# Thermal Comfort

### CREDIT 14

### DESIGN REVIEW SUBMISSION AS BUILT SUBMISSION

|  |  |  |  |
| --- | --- | --- | --- |
| TOTAL POINTS AVAILABLE: | 2 | POINTS CLAIMED: | [#] |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Criteria** | **Description** | **Points Available** | **Points Claimed** |
| **14.1** | **Thermal Comfort** | A high degree of thermal comfort is provided to occupants in the space, equivalent to 80% of all occupants being satisfied in the space. | 1 |  |
| NA |  |
| **14.2** | **Advanced Thermal Comfort** | A high degree of thermal comfort is provided to occupants in the space, equivalent to 90% of all occupants being satisfied in the space. | 1 |  |
| NA |  |

## Project-specific technical questions (formerly tcs and cirs)

|  |  |
| --- | --- |
| There are no project-specific Technical Questions for this credit. |  |
| There are project-specific Technical Questions for this credit and all responses received from the NZGBC are attached. |  |

## 14 general

Provide a list and description of areas to be excluded from the nominated area. The Nominated Area includes all primary and secondary spaces.

Please justify if NA is claimed

Identify where this information can be found within the supporting documentation provided.

|  |  |
| --- | --- |
| **Supporting Documentation** (Name / title / description of document) | **Reference** (Page no. or section) |
| [####] | [####] |
| [####] | [####] |

Provide details of the hours of occupancy.

Identify where this information can be found within the supporting documentation provided.

|  |  |
| --- | --- |
| **Supporting Documentation** (Name / title / description of document) | **Reference** (Page no. or section) |
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14.1 thermal comfort

Please select the compliance pathway(s) used to demonstrate that this criterion has been met:

|  |  |
| --- | --- |
| **14.1.1 Naturally Ventilated Spaces**  Thermal comfort is demonstrated as being within 80% Acceptability Limit 1 of ASHRAE 55-2013. |  |
| **14.1.2A Mechanically Ventilated Spaces – Prescriptive**  Thermal Comfort is demonstrated by meeting the prescriptive thermal comfort requirements. |  |
| **14.1.2B Mechanically Ventilated Spaces – PMV**  Thermal comfort is demonstrated with a PMV model where PMV levels between ±1.0 (inclusive) are achieved. |  |

14.2 advanced thermal comfort

Please select the compliance pathway(s) used to demonstrate that this criterion has been met:

|  |  |
| --- | --- |
| **14.2.1 Naturally Ventilated Spaces**  Thermal comfort is demonstrated as being within 90% Acceptability Limit 1 of ASHRAE 55-2013, in accordance with 14.1.1. |  |
| **14.2.2 Mechanically Ventilated Spaces** Thermal comfort is demonstrated with a PMV model where PMV levels between ±0.5 (inclusive) are achieved, in accordance with 14.1.2B. |  |

Provide a general description of how the project meets the compliance pathway(s) selected above.

Complete the relevant section(s) that follow based on the compliance pathway(s) selected.

14.1.1 & 14.2.1 - Naturally Ventilated Spaces

|  |  |
| --- | --- |
| Thermal comfort for the project has been designed in accordance with ASHRAE Standard 55-2013. |  |
| Temperature range that the project has been shown to be within the nominated percentage of Acceptability Limit 1 of 55-2013, achieved during 98% of the year, during the specified hours of occupancy. | [80% or 90%] |

Provide a description of how the project meets the above requirements:

*A summary of the thermal comfort modelling report, a producer statement, or calculations for the space.*

*A description of how the space meets the acceptability limits as per ASHRAE 55-2013.*

Identify where this information can be found within the supporting documentation provided.

|  |  |
| --- | --- |
| **Supporting Documentation** (Name / title / description of document) | **Reference** (Page no. or section) |
| [####] | [####] |
| [####] | [####] |

14.1.2A Mechanically Ventilated Spaced – Prescriptive

|  |  |
| --- | --- |
| The project is located in climate zones 1-3, as identified on the climate zone map in H1/VM1 5th edition and H1/VM2 1ST edition. |  |

