



# Green Star Design & As Built NZ v1.0 Guidance for Industrial Projects

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▲ Hautapu APL Manufacturing Facility, Auckland. Bardowie Investments Limited. 5 star Green Star Industrial Design (v3)

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# Introduction: Green Star – Design & As Built NZv1.0 Guidance for Industrial Projects

If you have any other suggestions or feedback related to this guide or on how Green Star can continue improving the industrial sector, please [contact us](#).

Green Star – Design & As Built NZ v1.0 Guidance for Industrial Projects is developed for all those involved in industrial projects that aim to achieve a Green Star – Design & As Built NZ v1.0 rating, including building owners, Green Star Accredited Professionals, and contractors. This document is intended to make your work more straightforward. We encourage you to read this guidance and use it to assist with your industrial projects.

This guidance provides a set of pathways for industrial facilities targeting a Green Star – Design & As Built NZ v1.0 rating. These pathways can be applied to both speculative and tenanted projects to provide further clarity in areas of Green Star guidance that have been ambiguous for the sector.

## How was this guide developed?

In August 2020, the Green Building Council of Australia (GBCA) released the Australian version of Green Star Design & As Built Guidance for Industrial Projects, intending to reduce time and cost barriers for industrial assets to achieve Green Star – Design & As Built ratings. They worked with industrial developers and asset owners to determine the additional guidance and pathways for the industrial sector.

The New Zealand Green Building Council (NZGBC) shared this document from GBCA with the New Zealand market as soon as it was released. Since then, we have received many requests from the industry to allow for a local adaptation of this guidance. In addition, the increased number of Green Star registrations for industrial projects suggests the urgency and necessity of introducing a New Zealand industrial guidance to provide better clarity and certainty.

Based on the Australian version of Green Star Design & As Built Guidance for industrial projects, NZGBC started the adaptation review of the document in late 2021. By taking on the feedback from industrial projects in New Zealand and identifying market differences between Australia and New Zealand, NZGBC made amendments to the original Australian Guidance and created this Green Star – Design & As Built NZ v1.0 Guidance for Industrial Projects.

## What happens next?

NZGBC is committed to updating Green Star – Design & As Built NZ and subsequently a review for the next iteration of Green Star. We will continue to work with those involved in delivering industrial facilities as Green Star evolves.



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# List of Credits Involved in this Guidance

CATEGORY	CREDIT	CRITERIA
<b>Management</b>	2 Commissioning and Tuning	2.3 Building Commissioning 2.4 Building Systems Tuning
	3 Adaptation and Resilience	3.1 Implementation of a Climate Adaptation Plan
	6 Metering and Monitoring	6.1 Metering 6.2 Monitoring Systems
	8 Operational Waste	8A Performance Pathway – Specialist Prescriptive Pathway – Facilities
<b>Indoor Environment Quality</b>	Nominated Spaces	
	Common Industrial Spaces	
	9 Indoor Air Quality	9.1 Ventilation System Attributes 9.2 Provision of Outdoor Air 9.3 Exhaust or Elimination of Pollutants
	10 Internal Noise Levels	10.1 Internal Noise Levels 10.2 Reverberation 10.3 Acoustic Separation
	11 Lighting Quality	11.1 Minimum Lighting Comfort 11.2 General Illuminance and Glare Reduction 11.3 Surface Illuminance 11.4 Localised Lighting Control

<b>CATEGORY</b>	<b>CREDIT</b>	<b>CRITERIA</b>
<b>Indoor Environment Quality (cont.)</b>	12 Daylight and Views	12.1 Glare Reduction
		12.2 Daylight
		12.3 Views
	13 Indoor Pollutants	13.1 Paints, Adhesives, Sealants and Carpets
		14 Thermal Comfort
	14 Thermal Comfort	14.1 Thermal Comfort
14.2 Advanced Thermal Comfort		
<b>Transport</b>	17C Sustainable Transport	17C.1 Access by Public Transport
		17C.2 Reduced Car Parking Provision
		17C.3 Low Emission Vehicle Infrastructure
		17C.4 Active Transport Facilities
		17C.5 Walkable Neighbourhoods
		19C Prescriptive pathway: Industrial
<b>Materials</b>	19 Life Cycle Impacts	19C.1 Life Cycle Impacts - Concrete
		19C.2 Life Cycle Impacts – Steel
		19C.3 Life Cycle Impacts – Building Reuse
		19C.4 Life Cycle Impacts – Structural Timber
		28 Refrigerant Impacts
<b>Emissions</b>	28 Refrigerant Impacts	28 Refrigerant Impacts
<b>Innovation</b>		Whole Building Thermal Comfort Air Permeability Testing

