# Thermal Comfort

### CREDIT 14

### DESIGN REVIEW SUBMISSION AS BUILT SUBMISSION

|  |  |  |  |
| --- | --- | --- | --- |
| TOTAL POINTS AVAILABLE: | 3 | POINTS CLAIMED: | [#] |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Criteria** | **Description** | **Points Available** | **Points Claimed** |
| **13.1** | **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 |  |
| **13.2** | **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 |  |

## 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 the project’s Nominated Area. The Nominated Area includes all primary and secondary spaces.

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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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. |  |
| **Not Applicable** This project type is one of those listed in the Submission Guidelines where the ‘Advanced Thermal Comfort’ criterion is made ‘Not Applicable’. |  |

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:

*Details of the fitout’s hours of occupancy.*

*A summary of the thermal comfort modelling report 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

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) |
| [####] | [####] |
| [####] | [####] |

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.

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

*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.

|  |  |
| --- | --- |
| **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** –––