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SUSTAINABLE DESIGN

STEENSEN VARMING



Santa Sophia Catholic College ESD SEARs Report



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1.0 Introduction

1.1 Overview

This report has been prepared by Steensen Varming on behalf of the Catholic Education Diocese of Parramatta c/TSA Management Pty Ltd (the Applicant). It accompanies an Environmental Impact Statement (EIS) in support of State Significant Development Application (SSD 18_9772) for the new Santa Sophia Catholic College on the corner of Fontana Drive and the future road 'B', between Red Gables Road and Fontana Drive, in Box Hill North (the site).

The new school will cater for approximately 1,920 primary and secondary school students, inclusive of a 60 student Catholic Early Learning Centre. The school will have 130 full-time equivalent staff.

The proposal seeks consent for approximately 15,000sqm of floor space across a part five and part six storey building. The building will present as three main hubs connected by terraced courtyards and garden spaces.

The school will include:

- Catholic Early learning centre for 60 students;
- General Learning Spaces for years Kindergarten to 12;
- Community Hub – knowledge centre and cafe;
- Creative Hub – art and applied science;
- Performance Hub – multipurpose hall and music, dance and drama spaces;
- Professional Hub – administrative space;
- Research Hub – science and fitness;
- Associated site landscaping and open space including a fence and sporting facilities;
- Bus drop off from Fontana Drive;
- Pick-up and drop-off zone from future road 'B';
- Pedestrian access points from Red Gables Road north, Fontana Drive and future road 'B';
- Staff parking for 110 vehicles provided off site in an adjacent location;
- Short term parking for pick up and drop off for Catholic Early Learning Centre from Red Gables Road; and
- Digital and non-digital signage to the school.

The purpose of this report is to provide a response to the Environmentally Sustainable Design (ESD) criteria stated in the project Secretary's Environmental Assessment Requirements (SEARs) for State Significant Development (SSD 18_9772).

1.2 Response to SEARs

The Santa Sophia SEARs Report is required by the Secretary's Environmental Assessment Requirements (SEARs) for SSD 18_9772. This table identifies the relevant SEARs requirement/s and corresponding reference/s within this report.

Table 1 – SEARs and Relevant Reference

SEARs Items	Project Response to DGR
Detail how ESD principles (as defined in clause 7(4) of Schedule 2 of the Regulation) will be incorporated in the design and ongoing operation phases of the development.	<p>The ESD initiatives proposed for the Santa Sophia project aims to reduce the environmental impacts typically associated with buildings during the construction and ongoing operation of the building. The project utilises a resource hierarchy approach, with emphasis on reduction of energy, water, waste, materials etc.</p> <p>The outcome of the resource hierarchy approach is to ensure the school aligns with the ecological sustainable development principles of Clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000.</p> <p>Refer to section 4.0 Resource Conservation for the proposed ESD initiatives.</p>
Include a framework for how the future development will be designed to consider and reflect national best practice sustainable building principles to improve environmental performance and reduce ecological impact. This should be based on a materiality assessment and include waste reduction design measures, future proofing, use of sustainable and low-carbon materials, energy and water efficient design (including water sensitive urban design) and technology and use of renewable energy.	<p>Steensen Varming have proposed the development of a Project-specific "Environmental Framework" to guide and inform the design of this building. This Framework provides detailed sustainable guidance to the design team, contractor and client from concept through to construction and operational phases of the project.</p> <p>The main philosophy of this approach is to provide appropriate and sensible sustainable design initiatives that would align with the building's functional and operational requirements, for a high-quality learning environment. The tool once developed will guide the design process and help achieve a low energy and sustainable building that draws on the expertise of the design team and of local and international Environmental Rating Standards such as Green Star (AUS), LEED (US), BREEAM (UK), High Performance Collaborative Schools (US), WELL (US) etc.</p> <p>The 'Environmental Framework' will provide a means to prioritise, monitor, record and ultimately achieve compliance with the project's environmental briefing requirements. Quantifiable benchmarks will be included where applicable, such as in the modelling of daylight, occupant comfort and emissions during the early stages of the project to inform design progression. All of which will be in general accordance with the best practice calculation methodologies such as Green Star, including:</p> <ul style="list-style-type: none"> ■ Consultant specific design requirements e.g. WoL (Whole of life) approach to system design; ■ Building Energy Modelling; ■ Occupant Comfort Assessments (Representative spaces); ■ Daylight and Glare assessments (Representative spaces);

SEARs Items	Project Response to DGR
<p>Include preliminary consideration of building performance and mitigation of climate change, including consideration of Green Star Performance.</p>	<p>Operational building performance will be considered in the design of Santa Sophia. Refer to section 3.0 and 4.0 for the building performance measures considered to reduce resource consumption and carbon emissions, and impacts on climate change.</p> <p>The principles of Green Star Performance will be considered and incorporated into the Project-specific “Environmental Framework” where applicable, to ensure continued optimal operational performance through the fine tuning of the systems and operational standards.</p> <p>The aim of Green Star Performance focuses on the building operation and maintaining a valid certification against the Australian Government's National Carbon Offset Standard for buildings. This requires ongoing measuring, reduction, offsetting and reporting of emissions. The project will consider strategies and building systems that facilitates measuring, reduction and reporting if desirable at a later stage.</p>
<p>Provide a statement regarding how the design of the future development is responsive to the CSIRO projected impacts of climate change. Specifically:</p> <ul style="list-style-type: none"> ■ hotter days and more frequent heatwave events; ■ extended drought periods; ■ more extreme rainfall events; ■ gustier wind conditions; and ■ how these will inform material selection and social equity aspects (respite/shelter areas). 	<p>At the current stage, the Santa Sophia project proposes the following strategies in response to the CSIRO projected impacts of climate change.</p> <p>Hotter days and more frequent heatwave events:</p> <ul style="list-style-type: none"> ■ Passive building design features to reduce/dampen the effects of increasing temperature, such as solar shading and solar control glazing. ■ The project proposes the use of mixed mode ventilation, however, acknowledges the impacts of climate change and has proposed the use of air conditioning during peak conditions. This is to ensure that appropriate internal conditions can be achieved and maintained as temperatures increase. ■ To ensure the proposed systems have spare capacity to meet increased demand and in the avoidance of major system upgrades / refurbishments. ■ Consideration of alternative heat rejection systems that are less affected by changes in external temperatures. <p>Extended drought periods:</p> <ul style="list-style-type: none"> ■ Consideration of native low water landscaping to reduce potable water consumption; and ■ Rainwater harvesting and low flow fixtures and fittings. <p>More extreme rainfall events:</p> <ul style="list-style-type: none"> ■ Consideration of increased drainage capacities to reduce flooding of roofs and hard surfaces; and ■ Assessment of design of the building to address post development probable maximum flood (PMF) level. <p>Gustier wind conditions:</p> <ul style="list-style-type: none"> ■ Design of windows and openings with controls to limit the impact of gustier wind conditions for internal spaces; ■ Landscaping to buffer strong winds to outdoor areas. <p>Material selection:</p> <ul style="list-style-type: none"> ■ Use of durable façade materials and materials to improve building thermal performance such as insulation and thermal mass; and ■ Covered/shaded outdoor respite areas.

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This report presents a concise summary of the design decisions made during Concept and Schematic Design stages, and outlines the key ESD opportunities and initiatives under consideration for the project.

To ensure a sustainable outcome, the following are key strategies being addressed within the proposed design:

- Incorporate a high-performance building envelope, to ensure energy efficiency as well as occupant comfort (including thermal, visual and acoustic comfort);
- Incorporate appropriate passive and active design strategies to ensure a low-energy as well as low-maintenance design outcome;
- Adopt water sensitive urban design principles;
- Adopt practices to minimise demolition, construction and operational waste; and
- Environmentally preferable materials.