# Maximising Green Star – Design & As Built for a Green Star – Performance rating

While Green Star – Design & As Built NZ v1.0 sets criteria for assessing a new building’s construction, there are benefits to aligning credits in Green Star – Design & As Built NZ v1.0 with outcomes for individual or portfolio Green Star – Performance certifications.

The following is a list of credits and outcomes that will help set up industrial assets for success in a Green Star – Performance rating:

<b>GREEN STAR – DESIGN &amp; AS BUILT NZ V1.0 CREDIT</b>	<b>GREEN STAR – PERFORMANCE CREDIT</b>	<b>BENEFIT</b>
<b>Building Information</b>	Building Information	Building Information resources developed for the As Built phase can be used to demonstrate compliance at the operational phase in Green Star – Performance, provided that a mechanism is used to ensure that the building information is kept up to date.
<b>Metering and Monitoring</b>	Metering and Monitoring Greenhouse Gas Emissions Potable Water	Provides the ability for tenants to meter and monitor energy and water use. The ability to collect energy and potable water consumption data is vital for Green Star – Performance projects.
<b>Commissioning &amp; Tuning</b>	Commissioning and Tuning	Commissioning and Tuning at the As Built phase will ensure that nominated building systems can operate as designed and installed and set up good systems for ongoing tuning and commissioning practices.
<b>Commitment to Performance</b>	Commitment to Performance	Commitment to Performance has a direct correlation between rating tools to commit to setting and achieving environmental performance targets.
<b>Sustainable Transport</b>	Sustainable Transport Program	The provision of active transport facilities is recognised in both rating tools as a building feature.
<b>Light Pollution</b>	Light Pollution	Minimising the light pollution to the night sky and neighbouring bodies are recognised in both rating tools.
<b>Refrigerant Impacts</b>	Refrigerant Impacts	The refrigerant impacts associated with refrigeration and air conditioning equipment are recognised in both rating tools as a building feature.
<b>Microbial Control</b>	Microbial Control	Waterless heat rejection systems are recognised in both rating tools as a building feature.  Legionella Control and Risk Management Policies or policies developed for water based heat rejection systems can be used at the operational phase of the building.

# Tenants in Industrial Buildings

Broadly, for buildings with lettable tenanted spaces, Green Star – Design & As Built expects the building owner/developer, not the tenant, to deliver solutions within the lettable area of a building that meets the Green Star credit criteria. Industrial facilities are frequently built with a single tenant in mind, who operates the whole building. As such the tenant often has very specific requirements which heavily influence the as-built outcome.

This section sets out expectations of where a tenant delivers outcomes included in a credit or where the base building delivers tenant outcomes. Because the scope of tenants in industrial facilities has been considered in this document, projects adopting the pathways in this document are not eligible to use the Fitout Scope Guidance Document.

## Tenant Scope

As with an integrated office fitout, credits for industrial assets are assessed based upon the finished space at the time of practical completion. Any changes made by a tenant prior to practical completion and delivered by the base building owner must be included in this assessment.

For example, where a tenant has requested changes to the mechanical systems or changed the distribution of ventilation openings in a space prior to practical completion, each space must comply with the corresponding Credit Criteria for the points to be awarded.

Where building attributes have been installed by the building owner, regardless of whether they are tenant owned or not, it is expected that they are included in the scope of the rating (excluding established exemptions for process loads).

## Formal Agreements

In some instances, tenants may be responsible for some aspects of the building's completion. Where guidance in this document refers to 'Formal Agreements' because tenants may be responsible for delivering outcomes, the following is required to demonstrate compliance:

Guidance (e.g., Tenancy Fitout Guide) describing the proposed outcomes of the building for the tenant and examples of how these can be achieved; and

- For speculative buildings: a model lease clause outlining a tenant's obligation to meet the credit requirements outlined in the Fitout Guide, and a commitment letter from the owner to include the model lease clause in all leases;

or

- For leased buildings: a signed lease agreement outlining a tenant's obligation to meet the credit requirements in the Fitout Guide, signed by both lessee and lessor.

