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Peregrine Corporation

Environmentally Sustainable Design Statement

Job no: 362212

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EXECUTIVE SUMMARY

SUHO was engaged by Peregrine Corporation to provide an Environmentally Sustainable Design Statement (ESDS) for a proposed development located at 41-45 Angove Street, North Perth 6006.

The proposed development is within the jurisdiction of the City of Vincent and for a development of this size, the council requires an ESDS or equivalent to be produced as part of its planning approval process showing that the “development will achieve a 5-star rating under the current version of the Green Star rating tool or equivalent”. The Green Building Council of Australia's Design and As Built (v1.3) tool has been used to quantify all sustainable design criteria. This is the most current and relevant rating tool for this project. The development has the potential to achieve the equivalent of a 5 Star Green Star rating, and therefore considered equal to 'Australian Excellence'.

The report summarises the sustainable design initiatives being incorporated in the proposed development and benchmarks them against industry best practice. The following table provides a summary of the green star credits targeted for this project.

Category	Total Points Available	Total Points Targeted
Management	14	10
Indoor Environment Quality	17	13
Energy	22	12
Transport	7	3
Water	18	9.3
Materials	14	10
Land Use & Ecology	6	3.2
Emissions	5	4
Innovation	10	1
Total	110	65.5

The final score needed for an 5-star equivalent rating is 60-74 points.

Key sustainable design strategies considered in the development include:

- > High performance building fabric with good levels of insulation
- > Efficient HVAC systems
- > Solar PV array to reduce the peak demand electricity loan and provide an on-site electricity generation
- > Excellent indoor amenity provided by reducing VOC's, high levels of daylight and access to views
- > Sub-metering of tenancies and major common area energy usage
 - > Installing efficient taps & appliances to minimise water consumption
 - > Rainwater harvesting tank plumbed to toilet flushing
 - > Provision of convenient waste sorting and recycling facilities
 - > Best Practice procurement and management procedures
 - > Target 90% construction & demolition waste recycling



BACKGROUND

1.1 Project Overview

The proposed commercial development at OTR Angove Street covered by this ESDS consists of a convenience store, office space and a fuel station:

	Area (m ²)
Site Area	1004
Convenience Store	398
Office Space	398

Table 1: Site area breakdown

The development is in NCC Climate Zone 5. The following images indicate the street view and location of the site.



Figure 1: Street view of site



Figure 2: Location of site



1.2 Assessment Method and Documentation

This report is based on the following drawing set provided by Peregrine Corporation:

Drawing	Description	Date
1460 (sk01c-sk07c)	TP Drawings	August 2022

To quantify the project's sustainability performance against an industry benchmark, this report uses the Green Building Council of Australia's (GBCA) Design. A target setting report is to be provided in accordance to Green Star Design and As Built tool (V1.3). This is as per the local planning policy P1.8.4 of the Built Form Policy.

Green Star is a comprehensive, voluntary environmental rating system that evaluates a building design across a range of sustainability criteria. The table below shows the scoring associated with the tool:

Star Rating	Weighted Points Score	Meaning
6	75 to 100	World leader in sustainability
5	60 to 74	Australian Excellence
4	45 to 59	Australian Best Practice
3	30 to 44	No Formal Certification Available
2	20 to 29	No Formal Certification Available
1	10 to 19	No Formal Certification Available

Table 2: Green Star score meaning

This report does not confer a formal rating certified by Green Star therefore is intended for council's internal use only.



GREEN STAR STRATEGY

The remainder of this report consists of a section for each of the categories outlined in the Green Star Design & As Built rating tool. In most sections, we make reference to specific Green Star credits.

Green Star credits are detailed in tables that indicate the number of points available and the number of points this project is targeting under each credit. The responsible consultant for each of the targeted points is included in Appendix A. For many credits, details are required that aren't available at this stage of the project. Where possible, evidence has been supplied to support the targeted credits.

2.1 Management

The following are some of the key ESD initiatives proposed in this category:

- > A Design Intent Report or an Owner's Project Requirements (OPR) document produced by the Design Team
- > Commissioning and Building Tuning in accordance with Green Star requirements.
- > Provide smart meters for metering electricity to all tenancies. Connect all tenancy electricity meters to a Building Automation System or common monitoring system. Provide water meters for all tenancies linked to a BAS or monitoring system. Sub-metering of major energy and water uses in common areas.
- > Install a Building Information Display system to display, among other things, energy and water usage data.
- > Provisions of adequate facilities and space for operational waste including a range of recyclables. Please refer to the waste management plan which have been provided.
- > Energy & Water Metering and Monitoring

Details of the Energy & Water Metering and Monitoring System:

- > Smart meters to all tenancies to allow detailed monitoring of electricity and water consumption. Sub-metering of all significant base building energy and water uses.
- > In addition to metering data, the monitoring system can be used to monitor the operation and status of key plant and equipment including HVAC systems, DHW systems, lighting and window reed switches. This will help to analyse and diagnose energy metering results.
- > A user-friendly front end to controls/ monitoring system to allow tenants to easily monitor their own energy and water consumption and compare with benchmark figures. This data could be accessed on-line.

