JOHN HOLLAND

SYDNEY FOOTBALL STADIUM REDEVELOPMENT
Internal Fit-Out Works, Architectural Finishes and Logistical Activities – Extension Request

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Table of Contents

1. Overview

The Sydney Football Stadium Redevelopment Stage 2 and the Stadium Fitness Facility (SFF) projects (in this document both are jointly referred to as the Project) are an Infrastructure NSW initiative to build a new rectangular stadium. The Project is part of the SCSGT Precinct, adjacent to the SCSGT and part of the wider Moore Park sports and entertainment precinct.

SSD 9835 provides consent for the following works:

- construction of the stadium, including:
  - 45,000 seats (additional 10,000 - person capacity in the playing field in concert mode) in four tiers including general admission areas, members seating and corporate I premium seating;
  - roof cover over all permanent seats and a rectangular playing pitch;
  - a mezzanine level with staff and operational areas;
  - internal pedestrian circulation zones, media facilities and other administration areas on the seating levels;
  - a basement level (at the level of the playing pitch) accommodating pedestrian and vehicular circulation zones, 50 car parking spaces, facilities for teams and officials, media and broadcasting areas, storage and internal loading areas;
  - food and drink kiosks, corporate and media facilities; and
  - four signage zones.
- construction and establishment of the public domain within the site, including:
  - hard and soft landscaping works;
  - publicly accessible event and operational areas;
  - public art; and
  - provision of pedestrian and cycling facilities.
- wayfinding signage and lighting design within the site;
- reinstatement of the existing Moore Park Carpark 1 (MP1) upon completion of construction works with 540 at-grade car parking spaces and vehicular connection to the new stadium basement level;
- operation and use of the new stadium and the public domain areas within the site for a range of sporting and entertainment events; and
- extension and augmentation of utilities and infrastructure.
- construction and operation of integrated members facilities, including
  - gymnasium, training area and three group fitness areas,
  - two squash courts, sauna, spa and steam room as well as wet and dry change rooms
  - day spa and treatment rooms
  - café with indoor and outdoor seating
  - a 25 meter (m) and a 50m open-air swimming pool
  - function spaces on the rooftop, poolside and at the café for members and their guests
  - basement level plant and equipment, landscaping, and associated services

Conditions C3 – C6 establish the construction hours within which the approved development can be undertaken. Condition C5 provides for activities to be undertaken outside of the approved construction hours nominated in condition C3 in the following circumstances:

a) if the delivery of oversized plant or structures has been determined by the police or other public; or authorities to require special arrangements to transport along public roads; or

b) in an emergency to avoid the loss of life, damage to property or to prevent environmental harm;
c) where the works and activities do not cause, when measured at the boundary of the most affected noise sensitive receiver:
    (i) Leq (15 minute) dB(A) noise levels greater than 5dB above the day, evening and night rating background level (RBL) as applicable; and
    (ii) L1(1 minute) dB(A) or LFmax dB(A) noise levels greater than 15dB above the night RBL for night works;
    (iii) continuous or impulsive vibration values greater than those for human exposure to vibration, set out for residences in Table 2.2 in "Environmental noise management - Assessing Vibration: a technical guideline" (Department of Environment and Conservation, February 2006); and
    (iv) intermittent vibration values greater than those for human exposure to vibration, set out for residences in Table 2.4 in "Environmental noise management - Assessing Vibration: a technical guideline" (Department of Environment and Conservation, February 2006); or

Note: For the purpose of this condition, the RBLs are those contained in an environmental assessment for the scheduled activity subject to this licence prepared under the Environmental Planning and Assessment Act 1979. Alternatively, the licensee may use another RBL determined in accordance with the NSW Noise Policy for Industry (EPA, 2017) and provided to the EPA prior to carrying out any works or activities under this condition.

Any variation to the works hours proposed in accordance with Condition C5 must be approved in advance in writing by the Planning Secretary if appropriate justification is provided for the works. Notification of the activities must be given to affected residents before undertaking the activities or as soon as is practical afterwards.

2. Extension Request

On 27 September 2021, the Department approved the carrying out of fit-out works as OOHW to occur between the periods of 6pm-12am Monday to Friday, 1pm to 12am on Saturdays and 8am to 12am on Sundays in accordance with Condition C6 of SSD 9835. The approval was granted until 14 November 2021 and subject to the following conditions:

1. No high noise impact works or activities, as defined in the consent, are permitted.
2. No simultaneous implementation of other OOHW previously approved by the Planning Secretary's nominee.
3. Written notice must be provided to residents at least 1 week before the commencement of the OOHW. The written notice must:
    a. identify the location and duration of the works that will occur;
    b. include a commitment to undertake suitable noise mitigation measures to meet prescribed noise limits including addressing any community complaints;
    c. indicate a commitment to providing an alternative accommodation, if necessary; and
    d. provide a valid telephone contact number of the site manager during OOHW.
5. Conduct in attendance noise monitoring for the first 2 weeks, at selected locations, as per the approved noise monitoring plan.
4. Submit a performance report along with noise monitoring results and a complaint register after four weeks of approval to seek further approval to continue the OOHW until July 2022.

To date, JHG has utilised the OOHW approval for fit out works on 7 occasions, endeavouring as far as practicable to complete all required works during standard construction hours. These works were undertaken in accordance with Conditions 1-3 of the Department's approval. In relation to Condition 4, noise monitoring of these events was provided to the Department in the requested performance report on 2/11/21 covering the period 27/9/21 – 25/10/21 (SSD 9835 PA-89). No complaints were received during this period in relation to these works, or any other out of hours works.

JHG is now seeking to formalise the extension to the OOHW approval to July 2022 as per Condition 4 of the Department's approval and letter dated 27 September 2021.

All works will be undertaken in accordance with eth terms of the Department's initial OOHW approval and will be scheduled so that there will be no other approved out of standard construction hours activities occurring at the same time as the fit out works described further on in the report to prevent any cumulative noise impacts. As there are no proposed impacts to residents from the works detailed in the noise impact statement (Appendix 1),

these works can be scheduled concurrently. JHG will manage complaints in accordance with the approved process in the CCS.