# Credit Criteria Guidance

## Using this document

Guidance provided in this document is intended for the following industrial facilities:

- ◊ Warehouses
- ◊ Storage buildings
- ◊ Buildings for the display of goods (or produce) that is for wholesale
- ◊ A factory building in which a process (or handicraft) is carried out for trade, sale, or gain. The building can be used for production, assembling, altering, repairing, finishing, packing, or cleaning of goods or produce
- ◊ Any office portions within or attached to the building types nominated above.

The guidance in this document is in addition to the Green Star – Design & As Built NZ v1.0 Submission Guidelines unless expressly stated otherwise.

Use of this document isn't mandatory for industrial projects. However, project teams wanting to adopt amended criteria must use the document guidance in full. Where new pathways have been created for credits, project teams may opt to use the ones in this document or the Submission Guidelines. Project teams must also clearly reference this guidance document in the relevant credit's submission template and include a copy of this document in the General Section.

The Green Star – Design & As Built NZ v1.0 scorecard, calculators, and submission templates have been updated with the industrial-specific pathways and credits to facilitate project teams using this guidance document. They can be downloaded from the NZGBC Design & As Built NZ Resources page [here](#).

- Ceres Organics, Auckland.  
Norak Properties Limited. 5 star  
Green Star Industrial Built (2009)



# Management

## 2 Commissioning and Tuning

2.3 Building Commissioning: Where the project is being delivered as speculative (without a tenant): Commissioning plan to include guidance for tenants with regards to their commissioning to avoid impact on base building systems, including handover documentation. Template commissioning method statements for the expected tenant plant shall be provided in assessment documentation. Statements shall cover all nominated systems, not limited to heating, cooling, ventilation, supplemental units, lighting, metering, hot water, cold water, fire, and controls. Commissioning is still required for any systems where commissioning is possible.

2.4 Building Systems Tuning: Where the project is being delivered as speculative (without a tenant): Tuning of tenant installed systems is exempt, but base building air handling, heating and cooling systems must be tuned irrespective of whether tenants have modified it or not.

## 3 Adaptation and Resilience

### 3.1 Implementation of a Climate Adaptation Plan

3.1.5 Implementation of the Climate Adaptation Plan: Where a project is located within an industrial complex, an individual project within the site boundary may demonstrate compliance with the Adaptation and Resilience credit using a site wide Climate Adaptation Plan.

The compliance requirements outlined under 3.1.5 Implementation of the Climate Adaptation Plan must be addressed on an individual project level. Where a climate change and adaptation risk assessment has been undertaken at a precinct level, there is no need for a project within that precinct to undertake a new risk assessment. The project is however required to prepare a project specific climate change adaptation plan and identify the design features that mitigate the risks identified, in accordance with the Credit Criteria.

## 6 Metering and Monitoring

The aim of the Metering and Monitoring credit is to recognise the implementation of effective energy and water metering and monitoring systems. For industrial buildings where a tenant controls most or all of the systems in a building, metering and monitoring are useful to distinguish the process loads from other energy and water uses in the building. The following guidance is provided to clarify the asset owner's obligations under Green Star.

6.1 Metering: As per the Submission Guidelines, a minimum of one meter per system is to be provided and commissioned by the base building. The installation of tenant sub-meters for specific tenant uses is not required. For speculative builds: The system must demonstrate sufficient spare capacity to accept tenant sub-meters for HVAC, lighting, power, water, gas and tenant process loads. The base building may not rely on uninstalled tenant meters for calculations, error or leak detection.

6.2 Monitoring Systems: For speculative builds: Where base building metering and monitoring strategy relies on connection of tenant meters, guidance must be created for tenants regarding metering requirements, including rules for connection of meters and programming of monitoring systems. Project teams to demonstrate this guidance has been created for tenants via a formal agreement.

