

Appendix B – Updated Mitigation Measures

The collective measures required to mitigate the impacts associated with the proposed works are detailed in the tables below. These measures have been updated as part of the response to submissions.

Ref No.	Mitigation Measure
Design and Operation	
<i>D/O-ACH – Aboriginal Cultural Heritage</i>	
<i>D/O-ACH1</i>	A copy of this report should be submitted with the Environmental Impact Statement (EIS) in support of SSD-55844212.
<i>D/O-ACH2</i>	As stated in the original Aboriginal Cultural Heritage Assessment Report (ACHAR), the proposed works are unlikely to cause harm to Aboriginal objects, it is recommended that no further investigation is required for the present development.
<i>D/O-ACH3</i>	<p>Should any archaeological deposits be uncovered during any site works, the following steps must be followed:</p> <ul style="list-style-type: none"> • All works within the vicinity of the find must immediately stop and the location cordoned off with signage installed to stop any accidental impact to the finds. The find must not be moved 'out of the way' without assessment. • The site supervisor or another nominated site representative must contact either the project archaeologist (if relevant) or Heritage NSW (Enviroline 131 555) to contact a suitably qualified archaeologist. • The nominated archaeologist must examine the find, provide a preliminary assessment of significance, record the item and decide on appropriate management measures. Such management may require further consultation with Heritage NSW, preparation of a research design and archaeological investigation/salvage methodology and registration of the find with the Aboriginal Heritage Information Management System (AHIMS). • Depending on the significance of the find, reassessment of the archaeological potential of the subject area may be required and further archaeological investigation undertaken. • Reporting may need to be prepared regarding the find and approved management strategies. • Works in the vicinity of the find can only recommence upon receipt of approval from Heritage NSW.
<i>D/O-ACH4</i>	<p>In the unlikely event that human remains are uncovered during the proposed works, the following steps must be followed:</p> <ul style="list-style-type: none"> • All works within the vicinity of the find must immediately stop and the location cordoned off with signage installed to stop any accidental impact to the finds. • The site supervisor or other nominated manager must notify the NSW Police and Heritage NSW (Enviroline 131 555). • The find must be assessed by the NSW Police, which may include the assistance of a qualified forensic anthropologist. • Management recommendations are to be formulated by the NSW Police, Heritage NSW and site representatives. • Works are not to recommence until the find has been appropriately managed.
<i>D/O-NV – Noise and Vibration</i>	

Ref No.	Mitigation Measure
<i>D/O-NV1</i>	An assessment of noise emissions from mechanical plant is to be carried out prior to the granting of a CC and certification provided that the proposed plant and acoustic treatment will achieve compliance with the assessment criteria established in this assessment.
<i>D/O-NV2</i>	During the operation of the development, truck movements in the loading dock to be restricted as follows: <ul style="list-style-type: none"> • Maximum of four truck ingress or egress movements within the loading dock in any 15 minute period during the day or evening between 7am and 10pm. • Maximum of one truck ingress or egress movement within the loading dock in any 15 minute period during the night between 10pm and 7am.
<i>D/O-NV3</i>	Detailed acoustic modelling and review of the recommendations outlined in Appendix O relating to food and drink tenancies to be conducted once layouts/capacities and operational details are confirmed. It is noted that a separate planning application will need to be undertaken for future fitout/operational works for tenancies.
<i>D/O-NV4</i>	Installation of acoustic measures are recommended for the Level 1 gym and retail zones where residential apartments are located above. Specifically, the following indicative treatments are suggested to consider: <ul style="list-style-type: none"> • The concrete floor slab for the gym should be designed with a natural frequency of at least 10hz. • Rowing machines/treadmills and similar will be installed on isolation mounts. • Pin loading weights machines to have spring isolation incorporated. • Free weights areas to have multilayer rubber or spring isolation flooring. Where treatments are not sufficient to adequately control noise/vibration emissions, management controls can be adopted to minimise noise such as restrictions on operations and weight limits.
<i>D/O-NV5</i>	It is recommended that a noise management plan be prepared by the future tenant of the gym and other retail tenancies that have potential to have noise impacts, detailing at a minimum: <ul style="list-style-type: none"> • Management methods to be adopted to prevent excessive noise. • Complaints handling mechanisms.
<i>D/O-TM – Tree Management</i>	
<i>D/O-TM1</i>	All trees to be retained within the Stage 2 Development area must be protected in accordance with AS4970-2009, generic details of which are included in section 12 of Appendix L . It is recommended that a site-specific Tree Protection Plan (TPP) is prepared in accordance with AS4970 Protection of trees on development sites (2009). The TPP should be developed in conjunction with the overall Construction Management Plan for the site, based on finalised design layout and other factors, such as site access routes and storage locations.
<i>D/O-TM2</i>	Where possible underground services should be located outside the TPZ of trees to be retained. All underground services located inside the TPZ of any tree to be retained must be installed via tree sensitive techniques in accordance with AS4970-2009. See Appendix L .
<i>D/O-TM3</i>	The protective fencing must be constructed of 1.8 metre 'cyclone chainmesh fence'. The fencing should only be removed for the landscaping phase and this should be approved by the project Arborist. Where it is not feasible to install fencing at the specified location due to factors such as restricting access to areas of the site or for constructing new structures, an alternative location and protection specification must be agreed with the project Arborist. Any modifications to the fencing locations must be approved by the project Arborist.
<i>D/O-TM4</i>	Tree protection signage is to be attached to the protective fencing, displayed in a prominent position and the sign repeated at 10 metres intervals or closer where the fence changes direction. Each sign shall contain in a clearly legible form, the following information: <ul style="list-style-type: none"> • Tree protection zone/No access.