Date	Time	Location	NML Laeq(15)	Result Laeq(15)	Comment
7/10/21	18:15	E5	45	61.4	Construction works inaudible, Traffic primary contribution to noise level
7/10/21	18:30	CC2	70	62.2	Construction works inaudible. Traffic only noise source
7/10/21	19:20	C1	70	52.2	Construction works indiscernible from background noise.
7/10/21	18;45	R6	54	57.1	Construction works inaudible. Traffic primary noise source
11/10/21	18:00	E5	45	64.6	Construction works inaudible, Traffic primary contribution to noise level
11/10/21	18:15	CC2	70	63.8	Construction works inaudible, Traffic primary contribution to noise level
11/10/21	19:15	C1	70	49.5	Construction works indiscernible from background noise.
11/10/21	18:35	R6	54	54.5	Construction works inaudible, Traffic primary contribution to noise level
12/10/21	18:45	E5	45	61.8	Construction works inaudible, Traffic primary contribution to noise level
12/10/21	19:00	CC2	70	61.2	Construction works inaudible, Traffic primary contribution to noise level
12/10/21	19:40	C1	70	50.5	Construction works indiscernible from background noise.
12/10/21	19:15	R6	54	60.9	Construction works inaudible, Traffic primary contribution to noise level
13/10/21	18:45	E5	45	62.8	Construction works inaudible, Traffic primary contribution to noise level
13/10/21	19:10	CC2	70	62.1	Construction works inaudible, Traffic primary contribution to noise level
13/10/21	19:55	C1	70	50.4	Construction works indiscernible from background noise.

Date	Time	Location	NML Laeq(15)	Result Laeq(15)	Comment
13/10/21	19:30	R6	54	61.0	Construction works inaudible, Traffic primary contribution to noise level
14/10/21	18:30	E5	45	64.6	Construction works inaudible, Traffic primary contribution to noise level
14/10/21	18:45	CC2	70	64.6	Construction works inaudible, Traffic primary contribution to noise level
14/10/21	19:30	C1	70	57.4	
14/10/21	19:00	R6	54	62.9	Construction works inaudible, Traffic primary contribution to noise level
15/10/21	19:15	E5	45	58.9	Construction works inaudible, Traffic primary contribution to noise level
15/10/21	19:30	CC2	70	61.3	Construction works inaudible, Traffic primary contribution to noise level
15/10/21	20:10	C1	70	50.0	Construction works indiscernible from background noise.
15/10/21	19:45	R6	54	60.9	Construction works inaudible, Traffic primary contribution to noise level
25/10/21	18:15	E5	45	62.6	Construction works inaudible, Traffic primary contribution to noise level
25/10/21	18:30	CC2	70	63	Construction works inaudible, Traffic primary contribution to noise level
25/10/21	19:25	C1	70	48.8	Construction works indiscernible from background noise.
25/10/21	18:50	R6	54	61.8	Construction works inaudible, Traffic primary contribution to noise level

The NSW Government has instructed John Holland to complete construction of the Sydney Football Stadium by September 2022 in time for the NRL Grand Final. The Grand Final is a set sporting fixture that is unable to be rescheduled and accordingly the September 2022 completion date is a hard deadline.

The 2021 COVID outbreak necessitated a two week shut down of all construction activities on the site in July 2021, resulting in the cessation of all works. While construction has recommenced, current NSW Government public health orders continued to limit the number of construction workers accommodated on site at any one time until vaccination rates were achieved. John Holland has continued to comply with the public health orders to maintain worker health and safety within current approved construction hours, however the overall

construction program and the September 2022 completion date is still at risk. While public health orders allow an increase in staff numbers onsite, the impact of restrictions has significantly impacted the ability to meet the completion date. Extended construction hours would enable works to be undertaken over a longer duration while complying with distancing requirements.

The implications of the COVID 19 Public Health Orders on construction are further detailed in Section 5 of this request.

3. Proposed Fit-Out and Commissioning Activities

The proposed fit-out and commissioning activities will be undertaken by a maximum of 100 personnel onsite, including supervision, during the extended hours.

The proposed activities will comprise:;

- The internal fit-out of services including electrical, hydraulic, mechanical, fire, security, communications, audio visual, and vertical transport, including isolation, servicing, and testing of the services. Equipment use includes:
  - Impact drivers
  - Oxy/acetylene kits
  - Hammers / small hand tools
  - Battery operated tools
  - Cable crimpers
  - Cable cutters
  - Cable pushers/rollers
  - Cable testing equipment
- Fit-out of architectural finishes including ceiling and partitions, wall linings, painting, tiling, joinery, floor coverings and finishes, handrails and balustrade, waterproofing, signage and wayfinding, window frames and glazing, automated door installation, roller shutter installation and Food & Beverage outlets. Equipment use includes:
  - Hand tools
  - Screw guns
  - Impact driver
  - Disc sanders
  - Mixer bit on drill
  - Drop saws
  - Rollers
  - Brushes
  - Screeders
  - Cordless grinders
  - Drop saw
  - Circular saw
  - Screw guns
  - Nail guns
  - Small scale concrete grinding
- Logistical activities including cleaning and material movement through internal goods lifts. Equipment includes

- Non powered hand tools
- Internal goods lift

The fit-out and commissioning activities are proposed to be carried out only in areas that can be completely enclosed or have no line of sight to residents. The external façade will be wholly installed, and partition installation will be largely completed prior to the proposed fit-out works commencing. The activities have already been assessed and approved under the Construction Noise and Vibration Impact Assessment submitted as Appendix 1 on the Environmental Impact Statement (EIS), and in the Construction Noise and Vibration Management Plan by ARUP and the subsequently approved Construction Noise and Vibration Management Plan approved by the Planning Secretary's delegate on 19/03/2020.

Figures 1 and 2 below indicate where works are to occur outside of standard construction hours.