All of the following conditions have been achieved (for at least 95% of the nominated area):

|  |  |
| --- | --- |
| **HVAC System requirements:** |  |
| Dry Bulb Temperature in space is controlled to minimum 20°C to maximum 24°C. |  |
| Relative humidity controlled between 40% and 60%. |  |
| Air velocity is not more than 0.2 m/s and no supply is directed at occupants (except where they have direct control over air flow and/or direction). |  |
| Modulation/turn down capability, i.e. the ability to maintain dry bulb temperature and relative humidity at low space loads. |  |
| The HVAC system has separate internal and perimeter zones with independent temperature controls which meet the following maximum zone size requirements (for at least 95% of the nominated area):   * 75m2 perimeter zones; * 120m2 internal zones; * No perimeter zone serves more than one orientation unless the second orientation is negligible (<4m perimeter length). |  |
| The perimeter zones must have a maximum depth of 4m, with exceptions permitted for small enclosed spaces at the discretion of the mechanical engineer. |  |
| **Building Façade requirements:** |  |
| SHGC of façade glazing is 0.3 or lower; OR Maximum solar heat gain through the glass is calculated to be no greater than 250W/m2 peak. |  |
| Total glazing U-Value (inclusive of glass and frame) is 3.0 W/m2.K or lower. |  |

Provide a description of how the project meets the above requirements:

*Details of the HVAC design and performance criteria, referencing any justification, tender drawings and evidence necessary.*

*A summary of how each of the above criteria has been met, referencing supporting information.*

Identify where this information can be found within the supporting documentation provided.

|  |  |
| --- | --- |
| **Supporting Documentation** (Name / title / description of document) | **Reference** (Page no. or section) |
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14.1.2B & 14.2.2 Mechanical ventilation – PMV

Thermal comfort has been calculated in accordance with either ISO7730-2005 or ASHRAE Standard 55-2013, during hours of occupancy for 98% of the year, using metabolic rate and air velocity values from the following table.

|  |  |  |
| --- | --- | --- |
| **Modelling Inputs** | | |
| **The Standard used:** | [ISO 7730-2005 or ASHRAE 55-2013] | |
| **Modelling Variable** | **Information Source** | **Areas Applied** |
| Hours of Occupancy |  |  |
| Clothing value (CLO) |  |  |
| Metabolic rate (MET) |  |  |
| Air velocity rate |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Calculating Percentage Compliance for Mechanically Ventilated Air-Conditioned Spaces** | | | | |
| **Floor** | **Zone** | **Total Area** | **PMV** | **Percentage of occupied hours with specified PMV** |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Note: Project teams may add more rows as required or use an attachment to display this information.

Evidence provided to demonstrate the compliance:

|  |  |
| --- | --- |
| A Producer Statement signed by an Accredited Energy Modeller OR |  |
| A modelling report |  |

When a modelling report is provided, please summarize how the project meets the requirements below:

*A summary of the thermal comfort calculations for the project design and demonstrating that the PMV targets are achieved.*

*A description of the methodology, weather data, and software package used for determining the thermal comfort levels.*

*A description of the HVAC system, including details of temperature, humidity, air rates, infiltration rates, control and zoning strategy.*

*The internal loads used, the usage profiles, the clothing, metabolic rate, and air movement values used, and relevant characteristics of building materials (including U-values).*

*A summary of the hourly thermal comfort results, mean radiant temperatures, air temperatures and humidity for each zone. The summary must include a tabulation of the hours where the system is within the designed range, and the hours where this is exceeded.*

Identify where this information can be found within the supporting documentation provided.

|  |  |
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| **Supporting Documentation** (Name / title / description of document) | **Reference** (Page no. or section) |
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## DISCUSSION

Outline any issues you would like to highlight and clarify for the Certified Assessor(s).

## DECLARATION

I confirm that the information provided in this document is truthful and accurate at the time of completion.

Provide author details, including name, position and email address:

[Date]

––– **Report end** –––