## 8 Operational Waste

The aim of the Operational Waste credit is to recognise projects that implement a waste management plan that facilitates the re-use, upcycling, recycling, or conversion of waste into energy, and stewardship of items to reduce the quantity of outgoing waste. It is acknowledged that operational waste streams for industrial facilities differ from other building classes and are dependent on the tenant due to the high variability in production activities. The following guidance allows project teams to work with tenants to provide outcomes tailored to the tenant waste streams.

### **8A Performance Pathway – Specialist Plan**

Where the tenant has an Operational Waste Management Plan (OWMP) which will be implemented during the operational phase of the building, it may be used to demonstrate compliance with the Performance Pathway – Specialist Plan requirements.

Where sorting and/or storage facilities exist within an industrial park where the building is located, these may be used to meet the compliance requirements of the OWMP. However, the project team is required to demonstrate the building's waste profile has been accounted for in sizing these facilities.

### **8B Prescriptive Pathway – Facilities**

8B.1 Separation of Waste Streams: Project teams may meet the compliance requirement by demonstrating this guidance has been created for tenants via a formal agreement. Waste streams for offices spaces include paper and cardboard, glass, plastic, and one other waste stream. Warehouse/manufacturing areas are required to provide at least four waste streams which respond to the applicable waste streams of the production (where they vary from those in office spaces).

The project must demonstrate compliance with 8B.2 Dedicated Waste Storage Area and 8B.3 Access to Waste Storage Area.

### **Additional Information:**

[NSW Environment Protection Authority's 'Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities' December 2012;](#)

[A study into commercial & industrial \(C&I\) waste and recycling in Australia by industry division, Ecycle Consulting Pty Ltd.](#)

# Indoor Environment Quality

## Nominated Spaces

As laid out in the Green Star – Design & As Built NZ v1.0 Submission Guidelines, the ‘Nominated Area’ refers to the areas of a building which are nominated as relevant to particular Credit Criteria. Credits within the Indoor Environment Quality category make reference to ‘Nominated Area’. The nominated area can include primary, secondary, and tertiary area types, as outlined in the table below.

The following section provides guidance on the recommended application of nominated areas to typical spaces within industrial buildings, as well as expected inclusions and exclusions for each credit. The predominant use of the space determines the space type classification.

At assessment, project teams are required to justify to Green Star assessors why each space has been given these classifications. Where project teams seek to include spaces within a nominated area, they are to justify to the assessor based on the function of the space. Where project teams seek to exclude areas from credits due to functional requirements, the project team must justify exclusions clearly in the Area Definition Form to the NZGBC for approval. Project teams are encouraged to contact the NZGBC Coordinator with specific questions regarding their project.

## Common Industrial Spaces

The following is a guide to common spaces within industrial assets.

- ❖ **Warehouse floor (speculative, manufacturing or production line):** Considered primary space where people are expected to stay for extended periods of time.
- ❖ **Distribution warehouse space (with racking):** Considered secondary space as the space will be accessed continuously for an extended period of time.
- ❖ **Storage:** Where long-storage exists in spaces which are accessed less than once a day. Typically considered tertiary space, though is subject to some credit requirements as outlined in the Indoor Environment Quality Credit Guidance Table below.
- ❖ **Refrigerated:** Temperature controlled spaces installed for tenants prior to practical completion. Considered as secondary space where it is continuously accessed for more than two hours (e.g., refrigerated distribution). Considered tertiary where the space is accessed intermittently (e.g., cold store).
- ❖ **Office:** Class 5 sections of an industrial building. Although the office spaces are used in a more transitory way than offices in a typical Class 5 building, these are still generally considered primary spaces. Breakout areas such as kitchens and bathrooms are considered secondary. Storage, corridors, or plant room within office spaces are considered tertiary.
- ❖ **Loading docks:** Typically considered an external area or a tertiary space (depending on the location) though is subject to some credit requirements as outlined in the Indoor Environment Quality Credit Guidance Table.