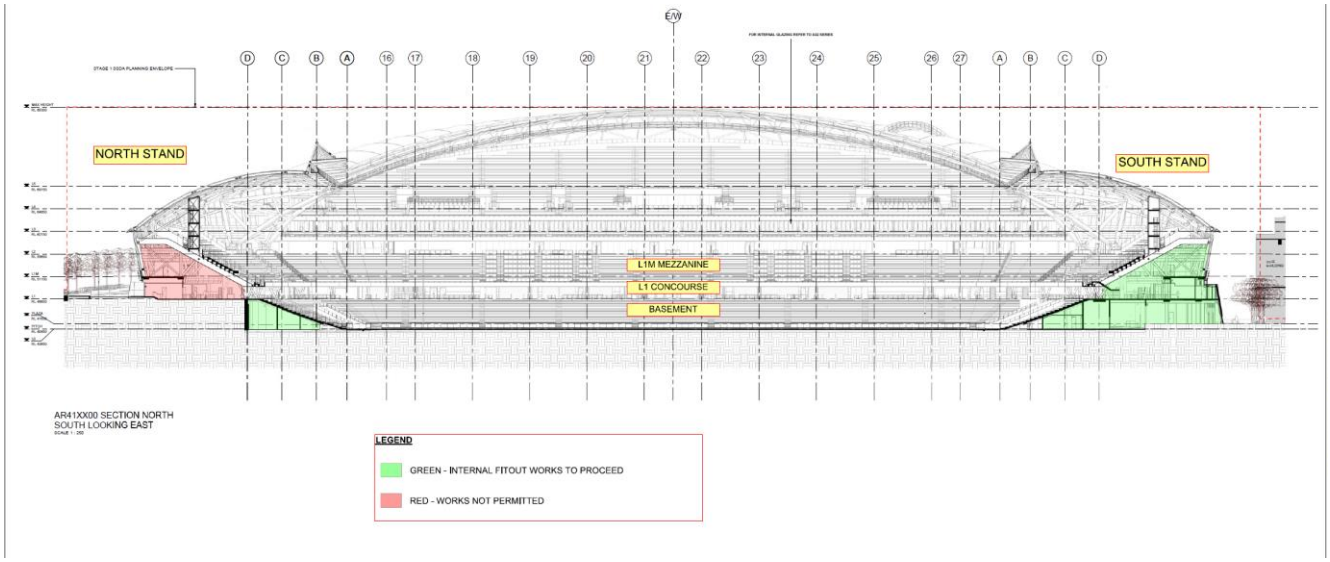

Figure 1 Internal fit out North South

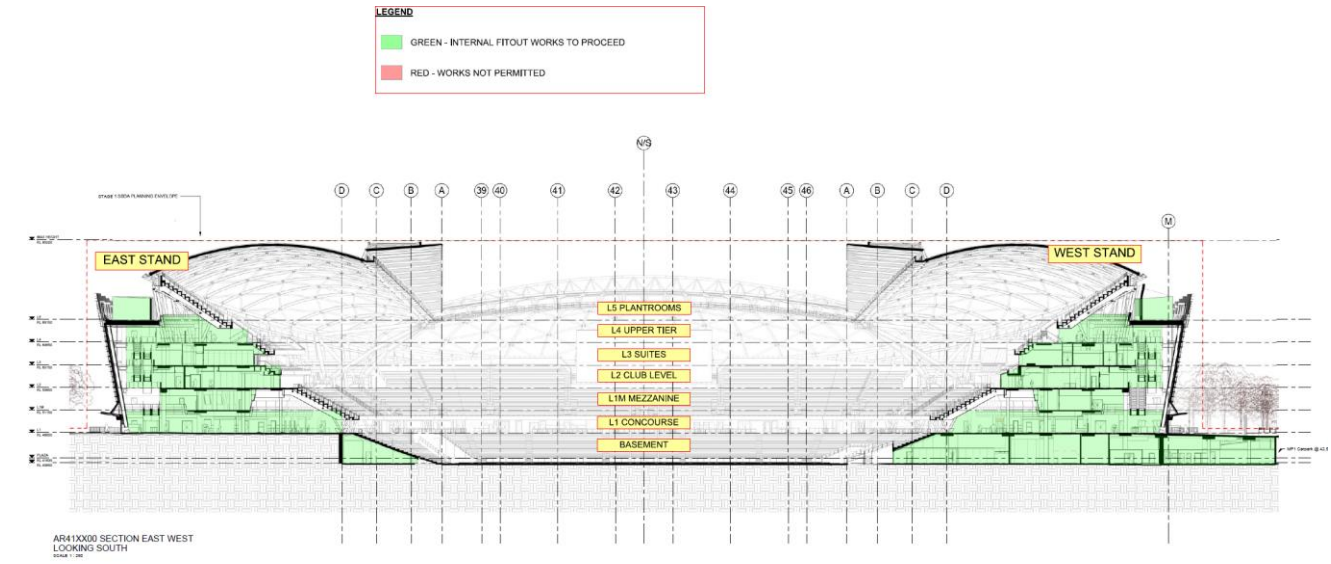

Figure 2 Internal fit out East West

4. Assessment and Mitigation Measures

To demonstrate the proposed activities and tools will not exceed the noise criteria in Condition C5(c), the proposed OOHW have been reassessed by Arup as provided in the Noise Impact Assessment prepared by ARUP provided at Appendix 1 of this request.

The Noise Impact Assessment concludes that noise emissions due to internal fit out and commissioning works are predicted to comply with SSD 9835 Development Consent.

In particular, noise emissions at the nearest residential receiver (252 Moore Park Road, Paddington) are predicted to be LAeq(15min) 38 dBA which is below the night noise management level of 42dBA at this receiver location. Noise emissions at receivers located further from site, including 5 Poate Road, Paddington and 107 Cook Road, Centennial Park, are located sufficiently further away from Moore Park Road, and are consequently deemed to comply with the noise management level of 37dBA. Attended noise monitoring shows compliance with the predicted levels, often with construction work being inaudible and traffic being the dominant noise source.

It is anticipated that all works will continue to comply with approved noise management levels as described in the Construction Noise and Vibration Management Plan. John Holland will continue to implement the following recommended mitigation measures:

- Community notification to residents 7 days prior to commencement of works
- OOHW requirements will be communicated to workers via toolbox at commencement of night works
- Internal fit-out will utilise task lighting in dedicated work areas, all lighting will be internal and not observed by residents
- Class A hoarding to remain closed including construction access to Moore Park Rd during any activities occurring during the OOHW period
- Noise monitoring of all activities with results to be reviewed and reported to the Department on a monthly basis
- Quarterly newsletter updates and community information line available during the OOHW consistent with the approved Community Consultation Strategy; and
- Implementation of the OOHW procedure and permit for all proposed activities
- Works if approved will be scheduled as such that works will not occur at the same time as other OOHW associated with installation of roof structures.