2.0 Targets / Benchmarks

In addition to the Secretary's Environmental Assessment Requirements (SEARs), the following environmental targets are aspired by the Catholic Education Diocese of Parramatta (CEDP):

- Exceed the requirements of Section-J of the National Construction Code (NCC) for energy-efficiency in building fabric and building services / systems.
- Incorporate appropriate and sensible sustainable design initiatives that would align with the building's functional and operational requirements, for a high-quality learning environment. Seek guidance from the experience within the design team, and of local and international Environmental Rating Standards / Best Practice such as Green Star, LEED (US), BREEAM (UK), High Performance Collaborative Schools (US), WELL etc.
- Demonstrate good design through early stage modelling and guidance, in general accordance with the best practice standards such as Green Star;
- Align with new Government Architects NSW school standards such as:
 - Better Placed Design Guide for Schools (2018);
 - Environmental Design in Schools (2018).

2.1 NCC Section-J

Section-J of the National Construction Code (Previously known as the Building Code of Australia) 2019 relates to "energy efficiency" of buildings". Section J is a minimum performance target for standard buildings, and specifies minimum performance targets known as deemed-to-satisfy (DTS) requirements, for building fabric and services.

The proposed Santa Sophia project aims to exceed the DTS requirements of Section-J. A JV3 methodology is being applied for the project to demonstrate the improvement beyond DTS.

2.2 Project Specific Environmental Framework

In the creation of a Project Specific "Environmental Framework", guidance is to be taken from national and international environmental rating standards. These include Greenstar, BREEAM, CHPS, WELL Building Standard and LEED. Greenstar is an Australian voluntary Environmental Assessment system. BREEAM is the UK equivalent, and CHPS (Collaborative for High Performance Schools) & LEED are American Environmental Standards. The WELL Building Standard is an American Standard specifically focused on occupant health & wellbeing and is currently gaining recognition & traction across the major markets. This guidance will be viewed in combination with the design teams past project experience and lessons learnt, in particular those from the CEDPs FM (Facilities Management) team on current building operation, maintenance, supplier and control requirements.

3.0 Sustainability Approach

Sustainable building design involves a holistic and integrated design approach, which builds on an increased awareness of site opportunities, form and function, to encompass and target a broad range of sustainable design initiatives.

For Santa Sophia Catholic College, the key priorities to support the functional demand i.e. a learning / teaching environment, are as follows:

- The promotion of natural daylight;
- High levels of IAQ (Indoor Air Quality);
- Thermal, Visual and Acoustic comfort;
- Resource conservation (energy, water and waste); and
- The creation of an integrated community resource.

The promotion of natural daylight – There is a direct correlation between access to daylight and student performance, attention, productivity and general wellbeing;

Excellent Indoor Air Quality (IAQ) – In a similar manner to daylight, there is proven correlation between student performance, occupant wellbeing, student attendance and staff retention. Principle strategies include:

- Increased levels of outside air through the promotion of mixed mode or natural ventilation strategies, and increased outdoor air allowances;
- Mould prevention through the avoidance of thermal bridges, condensation and effective strategies in ventilation, odour and pollution control;
- Low pollutant emitting materials selections such as low VOC paints, adhesives, sealants, composite woods etc.

Excellent Thermal, Visual and Acoustic comfort – To address:

- Thermal comfort: To ensure teachers, students and administrators are not subject to unacceptable extremes in temperature as they teach, learn and work;
- Visual comfort: To ensure the quality of light is supportive of visual tasks such as reading and presenting. In design for natural daylight, consideration must be given to daylight uniformity, penetration depth, solar heat ingress and glare control;
- Acoustic comfort: To ensure effective communication can always be achieved, noise from ventilation systems, external and internal disruptive noise affecting classrooms is minimised.

Resource conservation (energy, water and waste) – In delivering on the functional demands of an educational building (high levels of daylight, thermal comfort, visual comfort, and IAQ), incurs resource use through the optimisation of these attributes. These are to be supported with minimal consumption of energy and water resources, or the generation of waste and pollution in demolition, construction and operation of the building. Our approach to resource conservation is based on applying a “hierarchy” methodology as outlined in the following sections (See section 4.0).

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The creation of an integrated community resource – The school can play a role within the local community through the use of shared facilities (library's, auditoriums, sport facilities and open spaces).

The development will consider:

- Out of hours and/or vacation care facilities (OOSH);
- Sharing of school facilities with public after school hours;
- Utilise the neighbouring community sports field.

The development of the building and surrounds as a teaching tool – Students develop greater knowledge retention, understanding and awareness, when they have the opportunity to interact directly with their environment through the mediums of touch, sight and feel, compared to the traditional textbook learning.

The above approach has been taken to ensure the ESD strategies proposed meet the SEARs and targets/benchmarks discussed in the previous section.

The following sections provide a high-level overview of some of the strategies being considered.

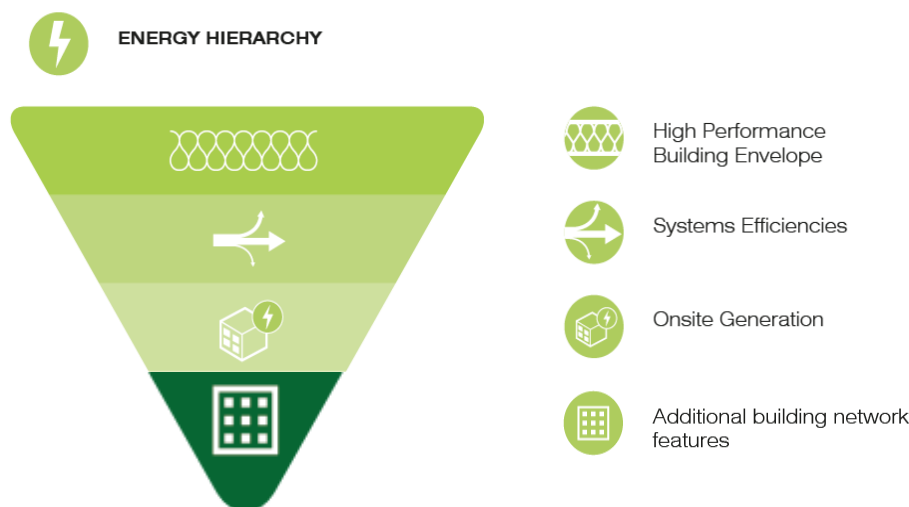
4.0 Resource Conservation

This section provides a further breakdown for resource conservation.

4.1 Energy

The proposed approach to sustainability and energy related systems is based on applying an “energy hierarchy” methodology.

This methodology has the reduction of energy use as its priority, and then seeks to meet the remaining energy demand by the most efficient means available, before the inclusion of on-site generation and importation of green power.