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	<ul style="list-style-type: none"> This fence has been installed to prevent damage to the tree/s and their growing environment both above and below ground. Do not move fencing or enter TPZ without the agreement of the project Arborist. The name, address, and telephone number of the developer/builder and project Arborist
<i>D/O-TM5</i>	Any areas of the TPZ located inside the subject site must be mulched to a depth of 75mm with good quality mulch. Mulch must not be built-up around the trunk the trees as it can cause collar rot.
<i>D/O-TM6</i>	Ground protection is required to protect the underlying soil structure and root system in areas where it is not practical to restrict access to whole TPZ, while allowing space for construction. Ground protection must consist of good quality composted wood chip/leaf mulch to a depth of between 150-300mm, laid on top of geo textile fabric, with timber/plywood boards overlaid. If vehicles are to be using the area, additional protection will be required such as rumble boards or track mats to spread the weight of the vehicle and avoid load points. Ground protection is to be specified and approved by the project Arborist as required.
<i>D/O-TM7</i>	Temporary irrigation should distribute water evenly throughout the area of the TPZ. The irrigation should be used for at minimum one hour daily throughout all stages of the development.
<i>D/O-TM8</i>	The landscape design should comply with the recommendations listed in the Arboricultural Impact Assessment.
<i>D/O-CPTED – Crime Prevention</i>	
<i>D/O-CPTED1</i>	<ul style="list-style-type: none"> Ensure safe wayfinding signage is installed to and from lift lobbies, stairwells, parking and loading collection bays to ensure safe pedestrian experience in basement. Design development should reinforce the safe circulation and activation of all external and internal 'destinations', including the retail, public and communal open spaces. Landscape elements should be designed to minimise potential for concealment or entrapment, particularly in and around basement, tenancy and residential entrances. Design development should confirm the safe design of public amenities, including 'end of trip facilities'. This includes doorless entry toilets, aimed at deterring and/or eliminating concealment and entrapment opportunities.
<i>D/O-CPTED2</i>	<ul style="list-style-type: none"> Design development should affirm the following opportunities for natural surveillance observation and surveillance: <ul style="list-style-type: none"> Throughout internal and external ground plane spaces and along contextual streetscapes, Approach to pedestrian and vehicular off street entries, Within the basement, On approaches to or within each of the building lobbies. Loading, waste storage, collection and utilities infrastructure will require surveillance augmentation from camera installations.
<i>D/O-CPTED3</i>	<ul style="list-style-type: none"> Access control technology should be standardised, including the technology admitting residents, guest-visitors, tenants, staff and contractors to their 'approved' areas. This will ensure the developments 'welcoming and safe' place reputation and prevent unauthorised access. Access restrictions should be fully understood and complied with by residents, their guests, staff, tenants, and contractors. Access to plant and associated infrastructure, the loading area, waste storage, waste collection and general storage areas should be strictly controlled. Maintenance and general contractors accessing sensitive and vulnerable zones should have to produce some form of identification prior to granting access.

