

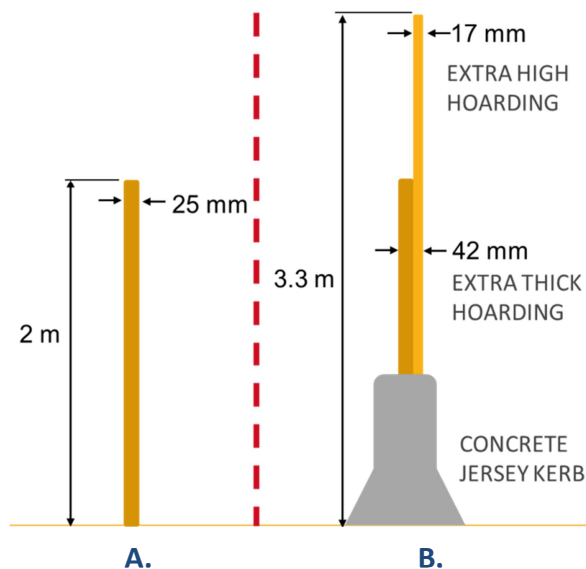
Appendix 3

Construction Impact Mitigation Measures

NSW Department of Planning & Infrastructure request for detail regarding the current standards that are required to be complied with in terms of construction impacts. This response considers the construction minimisation in terms of the conditions established in the Project Approval.

C1 Acoustic Fence

- 2m high acoustic barriers are to be installed around:
 - Darlington Public School
 - Boundary Lane Children's Centre
 - Mandelbaum House
- The acoustic barrier is to remain erected until such time as noise generated by construction works is no longer assessed as being adverse or intrusive.
- Material must have a minimum surface density of 12kg/m^2 .
 - Equivalent to 25mm thick timber



Acoustic fencing requirements of the Project Approval are shown in (A) as opposed to the measures JH has put in place along Darlington Public School and Boundary Lane Children's Centre.

C12 Noise Management Plan

- 1) Site specific Noise Management Plan shall be submitted to the Department for approval.

Approved 18 July 2013 by the Department of Planning & Infrastructure.

- 2) The Plan is to be prepared by a suitably qualified person who is eligible for the membership of either:
 - Australian Acoustic Society
 - Institution of Engineers Australia
 - Australian Association of Acoustic Consultants

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The Plan was developed by Marshall Day Acoustics, for John Holland. Marshall Day Acoustics have company membership with Australian Association of Acoustic Consultants.

3) The Plan must include

a) Level of community consultation

John Holland has in place a number of mechanisms to inform the community and stakeholders of construction activities and impacts as well methods to provide feedback as shown in the table below.

INFORM	DISTRIBUTION
Sensitive Receiver Update	Weekly
Community Newsletter	Quarterly
Methods for FEEDBACK / COMPLAINTS / ENQUIRIES	
Email	abercrombie.precinct@jh.com.au
Telephone	1800 855 262
Drop-In Session	Monthly – 1 st Thursday
Meetings	As required

b) Confirmation of **noise, vibration and dust monitoring methodology** that is to be undertaken during construction

John Holland has two Environment Control Plans (ECP; sub-plans of the Environmental Management Plan JH-B834-PLN-EMP-012) in place that govern mitigation methods and monitoring requirements for noise, vibration and dust. These are:

JH-B834-PLN-EMP-NVECP-012-005 Noise & Vibration Plan

JH-B834-PLN-EMP-NVECP-012-004 Air Quality & Visual Amenity Plan

A summary of monitoring requirements outlined in the above ECPs and the additional monitoring John Holland is undertaking is shown in the table below.

	Requirements outlined in the plan	Additional monitoring undertaken by JH
Noise	- Specialist contractor to undertake noise monitoring during the peak of each construction phase - Additional noise monitoring in response to complaints	Noise readings taken in 5 locations adjacent to site, 4 times per day
Vibration	Permanent vibration monitor at Mandelbaum House, the nearest representative location	
Dust	Air quality monitoring required in areas identified as containing contamination.	Air quality monitors set up on site for the duration of civil works