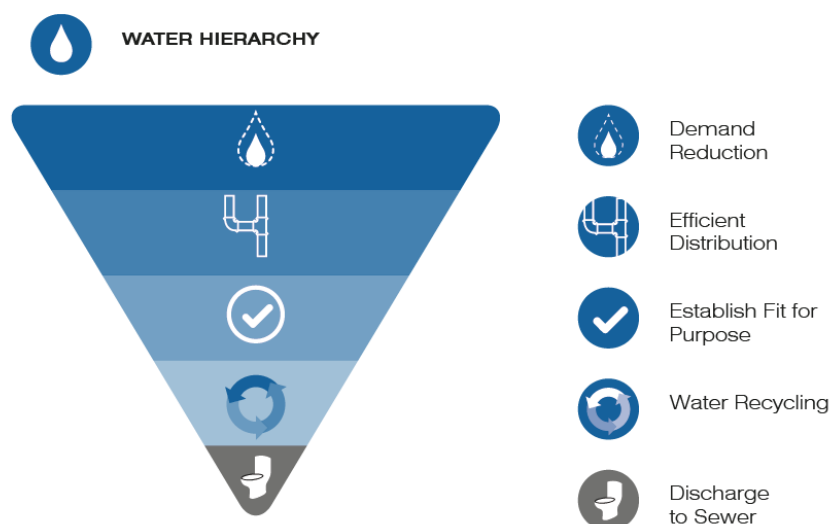
The following energy initiatives have been proposed for Santa Sophia:

- **Building Form** has been designed with consideration of façade access for greater access to natural daylight and opportunity for natural ventilation, within the constraints of the site.
- **Passive design principles** will be employed to respond to environmental conditions of the building including orientation, solar access, prevailing winds, seasonal and diurnal temperatures changes.
- **Building envelope performance** (airtightness and thermal) will be enhanced by prefabrication.
- **A Mixed Mode Ventilation strategy** will be accessed for improved indoor air quality, whilst also reducing energy consumption associated with air-conditioning. When external and internal conditions are favourable, external windows to each cluster can open to facilitate natural ventilation.
- **Building energy performance improvement** - Energy modelling will be performed in development of a design that betters current minimum standards.
- **Energy efficient LED lighting, zoning, controls and site co-ordination** for both internal and external lighting systems are to be designed.

- **Occupancy controls** will be provided to spaces so that AV, lighting and mechanical systems can be shut down both manually and automatically when unoccupied.
- **A Solar photovoltaic (PV) array** has been proposed and will be located on the roof terrace. Energy generated onsite can be reused onsite.
- **High efficiency HVAC (Heating, Ventilation & Air-conditioning)** systems to be incorporated;
- **CO₂ monitoring** in the appropriate control of outdoor air provisions.

4.2 Water

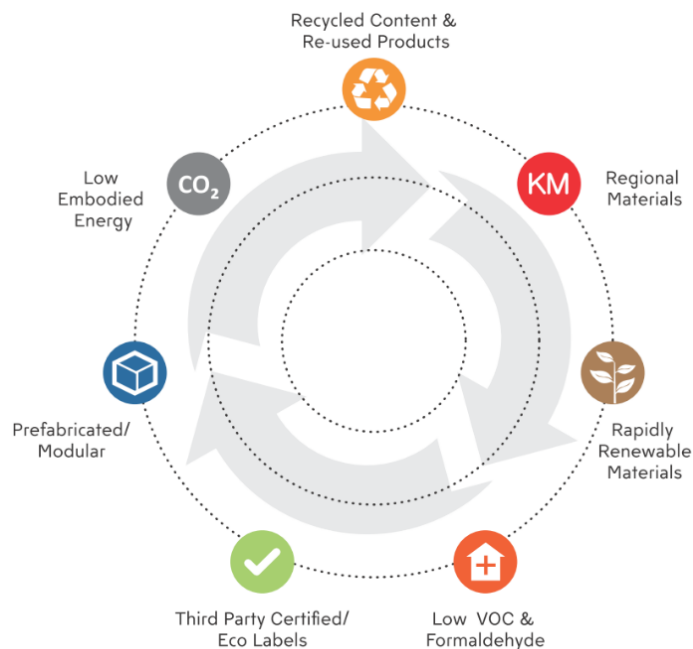
The following hierarchy and strategies will be applied:



- **Water efficient fixtures / fittings** will be specified. These include fittings such as taps, showerheads, toilets, zip taps, dishwashers etc certified under the WEL rating scheme;
- **Rainwater Reuse** - Rainwater collection and reuse systems will be accessed. Reuse options include landscape irrigation and toilet flushing.
- **Fire Systems test water** will be captured and stored for re-use using the rainwater tank.

4.3 Materials and Construction Waste

Selection of environmentally preferable materials is a key priority for the project, because building materials consume energy and natural resources during its manufacture and for their transportation to the construction site. Choices of materials and construction methods can significantly change the amount of energy embodied in the structure of a building.



In accordance with the short construction programme, low-impact construction methods of offsite prefabrication/preassembly will be applied for Santa Sophia. Prefabricated structures build in purpose-built factories are less labour intensive, more time efficient, and produce less waste compared to traditional onsite construction methods. Raw materials and construction elements are not exposed to the elements, which ensures high quality in the final building, and construction process is less weather dependant.

Preference will be given to materials that contain high-recycled content and/or are highly recyclable. The following strategies have been proposed:

- **Use sustainable timber** – Timber products used for concrete formwork, structure, wall linings, flooring and joinery will be sourced where possible from reused, post-consumer recycled or FSC-certified, or PEFC certified timber.
- **Steel** – will be specified to meet specific strength grades, energy-reducing manufacturing technologies, and off-site fabrication. Steel will also be sourced with a proportion of the fabricated structural steelwork via a steel contractor accredited by the Environmental Sustainability Charter of the Australian Steel Institute.
- **Recycled concrete** – The project aims to reduce the use of Portland cement through substitutions. Fine and coarse aggregate inputs are to be sourced from

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manufactured sand or other alternative materials, and the amount of Portland cement will be reduced within the concrete mix.

- **High recycled content or recyclability** – Furniture items with high recycled or recyclability content have been considered.
- **Site waste management plan.** During the demolition and construction phase, a project-specific site waste management plan (WMP) will be developed and implemented, for recycling of demolition and construction waste.

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5.0 Additonal key measure

- **Environmental Management Plan (EMP)** – An EMP has been considered for the school. This measure is intended to reduce the environmental impacts associated with the construction of new buildings.
The EMP will be developed and implemented for the construction stage, including demolition and excavation, to address environmental, worker health and safety and community risks. The EMP is a project specific plan and developed using State and Federal Guidelines and standards. The main contractor will implement an Environmental Management System certified to the ISO 14001 standard to ensure the objectives of the EMP are met.

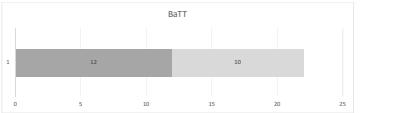
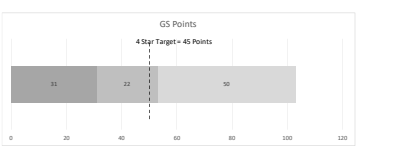
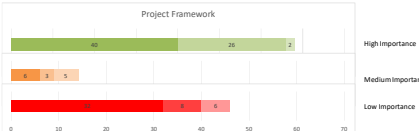
Santa Sophia Catholic College
Sustainability Performance Targets

Project Framework				
Category	Available Measures	Low / Med Risk	High Risk	Total Target
High Importance - mandatory	68	40	26	66
Medium Importance	14	2	2	8
Low Importance	40	12	8	40
Total	128	78	37	115

Green Star - Whole Project				
Category	Available Points	Low / Med Risk	High Risk	Total Target
MANAGEMENT	14	11	0	11
INDOOR ENVIRONMENTAL QUALITY	17	8	3	11
ENERGY	22	2	4	6
TRANSPORT	7	0	0	0
WATER	12	3	3	6
MATERIALS	30	0	2	2
LAND USE & ECOLOGY	5	1	1	2
EMISSIONS	5	2	3	5
INNOVATION	10	5	7	10
Total	103	31	22	53
4* Target	45			4 Stars

Well Additional				
Category	Procon. Interior Available	Low / Med Risk	High Risk	Total Target
Air Quality	8	3	5	8
Water	8	8	8	8
Food Provision	2	1	1	2
Light	5	3	3	5
Fitness	1	1	0	1
Connect	1	0	1	1
Mind	4	2	2	4
Total	31	9	12	21

Building as a Teaching Tool				
Category	Procon. Interior Available	Low / Med Risk	High Risk	Total Target
Indoor Environmental Quality	8	4	4	8
Energy	2	1	1	2
Water	1	1	0	1
Transport & Fitness	3	1	2	3
Materials & Waste	2	1	1	2
Recycling	4	2	1	4
Healthy Eating	2	1	1	2
Total	22	12	10	22