John Holland recognises the sensitive noise receivers along Moore Park Road and will limit fit out works on the northern stand to standard construction hours. The northern façade consists of a glazed acoustic screen, the primary design purpose of which is to mitigate noise transmission to sensitive receivers along Moore Park Road. John Holland believes this is an effective control helping to manage the highest noise level at peak time during out of hours works. This will be further coupled with no internal fit-out works being undertaken on northern stand to minimise amount of noise transmission from northern end of the Site.

John Holland will also ensure that management of out of hours works is appropriately managed via Site Management team and ensure appropriate level of supervision to ensure compliance with out of hours works is actively managed throughout the Project.

John Holland strongly commits to ensuring compliance with out of hours works mitigations and has demonstrated that the impact to residents can be managed to acceptable levels as confirmed in ARUP Noise Impact Assessment. This allows John Holland to safely operate the workplace considering current circumstances and NSW Government restrictions. To further reduce risk of potential impacts to residents no works will be permitted on the northern stand, being the closest point to sensitive receivers. Workers will only park along Driver Avenue in metered parking bays (>100 available), which will complement the agreement made with the Entertainment Quarter car park management to utilise the metered parking station at a discounted rate for the late shift (2000 spaces available). Driving to the site will allow workers to abide by current government health advice around public transport and carpooling with no impact to residential parking. As travel is proposed outside of the PM peak hours, no adverse traffic impacts to the surrounding network are anticipated.

5. COVID 19 Public Health Order Implications on Construction

As described previously, the primary reason for this OOHW submission is to mitigate the impacts from restrictions imposed by NSW Government because of the current COVID-19 pandemic. Current government legislation via Public Health Order, requires the safe operation of construction sites with the following measures in place:

- 50% cap on maximum daily workforce numbers;
- COVID-19 Safety Plan;
- Social distancing; and
- Vaccination compliance requirements for workers retuning from lockdown LGAs.

The outcome of John Holland complying with these restrictions has impacted the project to safely operate within the bounds of the current approved construction hours, ultimately resulting in impact to meeting contractual obligations for Project Completion.

John Holland has been further impacted with a two-week construction pause imposed by the NSW Government between 19th July 2021 to 30th July 2021. Since returning to work John Holland has complied with the above listed government restrictions which has ultimately impacted site productivity and construction programme. This is not withstanding any future government impacts that are not yet realised or additional COVID related shutdowns due to positive cases on site.

The Sydney Football Stadium project is a high-profile project. The NSW Government has well publicised that the project will be completed on time. This requires John Holland to mitigate COVID related impacts by seeking approval for extended hours to assist the NSW Government in meeting their obligations to the NSW public.

Whilst the NSW Government has eased restrictions of Public Health Orders regarding site numbers, John Holland has continued to implement aspects of the COVID Safety Plan to ensure safety of workforce via safe work practices including distancing requirements.

Fit out works (including installation of services and architectural finishes) require numerous subcontractor trades to work in conjunction and sequence with each other to deliver the finished works. This would typically see numerous trades in the same space/room working closely with each other. In order to comply with social distancing requirements in enclosed spaces, i.e., room fit-out, this is difficult to achieve safely; hence the ability to work extended hours, the same amount of work completed in a single shift can still be achieved through having differing trades work day and evening shifts. This will spread the work out and comply with NSW Government requirements and internal COVID Safety Plans.

Appendix 1 Noise Assessment

Appendix 2 OOHW Permit and Procedure

Appendix 1 Noise Assessment

ARUP

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Project title	Sydney Football Stadium Redevelopment	Job number	267489
To	Holly Hofland-JHG <Holly.Hofland@jhg.com.au>	File reference	AC03 v1
Prepared by	Mathew Simon <Mathew.Simon@arup.com>	Date	27 August 2021
Subject	Noise and Vibration Impact Statement - Out of Hours Works for Internal Fitout		

1 Introduction

On 6 December 2018, the then Minister for Planning approved a concept development application and concurrent early works package (SSD 9249) to facilitate redevelopment of the Sydney Football Stadium. These early works facilitated the demolition of the former SFS and associated buildings.

Stage 2 of the Sydney Football Stadium (SFS) Redevelopment (SSD 9835) was approved by the Minister for Planning and Public Spaces on 6 December 2019. Construction of the new SFS was assessed and approved as part of the Stage 2 SSD DA.

Approved hours of works are outlined in the SSD 9835 Development Consent [1] Condition C3.

Construction Noise and Vibration Management Plans have been approved for both applications and works have been undertaken accordingly.

Construction works associated with the internal fitout of the stadium are proposed to take place outside of currently approved hours. This report addresses the noise and vibration impacts of the proposed fitout work.

No vibration intensive plant is proposed for Out of Hours Works (OOHW). Vibration impacts have therefore not been assessed.

2 Assessment locations

The reasonably most-affected residences have been identified and grouped into Noise Catchment Areas (NCAs), with Rating Background Levels measured at representative locations as part of the SFSR Stage 2 SSDA Noise and Vibration Impact Assessment [2].

Representative most-affected residential and non-residential receivers are presented in Table 1 and Table 2 respectively and displayed in Figure 1.

Table 1: Reasonably most-affected residential receivers

Receiver ID	Address	No. of floors	NCA
R1	749 South Dowling Street, Redfern	2	1
R2	635 South Dowling Street, Surry Hills	3	1
R3	553 South Dowling Street, Surry Hills	3	1
R4	111 Greens Rd, Paddington	2	2
R5	479 South Dowling Street, Surry Hills	3	2
R6	252 Moore Park Road, Paddington	2	3
R7	314 Moore Park Road, Paddington	2	3
R8	45 Oatley Road. Paddington	2	4
R9	5 Poate Road, Paddington	2	5
R10	107 Cook Road, Centennial Park	2	5
R11	2 Martin Road, Moore Park	3	6

Table 2: Non-residential receivers

Receiver ID	Name	Address	No. of floors
Active Recreation Area			
AR1	Centennial Parklands Equestrian Centre	114-120 Lang Road, Moore Park	2
AR2	Moore Park Golf Course	Cleveland Street, Moore Park	0
Commercial			
C1	Fox Studios	38 Driver Avenue, Moore Park	2
C2	Sydney Cricket Ground	Driver Avenue, Moore Park	3
C3	Entertainment Quarter	122 Lang Road, Moore Park	3
C4	NRL building	Moore Park Road and Driver Avenue, Moore Park	3
Child Care			
CC1	Gumnut Gardens Early Learning and Long Day Care Ce	61 Moore Park Road, Centennial Park	1
CC2	Kira Child Care Centre	230 Moore Park Road, Paddington	1
CC3	Bambini's Child Care Centre	157/159 Cook Road, Centennial Park	2