c) Course of action following a **complaint**

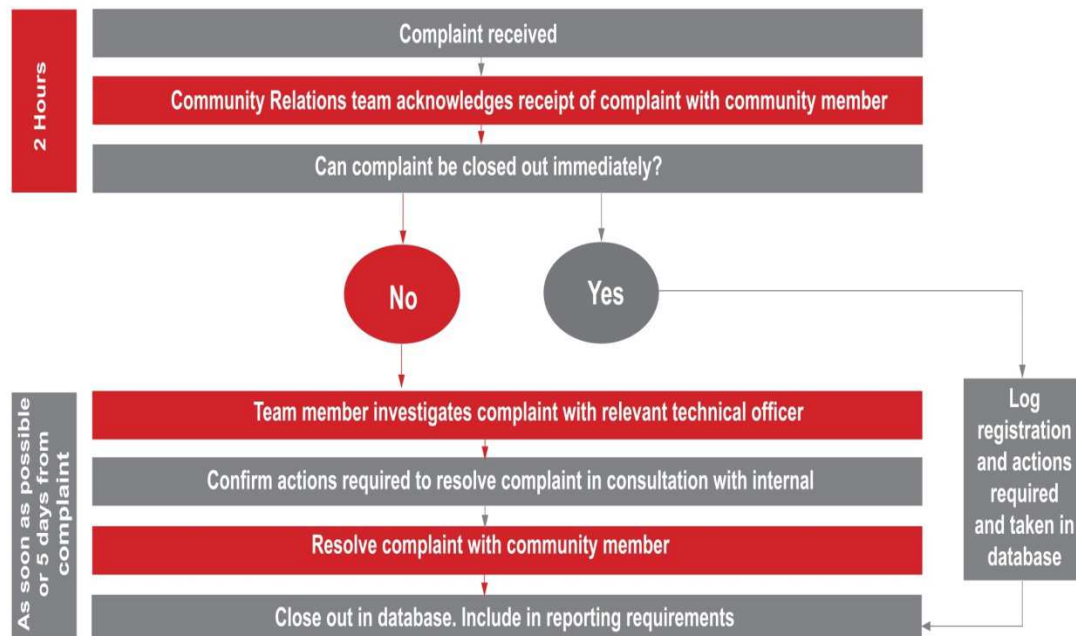
Complaints management is guided by the Stakeholder Consultation and Communications Management Plan (JH-B834-PLN-SCCP-003). The following taken directly from that plan.

A complaint is defined as any communication received from a stakeholder expressing dissatisfaction. This is a purposely broad definition and is used to

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ensure that matters of concern to stakeholders are addressed promptly. Complaints are an important feedback mechanism to improve project processes and mitigation measures to avoid or minimise further complaints.



Where a complainant indicates they are unsatisfied with the actions taken to respond to a complaint, the following process will be undertaken. Minutes will be documented at each stage of the resolution and mediation process, reviewed by the independent facilitator and provided to attendees for their records within five business days of the meeting.

Stage One - Complaint received via the complaints process and where possible, the project nominated person will act to resolve the issue as soon as possible

Stage Two - Where stage one is not successful and cannot be resolved within the complaints process timeframes, the stakeholder/community member will be invited to a meeting with the Project Director and the Community Liaison Manager.

Stage Three – If resolution is not found at stage two, the stakeholder/community member will be invited to meet with a representative from the client and the Project Director.

Stage Four - If the complaint still cannot be resolved the Project Director will escalate the complaint to the Director of Campus Infrastructure and Services for determination and final resolution.

Minutes will be documented at each stage of the resolution and mediation process, reviewed by the independent facilitator and provided to attendees for their records within five business days of the meeting.

- d) Details of **noise mitigation measures** that have been outlined by an acoustic engineer

As per the Construction Noise & Vibration Management Plan, the following are recommended by the acoustic consultant:

- Use of temporary structures & stockpiles as sound barriers

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- Reduce line of sight from noise sources
- Broadband noise generating reverse alarms instead of beepers
- Avoid unnecessary revving of engines
- Switch off engines when not in use

- e) What plant & equipment is to be used:
- Sound mitigation measures to be undertaken in each case
 - Criteria adopted in selection
 - Other less intrusive technologies available

The Construction Noise & Vibration Management Plan considers the noise impacts associated with the construction methodology and individual plant.

Specifically, the following are in place:

- Mufflers on machinery – where safe to do so
- Use of electrical cranes instead of diesel cranes
- Selection of new (where possible) or well maintained machinery
- Take advantage of school holidays

D12 Construction Noise Management

- 1) Do not exceed requirements of the EPA *Interim Construction Noise Guidelines*

Focus on applying a range of work practices most suited to minimise construction noise impacts, rather than focusing only on achieving numeric noise levels.

Excerpt from Interim Construction Noise Guideline.

In alignment with the *Interim Construction Noise Guideline*, John Holland has a holistic approach to noise management that begins in the planning stages with the development of construction methodology and selection of plant to the implementation of controls (mufflers, acoustic fencing etc.) on site.

- 2) Background noise levels are those identified in the Environmental Assessment Rating Background Levels (RBL) readings taking in November 2011 and reported in the March 2012 Environmental Assessment prepared by Marshall Day Acoustics.

Period	Time Period	RBL (dBA)
120 Darlington Road (from lane)		
Day	0700 – 1800	44
Evening	1800 – 2200	43
Night	2200 – 0700	39
422 Abercrombie Street		
Day	0700 – 1800	45
Evening	1800 – 2200	43
Night	2200 – 0700	39

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The RBL is used to determine the Management Level for each land use. The Management Level is an indication of regular noise level, above which people are expected to notice a change in regular activities. Marshall Day Acoustics have determined an estimated average and worst case noise level for construction activities at each sensitive receiver in comparison to this Management Level.