Project Brief alignment	Green Star				Total Points	Credit Requirements	Stage Input Required	Responsibility	Input from	Comments (SD - March/April 2019)	Costing
	Concepts and Features	Points Available	Low and Med Risk	High Risk							
Priority 1) High Importance - mandatory 2) Medium Importance 3) Low Importance	MANAGEMENT	14	11	0	11						1) Captured in current 2) YBC 3) Not captured in current
	1 Green Star Accredited Professional										
3	1.0 Accredited Professional	1	1		1	1 point is available where a Green Star Accredited Professional - Design & As Built (CSAP) has been contractually engaged for: • Provide advice, support and information related to Green Star principles, structure, timing and processes; • Provide evidence and support in all stages of the project leading to certification.	Concept	STEENSEN VAMPINC			1
	2 Commissioning and Tuning										
3	2.0 Environmental Performance Targets	Req.	Req.		Req.	Development of a design intent report (earlier in the design phase) or an owner's project requirements (OPR) document must be prepared by the design team (and ICA project team where applicable) at the design phase stage and outline, as a minimum, the following items: • Description of the basic functions, operations, and maintenance of the nominated systems. • The targets for the energy and water consumptions and budgets for nominated building systems. • Description of how energy, water, and aspects of indoor environment quality are metered and monitored. This typically would include a meter diagram that illustrates how energy and water budgets could be confirmed in operation.	Concept	CLIENT ARCH HYDRAULIC ELEC MECH FIRE			1
3	2.1 Services and Maintainability Review	1	1		1	The services and maintainability review is to facilitate input from the design team, the facilities manager and operations staff (if known), and any relevant suppliers and subcontractors (if engaged).	Design Development	PM CLIENT/PM	MECH HYDRAULIC ELEC MECH FIRE		2
3	2.2 Building Commissioning	1	1		1	The pre-commissioning and commissioning activities have been performed based on the approved standards and guidelines • Commissioning Specification • Commissioning Plan • Air Permeability Performance Testing	Design Development	CONTRACTOR ICA	MECH HYDRAULIC ELEC MECH FIRE FACADE ARCH		2
3	2.3 Building Systems Tuning	1	1		1	Following practical completion and prior to occupation, the owner client must commit to a tuning process of all nominated systems. As a minimum, the commitment must include quarterly adjustments and measurement for the first 12 months after occupation and a review of warranties.	Design Development	CONTRACTOR ICA / PM CLIENT/PM	ELEC MECH FIRE FACADE ARCH		2
3	2.4 Independent Commissioning Agent	1	1		1	• Verification that nominated systems are performing to their design potential in full and part load conditions; • Reviews of environmental performance against environmental targets; • Collection of user feedback to match the occupant's needs and the system performance; • Adjustment of all the systems to account for all deficiencies; and • Management, communication, and assignment of responsibilities for the tuning process within the team.	Design Development	ICA / PM		16-04-2019 TSA: Have advised that an ICA should/will be appointed.	1
	3 Adaptation and Resilience										
3	3.0 Implementation of a Climate Adaptation Plan	2			0	• 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 adaptation plan.	Scheme / Specs		HYDRAULIC ELEC MECH FIRE FACADE ARCH CONTRACTOR LAND CIVIL		3
	4 Building Information										
3	4.1 Building Operations and Maintenance Information	1	1		1	1 point is awarded where: • It is demonstrated that comprehensive Operations and Maintenance information is developed and made available to the facilities management team; and • A relevant and current building user information, is developed and made available to all relevant stakeholders.	Operation	CLIENT / PM PM	HYDRAULIC ELEC MECH FIRE FACADE ARCH CONTRACTOR		2
	5 Commitment to Performance										
3	5.1 Environment Building Performance	1	1		1	1 point is available where there is a commitment to set targets and measure results for the environmental performance of the building. Either targeting building performance metrics, or NABERS for 2 of: • GHG emissions or Energy • Potable water • Operational waste • IEQ	Operation	CLIENT / PM	ARCH MECH ELEC HYDRAULIC		1
3	5.2 End of Life Waste Performance	1	1		1	1 point is available where there is a commitment to reduce demolition waste at the end of life of an interior fitout or base building component.	Operation/ end of life	ARCH	CLIENT / PM ARCH		2
	6 Metering and Monitoring										
3	6.0 Metering	Req.	Req.		Req.	It is a mandatory minimum requirement of this credit that accessible metering be provided to monitor energy and water consumption of all energy and water common uses, major uses, and sources.	Detail	HYDRAULIC ELEC	CLIENT / PM ARCH		1
3	6.1 Monitoring Systems	1	1		1	1 point is available where a monitoring strategy is addressed through a monitoring system, capable of capturing and processing the data produced by the installed energy and water meters, and accurately and clearly presenting data consumption trends.	Detail	ICA	HYDRAULIC ELEC MECH	16-04-2019 TSA: Have advised that an ICA should/will be appointed.	1
	7 Responsible Construction Practices										
3	7.0 Environmental Management Plan	Req.	Req.		Req.	As a minimum requirement, environmental impacts must be managed during construction by implementing a best practice environmental management plan (EMP).	Specs / Construction	CONTRACTOR	ARCH CLIENT / PM		2
3	7.1 Environmental Management System	1	1		1	1 point is available where the responsible party for the site has a formalised approach to planning, implementing and auditing in place during construction, to ensure conformance with the EMP.	Specs / Construction	CONTRACTOR	CLIENT / PM		2
3	7.2 High Quality Staff Support	1			0	1 point is available where high quality staff support practices are in place that: • promote positive mental and physical health outcomes of site activities and culture of site workers, through programmes and solutions on site; and • enhance site workers' knowledge on sustainable practices through on-site, off-site, or online education programmes.	Specs / Construction	CLIENT / PM	CONTRACTOR		3
	8 Operational Waste										
3	8A Performance Pathway: Specialist Plan	1	1		1	1 point is available where a waste professional prepares and implements an Operational Waste Management Plan (OWMP) for the project in accordance with best practice approaches and this is reflected in the building's design.	Specs / Construction	WASTE	ARCH CLIENT / PM		1
	8B Prescriptive Pathway: Facilities	-	-		0	1 point is available where facilities are in place to collect and separate distinct waste streams, and where these facilities meet best practice access requirements for collection by the relevant waste contractor.					
	INDOOR ENVIRONMENTAL QUALITY	17	8	3	11						
	9 Indoor Air Quality										
1	9.1 Ventilation System Attributes	1	1		1	1 point is awarded where: • The entry of outdoor pollutants is mitigated; • The system is designed for ease of maintenance and cleaning; AND • The system has been cleaned prior to occupation and use.	Detail	CONTRACTOR	MECH		1
1	9.2 Provision of Outdoor Air	2		1	1	For mechanically ventilated or mixed-mode spaces: 1 point is awarded where outside air is provided at a rate 50% greater than that required in AS1668.2:2012 or CO2 concentrations are maintained below 800ppm. 2 points are awarded where outside air is provided at a rate 100% greater than that required in AS1668.2:2012 or CO2 concentrations are maintained below 700ppm For naturally ventilated spaces: 2 points are awarded where the requirements of AS1668.4:2012 are met.	Detail	MECH			1