The following will be provided by the Contractor:

- > A Commissioning Plan
- > Services and Maintainability Review documented in a Services and Maintainability Report by the Contractor



- > Operations and Maintenance Information Document produced by the Contractor
- > Building Log Book
- > Updates to Operations and Maintenance Information Document and Building Log Book to account for Building Tuning occurring after Handover
- > Environmental Management Plan (EMP) and a Formalised Environmental Management System (EMS) (Consider appointing a contractor with ISO14001 accreditation)

The following table provides benchmarking of the design against Green Star Management category:

Management				
Credit	Reference	Title	Max.	Target
Green Star Accredited Professional	1.1	Accredited Professional	1	1
Commissioning and Tuning	2	Environmental Modelled Targets	-	
	2.1	Services and Maintainability Review	1	1
	2.2	Building Commissioning	1	0
	2.3	Building Systems Tuning	1	1
	2.4	Independent Commissioning Agent	1	0
Adaptation and Resilience	3.1	Implementation of a Climate Adaptation Plan	2	0
	4.1	Building Operations and Maintenance Information	1	1
	4.2	Building User Information	1	1
Commitment to Performance	5.1	Environmental Building Reporting	1	1
	5.2	End of Life Waste Management	1	1
Metering and Monitoring	6	Metering Strategy	-	
	6.1	Monitoring Strategy	1	1
Construction Environmental Management	7	Environmental Management Plan	-	
	7.1	Formalised Environmental Management System	1	1
Operational Waste	8.1	Waste in Operations	1	1
Total			14	10

Table 3: Management credits



2.2 Indoor Environment Quality

The following are some of the key ESD initiatives proposed in this category:

- > Initiatives to minimise the ingress of pollution through the ventilation system
- > initiatives to ensure clean ductwork
- > initiatives to provide for convenient maintenance and cleaning in future
- > Provision of extra ventilation air over and above code requirements
- > Exhaust systems to minimise recirculation of odours and contaminants
- > Design for acoustic comfort
- > Lighting design with reduced glare, reduced contrast and greater occupant control
- > Optimising the provision of external views and daylight entry
- > Selection of internal materials to minimise off-gassing and improve Indoor Air Quality
- > Optimise building envelope for improved thermal comfort

The following table provides benchmarking of the design against Green Star Indoor Environment Quality category:

Indoor Environment Quality				
Credit	Reference	Title	Max.	Target
Quality of Indoor Air	9.1	Ventilation System Attributes	1	1
	9.2	Provision of Outside Air	2	1
	9.3	Exhaust or Elimination of Pollutants	1	1
Acoustic Comfort	10.1	Internal Noise Levels	1	1
	10.2	Reverberation	1	0
	10.3	Enclosed Spaces	1	1
Lighting Comfort	11	Minimum Lighting Comfort	-	
	11.1	General Illuminance and Glare Reduction	1	1
	11.2	Surface Illuminance	1	1
	11.3	Localised control	1	1
Visual Comfort	12	Glare Reduction	-	
	12.1	Daylight	2	1
	12.2	Views	1	1
Reduced Exposure to Pollutants	13.1	Paints, adhesives, sealants and carpets	1	1
	13.2	Engineered wood products	1	1
Thermal Comfort	14.1	Thermal Comfort	1	1
	14.2	Advanced Thermal Comfort	1	0
Total			17	13

Table 4: Indoor Environment Quality credits



Daylight has been calculated in accordance with the daylight factor modelled pathway 12.1B. 47% of the applicable spaces comply with the requirements and can therefore claim 1 points. Please refer to the attached Daylight markups for further details.

The layout of each block and apartment design is such that 91% of the habitable areas have access to high quality views. Under credit 12.2-Views this exceeds the threshold by 30% and thus receives 1 credit. Refer to Appendix for more details.

Daylight Markup	Area	Daylight Area	Compliant %
Control Building	123	56	46
Office	15	7	45
Meeting Room	41	21	51
Total	179	84	47

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Office	15	7	45
Meeting Room	41	21	51
Total	179	84	47

The thermal comfort of the project to be assessed and given that the size of the areas are relatively less, 1 point will be easy to achieve.



2.3 Energy

15E reference building pathway to be used for this type of development.

- > 15E.0: Projects teams must demonstrate that the operational (GHG) emissions from the proposed building are less than those of the equivalent benchmark building. The benchmark building represents a 10% improvement on the Reference Building's Greenhouse Gas Emissions. The reference building is a building which achieves minimal compliance with the NCC Section J DTS provisions using a defined HVAC systems type.
- > 15E.1: Points awarded for emissions reduction when the proposed building fabric perform at least 2% better than the DTS requirements.
- > 15E.2: Project team to make sure that GHG Emissions reduction takes place by at least 10% in comparison with the benchmark building.
- > 16A or 16B, project team to make sure that the use of on-site electricity generation systems reduces the total peak electricity demand by at least 15% (if using a prescriptive pathway). Or they should make sure that the project's predicted peak electricity demand has been reduced below that of a reference building by 20% (if using modelled pathway).