Receiver ID	Name	Address	No. of floors
Educational Facilities			
E1	Sydney Boys High School	556 Cleveland Street, Moore Park	3
E2	Sydney Girls High School	Corner of Anzac Parade and Cleveland Street, Surry Hills	2
E3	Paddington Public School	399-435 Oxford Street, Paddington	2
E4	Bourke Street Public School	590 Bourke Street, Surry Hills	2
E5	University of Technology Sydney Rugby Australia	Moore Park Road and Driver Avenue, Moore Park	5
Passive Recreation Area			
PR2	Moore Park	Moore Park	0
Town Hall			
T1	Paddington Town Hall	249 Oxford Street, Paddington	2
Place of Worship			
W1	St Francis of Assisi Catholic Church	64 Gordon Street, Paddington	3
W2	St Mattias Anglican Church	471-475 Oxford Street, Paddington	2
W3	Paddington Uniting Church	395 Oxford Street, Paddington	2
W4	St. Vladimir's Russian Orthodox Church	31 Robertson Rd, Centennial Park	2
W5	Kingdom Hall of Jehovah's Witnesses	20 Leinster St, Paddington	2

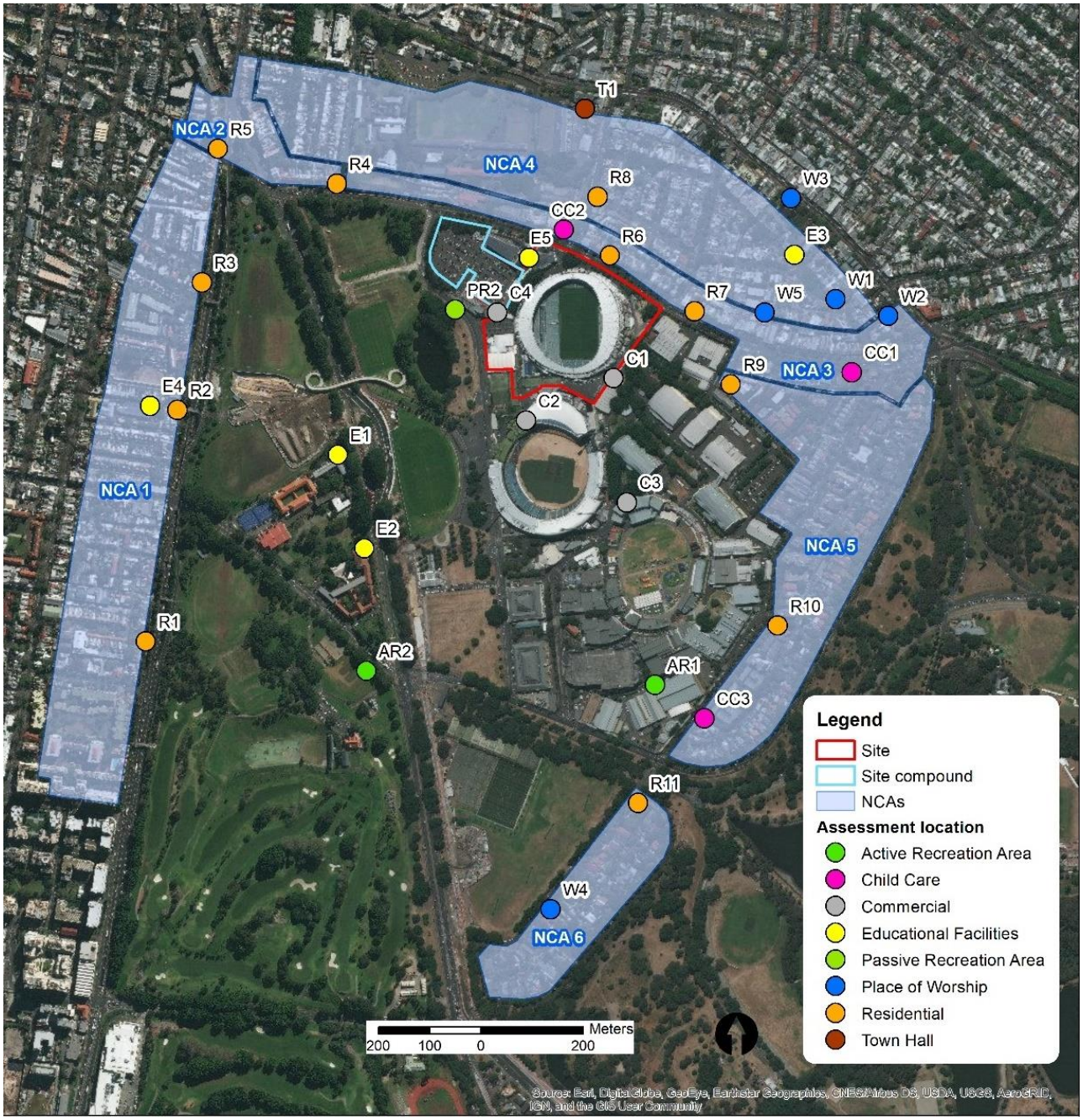


Figure 1: Assessment locations and NCAs

3 Development Consent Conditions – Approved hours

3.1 Approved hours

Current approved hours of construction are outlined in the SSD 9835 Development Consent [1] Condition C3, which states:

> *C3. Construction works, including the delivery of materials to and from the site, may only be carried out between the following hours:*
>
> *(a) between 7am and 6pm, Mondays to Fridays inclusive;*
>
> *(b) between 8am and 1pm, Saturdays; and*
>
> *(c) No construction work may be carried out on Sundays or public holidays.*

SSD 9835 was modified to permit OOHW for oversize deliveries and steel works associated with the stadium roof installation.