1	9.3 Exhaust or Elimination of Pollutants	1	1	1	1 point is awarded where the nominated pollutants, such as those arising from printing equipment, cooking processes and equipment and vehicle exhaust, are limited by either removing the source of pollutants from the nominated area, or exhausting the pollutants directly to the outside of the project while limiting their entry into other areas.	Detail	MECH	ARCH		1
	10 Acoustic Comfort									
1	10.1 Internal Noise Levels	1	1	1	1 point is awarded where internal ambient noise levels in the nominated area are suitable and relevant to the activity type in the room. This includes all sound generated by the building systems and the external noise ingress.	Detail	ACOUSTIC CONTRACTOR	MECH ARCH	10-04-2019 JHA: We recommend to target for two points (of three) for the Green Star design. Internal noise levels (R8B) and reverberation time (R77) points will be achievable. Changed from not targeted to low risk.	1
1	10.2 Reverberation	1	1	1	1 point is available where the nominated area has been built to reduce the persistence of sound to a level suitable to the activities in the space.	Detail	ACOUSTIC CONTRACTOR	MECH ARCH	Changed from not targeted to low risk.	1
1	10.3 Acoustic Separation	1	1	1	1 point is available where the nominated enclosed spaces have been built to minimise crosstalk between rooms and between rooms and open areas. The partition between the spaces should be constructed to achieve a weighted sound reduction index (Rw) of: <ul style="list-style-type: none"> ≥ At least 45; for all partitions which are: <ul style="list-style-type: none"> to fixed without a door; and/or to glazed partitions without a door. ≥ At least 35; for all partition types that contain a door OR; The sound insulation between enclosed spaces complies with: $D_w + L_{w,eqT} > 75$ Where: D_w = Weighted sound level difference measured between two spaces; and	Detail	ACOUSTIC CONTRACTOR	MECH ARCH	15-04-2019 TSA: Should be achieved. Changed from not-targeted to low risk.	1
	11 Lighting Comfort									
1	11.0 Minimum Lighting Comfort	R	R	R	It is a requirement for this credit that lights are flicker free and that the lights accurately address the perception of colour in the space	Detail	LIGHT	ELEC		1
1	11.1 General Illuminance and Glare Reduction	1	1	1	1 point is awarded where in the nominated areas: Lighting levels comply with best practice guidelines; and Glare is eliminated	Detail	LIGHT	ELEC		1
1	11.2 Surface Illuminance	1		0	Following the Prescriptive Method, 95% of the spaces in the nominated area comply with having: <ul style="list-style-type: none"> An average surface reflectance for ceilings of at least 0.75; and A direct/indirect lighting system is present such that the ceiling area has an average surface illuminance of at least 30% of the lighting levels on the working plane. The average surface reflectance value corresponds to a matte flat white ceiling. The surface reflectance value must be obtained from the manufacturer's data sheet for the final finish.	Detail	ARCH	ELEC LIGHT		3
1	11.3 Localised Lighting Control	1		0	Additional point is awarded where in the nominated areas: Occupants have the ability to control the lighting in their immediate environment	Detail	LIGHT	ARCH ELEC		3
	12 Visual Comfort									
1	12.0 Glare Reduction	Req.	Req.	Req.	It is a condition of this credit that glare in the nominated area from sunlight through all viewing apertures is reduced through a combination of blinds, screens, fixed devices, or other means.	Detail	ARCH			1
1	12.1 Daylight	2	1	1	1 point is awarded where a 40% of the nominated area receives high levels of daylight. Up to 2 points are available where a project can demonstrate that good levels are daylight are available to a higher percentage of the nominated area than is required for credit compliance. 60% - 2 points 60% - 3 points (Innovation)	Design Development	ESD	ARCH	19-03-2019 50% SD Façade Design: Significant difference from previous sketches, namely broken up floor-to-ceiling glazing banks as opposed to a continuous mid-to-high level glazing band. Changed from low risk to high risk.	1
1	12.2 Views	1	1	1	1 point is awarded where 60 % of the nominated area has a clear line of sight to a high quality internal or external view.	Design Development	ARCH			1
	13 Indoor Pollutants									
1	13.1 Paints, Adhesives, Sealants and Carpets	1	1	1	1 point is available where at least 95% of all internally applied paints, adhesives, sealants and carpets meet stipulated "Total VOC Limit", or, where no paints, adhesives, sealants or carpets are used in the building.	Specs	ARCH	HYDRAULIC ELEC MECH FIRE CLIENT / PM		2
1	13.2 Engineered Wood Products	1		0	1 point is available where at least 95% of all engineered wood products meet stipulated formaldehyde limits or no new engineered wood products are used in the building.	Specs	ARCH	CLIENT / PM ARCH		2
	14 Thermal Comfort									
1	14.1 Thermal Comfort	1	1	1	1 point is awarded where for 95% of the nominated area and 98% of the year: For naturally ventilated spaces, the internal temperatures are within 80% of Acceptability Limit 1 of ASHRAE Standard 55-2015. For mechanically ventilated spaces: the space meets specified prescriptive criteria for Thermal Comfort or The Predicted Mean Vote (PMV) levels are between -1 and +1, inclusive. This may be demonstrated through application of the Occupied-to-Satisfy criteria, AND/OR -In residential spaces, an average Nathers rating of 7 Stars or greater is achieved.	Detail	MECH	ARCH FAÇADE		1
1	14.2 Advanced Thermal Comfort	1		0	1 point is available where 95% of nominated area and 98% of the year a high degree of thermal comfort is provided. For Naturally ventilated spaces - Internal temps are within 90% of acceptability limit 1 of ASHRAE 55-2015; For Mechanically ventilated spaces - Predicted Mean Vote (PMV) levels are between -0.5 and +0.5, inclusive. Residential spaces - an average Nathers rating of 8 stars or greater is achieved, in accordance with 14.1.3 Additional Innovation point is available where the project has open plan work spaces.	Detail	MECH	ARCH FAÇADE		3
	ENERGY	22	2	4	5					
	15 Greenhouse Gas Emissions									
1	Conditional Requirement	Req.	Req.	Req.	Minimum point's threshold for GHG emissions to be met as per specific credit conditional requirement. Minimum points threshold of 6 required to receive a 5 star rating					1
	15A GHG Emissions Reduction - Prescriptive Pathway	R	R	R		Scheme / Detail	MECH ARCH FAÇADE ELEC VERTICAL TRANS			
	15B GHG Emissions Reduction - Nathers	-		0						
	15C GHG Emissions Reduction - BASIN	-		0						
	15D GHG Emissions Reduction - NABERS Energy Commitment Agreement	-		0						
1	15E GHG Emissions Reduction - Reference Building Pathway	20	2	3	5	Conditional Requirement: Project team 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. Up to 20 points are available where there is a specified reduction in the predicted energy consumption and GHG emissions of the proposed building. Points are awarded based both on improvements to the building's façade, and on the project's predicted ability to reduce its operating energy consumption and emissions towards 'net zero'.	Scheme / Detail / Completion	MECH ARCH ELEC HYDRAULIC VERTICAL TRANS		1
	16 Peak Electricity Demand Reduction									
	16A Prescriptive Pathway: On-site Energy Consumption	-		0						
1	16B Modelled Performance Pathway: Reference Building	2	1	1	Up to 2 points are available where it is demonstrated that the building's predicted peak electricity demand has been reduced below that of a Reference Building. 1 point at 20% improvement 2 points at 30% improvement	Detail	ELEC	MECH CLIENT / PM		2
	17 Sustainable Transport	10	0	0	0					
3	17A Performance Pathway	-	-	0	It is a requirement of this pathway that a travel plan be developed to ensure all aspects of transport have been considered and addressed as part of this pathway. Up to 10 points are then awarded where based on the holistic approach to reducing the impacts from transport against a reference building.	Design Development / Detail	TRANSPORT		19-04-2019 Steensen Varming: Under revision.	
	17 B Prescriptive Pathway	YES			0					
3	17B.1 Access by Public Transport	3	0	0	The measure or the accessibility relates to "the number of residents that can access the nominated destination through the use of public transport within a 45 minute time band during morning peak hour". The 45 minute threshold includes: <ul style="list-style-type: none"> Walk time to and from the public transport stop at both ends of the trip; In-vehicle time; and Walk time to and from the stop. 	Detail	ARCH	CLIENT / PM ARCH	19-04-2019 Steensen Varming: Under revision.	
3	17B.2 Reduced Car Parking Provision	1	0	0	Points are awarded where the number of parking spaces provided meets the maximum rates outlined in the table 17B.2. Where a building has multiple uses, a hybrid rate will be determined based on the proportion attributable to each use. The project's Accessibility Rating is determined through use of the Access by Public Transport Calculator.	Design Development	ARCH		19-04-2019 Steensen Varming: Under revision.	
3	17B.3 Low Emission Vehicle Infrastructure	1	0	0	1 point is awarded where the project includes low emission vehicle infrastructure that meets one of the following benchmarks: <ul style="list-style-type: none"> 15% of parking is designated for fuel efficient vehicles, with a maximum of 5% for motorcycle parking 5% of parking is designated for electric vehicles and charging infrastructure is provided per space. 	Detail	ARCH		19-04-2019 Steensen Varming: Under revision.	
3	17B.4 Active Transport Facilities	1	0	0	Cycle Facilities - Regular Building Occupants - Secure bicycle parking for staff is provided for 7.5% of total staff, with associated end of trip facilities. Cycle Facilities - Building Visitors - Secure bicycle parking for visitors is provided for 5% of peak visitors.	Design Development	ARCH		19-04-2019 Steensen Varming: Under revision.	
3	17B.5 Walkable Neighbourhoods	1		0	The distance is defined as a diameter from the centre of the development. Proximity can be 500m or less	Design Development	URBAN	ARCH	19-04-2019 Steensen Varming: Under revision.	
	18 WATER	19	3	3	6					
	18 Potable Water									
1	18A Performance Pathway	12	3	3	6	Up to 12 points are available based on the reduction of predicted potable water consumption when compared against a reference building or a building code benchmark. Points are awarded based on the proposed building's ability to reduce its predicted consumption to zero. This credit addresses the potable water consumption from the use of sanitary fixtures, appliances, HVAC, irrigation systems, and swimming pools (where present).	Design Development	HYDR	ARCH MECH LANDSCAPE	2
	18B Prescriptive Pathway	-			0	Up to 6 points out of 12 are available where it is demonstrated that the building's potable water consumption has been reduced through best practice water saving design features.				
	19 Life Cycle	18	1	1	2					