The following table provides benchmarking of the design against Green Star Energy category:

Energy – Reference Building Pathway			
Reference	Title	Max	Target
15-E.1	Building fabric (4% improvement)	4	2
15-E.2	GHG emission reduction (50% improvement)	16	8
16A or 16B	Prescriptive Pathway or Modelled Pathway	2	1

Table 5: Energy pathway



2.4 Transport

The following are some of the key ESD features and initiatives proposed in this category:

- > Parking dedicated to the electrical vehicle infrastructure and fuel efficient vehicles.

The following table provides benchmarking of the design against Green Star Transport Category:

Transport				
Credit	Reference	Title	Max.	Target
Sustainable Transport	17-A.1	Modelled Pathway	0	0
	17-B.1	Access by Public Transport	3	0
	17-B.2	Reduced Car Parking Provision	1	0
	17-B.3	Low Emission Vehicle Infrastructure	1	1
	17-B.4	Active Transport Facilities	1	0
	17-B.5	Walkable Neighbourhood	1	1
Total			7	2

Table 6: Transport credits

Low emission vehicle infrastructure requires 15% of car spaces to be dedicated to fuel-efficient modes of transport. A maximum of 5% of spaces dedicated to motorcycles can be recognized under these requirements.

Credit 17B-5 was assessed against the WalkScore tool (www.walkscore.com) and achieved a score of 88 for walks score category and 65 for good transit category. A summary of the results is provided below:

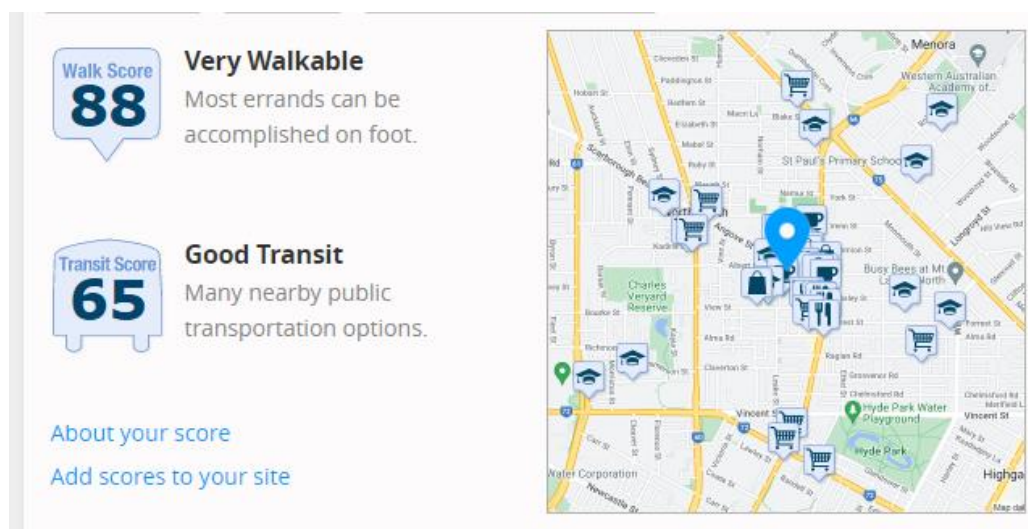


Figure 3: WalkScore results



2.5 Water

The following are some of the key ESD initiatives proposed in this category:

- > Taps, showers, toilets and appliances with high WELS ratings
- > Harvesting and re-use of rainwater toilet flushing
- > Landscape irrigation using drip systems with soil moisture sensing
- > Selection of native species with low water requirements
- > Provision to allow recovery of fire system test water
- > No cooling tower or evaporative cooling

The following table provides benchmarking of the design against the Green Star Water category:

Water				
Credit	Reference	Title	Max.	Target
Potable Water	18-A.1	Potable Water - Modelled Pathway	12	9.3
	18-B.1	Sanitary Fixture Efficiency	1	0
	18-B.2	Rainwater Reuse	1	0
	18-B.3	Heat Rejection	2	0
	18-B.4	Landscape Irrigation	1	0
	18-B.5	Fire System Test Water	1	0
Total			12	9.3

Table 7: Water credits

30kL rainwater tanks for development serving the office and the convenience store will collect water from all roof areas. A reduction in mains water consumption of 39kL annually can be achieved when compared to the standard reference building. This water will be used for toilet flushing, irrigation and washdown where required.



The following WELS ratings are required for all fittings and fixtures throughout the building:

Fixture	WELS rating
Toilets	4
Taps	6
Showers	NA

The above initiatives result in a 73 % reduction in mains water consumption when compared to a standard reference building.