Ref No.	Mitigation Measure
D/O-CPTED4	<ul style="list-style-type: none"> External lighting is required to provide safety and invitation throughout the site's ground plane, comprising complementary wayfinding and decorative solutions. LED luminaries (4000 Kelvin) is recommended to maximise throw, spill and (where appropriate) wash, eliminating, shadowing and dark gaps. Bollards should not be considered for any primary external lighting within the development. Landscaping solutions should eliminate possible concealment or entrapment within or around plantings, maximise sightline continuity, prevent the concealment or suspicious packages, and deter potential accidental and/or hostile vehicular access. Signage should consider first time resident guests, visitor shoppers, service and maintenance contracts to the site. All signs should be disability inclusive and where practical back-lit. Pictorial signs should be considered.
D/O-CPTED5	<ul style="list-style-type: none"> Recommend targeted IP network (CCTV) camera surveillance of the development footprint's, vulnerable spaces, covering as a minimum ,each tower entry point, basement, waste storage collection points, entrance doorways to internal plant and external utilities infrastructure, the approaches to retail and amenities spaces. Location of cameras should deter opportunities for concealment or entrapment and assist with identification. Help points should be considered, for the basement lift lobbies. Anti-graffiti coating is recommended for all masonry and concrete finishes at the ground floor interface.
D/O-FLO – Flooding	
D/O-FLO1	Update the TUFLOW model detailed design stage to capture any modifications to the design surface, particularly those made to introduce grade to areas currently designed as flat in the modelling and those levels interacting with the surrounding road network.
D/O-TIA -Traffic and Access	
D/O-TIA1	Prepare a Travel Access Guide prior to the issuance of occupation certification..
D/O-TIA2	Monitor and review Framework Travel Plan.
D/O-WMP – Waste Management	
D/O-WMP1	Where food waste is separated a minimum collection frequency of 2 days between services is recommended to prevent odour amenity issues.
D/O-WMP2	As a relatively new refuse stream within Australia, provision has been made for the potential implementation of FOGO collections.
D/O-WMP3	Cardboard, paper and plastics are all separated from the general waste and commingled recycling for both retail and residential uses. Provision has been made for potential separate collection of organise waste also.
D/O-WMP4	Where food waste may be separated, regular collection is recommended to prevent odour amenity issues. Glass should also be separated where significant volumes are generated and may be collected as a CDS stream.
D/O-ACC – Access	

Ref No.	Mitigation Measure
<i>D/O-ACCI</i>	Further work during design development will be undertaken to ensure appropriate outcomes are achieved for each of the requirements. Refer to Appendix X .
<i>D/O-BCA – Building Code of Australia</i>	
<i>D/O-BCA1</i>	Additional details during the design development stage will be reviewed to ensure that appropriate outcomes and compliance with the relevant BCA requirements are achieved. Refer to Appendix W .
<i>D/O-WIND</i>	Wind Impacts
<i>D/O-WIND1</i>	Wind mitigation measures provided at Appendix P have been implemented within the design. Further wind tunnel modelling is being undertaken to verify the efficacy of the design from a wind comfort and safety perspective, with additional scope included to further test any mitigation strategies as required.
<i>D/O-REF</i>	Reflectivity
<i>D/O-REF1</i>	Local shading measures, which includes both vertical and horizontal structural elements as well as shading fins are to be installed as per the recommendations of the reflectivity consultant as set out in Appendix Q .
<i>D/O-SIA</i>	Social Impact
<i>D/O-SIA1</i>	Preparation and implementation of a detailed Green Travel Plan to expand upon the preliminary plan attached to this Application.
<i>D/O-SIA2</i>	On-site programming, particularly in the first five years of operation to mitigate temporary impacts on sense of place and enhance community cohesion. This shall include regular communication with the internal community about future developments and plans via community meetings, newsletters or a development website.
Construction Management	
<i>CM-NV</i>	Noise and Vibration
<i>CM-NV1</i>	Noisy works are to be scheduled during EPA standard construction hours to ensure noise impacts surrounding residential receivers are minimised.
<i>CM-NV2</i>	Where reasonable and feasible for the construction process, noisy construction activities or items are to be located away from the nearest sensitive receivers. If possible, considerations may be given to localised noise barriers particularly when works are being carried out close to site boundaries.
<i>CM-NV3</i>	All excavation and construction equipment shall be well maintained.
<i>CM-NV4</i>	Stationary equipment shall be located as far as practicable from immediate sensitive receivers.
<i>CM-NV5</i>	Adopt quiet work methods/technologies: <ul style="list-style-type: none"> • The primary noise generation activity at the site will be during the excavation period. As much as practicable, use of quieter excavation methods is recommended. • Trucks should be generally located within the bounds of the site.
<i>CM-NV6</i>	Materials handling/vehicles:

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	<ul style="list-style-type: none"> • Trucks and bobcats, in general use on site, are to use a non-tonal reversing beacon where possible (subject to WHS requirements) to minimise potential disturbance of surrounding receivers. • Avoid careless dropping of construction materials into empty trucks. • Trucks, trailers, and delivery vehicles are to turn off engines when idling to reduce noise impacts (unless required for concrete pumping or similar).
CM-NV7	<p>Complaint's handling:</p> <ul style="list-style-type: none"> • An afterhours contact number is displayed outside of the building site, so that in the event that surrounding development believes that a noise breach is occurring, they may contact the site. • In the event of complaint, the procedures outlined in Section 12.9 of the Noise and Vibration Report at Appendix O are adopted.
CM-NV8	<p>Community Consultation:</p> <ul style="list-style-type: none"> • Nearby receivers are to be informed regularly of upcoming construction activities. is typically a critical aspect in reducing the risk of complaint when it comes to construction noise. The information provided to surrounding receivers is to: <ul style="list-style-type: none"> - Inform and educate the groups about the project and noise controls being implemented. - Increase understanding of all acoustic issues related to the project and options available. - Identify group concerns generated by the project, so they can be addressed. - Provide advice about the time and duration of potential noisy activities. - Ensure that concerned individuals or groups are aware of and have access to a Site Complaints Register which will be used to address any construction noise related problems should they arise.
CM-BIO	Biodiversity
CM-BIO1	<p>Prior to construction, a qualified and experienced Ecologist (>3 years of experience) with a minimum tertiary degree in science, conservation, biology, ecology, natural resource management, environmental science or environmental management is to be engaged.</p> <p>The Ecologist must be licensed with a current Department of Primary Industries Animal Research Authority permit and New South Wales Scientific License issued under the BC Act. The Ecologist must be a member of the NSW Ecological Consultants Association.</p>
CM-BIO2	<p>All trees to be retained must be protected in accordance with Australian Standard - Protection of Trees on Development Sites (AS-4970-2009), which outlines that a Tree Protection Zone (TPZ) is the principal means of protecting trees on development sites. It is an area isolated from construction disturbance so that the tree remains viable.</p> <p>Works will be avoided within the TPZ of any trees located outside of the development site that require retention. This includes trees on neighbouring properties.</p> <p>TPZs must be enforced in accordance with the Arboricultural Impact Assessment Report (Urban Arbor 2023).</p>
CM-BIO3	<p>Owing to the Critically Endangered and SAIL status of BGHF CEEC, it is recommended that the vegetation to be retained within the Subject Land is protected and enhanced post-development, including the removal of weeds and understorey plantings representative of this community, particularly within the PM3 zone indicated in the Landscape Plan (SQUARE ONE Pty Ltd 2023).</p>
CM-BIO4	<p>The Project Ecologist is to undertake a pre-clearing survey of the Subject Land, identifying active hollows, threatened species and/or nests. All felling of native trees should be supervised by the Ecologist who will be available on site to capture, treat/relocate any displaced fauna. If any threatened species are identified, the Project Ecologist must be consulted to determine the best course of action, including potential translocations.</p>

Ref No.	Mitigation Measure
CM-BIO5	If any tree hollows that are removed, they should be carefully handled and salvaged for installation in a nearby tree, or relocated to a suitable council reserve with permission and guidance from Ryde City Council. A minimum of 20m of logs (felled tree trunks, not branches or root ball) from felled trees are to be salvaged and relocated to a suitable position within the Subject Property or nearby Council Reserve (with Council permission) to continue to provide habitat value.
CM-BIO6	Appropriate erosion and sediment control will be erected and maintained during construction. At minimum such measures will comply with the relevant industry guidelines such as 'the Blue Book' (Landcom 2004).
CM-BIO7	The construction site compound and construction storage, stockpile and laydown areas will be located within the project disturbance area i.e. away from any native vegetation that is planned to be retained. Any soil imported from outside the site, if required, will be checked to make sure it is free of weeds
CM-BIO8	Appropriate light, noise and dust suppression methods will be implemented to reduce their impact on surrounding flora and fauna. Construction works should be limited to daylight hours where possible.
CM-TM	Tree Management
CM-TM1	Prior to any works commencing at the site a project Arborist should be appointed. The project Arborist should be qualified to a minimum AQF level 5 and/or equivalent qualifications and experience and should assist with any development issues relating to trees that may arise. If at any time it is not feasible to carryout works in accordance with this, an alternative must be agreed in writing with the project Arborist. See Appendix L .
CM-TM2	All tree work should be carried out by a qualified and experienced Arborist with a minimum of AQF level 3 in arboriculture, in accordance with NSW Work Cover Code of Practice for the Amenity Tree Industry (1998) and AS4373 Pruning of amenity trees (2007). See Appendix L .
CM-TM3	The following activities must be avoided inside the TPZ of all trees to be retained unless approved by the project Arborist. If at any time these activities cannot be avoided an alternative must be agreed in writing with the project Arborist to minimise the impact to the tree. A) Machine excavation. B) Ripping or cultivation of soil. C) Storage of spoil, soil or any such materials D) Preparation of chemicals, including preparation of cement products. E) Refuelling. F) Dumping of waste. G) Wash down and cleaning of equipment. H) Placement of fill. I) Lighting of fires. J) Soil level changes. K) Any physical damage to the crown, trunk, or root system. L) Parking of vehicles
CM-TM4	The demolition of all existing structures inside or directly adjacent to the TPZ of trees to be retained must be undertaken in consultation with the project Arborist. Any machinery is to work from inside the footprint of the existing structures or outside the TPZ, reaching in to minimise soil disturbance and compaction. If it is not feasible to locate demolition machinery outside the TPZ of trees to be retained, ground protection will be required. The demolition should be undertaken inwards into the footprint of the existing structures, sometimes referred to as the 'top down, pull back' method. See Appendix L .

