C, 8.6°F |  |  |
|------------------------------|--|--|

|                              |  |  |
|------------------------------|--|--|
| <b>COOLING:</b> 19°C, 66.2°F |  |  |
|------------------------------|--|--|

|                                |  |  |
|--------------------------------|--|--|
| <b>SOIL TEMPERATURE:</b> 10 °C |  |  |
|--------------------------------|--|--|

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**Attached documents:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Assumptions noted (in addition to listed assumptions on page 1):** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Notes from the calculator operator:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## **BUILDING ENVELOPE ELEMENTS**

### **WALLS**

1/ (TYP. EXT. WALL: R-22), inside wall, // 1/2" GWB, // framing w/ cavity insulation: softwood (default), 2x6 framing @ 16"OC, R20 (5.5"), // Sheathing materials, Softwood plywood, // Insulation, Mineral wool and glass fibre, // Cladding materials, Vinyl siding, outside air; 22.42R-VALUE

### **CEILINGS**

1/ (TYP. ROOF: R-32), inside ceilings, // 1/2" GWB, // framing w/ cavity insulation: softwood (default), 2x6 framing @ 24"OC, custom insulation, // Sheathing materials, Softwood plywood, // Roofing materials, Built-up roofing, outside air; 32.01R-VALUE

### **INTERIOR FOUNDATION WALL**

### **EXPOSED FLOOR**

1/ (TYP. EXPOSED FLOOR), inside floor, // Finished floor w/ underlay, // 3/4" ply, // framing w/ cavity insulation: softwood (default), 2x12 joists @ 16"OC, R35 (9.25"), // Exterior finished material, // outside air; 30.98R-VALUE

### **EXPOSED HEADER**

1/ (TYP. HEADER: R-22); 22R-VALUE

### **WINDOWS**

1/ (Windows (Energy Modelling Requirements)) custom, USI: 1.3, SHGC: 0.25

### **SKYLIGHTS**

1/ (SKYLIGHT) double glazed, Fixed — Wood/Vinyl, insulating, low-E, 13mm Air, USI: 1.96, SHGC: 0.47

### **DOORS**

1/ (EXT. DOOR) Insulated metal — Polyurethane core, without storm door, USI: 0.91

### **SHADINGS**

### **FOUNDATIONS**

1/ [Heated Crawlspace] Concrete Slab & Walls, insulation: below slab = 2.64RSI, interior wall = 2.11RSI, exterior wall = 2.11RSI (configuration #69) // any first storey construction type, interior surface of wall insulated over full-height, exterior surface of wall insulated over full-height, sub-surface of floor slab fully insulated but no insulation under footings, thermal-break between walls and floor slab // AREA: 81ft<sup>2</sup>, FULL PERIMETER: 55ft, EXPOSED PERIMETER: 29ft

HEAT LOSS & HEAT GAIN SUMMARY, (BTUH)

imperial

▼

| ROOM NAME           | FLOOR LEVEL | FL AREA (ft²) | HEAT LOSS | HEAT GAIN    |                           |
|---------------------|-------------|---------------|-----------|--------------|---------------------------|
|                     |             |               | TOTAL     | SENS.        | TOTAL (sensible + latent) |
| (#1)HEATED CRAWL-U3 | 1           | 84            | 1538      |              |                           |
| (#2)109-ENTRY       | 2           | 65            | 1876      |              |                           |
| (#3)202-KITCHEN     | 3           | 233           | 1875      | 2780         | 3614                      |
| (#4)203-LIVING      | 3           | 220           | 1859      | 2680         | 3484                      |
| (#5)304-LANDING     | 4           | 124           | 1255      | 703          | 914                       |
| (#6)305-WASHROOM    | 4           | 40            | 85        | 20           | 26                        |
| (#7)306-BEDROOM 1   | 4           | 136           | 690       | 125          | 163                       |
| (#8)307-BEDROOM 2   | 4           | 136           | 1651      | 799          | 1039                      |
|                     |             | AREA          | HEAT LOSS | GAIN (sens.) | GAIN (total)              |
| OVERALL BUILDING    |             | 1038          | 10830     | 7107         | 9239                      |