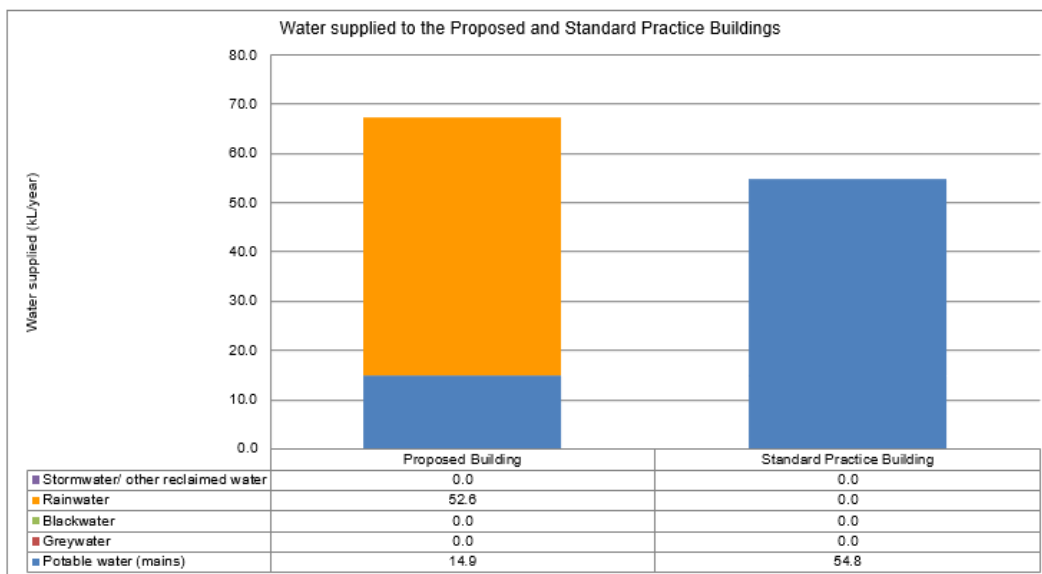


Figure 4: Water supplied to proposed and Standard Practice Building



2.6 Materials

The following are some of the key ESD initiatives proposed in this category:

- > Include a portion of recycled material in concrete to substitute for cement
- > Minimize the environmental footprint of steel by sourcing from a responsible supplier
- > To make sure that 50% of the façade is retained along with the 30% of the structure.
- > Specify only sustainable timber, in accordance with Green Star requirements
- > Procure cables, blinds, floor and pipes with either no PVC content or an EPD
- > Specify a requirement for the Contractor to implement procedures to reduce and recycle construction waste
- > Include materials and/ or products with minimal environmental footprint where feasible

The following table provides benchmarking of the design against the Green Star Materials category:

Materials				
Credit	Reference	Title	Max.	Target
Life Cycle Impacts	19.A.1	Comparative Life Cycle Assessment	0	0
	19.A.2	Additional Life Cycle Impact Reporting	0	0
	19.B.1	Concrete	3	2
	19.B.2	Steel	1	1
	19.B.3	Building Reuse	4	2
Responsible Building Materials	20.1	Responsible Steel Maker and Fabricator	1	1
	20.2	Timber	1	1
	20.3	Cables, pipes, floors and blinds	1	1
Sustainable Products	21.1	Sustainable Products	3	1
Construction and Demolition Waste	22.1	Reduction of Construction and Demolition Waste	1	1
Total			14	10

Table 8: Materials credits



2.7 Land Use and Ecology

A number of points can be gained in this category as a consequence of the nature and the improvement of the ecological value of the site. The credit for ecological value assumes the selection of native vegetation for all landscaped areas currently designated in the drawings.

The following table provides benchmarking of the design against the Green Star Land Use and Ecology category:

Land Use & Ecology				
Credit	Reference	Title	Max.	Target
Ecological Value	23	Endangered, Threatened or Vulnerable Species	-	
	23.1	Ecological Value	3	1.2
Sustainable Sites	24	Conditional Requirement	-	
	24.1	Reuse of Land	1	1
	24.2	Contamination and Hazardous Materials	1	0
Heat Island Effect	25.1	Heat Island Effect Reduction	1	1
Total			6	3.2

Table 9: Land Use & Ecology

- > Credit 23.0: To make sure that at date of purchase or option contract, no critically endangered species or ecological communities were present on site.
- > Credit 23.1: All landscaped areas require naïve vegetation to be planted and watered by sub surface drip irrigation systems preliminary. A calculation to assess the improvement of ecological value based on the current allocation of landscaping to the site has been conducted and the results are shown below:



Green Star Design & As Built

Ecological Value Calculator

greenstar Developed by the
Green Building Council of Australia



User Input Cells

Please enter project information in the light blue cells only.