▲ Air New Zealand Logistics Building, Auckland. Air New Zealand Limited. 5 star Green Star Industrial Design (v3)

GREEN STAR – DESIGN & AS BUILT CREDIT	NOMINATED AREAS	APPLICABLE INDUSTRIAL SPACES	GUIDANCE
<b>9.1 Ventilation System Attributes</b>	Primary & Secondary	Warehouse floor, office spaces, distribution, and storage spaces	<p>Project teams do not have to provide access to both sides of coils for cleaning and maintenance purposes of such systems, provided the following conditions are met:</p> <p>1. Design teams may provide access to the upstream side of fan coil units where the coils are protected by a filter rated at MERV 8 or higher and:</p> <ul style="list-style-type: none"> <li>◊ Provide heating only; or,</li> <li>◊ Provide cooling only with the coil assembly no more than 4 rows deep; or,</li> <li>◊ Provide dual heating/cooling with the coil assembly no more than 4 rows deep and</li> </ul> <p>2. For fan coil units or air handling units located within a ceiling void, in addition to the above criteria, the project team must fully demonstrate safe access for cleaning and maintenance. This may include:</p> <ul style="list-style-type: none"> <li>◊ Access panels in unit / ductwork is in close proximity to the coil to be cleaned.</li> <li>◊ Access panels in the ceiling below the unit is in close proximity to the unit / ductwork access panel.</li> <li>◊ The upstream surface of the coil must be accessible within 1m of the ceiling panel.</li> </ul>
<b>9.2 Provision of Outdoor Air</b>	Primary & Secondary	Warehouse floor, office spaces, distribution, and storage spaces	Refrigerated spaces can be excluded from this credit
<b>9.3 Exhaust or Elimination of Pollutants</b>	Primary & Secondary	Warehouse floor, office spaces, distribution, and storage spaces	Where no mechanical ventilation systems have been installed in the nominated areas, these spaces must meet the natural ventilation requirements of 9.2C.
<b>10.1 Internal Noise Levels</b>	Primary & Secondary	Office spaces	
<b>10.2 Reverberation</b>	Primary & Secondary	Office spaces	
<b>10.3 Acoustic Separation</b>	Primary & Secondary	Between office spaces, and any primary or secondary spaces adjacent to warehouse floors, or fully enclosed spaces within a warehouse or distribution floor	

Indoor Environment Quality Credit Guidance (cont.)

GREEN STAR – DESIGN & AS BUILT CREDIT	NOMINATED AREAS	APPLICABLE INDUSTRIAL SPACES	GUIDANCE
<b>11.1 Minimum Lighting Comfort</b>	Primary & Secondary	Warehouse floor, office spaces, distribution, storage and refrigerated spaces	
<b>11.2 General Illuminance and Glare Reduction</b>	Primary & Secondary	Warehouse floor, office spaces, distribution, storage and refrigerated spaces	
<b>11.3 Surface Illuminance</b>	Primary & Secondary	Office spaces	<p>Where the office space is less than 5% of GFA and less than 1000sqm, this criterion can be considered 'Not Applicable,' on the condition compliance with <b>three</b> of the following criteria is demonstrated for the office spaces:</p> <ul style="list-style-type: none"> <li>◊ 9.2 Provision of Outdoor Air</li> <li>◊ 9.3 Exhaust or Elimination of Pollutants</li> <li>◊ 10.1 Internal Noise Levels</li> <li>◊ 11.2 General Illuminance and Glare Reduction</li> <li>◊ 12.2 Daylight</li> <li>◊ 14.1 Thermal Comfort.</li> </ul> <p>Refer to <b>Note 1</b> for further information.</p>
<b>11.4 Localised Lighting Control</b>	Primary & Secondary	Office spaces	<p>Where the office space is less than 5% of GFA and less than 1000sqm, this criterion can be considered 'Not Applicable,' on the condition compliance with <b>three</b> of the following criteria is demonstrated for the office spaces:</p> <ul style="list-style-type: none"> <li>◊ 9.2 Provision of Outdoor Air</li> <li>◊ 9.3 Exhaust or Elimination of Pollutants</li> <li>◊ 10.1 Internal Noise Levels</li> <li>◊ 11.2 General Illuminance and Glare Reduction</li> <li>◊ 12.2 Daylight</li> <li>◊ 14.1 Thermal Comfort.</li> </ul> <p>Refer to <b>Note 1</b> for further information.</p>

Indoor Environment Quality Credit Guidance (cont.)