2	19A.1 Comparative Life Cycle Assessment	-	0	0	To comply with this credit, projects shall demonstrate the reduction of environmental impacts when compared with a reference building using a life cycle assessment. Points from operational energy reductions are capped at 3.	Detail	LCA	CLIENT / PM ARCH		
2	19A.2 Additional Reporting	-		0	Up to 4 additional points are available where the LCA conducted by projects includes reporting of five impact categories in addition to those required under the whole-of-building whole-of-life methodology.	Detail	LCA	CLIENT / PM ARCH		
2	19B.1 Prescriptive Pathway - Life Cycle Impacts - Concrete	3		0	Portland cement reduction, water reduction, aggregate reduction				19-04-2019 Steensen Varming: Under revision.	
2	19B.2 Prescriptive Pathway - Life Cycle Impacts - Steel	1		0	Up to 1 point is available where there is a reduction in the mass of steel framing used when compared to standard practice. OR Up to 1 point is available when there is a reduction in the mass of steel reinforcement used when compared to standard practice.				19-04-2019 Steensen Varming: Under revision.	
2	19B.3 Prescriptive Pathway - Life Cycle Impacts - Building Phase	4		0	Façade reuse, Structure reuse				19-04-2019 Steensen Varming: Under revision.	
2	19B.3 Prescriptive Pathway - Life Cycle Impacts - Structural Timber	3		0	Up to 3 points are available where the building is constructed from the following proportion of structural timber: 1 point for 30% of the building's GFA; 2 points for 70% of the building's GFA; and 3 points for 90% of the building's GFA.				19-04-2019 Steensen Varming: Under revision.	
20 Responsible Building Materials										
2	20.1 Structural and Reinforcing Steel	1	0	0	1 point is available where 95% of the building's steel (by mass) is sourced from a Responsible Steel Maker; and A. For steel framed buildings, at least 60% of the fabricated structural steelwork is supplied by a steel fabricator/steel contractor accredited to the Environmental Sustainability Charter of the Australian Steel Institute (ASI); OR B. For concrete framed buildings, at least 60% (by mass) of all reinforcing bar and mesh is produced using energy-reducing processes in its manufacture (measured by average mass by steel maker annually).	Design Development	STRUCT	QS CONTRACTOR CLIENT / PM		2
2	20.2 Timber	1	0	0	1 point is available where at least 95% (by cost) of all timber used in the building and construction works is either: A. Certified by a forest certification scheme that meets the GBCA's 'Essential' criteria for forest certification; OR B. Is from a reused source.	Detail / Specs	STRUCT	ARCH CLIENT / PM		2
2	20.3 Permanent Formwork, Pipes, Flooring, Blinds and Cables	1	0	0	1 point is available where 90% (by cost) of all permanent formwork, pipes, flooring, blinds and cables in a project either: A. Do not contain PVC and have a recognised product declaration; OR B. Meet Best Practice Guidelines for PVC.	Detail / Specs	ARCH STRUCT MECH ELEC HYDRAULIC FIRE	CLIENT / PM ARCH		2
21 Sustainable Products										
2	21.0 Product Transparency and Sustainability	3	1	1	Up to 3 points are awarded when products meet transparency and sustainability requirements under one of the following initiatives: A. Reused Products B. Recycled Content Products C. Environmental Product Declarations D. Third-Party Certification E. Stewardship Programs	Specs	ARCH	QS STRUCTURAL CLIENT / PM		2
22 Construction and Demolition Waste										
2	22A&B Reduction of Construction and Demolition Waste	1	1	1	Reduction of Construction and Demolition Waste sent to Landfill (Fixed Benchmark) - Up to 2 points are available where the construction waste going to landfill is reduced to a fixed benchmark or below. The benchmark is defined in kg of waste per square meter of gross floor area. (GFA) Reduction of Construction & Demolition Waste sent to landfill (Percentage Benchmark) - 1 point is awarded where the project reduces the amount of construction and demolition waste going to landfill to less than 90% of the total construction waste. Waste shall be reported in kg/tm2		CONTRACTOR	WASTE ARCH CLIENT / PM		1
LAND USE & ECOLOGY										
23 Ecological Value										
3	23.0 Endangered, Threatened or Vulnerable Species and Communities	R	R		R	Specs	ECOLOGY	ENV ARCH		2
3	23.1 Ecological Value	3			0	Specs	LAND	ARCH		3
24 Sustainable Sites										
3	24.0 Conditional Requirement	R	R		R	Specs	CLIENT/75A	ARCH ENV		1
3	24.1 Reuse of Land	1	0	0	0	Concept	ENV			N/A
3	24.2 Contamination and Hazardous Materials	1	0	1	1	Specs / Construction	CONTRACTOR			2
25 Heat Island Effect										
3	25.0 Heat Island Effect Reduction	1	1		1	Scheme / Detail	ARCH			1
EMISSIONS										
26 Stormwater										
3	26.1 Stormwater Peak Discharge	1	0	1	1	Detail	CIVIL	HYDRAULIC CLIMATE CHANCE CLIENT / PM		2
3	26.2 Stormwater Pollution Targets	1	0	1	1	Detail	CIVIL	HYDRAULIC		2
27 Light Pollution										
3	27.0 Light Pollution to Neighbouring Bodies	R	R		R	Design Development	LIGHT	ELEC LAND		1
3	27.1 Light Pollution to Night Sky	1	1		1	Design Development	LIGHT	ELEC LAND		1
28 Microbial Control										
1	28.0 Legionella Impacts from Cooling Systems	1	1		1	Design Development	MECH			1
29 Refrigerant Impacts										
2	29.0 Refrigerant Impacts	1		1	1	Detail	MECH			1
INNOVATION										
30A Innovative Technology or Process										
30B Market Transformation										
30C Improving on Green Star benchmark										
30D Innovation Challenge										
30E Global Sustainability										
Project Brief alignment	WELL Targets	Required / Optional	Low /med risk	High risk	Total	Recommended Approach				Costing
	Air Quality	8	3	5	8					
	1 A Smoking Ban	R	R		R	Operation	ARCH CLIENT / PM MECH			
1	5 Air Filtration	R	R		R	Detail / Specs	MECH CLIENT / PM			