Ref No.	Mitigation Measure
CM-TM5	<p>The project Arborist must supervise and certify that all excavations and root pruning are in accordance with AS4373-2007 and AS4970-2009. For continuous strip footings, first manual excavation is required along the edge of the structures closest to the subject trees. Manual excavation should be to a depth of 1 metre (or to unfavourable root growth conditions such as bed rock or heavy clay, if agreed by project Arborist). Next roots must be pruned back in accordance with AS4373-2007.</p> <p>After all root pruning is completed, machine excavation is permitted within the footprint of the structure. For tree sensitive footings, such as pier and beam, all excavations inside the TPZ must be manual. Manual excavation may include the use of pneumatic and hydraulic tools, high-pressure air or a combination of high-pressure water and a vacuum device. Pruning of roots greater than 30mm in diameter should be approved by the project arborist. All pruning of roots greater than 30mm in diameter must be carried out by a qualified Arborist/Horticulturalist with a minimum AQF level 3. Root pruning is to be a clean cut with a sharp tool in accordance with AS4373 Pruning of amenity trees (2007).¹³ The tree root is to be pruned back to a branch root if possible. Make a clean cut and leave as small a wound as possible.</p>
CM-TM6	Where possible underground services should be located outside the TPZ of trees to be retained. All underground services located inside the TPZ of any tree to be retained must be installed via tree sensitive techniques. This should include either directional drilling methods or manual excavations to minimise the impact to trees identified for retention. No roots greater than 30mm in diameter should be severed during the installation of service pipes unless approved in writing by the project Arborist.
CM-TM7	All contamination run off from the development such as but not limited to concrete, sediment and toxic wastes must be prevented from entering the TPZ at all times.
CM-TM8	Any wounding or injury that occurs to a tree during the construction process will require the project Arborist to be contacted for an assessment of the injury and provide mitigation/remediation advice. It is generally accepted that trees may take many years to decline and eventually die from root damage. All repair work is to be carried out by the project Arborist, at the contractor's expense.
CM-TM9	After all construction works are complete the project Arborist should assess that the subject trees have been retained in the same condition and vigour. If changes to condition are identified the project Arborist should provide recommendations for remediation.
CM-CON	Contamination
CM-CONI	As a basement excavation is proposed, it is understood that construction dewatering of groundwater seepage into the basement excavation is likely to be required. In addition to the pH and suspended sediment conditions within groundwater, given the presence of elevated heavy metals concentrations exceeding the 95% freshwater species protection criteria, consideration should be given to the development of a Construction Dewatering Management Plan (DMP) to ensure the appropriate management of excess groundwater seepage as may require off-site discharge during construction works. The findings and recommendations of JBS&G (2023) will be considered with regards to subsequent basement seepage water management
CM-GEO	Groundwater and Geotechnical
CM-GEOI	Inspections of the basement and monitoring of inflows and water levels during construction are recommended to allow confirmation of the assumptions and the outcomes presented in Appendix T .
CM-IWM	Integrated Water Management
CM-IWMI	A sediment basin is required to effectively capture sediment laden site runoff during siteworks. Sediment and erosion control measures will be installed and maintained for the duration of the construction works

Ref No.	Mitigation Measure
CM-IWM2	An underground storage tank with a capacity of 202.3m ³ is to be installed in accordance with the requirements of City of Ryde Council for the below ground pit and pipe network.
CM-IWM3	Stormwater Quality requirements will be achieved through the provision of pit baskets, filter cartridges, raingardens and rainwater tanks, in accordance with the requirements of City of Ryde Council.
CM-TIA	<i>Traffic and Access</i>
CM-TIA1	Finalisation of the Draft Construction Traffic Management Plan provided at Appendix N of the RtS Submission Package is to be undertaken prior to the commencement of construction works.