| HEAT LOSS COMPONENT BREAKDOWN, (BTUH) |      |         |       |                   |              |            |         |             |              |            |       |
|---------------------------------------|------|---------|-------|-------------------|--------------|------------|---------|-------------|--------------|------------|-------|
| ROOM NAME                             | WALL | CEILING | FLOOR | WINDOW & SKYLIGHT | DOOR & HATCH | FOUNDATION | LEAKAGE | VENTILATION | DISTRIBUTION | ADDITIONAL | TOTAL |
| (#1)HEATED CRAWL-U3                   | 106  |         |       |                   |              | 345        | 660     | 426         |              |            | 1538  |
| (#2)109-ENTRY                         | 577  |         |       |                   | 484          |            | 495     | 320         |              |            | 1876  |
| (#3)202-KITCHEN                       | 701  |         |       | 901               |              |            | 166     | 107         |              |            | 1875  |
| (#4)203-LIVING                        | 687  |         |       | 901               |              |            | 164     | 106         |              |            | 1859  |
| (#5)304-LANDING                       | 594  | 230     |       | 339               |              |            | 56      | 36          |              |            | 1255  |
| (#6)305-WASHROOM                      |      | 79      |       |                   |              |            | 4       | 2           |              |            | 85    |
| (#7)306-BEDROOM 1                     | 192  | 268     |       | 180               |              |            | 31      | 20          |              |            | 690   |
| (#8)307-BEDROOM 2                     | 474  | 268     |       | 180               | 606          |            | 74      | 48          |              |            | 1651  |
|                                       |      |         |       |                   |              |            |         |             |              |            |       |
|                                       |      |         |       |                   |              |            |         |             |              |            |       |
|                                       |      |         |       |                   |              |            |         |             |              |            |       |
| TOTAL BUILDING                        | 3332 | 844     |       | 2502              | 1091         | 345        | 1651    | 1065        |              |            | 10830 |

**PROJECT #: TPLX1-U3-NORTH. 0**

| HEAT GAIN<br>COMPONENT<br>BREAKDOWN, (BTUH) |      |         |       | WINDOW &<br>SKYLIGHT | DOOR & HATCH |         |             | DISTRIBUTION &<br>ADDITIONAL | INTERNAL | TOTAL SENSIBLE | TOTAL SENSIBLE<br>+ LATENT |
|---------------------------------------------|------|---------|-------|----------------------|--------------|---------|-------------|------------------------------|----------|----------------|----------------------------|
|                                             | WALL | CEILING | FLOOR |                      |              | LEAKAGE | VENTILATION |                              |          |                |                            |
| ROOM NAME                                   | WAL. | CEI.    | FLR.  | WIN.                 | DR.          | LEAK.   | VENT.       | DIST.                        | INT.     | SENS.          | TOTAL                      |
| (#1)HEATED CRAWL-U3                         |      |         |       |                      |              |         |             |                              |          |                |                            |
| (#2)109-ENTRY                               |      |         |       |                      |              |         |             |                              |          |                |                            |
| (#3)202-KITCHEN                             |      |         |       | 1207                 |              | -24     | -125        |                              | 1723     | 2780           | 3614                       |
| (#4)203-LIVING                              |      |         |       | 1093                 |              | -22     | -114        |                              | 1723     | 2680           | 3484                       |
| (#5)304-LANDING                             |      | 66      |       | 738                  |              | -16     | -84         |                              |          | 703            | 914                        |
| (#6)305-WASHROOM                            |      | 22      |       |                      |              | 0       | -2          |                              |          | 20             | 26                         |
| (#7)306-BEDROOM 1                           |      | 76      |       | 66                   |              | -3      | -15         |                              |          | 125            | 163                        |
| (#8)307-BEDROOM 2                           |      | 76      |       | 66                   | 770          | -19     | -95         |                              |          | 799            | 1039                       |
|                                             | WAL. | CEI.    | FLR.  | WIN.                 | DR.          | LEAK.   | VENT.       | DIST.                        | INT.     | SENS.          | TOTAL                      |
| TOTAL BUILDING                              |      | 241     |       | 3170                 | 770          | -85     | -435        |                              | 3446     | 7107           | 9239                       |

**MINIMUM INSTALLED OUTPUT CAPACITY:** 7391

## **MECHANICAL SYSTEM SIZING**

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### **HEATING**

- The heating system capacity must meet or exceed 100% of the total building heat loss (the minimum installed system capacity equals the total heat loss for the building)
- The combined capacity of the heating distribution system must meet or exceed 100% of the heat loss of the room or space that it serves.

### **COOLING**

- The installed system cooling capacity must meet or exceed 80% of the nominal cooling system capacity (*reflected in the MINIMUM INSTALLED CAPACITY shown for cooling*).
- The installed system cooling capacity shall not be less than the nominal system cooling capacity minus 1800W (*reflected in the MINIMUM INSTALLED CAPACITY shown for cooling*).
- If the cooling system is added to an existing heating system, its capacity (in Watts) need not exceed 18 times the air-handling capacity of the heating system (in L/s).
- Except for ground or water source heat pumps used for cooling, the installed cooling system capacity shall not exceed 125% of the nominal cooling system capacity for the building.
- If the nominal cooling system capacity for the building is less than 6000 W, the installed cooling system capacity may exceed the nominal cooling system capacity by up to 1750 W.
- Note that the nominal cooling system capacity incorporates a latent load multiplier value of 1.3 (unless specified otherwise). Most residential cooling units have a latent capacity of approximately 30% of the sensible capacity. For houses with very small latent loads (if the humidity values are entered by the user directly), it is important to mind the calculation factors. Equipment sizing must be done with individual consideration of sensible and latent loads.