1	6 Microbe and Mold Control	1	1	1	1	For mechanical cooling systems: UV lamps (254nm wavelength to not generate Ozone) used on cooling coils, drain pans, irradiance reaching coil, drain pans, plenum corners is modelled. OR Bleach requires modelled effectiveness. Capture particulates from shoes, installation and weekly cleaning of Permanent Walk off grille or grate at least 3m long and at least entrance width. Allow easy cleaning underneath. Or rollout mat, or other walk off system (3m long x) Provision of Entryway Air Seal to reduce poll through revolving doors or 2 door normally closed door system. Cleaning Plan: Extent and frequency of cleaning, sanitization or disinfecting: Cleaning protocol and dated cleaning logs (and available to all Rois); List of approved product used; Cleaning Products: Mops, rags and dusters should be microfibre with denier 1 or less; Cleaning products should be EPA Design for the Environment, Ecology or Green Seal; Mops can be wrung with hands free; Vacuum cleaners have HEPA rating. Chemical Storage: Ammonia and Bleach stored separately and clearly labelled with colour codes, and are not kept together or near foodstuffs.	Detail / Specs	MECH CLIENT / FM				
1	8 Healthy Entrance	1	1	1	1		Scheme / Detail	ARCH MECH				
1	9 Cleaning Plan, Products & Storage	1	1	1	1		Operation	CLIENT / FM FM				
1	10 Pesticide Management	1	1	1	1	Air Pesticides and Herbicides: Reduce pesticide / herbicide use through: Chapter 3 of San Francisco Environment Code Integrated Pest Management (IPM) Program. Only use pesticides from Tier 3 (least hazardous) from San Francisco Department of Environment (SFPD) Reduced Risk pesticide list. Perform air flow while maintaining level of SC and RH below 60%, at volume: 4,500m3 per m2 floor area (14,000ft3 per ft2 floor area) prior to occupancy; 1,060m3 per m2 floor area (3,500ft3 per ft2) prior to occupancy, plus 3,000m3 per m2 (10,500ft3 per ft2) post-occupancy. For post-occupancy, at least 0.1m3 per minute of outdoor air per m2 (0.37ft3 per ft2) at all times. Outdoor Facilities and Landscaping: Local sources of pollution in sealed rooms with self closing doors, with separate exhaust and no recirculation, including: Cleaning Chemical storage, bathrooms, printer rooms (except Ecology, Blue Angel or Green Star printers) Locker Room Ventilation: Locker rooms must be ventilated in the following manner: a. The return air is vented outdoors and not recirculated.	Operation	CLIENT / FM FM				
1	12 Air Flush	1	1	1	1		Construction	MECH				
1	17 Direct Source Ventilation	1	1	1	1		Scheme / Detail	MECH ARCH				
1	18 Air Quality Monitoring and Feedback	1	1	1	1	Hourly Air Quality Monitoring of: a. Particulates (resolution 35,000 counts per m3 (1,000 per ft3) (resolution 1ug/m3 or finer); b. CO2 (resolution 25ppm or finer); c. Ozone (resolution 10 ppb or finer) Real-time display of parameters of monitoring results on a screen showing: Temperature, Humidity, CO2 concentration and Air Quality. Plan for action if air quality drops below minimum levels (CO2: 700ppm / PM2.5: < 15ug/m3 (PM2.5) < 15ug/m3) All countertops and fixtures in bathrooms and kitchens, and at handsets, door knobs, light switches and elevator buttons are one of: Coated with abrasion resistant, non-leaching and meets EPA requirements for antimicrobial activity; Use of UV cleaning measures at entrance or greater.	Detail / Specs / Operation	CLIENT / FM MECH AV				
1	27 Antimicrobial Activity for Surfaces	1	1	1	1		Specs / Fit-out	ARCH CLIENT / FM LIGHT				
	Water	0	0	0	0							
1	30 Fundamental Water Quality	R	R		R	Test water quality supplied to site to confirm the following levels: Turbidity less than 1.0NTU Total coliforms (fecal flora & coli) not detected Provide drinking water stations throughout the school, at least one per block. Include necessary filtration to provide high quality drinking water for students. Water Station Cleaning: Daily cleaning of mouthpieces, protective guards and collective basins; Quarterly cleaning for outlet screens and apertures to remove debris and sediment.	Detail / Specs / Operation	HYDRAULIC				
1	37 Drinking Water Promotion	R	R		R		Fit-out / Operation	ARCH CLIENT / FM HYDRAULIC				
	Food Provision	2	1	1	2							
1	Healthy Food Plan	1	1		1	For food provided to students on site, food plan policy to include: Provision of variety of fruit and vegetables and salad; Provision of food and drinks with low sugar levels and reduced processed foods; Food labelling for common food allergies and special diets (gluten free, lactose free, vegetarian, etc) Responsible food selection - certified organic labelling, humane certified meat and dairy;	Operation	CLIENT / FM				
1	51 Food Production	1		1	1	Provide gardening space within the school campus, along with gardening support materials (irrigation, plants, tools, soil, etc)	Scheme / Operation	ARCH CLIENT / FM LAND				
	Light	5	2	3	5							
1	53 Visual Lighting Design	1	1		1	For workstations / desks: Average light levels 215 lux or more, at 0.76m above floor. Lights can be dimmed for daylight, but still need to achieve this level. Zoning in independently controlled banks no larger than 45.5m2 or 20% floor area; If light levels are below 300 lux, task lighting of 300-500lux available on request. Provision of controls to enable users to ensure brightness distribution is comfortable. One or more of: Light models / calls to show that at least 250 equivalent melanopic lux (EML) is present at 75% or more workstations, 1.2m above floor, at least 4 hours per day for the full year. EML level targets met or exceeded for 25-65 category in table B1 of IES-ANSI RP-1-12. All computer screens within 4.5m of view windows angled within 20 deg of perpendicular from window. Overhead luminaires not aimed at computer screens. CRI for R1, R8 or R10 or above CRI for R8 of 80 or above Light fixture lumens > 1000 lm Ceilings - LRV 0.8 for 80% of ceiling area Walls - 0.7 for 50% of wall area Entrances - 0.4 for 50% of surface area	Detail / Specs	LIGHT ARCH				
1	54 Circadian Lighting Design	1			1		Detail / Specs	LIGHT ESD				
1	57 Low-Glare Workstation Design	1		1	1		Detail / Specs / Fit-out	ARCH LIGHT				
1	58 Colour Quality	1	1		1		Detail / Specs	LIGHT				
1	59 Surface Design	1		1	1		Detail / Specs / Fit-out	ARCH				
	Fitness	2	2	0	2							
1	64 Inferior Fitness Circulation	1	1		1	Stairs are accessible and clearly visible for all occupants. Stair width min of 1.4m wide between handrails Design, artwork, details etc to encourage use of stair use	Concept / Fit-out / Operation	ARCH				
1	68 Physical Activity Spaces	1	1		1	Provision of indoor space for sport or activity Provision of walking / running track, park, exercise equipment, playing fields, or other facilities to encourage activity	Concept	ARCH URBAN LAND				
1	70 Accessible Design	R	R	1	1	Meet ADA requirements for accessible design	Concept / Detail / Specs	ARCH				
1	74 Acoustic Planning	1		1	1	Load and Quiet zones within the building, and noise emitting equipment location Appropriate design of spaces based on use, including reverberation time, mechanical sound levels, sound reducing ceilings and walls. Acoustic consultant to specify best practice requirements. Average sound pressure from outside (within 1 hour of operation) not to exceed 50dBA. All doors are designed to have a Sound Transmission Class (STC) of 40 or greater.	Detail / Specs	ACOUSTIC				
	Mind	4	2	2	4							
1	84 Health and Wellness Awareness	R	R		R	Building guide available to all occupants Provide library with books and/or subscriptions related to health and wellbeing	Scheme / Operation	CLIENT / FM				