Land Type	Weighting	Before			After		
		Area (m ²)		Score	Area (m ²)		Score
		Plan area	Green wall		Plan area	Green wall	
Hard surface	0.00	1,004	-	0.00	939	-	0.00
Exotic vegetation	0.05			0.00			0.00
Non-improved pastures	0.35		-	0.00		-	0.00
Planted native vegetation	0.50			0.00	65		32.50
Artificial water-bodies	0.50		-	0.00		-	0.00
Regenerating native habitat (re-growth) < 5 years old	0.50		-	0.00		-	0.00
Regenerating native habitat (re-growth) 5 – 10 years old	0.75		-	0.00		-	0.00
Regenerating native habitat (re-growth) > 10 years old	0.90		-	0.00		-	0.00
Remnant native vegetation	1.00		-	0.00		-	0.00
Natural water-bodies	1.00		-	0.00		-	0.00
Total		1,004	-	0.00	1,004	-	32.50
Ecological Value Score				0.00			0.03

Check Areas Match	TRUE
Total Change in Ecological Value	0.032
Points Achieved	1.2
This project automatically meets the minimum requirement of this credit due to the lack of habitat present in the 'Before' state of the site.	

Improvement in Ecological Value	Points
0.01	1
0.10	2
0.20	3



Figure 5: Ecological value calculator results

Credit 24: To make sure that at the site purchase, site did not have include old growth forest, agricultural land or wetland.

Credit 24.1: 75% of the site was a previously development land.

Credit 25.1: To make sure that 75% of the site area comprises of building or site elements that reduce the impact of heat island effect. For roof pitched 15-a three-year SRI of minimum 64 should be provided.



2.8 Emissions

- > The following are some of the key ESD initiatives proposed in this category:
- > Design external lighting to minimise light pollution to the night sky
- > The design of air-conditioning heat rejection systems to minimise the risk of legionella
- > The use of refrigerants with low environmental footprint (low ODP and GWP)

The following table provides benchmarking of the design against the Green Star Emissions category:

Emissions				
Credit	Reference	Title	Max.	Target
Stormwater	26.1	Peak Discharge To Sewer	1	1
	26.2	Pollution Targets	1	1
Light Pollution	27	Light Pollution to Neighbouring Properties	-	
	27.1	Light Pollution to Night Sky	1	1
Microbial Control	28.1	Microbial Control	1	1
Refrigerant Impacts	29.1	Refrigerant Impacts	1	0
Total			5	4

Table 10: Emissions

The project includes 30kL rainwater tank, to install the RWT on the site. Please refer to the MUSIC report provided by the civil engineers for more details.



2.9 Innovation

1 Innovation point is claimed for significant improvement upon the Green Star benchmark for External Views.

- > Improvement on the benchmarks: Onsite energy renewable systems to produce more than what is required:
 - » One point is available for a 15% improvement
 - » Two points available for a 30% improvement.

Innovation				
Credit	Reference	Title	Max.	Target
Innovative Technology or Process	30.A	Innovative Technology or Process	2	0
Market Transformation	30.B	Market Transformation	2	0
Improving on Green Star Benchmarks	30.C	Improving on Green Star Benchmarks	2	1
Innovation Challenge	30.D	Innovation Challenge	2	0
Global Sustainability	30.E	Global Sustainability	2	0
Total			10	1

Table 11: Innovation



CONCLUSION

The project's performance has been assessed against the Green Star Design & As Built tool (V1.3). Local planning policy has also been referenced and satisfied where applicable. Provided the requirements listed in Appendix A are implemented in the Design Documentation, this report demonstrates the project could achieve 60 points under Green Star, resulting in a potential 5 Star Green Star level of performance (Australian Excellence). As such the project is considered to achieve the requirements for the City Of Vincent's Local planning policy P1.8.4 of the Built Form Policy.