The Marshall Day Acoustics Management Plan references the *Interim Construction Noise Guidelines* for an estimated background level at Darlington Public School in the absence of a reading:.

Land Use	Management Level
Classrooms	45 dB(A)

- 3) Any activities that have the potential for noise emissions that exceed the objective much be identified and managed in accordance with the Noise Management Plan
- Selection of plant with a low inherent potential for noise and vibration generation.
 - All feasible and reasonable work practices be employed to minimise offensive noise.
 - Where it is anticipated that the management level will be exceeded, all potentially impacted receivers should be informed.

- 4) If the noise from a construction activity is substantially tonal or impulsive in nature, 5dB(A) must be added to measured construction noise level when comparing the noise with the construction noise objective

Noted.

- 5) Respite period from:
- › Rock breaking & hammering
 - › Sheet piling
 - › Pile driving
 - › Or similar

Respite	From	To
School Days	1000	1430
School Holidays	1200	1400
Saturdays	0900	1300

Details of the respite period are included in the project specific induction and reinforced periodically at pre-start meetings.

- 6) Bored piling is the preferred piling method (as opposed to driven piles)
Piling methods used on site include bored piling with potential to utilise continuous flight augers in tight spaces.

D13 Construction Noise Management

Any noise generated during construction must not be offensive noise:

- Defined by *Protection of Environment Operations Act 1997 (NSW)*
- Or exceed approved noise limits for subject site

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“Offensive noise “ means noise:

- a) that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:
 - i) is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or
 - ii) interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or
- b) that is of a level, nature and character or quality prescribed by the regulations or that is made at a time, or in other circumstances, prescribed by the regulations.

Excerpt from *Protection of Environment Operations Act 1997 (NSW)*

D14 Vibration Criteria

Vibration caused by construction at any residence or structure outside the subject site must be limited to:

- a) for structural damage vibration, *German Standard DIN4150 Part 3 Structural vibration – Effects of vibration on structures*

The information below is taken from *German Standard DIN4150 Part 3 Structural vibration – Effects of vibration on structures* and is repeated in the Construction Noise & Vibration Management Plan. The guideline values are conservative figures for structures that are to be potentially exposed to vibration in the long term.

Line	Type of structure	Guideline values for velocity, in mm/s of vibration in horizontal plane of highest floor, at all frequencies
I	Buildings used for commercial purposes, industrial buildings, and buildings of similar design	10
II	Dwellings and buildings of similar design and/or occupancy	5
III	Structures that, because of their particular sensitivity to vibration, cannot be classified under lines I and II and are of great intrinsic value (e.g. listed buildings under preservation order)	2.5

- b) for human exposure to vibration, the evaluation criteria presented in the EPA *Interim Construction Noise Guideline*

The *Interim Construction Noise Guideline* refers to *Assessing Vibration: A technical guideline* (Department of Environment & Conservation NSW, February 2006). The following is an excerpt from this Guideline, Section 2.5 Short Term Work.

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When short-term works such as piling, demolition and construction give rise to impulsive vibrations, undue restriction on vibration values may significantly prolong these operations and result in greater annoyance. Short-term works are works that occur for a duration of approximately one week.

In circumstances where work is short term, feasible and reasonable mitigation measures have been applied, and the project has a demonstrated high level of social worth and broad community benefits, then higher vibration values (above the maximum) may apply. In such cases, best management practices should be used to reduce values as far as practicable, and a comprehensive community consultation program should be instituted. An example of a possible management strategy would be to restrict the times during which high vibration values occur to the least sensitive times of the day. Typical issues covered in a consultation program include a public contact point for handling complaints, and early notification of proposed operations and any significant change to operations.

D19 Dust Control Measures

Dust control measures are to be in place or are to be undertaken for the duration of works to prevent dust from affecting the amenity of the immediate area during construction. The proponent is to carry out works generally in accordance with the Construction Management Plan, and controls are to be maintained at design level throughout the duration of the works, and are to be inspected for this purpose at frequent intervals. Any deficiencies are to be immediately made good.

Since construction began, John Holland has undertaken dust control measures in accordance with the standard practice. In an effort to further reassure the community that John Holland has everybody's best interest in mind, the control measures were increased and refined so as to be an example of best practice in the industry. The table below provides a summary of dust control measures originally in place and the additional measures.

Standard Practice	Best Practice
Water suppression: - Hoses - Water carts (use limited due to small site)	Additional water suppression: - Misting system along Darlington PS boundary - Timed sprinklers for overnight and weekends when conditions are hot, dry and windy
Physical barriers: - Temporary fencing with mesh cover - Timber hoarding along Darlington PS & BLCC in accordance with Condition C1	Improved physical barriers: - Raised height of the timber fencing along Darlington PS & BLCC
Minimise exposed soil	
Stabilise long term stockpiles (> 10days) with covers	Stabilise stockpiles with geo-textiles when not in use when conditions are hot, dry and windy