3.2 Noise management

Requirements for noise management for the construction of the SFS are outlined in Condition B28, which states:

> *B28. Prior to the commencement of construction, the Applicant must prepare a Construction Noise and Vibration Management Sub-Plan (CNVMP). The plan must address, but not be limited to, the following:*
>
> *(a) be prepared by a suitably qualified and experienced noise expert and in consultation with the EPA;*
>
> *(b) provide details of all the residential and non-residential receivers including the Kira Child Care Centre, University of Technology Sport Sciences Faculty Building (UTS) and Fox Studios, identified in Stage 2 SSDA – Noise and Vibration Assessment prepared by ARUP dated 30 August 2019;*
>
> *(c) provide details of the project specific construction noise management levels (NMLs) at all the identified receivers (B28(b)) considering the noise management levels in EPA's Interim Construction Noise Guideline (DECC, 2009) (ICNG) and the relevant provisions of Australian Standard 2436 - 2010 Guide to Noise Control on Construction and Maintenance and Sites, at all identified receivers;*
>
> *(d) identify the 'High Noise Impact works' with the associated predicted construction noise levels that would exceed the NMLs and reach or exceed the Highly Affected Noise Level of 75dB(A) LAeq(15min), at the identified the residential and non-residential receivers;*
>
> *Note: High noise impact works mean:*
>
> - *jack hammering, rock breaking or hammering, pile driving, vibratory rolling, cutting of pavement, concrete or steel or other work occurring on the surface that generates noise with impulsive, intermittent, tonal or low frequency characteristics that exceed the NML; or*

- *continuous noisy activities where 'continuous' includes any period during which there is less than a 1-hour respite between ceasing and recommencing any of the work that is the subject of this condition.*

4 Construction Noise Management Levels – Outside of approved hours

4.1 Construction noise criteria

The Interim Construction Noise Guideline [3] (ICNG) provides recommended noise levels for airborne construction noise at sensitive land uses. The ICNG provides construction management noise levels above which all 'feasible and reasonable' work practices should be applied to minimise the construction noise impact. The ICNG works on the principle of a 'screening' criterion – if predicted or measured construction noise exceeds the ICNG levels then the construction activity must implement all 'feasible and reasonable' work practices to reduce noise levels.

The ICNG sets out management levels for noise at noise sensitive receivers, and how they are to be applied. These management noise levels for residential receivers are reproduced below in Table 3.

Table 3: Construction noise management levels at residential receivers

Time of day	**Management level** [1] **$L_{Aeq\ (15\ min)}$**	**How to apply**
Recommended standard hours: Monday to Friday 7am to 6pm Saturday 8am to 1pm No work on Sundays or public holidays	Noise affected RBL + 10dB	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured $L_{Aeq\ (15\ min)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75dBA	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.

Time of day	Management level [1] $L_{Aeq\ (15\ min)}$	How to apply
Outside recommended standard hours	Noise affected RBL + 5dB	A strong justification would typically be required for works outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5dBA above the noise affected level, the proponent should negotiate with the community. For guidance on negotiating agreements see section 7.2.2 of the ICNG.

1 - Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 m above ground level. If the property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 m of the residence. Noise levels may be higher at upper floors of the noise affected residence.

4.1.1 Maximum noise level

The ICNG [3] states:

Where construction works are planned to extend over more than two consecutive nights, and a quantitative assessment method is used, the analysis should cover the maximum noise level, and the extent and the number of times that the maximum noise level exceeds the RBL.

The NSW Noise Policy for Industry [4] provides the following guidance with respect to maximum noise level assessments:

The potential for sleep disturbance from maximum noise level events from premises during the night-time period needs to be considered. Sleep disturbance is considered to be both awakenings and disturbance to sleep stages. Where the subject development/premises night-time noise levels at a residential location exceed:

- $L_{Aeq,15min}$ *40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or*
- L_{AFmax} *52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater,*

a detailed maximum noise level event assessment should be undertaken.

4.1.2 Project construction noise targets

Construction Noise Management Levels (NMLs) are established based on measured noise data representative of receivers. Measured noise data is detailed in SFSR Stage 2 SSDA Noise and Vibration Impact Assessment [2]. Logging results have been appended to this report for reference.

NMLs are presented in Table 4.

Table 4: Residential Noise Management Levels outside approved working hours

Location	Highly noise affected, $dBL_{Aeq(15min)}$	Noise Management Level, $dBL_{Aeq(15min)}$					Maximum noise level assessment (night), dBL_{Amax}
		Approved hours[1]	Outside approved hours				
			Shoulder[2]	Day[2]	Evening[2]	Night[2]	
R1	75	68	58	63	61	52	70
R2	75	68	58	63	61	52	70
R3	75	68	58	63	61	52	70
R4	75	66	50	61	57	44	66
R5	75	66	50	61	57	44	66
R6	75	62	48	57	54	42	64
R7	75	62	48	57	54	42	64
R8	75	53	43	48	46	42	56
R9	75	49	39	44	41	37	52
R10	75	49	39	44	41	37	52
R11	75	57	49	52	51	46	60

- Approved hours are shown in Section 3.1.
- Day, evening and night time periods are defined as:
  - Day: the period from 7 am to 6 pm Monday to Saturday; or 8 am to 6 pm on Sundays and Public Holidays;
  - Evening: the period from 6 pm to 10 pm; and
  - Night: the remaining period
- Shoulder: the period from 5 am to 7am, a portion of the night.

Although not all non-residential receivers would be in use outside of standard construction hours, OOHW noise impacts at these receivers have been predicted to indicate potential impacts.

NMLs for non-residential receivers are presented in Table 5.