APPENDIX A – POINTS TALLY



5 Star Green Star SUHO ref No: SH 362212													CLIENT	ARCHITECT	CONTRACTOR	LANDSCAPE	CIVIL	STRUCTURAL	MECHANICAL	ELECTRICAL	HYDRAULIC	ACOUSTIC	ESD					
Category/ Credit	Categor ies	Credit no.	Credit Name	Requirements	Points Avail.	Points Targeted	Relevant Disciplines										Consultant	Achievability / Risk level										
					110	65.5												Low	Med	High								
Green Star Accredited Professional	Man	1.1	Accredited Professional	To recognise projects that engage a Green Star Accredited Professional to support the Green Star certification process.	1	1												Architect/ ESD			1				GSAP engaged			
Commissioning and Tuning	Man	2.0	Environmental Performance Targets	Conditional Requirement - In order for the minimum requirement to be met, documented targets for the environmental performance of the project must be set.	Required	Required												All Consultants	Required						Targets must be set for the environmental performance of the project by the design team. Percentage reductions in water and energy use compared to a typical equivalent project are included in the ESD Report. Green Star equivalent rating is targeted and to be documented throughout all consultant briefs. Energy, water and waste levels to be documented in ESD Reports.			
Commissioning and Tuning	Man	2.1	Services and Maintainability Review	1 point is available where a comprehensive services and maintainability review of the project is performed	1	1												All Consultants / ICA			1				Demonstrate a comprehensive service and maintainability review is conducted, led by head contractor or ICA during design stage and prior to construction. All consultants to consider the following during design and prior to construction: - Commissionability - Controllability - Maintainability - Operability, including 'Fitness for Purpose' - Safety Head contractor to ensure that above is considered and reviewed by each sub-contractor. Head contractor to review design when appointed for the above items.			
Commissioning and Tuning	Man	2.2	Building Commissioning	1 point is available where comprehensive pre-commissioning and commissioning activities are performed for all nominated building systems. The tender documentation MUST list the commissioning requirements for each system.	1	0												All Consultants / ICA				0			Air tightness testing requirement not committed to.			
Commissioning and Tuning	Man	2.3	Building Systems Tuning	1 point – where a tuning process is in place that addresses all nominated building systems.	1	1												All Consultants/ ICA			1		0		This should be standard practice by all contractors. All the nominated building systems must be tuned. It is assumed that the contractors should be available during the defects liability period to ensure the nominated equipment is performing as expected.			
Commissioning and Tuning	Man	2.4	Independent Commissioning Agent	1 additional point is available for utilisation of an independent Commissioning Agent (ICA) to advise, monitor, and verify the commissioning and tuning of the nominated building systems throughout the design, tender, construction, commissioning and tuning phases.	1	0												ICA				0			ICA Independent Commissioning Agent to be engaged. Engaging ICA can be expensive, and but also helps to verify that systems can work as intended. Noted as high risk due to impact on cost			
Adaptation and Resilience	Man	3.1	Implementation of a Climate Adaptation Plan	2 points are available where: A project-specific Climate Adaptation Plan has been developed in accordance with a recognised standard; and Solutions have been included into the building design and construction that specifically address the risk assessment component of the plan.	2	0												All Consultants							Climate Adaptation Plan is not required for the informal Green Star. Additional fee has been provided as an option.			
Building Information	Man	4	Building Information	1 point is available where: Comprehensive operations and maintenance information is developed and made available to the facilities management team; and Relevant and current building user information is developed and made available to all relevant stakeholders.	1	1												Service Engineer				1			General specification document specifies to commit Implementation and monitoring in accordance to GS credits Comprehensive operations and maintenance (O&M) information is available to the facilities management team. Building User Info anticipated to be located in the lobby TV screen.			
Commitment to Performance	Man	5.1	Commitment to Performance - Environmental Building Reporting	1 point is available where there is a commitment to set targets and measure results for the environmental performance of the building	1	1												All Consultants	1			0			Setting out performance targets for Green house gas emission and Potable water usage.			
Commitment to Performance	Man	5.2A	Commitment to Performance - End of Life Waste Management	1 point is available where there is a commitment to reduce demolition waste at the end of life of an interior fit out or base building component.	1	1												ESD/Client	1						Formal commitment in place to reduce demolition waste at the end of life of an interior fit out or base building component. Internal Agreement - the building owner must commit to extending the life of the interior fit out or finishes to at least 10 years, barring minor wear and tear or minor repairs.			

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Category/ Credit	Categories	Credit no.	Credit Name	Requirements	Points Avail.	Points Targeted	Relevant Disciplines										Consultant	Achievability / Risk level			
Ecological Value	Eco	23.1	Ecological Value	Up to 3 points are awarded where the ecological value of the site is improved by the project. The number of points awarded is determined by the Green Star - Change of Ecological Value Calculator based on a comparison of the state of the site before and after design/construction	3	1.2											Architect/ ESD	1.2			Depends on the total landscape area. Any changes to landscaped area will affect this credit.
Sustainable Sites	Eco	24	Conditional Requirement Sustainable Sites	The Conditional Requirement is met where, at the date of site purchase or option contract, the project site did not: - Include old growth forest; - Include prime agricultural land; - Include a wetland of 'High National Importance'; or - Impact on 'Matters of National Significance'.	Conditional Requirement	Conditional Requirement												Conditional Requirement			The conditional requirement can be met
Sustainable Sites	Eco	24.1	Sustainable Sites - Re-use of Land	1 point is available where 75% of the site was previously developed land at the date of site purchase or, for previously owned land, at the project's Green Star registration date.	1	1											Architect/ Client			1	Does not look promising, but worth a look for the final assessment
Heat Island Effect	Eco	25.1	Heat Island Effect - Heat Island Effect Reduction	1 point is available where at least 75% of the total project site area comprises building or landscaping elements that reduce the impact of the heat island effect. -Roofing materials, including shading structures, having the following: -For roof pitched <15° – a three year SRI of minimum 64; or -For roof pitched >15° – a three year SRI of minimum 34. -Unshaded hard-scaping elements with a three year SRI of minimum 34 or an initial SRI of minimum 39;	1	1											Architect/ ESD			1	Car park and driveways are asphalt. If this is sought later, SUHO recommends selecting a lighter coloured ground, shading and/or roof finishes.
Stormwater	Emi	26.1	Stormwater Peak Discharge	1 point is available where the post-development peak Average Recurrence Interval (ARI) event discharge from the site does not exceed the pre-development peak ARI event discharge	1	1											Architect / Civil Engineer	1			The post-development peak Average Recurrence Interval (ARI) event discharge from the site does not exceed the pre-development peak ARI event discharge. Music modelling required from the Civil Engineers
Stormwater	Emi	26.2	Stormwater - Pollution Targets	1 additional point is available, where the first point has been achieved and all stormwater discharged from site meets specified pollution reduction targets.	1	1											Architect / Civil Engineer		1		1 point is available, where the first point has been achieved and all stormwater discharged from site meets specified pollution reduction targets. Music modelling required for the civil Engineers. Requirements are below: - Total Suspended Solids (TSS)1 80% - Gross Pollutants 85% - Total Nitrogen (TN)2 30% - Total Phosphorus (TP)2 30% -Total Petroleum Hydrocarbons 60%
Light Pollution	Emi	27	Conditional Requirement - Light Pollution to Neighbouring Properties	The minimum requirement is met where the project complies with AS 4282:1997 Control of the obtrusive effects of outdoor lighting. The following values from Table 2.1 of AS 4282:1997 must be applied: - For Class 3 to 9 buildings (non-residential), the values in Column 3.C .	Conditional Requirement	Conditional Requirement											Electrical	Conditional Requirement			Electrical Engineers to confirm this credit