1	86 Post Occupancy Surveys	1		1	1	Use of a BPS for Post Occupancy requirements	Operation	CLIENT / FM				
1	94 Self Monitoring	1		1	1	Body weight / mass, Heart rate variability, Activity and Steps, Sleep duration and quality and regularity. Use of steps to support health and fitness education and awareness. Monitor of air quality or noise during hours of 9.00am to 5.00pm. Increase ceiling height by 0.15m per every additional 3m. Integrated artwork into lobbies, entrances, and other regularly occupied spaces where appropriate	Operation	CLIENT / FM				
1	99 Beauty and Design	1	1		1	Clear grouping of spaces for different zones, through distinct artwork in shape and colour, and materials, the spaces (such as lobbies, corridors, stair pattern, etc) A range of greenery within landscaped areas and roof gardens, accessible to all school occupants. Incorporate greenery within the building, including pot plants, plant walls, etc. Incorporate water features within the design - link to waterway collection.	Concept / Fit-out	ARCH LAND HYDR				
1	100 Greenery	1	1		1		Concept / Fit-out	ARCH LAND HYDR				
Project Brief alignment	Building as a Teaching Tool	Core & Shell	Low/ med risk	High risk	Total	Suggested Approach / Ideas	1	2			Costing	
	Indoor Environmental Quality	8	4	4	8		1	1				
1	Indoor Air Quality	1	1		1	Highlight location of air quality monitoring sensors, and provide displays with real time information of air quality		MECH ELEC				
1	Acoustic Comfort	1	1		1	Identify acoustic features / materials - description of materials highlighted where present? Perhaps within acoustically sensitive areas / music rooms / auditor / inclusion of mechanical acoustic measures?		ACOUSTIC ARCH MECH				
1	Lighting Comfort	1		1	1	Sensors to monitor lux levels / colour temp / etc, and displays / apps to show live results. Highlight design features (automated blinds / shading devices (e tc) that help maintain visual comfort) Perhaps have demonstration area showing sunlight penetration at different times of day and throughout the year, with markings on the floor? Or similar type of approach to demonstrate solar design features		LIGHT ARCH ELEC				
1	Visual Comfort	1	1		1	Perhaps have demonstration area showing sunlight penetration at different times of day and throughout the year, with markings on the floor? Or similar type of approach to demonstrate solar design features		ARCH MECH LIGHT				
1	Indoor Pollutants	1		1	1	Personal information identified in certain areas? (Low VOC paint / Low formaldehyde wood finishes / IoT?)		ARCH				
1	Thermal Comfort	1		1	1	Temperature / RH / air speed monitoring and display?		MECH ELEC ARCH				
1	Smoking Ban	1	1		1	Clear signage banning smoking and explaining negative impacts of smoking.		CLIENT / FM				
1	Direct Source Ventilation	1		1	1	Highlight or colour coding of exhaust provision, and identification of pollutant sources. Include details of potential pollutant sources, including type of pollutants and how they are minimised and dealt with. Maybe include air quality monitoring nearby to confirm healthy levels are maintained?		MECH				
	Energy	2	3	1	2							
1	Monitoring and Monitoring	1		1	1	Highlight location of meters, provide displays with real time information throughout campus. Link data to app accessible by phone or computer, available to all staff and students. Passive Measures - specification or shading devices (as with visual comfort) / wear controls showing wall build up with insulation, structure, finish, etc / window performance demonstration? Active Measures - highlight mechanical plant efficiency measures - colour coding of mechanical plant / plant room with clear wall with diagrams or models explaining operation of efficient plant / highlight of automated features to optimise efficiency / highlight efficient equipment and small power devices / incorporate info into live displays identifying features activated by weather conditions / highlight motion and daylight sensors for controlling lighting. Renewable Energy - identify renewable energy (clearly visible and highlighted?) / Provide access to rooftop PV areas for tours / live displays showing generation and other data metrics		ELEC		HYDR ARCH MECH		
	Water	1	1	0	1							
1	Potable Water	1	1		1	Water reduction & Efficient Supply - Highlight low flow fixtures and fittings in bathrooms and shower areas. Identify low water demand planting, efficient irrigation supply methods, etc? Rainwater Collection, Treatment and Storage - include rainwater capture into the design, with visual incorporation of rainwater collection routes and storage areas. Highlight water storage and treatment areas		HYDR		LANDSCAPE ARCH		
	Transport & Fitness	3	1	2	3							
3	Sustainable Transport	1		1	1	Clear identification of travel plan initiatives to encourage active and public transport / clear and accessible cycle parking facilities / Clear and accessible bus stops / Clearly marked parking spaces for efficient vehicles & electric vehicles with charging points / Data collected and presented on avoided trips? / Education on sustainable transport and identification of available options for travel to and from school, apps to help or sharing and other sustainable transport methods? Clear and accessible fitness related facilities, inclusion of encouragement to use stairs, activity throughout the day.		TRANSPORT		ARCH LANDSCAPE		
1	Fitness Features	1	1		1			ARCH		LANDSCAPE		
1	Self Monitoring	1		1	1	In addition to offering wearable fitness monitoring, perhaps set up a competition and data representation of most steps walked, measures to encourage active learning, etc?		CLIENT / FM FM		ARCH		
	Materials & Waste	2	1	1	2							
2	Sustainable Materials & Products	1		1	1	Identify sustainable materials and products throughout campus, including information on sustainable properties. Use clearly identifiable recycled content and materials, natural materials, etc. Clear identification of recycling labels, colour coded with clear instructions for allowable materials in each bin. Education within syllabus for waste management hierarchy of reduce, reuse, recycle.		ARCH		STRUCTURE LANDSCAPE		
2	Operational Waste	1	1		1			WASTE		ARCH		
	Environment	4	3	1	4		1					
1	Ecological Value	1		1	1	Identify planting types and benefits throughout landscaping. Incorporate education of ecological benefits into curriculum.		ENV		ARCH LANDSCAPE		

1	Heat Island Effect	1	1		1	Identify material selection, building design, shading and planting features to help reduce heat island effect and maintain comfortable outdoor conditions.		ARCH	LANDSCAPE ENV	27-03-2018 MCGG This should be high priority. UHI is a big problem, especially in this area. Comfortable outdoor conditions is key to the success of the school. Changed from 3 to 1.	
1	Stormwater	1	1		1	Identify landscaping features for capture and passive treatment of stormwater falling on the site. Include green roofs / swales / bioretention and detention areas.		INFRA	ARCH LANDSCAPE		
3	Light Pollution	1	1		1	Identify external lighting design highlighting features that reduce light pollution.		LIGHT	ARCH ELEC		
1	Healthy Eating	1	1	1	1	Clear advertising and promotion of sustainable eating practices and health benefits of healthy eating. Highlight sustainable clear and accessible food production area, with education linked to plant growth and maintenance. Use of food produced onsite within school kitchens or weekend markets, etc?	1	CLIENT / PM PM	ARCH		
1	Food Production	1		1	1			LANDSCAPE	CLIENT / PM ARCH		