Table 5: Non-residential Noise Management Levels during intended working hours

Usage	Rec. ID	Name	Time period	Assess. location	NML, $dBL_{Aeq\ 15minute}$
Active recreation area	AR1	Centennial Parklands Equestrian Centre	When in use	External	65
	AR2	Moore Park Golf Course	When in use	External	65
Commercial premise	C1	Fox Studios	When in use	External	70
	C2	Sydney Cricket Ground	When in use	External	70
	C3	Entertainment Quarter	When in use	External	70
	C4	NRL building	When in use	External	70
Child Care	CC1	Gumnut Gardens Early Learning and Long Day Care Ce	When in use	External	70
	CC2	Kira Child Care Centre	When in use	External	70
	CC3	Bambini's Child Care Centre	When in use	External	70
	E1	Sydney Boys High School	When in use	Internal	45

Usage	Rec. ID	Name	Time period	Assess. location	NML, $dBL_{Aeq\ 15minute}$
Educational institution	E2	Sydney Girls High School	When in use	Internal	45
	E3	Paddington Public School	When in use	Internal	45
	E4	Bourke Street Public School	When in use	Internal	45
	E5	University of Technology Sydney Rugby Australia	When in use	Internal	45
Passive recreation area	PR2	Moore Park	When in use	External	60
Town hall	T1	Paddington Town Hall	When in use	Internal	45
Place of worship	W1	St Francis of Assisi Catholic Church	When in use	Internal	45
	W2	St Mattias Anglican Church	When in use	Internal	45
	W3	Paddington Uniting Church	When in use	Internal	45
	W4	St. Vladimir's Russian Orthodox Church	When in use	Internal	45
	W5	Kingdom Hall of Jehovah's Witnesses	When in use	Internal	45

5 Assessment

5.1 Activities

Fitout works are anticipated to take place over the durations of the project, approximately 12 months.

Works are anticipated to take place within any internal spaces within the stadium, including spaces adjacent to the northern façade, closest to nearest receivers along Moore Park Road

The activities listed in each construction stage have been provided by John Holland as:

- Services installation
- Architectural finishes
- Services testing and commissioning

Tools and equipment to be used are listed in Table 6.

Table 6: Equipment list

Noisy equipment	
Services installation	**Architectural finishes**
Impact drivers	Hand tools
Oxy/acetylene kits	Screw guns
Hammers / small hand tools	Impact driver
Battery operated tools	Disc sanders
Cable crimpers	Mixer bit on drill
Cable cutters	Drop saws
Cable pushers/rollers	Rollers
Cable testing equipment	Brushes
	Screeders
Loudest activity	
Impact drivers, L_w 104 dB$L_{Aeq(15min)}$, 112 dBL_{Amax}	**Impact drivers, L_w 104 dB$L_{Aeq(15min)}$, 112 dBL_{Amax}**

The single loudest activity, impact driving, has been conservatively modelled as occurring continuously over a 15 minute period.

5.2 Methodology

Noise emissions from construction activities have been assessed to criteria outlined in Section 4.

Noise emissions have been predicted based on:

- Loudest construction noise sources, impact driver, listed in Table 6;
- Stadium façade constructions include:

- Bronze cladding extrusion external to 3 mm thick aluminium cladding panels with 100 mm thick rockwool insulation within the panels (indicative construction), or
- Louvres with 3 mm thick aluminium blanking panel, or
- Typically 35 mm laminated glazed panels

  An assessment based on the worst-case façade construction, being the 3 mm thick aluminium louvre backing, has been undertaken.
- Receivers listed in Section 2.

5.3 Results

Noise emissions at the nearest residential receiver, R6 - 252 Moore Park Road, Paddington are predicted to be $L_{Aeq(15min)}$ 38 dBA. This is below the night NML of 42dBA at this receiver location.

Noise emissions at receivers located further from site, such as R9 - 5 Poate Road, Paddington and R10 - 107 Cook Road, Centennial Park located in the quieter NCA 5 set back from Moore Park Road, are predicted to be lower than R6, therefore are deemed to comply with NML of 37dBA.

Maximum noise levels of up to 46dBA are predicted at R6, below maximum noise level criteria (Table 6) for all assessment locations.

Noise impacts due to internal fitout works are predicted to comply with SSD 9835 Development Consent.

6 Recommendations

As part of SSD 9835 Development Consent [1], Condition B28 requires a Construction Noise and Vibration Management Sub-Plan (CNVMP) to be prepared. Details of this requirements are outlined in Section 3.1, and a CNVMP has been prepared with all work conducted in accordance with the plan.

No additional mitigation measures are considered necessary as part of the fitout works.

7 References

[1] Department of Planning, Industry and Environment , “Development Consent, As modified by SSD-9835-Mod-1 –03.04.2020,” Department of Planning, Industry and Environment, Consent Authority: Minister for Planning and Public Spaces , Sydney, 2020.

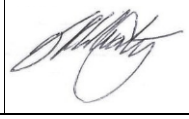
[2] Arup, “AC04-v5_SFSR Stage 2 NVIA,” Arup, Sydney, 2019.

[3] Department of Environment and Climate Change NSW, “Interim Construction Noise Guideline,” Department of Environment and Climate Change NSW, Sydney, 2009.

[4] NSW Environment Protection Authority, “NSW Noise Policy for Industry,” NSW Environment Protection Authority , Sydney, 2017.

267489 27 August 2021

DOCUMENT CHECKING (not mandatory for File Note)

	Prepared by	Checked by	Approved by
Name	Mathew Simon <Mathew.Simon@arup.com>	Glenn Wheatley	Mathew Simon
Signature			

Appendix 2 OOHW Permit and Procedure

Out of Hours Work Permit

JOHN HOLLAND

Section 1: Permit Details		Permit Number:
Project	Sydney Football Stadium Redevelopment	
Title		
Date		
Commencement date of works		
Proposed duration and working hours		