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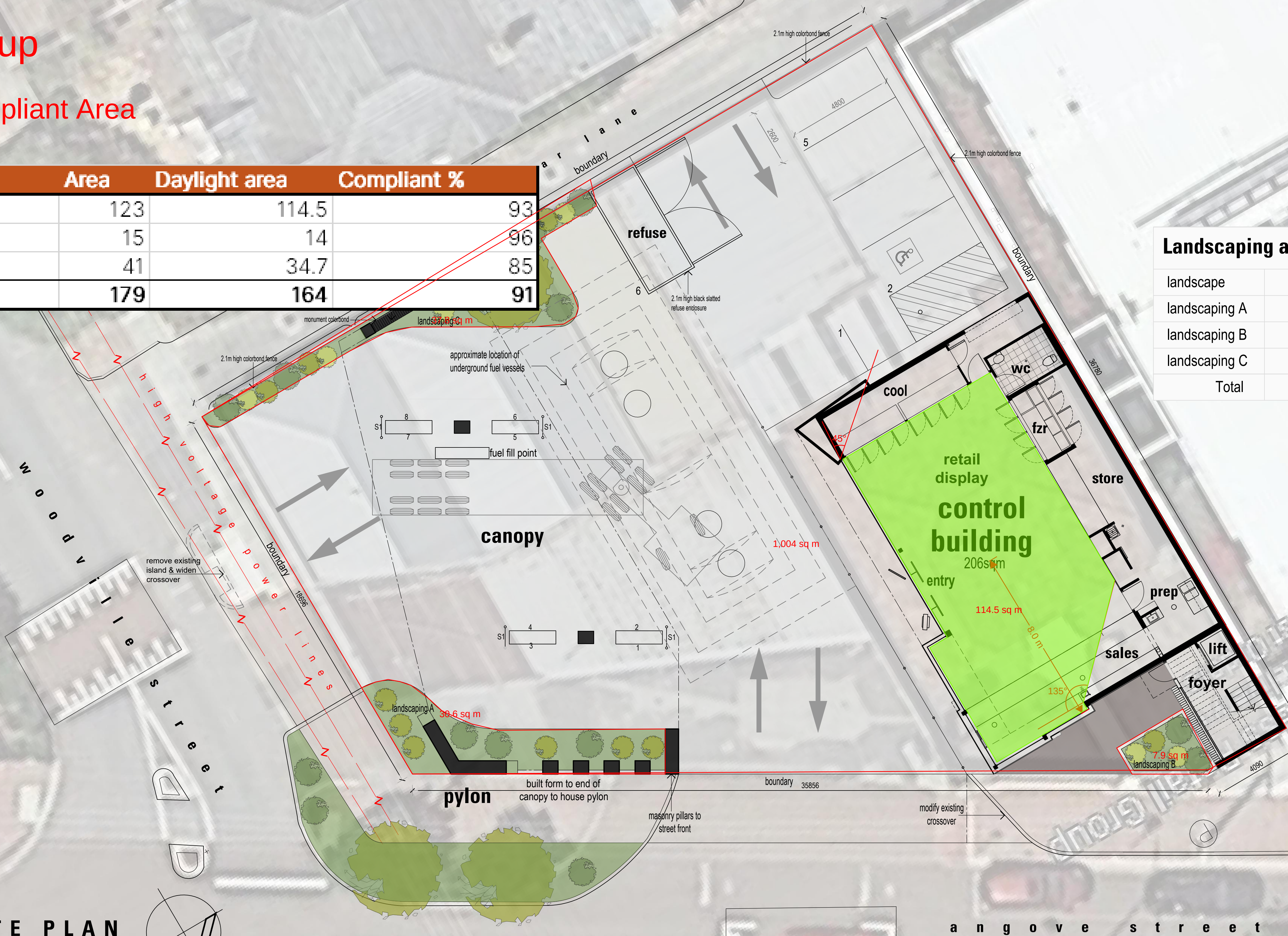
View Markup

