c/o REHAU Industries, Inc.
1250 Corona Pointe Court
Suite 301
Corona, CA 92879
Phone: 951-549-9017

# Load Details

**CSA Load Calculation**

Project #:RCP-210510374

## Project Information

Project #: RCP-210510374
Name: Poplar Pointe
Location: Red Deer, AB

Notes: Heat loss calculation based on CSA F280 data for Red Deer, Alberta.
Design based on information provided by EMCO Red Deer, via plans, email correspondences and design request form.
Radiant capacities based on Delta-T of 20 F. Radiant outputs based on bare concrete throughout.
Based on max recommended floor temp (85F) some supplemental is required
Construction R-Values; Wall= R-20, Ceiling= R-28, Floors=R-10, Doors=R-3.5, Windows=R-3.5, contractor to review and confirm.
With the exception of thermostats, floor sensors, zone actulators and zone control modules, controls are not included on materials list. Mechanical room components by others.
Flush mounted manifold cabinets added as option. Screed cover-plate not included.
Contractors should work with other trades to ensure pipe is routed away from floor drains, reserved areas and protected from possible damage that could occur during construction, specially where pipes are passing under a partition wall and cabinetries.

## CSA Load Details

**Total Heating: 87,623 Btu/hr** **Total Cooling: 0 Btu/hr** **Latent Factor: 1.3**

### Outdoor Conditions

| | |
|---|---|
| Location: | Red Deer, Alberta |
| Latitude: | 52 |
| Soil Temp: | 41.0 °F |
| Heating Design Temp: | -25.6 °F |

### Indoor Conditions

| | |
|---|---|
| Heating Room Temp: | 72 °F |
| Heating Design ΔT: | 97.6 °F |

### Infiltration

| | |
|---|---|
| Stories: | One |
| Air Tightness: | Present (1961-Current) |
| Building Site: | Suburban, forest |
| Walls Shielding: | Very heavy |
| Flue Shielding: | Heavy |
| Building Type/Foundation: | Detached/ Full |
| Flue Diameters: | 4 in, 4 in, 4 in, 4 in |

### Ventilation

| | |
|---|---|
| Num Occupants: | 4 |
| | **Heating** |
| Air Changes: | 0.00 /hr |
| Flowrate: | 0 cfm |
| Effectiveness: | 0.5 |

(*) Heating: apparent sensible effectiveness of the HRV; Cooling: adjusted total recovery efficiency of the HRV/ERV
Length = ft Area = ft² Temperature = °F Flowrate = USGPM Air Flow = cfm Heat Loss = Btu/hr Unit Heat Loss = Btu/(hr·ft²) Rv = hr·ft²·°F/btu
Head Loss = ft water RH = Radiant Floor Heating BB = Baseboard FA = Forced Air OTH = Other Heating SM = Snowmelt N = Not Heated

Created Using LoopCAD 2021 REHAU (5/21/2021)
Version:21.0.0096 R

**See end of report for important Notes and Disclaimers.**

| | |
|---|---|
| Building Volume / Height: | 31,295 ft³ / 9' |
| Heating Air Changes: | 0.32 /hr |

## Floorplan/Levels

| | | | |
|---|---|---|---|
| Main Floor | 3,477 ft² | Total Heated Area: | 3,477 ft² |
| | | Total Cooled Area: | 0 ft² |

## Constructions

### Doors

| Description | R-Value | Area | Heating |
|---|---|---|---|
| R-3.5 Doors | 4 | 569 | 15,871 |

### Walls

| Description | R-Value | Area | Heating |
|---|---|---|---|
| R-20 Walls | 20 | 3,492 | 17,039 |

### Ceilings

| Description | R-Value | Area | Heating |
|---|---|---|---|
| R-28 Ceilings | 28 | 3,477 | 12,121 |

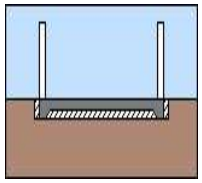
## Glazing

### Windows

| Description | Exposure | R-Value | SHGC | Area | Heating |
|---|---|---|---|---|---|
| R-3.5 Windows | N | 4 | 0.45 | 267 | 7,437 |
| R-3.5 Windows | E | 4 | 0.45 | 105 | 2,931 |
| R-3.5 Windows | S | 4 | 0.45 | 102 | 2,837 |
| R-3.5 Windows | W | 4 | 0.45 | 109 | 3,046 |

### Foundations

| ID | Code | Description | Area | Heat Loss | Options |
|---|---|---|---|---|---|
| F0 | SCB_29 | Slab Floors | 3,477 | 8,884 | Slab Insulation: 10.0 hr·ft²·°F/btu |



**F0**

### Description

SCB_29
- concrete or soil (for crawl space) floor
- bottom of slab fully insulated except under footing/foundation wall (ie. Insulation starts 0.25 m from edge)
- thermal break around edge of slab
- first storey is non-brick veneer or bricks thermally broken from concrete floor