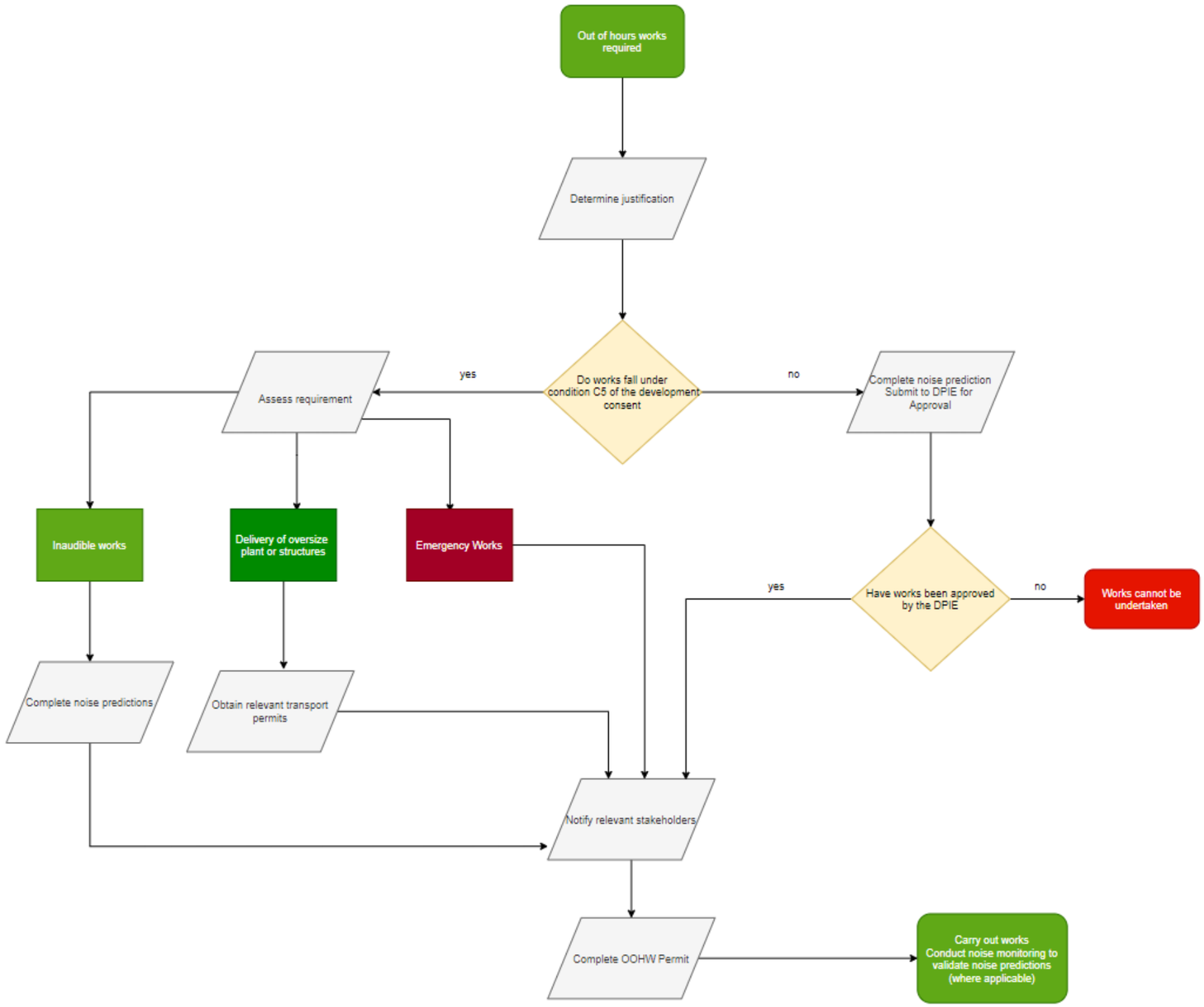
Section 2: Proposed OOHW Details	
Description of works: **Including:** **Work methodologies.** **List of plant/equipment to be used (worst case scenario).** **Map attached indicating location of works, plant/equipment locations and sensitive receivers (including distance to nearest sensitive receiver for noisiest plant/equipment).**	
Justification	☐*The delivery of oversized plant or structures has been determined by the police or other public authorities to require special arrangements to transport along public roads* ☐*an emergency to avoid the loss of life, damage to property or to prevent environmental harm* ☐*where the works and activities do not cause, when measured at the boundary of the most affected noise sensitive receiver:* *(i) Leq (15 minute) dB(A) noise levels greater than 5dB above the day, evening and night rating background level (RBL) as applicable; and* *(ii) L1(1 minute) dB(A) or LFmax dB(A) noise levels greater than 15dB above the night RBL for night works;* *(iii) continuous or impulsive vibration values greater than those for human exposure to*

	vibration, set out for residences in Table 2.2 in "Environmental noise management - Assessing Vibration: a technical guideline" (Department of Environment and Conservation, February 2006); and *(iv) intermittent vibration values greater than those for human exposure to vibration, set out for* *residences in Table 2.4 in "Environmental noise management - Assessing Vibration: a technical guideline" (Department of Environment and Conservation, February 2006);* ☐*None of the above – approval is required from DPIE. Describe below:*

Section 3: Impact Assessment	
Impacts **Describe impacts and any exceedances of the NML's**	
Mitigation Measures **List proposed mitigation measures .eg respite, noise barriers**	
Community Consultation **List community consultation carried out and any notifications issued**	

Section 4: Signoff
Project Engineer / Project Manager Name: ..... Signature: ..... Date: .....
HSEQ/ Environment Manager Name: ..... Signature: ..... Date: .....
Communications, Stakeholder and External Authorities Manager Name: ..... Signature: ..... Date: .....
Special Conditions / Comments

OUT OF HOURS WORK PROCEDURE



RESPONSIBILITIES

Environment Manager

- Review all documentation and sign off permits
- Complete noise predictions
- Conduct monitoring

Communications and Stakeholder Manager

- Notify affected stakeholders

Project Engineer

- Communicate requirements to subcontractor

Site Manager

- Manage works
- Enforce permit requirements

Subcontractor

- Comply with the permit

PROCEDURE

This is to be carried out in accordance with the following relevant plans

- Construction Environmental Management Plan
- Construction Noise and Vibration Management Plan

Inaudible works must meet the following criteria:

Leq (15 minute) dB(A) noise levels greater than 5dB above the day, evening and night rating background level (RBL) as applicable; and
(ii) L1(1 minute) dB(A) or LFmax dB(A) noise levels greater than 15dB above the night RBL for night works;
(iii) continuous or impulsive vibration values greater than those for human exposure to vibration, set out for residences in Table 2.2 in "Environmental noise management - Assessing Vibration: a technical guideline" (Department of Environment and Conservation, February 2006); and
(iv) intermittent vibration values greater than those for human exposure to vibration, set out for residences in Table 2.4 in "Environmental noise management - Assessing Vibration: a technical guideline" (Department of Environment and Conservation, February 2006)

The delivery of oversized plant or structures must be determined by the police or other public authorities to require special arrangements to transport along public roads

Emergency works are only to avoid the loss of life, damage to property or to prevent environmental harm

All OOHW must have appropriate justification. Eg, safety reasons, isolation, night road closures etc

Surrounding community and stakeholders must be notified as soon as possible prior to the works occurring

Appropriate mitigation measures will be considered for each scenario such as temporary noise barriers, respite offers etc.

Noise predictions will be completed for all activities

An OOHW Permit is required prior to any of proposed works occurring