Compliant Area

View markup	Area	Daylight area	Compliant %
Control building	123	114.5	93
Office	15	14	96
Meeting room	41	34.7	85
Total	179	164	91

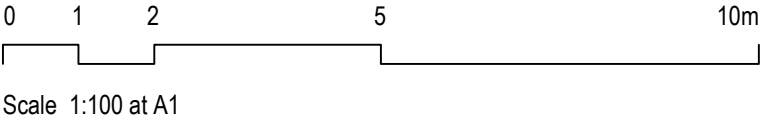
Landscaping area table

landscape	area sq.m.
landscaping A	24.93
landscaping B	6.48
landscaping C	33.36
Total	64.77



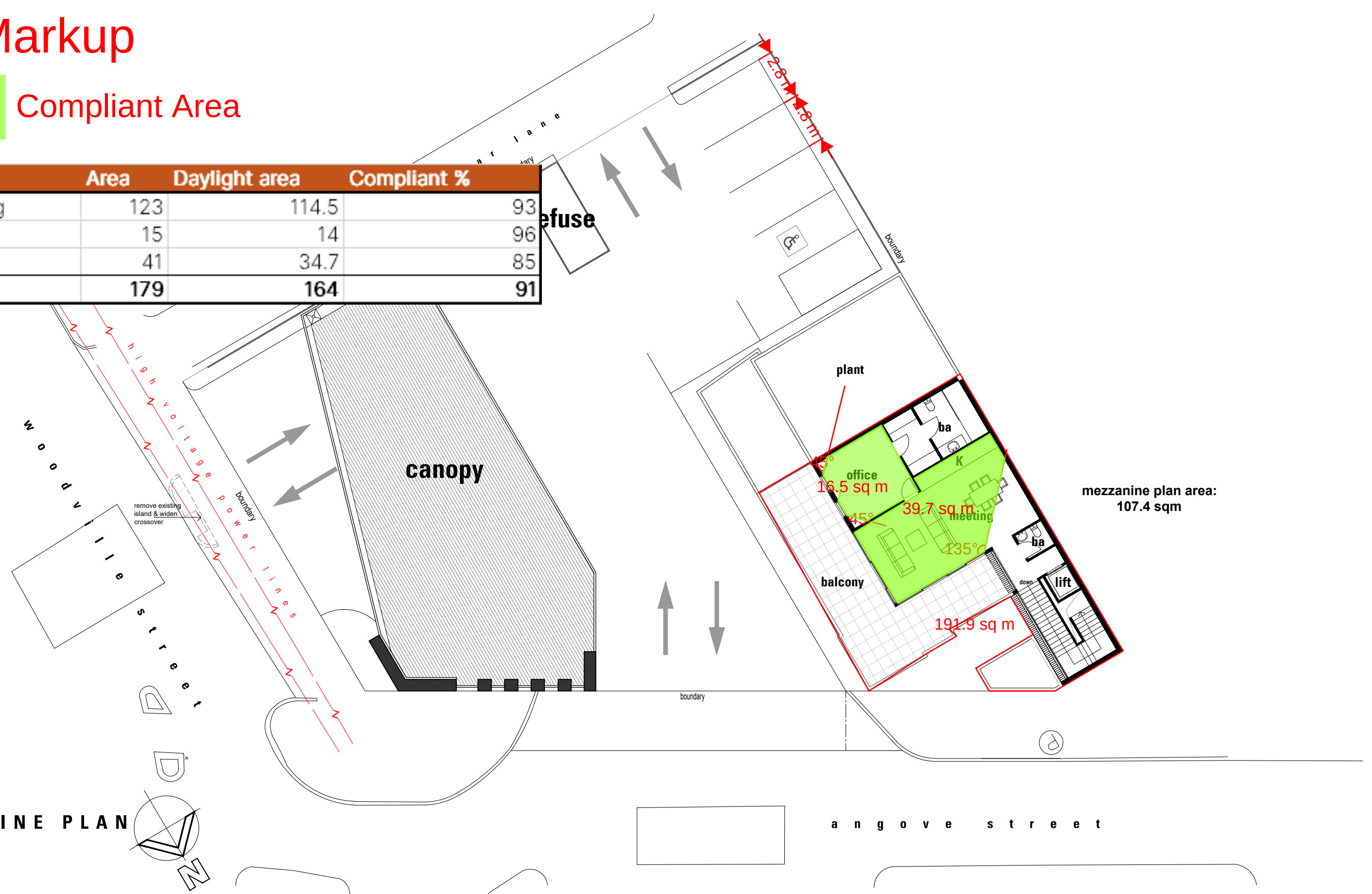
SITE PLAN
1:100 AT A1

NEW SERVICE STATION COMPLEX
41-45 ANGOVE STREET, NORTH PERTH WA



Compliant Area

View markup	Area	Daylight area	Compliant %
Control building	123	114.5	93
Office	15	14	96
Meeting room	41	34.7	85
Total	179	164	91



MEZZANINE PLAN
1:100 AT A1

NEW SERVICE STATION COMPLEX

41-45 ANGOVE STREET, NORTH PERTH WA