GREEN STAR – DESIGN & AS BUILT CREDIT	NOMINATED AREAS	APPLICABLE INDUSTRIAL SPACES	GUIDANCE
12.1 Glare Reduction	Primary	Warehouse floor, office spaces (excluding secondary spaces within these), and external loading dock areas	<p>Daylight roof strips can be deemed compliant if they comprise polycarbonate or similar translucent or opaque materials. Where clear or transparent roof strips are used, glare control devices or glare modelling will be required to demonstrate compliance.</p> <p>External loading dock areas need to be included as part of the assessable areas, even though they are not typically considered primary spaces. It is important to address glare reduction for external loading dock areas when many building occupants work at the loading dock.</p>
12.2 Daylight	Primary	Warehouse floor, office spaces (excluding secondary spaces within these)	<p>Where the office space is less than 5% of GFA and less than 1000sqm, this criterion can be considered 'Not Applicable,' on the condition compliance with <b>three</b> of the following criteria is demonstrated for the office spaces:</p> <ul style="list-style-type: none"> <li>◆ 9.2 Provision of Outdoor Air</li> <li>◆ 9.3 Exhaust or Elimination of Pollutants</li> <li>◆ 10.1 Internal Noise Levels</li> <li>◆ 11.2 General Illuminance and Glare Reduction</li> <li>◆ 12.2 Daylight</li> <li>◆ 14.1 Thermal Comfort.</li> </ul> <p>Refer to <b>Note 1</b> for further information.</p>
12.3 Views	Primary	Office spaces (excluding secondary spaces within these)	<p>Where the office space is less than 5% of GFA and less than 1000sqm, this criterion can be considered 'Not Applicable,' on the condition compliance with <b>three</b> of the following criteria is demonstrated for the office spaces:</p> <ul style="list-style-type: none"> <li>◆ 9.2 Provision of Outdoor Air</li> <li>◆ 9.3 Exhaust or Elimination of Pollutants</li> <li>◆ 10.1 Internal Noise Levels</li> <li>◆ 11.2 General Illuminance and Glare Reduction</li> <li>◆ 12.2 Daylight</li> <li>◆ 14.1 Thermal Comfort.</li> </ul> <p>Refer to <b>Note 1</b> for further information.</p>
13.1 Paints, Adhesives, Sealants and Carpets	Whole Building	All internal applications	<p>These requirements are applicable to all internal applications, regardless of being regularly occupied or not.</p>
13.2 Engineered Wood Products			

Indoor Environment Quality Credit Guidance (cont.)

GREEN STAR – DESIGN & AS BUILT CREDIT	NOMINATED AREAS	APPLICABLE INDUSTRIAL SPACES	GUIDANCE
14.1 Thermal Comfort	Primary & Secondary	Office spaces	<p><b>New compliance pathway</b></p> <p><u>14.2D Industrial spaces</u></p> <p><b>One additional point</b> is available where:</p> <p><b>In office spaces:</b></p> <ul style="list-style-type: none"> <li>🔄 A high degree of thermal comfort is provided equivalent to 90% of all occupants being satisfied in accordance with credit requirement 14.2,</li> </ul> <p>and:</p> <p><b>In warehouse primary spaces:</b></p>
14.2 Advanced Thermal Comfort	Primary & Secondary	Office spaces, Warehouse floor (primary only)	<ul style="list-style-type: none"> <li>🔄 Where they are naturally ventilated the internal temperatures are within 80% of Acceptability Limit 1 of ASHRAE Standard 55-2013</li> <li>🔄 Where they are mechanically ventilated spaces – the internal dry bulb temperature is maintained between 20°C and 24°C</li> <li>🔄 A combination of methods is acceptable.</li> </ul> <p>Two innovation points will be awarded in addition to the Advanced Thermal Comfort point for achieving the above requirements for warehouse primary spaces.</p> <p>Project teams may also choose to make Advanced Thermal Comfort ‘Not Applicable’ as per the sSubmission Guidelines.</p>

**Note 1:** Only ‘Not Applicable’ rather than the point can be targeted for these credits where the nominated area is less than 5% of the gross floor area and less than 1000sqm. NZGBC considers the outcome of making the credits ‘Not Applicable’ a more accurate reflection than awarding the point for a compliant area of less than 5% of the building.

Where the nominated area is more than 5% of the gross floor area, or more than 1000sqm, the space is subject to credit requirements.

