# Thermal Comfort

### Credit 13

### Design Review Submission As Built Submission

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| --- | --- | --- | --- |
| Total Points available: | 2 | Points claimed: | [#] |

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| --- | --- | --- | --- | --- |
|  | **Name** | **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. |  |

## general

Provide a list and description of the project’s nominated area. The nominated area includes all primary and secondary spaces.

Provide a description and details of any areas that have been excluded for functional reasons.

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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13.1 thermal comfort

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

|  |  |
| --- | --- |
| **13.1.1 Naturally Ventilated Spaces**  Thermal comfort is demonstrated as being within 80% Acceptability Limit 1 of ASHRAE 55-2013. |  |
| **13.1.2A Mechanically Ventilated Spaces – Prescriptive**  Thermal Comfort is demonstrated by meeting the prescriptive thermal comfort requirements. |  |
| **13.1.2B Mechanically Ventilated Spaces – PMV**  Thermal comfort is demonstrated with a PMV model where PMV levels between ±1.0 (inclusive) are achieved. |  |
| **13.1.3 Small Fitouts** The project complies with the prescriptive requirements for small fitouts. |  |
| **13.1.4 Fitout in a Green Star Rated Building** Thermal comfort for the project has been achieved and rated using a Green Star rating tool for the base building. |  |

13.2 advanced thermal comfort

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

|  |  |
| --- | --- |
| **13.2.1 Naturally Ventilated Spaces**  Thermal comfort is demonstrated as being within 90% Acceptability Limit 1 of ASHRAE 55-2013, in accordance with 13.1.1. |  |
| **13.2.2 Mechanically Ventilated Spaces** Thermal comfort is demonstrated with a PMV model where PMV levels between ±0.5 (inclusive) are achieved, in accordance with 13.1.2B. |  |
| **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.

13.1.1 & 13.2 Naturally ventilated Spaces

|  |  |
| --- | --- |
| Thermal comfort conditions for the project have been designed in accordance with ASHRAE Standard 55-2013. |  |
| The project has been shown to be within Acceptability Limit 1 of ASHRAE 55-2013, achieved during 98% of the year, for 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.

|  |  |
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| **Supporting Documentation** (Name / title / description of document) | **Reference** (Page no. or section) |
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13.1.2A Mechanical VENTILATION – Prescriptive

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

|  |  |
| --- | --- |
| Dry Bulb Temperature in space is controlled to a minimum 20°C and maximum 24°C. |  |
| Relative humidity is 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). |  |
| The system has 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:   * 75m2 perimeter zones; * 120m2 internal zones; * The perimeter zones have a maximum depth of 4m; and * No perimeter zone serves more than one orientation unless the second orientation is negligible. |  |

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.

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| **Supporting Documentation** (Name / title / description of document) | **Reference** (Page no. or section) |
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13.1.2b (& 13.2) Mechanical Ventilation – PMV

Thermal comfort has been calculated, during hours of occupancy for 98% of the year, using metabolic rate, clothing values and air velocity rates as listed in 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.

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| **Supporting Documentation** (Name / title / description of document) | **Reference** (Page no. or section) |
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13.1.3 Small Fitouts

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

|  |  |
| --- | --- |
| The fitout’s GFA is less than 500m2. |  |
| Dry Bulb Temperature in the space is controlled between 20°C and 24°C. |  |
| Relative humidity is controlled between 40% and 60%. |  |
| The HVAC has separate zones for distinct activities and with independent temperature controls and sensors. |  |
| The air velocity in the space is not more than 0.2 m/s and no supply air is directed at occupants (except where they have direct control over the air flow and/or direction). |  |

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

Details of all of the HVAC Design criteria referencing and appending any justification, tender drawings and evidence necessary.

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

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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13.1.4 Green star rated base building

|  |  |
| --- | --- |
| The ‘Thermal Comfort’ credit has been achieved as part of a Green Star rating for the base building, and no change to the base building systems have been undertaken as part of the fitout works. |  |

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

Green Star – Design & As Built or Green Star – Performance ‘Thermal Comfort’ credit compliance statement.

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 with 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** –––