### Options

Slab Insulation: 10.0 hr·ft²·°F/btu

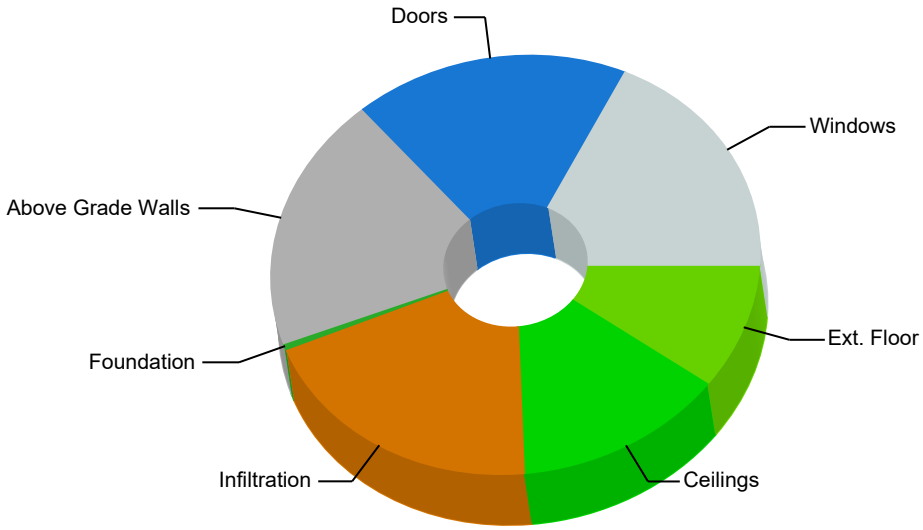
## Duct Loads

All ducts are in conditioned space.

### Load Breakdown

| Name | Heat Loss |
|---|---|
| Windows | 16,252 |
| Doors | 15,871 |
| Skylights | 0 |
| Above Grade Walls | 17,039 |
| Exposed Floors | 0 |
| Foundation | 427 |
| Infiltration | 17,456 |
| Ceiling | 12,121 |
| Duct Loads | 0 |
| Ventilation | 0 |
| Internal Loads | 0 |
| Other Loads | 0 |
| External Floor Radiant Panel Loss | 8,457 |
| Internal Floor Radiant Panel Loss | 0 |
| Total Sensible | 87,623 |
| Latent Gain | 0 |
| Total Load | 87,623 |
| Total Area | 3,477 ft² |

### Heat Loss Breakdown



## Heating Zones

| Zone | Area | Room Temp | Total Load |
|---|---|---|---|
| Zone 101 | 276 | 72 | 9,096 |
| Zone 102 | 302 | 72 | 8,063 |
| Zone 103 | 1,051 | 72 | 28,682 |
| Zone 104 | 1,018 | 72 | 20,692 |
| Zone 105 | 830 | 72 | 21,089 |

## Heating Rooms

| Room | Area | Room Temp | Total Load |
|---|---|---|---|
| Bedroom 1 | 174 | 72 | 2,537 |
| Bedroom 2 | 180 | 72 | 5,727 |
| Dining/Kitchen | 451 | 72 | 12,968 |
| Dressing | 99 | 72 | 1,306 |
| Ensuite | 204 | 72 | 6,757 |
| Garage | 830 | 72 | 21,089 |
| Hall | 192 | 72 | 3,426 |
| Laundry | 72 | 72 | 790 |
| Living | 356 | 72 | 5,364 |
| Main Entry | 163 | 72 | 6,661 |
| Master Bedroom | 276 | 72 | 9,096 |
| Mudroom | 113 | 72 | 3,385 |
| Shower/Bath | 108 | 72 | 1,191 |
| Storage0 | 145 | 72 | 3,091 |
| Study 6 | 80 | 72 | 3,689 |
| W/C | 35 | 72 | 546 |

## Disclaimers

With the permission of Canadian Standards Association, material is reproduced from CSA Standard, CSA F280-12 (Revision 2 June 2018), Determining the Required Capacity of Residential Space Heating and Cooling Appliances which is copyrighted by Canadian Standards Association, 178 Rexdale Blvd., Toronto, Ontario, M9W 1R3, www.shopcsa.ca. While use of this material has been authorized, CSA shall not be responsible for the manner in which the information is presented, nor for any interpretations thereof.

Cold weather humidification, or some lifestyles that produce excessive moisture, may cause condensation to occur if the absolute humidity of the indoor air is too high for the momentary circumstances. Condensation can occur on surfaces or concealed within the structure, and can lead to mold, mildew, frost damage, and moisture damage. The software does not perform calculations for the estimation or detection of possible condensation problems, and it is the designers (i.e. software users) responsibility to do so independently if required.

This technical information is provided only for general quotation purposes and is based in part on information you provided. No representations, warranties, or guarantees are made regarding the suitability of REHAU technical information to meet code requirements for any particular project, nor regarding the accuracy of the costing of any project based upon this information.

This technical information is not intended to be used as final drawings or specifications and is provided only as an aid in architect's/engineer's development of the final Specification and is not intended as a substitute for sound architectural/engineering judgment. The architect/engineer shall be responsible to convert this technical information into a final Specification that meets the functional and aesthetic needs of its client, as well as complying with all applicable codes and local climate conditions. 

IN NO EVENT WILL AVENIR SOFTWARE INC. (“AVENIR”) OR ITS AFFILIATES BE LIABLE UNDER ANY CONTRACT, NEGLIGENCE, STRICT LIABILITY OR OTHER LEGAL OR EQUITABLE THEORY FOR ANY CONSEQUENTIAL, INCIDENTAL, INDIRECT OR SPECIAL OR PUNITIVE DAMAGES WHATSOEVER (INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION OR DATA AND THE LIKE), EVEN IF SUCH PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. AVENIR’S CUMULATIVE LIABILITY FROM ANY CAUSE RELATED TO OR ARISING FROM THE USE THIS REPORT, AND REGARDLESS OF THE FORM OF THE ACTION, SHALL BE LIMITED TO NO GREATER THAN THE AMOUNT OF FEES PAID TO AVENIR UNDER THE SOFTWARE LICENSE AGREEMENT.