## 17 Sustainable Transport

A new prescriptive pathway has been created to reflect best practice sustainable transport outcomes for industrial assets. Project teams are not required to use this pathway and may opt to use other relevant pathways from the Submission Guidelines when pursuing this credit.

This pathway only applies to industrial projects located in regional areas where cycling to work was not practical. Where industrial projects are located in urban areas, seeking compliance through this industrial pathway will not be acceptable.

### **17C Prescriptive Pathway: Industrial**

Eleven points are presented. However, a maximum of **seven points** can be awarded where projects provide access to sustainable transport infrastructure as demonstrated using the below prescriptive criteria.

**17C.1 Access by Public Transport:** **One point** is available based on the accessibility of the site by public transport. Project teams to demonstrate compliance in accordance with 17B.1.

**17C.2 Reduced Car Parking Provision:** **One point** is available where there is a reduction in the number of car parking spaces in the proposed building site when compared to a standard practice building. Project teams to demonstrate compliance in accordance with 17B.2. For disabled parking spaces and parking spaces designed to accommodate commercial vehicles required for the industrial or commercial activity in the building (i.e. vehicles not used to transport people to the building) may be excluded from the total number of parking spaces. These parking spaces should be clearly marked through the use of different coloured line markings and highly visible signage.

**17C.3 Low Emission Vehicle Infrastructure:** **Five points** are available where parking spaces and/or dedicated infrastructure is provided to support the uptake of low-emission vehicles. One point is awarded for each of the following criteria:

- 📍 17C.3A. 15% of parking is dedicated to fuel efficient vehicles, with a maximum of 5% for motorcycle parking
- 📍 17C.3B. 5% of parking is dedicated to electric passenger vehicles and charging infrastructure is provided for each space
- 📍 17C.3C. Dedicated car share spaces are provided at the rate of one per 70 project occupants. Parking spaces for car share vehicles must be clearly designated, for example through use of different coloured line markings and highly visible signage. The car share parking spaces must be accessible to all car share scheme members
- 📍 17C.3D. No parking spaces have been provided
- 📍 17C.3E. Low emission facility transport (such as electrical buggies or share bicycles) is provided for use within an industrial park. Project teams to demonstrate transport capacity is equivalent to 5% of the industrial park occupancy.

Project teams to demonstrate compliance for 17C.3A – 17C.3D in accordance with 17B.3A – 17B.3D.

**17C.4 Active Transport Facilities:** **Two points** are available where end of trip facilities have been provided to a proportion of the building’s regular occupants as outlined in Table 17C.4.1.

End of trip facilities are defined as showers, changing amenities with appropriate drying space, and lockers. Showers and bathrooms provided to meet statutory accessibility requirements are not included in the calculation of end of trip facilities. There are no requirements for bicycle storage.

**Table 17C.4.1 Active transport facilities requirements**

<b>NUMBER OF REGULAR OCCUPANTS</b>	<b>SHOWERS</b>	<b>LOCKERS</b>
0-12	1 unisex)	
13-49	2	One secure locker must be provided for every eight regular building occupants in the changing rooms. All lockers are to be secure.
50-149	3	
150-299	4	
300-500	5	
Greater than 500	Additional 2 per extra 250 occupants	

**17C.5 Proximity to Amenities:** Two points are available where at least four amenities are accessible by project occupants.

Amenities must be located:

- 📍 Within the boundary of an industrial park where the site is located; or
- 📍 Located offsite within a 500m radius of the centre of the project’s site.

Amenities for industrial sites may include but are not limited to:

- 📍 Break out spaces in adjacent buildings (must be accessible by all staff)
- 📍 Cafés
- 📍 Childcare
- 📍 Grocery/convenience store
- 📍 Gym or sports facility
- 📍 Prayer room or place of respite
- 📍 Recreational facility.

The provision of high-quality outdoor break out space may also be included as an amenity. To claim the breakout space as an amenity, the following requirements must be met:

- ❖ The combined area is equivalent to at least 1% of the gross lettable area, or, where the occupancy is known, 2sqm per person with a minimum of 40sqm
- ❖ The space is designed to be universally accessible, well lit, well ventilated, non-smoking and located to avoid noise, odour, vehicle emissions and air pollution
- ❖ Shading to at least 50% of the space
- ❖ Screening from prevailing winds that have a frequency equal to or greater than 10% annually and
- ❖ A minimum area of 30% of the space is soft landscaping.

The amenity space can be provided as a part of a greater site wide solution.

- ▶ BRI Research Winery, Marlborough. Bragato Research Institute. 5 star Green Star Industrial Built (v3)



# Materials

## 19 Life Cycle Impacts

A new prescriptive pathway has been created to reflect best practice outcomes for industrial assets. Project teams are not required to use this pathway and may opt to use other relevant pathways from the Submission Guidelines when pursuing this credit.

### **19C Prescriptive Pathway: Industrial**

Fifteen points are presented, however a maximum **six points** can be awarded where the project reduces the amount of building materials used as demonstrated using the below prescriptive criteria.

#### **19C.1 Life Cycle Impacts – Concrete:**

**Up to four points** are available.

19C.1.1 Portland Cement Reduction: **Up to three points** are available where 25% of cement in situ and 15% of cement in precast concrete is replaced with inert filler and/or industrial waste by-product and/or pozzolanic material. Points are available on a sliding scale to one decimal place. Project teams to demonstrate compliance in accordance with 19B.1.1

19C.1.2 Alternative Fuel: Project teams to demonstrate compliance in accordance with 19B.1.2.

19C.1.3 Aggregates Reduction: Project teams to demonstrate compliance in accordance with 19B.1.3.

#### **19C.2 Life Cycle Impacts – Steel**

**Up to four points** are available.

19C.2.1 Reduced Mass of Steel Framing: Two points are available when there is a reduction in the mass of steel framing use when compared to standard practice. Project teams to demonstrate compliance in accordance with 19B.2A.

19C.2.2 Reduced Mass of Steel Reinforcement: Two points are available when there is a reduction in the mass of steel reinforcement used in concrete slabs when compared to standard practice. Project teams to demonstrate compliance in accordance with 19B.2B.

#### **19C.3 Life Cycle Impacts – Building Reuse**

Project teams to demonstrate compliance in accordance with 19B.3.

#### **19C.4 Life Cycle Impacts – Structural Timber**

Project teams to demonstrate compliance in accordance with 19B.4.

## Emissions

### 28 Refrigerant Impacts

Project teams should claim 'Not Applicable' rather than the point where the conditioned office space is less than 5% of the building (up to 500sqm) and the remainder of the building is naturally ventilated/unconditioned. The NZGBC considers the outcome of making this credit 'Not Applicable' a more accurate reflection than awarding the point for a compliant area of less than 5% of the building.

Where conditioned office space is more than 5% of the gross floor area, or more than 500sqm, the space is subject to credit requirements.

Where conditioned office space is less than 5% of the building (up to 500sqm) and other systems exist for industrial spaces, the office space may be excluded. All other systems must comply with the compliance requirements in the Green Star - Submission Guidelines.

Refrigeration equipment required for industrial or manufacturing processes and temporary cold/freezer rooms are excluded from the requirements of this credit. Appliances are also excluded from the requirements of this credit.

## Innovation

### Whole Building Thermal Comfort

**Two points** are available where warehouse floor primary spaces can demonstrate:

- 🔄 For naturally ventilated spaces - the internal temperatures are within 80% of Acceptability Limit 1 of ASHRAE Standard 55-2013
- 🔄 For mechanically ventilated spaces – the internal dry bulb temperature is maintained between 20°C and 24°C

A combination of methods is acceptable.

Project teams wanting to pursue alternative innovation pathways for Thermal Comfort should submit a Technical Question to the NZGBC.

### Air Permeability Performance Testing

When projects target this innovation, unconditioned spaces e.g. warehouse spaces, can be excluded. All other spaces, including office or refrigerated warehouse spaces, are considered conditioned spaces and applicable to the criterion. Where there is a specific use project teams would like to make exempt, project teams may submit a Technical Question to the NZGBC.



▲ Fisher and Paykel Healthcare, Daniell Building, Auckland. Fisher & Paykel Healthcare Properties Limited. 5 star Green Star Industrial Built (v3)

## Questions? Feedback?

Contact us at [greenstarnz@nzgbc.org.nz](mailto:greenstarnz@nzgbc.org.nz) | [www.nzgbc.org.nz](http://www.nzgbc.org.nz)

